



## HIGHWAYS INFRASTRUCTURE TRUST

(Registered in the Republic of India as an irrevocable trust set up under the Indian Trusts Act, 1882 and registered as an infrastructure investment trust under the Securities and Exchange Board of India (Infrastructure Investment Trusts) Regulations, 2014, as amended ("InvIT Regulations") on December 23, 2021 having registration number IN/InvIT/21-22/0019)

**Principal place of business:** 2<sup>nd</sup> Floor, Piramal Tower, Peninsula Corporate Park, Lower Parel, Mumbai 400 013, Maharashtra;  
**Tel:** +91 98205 50707; **Compliance Officer:** Charmy Bhoot  
**E-mail:** highwayinvit@virescent.co.in ; **Website:** www.highwaystrust.com

<b>Sponsor</b> Galaxy Investments II Pte. Ltd.	<b>Investment Manager</b> Virescent Infrastructure Investment Manager Private Limited	<b>Trustee</b> Axis Trustee Services Limited

Initial offer by Highways Infrastructure Trust ("Highways Trust") by way of fresh issue of 4,16,00,000\* Units through a private placement at a price of ₹100 per Unit (the "Issue Price"), aggregating to ₹4,160 million (the "Issue").

\*Subject to allotment of units by the board of directors of the Investment Manager or a committee thereof

**THE ISSUE, AND THE DISTRIBUTION OF THIS FINAL PLACEMENT MEMORANDUM, IS BEING MADE ONLY TO THE BIDDERS IN RELIANCE UPON REGULATION 14(2) OF THE INVIT REGULATIONS.**

The Units are proposed to be listed on the National Stock Exchange of India Limited (the "NSE" or the "Stock Exchange"). In-principle approval for listing of the Units has been received from the NSE on April 27, 2022 along with an extension letter dated July 15, 2022. NSE is the Designated Stock Exchange. Applications shall be made to the Stock Exchange for obtaining the final listing and trading approval for the Units to be Allotted pursuant to the Issue. The Stock Exchange assumes no responsibility for the correctness of any statements made, opinions expressed or reports contained herein. Admission of the Units to be Allotted pursuant to the Issue for trading on the Stock Exchange should not be taken as an indication of the merits of the Highways Trust or of the Units.

A copy of the Draft Placement Memorandum, the Placement Memorandum and this Final Placement Memorandum has been delivered to the Securities and Exchange Board of India (the "SEBI") and the Stock Exchange. This Final Placement Memorandum has not been, and will not be, registered as a prospectus, will not be circulated or distributed to the public at large in India or any other jurisdiction, and will not constitute a public offer in India or any other jurisdiction.

This is an initial offer of Units by way of fresh issue and there is no pre-existing formal market for the Units. The Issue Price (determined and justified in accordance with the InvIT Regulations by the Investment Manager in consultation with the Lead Manager), should not be taken to be indicative of the market price of the Units, after the Units are listed. No assurance can be given regarding an active or sustained market for trading in the Units or regarding the price at which the Units will be traded after listing.

The Investment Manager, having made all reasonable inquiries confirms that this Final Placement Memorandum contains all information with regard to the Highways Trust, the Units and the Issue, which is material in the context of the Issue, that the information contained in this Final Placement Memorandum is true, correct and adequate in all material aspects and is not misleading in any material respect, that the opinions and intentions expressed herein are honestly held and have been reached after considering all relevant circumstances and are based on reasonable assumptions and information presently available with the Investment Manager and that there are no other facts, the omission of which makes this Final Placement Memorandum as a whole or any of such information or the expression of any such opinions or intentions misleading in any material respect.

The Units have not been and will not be registered under the United States Securities Act of 1933, as amended (the "Securities Act") and may not be offered or sold within the United States except pursuant to an exemption from, or in a transaction not subject to, the registration requirements of the Securities Act and applicable U.S. state securities laws. Accordingly, the Units are being offered and allotted outside the United States in offshore transactions in reliance on Regulation S under the Securities Act ("Regulation S") and applicable law of the jurisdictions where such offers and allotments occur.

**THIS FINAL PLACEMENT MEMORANDUM IS PERSONAL TO THE BIDDERS AND DOES NOT CONSTITUTE AN ISSUE OR INVITATION OR SOLICITATION OF AN ISSUE TO THE PUBLIC OR ANY OTHER PERSON OR CLASS OF INVESTORS WITHIN OR OUTSIDE INDIA. THIS FINAL PLACEMENT MEMORANDUM HAS BEEN PREPARED BY THE HIGHWAYS TRUST SOLELY FOR PROVIDING INFORMATION IN CONNECTION WITH THE ISSUE.**

**YOU MAY NOT, AND ARE NOT AUTHORISED TO, (1) DELIVER THIS FINAL PLACEMENT MEMORANDUM TO ANY OTHER PERSON; OR (2) REPRODUCE THIS FINAL PLACEMENT MEMORANDUM IN ANY MANNER WHATSOEVER. ANY DISTRIBUTION OR REPRODUCTION OF THIS FINAL PLACEMENT MEMORANDUM, IN WHOLE OR IN PART, IS UNAUTHORISED. FAILURE TO COMPLY WITH THIS INSTRUCTION MAY RESULT IN A VIOLATION OF THE INVIT REGULATIONS, AND/ OR OTHER APPLICABLE LAWS OF INDIA AND/ OR OF OTHER JURISDICTIONS.**

### RISKS IN RELATION TO THE ISSUE

INVESTMENTS IN UNITS INVOLVE RISKS AND ELIGIBLE INVESTORS SHOULD NOT INVEST ANY FUNDS IN THE ISSUE UNLESS THEY CAN AFFORD TO TAKE THE RISK OF LOSING ALL OR PART OF THEIR INVESTMENT. FOR MAKING AN INVESTMENT DECISION, ELIGIBLE INVESTORS MUST RELY ON THEIR OWN EXAMINATION OF THE HIGHWAYS TRUST, THE UNITS, THE ISSUE AND THE PLACEMENT MEMORANDUM. ELIGIBLE INVESTORS ARE ADVISED TO CAREFULLY READ THE PLACEMENT MEMORANDUM, INCLUDING THE SECTIONS ENTITLED 'RISK FACTORS' AND 'RIGHTS OF UNITHOLDERS' ON PAGES 54 AND 283, RESPECTIVELY, BEFORE MAKING AN INVESTMENT DECISION. THE UNITS HAVE NOT BEEN RECOMMENDED OR APPROVED BY SEBI NOR DOES THE SEBI GUARANTEE THE ACCURACY OR ADEQUACY OF THE CONTENTS OF THIS FINAL PLACEMENT MEMORANDUM. THE ELIGIBLE INVESTORS ARE ADVISED TO CONSULT THEIR OWN ADVISORS ABOUT THE CONSEQUENCES OF AN INVESTMENT IN THE UNITS BEING ISSUED PURSUANT TO THE PLACEMENT MEMORANDUM AND THIS FINAL PLACEMENT MEMORANDUM.

Unless a serially numbered Placement Memorandum along with an Application Form was addressed to Eligible Investors, no invitation to offer shall be deemed to have been made to the Eligible Investors to make an offer to subscribe to Units on private placement basis pursuant to the Issue. For further details, please see the section 'Issue Procedure' on page 288. The distribution of the Draft Placement Memorandum, the Placement Memorandum and this Final Placement Memorandum or the disclosure of its contents without the Trustee's or Investment Manager's prior consent to any person other than the Eligible Investors is unauthorised and prohibited. Each addressee, by accepting delivery of this Final Placement Memorandum, agrees to observe the foregoing restrictions and to make no copies of this Final Placement Memorandum or any documents referred to in this Final Placement Memorandum. The information on the Sponsor's, Investment Manager's, Project Manager's, Lead Manager's or Highways Trust's website, as applicable, any website directly or indirectly linked to such websites, or the website of the Trustee does not form part of this Final Placement Memorandum and Eligible Investors should not and shall not be entitled to rely on such information contained in, or available through, any such websites.

<b>LEAD MANAGER</b> 	<b>REGISTRAR AND UNIT TRANSFER AGENT</b> 
<b>Axis Capital Limited</b> Axis House, 1 <sup>st</sup> Floor, Wadia International Centre, Pandurang Budhkar Marg, Worli Mumbai – 400 025 <b>Tel.:</b> + 91 22 4325 2183 <b>E-mail:</b> highways.invit@axiscap.in <b>Website:</b> www.axiscapital.co.in <b>Investor grievance mail:</b> compliants@axiscap.in <b>Contact Person:</b> Harish Patel/Akash Aggarwal <b>SEBI Registration No:</b> INM000012029	<b>Link Intime India Private Limited</b> 247 Park, C-101 1st Floor, L B S Marg Vikhroli (West) Mumbai 400 083 Maharashtra, India <b>Tel:</b> +91 22 4918 6000 <b>E-mail:</b> ajit.patankar@linkintime.co.in <b>Website:</b> www.linkintime.co.in <b>Contact Person:</b> Ajit Patankar <b>SEBI Registration No.:</b> INR000004058

## TABLE OF CONTENTS

NOTICE TO THE ELIGIBLE INVESTORS .....	1
DEFINITIONS AND ABBREVIATIONS .....	6
PRESENTATION OF FINANCIAL DATA AND OTHER INFORMATION.....	12
FORWARD-LOOKING STATEMENTS.....	14
THE ISSUE .....	16
OVERVIEW OF THE HIGHWAYS TRUST .....	18
FORMATION TRANSACTIONS IN THE HIGHWAYS TRUST .....	20
SUMMARY COMBINED FINANCIAL INFORMATION OF THE HIGHWAYS TRUST .....	25
SUMMARY FINANCIAL INFORMATION OF THE SPONSOR.....	30
SUMMARY FINANCIAL INFORMATION OF THE INVESTMENT MANAGER.....	35
SUMMARY OF INDUSTRY .....	40
SUMMARY OF BUSINESS .....	46
RISK FACTORS .....	54
GENERAL INFORMATION .....	97
PARTIES TO THE HIGHWAYS TRUST .....	101
OTHER PARTIES INVOLVED IN THE HIGHWAYS TRUST .....	139
CORPORATE GOVERNANCE .....	143
INDUSTRY OVERVIEW .....	150
BUSINESS.....	168
SUMMARY OF CONCESSION AGREEMENTS .....	189
INFORMATION CONCERNING THE UNITS.....	213
USE OF PROCEEDS .....	214
FINANCIAL INDEBTEDNESS .....	216
DISTRIBUTIONS.....	220
DISCUSSION AND ANALYSIS BY THE DIRECTORS OF THE INVESTMENT MANAGER OF THE FINANCIAL CONDITION, RESULTS OF OPERATIONS AND CASH FLOWS OF THE PROJECT SPVS OF THE HIGHWAYS TRUST.....	223
RELATED PARTY TRANSACTIONS.....	253
REGULATIONS AND POLICIES .....	262
REGULATORY APPROVALS.....	270
LEGAL AND OTHER INFORMATION.....	274
SECURITIES MARKET OF INDIA .....	279
SELLING AND TRANSFER RESTRICTIONS.....	281
RIGHTS OF UNITHOLDERS .....	283
DILUTION .....	286
ISSUE STRUCTURE .....	287
ISSUE PROCEDURE.....	288
STATEMENT OF TAX BENEFITS.....	296
LEGAL MATTERS.....	308
INDEPENDENT ACCOUNTANTS.....	309
SPECIAL PURPOSE COMBINED FINANCIAL STATEMENTS.....	310
PROJECTIONS OF REVENUE FROM OPERATIONS AND CASH FLOW FROM OPERATING ACTIVITIES.....	392
MATERIAL CONTRACTS AND DOCUMENTS FOR INSPECTION .....	402
DECLARATION .....	404
ANNEXURE I - VALUATION REPORT	
ANNEXURE II - TECHNICAL REPORT	
ANNEXURE III – TRAFFIC CONSULTANT’S REPORT	

## NOTICE TO THE ELIGIBLE INVESTORS

The statements contained in this Final Placement Memorandum relating to the Highways Trust and the Units are material, true, correct and adequate and not misleading in all material respects to enable investors to make an informed decision. The opinions and intentions expressed in this Final Placement Memorandum with regard to the Highways Trust and the Units are honestly held, have been reached after considering all relevant circumstances and are based on reasonable assumptions and information presently available with the Investment Manager, or the Sponsor, or both, as applicable. There are no other facts in relation to the Highways Trust and the Units, the omission of which would, in the context of the Issue, make any statement in this Final Placement Memorandum misleading in any material respect. Further, each of the Investment Manager Trustee and the Sponsor, has made all reasonable enquiries to ascertain such facts and to verify the accuracy of all such information and statements disclosed in this Final Placement Memorandum.

The Lead Manager nor any of its shareholders, employees, counsel, officers, directors, representatives, agents, associates or affiliates make any express or implied representation, warranty or undertaking and accept no responsibility or liability as to the accuracy or completeness of the information contained in this Final Placement Memorandum or any other information supplied in connection with the Issue or the distribution of the Units, other than in relation to themselves. Each Eligible Investor receiving this Final Placement Memorandum acknowledges that such person has neither relied on the Lead Manager, or any financial, legal or other advisors to the Sponsor nor any of their shareholders, employees, counsel, officers, directors, representatives, agents, associates or affiliates in connection with their investigation of the accuracy of such information or such person's investment decision. Each Eligible Investor must rely on its own examination of the Highways Trust and the merits and risks involved in investing in the Units. The Eligible Investors should not construe the contents of this Final Placement Memorandum as legal, tax, accounting or investment advice. The Eligible Investors receiving this Final Placement Memorandum acknowledge that in making an investment decision, they have relied solely on the information contained in this Final Placement Memorandum and not on any other disclosure or representation by the Investment Manager, Sponsor, Trustee or any of their respective financial, legal or other advisors or other party.

No person is authorized to give any information or to make any representation not contained in this Final Placement Memorandum and any information or representation not so contained must not be relied upon as having been authorized by or on behalf of the Trust or by, or on behalf, of the Sponsor, the Investment Manager or the Lead Manager. The delivery of this Final Placement Memorandum, at any time, does not imply that the information contained in it, is correct as of any time subsequent to its date. This Final Placement Memorandum is personal to the Eligible Investors. This Final Placement Memorandum shall not be relied upon by, and the Investment Manager, Sponsor, Trustee or the Project Manager and/ or the Lead Manager shall not be liable to any subsequent acquirer, transferee or investor of the Units.

This Final Placement Memorandum contains summaries of some terms of certain documents which are qualified in their entirety by the terms and conditions of those documents.

The distribution of the Placement Memorandum and this Final Placement Memorandum or the disclosure of their contents to any person, other than the Eligible Investors to whom it is addressed and retained by the Eligible Investors to enable them to make a decision with respect to its subscription to the Units, is unauthorised and prohibited. The Eligible Investors, by accepting delivery of this Final Placement Memorandum, agree to observe the foregoing restrictions and make no copies of the Draft Placement Memorandum, the Placement Memorandum, this Final Placement Memorandum or any other material in connection with the Issue or the Units.

### **Certain U.S. Matters**

The Units have not been, and will not be, registered under the Securities Act or any other applicable state securities laws of the U.S. and, unless so registered, may not be offered or sold within the U.S. except pursuant to an exemption from, or in a transaction not subject to, the registration requirements of the Securities Act and applicable state securities laws. Accordingly, the Units are being offered and sold only outside the United States in offshore transactions in reliance on Regulation S, in compliance with the applicable laws of the jurisdictions where those offers and sales occur.

The Eligible Investors will be deemed to have made the representations, agreements and acknowledgments as described in the section entitled '*Notice to the Investors – Representations by the Eligible Investors*' on page 2

**THE UNITS OFFERED HEREBY HAVE NOT BEEN AND WILL NOT BE REGISTERED WITH, OR APPROVED OR DISAPPROVED BY THE U.S. SECURITIES AND EXCHANGE COMMISSION (THE “SEC”) OR ANY STATE SECURITIES COMMISSION IN THE U.S. OR ANY OTHER U.S. REGULATORY AUTHORITY. ACCORDINGLY, THE UNITS MAY NOT BE OFFERED, SOLD, RESOLD OR OTHERWISE TRANSFERRED WITHIN THE UNITED STATES OR THE TERRITORIES OR POSSESSIONS THEREOF, EXCEPT IN A TRANSACTION EXEMPT FROM THE REGISTRATION REQUIREMENTS OF THE SECURITIES ACT. THE UNITS REFERRED TO IN THIS FINAL PLACEMENT MEMORANDUM ARE BEING OFFERED AND SOLD IN OFFSHORE TRANSACTIONS OUTSIDE THE UNITED STATES IN COMPLIANCE WITH REGULATION S UNDER THE SECURITIES ACT TO PERSONS LOCATED IN JURISDICTIONS WHERE SUCH OFFER AND SALE OF THE UNITS IS PERMITTED UNDER LAWS OF SUCH JURISDICTIONS. THE OFFERING TO WHICH THIS FINAL PLACEMENT MEMORANDUM RELATES IS NOT, AND UNDER NO CIRCUMSTANCES IS TO BE CONSTRUED AS, AN OFFERING OF ANY UNITS FOR SALE IN THE UNITED STATES OR AS A SOLICITATION THEREIN OF AN OFFER TO BUY ANY OF THE SAID SECURITIES. ACCORDINGLY, YOU SHOULD NOT FORWARD OR TRANSMIT THIS FINAL PLACEMENT MEMORANDUM IN OR INTO THE UNITED STATES AT ANY TIME. FURTHERMORE, THE FOREGOING AUTHORITIES HAVE NOT PASSED ON OR ENDORSED THE MERITS OF THE OFFERING OR THE ACCURACY OR ADEQUACY OF THIS FINAL PLACEMENT MEMORANDUM. ANY REPRESENTATION TO THE CONTRARY IS A CRIMINAL OFFENSE IN THE U.S.**

#### **Notice to Investors in certain other jurisdictions**

The distribution of the Draft Placement Memorandum, the Placement Memorandum, this Final Placement Memorandum and the issue of the Units in certain jurisdictions may be restricted by law. As such, neither the Draft Placement Memorandum, the Placement Memorandum nor this Final Placement Memorandum shall constitute, or be used for, or in connection with, an offer or solicitation by anyone in any jurisdiction in which such offer or solicitation is not authorised or to any person to whom it is unlawful to make such offer or solicitation. In particular, no action has been taken by the Investment Manager or the Lead Manager which would permit an issue of the Units in any jurisdiction other than India. Accordingly, the Units may not be offered or sold, directly or indirectly, and neither the Draft Placement Memorandum, the Placement Memorandum, this Final Placement Memorandum nor any Issue materials in connection with the Units be distributed or published in or from any country or jurisdiction that would require registration of the Units in such country or jurisdiction.

#### **Representations by the Eligible Investors**

References herein to “you” or “your” is to the Eligible Investors in the Issue.

By purchasing, or subscribing to the Units pursuant to the Issue, you are deemed to have represented to the Trustee, the Investment Manager, the Sponsor and the Lead Manager, and you acknowledge and agree as follows:

1. You are permitted to acquire the Units under the laws of all applicable jurisdiction and that you have necessary capacity and authority, and have obtained all necessary consents and authorisations to enable you to commit to this participation in the Issue and to perform your obligations in relation thereto (including, without limitation, on behalf of any person) and honour such obligations;
2. You undertake to (i) hold, manage or dispose of any Units that are Allotted to you in accordance with the InvIT Regulations and all other applicable laws; and (ii) to comply with all requirements under applicable law in relation to reporting obligations, if any, in this relation;
3. You have been provided a serially numbered copy of the Placement Memorandum and this Final Placement Memorandum and will be deemed to have read the Placement Memorandum and this Final Placement Memorandum in its entirety, including, in particular, the section entitled “*Risk Factors*” on page 54;
4. You will make all necessary filings and reportings, in relation to the Issue and your investment in Units, with appropriate governmental, statutory or regulatory authorities, including the RBI, as may be required, in accordance with applicable law in your respective jurisdiction;
5. You agree to provide on request in a timely manner, and consent to the use and disclosure (including to any taxation or other regulatory authorities) of, any information or documentation in relation to yourself and, if and to the extent required, the direct or indirect beneficial ownership of your Units (if any), as may be necessary for the Highways Trust (or the Trustee and its agents) and the Investment Manager to

comply with any regulatory obligations and/or appropriate withholding of taxes in accordance with the IT Act or other penalties under FATCA, the CRS or other similar exchange of tax information regimes, as maybe applicable. You acknowledge and agree that you shall have no claim against the Highways Trust (or the Trustee and its agents) and the Investment Manager for any losses suffered by you (including in relation to the direct or indirect beneficial ownership of your Units (if any)) as a result of such use by or disclosure of such information or documentation to, any relevant regulatory, governmental or statutory authority;

6. You are aware that the Units have not been, and will not be registered through a prospectus under the InvIT Regulations, or under any other law in force in India. This Final Placement Memorandum has been submitted to the SEBI and Stock Exchange and would be displayed on the website of SEBI and the Stock Exchange;
7. You confirm that, either: (i) you have not participated in or attended any investor meetings or presentations by the Highways Trust or its agents (“**Presentations**”) with regard to the Trust, the Units or the Issue; or (ii) if you have participated in or attended any Presentations, you understand and acknowledge that the Lead Manager, the Investment Manager, the Sponsor or the Trustee may not have knowledge of the statements that the Highways Trust or its agents may have made at such Presentations and are therefore unable to determine whether the information provided to you at such Presentations may have included any material misstatements or omissions, and, you acknowledge that the Lead Manager, the Trustee (or its agents), the Investment Manager or the Sponsor have advised you not to rely in any way on any information that was provided to you at such Presentations;
8. None of the Sponsor, the Investment Manager, the Trustee or the Lead Manager or any of their respective shareholders, directors, officers, employees, counsel, representatives, agents or affiliates is making any recommendations to you or advising you regarding the suitability of any transactions it may enter into in connection with the Issue and that participation in the Issue is on the basis that you are not and will not, up to the Allotment, be a client of the Lead Manager. None of the Sponsor, the Trustee, the Investment Manager, the Lead Manager or any of their respective shareholders, employees, counsel, officers, directors, representatives, agents or affiliates have any duties or responsibilities to you for providing the protection afforded to their clients, or for providing advice in relation to the Issue and are in no way acting in a fiduciary capacity towards you;
9. All statements, other than statements of historical fact included in this Final Placement Memorandum, including, without limitation, those regarding the Highways Trust’s financial position, business strategy, plans and objectives for future operations, the Investment Objectives, and the Projections, are forward-looking statements. Such forward-looking statements involve known and unknown risks, uncertainties and other important factors that could cause actual results to be materially different from the results, performance or achievements expressed or implied by such forward-looking statements. Such forward-looking statements are based on numerous assumptions regarding the Highways Trust’s present and future business strategies and the environment in which the Highways Trust will operate in the future. You should not place undue reliance on forward-looking statements, which speak only as of the date of this Final Placement Memorandum. The Highways Trust, the Trustee, the Sponsor, the Investment Manager and the Lead Manager or any of their respective shareholders, directors, officers, employees, counsel, representatives, agents, associates or affiliates assume no responsibility to update any of the forward-looking statements contained in this Final Placement Memorandum;
10. You are aware and understand that the Units are being offered only to you and are not being offered to the general public and the Allotment shall be on a discretionary basis;
11. You understand that the Units have not been, and will not be, registered under the Securities Act or with any securities regulatory authority of any state of the United States and accordingly, may not be offered or sold within the United States, except in reliance on an exemption from the registration requirements of the Securities Act; the Units are being offered and sold outside the United States in an offshore transaction within the meaning of Regulation S and the applicable law of the jurisdictions in which those offers and sales occur. You are not in United States and are eligible to acquire, and are acquiring, the Units in an offshore transaction meeting the requirements of Regulation S. You further understand that no offer or sale of the Units is the result of any “directed selling efforts” in the United States (as such term is defined in Regulation S). You further acknowledge and agree that Highways Trust and the Lead Manager, and their respective affiliates and representatives (including their legal counsel), will rely upon the truth and accuracy of the foregoing acknowledgements, representations, warranties and agreements and agree that, if at any time any of the acknowledgements, representations, warranties and agreements

made in connection with the Units is no longer accurate, it shall immediately notify Highways Trust and the Lead Manager in writing;

12. In making your investment decision, you have (i) relied on your own examination of the Highways Trust, the Units and the terms of the Issue, including the merits and risks involved, (ii) consulted your own independent advisors or otherwise have satisfied yourself concerning, without limitation, the effects of local laws; (iii) relied solely on the information contained in the Draft Placement Memorandum and the Placement Memorandum and no other disclosure or representation by the Sponsor or the Investment Manager, any of their respective financial, legal or other advisors or any other party; and (iv) received all information in the Placement Memorandum that you believe is necessary or appropriate in order to make an investment decision in respect of Highways Trust and the Units;
13. You have such knowledge and experience in financial, business and investment matters as to be capable of evaluating the merits and risks of an investment in the Units. You and any accounts for which you are subscribing to the Units, (i) are each able to bear the economic risk of the investment in the Units; (ii) will not, subject to the terms of this Final Placement Memorandum, look to any of the Investment Manager, the Trustee, the Sponsor or the Lead Manager or any of their respective shareholders, employees, counsel, officers, directors, representatives, financial advisors, agents or affiliates for all, or part, of any such loss or losses that may be suffered due to your investment in the Units; and (iii) are able to sustain a complete loss on the investment in the Units; (iv) have no need for immediate liquidity with respect to the investment in the Units, and (v) have no reason to anticipate any change in your or their circumstances, financial or otherwise, which may cause or require any sale or distribution by you or them of all or any part of the Units. You acknowledge that an investment in the Units involves a high degree of risk and that the Units are, therefore, a speculative investment. You are seeking to subscribe to the Units in the Issue for your own investment and not with a view to resell or distribute in any manner that could characterise you as an underwriter or similar party in any jurisdiction;
14. The Trustee, the Sponsor, the Investment Manager, the Lead Manager or any of their respective shareholders, directors, officers, employees, counsel, representatives, advisors, agents or affiliates have not provided you with any legal, financial or tax advice or otherwise made any representations regarding the tax consequences of the Units (including but not limited to, the Issue and the use of the proceeds of the Issue). You will obtain your own independent legal, financial or tax advice and will not rely on the Investment Manager, the Sponsor, the Trustee, the Lead Manager or any of their respective shareholders, employees, counsel, officers, directors, representatives, advisors, agents or affiliates or the Investment Manager when evaluating the tax consequences in relation to the Units (including but not limited to the Issue and the use of the proceeds of the Issue). You waive and agree not to assert any claim against the Lead Manager, the Sponsor, the Trustee or the Investment Manager with respect to the tax aspects of the Units or the Issue or as a result of any tax audits by tax authorities, in relation to the Units and the Issue, wherever situated;
15. You are not the Trustee, or the Valuer or an employee of the Valuer involved in the valuation of the Project SPVs;
16. You are aware that (i) we have received in-principle approval from NSE on April 27, 2022 along with an extension letter dated July 15, 2022, and (ii) the application for the final listing and trading approval will be made only after Allotment. There can be no assurance that the final approval for listing and trading of the Units will be obtained in a timely manner, or at all. The Highways Trust, the Trustee, the Investment Manager, Sponsor, shall not be responsible for any delay or non-receipt of such final approval (except to the extent prescribed under the InvIT Regulations) or any loss arising from such delay or non-receipt. Further, you shall not undertake any trade in the Units credited to your demat account until such time that the final listing and trading approval for the Units have been issued by the Stock Exchange;
17. You understand that, none of the Highways Trust, the Investment Manager, the Lead Manager or the Trustee has any obligation to purchase or subscribe to all, or any part, of the Units subscribed by you in the Issue or to support any losses directly or indirectly sustained or incurred by you for any reason whatsoever in connection with the Issue;
18. The only information you are entitled to rely on, and on which you have relied, in committing yourself to acquire the Units is contained in the Placement Memorandum, such information being all that you deem necessary to make an investment decision in respect of the Units and that you have neither received nor relied on any other information given or representations, warranties or statements made by the Trustee, the Lead Manager, the Investment Manager or the Sponsor, and neither the Trustee, the Lead

Manager, the Investment Manager nor the Sponsor will be liable for your decision to accept an invitation to participate in the Issue based on any other information, representation, warranty or statement that you have obtained or received;

19. You understand that the Units to be Allotted in this Issue will, when issued, be credited as fully paid and rank *pari passu* in all respects with all other Units, including in respect of the right to receive all distributions declared, made or paid in respect of the Units after the Allotment, except as permitted under applicable law. For details, please see the section entitled “*Distributions*” on page 220;
20. You are eligible to Bid for, and hold, Units, so Allotted. Your holding after the Allotment of the Units shall not exceed the investment level permissible as per any applicable law and regulation;
21. You agree to indemnify and hold the Highways Trust, the Trustee, the Investment Manager, the Sponsor and the Lead Manager harmless from any and all costs, claims, liabilities and expenses (including legal fees and expenses) arising out of or in connection with any breach of the representations and warranties in this section;
22. The Trustee, the Investment Manager, the Sponsor, the Lead Manager, their respective shareholders, employees, counsel, offices, directors, representatives, agents or affiliates, will rely on the truth and accuracy of the foregoing representations, warranties, acknowledgements and undertakings which are given to the Lead Manager on their own behalf and on behalf of the Highways Trust, the Sponsor, the Investment Manager, the Trustee, and the same are irrevocable;
23. You are eligible to invest in India and in the Units under applicable law, including the FEMA Rules, and have not been prohibited by SEBI or any other statutory, regulatory or judicial authority from buying, selling or dealing in securities;
24. Any dispute arising in connection with the Issue will be governed by, and construed in accordance with, the laws of the Republic of India and shall be subject to the jurisdiction of the courts at Mumbai, Maharashtra;
25. You have made the representations, warranties, acknowledgements and agreements provided in this section and each of the representations, warranties, acknowledgements and agreements set out above shall continue to be true and accurate at all times, until and including the Allotment of Units, listing and trading of Units in the Issue;
26. You are eligible to hold the Units, so Allotted. You are aware that your holding after the Allotment of the Units cannot exceed the investment level permissible as per any applicable law and regulations; and
27. You have made, or are deemed to have made, as applicable, the representations provided in the section entitled “*Selling and Transfer Restrictions*” on page 281.

#### **Available Information**

The Investment Manager agrees to comply with any undertakings given by it from time to time in connection with the Units and, without prejudice to the generality of foregoing, shall furnish to the Unitholders all such information as may be required under the InvIT Regulations.

## DEFINITIONS AND ABBREVIATIONS

*This Final Placement Memorandum uses certain definitions and abbreviations, which unless the context otherwise indicates or implies shall have the meanings ascribed to such terms herein and which you should consider when reading the information contained herein.*

*References to any legislation, act, regulation, rule, guideline, circular, notification, clarification or policy shall be to such legislation, act, regulation, rule, guideline, circular, notification, clarification or policy as amended, supplemented, or re-enacted from time to time and any reference to a statutory provision shall include any subordinate legislation made under that provision.*

*The words and expressions used in this Final Placement Memorandum, but not defined herein shall have the meaning ascribed to such terms under the InvIT Regulations, the SEBI Act, the Depositories Act, and the rules and regulations made thereunder.*

*Notwithstanding the foregoing, the terms not defined but used in the sections entitled ‘Risk Factors’, ‘Statement of Tax Benefits’, ‘Industry Overview’, ‘Business’, ‘Regulations and Policies’, ‘Special Purpose Combined Financial Statements’, ‘Legal and Other Information’ and ‘Projections of Revenue from Operations and Cash Flows from Operating Activities’ on pages 54, 296, 150, 168, 262, 310, 274 and 392, respectively, shall have the meanings ascribed to such terms in those respective sections.*

*In this Final Placement Memorandum, unless the context otherwise requires, a reference to “we”, “us” and “our” refers to the Highways Trust and the Project SPVs on a combined basis.*

### Highways Trust Related Terms

Term	Description
Associate	Associate shall have the meaning under Regulation 2(1)(b) of the InvIT Regulations
Auditor/ Statutory Auditor	Walker Chandiok & Co LLP
Business Support Services Agreement	The business support services agreements dated August 8, 2022 entered into between the Project SPVs, Project Manager and HC1. For details, please see the section entitled “ <i>Related Party Transactions – Business Support Services Agreement</i> ” on page 255
Capital Contribution	The total subscription amounts (either by way of cash or share swap or otherwise (including transfer of interest in the InvIT Assets by the Sponsor and any other entities)) received by the Trust from the Unitholders (including the Sponsor), for subscription of Units, in accordance with applicable law and the Highways Trust Documents, through private placement (as defined in the InvIT Regulations)
Completion Date	The date on which the first of the transactions contemplated under the Securities Purchase Agreement are complete
Concession Agreements	Collectively, the concession agreements entered into between the Project SPVs and the relevant concessioning authorities. For details, please see the section entitled “ <i>Summary of Concession Agreements</i> ” on page 289
DBCPL	Dewas Bhopal Corridor Private Limited
GEPL	Godhra Expressways Private Limited
HC1	Highway Concessions One Private Limited, an affiliate of the Sponsor
Highways Trust/Trust	Highways Infrastructure Trust
Highways Trust Assets	The aggregate of the immovable, movable and other assets and cash (including cash equivalents) owned by the Highways Trust, whether directly, or through holding companies or special purpose vehicles, and includes all rights, interests and benefits arising from and incidental to ownership of such assets, in accordance with the InvIT Regulations and applicable law
Highways Trust Documents	Trust Deed, the Investment Management Agreement, the Securities Purchase Agreement, PMA, any agreement between the Trustee and/or the Investment Manager and/or the Project Manager with respect to the Highways Trust or to which the Investment Manager or the Trustee is a party in their capacity as the manager or trustee of the Highways Trust or Units or any other obligations, securities or instruments as permitted under the applicable law, executed for the purpose of the Highways Trust, the Draft Placement Memorandum, the Placement Memorandum, this Final Placement Memorandum or any offer document, and such other documents in connection therewith, as originally executed and amended, modified, supplemented or restated from time to time
Investment Management Agreement	The investment management agreement dated December 6, 2021 entered into between Trustee (on behalf of Highways Trust) and the Investment Manager.
Investment Manager	Virescent Infrastructure Investment Manager Private Limited
Investment Objects	The investment objectives of the Trust, as provided in the section entitled “ <i>Overview of the Highways Trust</i> ” on page 18

<b>Term</b>	<b>Description</b>
JPEPL	Jodhpur Pali Expressway Private Limited
KKR	KKR & Co. Inc., and its subsidiaries (unless the context requires otherwise)
NBL	Nirmal BOT Limited
O&M Agreement(s)	The various agreements entered into by the Project SPVs with the O&M Contractors for the operations, maintenance and management activities of the respective Project SPVs. For details in relation to the O&M Agreements, please see the section entitled “ <i>Business – Key O&amp;M Agreements</i> ” on page 187
O&M Contractor(s)	The various third-party contractors undertaking the operations, maintenance and management activities of the Project SPVs in accordance with the O&M Agreements
Parties to the Highways Trust	Collectively, the Sponsor, the Trustee, the Investment Manager and the Project Manager
Project Management Agreement/ PMA	The project management agreement dated August 8, 2022 entered into amongst the Trustee, the Project Manager, the Investment Manager and the Project SPVs
Project Manager	Virescent Renewable Energy Project Manager Private Limited
Project SPVs	Unless the context otherwise requires, Dewas Bhopal Corridor Private Limited, Godhra Expressways Private Limited, Jodhpur Pali Expressway Private Limited, Ulundurpet Expressways Private Limited, Nirmal BOT Limited and Shillong Expressway Private Limited
Projections of Revenue from Operations and Cash Flow from Operating Activities or Projections	Statement of Projections of ‘Revenue from Operations’ and ‘Cash Flow from Operating Activities’ and the basis and notes to these projections along with significant assumptions underlying the Projections and other explanatory information of the Highways Trust and the following Project SPVs for the years ending 31 March 2023, 31 March 2024, 31 March 2025. For further details, please see the section entitled ‘ <i>Projections of Revenue from Operations and Cash Flows from Operating Activities</i> ’ on page 392.
Related Parties	Related parties of the Highways Trust, as defined under Regulation 2(1)(zv) of the InvIT Regulations
Reimbursement Agreement	The agreement dated August 8, 2022 entered into between the Investment Manager and HC1 in relation to reimbursement of costs. For details, please see the section entitled “ <i>Related Party Transactions – Reimbursement Agreement</i> ” on page 258
RPT Policy	Related Party Transactions Policy
SEPL	Shillong Expressway Private Limited
Securities Purchase Agreement	The securities purchase agreement dated August 8, 2022 executed between the Highways Trust (acting through the Trustee), the Investment Manager, the Sponsor, and the Project SPVs, in relation to the transfer of securities of the Project SPVs
Special Purpose Combined Financial Statements	The Special Purpose Combined Financial Statements of the Highways Trust which comprise the combined balance sheets as at March 31, 2022, March 31, 2021 and March 31, 2020, and the combined statements of profit and loss (including other comprehensive income), combined cash flow statements, combined statements of changes in equity, combined statements of net assets at fair value and combined statements of total returns at fair value for the years ended March 31, 2022, March 31, 2021 and March 31, 2020 and a summary of significant accounting policies and other explanatory information, prepared in accordance with the requirements of the InvIT Regulations and Ind AS on which the Auditors have issued an audit report dated July 8, 2022.
Sponsor	Galaxy Investments II Pte. Ltd.
Sponsor SPA 1	Share subscription and purchase agreements dated December 24, 2021 executed, amongst others, between the Sponsor and Ashoka Concessions Limited (“ <b>Ashoka</b> ”) for acquisition of 100% equity share capital of five entities held by Ashoka and/ or its affiliates
Sponsor SPA 2	Amended and restated share subscription and purchase agreement dated December 15, 2021 executed, amongst others between the Sponsor and India Infrastructure Fund II for acquisition of 76% of the equity share capital of an asset
Trust Deed	The trust deed dated December 3, 2021, entered into between the Sponsor and the Trustee
Trustee	Axis Trustee Services Limited
UEPL	Ulundurpet Expressways Private Limited
Unitholder	Any person who owns any Unit in the Highways Trust
Units	An undivided beneficial interest in the Highways Trust, and all issued and allotted Units together represent the entire beneficial interest in the Highways Trust
Virescent Infrastructure	The Investment Manager, Virescent Infrastructure Investment Manager Private Limited
Virescent Renewable	The Project Manager, Virescent Renewable Energy Project Manager Private Limited
Valuation Report	The valuation report dated June 30, 2022 issued by the Valuer
Valuer	S. Sundararaman
We/Us/Our	Unless the context otherwise requires or implies, the Highways Trust and the Project SPVs

## Issue Related Terms

Term	Description
Allocated/ Allocation	The allocation of Units, by the Investment Manager to Eligible Investors on the basis of the Application Form submitted by them.
Allot/ Allotment/ Allotted	Unless the context otherwise requires, the issue and allotment of Units to the Eligible Investors, pursuant to the Issue
Allottees	Bidders to whom Units are issued and Allotted pursuant to the Issue
Application Form	The serially numbered form pursuant to which Eligible Investors have submitted a Bid for the Units in the Issue
Bid(s)	Indication of interest of the Eligible Investor, as provided in the Application Form, to subscribe for the Units at the Issue Price, in terms of the Placement Memorandum and the Application Form
Bid Amount	The amount payable by a Bidder for the number of Units Bid for at the Issue Price specified in the Placement Memorandum
Bid/Issue Closing Date	August 22, 2022, which is the last date up to which the Application Forms have been accepted
Bid/Issue Opening Date	August 19, 2022, which is the date on which a serially numbered copy of the Placement Memorandum along with the Application Form was circulated to each Eligible Investor by the Investment Manager and the date from which, the Investment Manager accepted Application Forms
Bid/Issue Period	Period between the Bid/Issue Opening Date and the Bid/Issue Closing Date, inclusive of both days, during which Eligible Investors can submit their Bids
Bidder	Any Eligible Investor, who has made a Bid pursuant to the terms of the Placement Memorandum and the Application Form
Bid Lot	A minimum of 26,00,000 Units and in multiples of 2,00,000 Units thereafter
Body Corporate / Bodies Corporate	Body Corporate / Bodies corporate as defined in Regulation 2(1)(d) of the InvIT Regulations, whether Indian or foreign
Cash Escrow Account	'No-lien' and 'non-interest bearing' account opened with the Escrow Collection Bank and in whose favour Bidders should transfer money through direct credit/NEFT/NECS/RTGS in respect of the Bid Amount when submitting a Bid
Cash Escrow Agreement	The cash escrow agreement dated August 8, 2022 entered into amongst the Highways Trust (acting through the Trustee), the Investment Manager, the Lead Manager, the Sponsor and the Escrow Collection Bank, as applicable, for, among others, collection of the Bid Amounts and for remitting refunds, if any, of the amounts collected, to the Bidders
Client ID	Client identification number maintained with one of the Depositories in relation to a demat account
Closing Date	The date on which Allotment of Units pursuant to the Issue shall be made, i.e. on or about August 23, 2022
Demographic Details	Details of the Bidders, including the Bidder's address, investor status, occupation and bank account details
Designated Account	The account wherein the Bidders should transfer money through direct credit/NEFT/NECS/RTGS in respect of the Bid Amount when submitting a Bid
Designated Stock Exchange	National Stock Exchange of India Limited
Draft Placement Memorandum	The draft placement memorandum dated March 24, 2022, in relation to this Issue, filed with SEBI and the Stock Exchange, and issued in accordance with the InvIT Regulations, which does not contain the complete particulars of the Issue, including any modifications, amendments, supplements, notices, corrections or corrigenda thereto
Eligible Investors	Institutional Investors and Bodies Corporate, whether Indian or foreign
Escrow Collection Bank	Axis Bank Limited
Final Placement Memorandum	The Final Placement Memorandum dated August 22, 2022 to be issued in relation to this Issue, in accordance with the InvIT Regulations
Institutional Investors	Institutional investor as defined in Regulation 2(1)(ya) of the InvIT Regulations
Issue	The initial offer by way of fresh issue of 4,16,00,000* Units at an Issue Price of ₹100 per Unit, aggregating to ₹ 4,160 million, on a private placement basis to the Eligible Investors  *Subject to allotment of units by the Board or a committee thereof
Issue Price	₹ 100 per Unit, being the price at which Units will be Allotted to Eligible Investors in terms of the Placement Memorandum
Issue Proceeds	The proceeds of the Issue of ₹ 4,160 million.  For further details about the use of the Issue Proceeds, please see the section entitled "Use of Proceeds" on page 214
Issue Size	The initial offer by way of fresh issue of 4,16,00,000* Units aggregating to ₹4,160 million to the Eligible Investors

Term	Description
	<i>*Subject to allotment of units by the Board or a committee thereof</i>
Listing Agreement	The listing agreement to be entered into with the Stock Exchange by the Highways Trust, in line with the format as specified under the Securities and Exchange Board of India circular number CIR/CFD/CMD/6/2015 dated October 13, 2015 on “Format of uniform Listing Agreement”
Lead Manager	Axis Capital Limited
Listing Date	The date on which the Units will be listed on the Stock Exchange
Minimum Bid Size	₹260 million
Placement Agreement	The placement agreement dated March 23, 2022 entered into among the Highways Trust (acting through its Trustee), the Trustee, the Investment Manager, the Sponsor, the Project Manager and the Lead Manager
Placement Memorandum	The placement memorandum dated August 8, 2022 issued in relation to this Issue in accordance with the InVIT Regulations
Qualified Institutional Buyers or QIB(s)	Qualified institutional buyers, as defined under Regulation 2(1)(ss) of the SEBI ICDR Regulations, which currently includes (i) a mutual fund, a VCF, an AIF and an FVCI registered with SEBI, (ii) an FPI, other than individuals, corporate bodies and family offices, (iii) a public financial institution as defined in section 2(72) of the Companies Act, 2013, (iv) a scheduled commercial bank as included in the second schedule to the Reserve Bank of India Act, 1934, (v) a multilateral and bilateral development financial institution, (vi) a state industrial development corporation, (vii) an insurance company registered with the IRDAI, (viii) a provident fund with minimum corpus of ₹250 million, (ix) a pension fund with minimum corpus of ₹250 million, (x) National Investment Fund set up by resolution no. F. No. 2/3/2005-DDII dated November 23, 2005 of the Government published in the Gazette of India, (xi) insurance funds set up and managed by army, navy or air force of the Union of India, (xii) insurance funds set up and managed by the Department of Posts, India, and (xiii) systemically important non-banking financial companies
Registrar and Unit Transfer Agent or Registrar	Link Intime India Private Limited
Working Day	Working Day, with reference to (a) Bid/Issue Period, shall mean all days, excluding Saturdays, Sundays and public holidays, on which commercial banks in Mumbai are open for business; and (b) the time period between the Bid/Issue Closing Date and the listing of the Units on the Stock Exchange, shall mean all trading days of Stock Exchange, excluding Sundays and bank holidays

### Technical and Industry Related Terms

Term	Description
BOT	Build Operate and Transfer
COD	Commercial Operations Date
CRISIL	CRISIL Research
CRISIL Report	A report entitled “ <i>CRISIL Research – An assessment of the roads sector in India</i> ” dated February, 2022, prepared by CRISIL
DBFOT	Design, Build, Finance, Operate and Transfer
Lane kms	shall mean the length of the road calculating by considering length of each lane comprising such road
O&M	Operation and maintenance
PCOD	Provisional Commercial Operation Date
PCU	Passenger Car Unit
Technical Consultant	Samarth Infraengg Technocrats Pvt Ltd. for UEPL, GEPL, JPEPL and SEPL and Resotech Consultancy Services Pvt. Ltd. for DBCPL and NBL.
Technical Reports	The technical reports prepared by the Technical Consultant for each of the highway projects, together with the addendums attached as Annexure II
Traffic Study Report	The traffic reports prepared by the Traffic Study Consultant for each of the Project SPVs, attached as Annexure III
Traffic Study Consultant	Ramboll India Private Limited

### Abbreviations

Term	Description
AIF	Alternative Investment Fund as defined in and registered with SEBI under the SEBI AIF Regulations
Air Act	Air (Prevention and Control of Pollution) Act, 1981

<b>Term</b>	<b>Description</b>
AUM	AUM is the enterprise value as set out by the Valuer under the Valuation Report. For details, please see the 'Valuation Report', attached as Annexure I
Board/Board of Directors	The board of directors of the Investment Manager
BSE	BSE Limited
CAGR	Compounded annual growth rate
CCDs	Compulsorily convertible debentures
CCPS	Compulsorily convertible preference shares
CDSL	Central Depository Services (India) Limited
Civil Code	Code of Civil Procedure, 1908
Companies Act	Companies Act, 1956 and/or the Companies Act, 2013, as amended, as applicable
Companies Act, 1956	Companies Act, 1956 and the rules, regulations, modifications and clarifications made thereunder as the context requires, repealed as of January 30, 2019
Companies Act, 2013	Companies Act, 2013, as amended and read with the rules, regulations, notifications, clarifications and modifications thereunder
COVID-19	A public health emergency of international concern as declared by the World Health Organization on January 30, 2020 and a pandemic on March 11, 2020
CPCB	The Central Pollution Control Board of India
Depositories	Depositories registered with SEBI under the Securities and Exchange Board of India (Depositories and Participant) Regulations, 2018, being the NSDL and the CDSL
Depositories Act	Depositories Act, 1996
Depository Participant	A depository participant as defined under the Depositories Act
DIN	Director Identification Number
DP ID	Depository Participant ID
EIA	Environment Impact Assessment
EV	Enterprise Value
Environment Act	Environment (Protection) Act, 1986
FEMA	Foreign Exchange Management Act, 1999, read with rules and regulations thereunder
FEMA Rules	Foreign Exchange Management (Non-Debt Instrument) Rules, 2019
Fiscal/Financial Year	Period of 12 months ended March 31 of that particular year, unless otherwise stated
FPI	Foreign Portfolio Investors
GoI or Government	Government of India
ICAI	Institute of Chartered Accountants of India
Ind AS	Indian Accounting Standards prescribed under Section 133 of the Companies Act, 2013, as notified under Rule 3 of the Companies (Indian Accounting Standards) Rules, 2015, notified on February 19, 2015 by the MCA, including any amendments or modifications thereto
Indian GAAP	Accounting principles generally accepted in India, including the Accounting Standards as prescribed under Section 133 of the Companies Act, 2013 read with Rule 7 of the Companies (Accounts) Rules, 2014
InvIT	Infrastructure investment trust
Indian Trusts Act	Indian Trusts Act, 1882
IRDAI	Insurance Regulatory and Development Authority of India
IST	Indian Standard Time
IT Act	The Income Tax Act, 1961
MCA	Ministry of Corporate Affairs
MoEF	Ministry of Environment, Forest and Climate Change
MoRTH	Ministry of Road Transport and Highways
Mutual Funds	Mutual funds registered with SEBI under the Securities and Exchange Board of India (Mutual Funds) Regulations, 1996
MPRDC	Madhya Pradesh Road Development Corporation Limited
NAPCC	National Action Plan on Climate Change
NCD	Non-convertible debentures
NHAI	National Highways Authority of India
NRE	Non Resident External
NSDL	National Securities Depository Limited
NSE	The National Stock Exchange of India Limited
PAN	Permanent Account Number
PCB	Pollution Control Boards
PWD(R)	Public Works Department, Rajasthan
RBI	Reserve Bank of India
Regulation S	Regulation S under the Securities Act
Rs./Rupees/INR/₹	Indian Rupees
RTGS	Real Time Gross Settlement
SCRA	The Securities Contracts (Regulation) Act, 1956

<b>Term</b>	<b>Description</b>
SEBI	Securities and Exchange Board of India
SEBI Act	The Securities and Exchange Board of India Act, 1992
SEBI AIF Regulations	Securities and Exchange Board of India (Alternative Investments Funds) Regulations, 2012
SEBI FPI Regulations	Securities and Exchange Board of India (Foreign Portfolio Investors) Regulations, 2014
SEBI Intermediaries Regulations	Securities and Exchange Board of India (Intermediaries) Regulations, 2008
SEBI ICDR Regulations	Securities and Exchange Board of India (Issue of Capital and Disclosure Requirements) Regulations, 2018
SEBI InvIT Regulations or InvIT Regulations	Securities and Exchange Board of India (Infrastructure Investment Trusts) Regulations, 2014 and circulars issued by SEBI from time to time
SERC	State Electricity Regulatory Commissions
Securities Act	U.S. Securities Act of 1933, as amended
Securities Exchange Act	U.S. Securities Exchange Act of 1934, as amended
Tax	(i) all forms of direct and indirect taxes, duties, charges, levies, including without limitation corporate income tax, withholding tax, minimum alternate tax, sales tax, goods & services tax, value added tax, customs and excise duties, service tax, capital gains tax and all charges, interest, penalties and fines incidental or relating to any taxation falling within paragraph (i) above or which arise as a result of the failure to pay any taxes on the due date or to comply with any obligation relating to Tax
U.S./U.S.A/United States	United States of America, including the territories and possessions thereof
USD/US\$	United States Dollars
Water Act	Water (Prevention and Control of Pollution) Act, 1974

## PRESENTATION OF FINANCIAL DATA AND OTHER INFORMATION

### Certain Conventions

Unless stated otherwise, all references to page numbers in this Final Placement Memorandum are to the page numbers of this Final Placement Memorandum.

### Financial Data

Unless stated otherwise, the financial information in this Final Placement Memorandum is derived from the Special Purpose Combined Financial Statements. The Highways Trust was settled as a trust on December 23, 2021, and will not acquire ownership of the Project SPVs until immediately prior to the Allotment of the Units in the Issue. As of the date of this Final Placement Memorandum, there is no available financial information of the Highways Trust.

The Special Purpose Combined Financial Statements have been prepared in accordance with the accounting principles generally accepted in India, including the Ind AS notified under the Companies (Indian Accounting Standards) Rules, 2015 prescribed under the Companies Act, 2013, as applicable and other provisions relating to disclosures required as per of the InvIT Regulations and the SEBI Circular (CIR/IMD/DF/114/2016) dated October 20, 2016 on 'Disclosure of Financial Information in Placement Memorandum or any Offer Document for InvITs' ("**SEBI Circular on Financial Disclosures**"). For further details, please see the section entitled "*Special Purpose Combined Financial Statements*" on page 310.

This Final Placement Memorandum includes projections of revenue from operations and cash flows from the operating activities and the underlying assumptions of the Highways Trust and the Project SPVs for the Financial Years ending March 31, 2023, March 31, 2024 and March 31, 2025 prepared in accordance with Standard on Assurance Engagement 3400, 'The Examination of Prospective Financial Information', issued by the Institute of Chartered Accountants of India (the "**Projections**"). For further details, please see the section entitled "*Projections of Revenue from Operations and Cash Flow from Operating Activities*" on page 392.

Further, this Final Placement Memorandum includes summary financial statements of the (i) Sponsor, for the period from June 11, 2021 (date of incorporation of the Sponsor) to December 31, 2021, prepared in accordance with International Financial Reporting Standards, and (ii) Investment Manager for the period from August 22, 2020 (date of incorporation of the Investment Manager) till December 31, 2021, prepared in accordance with Ind AS. For further details, please see the sections entitled "*Summary Financial Information of the Sponsor*" and "*Summary Financial Information of the Investment Manager*" on pages 30 and 35.

The financial year for the Highways Trust, the Project SPVs and our Investment Manager commences on April 1 of the immediately preceding calendar year and ends on March 31 of that particular calendar year. The financial year for our Sponsor commences on January 1 and ends on December 31 of the same calendar year. Accordingly, all references to a particular financial year (unless stated otherwise or with respect to our Sponsor) are to the 12-month period commencing on April 1 of the immediately preceding calendar year and ending on March 31 of that particular calendar year.

The degree to which the financial information included in this Final Placement Memorandum will provide meaningful information is entirely dependent on the reader's level of familiarity with Indian accounting policies and practices, the Companies Act, the Indian GAAP, Ind AS and the InvIT Regulations. Any reliance by persons not familiar with Indian accounting policies and practices on the financial disclosures presented in this Final Placement Memorandum should accordingly be limited.

In this Final Placement Memorandum, any discrepancies in any table between the total and the sums of the amounts listed are due to rounding off. All figures and percentage figures have been rounded off to two decimal places.

### Currency and Units of Presentation

All references to:

- "Rupees" or "Rs." or "INR" or "₹" are to Indian Rupees, the official currency of the Republic of India; and
- "USD" or "US\$" or "\$" or "U.S. dollars" are to United States Dollars, the official currency of the United States.

Except otherwise specified, numerical information in this Final Placement Memorandum has been presented in “million” units. One million represents 1,000,000 and one billion represents 1,000,000,000. However, certain numerical information in this Final Placement Memorandum has been presented in “lakhs” units where one lakh represents 1,00,000 or “crore” units where one crore represents 1,00,00,000.

Unless the context requires otherwise, any percentage amounts, as set forth in this Final Placement Memorandum, have been calculated on the basis of the Special Purpose Combined Financial Statements and the Summary Financial Statements of (i) the Sponsor; and (ii) the Investment Manager.

### Exchange Rates

This Final Placement Memorandum contains conversion of certain other currency amounts into Indian Rupees. These conversions should not be construed as a representation that these currency amounts could have been, or can be converted into Indian Rupees, at any particular rate.

The following table sets forth, for the periods indicated, information with respect to the exchange rate between the Rupee and the US\$:

Currency	Exchange Rate as on March 31, 2022	Exchange Rate as on March 31, 2021	Exchange Rate as on March 31, 2020
1 US\$	75.81	73.50	75.38

(in ₹)

Source: [www.rbi.org.in](http://www.rbi.org.in) and [www.fbil.org.in](http://www.fbil.org.in)

### Industry and Market Data

Unless stated otherwise, industry and market data used in this Final Placement Memorandum has been obtained or derived from the CRISIL Report with respect to the assessment of roads sector in India which is a commissioned report, and publicly available information as well as other Government and industry publications and sources. The Investment Manager has commissioned the CRISIL Report, to provide an independent estimation of the assessment of roads sector in India, which is based on historical data and certain assumptions. The CRISIL Report is issued by CRISIL and is subject to the following disclaimer:

*“CRISIL Research, a division of CRISIL Limited (CRISIL) has taken due care and caution in preparing this report (Report) based on the Information obtained by CRISIL from sources which it considers reliable (Data). However, CRISIL does not guarantee the accuracy, adequacy or completeness of the Data/Report and is not responsible for any errors or omissions or for the results obtained from the use of Data / Report. This Report is not a recommendation to invest/disinvest in any entity covered in the Report and no part of this Report should be construed as an expert advice or investment advice or any form of investment banking within the meaning of any law or regulation. CRISIL especially states that it has no liability whatsoever to the subscribers / users / transmitters/ distributors of this Report. Without limiting the generality of the foregoing, nothing in the Report is to be construed as CRISIL providing or intending to provide any services in jurisdictions where CRISIL does not have the necessary permission and/or registration to carry out its business activities in this regard. Highways Infrastructure Trust and Virescent Infrastructure Investment Manager Private Limited will be responsible for ensuring compliances and consequences of non-compliances for use of the Report or part thereof outside India. CRISIL Research operates independently of, and does not have access to information obtained by CRISIL Ratings Limited / CRISIL Risk and Infrastructure Solutions Ltd (CRIS), which may, in their regular operations, obtain information of a confidential nature. The views expressed in this Report are that of CRISIL Research and not of CRISIL Ratings Limited / CRIS. No part of this Report may be published/reproduced in any form without CRISIL’s prior written approval”*

Industry publications as well as government publications generally state that the information contained in such publications has been obtained from various sources believed to be reliable but that their accuracy and completeness are not guaranteed and their reliability cannot be assured. Accordingly, no investment decisions should be based solely on such information. The data used in these sources may have been re-classified for the purposes of presentation. Data from these sources may also not be comparable. Such data involves risks, uncertainties and numerous assumptions and is subject to change based on various factors, including those disclosed in the section entitled “Risk Factors” on page 54. Accordingly, investment decisions should not be based solely on such information.

The extent to which the market and industry data used in this Final Placement Memorandum is meaningful depending on the reader’s familiarity with and understanding of the methodologies used in compiling such data. There are no standard data gathering methodologies in the industry in which the business of the Highways Trust is conducted, and methodologies and assumptions may vary widely amongst different industry sources.

## FORWARD-LOOKING STATEMENTS

Certain statements contained in this Final Placement Memorandum are not statements of historical fact but constitute 'forward-looking statements'. Investors can generally identify forward-looking statements by terminology such as 'aim', 'anticipate', 'believe', 'continue', 'could', 'estimate', 'expect', 'intend', 'may', 'objective', 'plan', 'potential', 'project', 'propose', 'pursue', 'seek', 'shall', 'should', 'will', 'would', or other words or phrases of similar import. Similarly, statements that describe our strategies, objectives, plans or goals, including the Highways Trust's business strategy, revenue and profitability (including, without limitation, any financial or operating projections or forecasts) are also forward-looking statements.

All statements regarding the Highways Trust's expected financial conditions, results of operations, cash flows, business plans and prospects are forward-looking statements. These forward-looking statements include statements as to the Highways Trust's business strategy, revenue, cash flows and profitability (including, without limitation, any financial or operating projections or forecasts) and other matters discussed in this Final Placement Memorandum that are not historical facts.

These forward-looking statements and any other projections contained in this Final Placement Memorandum (whether made by the Parties to the Highways Trust or any third party), are based on current plans, estimates, presumptions and expectations and involve known and unknown risks, uncertainties, assumptions and other factors that may cause the Trust's actual results, performance or achievements to be materially different from any future results, performance or achievements expressed or implied by such forward-looking statements or other projections. In accordance with the InvIT Regulations, the Projections have been included in this Final Placement Memorandum. The Projections should be read together with the underlying assumptions and notes thereto. Please see the section entitled "*Projections of Revenue from Operations and Cash Flows from Operating Activities*" on page 392 for details.

The Valuation Report included in this Final Placement Memorandum, is based on certain projections and accordingly, should be read together with assumptions and notes thereto. For further details, please see the '*Valuation Report*' attached as Annexure I.

The CRISIL Report includes assumptions and estimates in relation to the information contained therein, and accordingly, should be read in conjunction with the relevant estimates and assumptions thereto.

Actual results may differ materially from those suggested by forward-looking statements and financial projections due to certain known or unknown risks or uncertainties associated with the Investment Manager's expectations with respect to, but not limited to, the actual growth in the infrastructure sector, the Investment Manager's ability to successfully implement the strategy, growth and expansion plans, technological changes, cash flow projections, exposure to market risks, general economic and political conditions in India, changes in competition in the infrastructure sector, the outcome of any legal or regulatory proceedings and the future impact of new accounting standards. By their nature, certain of the market risk disclosures are only estimates and could be materially different from what actually occurs in the future. As a result, actual future gains, losses or impact on net income could materially differ from those that have been estimated.

Factors that could cause actual results, performance or achievements of the Highways Trust to differ materially include, but are not limited to those disclosed under the sections entitled "*Risk Factors*", "*Industry Overview*", "*Business*" and "*Discussion and Analysis by the Directors of the Investment Manager of the Financial Condition, Results of Operations and Cash Flows of the Project SPVs of the Highways Trust*", on pages 54, 150, 168 and 223, respectively. Some of the factors that could cause the Highways Trust's actual results, performance or achievements to differ materially from those in the forward-looking statements, financial projections and financial information include, but are not limited to, the following:

1. The Highways Trust is a newly settled trust with no established operating history and no historical financial information and, as a result, investors may not be able to assess its prospects on the basis of past records;
2. The Highways Trust may be subject to penalties and claims from the concessioning authorities and third parties during the course of operations of the Projects and may not be able to recover all operational losses from the Project Manager and/ or other contractors providing operations and maintenance services to the Projects;
3. The Valuation Report by Mr. S. Sundararaman is not an opinion on the commercial merits and structure of the Issue nor is it an opinion, express or implied, as to the future trading price of Units or the financial

condition of Highways Trust upon the Listing, and the valuation of the Project SPVs contained in such Valuation Report may not be indicative of the true value of the Project SPVs;

4. The accuracy of statistical and other information with respect to the road infrastructure sector and the Technical Report and Traffic Report commissioned by the Investment Manager for the Projects contained in this Final Placement Memorandum cannot be guaranteed; and
5. The Audited Special Purpose Combined Financial Statements and Projections of Revenue from Operations and Cash Flow from Operating Activities presented in this Final Placement Memorandum may not be indicative of the future financial condition and results of operations of the Highways Trust.

The forward-looking statements, Projections, the Valuation Report and the CRISIL Report are not a guarantee of future performance or returns to Bidders. These statements and projections are based on certain beliefs and assumptions, which in turn are based on currently available information. Although we believe that the expectations and the assumptions upon which such forward-looking statements are based, are reasonable at this time, we cannot assure Bidders that such expectations will prove to be correct or accurate. Given these uncertainties, investors are cautioned not to place undue reliance on such forward-looking statements and not to regard such statements as a guarantee of future performance.

In accordance with the InvIT Regulations, the assumptions underlying the Projections have been examined by the Auditors. The Projections have been prepared for inclusion in this Final Placement Memorandum for the purposes of this Issue, using a set of assumptions that include hypothetical assumptions about future events and management's actions that are not necessarily expected to occur, and have been approved by the Board. Consequently, Bidders are cautioned that the Projections may not be appropriate for purposes other than that described above. In any event, these statements speak only as of the date of this Final Placement Memorandum or the respective dates indicated in this Final Placement Memorandum.

The Highways Trust, the Investment Manager, the Sponsor, the Trustee or the Lead Manager or their respective affiliates or advisors, (financial, legal or otherwise), undertake no obligation to update or revise any of the statements reflecting circumstances arising after its date or to reflect the occurrence of underlying events, whether as a result of new information, future events or otherwise after the date of this Final Placement Memorandum. If any of these risks and uncertainties materialise, or if any of the Investment Manager's underlying assumptions prove to be incorrect, the actual results of operations or financial condition or cash flows of the Highways Trust could differ materially from that described herein as anticipated, believed, estimated or expected. All subsequent forward-looking statements attributable to the Highways Trust are expressly qualified in their entirety by reference to these cautionary statements. Given these uncertainties, Bidders are cautioned not to place undue reliance on such forward-looking statements and financial projections, and not to regard such statements to be a guarantee or assurance of the Highways Trust's future performance or returns to investors.

## THE ISSUE

The following is a general summary of the terms of this Issue. This summary should be read in conjunction with, and is qualified in its entirety by, the detailed information appearing elsewhere in this Final Placement Memorandum:

<b>Issue</b>	Initial Offer by way of fresh issue 4,16,00,000* Units aggregating to ₹ 4,160 million
<b>Issue Price per unit</b>	₹ 100
<b>Minimum Bid Size</b>	₹ 260 million
<b>Bid/Issue Opening Date</b>	August 19, 2022
<b>Bid/Issue Closing Date</b>	August 22, 2022
<b>Sponsor</b>	Galaxy Investments II Pte. Ltd.
<b>Trustee</b>	Axis Trustee Services Limited
<b>Investment Manager</b>	Virescent Infrastructure Investment Manager Private Limited
<b>Project Manager</b>	Virescent Renewable Energy Project Manager Private Limited
<b>Eligible Investors</b>	Institutional Investors and Bodies Corporate, Indian or foreign, subject to applicable law
<b>Authority for this Issue</b>	This Issue was authorised, and approved by the board of directors of the Investment Manager on March 22, 2022.
<b>Tenure of the Trust</b>	The Highways Trust shall remain in force perpetually until it is dissolved or terminated in accordance with the Trust Deed. For details, please see the section entitled “ <i>Parties to the Highways Trust</i> ” on page 101.
<b>Units issued and outstanding as of the date of this Final Placement Memorandum</b>	As of the date of this Final Placement Memorandum, there are no issued and outstanding Units
<b>Units issued and outstanding immediately after this Issue</b>	41,55,00,000 Units*
<b>Sponsor Units as on the date of this Final Placement Memorandum</b>	37,39,00,000 Units**  The Units held by the Sponsor shall rank <i>pari passu</i> with, and have the same rights as the Units to be Allotted pursuant to this Issue. The Units to be held by the Sponsor will be allotted to the Sponsor, subject to the fulfilment of certain terms and conditions pursuant to the resolution of the InvIT Committee constituted by the Board.
<b>Distribution</b>	Please see the section entitled “ <i>Distributions</i> ” on page 220
<b>Indian Taxation</b>	Please see the section entitled “ <i>Statement of Tax Benefits</i> ” on page 296
<b>Use of Proceeds</b>	Please see the section entitled “ <i>Use of Proceeds</i> ” on page 214
<b>Listing</b>	Prior to this Issue, there has been no market for the Units. The Units are proposed to be listed on the Stock Exchange. In-principle approval for listing of the Units has been received from NSE on April 27, 2022 along with an extension letter dated July 15, 2022. The Investment Manager shall apply to the Stock Exchange for the final listing and trading approval, after the Allotment and the credit of the Units to the demat accounts of the Allottees
<b>Designated Stock Exchange</b>	NSE
<b>Closing Date</b>	The date on which Allotment of the Units pursuant to this Issue shall be made, i.e. on or about August 23, 2022
<b>Ranking</b>	The Units being issued shall rank <i>pari passu</i> in all respects, including rights in respect of distribution.  Please see the section entitled “ <i>Rights of Unitholders</i> ” on page 283
<b>Lock-in and Rights of Unitholders</b>	For details, please see the sections entitled “ <i>Information Concerning the Units</i> ” and “ <i>Rights of Unitholders</i> ” on pages 213 and 283, respectively
<b>Risk Factors</b>	Prior to making an investment decision, Bidders should consider carefully the matters discussed in the section entitled “ <i>Risk Factors</i> ” on page 54

\* Subject to the Board or a committee thereof passing a resolution for allotment of Units (i) to the Sponsor, subject to fulfilment of certain conditions; and (ii) pursuant to the Issue to the Eligible Investors, on or about August 23, 2022

\*\* Subject to allotment of Units by the Board or a committee thereof and the fulfilment of certain terms and conditions

The Issue is a private placement of listed Units under Regulation 14(2) of the SEBI InvIT Regulations. Upon listing of the Units on the Stock Exchange, the Units shall be traded only on the dematerialized segment of the Stock Exchange.

In accordance with the InvIT Regulations, no Unitholder shall enjoy superior voting or any other rights over another Unitholder. Further, there shall not be multiple classes of Units. However, in the future, the Highways Trust may issue subordinate units of the Highways Trust only to the Sponsor and its Associates, in compliance with the InvIT Regulations, where such subordinate units of the Highways Trust shall carry only inferior voting or other rights compared to the Units. No person connected with the Issue, including any person connected with the distribution of this Final Placement Memorandum, shall offer any incentive, whether direct or indirect, in any manner, whether in cash or kind or services or otherwise to any person for making an application for Allotment of the Units.

For further details in relation to this Issue, including the method of application, please see the section entitled "*Issue Procedure*" on page 288.

## OVERVIEW OF THE HIGHWAYS TRUST

*The following overview is qualified in its entirety by, and is subject to, the more detailed information contained in, or referred to elsewhere in this Final Placement Memorandum. The statements contained in this summary that are not historical facts may be forward-looking statements. Such statements are subject to certain risks, uncertainties and assumptions that could cause actual results of the Trust to differ materially from those forecasted or projected in this Final Placement Memorandum. Under no circumstances should the inclusion of such information herein be regarded as a representation, warranty or prediction of the accuracy of the underlying assumptions by the Highways Trust or the Parties to the Highways Trust or the Lead Manager or any other person or that these results will be achieved or are likely to be achieved.*

### Structure and description the Highways Trust

The Highways Trust has been settled by the Investment Manager (acting as the settlor) on the instructions of the Sponsor, as a contributory, determinate and irrevocable trust under the provisions of the Trusts Act in Mumbai, India pursuant to the Trust Deed. The Highways Trust has been registered with the SEBI as an infrastructure investment trust under the InvIT Regulations on December 23, 2021 having registration number IN/InvIT/21-22/0019. The Investment Manager irrevocably transferred to the Trustee an amount of ₹ 10,000 towards the initial corpus of the Highways Trust, with an intention to settle and establish the Highways Trust. This initial corpus of the Highways Trust shall, in no event, be distributed to the Investment Manager.

For details of the principal place of business, credit ratings obtained and contact person of the Sponsor, please see the section entitled “*General Information*” on page 97. Further, for details with respect to Unitholders holding more than 5% of the Units, please see the section entitled “*Information Concerning the Units*” at page 213.

Additionally, Virescent Infrastructure Investment Manager Private Limited has been appointed as the Investment Manager, and Virescent Renewable Energy Project Manager Private Limited has been appointed as the Project Manager. For further details, please see the sections entitled ‘*General Information*’ and ‘*Parties to the Highways Trust*’ on pages 97 and 101, respectively.

### Investment Objectives

The object and purpose of the Highways Trust, as described in the Trust Deed, is to carry on the activity of an infrastructure investment trust as permissible under the InvIT Regulations to raise funds through the Highways Trust, to make investments in accordance with the InvIT Regulations and the investment strategy and to carry on the activities as may be required for operating the Highways Trust, including incidental and ancillary matters thereto.

The objective and purpose of the Highways Trust includes the following:

- (a) to raise funds in accordance with applicable law, for the purpose of attaining the objective and purpose of the Highways Trust;
- (b) to make investments or re-investments in accordance with the Highways Trust Documents and applicable law, including investments in government securities, money market instruments, liquid mutual funds or cash equivalents, in the manner and to the extent permitted under the InvIT Regulations;
- (c) to park amounts held by the Highways Trust pending investment or distribution, or as a reserve of the Highways Trust’s anticipated obligations, as permitted under the InvIT Regulations;
- (d) to make distributions to the Unitholders in the manner prescribed in the Trust Deed;
- (e) to do all other things necessary and conducive to the attainment of the investment objective of the Highways Trust, through agents or other delegates (including the Investment Manager); and
- (f) to carry on generally such other activities as may be permitted under applicable laws.

For further details in relation to the business and investment strategy of the Highways Trust, please see the section entitled “*Business*” on page 168. The Highways Trust is required to make distributions to the Unitholders in accordance with the InvIT Regulations and the Distribution Policy. For details in relation to the distribution policy of the Highways Trust, please see the section entitled “*Distributions*” on page 220.

## Fees and expenses

The expenses in relation to the Highways Trust, other than such expenses incurred in relation to operations of the Project SPVs would broadly include fee payable to: (i) the Trustee; (ii) the Investment Manager; (iii) the Project Manager; (iv) the Auditors, (v) the Valuer; and (vi) other intermediaries and consultants.

The estimated recurring expenses on an annual basis (exclusive of out of pocket expenses and escalations), including but not limited to, are as follows:

Payment by the Highways Trust	Estimated Expenses*
Fee payable to the Trustee	₹ 9,00,000
Fee payable to the Valuer	₹ 12,00,000
Fee payable to the Auditor	₹ 80,00,000
Fee payable to the Investment Manager	Investment Manager shall charge a fee equivalent to 110% of the cost incurred by the Investment Manager in providing such services to the Highways Trust
Fee payable to the Project Manager	Project Manager shall charge a fee equivalent to 110% of the cost incurred by the Project Manager in providing such services to the Highways Trust
Fee payable to the Registrar	₹ 1,20,000
Fee payable to the Stock Exchange and Depositories	₹ 11,70,000
Fee payable to the credit rating agencies	₹ 77,00,000

\*Excluding applicable taxes.

## Issue Expenses

The total expenses of this Issue are estimated to be up to ₹ 138.50 million. For details in relation to the Issue expenses, please see the section entitled “Use of Proceeds” on page 214.

## Details of credit ratings

The Highways Trust has been given a rating of (i) ‘Provisional CRISIL AAA/Stable (Assigned)’ by CRISIL Ratings, for bank loan facilities aggregating to ₹ 10,000 million and, (ii) a rating of ‘Provisional CRISIL AAA/Stable’(pronounced as Provisional CRISIL triple A rating with Stable outlook) for non-convertible debentures aggregating to ₹ 9,000 million, by way of its letters dated March 14, 2022, the rationale for which is available at their website [https://www.crisil.com/mnt/winshare/Ratings/RatingList/RatingDocs/HighwaysInfrastructureTrust\\_March%2011,%202022\\_RR\\_288671.html](https://www.crisil.com/mnt/winshare/Ratings/RatingList/RatingDocs/HighwaysInfrastructureTrust_March%2011,%202022_RR_288671.html)

Additionally, the Highways Trust has been given a rating of ‘Provisional IND AAA/Stable’ by India Ratings, for bank loan facilities aggregating to ₹ 10,000 million and non-convertible debentures aggregating to ₹ 9,000 million, by way of its letter dated March 11, 2022, the rationale for which is available at their website <https://www.indiaratings.co.in/pressrelease?pressreleaseid=57769&title=india%20ratings%20assigns%20national%20highways%20infra%20trust%20final%20ind%20aaastable>.

## FORMATION TRANSACTIONS IN THE HIGHWAYS TRUST

### Parties to the Highways Trust

In accordance with the InvIT Regulations, the Parties to the Highways Trust are (i) the Sponsor; (ii) the Investment Manager; (iii) the Trustee; and (iv) the Project Manager. For details, please see the section entitled “Parties to the Highways Trust” on page 101.

The initial portfolio of assets of the Highways Trust comprises six Project SPVs to be acquired by the Highways Trust, namely, DBCPL, GEPL, JPEPL, UEPL, NBL and SEPL\*. The details of the Project SPVs as of the date of this Final Placement Memorandum are provided below:

*\*The Initial Portfolio Assets shall be acquired by the Highways Trust prior to the Allotment of Units.*

### Details of the Project SPVs

The details of DBCPL, GEPL, JPEPL, UEPL, NBL and SEPL as of the date of this Final Placement Memorandum are provided below:

#### Dewas Bhopal Corridor Private Limited (“DBCPL”)

DBCPL was incorporated on May 14, 2007 as a private limited company under the Companies Act, 1956 at Mumbai, Maharashtra. Subsequently, it was converted to a public limited company and a fresh certificate of incorporation dated March 31, 2008 was issued by the Registrar of Companies, Mumbai. Further, DBCPL was again converted to a private limited company and a fresh certificate of incorporation dated September 9, 2015 was issued by the Registrar of Companies, Mumbai. The registered office of DBCPL is situated at Unit No. 316 & 317, C Wing, 3<sup>rd</sup> Floor, Kanakia Zillion, LBS Marg, BKC Annexe Mumbai 400 070, Maharashtra. Its CIN is U45203MH2007PTC170813. DBCPL operates the Bhopal-Dewas section of SH-18 starting at Bhopal (km 6.80) and ending at Dewas Bypass junction (km 151.60). The length of project road is 140.79 km. DBCPL is maintained on a BOT (toll) basis pursuant to the DBCPL Concession Agreement. For further details of the DBCPL Concession Agreement, please see the section entitled “Summary of Concession Agreements” on page 189.

#### Capital Structure

The capital structure of DBCPL is as follows:

Particulars	Amount (in ₹)
<b>Authorised capital</b>	
100,000 Equity Shares of face value of ₹ 10 each	1,000,000
69,900,000 Preference Shares of ₹ 10 each	699,000,000
<b>Total</b>	<b>700,000,000</b>
<b>Issued, subscribed and paid-up capital</b>	
100,000 Equity Shares of face value of ₹ 10 each	1,000,000

#### Shareholding Pattern

The shareholding pattern of DBCPL is as follows:

S. No.	Name of the Shareholder	Number of Equity Shares of ₹ 10 each	Percentage of the issued, subscribed and paid-up capital
1.	Galaxy Investments II Pte. Ltd.	99,999	100
2.	G V M Kiran Babu*	1	Negligible

*\*As a nominee of Galaxy Investments II Pte. Ltd.*

#### Godhra Expressways Private Limited (“GEPL”)

GEPL was incorporated on January 21, 2010 as a public limited company as “BSCPL Godhra Tollways Limited” under the Companies Act, 1956 at Hyderabad, Andhra Pradesh. Subsequently, it was converted to a private limited

company and a fresh certificate of incorporation dated June 23, 2017 was issued by the Registrar of Companies, Hyderabad. Subsequently, its name was changed to “Godhra Expressways Private Limited”, and a fresh certificate of incorporation dated July 7, 2017 was issued by the Registrar of Companies, Hyderabad. Pursuant to a certificate of registration dated November 8, 2017 issued by the Registrar of Companies, Mumbai, GEPL shifted its registered office from Telangana to Maharashtra. The registered office of GEPL is situated at Unit No. 316 & 317, C Wing, Third Floor, Kanakia Zillion, LBS Marg, BKC Annexe, Mumbai 400 070, Maharashtra. Its CIN is U45209MH2010PTC301565. GEPL operates, a four-lane highway starting at Piravdi near Godhra (km 129.300) ending at the border of Gujarat with Madhya Pradesh, under NHDP Phase III on Design, Build, Finance, Operate and Transfer (“**DBFOT**”) (toll) basis pursuant to the GEPL Concession Agreement. For further details of the GEPL Concession Agreement, please see the section entitled “*Summary of Concession Agreements*” on page 189.

### **Capital Structure**

The capital structure of GEPL is as follows:

<b>Particulars</b>	<b>Amount (in ₹)</b>
<b>Authorised capital</b>	
29,050,000 Equity Shares of face value of ₹ 10 each	290,500,000
<b>Issued, subscribed and paid-up capital</b>	
23,380,840 Equity Shares of face value of ₹ 10 each	233,808,400

### **Shareholding Pattern**

The shareholding pattern of GEPL is as follows:

<b>S. No.</b>	<b>Name of the Shareholder</b>	<b>Number of Equity Shares of ₹ 10 each</b>	<b>Percentage of the issued, subscribed and paid-up capital</b>
1.	Galaxy Investments II Pte. Ltd.	23,380,839	100
2.	G V M Kiran Babu*	1	Negligible

\*As a nominee of Galaxy Investments II Pte. Ltd.

### **Jodhpur Pali Expressway Private Limited (“JPEPL”)**

JPEPL was incorporated on January 10, 2013 as a public limited company under the name of “Jodhpur Pali Expressway Limited” under the Companies Act, 1956 at Delhi. Subsequently, it was converted to a private limited company and a fresh certificate of incorporation dated July 28, 2017 was issued by the Registrar of Companies, National Capital Territory of Delhi and Haryana. Pursuant to a certificate of registration of the Regional Director order for change of state dated May 3, 2018 issued by the Registrar of Companies, Mumbai, the place of situation of the registered office of JPEPL was changed from Delhi to Maharashtra. The registered office of JPEPL is situated at Unit No. 316&317, Third Floor, C wing, Kanakia Zillion, BKC Annexe, Mumbai 400 070, Maharashtra. Its CIN is U45203MH2013PTC308861. JPEPL operates the Jodhpur-Pali Section of NH-65 , starting at Jodhpur km 308 to km 366 and includes the bypass to Pali starting from km 366 at NH-65, connecting NH-14 at km 114 in the state of Rajasthan on DBFOT (toll) basis pursuant to the JPEPL Concession Agreement

### **Capital Structure**

The capital structure of JPEPL is as follows:

<b>Particulars</b>	<b>Amount (in ₹)</b>
<b>Authorised capital</b>	
100,000 Equity Shares of face value of ₹ 10 each	1,000,000
<b>Issued, subscribed and paid-up capital</b>	
61,640 Equity Shares of face value of ₹ 10 each	616,400

### Shareholding Pattern

The shareholding pattern of JPEPL is as follows:

S. No.	Name of the Shareholder	Number of Equity Shares of ₹ 10 each	Percentage of the issued, subscribed and paid-up capital
1.	Galaxy Investments II Pte. Ltd.	61,639	100
2.	G V M Kiran Babu*	1	Negligible

\*As a nominee of Galaxy Investments II Pte. Ltd.

### Ulundurpet Expressways Private Limited (“UEPL”)

UEPL was incorporated on March 20, 2006 as a private limited company under the name of “GMR Ulundurpet Expressways Private Limited” under the Companies Act, 1956 at Bangalore. Subsequently, its name was changed to “Ulundurpet Expressways Private Limited”, and a fresh certificate of incorporation dated August 13, 2014 was issued by the Registrar of Companies, Bangalore. Pursuant to a certificate of registration dated June 16, 2015 issued by the Registrar of Companies, Mumbai, UEPL shifted its registered office from Bangalore to Maharashtra. The registered office of UEPL is situated at Unit No. 316 & 317, Third Floor, C wing, Kanakia Zillion, LBS Marg, BKC Annexe, Mumbai 400 070, Maharashtra. Its CIN is U45203MH2006PTC265580. UEPL operates a four-lane highway in the state of Tamil Nadu starting at km 121.00 near Tindivanam and ending at km 192.25 near Sengurchi of NH-45 on a BOT (toll) basis pursuant to the UEPL Concession Agreement. For further details of the UEPL Concession Agreement, please see the section entitled “*Summary of Concession Agreements*” on page 189.

### Capital Structure

The capital structure of UEPL is as follows:

Particulars	Amount (in ₹)
<b>Authorised capital</b>	
350,000,000 Equity Shares of face value of ₹ 10 each	3,500,000,000
<b>Issued, subscribed and paid-up capital</b>	
264,552,365 Equity Shares of face value of ₹ 10 each	2,645,523,650

### Shareholding Pattern

The shareholding pattern of UEPL is as follows:

S. No.	Name of the Shareholder	Number of Equity Shares of ₹ 10 each	Percentage of the issued, subscribed and paid-up capital
1.	Galaxy Investments II Pte. Ltd.	264,552, 364	100
2.	Vidyadhar S Dabholkar*	1	Negligible

\*As a nominee of Galaxy Investments II Pte. Ltd.

### Nirmal BOT Limited (“NBL”)

NBL was incorporated on September 19, 2006 as a public limited company under the Companies Act, 1956 at Mumbai. The registered office of NBL is situated at Unit No. 316 & 317, Third Floor, C wing, Kanakia Zillion, LBS Marg, BKC Annexe, Mumbai 400 070, Maharashtra. Its CIN is L45201MH2006PLC164728. NBL operates a four-lane highway section of NH-7 starting from Kadital in Adilabad District (New Ch. 282+617) and ending at Armur in Nizamabad District (New Ch. 313+507) under North - South corridor (NHDP Phase II) on a BOT (annuity) basis pursuant to the NBL Concession Agreement. For further details of the NBL Concession Agreement, please see the section entitled “*Summary of Concession Agreements*” on page 189.

### Capital Structure

The capital structure of NBL is as follows:

Particulars	Amount (in ₹)
<b>Authorised capital</b>	
35,000,000 Equity Shares of face value of ₹ 10 each	3,50,000,000
<b>Issued, subscribed and paid-up capital</b>	
31,500,000 Equity Shares of face value of ₹ 10 each	315,000,000

### Shareholding Pattern

The equity shareholding pattern of NBL is as follows:

S. No.	Name of the Shareholder	Number of Equity Shares of ₹ 10 each	Percentage of the issued, subscribed and paid-up capital
1.	Galaxy Investments II Pte. Ltd.	31,499,940	100
2.	Prashantha Karkera*	10	Negligible
3.	Lata J Shelke*	10	Negligible
4.	Shashikant P Shendge*	10	Negligible
5.	Rishi Mishra*	10	Negligible
6.	Silalipi Mishra*	10	Negligible
7.	Savita Balkrishna Nayak*	10	Negligible

\*As nominees of Galaxy Investments II Pte. Ltd.

### Shillong Expressway Private Limited (“SEPL”)

SEPL was incorporated on June 9, 2010 as a private limited company under the Companies Act, 1956 at Delhi. Subsequently, SEPL was converted to a public limited company and a fresh certificate of incorporation dated December 13, 2010 was issued by the Registrar of Companies, National Capital Territory of Delhi and Haryana. Further, SEPL was again converted to a private limited company and a fresh certificate of incorporation dated August 4, 2017 was issued by Registrar of Companies, National Capital Territory of Delhi and Haryana. Pursuant to a certificate of registration of the Regional Director order for change of state dated October 11, 2018 issued by the Registrar of Companies, Mumbai, the place of situation of the registered office of SEPL was changed from Delhi to Maharashtra. The registered office of SEPL is situated at Unit No. 316 & 317, Third Floor, C wing, Kanakia Zillion, LBS Marg, BKC Annexe, Mumbai 400 070, Maharashtra. Its CIN is U45204MH2010PTC315633. SEPL operates a two-lane highway on the Shillong Bypass starting from Km 6.800 of NH-40 near Barapani and ending on NH-44 at Km 34/850 in the State of Meghalaya, on DBFOT (annuity) basis pursuant to the SEPL Concession Agreement. For further details of the SEPL Concession Agreement, please see the section entitled “*Summary of Concession Agreements*” on page 189.

### Capital Structure

The capital structure of SEPL is as follows:

Particulars	Amount (in ₹)
<b>Authorised capital</b>	
500,000 Equity Shares of face value of ₹ 10 each	5,000,000
6,000,000 6% Non-Cumulative Redeemable Preference Shares of ₹ 10 each	60,000,000
<b>Total</b>	<b>65,000,000</b>
<b>Issued, subscribed and paid-up capital</b>	
500,000 Equity Shares of face value of ₹ 10 each	5,000,000
1,817,000 6% Non-Cumulative Redeemable Preference Shares of ₹ 10 each	18,170,000
<b>Total</b>	<b>23,170,000</b>

## Shareholding Pattern

The shareholding pattern of the equity share capital of SEPL is as follows:

S. No.	Name of the Shareholder	Number of Equity Shares of ₹ 10 each	Percentage of the issued, subscribed and paid-up capital
1.	Galaxy Investments II Pte. Ltd.	499,999	100
2.	Vidyadhar S Dabholkar*	1	Negligible

\*As a nominee of Galaxy Investments II Pte. Ltd.

The shareholding pattern of the preference share capital of SEPL is as follows:

S. No.	Name of the Shareholder	Number of 6% Non-Cumulative Redeemable Preference Shares of ₹ 10 each	Percentage of the issued, subscribed and paid-up capital
1.	India Infrastructure Fund II	1,817,000	100

## Acquisition of the Project SPVs by the Highways Trust

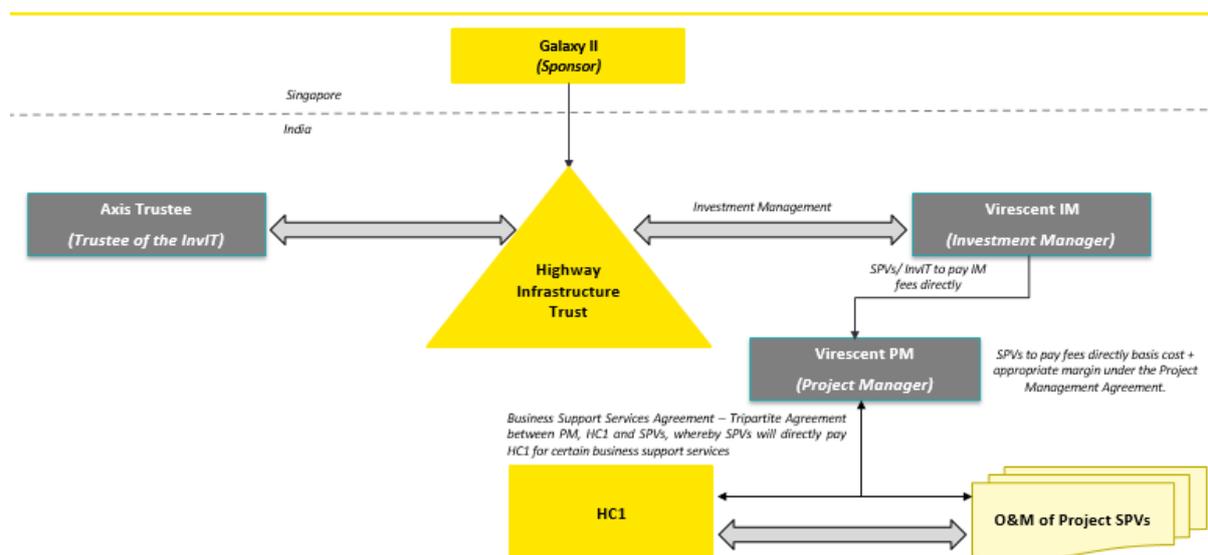
Please see the section entitled “*Related Party Transactions – Acquisition of the Project SPVs by the Trust*” on page 258 for a description of the terms of the Securities Purchase Agreement.

## Utilisation of Issue Proceeds

Upon the listing of the Units, the Trust shall utilize the Issue Proceeds as set out in the section entitled “*Use of Proceeds*” on page 214.

## Proposed post-listing structure

The following structure illustrates the relationship between the Trust, the Trustee, the Sponsor, the Investment Manager, the Project Manager and the Unitholders as on the Listing Date:



## **SUMMARY COMBINED FINANCIAL INFORMATION OF THE HIGHWAYS TRUST**

*The following tables set forth the summary financial information derived from the Special Purpose Combined Financial Statements of the Initial Portfolio Assets prepared in accordance with Ind AS and other relevant provisions of the InvIT Regulations, for the financial years ended March 31, 2022, March 31, 2021 and March 31, 2020*

*The degree to which the summary financial information included herein below will provide meaningful information is entirely dependent on the reader's level of familiarity with Indian accounting practices, Ind AS, the Companies Act and the InvIT Regulations. Accordingly, any reliance by persons not familiar with Indian accounting practices, Ind AS, the Companies Act and the InvIT Regulations on the summary financial information presented below should be limited.*

*The summary financial information derived from the Special Purpose Combined Financial Statements, as presented below, should be read together with the section entitled "Discussion and Analysis by the Directors of the Investment Manager of the Financial Condition, Results of Operations and Cash Flows of the Project SPVs of the Highways Trust" on page 223 in conjunction with the section entitled "Special Purpose Combined Financial Statements" on page 310.*

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**Highways Infrastructure Trust  
Combined Balance Sheet**

(In ₹ million)

	As at March 31, 2022	As at March 31, 2021	As at March 31, 2020
<b>ASSETS</b>			
<b>Non-current assets</b>			
Property, plant and equipment	130.04	66.93	62.05
Capital work-in-progress	2.39	9.40	-
Intangible assets	20,246.56	21,249.03	22,159.81
Financial assets			
Other financial assets	1,382.88	1,626.38	1,861.32
Non-current tax assets (net)	89.40	74.29	77.52
Other non-current assets	-	0.45	0.45
<b>Total non-current assets</b>	<b>21,851.27</b>	<b>23,026.48</b>	<b>24,161.15</b>
<b>Current assets</b>			
Financial assets			
Investments	2,152.39	2,156.37	2,465.11
Trade receivables	37.30	68.92	87.48
Cash and cash equivalents	365.82	79.81	174.91
Bank balances other than cash and cash equivalents above	1,972.62	1,622.21	859.13
Other financial assets	941.61	949.80	939.68
Other current assets	72.56	122.14	109.84
<b>Total current assets</b>	<b>5,542.30</b>	<b>4,999.25</b>	<b>4,636.15</b>
<b>Total assets</b>	<b>27,393.57</b>	<b>28,025.73</b>	<b>28,797.30</b>
<b>EQUITY AND LIABILITIES</b>			
<b>EQUITY</b>			
Equity share capital	3,200.95	3,200.95	3,200.95
Other equity	(2,812.09)	(2,467.13)	(1,619.74)
<b>Total equity</b>	<b>388.86</b>	<b>733.82</b>	<b>1,581.21</b>
<b>LIABILITIES</b>			
<b>Non-current liabilities</b>			
Financial liabilities			
Borrowings	21,260.80	22,252.15	22,464.09
Other financial liabilities	1,276.93	1,265.55	1,243.06
Provisions	324.55	571.96	587.46
Deferred tax liabilities (net)	849.36	334.57	490.12
<b>Total non-current liabilities</b>	<b>23,711.64</b>	<b>24,424.23</b>	<b>24,784.73</b>
<b>Current liabilities</b>			
Financial liabilities			
Borrowings	2,007.63	1,742.21	1,661.56
Trade payables			
(a) Total outstanding dues of micro enterprises and small enterprises	18.66	0.08	14.94
(b) Total outstanding dues of creditors other than micro enterprises and small enterprises	302.14	211.24	198.33
Other financial liabilities	649.37	303.19	260.50
Other current liabilities	31.16	15.82	30.95
Provisions	279.82	580.08	262.63
Current tax liabilities (net)	4.29	15.06	2.45
<b>Total current liabilities</b>	<b>3,293.07</b>	<b>2,867.68</b>	<b>2,431.36</b>
<b>Total liabilities</b>	<b>27,004.71</b>	<b>27,291.91</b>	<b>27,216.09</b>
<b>Total equity and liabilities</b>	<b>27,393.57</b>	<b>28,025.73</b>	<b>28,797.30</b>
<b>Significant accounting policies</b>			

**Highways Infrastructure Trust**  
**Combined Statement of Profit and Loss**

(In ₹ million)

	For the financial year ended March 31, 2022	For the financial year ended March 31, 2021	For the financial year ended March 31, 2022
<b>Income</b>			
Revenue from operations	5,866.56	5,085.04	5,008.80
Other income	311.09	241.09	231.43
<b>Total income</b>	<b>6,177.65</b>	<b>5,326.13</b>	<b>5,240.23</b>
<b>Expenses</b>			
Operating expenses	1,437.60	1,377.29	1,388.02
Employee benefits expense	128.35	117.56	116.19
Finance costs	2,775.55	2,740.51	2,774.77
Depreciation and amortisation expense	1,017.44	919.81	1,038.67
Other expenses	459.15	393.69	349.50
<b>Total expenses</b>	<b>5,818.09</b>	<b>5,548.86</b>	<b>5,667.15</b>
<b>Profit/ (loss) before tax</b>	<b>359.56</b>	<b>(222.73)</b>	<b>(426.92)</b>
<b>Tax expense</b>			
Current tax	189.97	127.00	91.10
Deferred tax	514.79	(155.54)	(2.41)
<b>Total tax expense</b>	<b>704.76</b>	<b>(28.54)</b>	<b>88.69</b>
<b>Net loss for the year</b>	<b>(345.20)</b>	<b>(194.19)</b>	<b>(515.61)</b>
<b>Other comprehensive income/(loss)</b>			
Items that will not be reclassified to profit or loss			
Re-measurement gains /(losses) on defined benefit obligations	0.24	0.57	(1.25)
Income tax relating to these items	-	-	-
<b>Total other comprehensive income / (loss) for the year</b>	<b>0.24</b>	<b>0.57</b>	<b>(1.25)</b>
<b>Total comprehensive loss for the year</b>	<b>(344.96)</b>	<b>(193.62)</b>	<b>(516.86)</b>
Earning per unit- Refer note 42			
<b>Significant accounting policies</b>			

**Highways Infrastructure Trust**  
**Statement of Cash Flows**

(In ₹ million)

	For the financial year ended 31 March 2022	For the financial year ended 31 March 2021	For the financial year ended 31 March 2020
<b>A. Cash flows from operating activities</b>			
<b>Profit/ (loss) before tax</b>	<b>359.56</b>	<b>(222.73)</b>	<b>(426.92)</b>
<b>Adjustments for:</b>			
Depreciation and amortisation expense	1,017.44	919.81	1,038.67
Gain on sale of property, plant and equipment (net)	(0.04)	-	-
Gain on sale of investments (net)	(70.59)	(81.51)	(120.96)
(Gain) / loss on investments carried at fair value through profit or loss (net)	(6.51)	5.59	(1.26)
Modification gain on annuity	(51.71)	(143.66)	(91.10)
Excess provisions written back	(1.40)	(2.26)	(0.99)
Interest income	(103.07)	(62.27)	(63.73)
Re-measurement losses / ( gains) on defined benefit obligations	0.24	0.57	(1.25)
Unwinding finance cost on deferred payment to NHAI for purchase of right to charge user of tollroads	148.30	145.97	143.44
Unwinding of discount on provisions and financial liabilities carried at amortised cost	49.15	41.74	38.65
Unwinding of discount on major maintenance provision	78.44	59.97	68.75
Finance cost	2,499.67	2,492.83	2,523.93
Major maintenance provision	310.20	451.45	834.11
Gain on modification of financial liability	(52.55)	(64.09)	(13.34)
<b>Operating profit before working capital changes and other adjustments</b>	<b>4,177.13</b>	<b>3,541.41</b>	<b>3,928.01</b>
<b>Working capital changes and other adjustments:</b>			
Trade receivables	31.62	18.56	(25.41)
Other current and non-current financial assets	355.95	(179.52)	4.00
Other current and non-current assets	50.03	0.54	(119.31)
Trade payables	109.47	70.18	150.53
Provisions	(934.92)	(288.31)	(902.96)
Other current and non-current financial liabilities	116.34	(176.05)	(286.68)
Other current and non-current liabilities	15.35	(15.15)	(0.29)
<b>Cash flow from operating activities post working capital changes</b>	<b>3,920.97</b>	<b>2,971.67</b>	<b>2,747.89</b>
Income tax paid (net)	(216.53)	(126.34)	(88.57)
<b>Net cash generated from operating activities (A)</b>	<b>3,704.44</b>	<b>2,845.33</b>	<b>2,659.32</b>
<b>B. Cash flows from investing activities</b>			
Acquisition of property, plant and equipment and capital work-in-progress and intangible assets	(76.30)	(14.19)	(26.24)
Proceeds from disposal of property, plant and equipment	-	1.17	-
Purchase of bank deposits (net)	(1,821.76)	(1,373.94)	(697.27)
Proceeds from sale of bank deposits	1,471.34	1,209.98	892.68
Purchase of current investments	(5,359.54)	(94.80)	(561.27)
Proceeds from sale of current investments	5,441.27	479.44	266.80
Interest received on bank deposits and others	103.07	62.27	63.75
<b>Net cash (used in) / flow from investing activities (B)</b>	<b>(241.92)</b>	<b>269.93</b>	<b>(61.55)</b>
<b>C Cash flows from financing activities</b>			
Proceeds from current borrowings	-	111.68	858.69
Repayment of optionally-convertible debentures (including interest)	(7,621.91)	(258.30)	-
Repayment of non-current borrowings (including current maturities)	(1,889.10)	(845.01)	(1,800.01)
Proceeds from issue of compulsory convertible debentures	7,978.14	-	-
Dividend paid on equity shares	-	(653.77)	-
Finance costs paid	(1,643.64)	(1,564.96)	(1,669.06)
<b>Net cash used in financing activities (C)</b>	<b>(3,176.51)</b>	<b>(3,210.36)</b>	<b>(2,610.38)</b>

<b>D Net increase / (decrease) in cash and cash equivalents (A+B+C)</b>	<b>286.01</b>	<b>(95.10)</b>	<b>(12.61)</b>
<b>E Cash and cash equivalents at the beginning of the year</b>	<b>79.81</b>	<b>174.91</b>	<b>187.52</b>
<b>Cash and cash equivalents at the end of the year (D+E) {refer note 13}</b>	<b>365.82</b>	<b>79.81</b>	<b>174.91</b>

## **SUMMARY FINANCIAL INFORMATION OF THE SPONSOR**

*The summary financial information of the Sponsor is included in this Final Placement Memorandum as per the requirements of the InvIT Regulations.*

*The degree to which the summary financial information included herein below will provide meaningful information is entirely dependent on the reader's level of familiarity with IFRS.*

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*Galaxy Investments II Pte. Ltd.*

*Statement of Financial Position  
December 31, 2021*

	<u>2021</u>
	US\$
<b>ASSET</b>	
<b>Current asset</b>	
Cash and cash equivalents	23,106,321
<b>Non-current asset</b>	
Investment	377,156,640
<b>Total assets</b>	400,262,961
<b>LIABILITY AND EQUITY</b>	
<b>Current liability</b>	
Other payables	2,850,635
<b>Capital and reserves</b>	
Share capital	205,253,833
Capital reserves	205,253,834
Accumulated losses	(13,095,341)
Total equity	397,412,326
<b>Total liability and equity</b>	400,262,961

*Galaxy Investments II Pte. Ltd.*

*Statement of Profit and Loss and other Comprehensive Income  
For the period from June 11, 2021 (date of incorporation) to December 31, 2021*

	For the period from June 11, 2021 (date of incorporation) to December 31,2021
	US\$
Change in fair value on financial assets at fair value through profit or loss	7,218,208
Transaction costs	(11,568,190)
Management fee	(3,156)
Operating expenses	(8,742,203)
<b>Loss before income tax</b>	<b>(13,095,341)</b>
Income tax	–
<b>Loss for the period, representing total comprehensive loss for the period</b>	<b>(13,095,341)</b>

*Galaxy Investments II Pte. Ltd.*

*Statement of Changes in Equity*

*For the period from June 11, 2021 (date of incorporation) to December 31, 2021*

	<u>Share capital</u>	<u>Capital reserves</u>	<u>Accumulated losses</u>	<u>Total</u>
	US\$	US\$	US\$	US\$
Loss for the period representing total comprehensive loss for the period	–	–	(13,095,341)	(13,095,341)
Transactions with owners, recognised directly in equity:				
Issue of shares on date of incorporation	1	–	–	1
Issue of new shares	205,253,832	–	–	205,253,832
Deemed capital contribution from immediate holding company	–	205,253,834	–	205,253,834
<b>Balance at December 31, 2021</b>	<b>205,253,833</b>	<b>205,253,834</b>	<b>(13,095,341)</b>	<b>397,412,326</b>

*Galaxy Investments II Pte. Ltd.*

*Statement of Cash Flows*

*For the period from June 11, 2021 (date of incorporation) to December 31, 2021*

	For the period from June 11, 2021 (date of incorporation) to December 31,2021
	US\$
<b>Operating activities</b>	
Loss before income tax	(13,095,341)
Adjustments for:	
Change in fair value on financial asset at fair value through profit or Loss	(7,218,208)
Operating cash flows before movements in working capital	(20,313,549)
Other payables	2,850,635
Cash used in operations, representing net cash used in operating activities	(17,462,914)
<b>Investing activity</b>	
Acquisition of financial asset at fair value through profit or loss, representing cash used in investing activity	(369,938,432)
<b>Financing activities</b>	
Proceeds from issue of shares	205,253,833
Deemed capital contribution from immediate holding company	205,253,834
Net cash generated from financing activities	410,507,667
Net increase in cash and cash equivalents	23,106,321
Cash and cash equivalents at beginning of the period	–
<b>Cash and cash equivalents at end of the period</b>	<b>23,106,321</b>

## **SUMMARY FINANCIAL INFORMATION OF THE INVESTMENT MANAGER**

*The following tables set forth the summary financial information derived from the audited financial statements of the Investment Manager, which was prepared in accordance with Ind AS, as defined in Rule 2(1)(a) of Companies (Indian Accounting Standards) Rules, 2015, as amended, prescribed under the Section 133 of the Companies Act, as of and for the fiscals 2021.*

*The degree to which the summary financial information included herein below will provide meaningful information is entirely dependent on the reader's level of familiarity with Indian accounting practices, Ind AS, the Companies Act and the InvIT Regulations. Accordingly, any reliance by persons not familiar with Indian accounting practices, Ind AS, the Companies Act and the InvIT Regulations on the summary financial information presented below should be limited.*

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**Condensed Balance Sheet as at December 31, 2021**

(Amount in INR) (Amount in INR)

Particulars	As at 31st December 2021	As at 31st March 2021
<b>ASSETS</b>		
<b>Financial Assets</b>		
Cash and Cash Equivalents	18,69,34,811	3,66,43,840
Bank Balance other than Cash and Cash Equivalents	-	-
Receivables		
- Trade Receivables	7,23,83,955	14,09,64,849
Investments	25,99,990	25,99,990
Other Financial Assets	47,86,519	12,75,000
<b>Non-Financial Assets</b>		
Current Tax Assets (Net)	1,85,90,204	86,84,487
Deferred Tax Assets (Net)	17,39,861	7,96,389
Property, Plant and Equipment	1,35,03,023	15,07,187
Intangible Assets under development	-	91,56,000
Other Non-Financial Assets	2,31,13,767	1,38,89,928
<b>TOTAL ASSETS</b>	<b>32,36,52,130</b>	<b>21,55,17,670</b>
<b>LIABILITIES AND EQUITY</b>		
<b>Financial Liabilities</b>		
Payables		
Trade Payables		
(i) Total outstanding dues of micro enterprises and small enterprises	6,49,156	9,65,972
(ii) Total outstanding dues of other than micro enterprises and small enterprises	12,61,69,924	28,77,633
<b>Non-Financial Liabilities</b>		
Current Provisions	3,47,93,569	6,60,15,123
Non-Current Provisions	60,42,519	25,01,100
Other Non Financial Liabilities	54,79,332	2,66,86,386
<b>EQUITY</b>		
Equity Share Capital	12,74,77,530	11,01,00,000
Other Equity	2,30,40,100	63,71,456
<b>TOTAL LIABILITIES AND EQUITY</b>	<b>32,36,52,130</b>	<b>21,55,17,670</b>

As per our report of even date  
For **M S K A & Associates**

For and on behalf of the Board of Directors of

Chartered Accountants

ICAI Firm Registration  
Number: 105047W

**Tushar Kurani**  
Partner  
Membership Number: 118580

Place: Mumbai  
Date: March 22, 2022

Virescent Infrastructure Investment  
Manager Private Limit

Sanjay Grewal  
Whole-time Director  
DIN: 01971866

Place: New Delhi  
Date: March 22, 2022

Hardik Shah  
Director  
DIN: 06648474

Charmy Bhoot  
Company  
Secretary  
Membership  
No.A25974

Place: Mumbai  
Date: March 22,  
2022

**Condensed Statement of Profit & Loss for the period from April 01, 2021 to December 31, 2021**

Particulars	(Amount in INR)	
	For the period April 01, 2021, to December 31, 2021	For the period August 22, 2020 (date of incorporation) to December 31, 2020
<b>Revenue from operations</b>		
Management Fee Income	23,59,74,023	3,44,30,000
<b>Total revenue from operations</b>	<b>23,59,74,023</b>	<b>3,44,30,000</b>
Other Income (Interest on Fixed Deposits)	82,849	2,92,849
<b>Total Income (I)</b>	<b>23,60,56,872</b>	<b>3,47,22,849</b>
<b>Expenses</b>		
Employee benefits expense	17,39,25,145	2,16,51,477
Depreciation and amortisation expense	27,81,590	1,40,027
Other expenses	3,94,22,329	2,02,50,852
<b>Total Expenses (II)</b>	<b>21,61,29,064</b>	<b>4,20,42,356</b>
<b>Profit / (Loss) before tax (III) = (II-I)</b>	<b>1,99,27,808</b>	<b>(73,19,507)</b>
<b>Tax expenses</b>		
Current tax	64,61,575	-
Deferred tax	(9,17,659)	-
<b>Total tax expense</b>	<b>55,43,916</b>	<b>-</b>
<b>Profit / (Loss) for the period</b>	<b>1,43,83,892</b>	<b>(73,19,507)</b>
<b>Other Comprehensive income for the period</b>		
- Remeasurement of employee benefits obligations	66,974	-
<b>Total Comprehensive income/(loss) for the period</b>	<b>1,43,16,918</b>	<b>(73,19,507)</b>

Earnings per equity share (nominal value of share Rs.10)

- Basic	1.25	-0.95
- Diluted	1.25	-0.95

Select Explanatory Notes

As per our report of even date

**For M S K A & Associates**  
Chartered Accountants

ICAI Firm Registration Number: 105047W

**Tushar Kurani**  
Partner  
Membership Number: 118580

For and on behalf of the Board of Directors of  
Virescent Infrastructure Investment Manager Private

Sanjay Grewal  
Whole-time Director  
DIN: 01971866

Hardik Shah  
Director  
DIN: 06648474

Charmy Bhoot  
Company Secretary  
Membership  
No.A25974

Place: Mumbai  
Date: March 22, 2022

Place: New Delhi  
Date: March 22, 2022

Place: Mumbai  
Date: March 22, 2022

*Condensed Statement of Changes in Equity for the period April 01, 2021 to March 31, 2022*

<b>Equity Share Capital</b>			(Amount in INR)
Particulars	Balance at the beginning of the reporting period	Changes in equity share capital during the reporting period	Balance at the end of the reporting period
For the period April 01, 2021 to December 31, 2021	11,01,00,000	1,73,77,530	12,74,77,530
<b>Other Equity</b>			
Particulars	General Reserves	Retained earnings	Total
<b>Balance at the beginning of the reporting period</b>	-	63,71,455	63,71,455
Profit for the period	-	1,43,16,918	1,43,16,918
Dividends	-	-	-
Dividend Distribution Tax	-	-	-
Securities premium on fresh equity issuance	-	23,51,727	23,51,727
<b>Balance at the end of the reporting period</b>	-	<b>2,30,40,100</b>	<b>2,30,40,100</b>

As per our report of even date

**For M S K A & Associates**

Chartered Accountants

ICAI Firm

Registration Number: 105047W

**Tushar Kurani**

Partner

Membership Number: 118580

Place: Mumbai

Date: March 22, 2022

For and on behalf of the Board of Directors of

Virescent Infrastructure Investment Manager Private Limited

Sanjay

Grewal

Whole-time Director

DIN: 01971866

Place: New Delhi

Date: March 22, 2022

Hardik Shah

Director

DIN:06648474

Charmy Bhoot

Company Secretary

Membership

No.A25974

Place: Mumbai

Date: March 22, 2022

**Condensed Cash Flow Statement for the period April 01, 2021 to March 31, 2022**

Particulars	For the period for the period April 01, 2021 to December 31, 2021	For the period August 22, 2020 (date of incorporation) to December 31, 2020
1 Net Cash Flows from/(used in) Operating Activities	13,61,83,139	(3,44,71,091)
2 Net Cash used in Investing Activities	(56,21,426)	(64,62,208)
3 Net Cash Flows from Financing Activities	1,97,29,257	11,01,00,000
4 <b>Net increase/(decrease) in Cash and Cash equivalents</b>	<b>15,02,90,971</b>	<b>6,91,66,701</b>
5 Cash and Cash equivalents at beginning of period	3,66,43,840	-
6 <b>Cash and Cash equivalents at end of period</b>	<b>18,69,34,811</b>	<b>6,91,66,701</b>

As per our report of even date

**For M S K A & Associates**

For and on behalf of the Board of Directors of

Virescent Infrastructure Investment Manager Private Limited

Chartered Accountants

ICAI Firm Registration Number: 105047W

**Tushar Kurani**  
Partner

Membership Number: 118580

Sanjay Grewal  
Whole-time Director

DIN: 01971866

Hardik Shah  
Director

DIN:  
06648474

Charmy Bhoot  
Company  
Secretary  
Membership  
No.A25974

Place: Mumbai

Date: March 22, 2022

Place: New Delhi

Date: March 22, 2022

Place: Mumbai

Date: March 22, 2022

## SUMMARY OF INDUSTRY

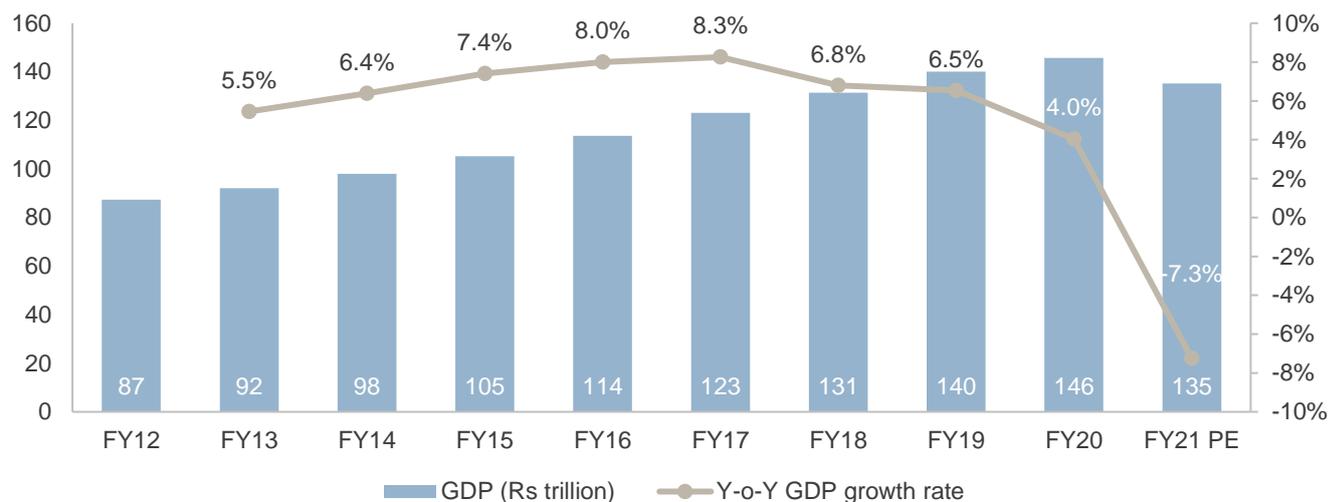
### Macro-economic overview of India

#### Review of India's GDP growth

##### GDP grew 6.6% CAGR from fiscals 2012 to 2020

Fiscal 2021 has been a challenging year for the Indian economy, which was already experiencing a slowdown before the pandemic struck. GDP contracted 7.3% (in real terms) last fiscal, after growing 4.0% in fiscal 2020.

##### Real GDP growth in India (new GDP series)

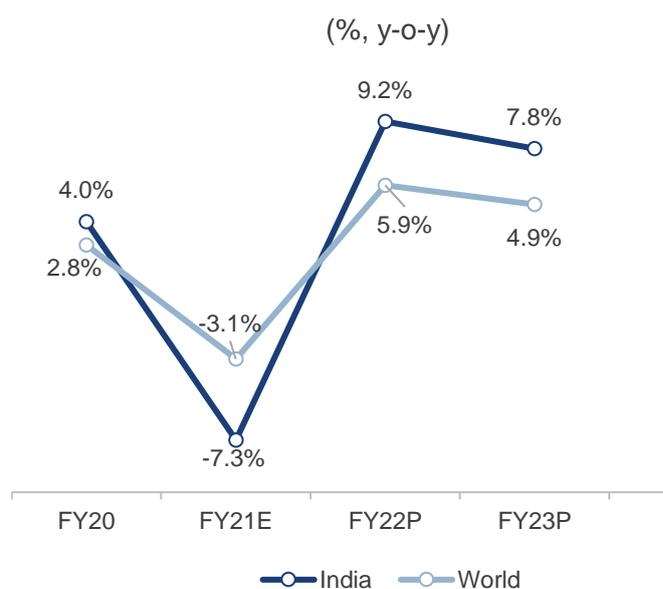


PE: Provisional estimates

Source: Provisional estimates of Annual National Income 2020-21, Central Statistics Office (CSO), Ministry of Statistics and Programme Implementation (MoSPI), CRISIL Research

The economy is in recover mode, with GDP expanding 20.1% on-year in the first quarter of fiscal 2022 and 8.4% on-year in the second quarter of fiscal 2022. In absolute terms GDP for the second quarter of fiscal 2022 has just crossed the GDP value reported in first quarter of fiscal 2020 (pre-covid), reporting a rise of 0.2%. The economic rebound comes on the back of reduced pandemic restrictions and improving vaccination coverage.

## India to surpass global GDP growth in next three fiscals



### GDP growth to rebound to 9.2% this fiscal on the back of a very weak base and the rising-global-tide effect

CRISIL sees India's GDP growth rebounding to 9.2% this fiscal due to a very weak base, flattening of the Covid-19 curve, rollout of vaccinations, investment-focused government spending, and benefit from the 'rising global tide lifts all boats' effect. Yet, the economy is expected to reach pre-pandemic levels only by the second quarter of this fiscal. Services will take longer to recover than manufacturing. Beyond fiscal 2022, India is seen growing faster than the world.

Note: Forecasts for World are for calendar year; FY20 corresponds to 2019 and so on; P: Projected; updated as of June 2021; India numbers for FY20 and FY21 are based on MoSPI's latest GDP estimates and FY22 onwards are CRISIL Research's forecast. World GDP growth rates are from IMF world economic outlook update as of April 2021.

– Source: S&P Global Ratings, CRISIL

### Key Fiscal Measures announced by government for Infrastructure sector to deal with Covid-19

The government announced a series of fiscal measures under the Atmanirbhar Bharat initiative to contain the human and economic damage from the COVID-19 pandemic. Following are the details of key measures announced under three packages announced in the months of May, October and November of fiscal 2021.

#### Fiscal stimulus 1.0:

The government announced measures worth Rs 11 trillion in five tranches. This was in addition to the earlier announced measures worth Rs 9.9 trillion (RBI liquidity support and others), taking the total financial support amount to Rs 20.9 trillion. It was announced by Government of India with the aim to revive the economy by liquidity infusion and income support. The actual committed fiscal outgo of Rs 1 trillion, translating to 9% of the Rs 11 trillion of measures outlined over the five tranches. The bulk of this direct support was through the Pradhan Mantri Garib Kisan Yojana. The government also ploughed in some earlier discussed structural reforms, especially in tranches 4 and 5, to help drive India's medium-term growth story. The announcements pertained especially to sectors such as mining, aviation, urban infrastructure, power, and agriculture.

Further, the government increased the borrowing limit for state governments from 3% of their GDP to 5% of GDP. However, of this additional 2 percentage points, 1.5 percentage point is conditional upon states achieving certain targets.

For addressing near-term issues, apart from direct benefit transfers and additional spending through MNRGA, the government mobilised credit to micro, small and medium enterprises (MSMEs), agriculture, and the affordable housing sector. Like the 100% guarantee on Rs 3 trillion loans to MSMEs with one year moratorium to help these units, which are typically strapped for working capital. It was also aimed at spurring credit growth for both banks and non-banks in fiscal 2021 and contain delinquencies in the segment, which would have increased otherwise.

#### Fiscal stimulus 2.0:

The government measures targeted increasing the demand in the economy. Government has proposed a scheme where central government employees can spend their tax-exempt travel concessions on certain goods and services. It also made provisions for them to receive a part of their wages in advance to spend on their choice of festival before the end of March 2021. The stimulus also includes infrastructure spending of Rs.250 billion and interest free loan to states which stands at Rs.120 billion. The measures announced under this package amounted to Rs 0.7 trillion.

### **Fiscal stimulus 3.0:**

This Rs 2.65 trillion stimulus package is aimed at job creation, access to credit and farm support with. The key highlight of this stimulus is to provide production linked incentives to 10 sectors which is estimated at around 1.45 trillion. This is proposed to be spent over the next 4-6 years i.e. till FY28 to encourage domestic manufacturing across 10 sectors – namely, textiles, food, pharma, consumer durables, auto, telecom, specialty steel, solar, electronic, and battery. The stimulus package also provides Rs.650 billion additional outlay for subsidy towards fertilisers sector. The stimulus also includes outlay of Rs.180 billion for housing for all plan besides it also includes package of Rs.100 billion to support rural economy.

### **Key Measures announced by government for Infrastructure sector to deal with Covid-19**

Central government have announced some key measures to address the implications caused by Covid-19. Some of the key measures announced by government are as follows:

- Up to 6 month extensions for completion of infrastructure projects: Central government has given extension of up to 6 months to contractors whose operations are hit by Covid-19. This extension is given with no additional penalty for missing out on milestones. All central agencies like Railways, Ministry of Road transport and highways and central public works department will grant extensions to its contractors engaged in different projects work under PPP mode.
- Revenue Shortfall Loan provisions under the concession agreement were extended by NHAI to BOT concessionaires at Bank Rate + 2% to provide relief from the Covid-19 impact. The loan amount would be lower of i) Debt obligation plus the O&M expenses; or ii) Estimated toll collection minus actual collection during the period. NHAI had tried to reduce impact on toll collection due to suspension of tolling operations from 26<sup>th</sup> March-19<sup>th</sup> April, 2020 by NHAI as well as disruption in traffic post 19<sup>th</sup> April due to lockdown in major parts of the country.
- Extension in concession period was granted to road asset operators due to suspension in tolling activity from 26<sup>th</sup> March to 19<sup>th</sup> April, 2020. Extension in concession period would be in proportion for period where daily toll collection would be less than 90% of average daily collection. Also waiver of concession fee/premium was announced for 26<sup>th</sup> March to 19<sup>th</sup> April period. Extension and waiver of premium/concession fee helped mitigate the extent of impact on decline in return on the assets.
- Release of retention money in proportion of work done and no further deduction of retention money for 3-6 months from contractors
- Enabled monthly payments based on work completed instead of milestone based payments
- Performance security on contracts reduced to 3% instead of 5-10%. The rate of deposits have been slashed in view of Covid-19 pandemic. As these fees usually have to be paid upfront, reduction in the rate of deposit is expected to bring respite to stressed construction companies
- Earnest Money Deposit (EMD) for tenders to be replaced by bid security self-declaration: Government of India have provided relaxation on Earnest money deposit on government tenders. EMD is to be replaced by bid security self-declaration.

### **Key budgetary proposals for Infrastructure sector**

The Union Budget 2022-23 bet big on an investment push to lift economic growth, two years and three waves into the pandemic. The total capex of the government (budgetary capex plus revenue grants for capital creation and capex by central public sector enterprises) is budgeted to rise 14.5% as compared with only 3.1% in the current fiscal. The government thus has tightened the belt around revenue expenditure and frontloaded infrastructure spending that would lead to faster economic growth.

Among the sectors, infrastructure continues to be in the bright spot with a 30% hike in budgetary support.

Key budget announcements concerning infrastructure are,

- At Rs 7.5 trillion, aggregate budgetary support (gross budgetary support or GBS) for capex next fiscal is up 39% over fiscal 2022RE. For infrastructure sectors, budgetary support is 30% up at Rs 4.3 trillion. These exclude Rs 620.57 billion equity infusion into AI Assets Holding Ltd (AIAHL) in fiscal 2022RE

- PM Gati Shakti Master Plan for expressways is to be formulated. The national highways network will be expanded by 25,000 km next fiscal
- In the railways sector, 2,000 km of tracks will be brought under train collision avoidance system, Kavach; 400 new generation Vande Bharat trains will be introduced in the next three years
- Four multi-modal logistics parks will be awarded through the PPP mode next fiscal

Asset monetisation as an infrastructure funding mechanism was largely missing in the budget proposals. It found mention only in the roads sector, where it is expected to generate Rs 200 billion and fund 10% of the National Highways Authority of India's (NHAI) requirement for the next fiscal. This fiscal, the share is estimated to be 5-8% dependent on the realisation of toll-operate-transfer (TOT) bundles 6-8.

## Review of roads infrastructure in India

### Road sector's contribution to Indian gross value added (GVA)

The road transport sector's share in Indian GDP stood at 3.0% in fiscal 2020. The share of road transport in India's GDP has hovered between 2.9% to 3.1% from fiscals 2012 to 2020.

GVA share (%)	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20
Road transport (at constant prices)	3.0%	3.1%	3.1%	3.0%	3.0%	2.9%	3.0%	3.0%	3.0%

Source: Ministry of Statistics and Programme Implementation (MoSPI), CRISIL Research

### Road network in India

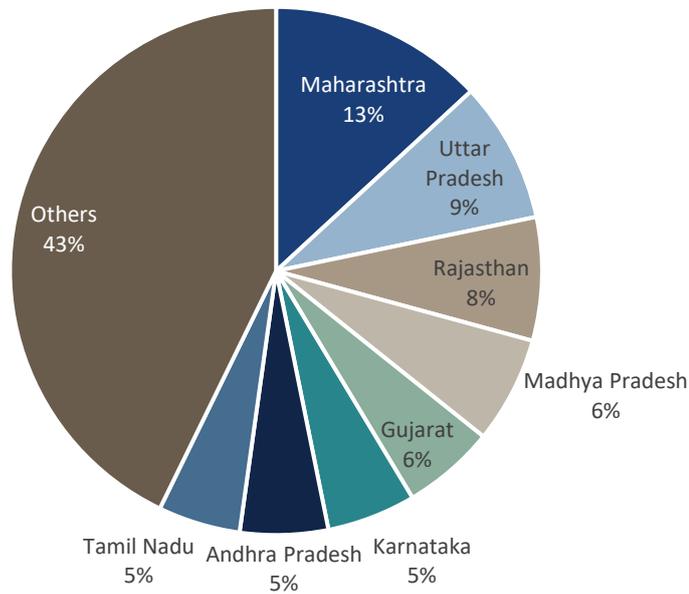
India has the second-largest road network in the world, spanning 6.2 million km.

### Road network in India in fiscal 2021

Road network	Length ('000km)	Percentage of total - length	Percentage of total - traffic	Connectivity to
National highways	136.4	~2%	40%	Union capital, state capitals, major ports, foreign highways
State highways	176.8	~3%	60%	Major centres within the states, national highways
Other roads	5,902.5	95%		Major and other district roads, rural roads - production centres, markets, highways, railway stations

Source: MoRTH Annual Report 2020-21, CRISIL Research

**State-wise length of national highways in India as of FY21**



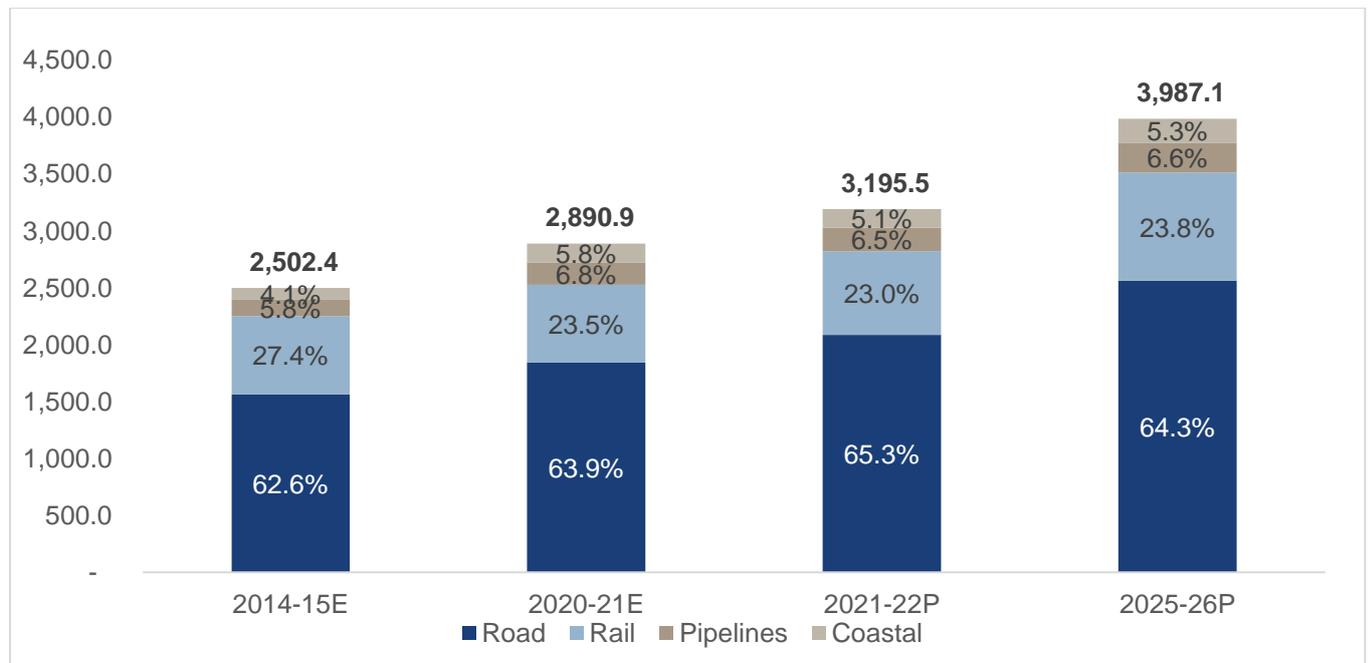
– Source: MoRTH Annual Report 2020-21, CRISIL Research

**Indian freight traffic scenario**

**Roads to continue to have a dominant share in the overall freight movement**

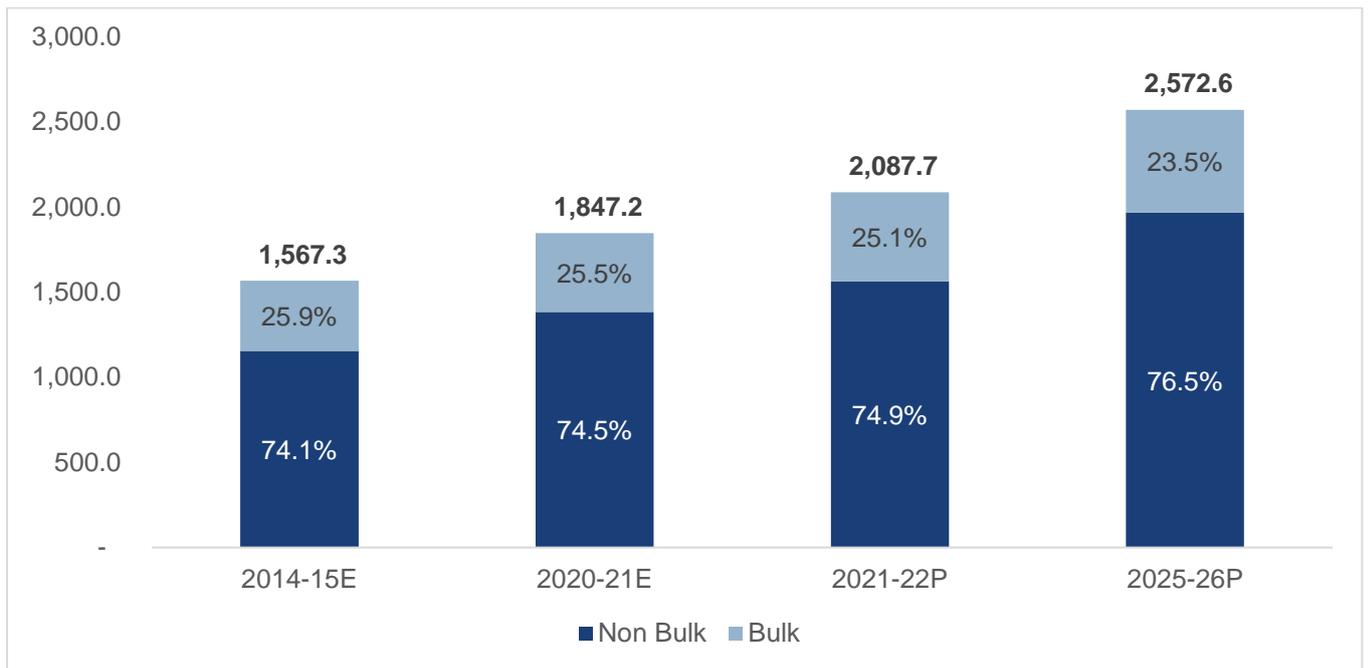
CRISIL Research expects growth in road freight traffic to increase at a compounded annual growth rate (CAGR) of 6-8% in billion-tonne-kilometre (BTKM) terms between fiscals 2021 and 2026, on a low base.

**Share of roads in total freight movement (in terms of BTKM)**



– E: Estimated; P: Projected  
 – Source: CRISIL Research

**Roads predominantly transfer non-bulk freight (in terms of BTKM)**



- E: Estimated; P: Projected
- Source: CRISIL Research

## SUMMARY OF BUSINESS

### Overview

Highway Infrastructure Trust (the “**Highways Trust**”) is an Indian infrastructure investment trust which proposes to invest in road infrastructure assets and is sponsored by Galaxy Investments II Pte. Ltd. (the “**Sponsor**”). Highways Trust will have an initial portfolio consisting of the six Project SPVs having an aggregate of 451.98 kms (1,710 lane kms), located across six states in India.

The Sponsor is affiliated with funds, vehicles and/or entities managed and/or advised by affiliates of KKR. As on date, the Sponsor is a 100% subsidiary of Galaxy Investments Pte. Ltd., which is majority owned and controlled by KKR Asia Pacific Infrastructure Holdings Pte. Ltd.

Founded in 1976, KKR is a leading global investment firm that offers alternative asset management and capital markets and insurance solutions with US\$ 491 billion of assets under management as of June 30, 2022. KKR sponsors investment funds that invest in private equity, credit and real assets and has strategic partners that manage hedge funds. KKR’s insurance subsidiaries offer retirement, life and reinsurance products under the management of Global Atlantic Financial Group. KKR aims to generate attractive investment returns by following a patient and disciplined investment approach, employing world-class people, and supporting growth in its portfolio companies and communities.

In 2008, KKR established a dedicated infrastructure team and strategy focused on global investment opportunities. KKR has been one of the more active infrastructure investors globally over the past several years, having made approximately 65 infrastructure investments globally and more than US\$40 billion in assets under management within infrastructure.

Currently, KKR’s Infrastructure platform has expanded to include approximately 75 dedicated investment professionals across 10 offices covering a broad spectrum of investment opportunities in various infrastructure subsectors, including: midstream energy, renewables, power & utilities, water and wastewater, waste, telecommunications and transportation, among others. KKR continually monitors infrastructure sectors and infrastructure-related investments for emerging trends, and may identify and prioritize investments in other sectors as conditions change or cycles evolve. Among KKR’s focus areas are investments in assets related to the global roads sector. KKR has invested or committed over US\$6.7 billion of equity in private equity and infrastructure deals in India since 2010 with over 20 investments made and more than a dozen active portfolio companies today. For further details in relation to the Sponsor, please see the section entitled “*Parties to the Highways Trust*” on page 101.

### *Our Projects*

Our initial portfolio of assets includes the following six Projects, comprise both, National Highways and State Highways, and are located in the states of Telangana, Gujarat, Madhya Pradesh, Meghalaya, Rajasthan and Tamil Nadu to be acquired by way of 100% shareholding in six Project SPVs:

- the DBCPL Project, a four lane highway with an aggregate length of 140.79 kilometres, between Bhopal to Dewas on State Highway 18\* in Madhya Pradesh, operated by DBCPL;
- the GEPL Project, a four lane highway with an aggregate length of 87.10 kilometres, on the Godhra and the border between Madhya Pradesh and Gujarat on National Highway 59\* in Gujarat, operated by GEPL;
- the JPEPL Project, a four lane highway with an aggregate length of 71.54 kilometres, between the Jodhpur and Pali section on National Highway 65\* in Rajasthan, operated by JPEPL;
- the NBL Project, a four lane highway with an aggregate length of 30.89 kilometres, between the Kadatal and Armur section on National Highway 7\* in Telangana, operated by NBL;
- the SEPL Project, a two lane highway with an aggregate length of 48.77 kilometres, comprising the Shillong bypass connecting National Highway 40\* with National Highway 44\* in Meghalaya, operated by SEPL; and

- the UEPL Project, a four lane highway with an aggregate length of 72.90 kilometres, between the Tindivanam and Ulundurpet section on National Highway 45\* in Tamil Nadu, operated by UEPL;

*\*Note: The State Highway and National Highway numbers and chainages mentioned in this Final Placement Memorandum are old Highway numbers and chainages, as per the concession agreements. The actual SH/NH numbers and chainages at site may differ based on subsequent changes.*

Through these six SPVs, we will maintain and operate road assets aggregating to 451.98 kms (1,710 lane kms).

The combined operating revenue of the Project SPVs for Fiscals 2022, 2021 and 2020 was ₹ 5,866.56, ₹ 5,085.04 million, and ₹ 5,008.80 million, respectively.

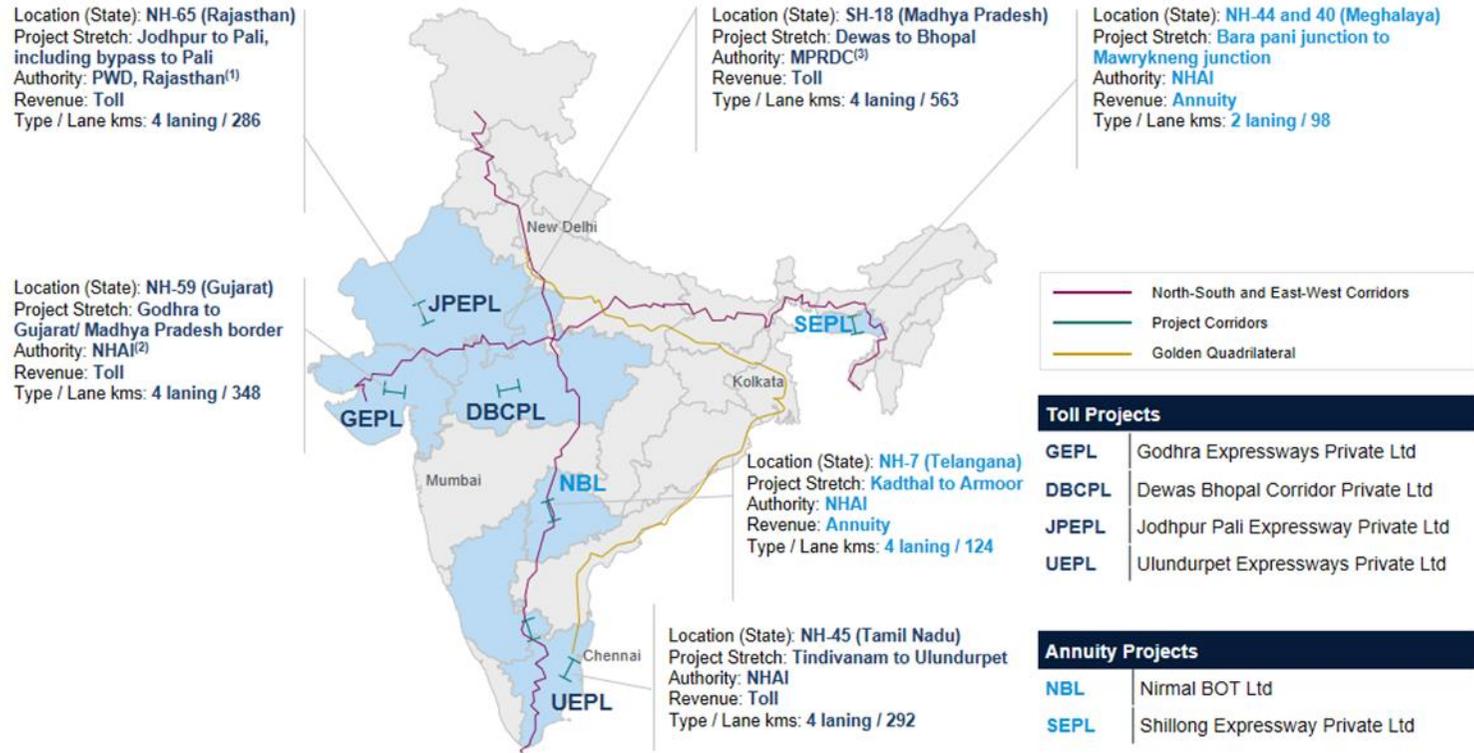
The Projects are divided into two types on the basis of the implementation mode: (i) toll and (iii) annuity. Key details of these models are set out below:

**Annuity-based Projects:** Under this model, the concessionaire is responsible for the construction and maintenance of the project during the concession period. The concessionaire generates revenue through fixed annuity payments received from the concessioning authority, over the concession period. Since this annuity payment is a cost to the concessioning authority, the contract is awarded to the lowest bidder.

**Toll-based Projects:** Under this model too, the concessionaire is responsible for the construction, operation and maintenance of the project during the concession period, post which the project is transferred to the concessioning authority. During the concession period, the concessionaire realises its returns by way of toll collection rights under the concession agreement. Therefore, the concessionaire bears the revenue risk during the concession period. The toll charged under these contracts is generally regulated by a policy or a public agency.

For further details, please see the section entitled “*Industry Overview*” on page 150.

The map below illustrates the locations of the Projects:



1. Public Works Department, Rajasthan; 2. National Highways Authority of India; 3. Madhya Pradesh Road Development Corporation Limited.

\*Map not drawn to scale

The Investment Manager will also have the flexibility to acquire new projects through acquisitions from the Sponsor and third parties, and by directly submitting bids to the relevant Governmental entities for the acquisition of assets.

Virescent Infrastructure Investment Manager Private Limited is the Investment Manager for the Highways Trust. The Investment Manager is a private limited company incorporated on August 22, 2020 under the Companies Act, 2013, having CIN U74999MH2020PTC344288.

Virescent Renewable Energy Project Manager Private Limited, is the Project Manager and is a private limited company incorporated on November 27, 2020 under the Companies Act, 2013, having U74999MH2020PTC350874.

Axis Trustee Services Limited is the Trustee of the Highways Trust. The Trustee is a registered intermediary with SEBI under the Securities and Exchange Board of India (Debenture Trustees) Regulations, 1993, as a debenture trustee.

For further details of the Sponsor, the Investment Manager, the Project Manager and the Trustee, please see the section entitled “*Parties to the Highways Trust*” on page 101.

## **Strengths**

The Investment Manager believes the following to be the key strengths of the Highways Trust:

### ***Sizeable and Diversified Portfolio - Strategically located Projects and variety of Concessioning Authorities***

Highways Trust will have a sizeable initial portfolio consisting of the six Project SPVs having an aggregate of 451.98 kms (1,710 lane kms), located across six states in India. The portfolio of the Highways Trust has toll assets with operating histories of 7 to 13 years and each Project SPV has entered into a long term concession agreement with the NHAI and other state authorities, having terms of between 15 and 27 years, thereby providing long term cash flows to the Highways Trust.

The Concessioning Authorities for these Projects include the NHAI, MPRDC and PWD, Government of Rajasthan. Further, the initial portfolio of assets comprises a mix of both toll and annuity road projects bringing in diversity in the earnings of the Project SPVs as well. We believe that the diversified revenue streams from our Projects provide us with steady cash flow during the course of the year. The Projects are located in corridors that have a mix of high commercial and passenger vehicular traffic, located in parts of India with high gross state domestic product growth. The principal features of the Projects are as follows:

- the DBCPL Project connects two major cities of Madhya Pradesh – Bhopal (political capital of Madhya Pradesh) and Indore (business and trading capital of Madhya Pradesh) via Dewas and serves the regional traffic demand. Additionally, the Project Road provides connectivity to the mobility requirements of smaller towns/cities along the project corridor such as, amongst other, Sehore, Ashta and Sonkatch;
- the GEPL Project serves the long-distance traffic majorly plying from Godhra and beyond to Madhya Pradesh and beyond. Apart from long distance traffic, it also serves the short distance traffic which is mainly generated between Godhra and Dahod and surrounding areas;
- the JPEPL Project is a part of the national highway that connects the states of Punjab and Rajasthan with western states of Gujarat and Maharashtra. Apart from long distance traffic, it also serves the short distance traffic which is mainly generated between Jodhpur and Pali areas;
- the UEPL Project acts as one of the primary life-line corridor in the state of Tamil Nadu connecting the Chennai (the state capital) with various industrial towns and tourist places in the southern, eastern, western parts of Tamil Nadu. The UEPL Project serves long-distance distance traffic which is majorly plying between Tindivanam/north of Tindivanam (Chengalpattu/Chennai) and eastern/southern and western Tamil Nadu districts (amongst other, Trichy, Madurai, Cuddalore, Salem and Thanjavur). Apart from long distance traffic, it also serves the short distance traffic which is mainly generated between Tindivanam and Villupuram, Madapattu and Kadilam areas;

- the NBL Project is a part of the Nagpur – Hyderabad section of NH-7 and also part of the 4,000 km North-South Corridor that connects Srinagar in Jammu and Kashmir with Kanyakumari in Tamil Nadu; and
- the SEPL Project is part of one of the important road links in North-Eastern India and connects Guwahati, the largest city of Assam with state capitals of Tripura, Mizoram and Manipur.

The concession periods of the Project SPVs started at different times and they are expected to expire at different times, thereby ensuring continuous cash flows. The residual terms of the concession agreements range between approximately 4 years and 21 years as of March 31, 2022 (including any potential extensions on account of shortfall of actual traffic against target traffic. For further details, please see the Traffic Reports in Annexure III). We believe that our temporally and geographically diverse project portfolio provides us with an advantage in capitalizing on new opportunities available in the Indian roads and highways sector and reduces our dependence on select state geographies. We believe that this diversification strengthens our business by reducing our reliance on any specific project and reducing the potential impact on our business of any economic slowdown or Project-specific *force majeure* event or with respect to any particular project.

The Investment Manager believes that the Projects cater to growth sectors and population densities that will utilise these Projects on an increasing basis, thereby contributing to expected growth in the Highways Trusts' toll revenues.

#### ***Stable income through annuity assets and toll income generating assets with high traffic volume***

We believe that the diversified revenue streams from our Projects provide us with steady cash flow during the course of the year. Approximately 17.63% of our combined revenue received in cash in the financial year ended March 31, 2022 came from annuities paid by the relevant Concessioneing Authorities while approximately 82.37% of our combined total revenue received in cash in the financial year ended March 31, 2022 was generated from toll collections.

The earliest operating toll-based Project SPV started collecting toll from 2009. The aggregate toll collections were ₹ 4,549.06, ₹ 3,919.12 million, and ₹ 3,922.85 million in Fiscal 2022, Fiscal 2021 and Fiscal 2020 respectively. While, there was no growth in aggregate toll collections by the four toll based Project SPVs in Fiscal 2021, due to, amongst other things, the impact of COVID-19 in the first two quarters of Fiscal 2021, some of the main reasons for the increase in toll collections historically were the increase in traffic volumes on the Project stretches over the relevant period and the revision of the applicable toll rates with WPI growth on an annual basis as per the terms of concession agreements. According to the Traffic Reports, it is expected that toll collections will continue to increase for the same reasons. Our toll-based Projects are located in strategic areas and connect, amongst others, industrial areas, ports, tourist places and economically important cities. This allows our toll-linked Project SPVs to exhibit a stable growth in toll collections. For further details, please see the section entitled "*Discussion and analysis by the Directors of the Investment Manager of the financial condition, results of operations and cash flows of the Project SPVs of the Highways Trust*" on page 223 and the Traffic Reports in Annexure III.

Our two annuity based Project SPVs, SEPL and NBL have received semi-annual annuities until March 31, 2022. As per the concession agreements, the relevant Concessioneing Authorities are required to make payments on the dates set out in the concession agreements. However, average collection days on all annuities is 2 days from the due date, excluding the first annuity. Our annuity-based Project SPVs have predictable cash flows and bring stable income to the Highways Trust.

#### ***Strong support from the Sponsor, Project Manager and Investment Manager***

We intend to leverage the experience and expertise of our Sponsor and its affiliates, to gain a competitive advantage within the road infrastructure industry. Our Sponsor is engaged in investment activities primarily with an objective of generating stable returns and earning long term capital appreciation. Our Sponsor is affiliated with funds, vehicles and/or entities managed and/or advised by affiliates of KKR.

KKR is a leading global investment firm with US\$491 billion of assets under management as of June 30, 2022. KKR sponsors investment funds that invest in private equity, credit and real assets and has strategic partners that manage hedge funds. KKR's insurance subsidiaries offer retirement, life and reinsurance products under the management of Global Atlantic Financial Group. KKR aims to generate attractive investment returns by following

a patient and disciplined investment approach, employing world-class people, and supporting growth in its portfolio companies and communities. In 2008, KKR established a dedicated infrastructure team and strategy focused on global investment opportunities. KKR has been one of the more active infrastructure investors globally over the past several years, having made approximately 65 infrastructure investments globally and more than US\$40 billion in assets under management within infrastructure. Currently, KKR's infrastructure platform has expanded to include over 75 dedicated investment professionals across 10 offices covering a broad spectrum of investment opportunities in various infrastructure subsectors, including: midstream energy, renewables, power & utilities, water and wastewater, waste, telecommunications and transportation, among others. KKR continually monitors infrastructure sectors and infrastructure-related investments for emerging trends, and may identify and prioritize investments in other sectors as conditions change or cycles evolve. Among KKR's focus areas are investments in assets related to the global roads sector. KKR has invested or committed US\$6.7 billion of equity in private equity and infrastructure deals in India since 2010 with over 20 investments made and more than a dozen active portfolio companies today.

KKR's Asia Pacific infrastructure portfolio other than Highways Trust, includes, amongst others, the Terra InvIT, India Grid Trust, and recently, HC1. KKR's experienced team is well positioned to capture compelling opportunities and add value to its portfolio to generate attractive, risk adjusted returns for its investors. Drawing upon this depth of experience, our Sponsor has established a strong track record of operating and managing large-scale projects, which will benefit us across all stages of project operations and acquisitions within India's complex regulatory framework (including, for example, strategic acquisition, O&M, and receivables management). Our Sponsor also provides us the ability to leverage its parentage and long-term industry relationships with stakeholders to gain cost efficient access to financing from institutions and capital markets. Further, our Investment Manager and Project Manager are also affiliates of the Sponsor. We believe our affiliation to KKR will allow us to pursue marquee and high quality road infrastructure assets and engage effectively with regulators and concessioning authorities.

#### ***Attractive industry sector with favourable government policies***

Further development of the infrastructure sector, in particular road infrastructure, is a priority for the GoI and many state governments and has been the subject of enhanced investment from the public sector through traditional means of public investment and new channels such as PPPs. Roads have been the key focus area for budget allocations over the years. Under Union Budget 2022-23, the Government has allocated ₹ 1,99,107.71 crore under the Ministry of Road Transport and Highways. Between FY2016-17 and FY2022-23, budget allocation for road transport and highways increased at a robust CAGR of 24.90%. Huge investment have been made in the sector with total investment increasing more than three times from ₹ 51,914 crore (US\$ 7.43 billion) in 2014-15 to ₹ 158,839 crore (US\$ 22.73 billion) in 2018 – 2019. As of December 2021, road projects with an aggregate length of 19,265 km has been awarded under Bharatmala Pariyojna, of which road length of 6,750 km has already been completed. Through the PPP model, among others, the Investment Manager believes that the Highways Trust has acquired, and will continue to capture through further acquisitions, a significant share in the PPP format of the road infrastructure sector. For further details on the market opportunity for the road infrastructure industry in India, please see the section entitled "*Industry Overview*" on page 150.

#### ***Skilled and experienced management team with a focus on corporate governance***

We have a strong management team with several years of experience in the infrastructure sector providing us an ability to pursue our growth strategies in a seamless manner. We draw on the knowledge of our Board of Directors and key personnel, who bring us expertise in the areas of risk management, business strategy and operational and financial capabilities, amongst others. We believe this will be key to the execution of our growth strategies. Our Board comprises of 6 directors, as on the date of this Final Placement Memorandum with extensive experience in management, finance and infrastructure.

Further, the Project Manager will also entered into a business support services agreement with HC1, an affiliate of the Investment Manager, for provision of certain services to the Project SPVs including, amongst others, corporate accounting, banking and financing services, payroll management services, corporate secretarial services and tax and statutory compliance. For further details in relation to the business support services agreement, please see the section entitled "*Related Party Transactions – Business Support Services Agreement*" on page 255. HC1 houses a team of individuals with an in-depth understanding of the road sector and cumulative experience in the road sector of more than 150 years which we believe will contribute to our growth and success.

We believe that the experience of our management team (Investment Manager and Project Manager) in the infrastructure sector will ensure that the Project SPVs and the Highways Trust are operated and managed in an efficient manner. The team is supported by other qualified operational personnel, through appropriate contractual arrangements, who have an in-depth understanding of the sector in which we operate. We have contracted a significant number of qualified personnel (including the experienced contractors and service provider identified by the Investment Manager and the Project Manager) who are engaged in operating and managing our projects as on the date of this Final Placement Memorandum.

With the aim of enshrining principles of good corporate governance and effective management and operations of the Highways Trust, the Investment Manager has constituted various committees and adopted policies such as an anti-bribery and corruption policy, a health, safety and environment policy, a prevention of sexual harassment policy, a risk management policy and a vigil mechanism policy to manage the activities of the Highways Trust. The Investment Manager has further created separate audit and risk management committee and investment committee for managing the decision-making process for the Highways Trust. In accordance with the SEBI InvIT Regulations, the Investment Manager has also adopted the (a) distributions policy pursuant to which distributions are required to be made to the Unitholders at least once a year for periods after Allotment and (b) borrowing policy which aims to outline the borrowing thresholds and process in relation to the Highways Trust. Further, the Investment Manager has also adopted appointment of auditor and valuer policy which aims at formulating a structure for ensuring compliance by the Highways Trust in appointment of its auditor and the auditing standards followed and the appointment of its valuer, in accordance with applicable law including the SEBI InvIT Regulations and code of conduct policy which aims at formulating a framework for ensuring interest of the Unitholders and proper conduct in carrying out the business and affairs of the Highways Trust in accordance with SEBI InvIT Regulations. For details in relation to the corporate governance framework of the Investment Manager, please see the section entitled “*Corporate Governance*” on page 143.

We believe that our governance process will ensure adherence and enforcement of principles of sound corporate governance with the objectives of fairness, transparency, professionalism, trusteeship and accountability, while facilitating effective management of the businesses and efficiency in operations.

### **Business Strategies**

The Investment Manager believes the following to be the key strategies of the Highways Trust:

#### ***Continue to pursue accretive growth by expanding the portfolio of road assets***

The Investment Manager intends to be selective with respect to any projects it acquires in the future and will consider factors such as access to important locations in the vicinity, connecting roads, industrial and manufacturing hubs, connectivity with raw materials, ports, availability of the relevant approvals, ease of complying with laws and also evaluating competing modes of transportation.

The Investment Manager believes that it will be able to leverage the Sponsor’s established network of relationships and contacts, extensive knowledge and experience in the roads sector in India to implement its acquisition strategy, which is to acquire eligible infrastructure assets, operational road projects and road projects that are in advanced stages of construction. In this regard, it may be noted that the Sponsor has entered into the Sponsor SPA 1 and Sponsor SPA 2 for acquisition of certain assets held by Ashoka Concessions Limited and/ or its affiliates and India Infrastructure Fund II, respectively. Upon completion of such acquisitions by the Sponsor, these assets may be made available by the Sponsor for acquisition to the Highways Trust in the future, whether directly or indirectly, subject to various conditions precedents specified in the Sponsor SPA 1 and Sponsor SPA 2 and, subject to certain conditions including the receipt of necessary regulatory and statutory approvals. The Investment Manager intends to expand the portfolio of road projects without compromising on the returns on investment from the Projects while providing attractive cash flows and yields, and opportunities for future income and capital growth.

In addition, the Investment Manager believes that due to trends in the industry, a number of acquisition opportunities may be available. These trends include the potential divestment of assets by highly leveraged private companies and by financial and private equity investors seeking to exit their investments. Further, the Investment Manager (on behalf of the Highways Trust) may also consider expanding the portfolio of the Highways Trust by directly submitting bids to the relevant Governmental entities for the acquisition of assets. The Investment

Manager hopes to take advantage of these opportunities by actively sourcing and acquiring quality assets from such third parties and the Government on a case-by-case basis, subject to its investment criteria as provided below:

- the asset having stable, predictable cash flow;
- the terms and duration of the concession agreement, the O&M agreements and other relevant agreements with respect to the asset;
- the location of the asset;
- the historical and expected traffic volume of the asset;
- the expected cash flows from the asset;
- the maintenance cost of the asset;
- the extent of any ongoing or potential disputes relating to the asset; and
- any other factor that may have an impact on the profitability of the asset.

#### ***Maintain optimum capital structure to maximise distributions to Unitholders***

We focus on achieving an optimal capital structure for our projects and will continue to draw upon the experience, relationship and expertise of our Sponsor and its affiliates in sourcing funds from multiple sources, both from domestic and international markets. The Highways Trust's total outstanding consolidated net debt after full utilization of the Issue Proceeds, will be within the regulatory requirement of 49% of the value of the InvIT Assets upon completion of the Issue (net of cash and cash equivalents) as specified under the InvIT Regulations.

We also intend to optimise our leverage to retain enough flexibility to provide sustainable and predictable cash flows while also evaluating potential acquisition opportunities in the future. After the completion of the Issue, we believe that we will have sufficient equity capital and ability to add additional debt to support acquisition of additional assets while maintaining an optimum capital structure. We will seek to employ appropriate financing policies and also diversify our funding sources with an objective of minimising our overall cost of capital. We will seek to optimise our debt and equity mix in such a manner that the aggregate consolidated borrowings and deferred payments of the Highways Trust, net of cash and cash equivalents does not exceed 70% of the value of the Highways Trust Assets at any time subject to the approval of the unitholders as provided in accordance with the SEBI InvIT Regulations. Further, any additional debt beyond 49% of the value of the Highways Trust Assets will be raised only upon compliance with the conditions set out in the SEBI InvIT Regulations. In accordance with the Trust Deed, and subject to the Applicable Law permitting such additional debt, any additional debt will be raised only with consent of 51% of the Unitholders of the Highways Trust. If it is in the interests of the Unitholders, the Investment Manager may also pursue growth opportunities that require raising additional capital through the issuance of new Units.

#### ***Continue to ensure efficient and active asset management***

We will appoint the Project Manager to undertake operations and management of the Project SPVs in furtherance of which the Project Manager will be added as a party to the existing O&M Agreements with O&M Contractors to provide operation and maintenance services in respect of the Project SPVs.

Our O&M Contractors undertaking toll operations will be professional and reputed toll collection agencies and performance of these O&M Contractors will be evaluated on a regular basis. Our Projects are maintained by contracting professional or expert highway maintenance contractors which undertake maintenance activities such as routine maintenance, repair of defects or damages, route operations and preventive maintenance. We will continue to assess the performance of these O&M Contractors on a regular basis based on certain service level agreements fixed during signing of the O&M Agreements.

The Project Manager will engage a network of O&M Contractors for undertaking the O&M activities relating to the Projects. The principal objective is to incorporate industry best practices in operating and maintaining the Projects. This proactive approach to O&M activities seeks to employ both preventive and corrective measures in order to optimise the long term performance of each Project and reduce, as much as possible, any periods where the roads are unavailable for users (in whole or in part), which may result in a loss of revenue.

## RISK FACTORS

*An investment in the Units involves a high degree of risk. Investors should carefully consider all the information in the Placement Memorandum and this Final Placement Memorandum, including the risks and uncertainties described below, before making an investment in the Units. If any of the following risks actually occurs, the business, results of operations and financial condition of the Highways Trust could suffer, the price of the Units could decline and investors may lose all or part of their investment. The risks and uncertainties described below are not the only risks that the Highways Trust faces or may face. Additional risks and uncertainties not presently known to the Investment Manager and the Highways Trust or that they currently believe to be immaterial may also have an adverse effect on the business, results of operations and financial condition of the Highways Trust and as a result, the returns on investments of the Unitholders. If any of the following risks, or other risks that are not currently known or are currently considered immaterial, actually occur, our business prospects, results of operations, cash flows and financial condition could suffer, the price of the Units could decline, and prospective investors may lose all or part of their investment. Unless specified or quantified in the relevant risk factors below, the Investment Manager and the Sponsor are not in a position to quantify or specify the financial or other implications of any of the risks described in this section.*

*In making an investment decision, prospective investors must rely on their own examination of the Highways Trust and the terms of the Issue, including the merits and risks involved. To obtain a complete understanding, this section should be read in conjunction with the sections entitled “Business” and “Discussion and Analysis by the Directors of the Investment Manager of the Financial Condition, Results of Operations and Cash Flows of the Project SPVs of the Highways Trust” on pages 168 and 223, respectively as well as the financial statements and other financial information included elsewhere in this Final Placement Memorandum. Before investing in the Units, prospective investors should obtain professional advice on investing in the Issue.*

*This Final Placement Memorandum also contains forward-looking statements that involve risks and uncertainties and assumptions. The Highways Trust’s actual results could differ materially from those anticipated in these forward-looking statements as a result of certain factors, including considerations described below and in the section entitled “Forward Looking Statements” on page 14.*

*Investors should be aware that the price of the Units, and the income from them, may be subject to volatility. If any of the risks described below occurs, our business and prospects could be materially and adversely affected, and investors could lose all or part of their original investment.*

*In making an investment decision, prospective investors must rely upon their own examinations and the terms of the Issue, including the merits and the risks involved. The prospective investors should consult their tax, financial and legal advisors about the particular consequences of investing in the Issue.*

### RISKS RELATING TO THE HIGHWAYS TRUST’S BUSINESS AND INDUSTRY

- 1. The Highways Trust is a newly settled trust with no established operating history and no historical financial information and, as a result, investors may not be able to assess its prospects on the basis of past records.***

The Highways Trust was established on December 3, 2021 and registered with SEBI on December 23, 2021 and proposes to acquire 100% of the issued and paid-up equity share capital of the Project SPVs (the “Share Capital”), pursuant to the Securities Purchase Agreement, immediately prior to the Closing Date. For further details, please see the section entitled “Related Party Transactions – Acquisition of the Project SPVs by the Trust” on page 258. Accordingly, the Highways Trust, as an infrastructure investment trust, does not have an operating history or historical financial information by which our past performance may be judged. This will make it difficult for investors to assess our future performance. There can be no assurance that we will be able to generate sufficient revenue from our operations or that the Project SPVs will be able to generate sufficient cash flows from the operations of the InvIT Assets to make distributions to our Unitholders or that such distributions will be in line with those set out in the section entitled “Projections of Revenue and Operating Cash Flow” on page 392.

The Audited Consolidated Financial Statements, consisting of historical financial data of the Project SPVs and the Highways Trust, as applicable, have been included elsewhere in this Final Placement Memorandum, and there are estimates and judgments inherent in the preparation of such data. There can be no assurance that our future performance will be consistent with the estimates of past financial

performance included elsewhere in this Final Placement Memorandum.

2. ***We may be subject to penalties and claims from the concessioning authorities and third parties during the course of operations of the Project and may not be able to recover all operational losses from the Project Manager and/ or other contractors providing operations and maintenance services to the Projects.***

The Project SPVs may, from time to time, receive letters and notices from the concessioning authorities or other third parties imposing penalties and seeking claims for any deficiencies or non-compliance with the terms of the concession agreement or other project agreements or a claim or compensation under the terms of the concession agreements. The Project SPVs may contest such claims or invoke any indemnification provided by the Project Manager and/ or any O&M contractor it has appointed or may appoint. However, there would be an adverse effect on the Project SPV's operations and financial condition if a claim is decided against such Project SPV. Ongoing claims by the Project SPVs against the concessioning authorities, if any, have been disclosed in the section entitled "Legal and other information" on page 274. Further, the maximum aggregate liability of the Project Manager for any breach of any of the terms of the Project Management Agreement by the Project Manager in a particular year, shall be limited to the service fee payable to the Project Manager for that year. Accordingly, claims exceeding the amount limits, which are not the liability of the Project Manager, would have an adverse effect on the Project SPVs' financial performance. Similarly, the limitation of liability of the O&M Contractors under the relevant O&M Agreements (other than the major maintenance agreements) is in the range of 10 to 12 percentage of the annual fee paid. Further, in case of major maintenance contracts, the limitation of liability of the O&M Contractors under the relevant O&M Agreements is typically 5% of the annual fee.

3. ***The Valuation Report by Mr. S. Sundararaman (the "Valuer") is not an opinion on the commercial merits and structure of the Issue nor is it an opinion, express or implied, as to the future trading price of Units or the financial condition of Highways Trust upon the Listing, and the valuation of the Project SPVs contained in such Valuation Report may not be indicative of the true value of the Project SPVs.***

Mr. S. Sundararaman was appointed as the independent valuer (the "Valuer") to undertake independent appraisals of the Project SPVs. The Valuer issued a letter and a report appended to it (together, the "Valuation Report"), which sets out its opinion as to the fair enterprise value of the Project SPVs as of March 31, 2022. The Valuation Report is based on various assumptions with respect to the Project SPVs, including, amongst others, their revenue cash flows, O&M expenses, major maintenance and repairs costs, depreciation and amortization, capital expenditure and working capital. Further, the valuation report has also taken into account potential extensions of the concession agreements in relation to two of our Project SPVs. Such assumptions are based on the information provided by, and discussions with, the Investment Manager. Further, the Valuation Report is based on estimates of future financial performance or opinions, which represent reasonable expectations at a particular point of time, but such information, estimates or opinions are not offered as predictions or as assurances that a particular level of income or profit will be achieved, a particular event will occur or that a particular price will be offered or accepted.

The Valuation Report is neither an opinion on the commercial merits and structure of the Issue, nor is it an opinion, express or implied, as to the future trading price of Units or the financial condition of the Highways Trust upon Listing. The Valuation Report does not purport to contain all the information that may be necessary or desirable to fully evaluate the commercial or investment merits of the Issue or the Highways Trust. The Valuation Report does not confer rights or remedies upon investors or any other person, and does not constitute and should not be construed as any form of assurance as to the financial condition or future performance of the Highways Trust or the Project SPVs. Further, the Valuation Report is necessarily based on financial, economic, monetary, market and other conditions as of the date of the Valuation Report. The Valuation Report has not been updated since the date of its issue and does not take into account any developments subsequent to the date of its issue.

Further, the outbreak of the COVID-19 pandemic has created significant uncertainty in valuation and accordingly, the Valuer has recommended a degree of caution to the values arrived under current circumstances, as the impact assessment of COVID - 19 is a continuing process given the uncertainties associated with its nature and durations. Due to the outbreak of the COVID-19 pandemic and the consequent economic slowdown, the risks and uncertainties relating to the events occurring in the future, the actual figures in future may differ from these estimates and may have an impact on the valuation of the Project SPVs.

There can be no assurance that the Valuation Report reflects the true value of the Project SPVs or that other independent valuers would arrive at the same valuation. Accordingly, investors should not rely unduly on the Valuation Report in making an investment decision to purchase Units in the Issue. For details, please see the Valuation Report in Annexure I.

**4. *The accuracy of statistical and other information with respect to the road infrastructure sector and the Technical Report and Traffic Report commissioned by the Investment Manager for the Projects contained in this Final Placement Memorandum cannot be guaranteed.***

Statistical and other information in this Final Placement Memorandum relating to India, the Indian economy or the road infrastructure sector have been derived from various government publications, research reports from reputable institutions and communications with various Indian government agencies that are believed to be reliable. However, there can be no guarantee as to the quality or reliability of such information.

Four of the Projects are exclusively toll based (together, the “**Toll Projects**”) and in respect of the same, the information reflected in the Traffic Report is subject to various limitations and is based upon certain estimates and assumptions that are subjective in nature. The Technical and Traffic Reports reflect current expectations and views regarding future events, and contain forecasts, projections and other forward-looking statements that relate to future events. The future events referred to in the Technical and Traffic Reports are subject to risks, uncertainties and factors such as gross domestic product growth, current and future traffic mix and per capita income changes, which may cause the actual traffic volumes to be materially different from any future traffic volumes expressed or implied by the Technical and Traffic Reports.

While reasonable care has been taken in the reproduction of the information, no assurance can be made as to the accuracy of such facts and statistics, which may not be consistent with other information compiled within or outside India. Due to possibly inconsistent or ineffective collection methods or discrepancies between published information and market practice, the statistics contained in the Technical and Traffic Reports may be inaccurate or may not be comparable to statistics produced for other economies and should not be unduly relied upon. Further, there is no assurance that the statistics are stated or compiled on the same basis or with the same degree of accuracy as may be the case with information from elsewhere.

Further, the Technical Consultant has prepared the Technical Reports concerning the Project SPVs which are contained in this Final Placement Memorandum and the Traffic Consultant has prepared the Traffic Reports. We commissioned the Technical Reports and Traffic Reports for the purposes of conducting an assessment of the Project SPVs. Further, the Technical and Traffic Reports have been prepared based on information as of specific dates and may no longer be current or reflect current trends. Opinions in the Technical and Traffic Reports based on estimates, projections, forecasts and assumptions may prove to be incorrect. The Technical and Traffic Reports are subject to various limitations and are based upon certain bases, estimates and assumptions that are subjective in nature and that are based, in part, on information provided by and discussions with or on behalf of us and the Investment Manager. There can be no assurance that the bases, estimates and assumptions adopted by the consultants for the purposes of preparing the Technical and Traffic Reports will prove to be accurate. Future reports for the Project SPVs could be materially different from those that are set forth in the Technical and Traffic Reports and this Final Placement Memorandum. The Technical and Traffic Reports are not a recommendation to invest or disinvest in the Project SPVs. Prospective investors are advised not to unduly rely on the Technical Reports when making their investment decision.

**5. *The Audited Special Purpose Combined Financial Statements and Projections of Revenue from Operations and Cash Flow from Operating Activities presented in this Final Placement Memorandum may not be indicative of the future financial condition and results of operations of the Highways Trust.***

The Audited Special Purpose Combined Financial Statements of the Project SPVs for Fiscals 2022, 2021 and 2020 constitute a different presentation of information and may not necessarily reflect the consolidated financial position, results of operations or cash flows of the Highways Trust, and nor will they necessarily give an indication of the financial position, results of operations or cash flows of the Highways Trust or the Project SPVs in the future.

After the Listing, there may be certain changes to the Highways Trust’s cost structure, levels of

indebtedness and operations, and these could differ materially from the historical combined cost structure and levels of indebtedness presented in the Audited Special Purpose Combined Financial Statements. For example, there are certain costs, such as the Investment Manager's fee, the Project Manager's fee and other costs relating to the Highways Trust, that will be incurred by the Highways Trust going forward, some of which were not incurred by the Project SPVs historically. For details of recurring expenses, please see the section entitled "*Overview of the Highways Trust*" on page 18. In addition, the Project SPVs will be valued at fair value at the time of the actual acquisition of such assets by the SEBI registered Category I Merchant Banker or a chartered accountant, which will occur prior to the Closing Date, for the purpose of a purchase price allocation exercise required under Ind AS for financial reporting purposes. Furthermore, the future consolidated financial statements of the Highways Trust will be prepared on the basis of Ind AS 103 "Business Combinations", which is different from the accounting treatment used for the preparation of the Audited Special Purpose Combined Financial Statements.

The financial projections contained in this Final Placement Memorandum are based on historical financial information and certain estimates and assumptions. There can be no assurance that the Project SPVs will be able to generate sufficient cash from the operations of the Projects for the Highways Trust to make distributions to Unitholders or that such distributions will be in line with those set out in the section entitled "*Projections of Revenue from Operations and Cash Flow from Operating Activities*" on page 392. The future financial performance of the Highways Trust could vary materially from the financial projections and some of such projections' underlying assumptions might change or not materialise as expected. Unfavourable events or circumstances not anticipated may also arise. There can be no assurance that the assumptions will be realised or actual distributions will be as anticipated.

**6. *The Project SPVs have entered into concession agreements which contain certain onerous provisions and any failure to comply with such concession agreements could result in adverse consequences including penalties and the substitution of the concessionaire.***

The Project SPVs have entered into concession agreements with their respective concessioning authorities with which the Project SPVs have a limited ability to negotiate the terms of the concession agreements. As a result, the concession agreements contain terms that may be onerous to the Project SPVs in relation to, among other things, compliance with and monitoring of O&M requirements. The O&M requirements include, among other things, permitting the safe, smooth and uninterrupted flow of traffic, undertaking routine maintenance, including repairs of potholes, cracks, concrete joints, drains, line markings, lighting and signage, undertaking major maintenance in accordance with the relevant concession agreement, including but not limited to resurfacing of pavements, repairs to structures, and repairs and refurbishment of tolling system and other equipment and preventing, with the assistance of the concerned law enforcement agencies, any encroachments on, or unauthorized entry to the relevant Project. Failure to comply with these requirements could result in adverse consequences, including the Project SPVs being liable for compensating the relevant concessioning authorities for such breach or termination.

There are terms in the concession agreements which require the relevant concessioning authority's prior written approval before a Project SPV can create encumbrance or security interest over, or transfer its rights and benefits under, the respective concession agreement. The terms of the concession agreements limit the creation of security interest to secure the loans taken by the Project SPVs to finance the project cost of the respective project only. There is no assurance that a concessioning authority will approve the actions of any Project SPV in time or at all. Even if approval from a concessioning authority is obtained, there is no assurance that the transfer of the rights and benefits under the respective concession agreement would have no adverse effect on the Unitholders. The restrictions and uncertainties impose constraints on the flexibility of the Highways Trust to conduct its business and its financial conditions and results of operations may be adversely affected.

In addition, the concession agreements also contain clauses which will allow a concessioning authority to step in, in place of a Project SPV, in the event of a suspension or termination of the concession agreement. Further, the concessioning authorities, on the request of the lenders of such Projects, may substitute the Project SPV in the event that the Project SPV is in "financial default"; that is, for example, if the concessioning authorities or the lenders of such Project have a reason to believe that a Project SPV is likely to face financial distress and is likely to default in its obligations under the terms of the relevant concession agreement. The concessioning authorities may also impose a penalty on the defaulting Project SPV or can also terminate the concession agreements, in case the substitution is not feasible or accepted by the concessioning authority.

The concession agreements also require the Project SPVs to indemnify the concessioning authorities, including for losses arising out of, or with respect to, the failure of the concessionaire to comply with applicable laws and permits, payment of taxes payable by the concessionaire or the non-payment of amounts arising out of materials or services provided to the relevant Project SPV, among others.

Further, the GoI or respective State Governments where the Project SPVs are located, may, on the occurrence of certain events, suspend toll collection at any of the Projects. For example, as part of the GoI's demonetisation exercise, the GoI announced a toll exemption for all vehicles across all toll plazas from November 9, 2016 to December 2, 2016. Further, during the national and state lockdowns imposed from March 24, 2020 in India on account of the COVID-19 pandemic, the concessioning authorities suspended toll collection for a certain period. The lockdowns and these instances resulted in huge revenue loss and other work constraints (such as availability of labour and spare parts) for entities operating in the road sector, including the Project SPVs. There is no assurance that if such situations occur in the future, to the extent the Highways Trust faces any loss of revenue, it would be able to claim for such loss of revenue and any such claim would be successful.

In the event that any change in law under a Project's concession agreement imposes a financial burden on the affected Project SPV, the Project SPV may be entitled to approach the relevant concessioning authority to amend its concession agreement or seek compensation such that the Project SPV is placed in its former financial condition. The Project SPV have, in the past, raised claims for compensation against the concessioning authorities, under the concession agreement, some of which are still pending. The claims raised by the Project SPVs include, amongst others, claims in relation to change of scope, change of law and force majeure claims. If compensation is sought under such provisions in the concession agreements, there is no assurance that the affected Project SPV will receive such compensation from the relevant concessioning authority in the amounts claimed, in a timely manner, or at all. This could have an adverse effect on the Highways Trust's financial performance. Further, the adverse settlement of any claims raised by the concessioning authorities, including the payment of damages, fines or other penalties by the Project SPVs could adversely affect the business, prospects, financial condition and results of operations of the Project SPVs.

The form of the concession agreement has evolved in the previous decade and there is limited guidance available on the interpretation of the terms and conditions contained in such concession agreements. In addition, certain terms of the concession agreements are ambiguous and untested and accordingly, their interpretation by the relevant concessioning authorities may differ from that of the Project SPVs. In the event that the interpretation of the concession agreements is unfavourable to the Project SPVs, their business, financial condition and results of operations may be adversely affected.

**7. *The flexibility of the Highways Trust and the Project SPVs to utilise available funds may be restricted by the escrow arrangements they are required to maintain under the concession agreements.***

Under the terms of the concession agreements, the Project SPVs are required to establish escrow accounts. The Project SPVs are required to deposit all their cash inflows and receipts into the escrow accounts, including, among other things, tolls collected from the Projects and any payments (including termination payments) by the concessioning authorities. The funds in such escrow accounts are to be utilised only in the manner prescribed in the escrow agreements and the concession agreements. The escrow arrangements typically prioritise the payment of all taxes due and payable by the Project SPV, followed by the payment of expenses in connection with, amongst others, (i) the construction of the Projects, (ii) O&M expenses and other costs and expenses incurred by the relevant concessioning authority, (iii) any payments and dues payable to the relevant concessioning authority, and (v) debt servicing of the project lenders. The balance, if any, will be in accordance with the instructions of the Project SPVs.

Any withdrawals from the escrow accounts by the Project SPVs during the concession periods must be made strictly in accordance with the terms of the concession agreements, debt documentation and escrow agreements, thereby limiting the flexibility of the Project SPVs in utilising available funds to plan for, or react to, changes in their business needs, which could have an adverse effect on their business, financial condition and results of operations.

With respect to withdrawals on termination of the concession agreements, the escrow arrangements typically prioritize the payment of all taxes due, followed by, amongst other things, the payment of outstanding concession fee, payment due to the concessioning authorities, the payment of damages in

relation to the concession, retentions and payments arising out of liability for any defects, accrued debt service payment and accrued O&M expenses and any other payment required to be made under the concession agreements. The loans/advances by the shareholders will be classified as subordinated debt and equity under the concession agreements, unless the same is otherwise approved by the concessioning authorities.

Accordingly, the ability of the Highways Trust to access such termination payments will be subordinated to the payment of, among other things, any outstanding concession fees, outstanding dues of the senior lenders and damages. Any shortfall in the termination payments received from the concessioning authorities may prevent us from recovering our investments or returns in the relevant Project SPVs adequately or at all. Also, on termination of the concession agreements and/or default under the financing documents executed with the project lenders, the payments/withdrawals from the escrow accounts of the respective Project SPVs may be entirely controlled by the discretion of the concessioning authorities and/or the project lenders.

**8. *The concession agreements may be terminated prematurely under certain circumstances.***

Under the terms of concession agreements entered into by the Project SPVs, we have obligations to maintain our BOT and DBFOT road projects in good working order and maintain the roads periodically. Our road projects require repair or maintenance due to natural disasters, accidents and other factors beyond our control. The concessioning authorities will periodically carry out tests through one or more engineering firms to assess the quality of roads and their maintenance. If we fail to maintain the roads to the standards set forth in the relevant concession agreements, the concessioning authorities may impose penalties, withhold annuity payments and demand remedies within cure periods. If we fail to cure our defaults in a timely manner within such time as may be prescribed under the concession agreement, our concession agreements may be terminated.

The contracts for our BOT and DBFOT road projects typically specify certain operation and maintenance standards and specifications to be met by us while undertaking our operation and maintenance activities and develop a maintenance manual. These specifications and standards require us to incur operation and maintenance costs on a regular basis. The operation and maintenance costs of our projects may increase due to factors beyond our control, including but not limited to:

- standards of maintenance or road safety applicable to our projects prescribed by the relevant regulatory authorities;
- requirement for restoration of our projects in the event of any landslides, floods, road subsidence, other natural disasters accidents or other events causing structural damage or compromising safety;
- unanticipated increases in material and labour costs, higher axle loading, traffic volume or environmental stress leading to more extensive or more frequent heavy repairs or maintenance costs. The cost of major repairs may be substantial and repairs may adversely affect traffic flows;
- increase in electricity or fuel costs resulting in an increase in the cost of energy; or
- other unforeseen operational and maintenance costs.

Any failure by a Project SPV to maintain the relevant Project according to the terms of the concession agreement will entitle the concessioning authorities to terminate the concession agreement or take remedial actions at the risk and cost of the Project SPV and recover such cost and damages from the Project SPV from the escrow account as if such costs and damages were O&M expenses.

If a concession agreement is terminated by the concessioning authority due to a default by a Project SPV, the Project SPV may be exposed to additional liability as it is obliged to repair or rectify, at its own cost, any defects or deficiencies identified by the independent engineer of the Project for a period specified in the concession agreement upon such termination. In addition, the termination payment by the concessioning authority due to a default by a Project SPV, will be calculated according to the terms of the concession agreement, which may be less than the actual cost incurred by a Project SPV on its Project. Consequently, not only would the Project SPV recover less than the costs incurred, but such an occurrence would also have an adverse effect on the Highways Trust's financial performance. Unless otherwise

approved by the concessioning authorities, the termination payments to the Highways Trust, pursuant to a default by a Project SPV, may be contested by the concessioning authorities on the ground of the same being in nature of loans/advances by the shareholders of the Project SPV and the absence of the concessioning authority's approval to recognize the Highways Trust as a senior lender.

In addition, our operations may be adversely affected by interruptions or failures in the technology and infrastructure systems that we use to support our operations, including toll road collection and traffic measurement systems. Furthermore, accidents and natural disasters may also disrupt the construction, operation or maintenance of our projects and concessions. Any significant increase in operations and maintenance costs beyond our budget and any failure by us to meet quality standards may reduce our profits and could expose us to regulatory penalties and could adversely affect our business, financial condition and results of operations.

If a concession agreement is terminated by the concessioning authorities due to a default by a Project SPV, or by the Project SPV due to a default by the concessioning authorities, such Project SPV is entitled to termination payments or otherwise from the concessioning authorities in accordance with the terms of the relevant concession agreement. In the future, if the Project SPVs avail financing from the Highways Trust, the loans/advances from Highways Trust may be for a maturity term that exceeds the maturity term of the original facilities obtained from the project lenders. There can be no assurance that the concessioning authorities will recognize such amounts as outstanding after the term of the original facilities obtained by the Project SPVs from their respective senior lenders or allow creation/enforcement of security interest over the assets/shares of the respective Project SPVs to secure such financing. There can also be no assurance that the concessioning authorities will pay the termination payments promptly or at all or that any termination payments will be adequate to enable us to recover our investments or returns in the relevant Project SPVs.

If any concession agreement is terminated prematurely, the business, financial condition and results of operations of the relevant Project SPV could be adversely affected. Please see the section entitled "*Summary of Concession Agreements*" on page 189.

**9. *The Project SPVs' financing agreements entail interest at variable rates, and any increases in interest rates may adversely affect our results of operations, financial condition and cash flows. Further, the Project SPVs are subject to restrictive covenants under their financing agreements that could limit our flexibility in managing our business or to use cash or other assets.***

We expect that certain financing arrangements of the Project SPVs will remain in place after the allotment of the Units. Please see the section entitled "*Use of Proceeds*" on page 214 for details. These financing agreements entail interest at variable rates with a provision for the periodic reset of interest rates. Under the Project SPVs' financing agreements, the lenders may be entitled to change the applicable rate of interest on any date and accordingly, the Project SPVs are susceptible to changes in interest rates and the risks arising therefrom. Any increase in interest rates may have an adverse effect on our results of operations, financial condition and cash flows.

Further, the financing agreements entered into by the Project SPVs with certain banks and financial institutions contain certain restrictive covenants and cross default provisions. The financing agreements restrict the Project SPVs from, amongst other things, (i) incurring any indebtedness without prior approval of the lenders, other than indebtedness specifically permitted pursuant to the documents executed in connection with the facility from the lenders; (ii) make any capital expenditure or acquiring fixed assets on lease without prior consent of the lenders; and (iii) effecting changes in its ownership without prior approval of the lenders. In addition, these restrictive covenants may also affect some of the Highways Trust's rights as the shareholder of the relevant Project SPV and the Project SPV's ability to pay dividends if it is in breach of its obligations under the applicable financing agreement. These may restrict our ability to conduct business and any breach thereof may adversely affect our results of operations and financial condition. In the event of any breach of any covenant contained in these financing agreements, apart from other consequences, the security trustee may enforce the security under the financing agreements which may adversely affect our business, financial condition and results of operations. We may also be required to immediately repay our borrowings either in whole or in part, together with any related costs.

In addition, our ability to meet the debt service obligations and repay the outstanding borrowings of the Project SPVs will depend primarily on the cash generated by our business. We cannot assure you that we will generate sufficient cash to service existing or proposed borrowings or fund other liquidity needs, which could have an adverse effect on our business, cash flows and results of operations. We may be required to refinance our outstanding borrowings in the future. There is no assurance that we will be able to obtain such financing, on favorable terms, or at all, which may have a material adverse effect on our business, financial condition and results of operations.

For further details in relation to the financing arrangements entered into by the Project SPVs, please see the section entitled “*Financial Indebtedness*” on page 216.

**10. *The acquisition by the Highways Trust of the Project SPVs from the Sponsor may be subject to certain risks, which may result in damages and losses. We may not be able to recover losses arising from the acquisition of the Project SPVs from the Sponsor or third parties under relevant contractual arrangements.***

The Project SPVs were not originally owned by the Sponsor, and were acquired by the Sponsor from India Infrastructure Fund, India Infrastructure Fund -II and Highway Concessions One Private Limited (“**Original Seller**”) pursuant to share purchase agreements dated July 4, 2021 and the amended and restated share purchase agreement dated December 15, 2021 (“**IIF SPAs**”). We will rely on certain information and management representations provided by the Original Sellers until the date of acquisition of the Project SPVs by the Sponsor and accordingly any adverse impact pursuant to such information or representations may affect the Highways Trust’s earnings and cash flows. While, the IIF SPAs may be assigned to the Highways Trust, there is no assurance of enforcement and recovery of any losses arising on account of defects or deficiencies or any other issues in the Projects SPVs from the Original Sellers. Further, the Sponsor may not provide any representations in relation to the Project SPVs for the time period between the date of acquisition of the Project SPVs by the Sponsor and the date of our acquisition of the Project SPVs. There is no assurance that in the event any of defects or deficiencies in the Project SPVs, we will be able to raise any claim or recover any losses from the Sponsor, in a timely manner, or at all.

Further, there can be no assurance that the Project SPVs or the Projects will not have defects or deficiencies that are unknown or unquantified and that may require additional capital expenditure or obligations to third parties, including to the relevant concessioning and statutory authorities, which may have an adverse effect on the Highways Trust’s earnings and cash flows and the distributions to the Unitholders, upon acquisition. Further, the Sponsor does not have an extended history of operating the Project SPVs and despite pre-acquisition due diligence, we do not believe that it is possible to fully understand an asset before it is owned and operated for an extended time. Accordingly, the acquisition of the Project SPVs from the Sponsor may entail integration and management of these future assets to realize economies of scale and control costs, as well as other risks, including diversion of management resources otherwise available for ongoing development of our business. The acquisition may cause disruptions to our operations and divert management’s attention away from day-to-day operations. Newly acquired assets may require significant management attention that would otherwise be devoted to our ongoing business.

In accordance with the IIF SPAs and the Securities Purchase Agreement, certain claims of the Project SPVs are required to be passed through to certain third parties. In addition, the Project SPVs may be subject to unknown or contingent liabilities for which the Highways Trust may have limited or no recourse against the Sponsor or the Original Seller. Such unknown or contingent liabilities may also include tax liabilities and other liabilities whether incurred in the ordinary course of business or otherwise.

The Project SPVs have received consents from the concessioning authorities in relation to, amongst others, the transfer of the Project SPVs to the Highways Trust. However, there can be no assurance that the concessioning authorities will not impose any additional conditions in relation to such transfer. Further, the Project SPVs have availed certain borrowings from banks and other institutions accordingly have obtained no-objection certificates or lender consents from the lenders for purposes of transfer of the Project SPVs to the Highways Trust. If the conditions in the consents are not fulfilled, or in the event of a dispute with the lenders in relation to such debt financing, the Highways Trust may not be able to acquire all of the Project SPVs from the Sponsor which could have an adverse effect on the Highways Trust’s business and results of operations. Additionally, the Project SPVs may require consents from other third parties (including regulatory authorities) in relation to the transfer. If such consents are not received, the Highways Trust may not be able to acquire all the Project SPVs from the Sponsor which could have an adverse effect

on the Highways Trust's business and results of operations.

**11. *We intend to acquire certain compulsorily convertible debentures issued by GEPL ("GEPL CCDs") with the proceeds of this Issue and any failure to acquire the GEPL CCDs could have an adverse effect on our shareholding in the Project SPVs.***

In terms of the Securities Purchase Agreement, the GEPL CCDs shall be acquired by the Highways Trust from the Sponsor for a cash consideration. We intend to acquire such GEPL CCDs from the proceeds of the Issue. For further details, please see section entitled "Use of Proceeds" on page 214. If we are unable to raise the expected proceeds from this Issue, we may not be able to acquire GEPL CCDs and may not be able to realize the anticipated benefits of the acquisition. This could have a material adverse impact on our business, financial condition and results of operations and prospects.

Further, while we will be able to acquire other securities of the Project SPVs pursuant to the Securities Purchase Agreement and subject to the fulfillment of the conditions set out in the Securities Purchase Agreement, prior to the Allotment, we will only be able to acquire the GEPL CCDs upon only after receipt of the final listing and trading approval for the Units from Stock Exchange.

**12. *Lower than expected returns on our investment in our Projects may adversely affect our financial results.***

In our annuity based projects, our revenue depends on the fixed amounts paid to us semi-annually by our government clients. The amount of annuity is not necessarily linked to investment and will only be calculated pursuant to the relevant concession agreements. In our toll-based projects or projects with a toll component, our toll revenue depends on the tolling rates set by the relevant concessioning authority in accordance with the relevant concession agreements and the actual traffic volume using our roads. Our decision to undertake BOT or DBFOT road projects is largely based on our estimate of our expected toll revenue, which in turn is partly based on our estimate of the traffic volume using our roads.

Traffic volume may be affected by a number of factors beyond our control, including general economic conditions, alternate routes, alternate means of transportation, location of toll plazas, weather conditions, demographic changes, fuel prices, reduction in commercial or industrial activities in the regions served by the roads and natural disasters. Thus the actual traffic volume may be lower than our estimate. Any decrease in traffic volume, could result in a significant loss of our toll revenue. In addition, our concession agreements typically limit and regulate increases in tolling fees. In accordance with the Concession Agreements, the NHAI or other applicable authority sets the applicable tolling rates which is revised by such authority and we may not be able to increase tolling rates to cover increases in our operational costs.

Further, there are no provisions in our concession agreements protecting us against increases in interest rates or cost of raw materials. Our lenders may have the right to periodically adjust our interest rates and our applicable interest rates may increase based on their review of our credit profile and perceived risks in our operations. Our operational costs may also increase substantially during the operation of our BOT or DBFOT projects due to shortage of raw materials or substantial increases in prices of raw materials required for operation and maintenance beyond the permitted scope of adjustment due to occurrence of certain events under the relevant provisions of the concession agreements. Many factors causing such adverse changes are beyond our control and we are usually not able to demand matching increases in our tolling fees over and above certain fixed increases, in accordance with the concession agreements.

Under the relevant concession agreements, our Project SPVs have rights to construct and operate the road projects exclusively for fixed periods of time and we receive annuities and/or collect tolls, as the case may be, for the use of our roads. However, we may be faced with competition from new roads developed by NHAI and/or State Governments, which are not within our control. For example, MPRDC has the right to construct competing roads after a prescribed period of time, pursuant to the terms of the concession agreements. State Governments may not always charge for the use of these roads. There can be no assurance that our road projects will compete effectively against such roads that connect the same locations. Any material decrease in the actual traffic volume as compared to our forecasted traffic volume could have a material adverse effect on our cash flows from our tolling projects, which in turn can adversely affect our business, prospects, financial condition and results of operation.

As our Projects often require significant capital investment with potential returns spread over a long period of time, inadequate toll revenues and annuities collected from our projects may result in a low return or even loss on our investment, which may adversely affect our liquidity, business, financial condition and results of operation.

- 13. *The Projects' revenues from tolls are subject to significant fluctuations due to changes in traffic volumes and the mix of traffic and a decline in traffic volumes could adversely affect their business prospects, financial condition, results of operations and their ability to make distributions. Further, the Projects' revenues from tolls are subject to regulatory restrictions.***

Four of the Projects are exclusively toll based and two of the Projects are annuity projects. Toll revenues depend on toll receipts and are affected by changes in traffic volumes and the mix of traffic. Traffic volumes are directly or indirectly affected by a number of factors, many of which are outside the relevant Project SPVs' control, including toll rates, fuel prices, the affordability of automobiles, the quality, convenience and travel time on alternate routes, industrial growth and development and the availability of alternate means of transportation, including rail networks and air transport. Moreover, such Project SPVs' cash flows are affected by seasonal factors, which may adversely affect traffic volumes. India experiences monsoon rains each year, which can affect the volume of traffic on such Projects. During such periods of curtailed activity, such Project SPVs may continue to incur operating expenses but receive reduced toll revenues. Such fluctuations may adversely affect the Project SPVs' business, financial condition or results of operations.

The toll revenues of the Project SPV may also be affected by various regulatory and statutory conditions and restrictions. On May 26, 2021, the NHAI issues guidelines to ensure service time of not more than 10 seconds per vehicle even at peak hours at the toll plazas on the National Highways. In accordance with these guidelines, queues of vehicles at toll plazas must not exceed 100 meters, and in the event of queues longer than 100 meters the vehicles will be allowed to pass without paying toll till the queue comes within 100 meters from the toll booth. Such conditions on the payment of toll may adversely affect the Project SPV's business, financial condition or results of operations. Further, in accordance with the National Highways Fee (Determination of Rates and Collection) Rules, 2008, the minimum distance between the two toll plazas on the same section of a national highway shall not be less than 60 km. Provided that where the execution authority deems necessary, it may for reasons to be recorded in writing, establish or allow the concessionaires to establish another toll plaza within distance of 60 km of another toll plaza. Such conditions may impact our ability to collect the toll fee from current established toll plazas.

Traffic volumes are also influenced by the convenience and extent of a toll road's connections with other parts of the state and national highway and toll road network, as well as the cost, convenience and availability of other means of transportation and alternative routes. There can be no assurance that future changes affecting the road network in India, through road additions and closures or through other traffic diversions or redirections, or the development of other means of transportation, such as air or rail transport, will not adversely affect traffic volume on toll roads.

The toll-linked Projects may experience high traffic levels and congestion at certain times of the day or on certain days of the week. Although such Project SPVs may consider possible solutions and take appropriate steps in order to ease traffic flow and reduce congestion, there can be no assurance that the saturation problems will be resolved under conditions that are economically satisfactory to such Project SPVs. This could also lead to user dissatisfaction and could potentially reduce traffic volume.

- 14. *Leakage of the tolls collected on the toll-linked Projects may adversely affect the relevant Project SPVs' revenues and earnings.***

Four of the Projects are exclusively toll based and two of the Projects are annuity projects. Toll receipts are primarily dependent on the integrity of toll collection systems. The Project SPVs that have a toll component generate revenues from the Projects through the collection of tolls. On Indian toll roads, each motorist generally pays a one-time entry tariff to the toll operator at the point of entry to the toll road based on the average trip distance calculated for all users of the toll road. Such Project SPVs employ toll management software to monitor their operations.

Further, there may be occasions where political parties and local communities protest against the collection of tolls on roads. During such an event, a Project SPV could have a limited ability to collect tolls. Under

the terms of the Project SPVs' concession agreements, in the event that the concession agreement is terminated by either party as a result of an occurrence of a political event, the relevant concessioning authority is required to make payments to the affected Project SPV as a result of such an event; however there is no assurance that concessioning authorities will do so in a timely manner or at all.

The level of revenues derived from the collection of tolls may be affected by reduction in toll rates as determined by the concessioning authorities. Toll revenues may also be affected by leakage through toll evasion, theft, fraud or technical faults in the toll systems or forced violations by users of toll roads. At times, there may be a need to allow users of toll roads to pass through without paying applicable tolls due to heavy traffic build up, or there may be an inability to collect tolls due to political protests or agitations relating to tolling. In addition, in certain circumstances, the governmental authorities or Indian courts could seek to suspend toll collection for or during certain periods, in full or in part, which suspension would result in a reduction in revenues. Further, while there are provisions under the concession agreements to compensate the Project SPVs, there may be a considerable delay in the receipt of such compensation. Although the Project SPVs have systems in place to minimise leakage through fraud and pilfering, any significant failure to control leakage in toll collection systems could have an adverse effect on the business, prospects, financial condition and results of operations of the Project SPVs.

**15. *The lenders of the Project SPVs may not release the pledge of shares or waive the obligations under non-disposal undertakings of certain Project SPVs, that has been created pursuant to loan agreements that have been entered into between the Project SPVs and their lenders.***

The shares of certain Project SPVs are pledged or fall under certain non-disposal undertakings with their lenders as part of the security for borrowings availed by them from their respective lenders. If such security is not released by the lenders in a timely manner after the Bid/Issue Closing Date, it could have an adverse effect on the ability of the Highways Trust to acquire shareholding in such Project SPVs in a timely manner or at all.

**16. *The terms of the Project Management Agreement may change subject to comments provided by Concessioning Authorities***

Pursuant to the terms of the respective concession agreements, the Project SPVs are required to submit to their respective concessioning authorities, drafts of all project agreements and documents or any amendments or replacements, pursuant to which the relevant concessioning authorities have the right to review and provide comments within specified time periods. Accordingly, the Project SPVs have submitted drafts of the Project Management Agreement to the relevant concessioning authorities and have received comments from NHAI, which have been incorporated. PWD(R) and MPRDC have not provided any comments within the time period indicated in the relevant concession agreement for providing such comments. We cannot assure you that, (i) the concessioning authorities may not have any further comments on the Project Management Agreement, and (ii) such comments may not have an impact on the business and operations of the Project SPVs and their financial operations. Further, the Project Manager will be added as a party to the existing O&M Agreements with O&M Contractors and we cannot assure you that (i) the O&M Agreements will not change pursuant to requirements of the Project Manager or the concessioning authorities, and (ii) such comments may not have an impact on the business and operations of the Project SPVs and their financial operations.

**17. *Our operating expenses are dependent on the routine and periodic major maintenance obligations contained in the concession agreements and are subject to fluctuations.***

The Project SPVs are required to operate and maintain the Projects in accordance with the respective concession agreements. Accordingly, the Project SPVs prepare a maintenance manual and a maintenance program in consultation with an independent engineer appointed by the NHAI or other concessioning authority for each Project, and are required to abide by the same. The Project SPVs' maintenance obligations are primarily to operate and maintain the Projects in order to permit the safe, smooth and uninterrupted flow of traffic and the related work and maintenance that they are required to undertake in order to fulfil such obligations. Such maintenance obligations include the repair of wear and tear of roads including overlaying the surface of the roads, among other things. Please see the section entitled "*Summary of the Concession Agreements*" on page 189 for details on the Project SPVs' O&M obligations.

Routine and periodic major maintenance costs mainly comprise costs of raw materials and other items including fuel, equipment costs and labour expenses, besides maintenance and replacement of hardware, software, tolling expenses and equipment. The prices and supply of raw materials depend upon factors that are beyond our control, including, but not limited to, general economic conditions, transportation costs, global and domestic market prices, competition, production levels and import duties, which could be cyclical in nature. Unanticipated increases in the price of materials, fuel costs, labour or other inputs will affect the results of operations of the Project SPVs, especially if the wear and tear on the relevant Project requires major work. The Project SPVs' ability to absorb increases in the purchase price of materials, fuel and other inputs is limited.

Further, our operational costs may also increase substantially, if the relevant O&M Contractors fail to perform its duties as per the O&M Agreements.

**18. *We may be subject to inflation/deflation and interest rate risks.***

There are no specific provisions in our concession agreements protecting us against increases in interest rates or cost of raw materials. Our lenders may have the right to periodically adjust our interest rates and our applicable interest rates may increase based on their review of our credit profile and perceived risks in our operations. Many factors causing such adverse changes are beyond our control and we are usually not able to demand matching increases in our tolling fee or annuities. While our tolling rates may increase with an increase in WPI, any increase may not be adequate to offset the negative impact of increases in interest rates or O&M costs. Further, our tolling rates may decrease with a decrease in WPI and accordingly, the business, financial condition and results of operations of the Highways Trust may be adversely affected.

**19. *The Project SPVs have a limited period to operate the Projects as the concession periods granted to the Project SPVs are fixed.***

Each of the concession agreements entered into by the Project SPVs provides for a fixed term concession, subject to some variations and extension as permitted under the concession agreements or as may be granted by the concessioning authorities, at the end of which the operation of the relevant Project will be transferred to the relevant concessioning authority. For details of the concession periods of the Project SPVs, please see the section entitled "*Business*" on page 168. We have, in the past, sought and been granted extensions for the concession periods. However, there is no assurance that concessioning authorities will grant any similar extensions in the future. In addition, there can be no assurance that the Highways Trust will be able to successfully acquire new assets to replenish its portfolio once the existing concession agreements expire. Further, if the operating periods of the Projects are shortened or disrupted or the Project SPVs' rights to operate the Projects are terminated before the expiration of the concessions, the business, financial condition and results of operations of the Highways Trust may be adversely affected.

**20. *Notwithstanding that the concession periods granted to the Project SPVs are fixed, concession periods may be modified under particular circumstances and affect the Project SPVs' revenues.***

While the term of the concession agreements are typically fixed, certain concession agreements also provide that, if, amongst other things, the actual traffic volume falls short of, or exceeds, the target traffic volume on specified dates mentioned in such concession agreement, the concession period may be deemed to be extended or reduced, as the case may be, in accordance with the terms of the concession agreement.

The traffic reports related to the GEPL Project and JPEPL Project indicate that the concession periods for these Projects will be extended by approximately 5.4 years and 5 years respectively. In accordance with the Traffic Reports, in respect of the GEPL Project, the traffic volume is approximately 30% lower than the targeted traffic volume and in respect of the JPEPL Project, the traffic volume may be 23.2% lower than the targeted traffic volume. Such extensions, however, remains subject to actual traffic volume tests undertaken or to be undertaken on the specified dates in accordance with the concession agreements. Accordingly, there is no assurance that any extensions will be available for these Projects. Please see the sections entitled “*Summary of Concession Agreements*” and “*Business*” on pages 189 and 168 and the Traffic Reports in Annexure III, for further details.

There can be no assurance that any modifications to the concession periods will be implemented by the concessioning authorities. While there can be no assurance that the concession periods will be extended or reduced, any modification of the concession periods will affect the amount of toll revenue anticipated and may have an adverse effect on the Highways Trust’s business prospects, financial condition and results of operations and its ability to make distributions to Unitholders.

- 21. *The Project SPVs, which are responsible for the operation and maintenance of the Projects under the respective concession agreements, may be directed by the relevant concessioning authority to undertake, and the Project SPVs will be obliged to perform, additional construction work.***

Under the terms of the concession agreements, the Project SPVs are responsible for the operation and maintenance of the Projects during the applicable concession periods. A concessioning authority may require a Project SPV to provide additional work and services not included in the original scope of the concession agreement. For example, if a Project SPV is required to construct additional fast tag lanes, in addition to the construction, it needs to facilitate electronic toll lanes and build weigh-in motion equipment to check for the overloading of vehicles, among other things. There is no assurance that the money spent on complying with change of scope orders will be reimbursed in a timely or complete manner by the concessioning authority.

Further, in accordance with the concession agreement, the concessioning authorities may require the Project SPVs to procure capacity augmentation in relation to the Projects which may result in significant capital expenditure for the Project SPVs. On refusal or non-acceptance by the Project SPVs to undertake such augmentation, or on the failure of the Project SPVs to undertake such augmentation as per the timelines set out by the concessioning authority, the concessioning authorities may in their discretion terminate the concession agreement.

- 22. *Newly constructed roads or existing alternative routes may compete with the Projects and result in the diversion of the vehicular traffic and a reduction of tolls that the Project SPVs can collect.***

Four of the Projects are exclusively toll based and two of the Projects are annuity projects. Under the terms of the concession agreements entered into by the Project SPVs with a toll component, the relevant concessioning authority is entitled to construct an additional tollway for use by traffic which may serve as alternate routes to the Projects after the expiry of determined time periods, depending on the terms of the concession agreements. Notwithstanding that, in some cases, the concession period will accordingly increase, the development of such an additional tollway during the subsistence of the concession agreement could compete with the relevant Project and attract users (who would have otherwise used the Project) to use the additional tollway and divert vehicular traffic from the Projects, thereby reducing toll collections by the Project SPVs which could have an adverse effect on their business, financial condition or results of operations. Please see the section entitled “*Summary of Concession Agreements*” on page 189.

There is no assurance that any alternative roads built or improved will not compete with the Projects and have an adverse effect on the Highways Trust’s business, financial condition, revenues and operations.

**23. *Systems failures, cyber security breaches and attacks and resulting interruptions in our toll-linked project could adversely affect our business, financial condition, cash flows and results of operations.***

The proper functioning of our technology infrastructure is essential to the conduct of our business. As the Project SPVs are reliant on an electronic toll collection system, our transaction-processing systems and our network infrastructure are critical to our success.

Our electronic toll collection systems may experience service interruptions or degradation or other performance problems because of, amongst other, hardware and software defects or malfunctions, unexpected high volume of transactions, cyberattacks and cyber-security breaches, infrastructure changes, human error, natural disasters, power losses, disruptions in telecommunications services, unauthorized access, fraud, military or political conflicts, terrorist attacks, legal or regulatory takedowns, computer viruses, ransomware, malware, or other events. In some instances, we may not be able to identify the cause or causes of these performance problems within an acceptable period of time. Further, as techniques used to obtain unauthorized access to or sabotage systems change frequently and may not be known until launched against us, we may be unable to anticipate, or implement adequate measures to protect against, these attacks.

Our insurance coverage may not be sufficient to cover all of our losses that may result from interruptions in our service as a result of systems failures and similar events and we may need to expend significant financial and development resources to analyze, correct, or eliminate errors or defects or to address and eliminate vulnerabilities. Any failure to timely and effectively resolve any such errors, defects, or vulnerabilities could adversely affect our business, financial condition, cash flows and results of operations.

**24. *An inability to obtain, renew or maintain the required statutory and regulatory permits and approvals or to comply with the applicable laws may have an adverse effect on the business of the Project SPVs.***

The Project SPVs require certain approvals, licenses, registrations and permissions under regulations, guidelines, circulars and statutes regulated by the Indian regulatory and government authorities to be obtained at various stages and by a number of parties. There can be no assurance that the relevant authorities will issue these approvals or licenses, or renewals thereof, in a timely matter, or at all. In addition, the Project SPVs are required to comply with a wide variety of Indian laws and regulations. There can be no assurance that the Project SPVs are in compliance with such laws and regulations or as requested by the regulatory authorities, have obtained all necessary approvals or that they will continue to obtain the necessary approvals or have been and will continue to be in compliance with all applicable laws and regulations. For example, in the case of one of our Project SPVs, UEPL, while we have applied for a consent for toll operations from the Tamil Nadu Pollution Control Board, we have not received the same. In the event of any failure to obtain or renew the approvals or if there is a delay in the obtaining of such approvals, the business and financial condition of the Project SPVs could be adversely affected. Further, these permits, licenses and approvals could be subject to several conditions, and the Highways Trust cannot assure investors that the Project SPVs have complied with all such conditions and will be able to continuously meet such conditions or be able to prove compliance with such conditions to the authorities. Any non-compliance may lead to cancellation, revocation or suspension of relevant permits, licenses or approvals, which may result in the interruption of the operations of the Project SPVs and may adversely affect the business, financial condition and results of operations of the Project SPVs.

Further, certain terms and conditions in the Project SPVs' concession agreements, financing agreements, and our other approvals require the concessioning authorities' prior written approval to be obtained for one or more of the following actions, among others:

- amendment, modification, or replacement by the Project SPV of any project agreements (including financing agreements) relating to the operation of the road asset to which the Project SPV is a party if the amendment, modification, or replacement of such agreement increases or imposes any financial liability or obligation on the concessioning authorities;
- the creation of any encumbrance or security interest over, or transfer of rights and benefits of the Project SPVs under, the concession agreements or any project agreements; and
- the selection or replacement of any engineering, procurement and construction contract, operation and maintenance contractor and execution of the engineering, procurement and construction

agreements and the operation and maintenance agreements.

The concession agreements of the Project SPVs also require the submission to the concessioning authorities, for its review and comments, all project agreements (including, financing agreements, O&M contracts) to which a Project SPV is a party prior to entry, amendment, or replacement of such agreements, even if such agreements do not affect the financial liability or obligations of the concessioning authorities.

The restrictions described above may impose constraints on our flexibility to conduct our business. Further, if as a result of these restrictions, we are unable to pursue a favourable course of action or to respond to an unfavourable event, condition, or circumstance, then our business, financial condition and results of operations may be materially and adversely affected.

**25. *Failure to comply with and changes in, safety, health and environmental laws and regulations in India may adversely affect the business, prospects, financial condition and results of operations of the Project SPVs.***

The Project SPVs are required to adhere to various environmental, health and safety laws and regulations and various labour, workplace and related laws and regulations in India as per the requirements of the concession agreements they have entered into. Please see the section entitled “*Regulations and Policies*” on page 262. If any of the Project SPVs fail to meet environmental, health or safety requirements, they may also be subject to administrative, civil and criminal proceedings by government authorities, as well as civil proceedings by environmental groups and other individuals, which could result in substantial fines and penalties against the Project SPVs as well as orders that could limit or halt the operations of the Project SPVs. The Highways Trust cannot assure investors that the Project SPVs have been and will continue to be in compliance with all environmental, health and safety and labour laws and regulations.

Further, any changes in, or amendments to, these standards or laws and regulations could further regulate the operations of the Projects and could require the Project SPVs to incur additional, unanticipated expenses in order to comply with these changed standards. The scope and extent of any new environmental, health and safety regulations, including their effect on the operations of the Projects and the cash flows of the Project SPVs, cannot be predicted with certainty. The costs and management time required to comply with these requirements could be significant. The measures taken in order to comply with these new laws and regulations may not be deemed sufficient by government authorities and compliance costs may significantly exceed estimates.

There can be no assurance that the Project SPVs will not become involved in future litigation or other proceedings or be held responsible in any such future litigation or proceedings relating to safety, health and environmental matters in the future. Clean-up and remediation costs, as well as damages, payment of fines or other penalties, other liabilities and related litigation, could adversely affect the business, prospects, financial condition and results of operations of the Project SPVs.

**26. *The current insurance coverage for the Projects may not protect the Project SPVs from all forms of losses and liabilities associated with their businesses.***

Road infrastructure development project contracts are subject to various risks including:

- political, regulatory and legal actions that may adversely affect a project’s viability;
- changes in government and regulatory policies;
- design and engineering defects;
- breakdown, failure or substandard performance of equipment;
- improper installation or operation of equipment;
- labour disturbances;
- terrorism and acts of war;

- inclement weather and natural disasters, including earthquakes, flooding, tsunamis and landslides and pandemics; and
- adverse developments in the overall economic and capital financing environment in India.

The Project SPVs have in place various project-specific insurance policies covering the Project SPVs against material damage, burglary, terrorism and all-risk policies against risk of fire and natural calamities. Certain of the Project SPVs also have obtained a signature management plus liability insurance. For further details, please see the section entitled “*Business*” on page 168. However, there can be no assurance that all risks are adequately insured against or that the Project SPVs will be able to procure adequate insurance coverage at commercially reasonable rates in the future. Natural disasters in the future may disrupt traffic, thereby adversely affecting toll collections and causing significant disruption to the operations of the Projects, and causing damage to the Projects and the environment that could have an adverse impact on the business and operations of the Project SPVs. In addition, not all of the above risks may be insurable on commercially reasonable terms, or at all. For example, the Project SPVs are required, under the concession agreements, to maintain the quality of the roads and to repair the roads in the event of damage to the roads on account of accidents or other reasons. Accordingly, there may be significant expenditure incurred by a Project SPVs to repair damaged roads and maintain the Projects in good condition, particularly if the damage is major, unanticipated or uninsured. The insurance obtained in relation to the Project SPVs may not provide adequate coverage in certain circumstances and is subject to certain deductibles, exclusions and limits on coverage. In addition, these insurance policies are subject to annual review by insurers, and there can be no assurance that they will be renewed on similar or otherwise acceptable terms, if at all. To the extent that the Project SPVs suffer any damage or loss which is not covered by insurance, or exceeds the insurance coverage, the loss would have to be borne by the Project SPVs. Further, the Project SPVs have, from time to time, insurance claims pending, with respect to its insurance policies. The proceeds of any insurance claim may also be insufficient to cover rebuilding costs as a result of inflation, changes in regulations regarding infrastructure projects, environmental and other factors. The resulting costs could have an adverse effect on the Highways Trust’s business, prospects, financial condition or results of operations and no assurance can be given that losses in excess of insurance proceeds will not occur in the future.

**27. *The cost of repairing and refurbishing existing equipment for operating, maintaining and monitoring the Projects could be significant and could adversely affect the results of operations, cash flows and financial condition of the Project SPVs.***

Some of the equipment used by the Project SPVs at the Projects have pre-determined useful lives and the Project SPVs are required to repair or refurbish such equipment at periodical intervals, pursuant to the terms of the concession agreements. These obligations may be undertaken by the O&M Contractors pursuant to O&M Agreements. There can be no assurance that such replacement or refurbishment will be undertaken in a timely or efficient manner by such O&M Contractors, and any increased costs to the Project SPVs as a result of such replacement or refurbishment by the O&M Contractors will not affect the profit margins of the Project SPVs and adversely affect their cash flows.

**28. *The cost of implementing new technologies for collection of tolls and monitoring our Projects could materially and adversely affect our business, financial condition and results of operations.***

The future success of the Project SPVs will depend, in part, on our ability to respond to technological advances and emerging standards and practices on a cost effective and timely basis. In addition, rapid and frequent technology and market demand changes can often render existing technologies and equipment obsolete, requiring substantial new capital expenditures or write-down of assets. The concessioning authorities may also require the Project SPVs to implement and adhere to certain technologies in connection with the Projects in the future and there can be no assurance that we would be able to do so in a timely manner, or at all. Failure to successfully adopt such technologies in a cost effective and a timely manner could increase the costs of operating the Projects. There is no guarantee that the cost of implementing new technologies for the Projects will be fully reimbursed by the concessioning authority and any such cost may therefore have an adverse effect on our business, results of operations and financial condition.

29. ***The business and financial performance of the Highways Trust, the operations of the Projects and any future projects that the Highways Trust may acquire, are significantly dependent on the policies of, and relationships with, various government entities in India and could be affected if there are adverse changes in such policies or relationships.***

The operations of the Projects and any future projects that the Highways Trust may acquire, are and will be significantly dependent on various central and state government entities, in terms of policies, incentives, budgetary allocations and other resources provided by these entities for the surface transportation industry, as well as the terms of the contractual arrangements, concessions and other incentives available from these government entities for the projects. Sustained increases in budgetary allocations by the GoI and various state governments for investments in the infrastructure sector, the development of structured and comprehensive infrastructure policies that encourage greater private sector participation and increased funding by international and multilateral development financial institutions in infrastructure projects in India have resulted in, and are expected to continue to result in, an increase in the amount of transportation infrastructure projects undertaken in India. Any adverse change in the focus or policy framework regarding infrastructure development or the surface transportation industry, of or change in the Highways Trust's relationships with the GoI or various government entities in India, could adversely affect the Projects, the opportunities for the Highways Trust to secure new projects and the business, financial condition and results of operations of the Highways Trust.

In addition, the projects in which government entities participate may be subject to delays, extensive internal processes, policy changes, changes due to local, national and internal political pressures and changes in governmental or external budgetary allocation and insufficiency of funds. Since government entities are responsible for awarding concessions and are parties to the development and operations of projects, projects are directly and significantly dependent on their support. Any withdrawal of support or adverse changes in their policies may lead to the agreements being renegotiated and could also adversely affect the financing, capital expenditure, revenues, development or operations relating to the Projects.

30. ***The Project SPVs and Projects may be subject to legal or regulatory action and the Highways Trust may be required to incur substantial expenses in defending any such actions and there is no assurance that the Project SPVs will be successful in defending such actions.***

Certain Project SPVs are involved in legal proceedings which are pending at different levels of adjudication before various courts, tribunals and regulatory authorities. In addition, arbitration and litigation proceedings in India can be time consuming and the Project SPVs may have to incur costs and devote considerable resources towards defending the outstanding legal proceedings. There is no assurance that the legal proceedings will be decided in favour of the relevant Project SPVs. The legal proceedings may be decided against the relevant Project SPV or changes in the relevant laws and regulations may adversely affect the outcome of such legal proceedings. For more details, please see the section entitled "Legal and other information" on page 274.

Under the Project Management Agreement, the Project Manager will indemnify the Highways Trust against certain identified matters. Further, under certain of the O&M Agreements, the O&M Contractors will provide indemnities to the Project SPVs. However, the aggregate liability from such claims is limited under each contract. Further, there can be no assurance that the Highways Trust will be able to successfully bring a claim and invoke the indemnity obligations against the Project Manager or the O&M Contractors. Any substantial costs incurred by the relevant Project SPV towards defending the outstanding legal proceedings or any unfavourable outcome in relation to such proceedings could have an adverse effect on the Highways Trust's business, financial condition, results of operations and prospects.

31. ***The Sponsor, Investment Manager, Project Manager and/or their respective associates, and the Trustee are or may, from time to time, be involved in legal proceedings, which if determined against such parties, may have an adverse effect on the reputation, business and results of operations of the Highways Trust.***

The Sponsor, Investment Manager, Project Manager and/or their respective associates, and the Trustee are or may, from time to time, be involved in certain legal proceedings, including in relation to criminal matters, tax matters, civil and arbitration proceedings, which are or may be pending at different levels of adjudication before various courts, tribunals and appellate authorities. There is no assurance that these legal proceedings and regulatory matters will be decided in favour of the respective entities. Decisions in any of the aforesaid proceedings adverse to the Highways Trust's or the Project SPVs' interests may have an

adverse effect on our business, future financial performance and results of operations. For more details, please see the section entitled “*Legal and other information*” on page 274.

**32. *The Project SPVs depend on the O&M Contractors to operate and maintain the Projects. Any delay, default or unsatisfactory performance by the O&M Contractors could adversely affect the Project SPVs’ ability to effectively operate or maintain the Projects.***

The Project SPVs are obligated to maintain the Projects according to standards specified in the concession agreements. In this regard, the Project SPVs have entered into the O&M Agreements with the O&M Contractors. Under such O&M Agreements, the O&M Contractors are required to discharge the obligations of the Project SPVs under the concession agreements relating to operation and maintenance. The Project SPVs may have limited control over the timing or quality of services, equipment or supplies provided by the O&M Contractors. Inefficiencies or operational failures on the part of the Project SPVs or the O&M Contractors, as a result of defects in design, quality of construction or maintenance, could result in the Project SPVs incurring increased costs, loss of revenue and penalties, thereby causing adverse impact on the financial position of the Project SPVs.

The Project SPVs may also be exposed to risks relating to inability of the O&M Contractors or other sub-contractors to obtain requisite approvals for operation and maintenance activities, as well as risks relating to the quality of their services, equipment and supplies. The O&M Agreements only provide for damages in case of default by the O&M Contractor in performance of its obligations and do not provide for any kind of security/guarantee from the O&M Contractors. Further, the aggregate liability from such claims is limited under each contract

In addition, under certain of the concession agreements, the consent of the concessioning authority is required for any selection or replacement of an operation and maintenance contractor. Any delay, default or unsatisfactory performance by the O&M Contractors or other sub-contractors could adversely affect the ability of the Project SPVs to effectively operate or maintain the Projects. This may result in increased costs as well as losses of revenue for the Project SPVs and thereby have an adverse effect on the financial condition and results of operations of the Highways Trust.

**33. *The Project SPVs depend on HC1 for provision of certain services. Any delay, default or unsatisfactory performance by HC1 could adversely affect the Project SPVs’ ability to effectively operate or maintain the Projects.***

The Project Manager and the Project SPVs will also entered into a business support services agreement with HC1, an affiliate of the Investment Manager, for provision of certain services to the Project SPVs including, amongst others, corporate accounting, banking and financing services, payroll management services, corporate secretarial services and tax and statutory compliance. For details in relation to the agreement, please see the section entitled “*Related Party Contracts – Business Support Services Agreement*” on page 255. Any delay, default or unsatisfactory performance by HC1 could adversely affect the ability of the Project SPVs to effectively operate or maintain the Projects. This may result in increased costs as well as losses of revenue for the Project SPVs and thereby have an adverse effect on the financial condition and results of operations of the Highways Trust. The Project SPVs may be required to pay annual premiums to the concessioning authorities in consideration for being granted the right to build and operate the Projects. Failure to make such payments could result in the termination of the Concession Agreement by the NHAI.

In accordance with the concession agreements, the Project SPVs are required to pay annual premiums to the concessioning authorities. In the past, one of our Project SPVs has sought and received approval from NHAI for deferment on such payments. We cannot assure you that the concessioning authorities will permit such deferment in the future. Failure of the Project SPVs to pay such annual premiums as per the timelines set out by the concessioning authorities may result in the concessioning authorities, in their discretion prematurely terminating the concession agreement.

**34. *The Project SPVs may be held liable for the payment of wages to the contract labourers engaged indirectly in the operations of the Highways Trust.***

The Project SPVs or the O&M Contractors may appoint independent contractors who, in turn, engage on-site contract labour to perform certain operations. Some of the Project SPVs have obtained the relevant

registrations under the Contract Labour (Regulation and Abolition) Act, 1970 (the “**Contract Labour Act**”) for certain locations where workmen are employed through contractors or agencies licensed under the Contract Labour Act. Although the Project SPVs do not engage the labourers directly, in the event of default by any independent contractor, the relevant Project SPV may be held responsible for any wage payments and other statutory benefits due to the labourers of such contractor. Any violation of the provisions of the Contract Labour Act by a Project SPV may result in penalties pursuant to the provisions of the Contract Labour Act. If any of the Project SPVs are required to pay the wages of contracted workmen and subjected to other penalties under the Contract Labour Act, the reputation, results of operations, cash flows and financial condition of the Highways Trust could be adversely affected.

35. ***The results of operations of the Project SPVs could be adversely affected by strikes, work stoppages or increased wage demands by the employees of the Project SPV, O&M Contractors or other sub-contractors.***

Under the O&M Agreements, the Project SPVs have engaged the O&M Contractors to conduct all O&M activities required under the respective concession agreements apart from certain services being provided by HC1. For details in relation to the agreement, please see the section entitled “*Related Party Contracts – Business Support Services Agreement*” on page 255. In the event of any strikes or work stoppages by employees of the Project SPV itself, the O&M Contractors or other sub-contractors due to increased wage demands or the inability of the Project SPV, O&M Contractors or other sub-contractors to either retain or recruit employees and sub-contractors with suitable credentials, the ability of the Project SPVs to collect tolls and maintain and operate the Projects will be adversely affected. In addition, any disruption to the services provided by the employees of the Project SPV, the O&M Contractors or other sub-contractors will have an adverse effect on the operations of the Project SPVs. There can be no assurance that future disruptions will not be experienced due to disputes or other problems with the work force, which may adversely affect the business and results of operations of the Project SPVs.

36. ***The Project SPVs have experienced losses in previous years and any losses in the future could adversely affect the Highways Trust’s business, financial condition and the results of its operations, its ability to make distributions and the trading price of the Units.***

The Project SPVs have experienced losses for one or more Fiscals in the last three Fiscals. Under the Companies Act, 2013, companies that do not generate “distributable profits” are not permitted to pay dividends. Accordingly, any Project SPV that fails to generate such distributable profits will not be permitted to pay dividends to the Highways Trust which will adversely affect the quantum of distributions made by the Project SPVs to the Highways Trust. Such change may adversely affect the Highways Trust’s ability to make distributions to Unitholders.

37. ***The Project SPVs may be required to pay additional stamp duty if any concession agreement is subject to payment of stamp duty as a deed creating leasehold rights, or as a development agreement.***

Currently, concession agreements are treated as agreements which are not lease deeds and stamp duty ranging between ₹ 100 to ₹ 500 is typically paid for such concession agreements. Stamp duty authorities of certain states in India have issued notices to some concessionaires alleging inadequate stamp duty on the concession agreements executed between the concessionaires and the concessioning authorities. The stamp authorities allege that since the concession agreements relate to the letting of tolls to the concessionaires in the form of leases, or as development agreements, such agreements were required to be stamped as lease agreements or development agreements, as applicable. Accordingly, concession agreements that have not been stamped as such could be considered to be inadequately stamped. The High Courts of Allahabad and Madhya Pradesh have also held that a concession agreement ought to be stamped as a lease agreement and have upheld the imposition of a higher stamp duty on such agreements.

The stamp duty for a lease agreement or a development agreement ranges between 1.0% and 11.0% of the annual rent or premium payable or the market value of the property. Furthermore, stamp duty authorities may impose penalties for payment of inadequate stamp duty, which could extend up to 10 times the amount of the stamp duty payable.

If any of the concession agreements were determined to be inadequately stamped, then such agreements would be inadmissible as evidence in any legal action, until the deficient amount of stamp duty together with penalties, if any, was paid. Any deficiently stamped documents can also be impounded by any person

having authority, by law or consent, to receive evidence or every person who is in-charge of a public office. Such persons impounding the deficiently stamped documents can either levy the appropriate stamp duty and penalty or send them to revenue authorities for that purpose. In addition, a person who signs an instrument chargeable with stamp duty will be subject to a fine if such instrument is not duly stamped.

Concession agreements contain change in law provisions which extend to a change in the interpretation or application of any Indian law by a court of record after the date of the concession agreement or the submission of the bid documents, as the case may be. Under the terms of the concession agreements, if any financial burden exceeding a certain prescribed threshold is imposed on a concessionaire as a result of such change in law, then it may be entitled to approach the concessioning authority to amend the concession agreement or seek compensation to place the concessionaire in its former financial condition. However, relief under the concession agreements may be limited in nature. There can be no assurance that the relevant concessioning authority will consider additional stamp duty on the concession agreements as a change in law for which they will amend the concession agreement or agree to provide compensation to the concessionaire. Any disagreement between the relevant concessionaire and the concessioning authority may result in arbitration proceedings between the parties which could lead to increased costs.

Any imposition of a demand for payment of a higher stamp duty or imposition of penalty would increase the costs of the Projects, to the extent such additional costs are not recoverable from the concessioning authorities, and could adversely affect the business, results of operations and prospects of the Project SPVs.

**38. *We have entered into material related party transactions and may continue to do so in the future, which may potentially involve conflict of interests with the Unitholders.***

The transactions resulting from the Project Management Agreement, the Investment Management Agreement, the Business Support Services Agreement, the Reimbursement Agreement and the Securities Purchase Agreement are related party transactions and their terms may not be deemed as favourable to us as if they had been negotiated solely amongst unaffiliated third parties. Furthermore, it is likely that we will enter into additional related party transactions in the ordinary course of our business. The terms of such transactions may not be as favourable to us as those negotiated solely amongst unaffiliated third parties and may involve conflicts of interest. Such transactions, individually or in the aggregate, could have a material adverse effect on our business, prospects, financial condition, results of operations and cash flows. For additional details, please see the sections entitled “*Related Party Transactions*”, “*Formation Transactions in Relation to the Highways Trust*” and “*Parties to the Highways Trust*” on pages 253, 20 and 101, respectively.

**39. *There may not be any eligible acquisition opportunities from the Sponsor or third parties in the future, which may adversely affect the Highways Trust’s business, financial condition, results of operations and prospects.***

The Highways Trust aims to achieve portfolio growth through its acquisition growth strategy. Accordingly, in respect of future acquisitions, the Highways Trust may depend on third parties as a source of attractive acquisition opportunities. Further, the Highways Trust may also wish to acquire certain assets from the Sponsor in the future. In this regard, it may be noted that the Sponsor has entered into the Sponsor SPA 1 and Sponsor SPA 2 for acquisition of certain assets held by Ashoka Concessions Limited and/ or its affiliates and India Infrastructure Fund II , respectively. Upon completion of such acquisitions by the Sponsor, these assets may be made available by the Sponsor for acquisition to the Highways Trust in the future, whether directly or indirectly, subject to various conditions precedents specified in the Sponsor SPA 1 and Sponsor SPA 2 and, subject to certain conditions including the receipt of necessary regulatory and statutory approvals. There can be no assurance that any such acquisition opportunities will materialise and the Highways Trust will be able to avail of the same.

Eligible acquisition opportunities from third parties may also not materialise or the Highways Trust may face increased competition from other InvITs and third parties, which may cause the price at which the Highways Trust is able to acquire a given asset to not be financially desirable.

An inability to grow through prudent acquisitions may adversely affect the Highways Trust’s business, financial condition and results of operations.

- 40. *The Highways Trust may not be able to successfully fund future acquisitions of new projects due to the unavailability of equity financing on acceptable terms, which could impede the implementation of its acquisition strategy and negatively affect its business.***

The Highways Trust may fund the consideration (in whole or in part) for future acquisitions through the issuance of additional Units. Such issuances may result in the dilution of the interests in the Highways Trust held by existing Unitholders. The Highways Trust may not be able to complete the issuance of the required number of Units on short notice or at all due to a lack of investor demand for the Units at prices that it considers to be in the interests of then-existing Unitholders. As a result of a lack of funding, the Highways Trust may not be able to pursue its acquisition strategy successfully. Potential vendors may also view the prolonged time frame and lack of certainty generally associated with the raising of equity capital to fund any such purchase negatively and may prefer other potential purchasers.

Further, in addition to compliance with the provisions of the SEBI InvIT Regulations, due to the Sponsor being a non-resident entity, any future investment by us in holding companies or Project SPVs may also be subject to the investment conditions prescribed under the extant foreign exchange regulations for investment in infrastructure sector. For example, any downstream or other investments made by us are subject to conditions under the extant foreign exchange regulations for investment in infrastructure sector, both in terms of investments and divestments.

- 41. *The use of additional leverage by the Investment Manager and the Highways Trust are subject to risks. Further, the Highways Trust may not be able to successfully fund future acquisitions of new projects due to the unavailability of debt financing, which could impede the implementation of its acquisition strategy and negatively affect its business***

The Highways Trust's total outstanding consolidated net debt after full utilization of the Issue Proceeds, will be within the regulatory requirement of 49% of the value of the InvIT Assets upon completion of the Issue (net of cash and cash equivalents) as specified under the SEBI InvIT Regulations. Under the terms of the InvIT Regulations, the consolidated borrowings and deferred payments of the Highways Trust, net of cash and cash equivalents, cannot exceed 49% of the value of the assets of Highways Trust until certain conditions are met, and cannot exceed 70% of the value of the assets of Highways Trust until, amongst others, the Highways Trust has made six consecutive distributions to Unitholders. Further, if the consolidated borrowings of the Highways Trust exceed 25% of the value of the assets of the Highways Trust, further borrowings, up to 49% of the value of the assets of the Highways Trust, would be subject to: (i) obtaining a credit rating from a credit rating agency registered with SEBI; and (ii) approval of the Unitholders, in accordance with the InvIT Regulations and Trust Deed. There is no assurance that the relevant approvals can be obtained in a timely manner, or at all. The Highways Trust may want to rely on debt to expand its portfolio of projects through acquisitions, which may not be available on favourable terms or at all.

Although the Investment Manager will seek to use leverage in relation to the Highways Trust in a manner it believes is prudent and manage the Highways Trust according to the Investment Objectives, the use of leverage will generally magnify both the opportunities for gain and risk of loss from any given asset. The cost and availability of leverage is variable and it is not always possible to obtain or maintain the desired degree of leverage. The use of leverage will also result in interest expense and other costs that will limit distributions made by the Highways Trust or appreciation of its investments. An increase in interest rates may decrease the profitability of the Highways Trust or any of the Project SPVs. A leveraged capital structure will increase a Project SPV's exposure to any deterioration in market conditions, competitive pressures, an adverse economic environment or rising interest rates, which could accelerate and magnify declines in the value of the Highways Trust's investments. If a Project SPV is not able to generate adequate cash flow to meet debt service, the Highways Trust may suffer a partial or total loss of capital invested in such Project SPV.

Further, debt financing to fund the acquisition of a project may not be available in accordance with applicable law, or may not be available on acceptable terms. Restrictions imposed by the Reserve Bank of India may limit the Highways Trust's ability to borrow overseas for projects under development and hence could constrain its ability to obtain financing on competitive terms and refinance existing indebtedness. In addition, there can be no assurance that any required regulatory approvals or borrowing in foreign currencies will be granted to the Highways Trust without onerous conditions, or at all. In addition to compliance with the provisions of the SEBI InvIT Regulations, due to the Sponsor being a non-resident

entity and the Investment Manager being considered foreign owned and controlled in accordance with the extant regulation, any future debt acquired may also be subject to the investment conditions prescribed under the extant foreign exchange regulations for investment in infrastructure sector.

Under the Project SPVs' financing agreements, the lenders may be entitled to change the applicable rate of interest on any date and accordingly, the Project SPVs are susceptible to changes in interest rates and the risks arising therefrom. Any increase in interest rates may have an adverse effect on our results of operations, financial condition and cash flows.

Any financing agreements entered into by the Highways Trust may contain certain restrictive covenants and cross default provisions. These may restrict our ability to conduct business and any breach thereof may adversely affect our results of operations and financial condition. In the event of any breach of any covenant contained in these financing agreements, apart from other consequences, the security under the financing agreements may be enforced which may adversely affect our business, financial condition and results of operations.

Debt financing may increase the Highways Trust's vulnerability to general adverse economic and industry conditions by limiting its flexibility in planning for or reacting to changes in its business and its industry. The Highways Trust will also be subject to the risk that certain covenants in connection with any future borrowings may limit or otherwise adversely affect its operations and its ability to make distributions to its Unitholders. Such covenants may also restrict the Highways Trust's ability to acquire additional projects or undertake other capital expenditure by requiring it to dedicate a substantial portion of its cash flows from operations to interest and principal payments on its debt.

**42. *The actual performance of the Highways Trust is subject to significant business, regulatory, and tax risks, uncertainties and contingencies that could cause actual results to differ materially from the forward-looking statements in this Final Placement Memorandum.***

This Final Placement Memorandum contains forward-looking statements including the Projections of Revenue from Operations and Cash Flow from Operating Activities. These forward-looking statements are based on a number of assumptions, many of which are outside the control of the Highways Trust. The assumptions underlying the Projections of Revenue from Operations and Cash Flow from Operating Activities are inherently uncertain and are subject to significant business, regulatory, and tax risks, uncertainties and contingencies that could cause actual results to differ materially from the forecast results. In addition, the revenue of the Highways Trust is dependent on a number of factors, including the toll receipts and receipt of annuities from the Projects, which may decrease for a number of reasons. This may adversely affect the ability of the Highways Trust to achieve the landmarks set out in the Projections of Revenue from Operations and Cash Flow from Operating Activities as some or all of the events and circumstances assumed may not occur as expected, or events and circumstances, which are not currently anticipated, may arise. While the Highways Trust currently expects to meet the Projections of Revenue from Operations and Cash Flow from Operating Activities based on the assumptions set out in the section entitled "*Projections of Revenue from Operations and Cash Flow from Operating Activities*" on page 392, no assurance can be given that the assumptions will remain true or relevant and that the actual profit and cash flow will be achieved as forecasted or projected.

The Projections of Revenue from Operations and Cash Flow from Operating Activities should be reviewed in conjunction with the description of the business of the Project SPVs, the section entitled "*Discussion and analysis by the Directors of the Investment Manager of the financial condition, results of operations and cash flows of the Project SPVs of the Highways Trust*" on page 223 and other information contained in this Final Placement Memorandum, including the information set forth in this "*Risk Factors*" section.

The Investment Manager does not intend to provide any updated or otherwise revised profit and cash flow forecast or profit and cash flow projection in the event that any assumptions differ from actual results.

**43. *The ability of the Highways Trust to make or maintain consistency in distributions to Unitholders depends on the financial performance of the Project SPVs and their profitability.***

The amount of future distributions, if any, will depend upon various factors including future earnings, financial condition, cash flows, working capital requirements and capital expenditures of the Project SPVs and the dividends, interest payments and repayments of indebtedness that are distributed to the Highways

Trust. The income earned from the Projects depends on, among other things, the amount of income generated from toll receipts and annuities and the level of operating and other expenses incurred. If the Projects do not generate sufficient operating profit, the income of the Highways Trust, cash flows and ability to make distributions or level of distributions made to Unitholders will be adversely affected.

The ability of the Project SPVs to make dividend payments is subject to, among other things, applicable laws and regulations in India and other contractual restrictions that they may be bound by. Under the terms of the InvIT Regulations, in the event any assets are sold by the Highways Trust, the Holding Companies or any Project SPV or if the equity shareholding or interest in any Holding Company or Project SPV is disposed of by the Highways Trust and the proceeds of such sale are proposed to be reinvested in another infrastructure asset, then the Highways Trust is not obligated to make any distributions from such proceeds to the Unitholders.

In addition, the InvIT Regulations provide that the Highways Trust must distribute not less than 90% of net distributable cash flows of each Project SPV in proportion of its holding in each of the Project SPV subject to the applicable provisions of the Companies Act, 2013. Further, a Holding Company must distribute 100% of the net distributable cash flows received from the underlying Project SPVs and must distribute 90% of the net distributable cash flows generated by the Holding Company. The distributions to the Unitholders must be declared and made not less than once every financial year and must not be made later than 15 days from the date of such declaration. There is no assurance that the Highways Trust will be able to make distributions to the Unitholders or that such distributions will be consistent across various periods.

Further, the method of calculating the net distributable cash flows of a Project SPV is subject to change and any change in the applicable laws in India or elsewhere may limit the Highways Trust's ability to pay or maintain consistency in distributions to Unitholders. There is also no assurance that the expansion of the Highways Trust's portfolio of infrastructure assets will increase the Highways Trust's cash flows and thereby result in an increase in the level of distributions to Unitholders over time.

**44. *It may be difficult for the Highways Trust to dispose of its non-performing assets.***

The Projects may be illiquid as a result of the current market condition or the limited residual life of the Projects, among other things. In the event that the Projects are performing poorly, the Highways Trust may experience difficulty in realising, selling or disposing its shareholding in a Project at the appropriate time or at all or at an attractive price, and this may have an adverse effect on the business, prospects, financial condition and results of operations of the Highways Trust.

**45. *We have received provisional credit ratings from credit rating agencies.***

The Highways Trust has been given an issuer rating of (i) 'Provisional CRISIL AAA/Stable (Assigned)' by CRISIL Ratings, for bank loan facilities aggregating to ₹ 10,000 million and, (ii) a rating of 'Provisional CRISIL AAA/Stable for non-convertible debentures aggregating to ₹ 9,000 million, by way of its letters dated March 14, 2022. Additionally, the Highways Trust has been given an issuer rating of 'Provisional IND AAA/Stable' by India Ratings, for bank loan facilities aggregating to ₹ 10,000 million and non-convertible debentures aggregating to ₹ 9,000 million, by way of its letter dated March 11, 2022. There is no assurance that CRISIL Ratings or India Ratings will provide continue to provide a positive credit rating to the Highways Trust or that the agencies will provide a rating without covenants. A negative or lower rating may adversely affect our ability to raise additional financing, and the interest rates and other terms at which such additional financing is available. This in turn could in turn materially and adversely affect our business, prospects, financial condition, results of operations and cash flows.

**46. *The Highways Trust does not own the trademark "Highways Infrastructure Trust" and the associated logo to be used by it for its business and its ability to use the trademark may be impaired.***

Highways Trust has not made an application for the use of the trademark "Highways Infrastructure Trust" and the associated logo. Highway Trust's ability to use the trademark and the associated logo may be impaired if it does not make a trademark application, or if such an application is made and the application is rejected. Consequently, Highways Trust could be required to cease using "Highways Infrastructure Trust" and the associated logo, which may have an adverse effect on its operations.

## RISKS RELATING TO OUR ORGANISATION AND STRUCTURE

### **47. *The Highways Trust must maintain certain investment ratios which may pose additional risks.***

Pursuant to the InvIT Regulations, we are required to invest not less than 80% of the value of our assets in eligible infrastructure projects as defined under the InvIT Regulations, such as the Project SPVs. In addition, we must not invest more than 20% of the value of our assets in certain financial instruments prescribed under the InvIT Regulations. Such regulations may prevent us from acquiring additional assets to achieve our growth strategy

Additionally, if the aggregate consolidated borrowings of the Highways Trust and the Project SPVs, net of cash and cash equivalents exceed 25% of the value of the assets of the Highways Trust, for any further borrowings up to 49% of the value of the assets of the Highways Trust, we are required to adhere to specific conditions, such as obtaining a credit rating and seeking Unitholder approval. For any further borrowings beyond 49% of the value of the assets of the Highways Trust, we are required to comply with specific conditions prescribed under the InvIT Regulations, which include amongst others, obtaining a credit rating of “AAA” or equivalent from a credit rating agency registered with SEBI, prior approval from at least 75% of the Unitholders, and demonstrating a track record of at least six distributions on a continuous basis post listing of the Units, in the years preceding the financial year in which the enhanced borrowings are proposed to be made. The aggregate consolidated borrowings and deferred payments, net of cash and cash equivalents of the Highways Trust and the Project SPVs cannot exceed 70% of the value of the assets of the Highways Trust.

If these conditions are breached on account of market movements of the price of the underlying assets or securities, the Investment Manager must inform the Trustee and ensure that these conditions are satisfied within six months of such breach (or within one year with Unitholder approval). Failure to comply with these conditions may present additional risks to us, including divestment of certain assets, delisting and other penalties, which could have a material, adverse effect on our business, financial condition and results of operations.

### **48. *We depend on the Investment Manager, the Project Manager and the Trustee to manage our business and assets, and our financial condition, results of operations and cash flows and our ability to make distributions may be harmed if the Investment Manager, Project Manager or the Trustee fail to perform satisfactorily. The rights of the Highways Trust and the rights of the Unitholders to recover claims against the Project Manager, the Investment Manager or the Trustee may be limited.***

The success of our business and growth strategy and the operational success of our assets will depend significantly upon the managers’ satisfactory performance of these services. Our recourse against the Project Manager, the Trustee and Investment Manager is limited.

The aggregate maximum liability of the Project Manager under the Project Management Agreement in each financial year will be limited to the service fees payable to the Project Manager in such financial year in accordance with the terms of the Project Management Agreement except in the event that such liability arises out of any gross negligence, wilful default or fraud on the part of the Project Manager.

If the Trustee is required by the InvIT Regulations or any applicable law to provide information regarding the Highways Trust or the Sponsor or the Unitholders, the investments made by the Highways Trust and income therefrom and provisions of such presents, and complies with such request in good faith, whether or not it was in fact enforceable, the Trustee shall not be liable to the Unitholders or to any other party as a result of such compliance or in connection with such compliance. The Trustee is also not liable on account of anything done or omitted to be done or suffered by the Trustee in good faith in accordance with, or in pursuance of any request or advice of the Investment Manager. Further, the Trustee is not liable for any act or omission which may result in a loss to a Unitholder (by reason of any depletion in the value of the fund of the Highways Trust or otherwise), except in the event that such depletion is a result of fraud, gross negligence or misconduct on the part of the Trustee or results from a breach by the Trustee of the Trust Deed, as determined by a court of competent jurisdiction. The liability of the Trustee shall be limited to the extent of the fees received by it, in all circumstances whatsoever except, amongst others, in case of any negligence or misconduct or fraud on the part of the Trustee as may be determined by a court of competent jurisdiction.

The Investment Manager's liability to Trustee, its directors, employees and officers for breach of its obligations under the Investment Management Agreement in each financial year is limited to the aggregate fees paid to the Investment Manager for that financial year under the agreement. Further, the Investment Manager is not personally liable for any losses (including indirect or consequential losses), costs, damages or expenses incurred in any way arising from anything which the Investment Manager does or fails to do during the course of discharge of its duties as an Investment Manager to the InvIT, except in the event that such loss is a result of any disabling conduct on part of the Investment Manager.

Accordingly, the Unitholders may not be able to recover claims against the Project Manager, the Trustee or the Investment Manager.

If the management agreements were to be terminated or if their terms were to be altered, our business could be adversely affected, as the Trustee may not be able to immediately replace such services, and even if replacement services were immediately available, the terms offered or obtained with the new managers could be less favourable than the ones currently offered by the Investment Manager and the Project Manager.

**49. *The Investment Manager is the investment manager of another InvIT.***

The Investment Manager has been appointed to act as the investment manager of Virescent Renewable Energy Trust ("Terra InvIT"). The Investment Manager is not prohibited from providing management services to investment trusts sponsored by other persons. However, to ensure good governance and clear segregation of the management and operations of the different InvITs being managed by the Investment Manager from time to time, the Investment Manager is required to implement appropriate systems for efficient management of such InvITs. Additionally, in compliance with requirements under the SEBI InvIT Regulations, any potential transactions between the Terra InvIT and the Highways Trust must be treated as related party transactions. We cannot assure you that such systems will be effectively implemented by the Investment Manager or prevent the actions of the Investment Manager from adversely affecting the levels of service that Highways Trust requires, which may have an adverse effect on our business.

**50. *Our success depends in large part upon the Investment Manager and Project Manager, the management and personnel that they employ, and their ability to attract and retain such persons.***

Our ability to make consistent distributions to our Unitholders depends on the continued service of management teams and personnel of the Investment Manager and Project Manager. Each of the Investment Manager and Project Manager may face challenges in recruiting and retaining a sufficient number of suitably skilled personnel. Generally, there is significant competition for management and other skilled personnel in our industry in India, and it may be difficult to attract and retain the skilled personnel that the Investment Manager and Project Manager need for our operations. Furthermore, the Investment Manager and Project Manager may not be able to adequately re-deploy and re-train their employees to keep pace with evolving industry standards and changing customer preferences. The loss of key personnel of either of the Investment Manager or the Project Manager, may have a material adverse effect on our business, prospects, financial condition, results of operations and cash flows of the Highways Trust.

**51. *The Investment Manager has limited experience in investment management activities for an InvIT and may not be able to successfully implement its investment strategy for and Investment Objectives of the Highways Trust or to manage the Highways Trust's growth effectively.***

While the Investment Manager is also acting as the investment manager for one other InvIT, such InvIT was registered recently (on February 25, 2021) and accordingly the Investment Manager, and its directors and employees have limited experience in investment management activities for an InvIT.

Further, there can be no assurance that the Investment Manager will be able to implement its investment strategy or Investment Objectives successfully or that it will be able to expand the portfolio of the Highways Trust at all, or at any specified rate or to any specified size or make distributions as projected. The results of the operations of the Highways Trust will depend on many factors, including but not limited to, its ability to operate and manage the Projects efficiently, changes in the regulatory framework, competition for assets or macro-economic condition. These factors will, in turn, affect the availability of further opportunities for the acquisition of road assets and the availability of finance to achieve leverage. The Highways Trust will be relying on external sources of funding to expand its asset portfolio, which may

not be available on favourable terms, or at all. Even if the Highways Trust is able to successfully acquire additional road assets, portfolio growth and expansion could place significant demands on the management and administrative resources of the Investment Manager and the capital resources of the Highways Trust and there can be no assurance that the Highways Trust will be able to efficiently manage such assets and achieve its intended return on such acquisitions.

The Investment Manager can also stop acting as the Investment Manager by providing notice under the Investment Management Agreement or the Highways Trust may replace the Investment Manager in accordance with the terms of the Trust Deed. There is no assurance that the financial performance of the Highways Trust would not be affected upon the appointment of a new investment manager.

- 52. *Upon completion of the Issue, the Sponsor may be able to exercise significant influence over activities of the Highways Trust on which Unitholders are entitled to vote. The Sponsor's interests may be different from Unitholders.***

Under the InvIT Regulations, upon completion of the Issue, the Sponsor must continue to own all of its Units for one year and must own 15% of the outstanding Units for three years from the date of listing of the Units, subject to the conditions specified in the InvIT Regulations. As a result, the Sponsor, may be able to control the outcome of matters on which Unitholders are entitled to vote and for which the Sponsor is not prohibited from voting due to a conflict of interest. The interests of the Sponsor may be different from those of the Unitholders.

- 53. *The Investment Manager is required to comply with certain ongoing reporting and management obligations in relation to the Highways Trust. We cannot assure you that the Investment Manager will be able to comply with such requirements.***

The Investment Manager is required to comply with certain ongoing reporting and management obligations in relation to the Highways Trust in accordance with the SEBI InvIT Regulations. These requirements include, amongst other things, (a) making investment decisions with respect to the underlying assets or projects of the Highways Trust, (b) overseeing the activities of the Project Manager, (c) investing and declaring distributions in accordance with the SEBI InvIT Regulations, (d) submitting reports to the Trustee and (e) ensuring the audit of the Highways Trust's accounts. We cannot assure you that the Investment Manager will be able to comply with such requirements in a timely manner or at all, which could subject the Investment Manager, the other parties to the Highways Trust, the Highways Trust or any person involved in the activity of the Highways Trust to applicable penalties under the SEBI InvIT Regulations, the SEBI Intermediaries Regulations and/or the SEBI Act. Any such failure to comply or the imposition of any penalty could have an adverse effect on our business, financial condition and results of operations. Under the SEBI InvIT Regulations, the SEBI also has the right to inspect documents, accounts and records relating to the activity of the Highways Trust, Project SPVs or Parties to the Highways Trust and may issue directions in the nature of, inter-alia, (i) requiring the Highways Trust to surrender its certificate of registration; (ii) requiring the Highways Trust to wind-up; (iii) requiring the Highways Trust to sell its assets; (iv) requiring the Highways Trust or Parties to the Highways Trust to take such action as may be in the interest of investors; or (v) prohibiting the Highways Trust or Parties to the Highways Trust from operating in the capital markets or from accessing the capital markets for a specified period.

- 54. *The Highways Trust may be dissolved, and the proceeds from the dissolution thereof may be less than the amount invested by the Unitholders.***

The Highways Trust is an irrevocable trust registered under the Indian Registration Act, 1908 and it may only be extinguished: (i) if it is impossible to continue with the Highways Trust or if the Trustee, on the advice of the Investment Manager, deems it impracticable to continue; (ii) on the written recommendation of the Investment Manager and upon obtaining the prior written consent of such number of the Unitholders as is required under the InvIT Regulations; (iii) if our Units are delisted from the Stock Exchange; (iv) if the SEBI passes a direction to wind up the Highways Trust or the delisting of the Units; or (v) in the event our activities are rendered illegal. Should the Highways Trust be dissolved, depending on the circumstances and the terms upon which our assets are disposed of, there is no assurance that our Unitholder will recover all or any part of its investment.

If a default is triggered under the financing documents the Highways Trust is a party to, the Trustee will take steps to cure such default and/or to repay the affected lender by appropriate means, including divesting or liquidating the assets of the Highways Trust or raising additional financing, in accordance with such financing documents and applicable laws. If such default is not cured, and the affected lender initiates proceedings against the Highways Trust, the Highways Trust will be terminated immediately in accordance with applicable laws. In the event of a termination of the Highways Trust, the net assets which will be paid to the Unitholders will take into account the debt, liabilities and obligations of the Highways Trust. There is no assurance that Unitholders will recover all or any part of their investments.

55. ***As a proposed shareholder of the Project SPVs, the Highways Trust's rights are subordinated to the rights of creditors, debt holders and other parties specified under Indian law in the event of insolvency or liquidation of the Project SPVs.***

In the event of liquidation of any of the Project SPVs, the secured and unsecured creditors of the relevant Project SPV will be entitled to payment from the liquidation proceeds in priority to us in our capacity as an equity shareholder of the Project SPV. Under the Insolvency and Bankruptcy Code, 2016, in the event of winding-up of any Project SPV, workmen's dues and debts due to secured creditors which rank *pari passu* are required to be paid in priority over all other outstanding debt, followed by wages and salaries of employees, debts due to unsecured creditors, any amounts due to the central or state government, any other debts, preference shareholders and equity shareholders. Further, amounts payable to us in respect of any unsecured debt issued by the Project SPV will be subordinated in the manner set forth above.

56. ***Information and the other rights of Unitholders under Indian law may differ from such rights available to equity shareholders of an Indian company or under the laws of other jurisdictions.***

The Trust Deed and various provisions of Indian law govern the Highways Trust's affairs. Legal principles relating to these matters and the validity of procedures, fiduciary duties and liabilities, and Unitholders' rights may differ from those that would apply to a company in India or a trust in another jurisdiction. Unitholders' rights and disclosure standards under Indian law may also differ from the laws of other countries or jurisdictions. For details, please see the section entitled "*Rights of Unitholders*" on page 283.

57. ***Parties to the Highways Trust are required to satisfy the eligibility conditions specified under Regulation 4 of the InvIT Regulations on an ongoing basis. We may not be able to ensure such ongoing compliance by the Sponsor, the Investment Manager, the Project Manager and the Trustee, which could result in the cancellation of the registration of the Highways Trust.***

Each of the Parties to the Highways Trust is required to satisfy the eligibility conditions specified in the InvIT Regulations on an ongoing basis. These eligibility conditions include, among other things, that: (a) the Sponsor, Investment Manager and Trustee are separate entities; (b) the Sponsor has a net worth of not less than ₹ 1,000 million and has a sound track record in the development of infrastructure or fund management in the infrastructure sector; (c) the Investment Manager has a net worth of not less than ₹ 100 million and has not less than five years' experience in fund management or advisory services or development in the infrastructure sector or development in the infrastructure sector or the combined experience of the directors, partners and employees of the Investment Manager in fund management or advisory services or development in the infrastructure sector is not less than 30 years; (d) the Trustee is registered with the SEBI under Securities and Exchange Board of India (Debenture Trustees) Regulations, 1993 and is not an Associate of the Sponsor or Investment Manager; and (e) each of the Sponsor, Investment Manager, Project Manager and Trustee are "fit and proper persons" as defined under Schedule II of the Securities and Exchange Board of India (Intermediaries) Regulations, 2008 on an ongoing basis. We may not be able to ensure such ongoing compliance by the Sponsor, the Investment Manager, the Project Manager and the Trustee, which could result in the cancellation of the registration of the Highways Trust.

58. *We are governed by the provisions of, amongst others, the InvIT Regulations and the Securities Contracts (Regulation) Act, 1956 (“SCRA”), the implementation and interpretation of which, is evolving. The evolving regulatory framework governing infrastructure investment trusts in India may have a material adverse effect on the ability of certain categories of investors to invest in the Units, our business, financial condition and results of operations and our ability to make distributions to the Unitholders.*

The Highways Trust has been constituted under the InvIT Regulations which were issued in 2014, as amended and supplemented with additional guidelines and circulars.

As the regulatory framework governing infrastructure investment trusts in India comprises a separate set of regulations, interpretation and enforcement by regulators and courts involves uncertainties. Furthermore, regulations and processes with respect to certain aspects of infrastructure investment trusts, including, but not limited to, follow-on public offers and bonus issues, the liabilities of the Unitholders, and the procedure for dissolution of infrastructure investment trusts have not yet been issued. For example, and infrastructure investment trusts are not “companies” or “bodies corporate” within the meaning of the Companies Act, 2013 and various SEBI regulations, including the Securities and Exchange Board of India (Buy-back of Securities) Regulations, 2018 and the Securities and Exchange Board of India (Substantial Acquisition of Shares and Takeovers) Regulations, 2011.

The InvIT Regulations and other corresponding changes to applicable law, are largely untested in their implementation. Uncertainty in applicability, interpretation or implementation of any amendment to, or change in, law, regulation or policy, including due to an absence, or a limited body, of administrative or judicial precedent may be time consuming and costly for us to resolve and may impact the viability of our current business or restrict our ability to grow our business in the future and consequently, our ability to make distributions to the Unitholders. Changes to our organizational structure, changes to our agreements, cost increases, fines, legal fees or business interruptions may result from changes to regulations, from new regulations, from new interpretations by courts or regulators of existing regulations or from stricter enforcement practices by regulatory authorities of existing regulations. In addition, new costs may arise from audit, certification and/or self-assessment standards required to maintain compliance with new and existing InvIT Regulations, which may render it economically unviable to continue conducting business as an infrastructure investment trust or otherwise have a material, adverse effect on our business, financial condition, results of operations and cash flows.

Further, SEBI has the right to, with or without prior notice, order inspection of the books of accounts, records and other documents pertaining to our operations, either on its own or, upon receipt of complaint. Upon review of the inspection report, SEBI is entitled to, if it so deems appropriate (in the interest of the securities markets or our investors) (a) to require us to surrender our certificate of registration; (b) to wind-up our operations; (c) to sell our assets; (d) direct us to not operate or access the capital markets for a specified period; or (e) direct us to not do such things as SEBI may deem appropriate in the interest of our investors. Any such occurrence may have a material adverse effect on our business, result of operations, financial conditions and cash flows.

Additionally, with effect from April 1, 2021, units and other instruments issued by an InvIT have been included in the definition of ‘securities’ under section 2(h) of the SCRA. Such amendments have come into effect on April 1, 2021 and consequently, the implementation and interpretation of these amendments is untested and evolving. Accordingly, the applicability of several regulations (including regulations relating to intermediaries, underwriters, merchant bankers, takeover, insider trading and fraudulent and unfair trade practices) to the Highways Trust is unclear and subject to the interpretation and clarifications issued by regulatory bodies such as SEBI.

There can be no assurance that the legal framework for infrastructure trusts will not impose additional regulations and policies which could impact our operations and it is difficult to forecast how any new laws, regulations or standards or future amendments to the InvIT Regulations, the SCRA and other applicable law will affect infrastructure trusts and the infrastructure sector in India. Such changes may adversely affect our business, results of operations and prospects, to the extent that we are unable to suitably respond to and comply with any such changes in applicable law and policy. We may incur increased costs and other burdens relating to compliance with such new regulations, which may also require significant time and other resources, and any failure to comply with these changes may adversely affect our business, results of operations and prospects.

59. ***The reporting requirements and other obligations of infrastructure investment trusts post-listing are still evolving. Accordingly, the level of ongoing disclosures made to and the protection granted to our Unitholders may be more limited than those made to or available to shareholders of a company that has listed its equity shares upon a recognised stock exchange in India.***

The InvIT Regulations, along with the guidelines and circulars issued by the SEBI from time to time, govern the infrastructure investment trusts in India. However, as compared with the statutory and regulatory framework governing companies that have listed their equity shares or debt securities on recognised stock exchanges in India, the regulatory framework applicable to infrastructure investment trusts is relatively nascent and thus, still evolving.

Accordingly, the ongoing disclosures made to our Unitholders under the InvIT Regulations may differ from those made to shareholders of a company that has listed its equity shares on a recognised stock exchange in India in accordance with the Securities and Exchange Board of India (Listing Obligations and Disclosure Requirements) Regulations, 2015. Further, the rights of our Unitholders may not be as extensive as the rights of shareholders of a company that has listed its equity shares on a recognised stock exchange in India, and accordingly, the protection available to our Unitholders may be more limited than those available to such shareholders.

60. ***The InvIT Regulations allow for sponsors of listed infrastructure investment trusts to be declassified from the status of sponsors subject to certain conditions. There can be no assurance that our Sponsor will not exercise its ability to be declassified as the Sponsor of the Highways Trust.***

The InvIT Regulations, pursuant to amendments made in June 2020, permit sponsors of listed infrastructure investment trusts to be declassified from the status of sponsors subject to compliance with the following conditions:

- (i). The units of the relevant InvIT should have been listed on the stock exchanges for a period of three years;
- (ii). The unitholding of such sponsor and its associates taken together should not exceed 10.00% of the outstanding units of the relevant InvIT;
- (iii). The investment manager of the relevant InvIT is not an entity controlled by such sponsor or its associates; and
- (iv). approval of unitholders has been obtained in accordance with the InvIT Regulations and relevant circulars and guidelines issued by SEBI.

There can be no assurance that in the future, our Sponsor, upon fulfilment of the aforementioned conditions or any other conditions that SEBI prescribes for declassifications of sponsors, will not exercise its ability to declassify itself from the status of our Sponsor.

61. ***It may be difficult for the Unitholders to remove the Trustee or the Investment Manager.***

Under the InvIT Regulations, the Trustee or the Investment Manager cannot be removed without the prior approval of Unitholders where the votes cast in favour of the resolution shall not be less than one and a half times the votes cast against such resolution. Accordingly, the Unitholders may face difficulties in removing and replacing the Trustee or the Investment Manager. Further, under the InvIT Regulations, prior approval of SEBI is required for change in the Investment Manager of the Highways Trust.

62. ***Unitholders will have no vote in the election or removal of Directors in the Investment Manager and will be able to remove the Investment Manager and Trustee only pursuant to a majority resolution.***

The Investment Manager has the responsibility of managing the Highways Trust.

Unitholders have no vote in the election or removal of Directors in the Investment Manager. Unitholders' recourse is the removal of the Investment Manager by way of a resolution where Unitholders holding at least 60% of the Units must vote in favour of the resolution. In comparison, the Companies Act, 2013 requires the removal of a director of a public company to be by way of an ordinary resolution approved by a simple majority.

Similarly, Unitholders may remove the Trustee only if they believe that the acts of the Trustee are

detrimental to the interests of the Unitholders and by way of a resolution where the votes cast in favour of the resolution must meet the required percentage as set out in the InvIT Regulations. Further, the Investment Manager and the Trustee cannot be discharged until a suitable replacement is appointed in their place, and there can be no guarantees that a suitable replacement will be appointed, or that appointment will take place in a timely manner, or at all.

Accordingly, as opposed to shareholders removing a director of a public company, it may not be possible for Unitholders to remove the Investment Manager or the Trustee.

## **RISKS RELATING TO THE UNITS**

- 63. *The sale or possible sale of a substantial number of Units by the Sponsor in the public market following the end of its lock-in requirement as prescribed under the InvIT Regulations could adversely affect the price of the Units.***

Under the InvIT Regulations, the Sponsor is required to hold a minimum of 15% of our Units for a minimum period of three years from the date of listing pursuant to this Issue and the balance of its unitholding in the Highways Trust is required to be locked in for a period of one year from the date of listing of the Units.

The Units are proposed to be listed on the Stock Exchange. If the Sponsor, subsequent to the end or lapse of either of the aforesaid lock-in periods directly or indirectly sells or is perceived as intending to sell a substantial number of its Units, or if a secondary offering of the Units is undertaken, the market price for the Units could be adversely affected.

- 64. *No investors are permitted to withdraw or lower their Bids (in terms of quantity of Units or the Bid Amount) at any stage after submitting a Bid.***

Pursuant to the InvIT Regulations and SEBI guidelines, investors are required to pay the Bid Amount on submission of the Bid, and are not permitted to withdraw or lower their Bids (in terms of quantity of Units or the Bid Amount) at any stage after submitting a Bid, notwithstanding adverse developments in international or national monetary policy, financial, political or economic conditions, our business, results of operations, or otherwise, at any stage after the submission of their Bids.

- 65. *Under Indian law, foreign investors are subject to restrictions that limit their ability to transfer or redeem Units, which may adversely impact the trading price of the Units.***

Under foreign exchange regulations currently in force in India, transfers of units between non-residents and residents are permitted, subject to certain exceptions, if they comply with the pricing and reporting requirements specified by RBI. If a transfer of units is not compliant with such pricing or reporting requirements and does not fall under any of the exceptions specified by RBI, then RBI's prior approval is required.

Additionally, unitholders who seek to convert Indian rupee proceeds from a sale of units in India into foreign currency and repatriate that foreign currency from India require a no-objection or a tax clearance certificate from the Indian income tax authorities.

We cannot assure you that any required approval from RBI or any other Governmental agency can be obtained on any particular terms or in a timely manner, or at all.

Our Unitholders will not have the right to redeem or request the redemption of our Units while our Units are listed on the Stock Exchange. In terms of the InvIT Regulations, an infrastructure investment trust may redeem units only by way of a buyback or at the time of delisting of units and may be subject to additional conditions and restrictions under Indian regulations.

**66. *The Units have never been traded and the listing of the Units on the Stock Exchange may not result in an active or liquid market for the Units.***

There is no market for the Units prior to the Issue and an active market for the Units may not develop or be sustained after the Issue. Moreover, the listing and quotation do not guarantee that a trading market for the Units will develop or, if a market does develop, the liquidity of that market for the Units. As the Units will be sold through a private placement in a Minimum Bid Size, there may be a lack of liquidity and a limited market for the Units. The price of the Units may be volatile, and investors may be unable to resell the Units at or above the Issue Price, or at all. Although it is currently intended that the Units will remain listed on the Stock Exchange, there is no guarantee of the continued listing of the Units. There is no assurance that the Highways Trust will continue to satisfy the listing requirements for InvITs. Further, it may be difficult to assess the Highways Trust's performance against domestic benchmarks.

**67. *Market and economic conditions may affect the market price and demand for the Units.***

Movements in domestic and international securities markets, economic conditions, foreign exchange rates and interest rates may affect the market price of and demand for the Units. In particular, an increase in market interest rates may have an adverse impact on the market price of the Units if the annual yield on the price paid for the Units gives investors a lower return as compared to other investments.

**68. *There is no assurance that our Units will remain listed on the stock exchange.***

Although it is currently intended that the Units will remain listed on the Stock Exchange, there is no guarantee of the continued listing of the Units. Among other factors, we may not continue to satisfy the listing requirements of the Stock Exchange. Accordingly, Unitholders will not be able to sell their Units through trading on the Stock Exchange if the Units are no longer listed on the Stock Exchange. While the InvIT Regulations state that we must provide Unitholders with an exit prior to delisting, the specific mechanism of such delisting and related exit offer has not yet been finalised by the SEBI. Further, under the InvIT Regulations, we are required to maintain a minimum of five Unitholders (other than the Sponsor, its related parties and its associates) at all times after the listing of the Units pursuant to the Issue and certain minimum public holding requirements. Failure to maintain such minimum number of Unitholders or public holding may result in action being taken against us by the SEBI and the Stock Exchange, including the compulsory delisting of our Units.

**69. *The Issue Price of the Units may not be indicative of the market price of the Units after the Issue.***

The Units may trade at prices significantly below the Issue Price after the Issue. The trading price of the Units will depend on many factors, including:

- the perceived prospects of our business and the road sector;
- differences between our actual financial and operating results and those expected by investors and analysts;
- changes in analysts' recommendations or projections;
- changes in general economic or market conditions;
- the market value of our assets;
- the perceived attractiveness of the Units against those of other equity or debt securities, including those not in the infrastructure industry;
- the balance of buyers and sellers of the Units;
- the future size and liquidity of the Indian infrastructure investment trust market;
- any future changes to the regulatory system, including the tax system, both generally and specifically in relation to Indian infrastructure investment trusts;
- the ability on our part to successfully implement its investment and growth strategies;
- foreign exchange rates; and
- broad market fluctuations, including weakness of the equity markets and increases in interest rates.

For these reasons, among others, the price of Units may fluctuate. To the extent that we retain operating cash flow for investment purposes, working capital reserves or other purposes, these retained funds, while increasing the value of its underlying assets, may not correspondingly increase the market price of the

Units. Any failure on our part to meet market expectations with regard to future earnings and cash distributions may adversely affect the market price for the Units.

In addition, the Units are not capital-protected products and there is no guarantee that Unitholders can regain the amount invested. If the Highways Trust is terminated or liquidated, it is possible that investors may lose all or a part of their investment in the Units.

- 70. *Any future issuance of Units by us may dilute investors' Unitholding. The sale or possible sale of a substantial number of Units by the Sponsor or another significant Unitholder could adversely affect the price of the Units.***

Where new Units are issued at less than the market price of the Units, the value of an investment in the Units may be affected. In addition, Unitholders who do not, or are not able to, participate in the new issuance of Units may experience a dilution of their interest in the Highways Trust.

Further, under the InvIT Regulations, the Sponsor is required to hold a minimum of 15% of our Units for a minimum period of three years from the date of listing pursuant to the Issue and the balance of its unitholding in the Highways Trust is required to be locked in for a period of one year from the date of listing of the Units. The Units are proposed to be listed on the Stock Exchange. If the Sponsor, following the lapse of either of the aforesaid lock-in period directly or indirectly sells or is perceived as intending to sell a substantial number of its Units, or if a significant Unitholder other than the Sponsor directly or indirectly sells or is perceived as intending to sell a substantial number of its Units, the market price for the Units could be adversely affected.

- 71. *The Highways Trust has a limited number of listed peers undertaking similar lines of business for comparison of performance and therefore investors must rely on their own examination of the Highways Trust for the purposes of investment in the Issue.***

As of the date of this Final Placement Memorandum, there are a limited number of other infrastructure investment trusts listed on the Indian stock exchanges and, accordingly, the Highways Trust is not in a position to provide a comparative analysis of its performance with many listed InvITs. Investors must rely on their own examination of the Highways Trust for the purposes of investing in the Units.

- 72. *Rights of Unitholders under Indian law may be more limited than under the laws of other jurisdictions.***

Indian legal principles related to corporate procedures, directors' fiduciary duties and liabilities, and unitholders' rights may differ from those that would apply to a company in another jurisdiction. Unitholders' rights under Indian law may not be as extensive as Unitholders' rights under the laws of other countries or jurisdictions. Investors may have more difficulty in asserting their rights as unitholder in an Indian entity than as unitholder of a corporation in another jurisdiction.

## **RISKS RELATING TO INDIA**

- 73. *Our results may be adversely affected by the outbreak of the Novel Coronavirus ("COVID-19") and can be adversely affected by other future unforeseen events, such as adverse weather conditions, natural disasters, terrorist attacks or threats, future epidemics or pandemics or other catastrophic events.***

Unforeseen events, such as adverse epidemics, pandemics, weather conditions, natural disasters, threatened or actual armed conflicts, terrorist attacks, efforts to combat terrorism or other catastrophic events can adversely impact our business. We cannot predict the affect any such events will have on our business, prospects, financial condition, results of operations, cash flows, future operations and performance; however, they could be material.

The World Health Organization declared COVID-19 outbreak a Public Health Emergency of International Concern on January 30, 2020, and a pandemic on March 11, 2020. The rapid and diffused spread of COVID-19 and global health concerns relating to this pandemic have had a severe negative impact on, among other things, financial markets, liquidity, economic conditions and trade and could continue to do so or could worsen for an unknown period of time. The spread of COVID-19 has led to governments around the world taking various restrictive measures design to limit the spread of the virus, such as the

implementation of travel restrictions, mandatory cessations of business operations, mandatory quarantines and work-from-home and other alternative working arrangements, curfews, limitations on social and public gatherings and partial lockdowns of cities or regions. The extent to which the COVID-19 outbreak will impact our business, cash flows, results of operations and financial condition will depend on future developments, including the timeliness and effectiveness of actions taken or not taken to contain and mitigate the effects of COVID-19 both in India and internationally, which are highly uncertain and cannot be predicted. A rapid increase in severe cases and deaths where measures taken by governments fail or are lifted prematurely, may cause unprecedented economic disruption in India and in the rest of the world. The scope, duration and frequency of such measures and the adverse effects of COVID-19 remain uncertain and are likely to be severe.

If the outbreak of this virus, or any other similar outbreak, continues for an extended period, occurs again and/or increases in severity, it could have an adverse effect on economic activity in India, and could materially and adversely affect our business, financial condition and results of operations. Similarly, any other future epidemics/ pandemics in India or elsewhere could materially and adversely affect our business, prospects, financial condition, results of operations, cash flows, future operations and performance.

**74. *We are exposed to risks associated with the road sector in India.***

We derive and expect to continue to derive in the foreseeable future, most of our revenues and operating profits from India. Changes in macroeconomic conditions generally impact the road industry and could negatively impact our business. Accordingly, our business is highly dependent on the state of development of the Indian economy and the macroeconomic environment prevailing in India. Since the use of our Projects, our expansion plans and future projects depend or will depend on macroeconomic factors that may negatively impact demand the development of road infrastructure projects in India, or the timely commencement of their operations could in turn have a material adverse effect on our growth prospects, business and cash flows. In addition, access to financing may be more expensive or not available on commercially acceptable terms during economic downturns. Any of these factors and other factors beyond our control could have a material adverse effect on our business, prospects, financial condition, results of operations and cash flows.

**75. *Our performance and growth are dependent on the factors affecting the Indian economy.***

Our performance and the growth are dependent on the performance of the Indian economy, which, in turn, depends on various factors. The Indian economy has been affected by the recent global economic uncertainties, volatility in interest rates, currency exchange rates, commodity and electricity prices, adverse conditions affecting agriculture and various other macroeconomic factors.

Conditions outside India, such as a slowdown or recession in the economic growth of other major countries and regions, especially in U.S., Europe and China, have an impact on the growth of the Indian economy, and GoI policy may change in response to such conditions. While recent Indian governments have been focused on encouraging private participation in the industrial sector, any adverse change in policy could result in a further slowdown of the Indian economy. The rate of economic liberalisation could decrease, and specific laws and policies affecting foreign investment, currency exchange rates and other matters affecting investment in India could change as well. In the road sector, there can be no assurance that the GoI's engagement with and outreach to private sector operators, including the Highways Trust, will continue in the future. A significant change in India's economic liberalisation and deregulation policies, in particular, those relating to the road sector, could disrupt business and economic conditions in India generally and our business in particular. In addition, adverse developments in the Indian economy could also impact companies and banks that provide services to us. For example, on March 5, 2020 and November 17, 2020, respectively, the GoI, in consultation with RBI placed Yes Bank Limited and Lakshmi Vilas Bank under moratorium, imposed limitations on their operations as well as on withdrawals by depositors and payments to creditors over certain specified amounts for a limited period of time from the date of such moratorium coming into effect. The limitations on operations and the moratorium were subsequently lifted in both cases. The occurrence of any such development in the future may impact our banking channels, and we may or may not be able to recover our deposits, in part or in full. This could result in potential write-offs on our books of accounts, and materially and adversely affect the business, prospects, financial condition, results of operations and cash flows.

Additionally, an increase in trade deficit or a decline in India's foreign exchange reserves could negatively impact interest rates and liquidity, which could adversely impact the Indian economy and our business. Any downturn in the macroeconomic environment in India could materially and adversely affect the business, prospects, financial condition, results of operations and cash flows.

**76. *Changing laws, rules and regulations, including changes in legislation or the rules relating to tax regimes, legal uncertainties and the political situation in India may adversely affect our business, financial condition, results of operations and ability to make distributions to our Unitholders.***

Our business, financial condition and results of operations could be adversely affected by any change in laws or interpretations of existing, or the promulgation of new, laws, rules and regulations applicable to us and our business. We cannot assure you that the Government or the state governments will not implement new regulations and policies which will require the Highways Trust and Project SPVs to obtain additional approvals and licenses from governmental and other regulatory bodies or impose onerous requirements and conditions on our operations. Regulatory changes in India, particularly in respect of the InvIT Regulations and other taxation legislations such as the Finance Act, 2020, could expose us to greater tax liability than what our financial projections assume. The application of various Indian sales, value-added and other tax laws, rules and regulations to our services, currently or in the future, may be subject to differing or stricter interpretation by applicable authorities, which could result in an increase in our tax payments (prospectively or retrospectively) and/or subject us to penalties, which could affect our business operations and affect our ability to make distributions to our Unitholders. For further details, please see section entitled "*Risk Factors - Changes in legislation or the rules relating to tax regimes could materially and adversely affect our business, prospects and results of operations*" and "*Regulations and Policies*" on pages 91 and 262, respectively.

**77. *We may be exposed to variations in foreign exchange rates. Fluctuations in the exchange rate of the Indian Rupee with respect to the U.S. Dollar or other currencies could affect the foreign currency equivalent of the value of the Units and any distributions.***

Our revenues are in Indian rupees, and currently there are no interest payments and loan repayments in foreign currency in relation to debt availed for utilisation at the Project SPVs. The Indian rupee has depreciated in recent years, and in the future may continue to depreciate, against the U.S. dollar, leading to increases in the Indian rupee cost for us to service and repay foreign currency borrowings. In addition, in the event of disputes under any of our foreign currency borrowings, if we raise foreign currency debt in future, we may be required by the terms of those borrowings to defend ourselves in foreign courts or arbitration proceedings, which could result in additional costs. A depreciation of the Indian rupee would also increase the costs of imports and may have a material adverse effect on our business, prospects, financial condition, results of operations and cash flows.

Fluctuations in the exchange rates between the Indian Rupee and other currencies could also affect the foreign currency equivalent of the Indian Rupee price of the Units. The fluctuations could also affect the amount that Unitholders will receive in foreign currency upon conversion of any cash distributions or other distributions paid in Indian Rupees by the Highways Trust on the Units, and any proceeds paid in Indian Rupees from any sale of the Units in the secondary trading market.

**78. *A decline in India's foreign exchange reserves may reduce liquidity and increase interest rates in India, which could have an adverse impact on us.***

Flows to foreign exchange reserves can be volatile, and past declines have adversely affected the valuation of the Indian rupee. During the first half of 2014, emerging markets including India, witnessed significant capital outflows due to concerns regarding the withdrawal of quantitative easing in the U.S. and other structural factors in India such as high current account deficits and lower growth outlook. As a result, the Indian rupee depreciated significantly. To manage the volatility in the exchange rate, the RBI took several measures including increasing the marginal standing facility rate by 200 basis points and reducing domestic liquidity. The RBI also subsequently announced measures to attract capital flows, particularly targeting the non-resident Indian community. The RBI intervened again in February 2016 as a result of increased volatility of the exchange rate. Depreciation of the Indian rupee in 2018 led to RBI further intervening and increasing the interest rates. Any increased intervention in the foreign exchange market or other measures by the RBI to control the volatility of the exchange rate may result in a decline in India's foreign exchange

reserves, reduced liquidity and higher interest rates in the Indian economy, which could adversely affect our ability to obtain financing on adequate terms or at all, which in turn could affect our business and future financial performance.

**79. *Social, economic and political conditions and natural disasters could have a negative effect on our business.***

Each of the Project SPVs is incorporated in India and they derive all of their revenue from India. In addition, all of our assets are located in India. Consequently, our business and the trading price of our Units may be adversely affected by the social, economic and political conditions in India and its neighbouring countries. Specific risks, such as the following could adversely influence the Indian economy, thereby having a material adverse effect on our business, financial condition, results of operations and cash flows:

- political instability, riots or other forms of civil disturbance or violence;
- war, terrorism, invasion, rebellion or revolution;
- Government interventions, including expropriation or nationalisation of assets, increased protectionism and the introduction of tariffs or subsidies;
- changing regulatory regimes;
- underdeveloped industrial and economic infrastructure;
- changes in exchange rates and controls, interest rates, government policies, taxation and economic and political developments;
- changes in policies such as, the fiscal and economic policy, industrial policy, direct and indirect taxes and the export-import policy; and
- changes in state specific regulation and conditions.

Pandemics, such as the outbreak of the COVID-19, and natural disasters such as floods, earthquakes or famines, events and conditions linked to climate change have in the past had a negative impact on the Indian economy. Potential effects may include damage to infrastructure and the loss of business continuity and business information. If our facilities are affected by any of these events, our operations may be significantly interrupted, which could materially and adversely affect our business, prospects, financial condition, results of operations and cash flows.

**80. *Any downgrading of India's debt rating by rating agencies could have a negative impact on our business.***

As of the date of this Final Placement Memorandum, India was rated Baa3 (Negative) by Moody's, BBB- (Negative) by Fitch and BBB- (Stable) by S&P. India's sovereign rating could be downgraded due to various factors, including changes in tax or fiscal policy or a decline in India's foreign exchange reserves, which are outside our control. Any adverse revisions to India's credit ratings by rating agencies may adversely affect our ability to raise additional financing, and the interest rates and other terms at which such additional financing is available. This could materially and adversely affect our ability to obtain financing for capital expenditure, which could in turn materially and adversely affect our business, prospects, financial condition, results of operations and cash flows.

**81. *Financial instability in other countries may cause increased volatility in Indian financial markets.***

The Indian market and the Indian economy are influenced by economic and market conditions in other countries, including conditions in the United States, Europe and certain emerging economies in Asia. Financial turmoil in Asia, Russia and elsewhere in the world in recent years has adversely affected the Indian economy. Any such financial instability may cause increased volatility in the Indian financial markets and, directly or indirectly, adversely affect the Indian economy and financial sector and us.

Although economic conditions vary across markets, loss of investor confidence in one economy may cause increased volatility across other economies, including India. Financial instability in other parts of the world could have a global influence and thereby negatively impact the Indian economy. Financial disruptions could materially and adversely affect our business, prospects, financial condition, results of operations and cash flows.

The global credit and equity markets have experienced substantial dislocations, liquidity disruptions and market corrections. The dislocation of the sub-prime mortgage loan market in the United States since September 2008, and the more recent European sovereign debt crisis, has led to increased liquidity and credit concerns and volatility in the global credit and financial markets. These and other related events have had a significant adverse impact on the global credit and financial markets as a whole, including reduced liquidity, greater volatility, widening of credit spreads and a lack of price transparency in the global credit and financial markets. Further, economic developments globally can have a significant impact on our principal markets. Following the United Kingdom's exit from the European Union ("**Brexit**"), there remains significant uncertainty around the terms of their future relationship with the European Union and, more generally, as to the impact of Brexit on the general economic conditions in the United Kingdom and the European Union and any consequential impact on global financial markets. For example, Brexit could give rise to increased volatility in foreign exchange rate movements and the value of equity and debt investments.

In addition, China is one of India's major trading partners and there are rising concerns of a possible slowdown in the Chinese economy as well as a strained relationship with India, which could have an adverse impact on the trade relations between the two countries. In response to such developments, legislators and financial regulators in the United States and other jurisdictions, including India, implemented a number of policy measures designed to add stability to the financial markets. However, the overall long-term effect of these and other legislative and regulatory efforts on the global financial markets is uncertain, and they may not have the intended stabilizing effects. Any significant financial disruption could have a material adverse effect on our business, financial condition, results of operation, and cash flows. These developments, or the perception that any of them could occur, have had and may continue to have a material adverse effect on global economic conditions and the stability of global financial markets, and may significantly reduce global market liquidity, restrict the ability of key market participants to operate in certain financial markets or restrict our access to capital. This could have a material adverse effect on our business, financial condition, results of operations, and cash flows, and reduce the price of the Units.

**82. *If inflation rises in India, increased costs may result in a decline in profits.***

Inflation rates in India have been increasing and demonstrating volatility in the recent past, and such volatility may continue. Increasing inflation in India could cause a rise in the price of transportation, wages, raw materials and other expenses. There can be no assurance that increased toll charges will sufficiently offset our increased costs due to inflation which could have a material adverse effect on our business, prospects, financial condition, results of operations and cash flows. Inflation may also have an impact on interest rates, which can affect our profitability.

**83. *Significant differences exist between Ind AS and other accounting principles, such as IFRS, Indian GAAP and U.S. GAAP, which may be material to investors' assessments of our financial condition, result of operations and cash flows.***

The Combined Financial Statements included in this Final Placement Memorandum are prepared and presented in conformity with Ind AS, consistently applied during the periods stated in those reports, except as otherwise provided therein, and no attempt has been made to reconcile any of the information given in this Final Placement Memorandum to any other principles or to base the information on any other standards. Ind AS differs from other accounting principles with which prospective investors may be familiar in, such as IFRS, Indian GAAP and U.S. GAAP. In addition, as the mandated transition to Ind AS is very recent, there is no significant body of established practice from which we can draw on in forming judgments regarding the implementation and application of Ind AS, as compared to established IFRS or Indian GAAP generally, or in respect of specific industries. Accordingly, the degree to which the Combined Financial Statements included in this Final Placement Memorandum will provide meaningful information is entirely dependent on the reader's level of familiarity with Indian accounting practices. Persons not familiar with Indian accounting practices should limit their reliance on the financial disclosures presented in this Final Placement Memorandum.

**84. *Unitholders may not be able to enforce a judgment of a foreign court against the Highways Trust or the Investment Manager.***

The enforcement of civil liabilities by overseas investors in the Units, including the ability to effect service of process and to enforce judgments obtained in courts outside of India, may be adversely affected by the fact that (i) the Highways Trust is constituted under the laws of the Republic of India, (ii) the Investment Manager is a limited liability company incorporated under the laws of the Republic of India, (iii) the directors and key personnel of the Investment Manager reside in India and (iv) all of the assets of the Highways Trust and the Investment Manager are located in India. All of the assets of the Highways Trust and the assets of the Directors are also located in India. As a result, it may be difficult to serve process upon the Highways Trust, the Investment Manager or any of these persons outside of India or to enforce in India judgments obtained against such persons in courts outside of India.

India is not a party to any international treaty in relation to the recognition or enforcement of foreign judgments. Recognition and enforcement of foreign judgments are provided for under Section 13, Section 14 and Section 44A of the Civil Procedure Code. The GoI has, under Section 44A of the Civil Procedure Code, notified certain countries as reciprocating countries. Section 13 of the Civil Procedure Code provides that a foreign judgment will be conclusive regarding any matter directly adjudicated upon, between the same parties or between the parties whom they or any of them claim are litigating under the same title, except: (i) where the judgment has not been pronounced by a court of competent jurisdiction; (ii) where the judgment has not been given on the merits of the case; (iii) where it appears on the face of the proceedings that the judgment is founded on an incorrect view of international law or a refusal to recognise the law of India in cases in which such law is applicable; (iv) where the proceedings in which the judgment was obtained were opposed to natural justice; (v) where the judgment has been obtained by fraud; or (vi) where the judgment sustains a claim founded on a breach of any law in force then in India. Section 44A of the Civil Procedure Code provides that where a foreign judgment has been rendered by a superior court in any country or territory outside India, which the GoI has, by notification, declared to be a reciprocating territory, it may be enforced in India by proceedings in execution as if the judgment had been rendered by the relevant court in India. However, Section 44A of the Civil Procedure Code is applicable only to monetary decrees not being in the nature of any amounts payable in respect of taxes or other charges of a similar nature or in respect of a fine or other penalties and does not include arbitration awards. The United Kingdom and some other countries have been declared by the GoI to be a reciprocating territory for the purposes of Section 44A. However, the United States has not been declared by the GoI to be reciprocating territories for the purposes of Section 44A. A judgment of a court in the United States may be enforced in India only by a suit upon the judgment, subject to Section 13 of the Civil Procedure Code and not by proceedings in execution.

There may be considerable delays in the disposal of suits by Indian courts. It may be unlikely that a court in India would award damages on the same basis as a foreign court if an action is brought in India. Furthermore, it may be unlikely that an Indian court would enforce foreign judgments if it viewed the amount of damages awarded as excessive or inconsistent with the public policy in India. A party seeking to enforce a foreign judgment in India is required to obtain prior approval from the RBI to repatriate any amount recovered pursuant to execution and any such amount may be subject to income tax in accordance with applicable laws. Any judgment or award in a foreign currency would be converted into Indian Rupees on the date of the judgment or award and not on the date of the payment which could be subject to foreign exchange risk. Generally, there are considerable delays in the processing of legal actions to enforce a civil liability in India, and therefore it is uncertain whether a suit brought in an Indian court will be disposed of in a timely manner or subject to considerable delays.

Further, the Sponsor is incorporated in Singapore and accordingly, the enforcement of civil liabilities by overseas investors in the Units including the ability to effect service of process and to enforce judgments, against the Sponsor, will be subject to the applicable laws of Singapore.

**85. *We may be affected by competition law in India and any adverse application or interpretation of the Competition Act, 2002 (“Competition Act”) could adversely affect our business.***

The Competition Act regulates practices having an appreciable adverse effect on competition in the relevant market in India. Under the Competition Act, any formal or informal arrangement, understanding or action in concert, which causes or is likely to cause an appreciable adverse effect on competition, is

considered void and results in the imposition of substantial monetary penalties. Further, any agreement among competitors which, directly or indirectly, involves the determination of purchase or sale prices, limits or controls production, supply, markets, technical development, investment or provision of services, shares the market or source of production or provision of services by way of allocation of geographical area, type of goods or services or number of customers in the relevant market or, directly or indirectly, results in bid-rigging or collusive bidding, is presumed to have an appreciable adverse effect on competition. The Competition Act also prohibits abuse of a dominant position by any enterprise. The Competition Commission of India (“CCI”) has extra-territorial powers and can investigate any agreements, abusive conduct or combination occurring outside India if such agreement, conduct or combination has an appreciable adverse effect on competition in India. Further, future acquisitions by the Highway Trust may also require approval from CCI if such acquisition is beyond the thresholds permitted for combinations under the Competition Act and its relevant regulations. There can be no assurance as to the impact of the provisions of the Competition Act on the agreements that the Project SPVs have entered into. We are not currently party to any outstanding proceedings, nor have we received notice in relation to non-compliance with the Competition Act or the agreements they have entered into. However, if we are affected, directly or indirectly, by the application or interpretation of any provision of the Competition Act, or any enforcement proceedings initiated by the CCI, or any adverse publicity that may be generated due to scrutiny or prosecution by the CCI, or if any prohibition or substantial penalties are levied under the Competition Act, it could materially and adversely affect our business, prospects, financial condition, results of operations and cash flows.

## RISKS RELATING TO TAXATION

**86. *Changes in legislation or the rules relating to tax regimes could materially and adversely affect our business, prospects and results of operations.***

Tax and other levies imposed by the Government and state governments may include: (i) income tax (including withholding tax and tax collection at source); (ii) wealth tax (which was withdrawn with effect from January 1, 2016); (iii) excise duty; (iv) value added tax/central sales tax/ goods and service tax; (v) service tax; (vi) stamp duty; and (vii) other special taxes and surcharges that are introduced on a temporary or permanent basis from time to time. In some cases, these taxes and other levies may be changed from year to year and the Indian courts which interpret tax legislation may apply such interpretations with retroactive effect. Also, the Government in certain situations has the authority to change tax laws retrospectively.

The GoI has announced the union budget for the Fiscal 2021 and the Finance Act, 2021 (the “**Finance Act**”) has been granted assent by the President of India on March 28, 2021. By way of the Finance Act, the GoI, amongst others, amended the Securities Contracts (Regulation) Act, 1956 (“**SCRA**”) to recognise pooled investment vehicles and recognise the units, debentures, other marketable securities and other instruments issued by InvITs as “*securities*”. The Finance Act exempted the payment of tax deducted at source on dividends paid to InvITs. For further details, please see the sections entitled “*Risk Factors – Investors may be subject to Indian taxes arising out of capital gains on the sale of Units and on any dividend or interest component of any returns from the Units*” and “*Risk Factors – We are governed by the provisions of, amongst others, the InvIT Regulations and the Securities Contracts (Regulation) Act, 1956 (“SCRA”), the implementation and interpretation of which, is evolving. The evolving regulatory framework governing infrastructure investment trusts in India may have a material adverse effect on the ability of certain categories of investors to invest in the Units, our business, financial condition and results of operations and our ability to make distributions to the Unitholders*” on pages 93 and 81, respectively.

There have been two recent major reforms in Indian tax laws, namely the introduction of the Goods and Services Tax (“**GST**”) and provisions relating to general anti-avoidance rules (“**GAAR**”).

The GST regime came into effect on July 1, 2017, combining taxes and levies by the Government and State Governments into a unified rate structure. Given the limited availability of information in the public domain concerning the GST, we cannot assure you as to the tax regime following implementation of the GST. Further, any application of existing law or future amendments may affect our overall tax efficiency and may result in significant additional taxes becoming payable.

Additionally, there is limited clarity on the availability of input tax credit, and any unfavourable orders in this regard may have a material adverse impact on our financial position and cash flows. Further, any

application of existing law or future amendments may affect our overall tax efficiency and may result in significant additional taxes becoming payable.

The GAAR regime came into effect on April 1, 2017. For the GAAR to apply to any arrangement, the transaction should meet any one of the following specified tests, amongst others: (i) creates rights, or obligations, which are not ordinarily created between persons dealing at arm's length; (ii) results, directly or indirectly, in the misuse, or abuse, of the provisions of the IT Act; (iv) lacks commercial substance or is deemed to lack commercial substance as prescribed under the IT Act in whole or in part; and (v) is entered into, or carried out, by means which are, or in a manner which is, not ordinarily employed for bona fide purposes. Such transactions are declared as impermissible avoidance arrangements. The tax consequences of the GAAR provisions being applied to an arrangement could result in denial of tax benefit, amongst other consequences, including on the interest paid by the Project SPVs on the debt from the Highways Trust or claim of any benefit under a tax treaty. In the absence of any precedents on the subject, the application of these provisions is uncertain. If the GAAR provisions are made applicable to the Highways Trust or any member of the Highways Trust, it may have a material adverse tax impact on the Highways Trust.

The rules notified with respect to GAAR prescribe that these shall not be applicable to FIIs in accordance with the SEBI (Foreign Institutional Investors) Regulations, 1995 subject to the fulfilment of certain conditions. GAAR may have a material adverse tax impact on the Highways Trust, the Sponsor and the Unitholders.

Further, vide Finance Act, 2022, the applicability of section 94(7) of the IT Act has been extended to the units of business trust (with effect from Financial Year 2022-23), which provides that where:

- (1) any person buys or acquires any securities or unit within a period of three months prior to the record date in relation to the dividend;
- (2) such person sells or transfers such securities within three months after such record date or such units within a period of nine months after such record date; and
- (3) the dividend or income on such securities or unit received or receivable by such person is exempt,

then, the loss, if any, arising from the sale and purchase of securities and units, to the extent of dividend or income received or receivable on such securities or unit, shall be ignored for computing income chargeable to tax.

Vide Finance Act, 2022, the applicability of section 94(8) of the IT Act (commonly known as bonus stripping) has been extended to the units of business trusts (with effect from Financial Year 2022-23), which provides that where:

- (i). any person buys or acquires any units within a period of three months prior to the record date;
- (ii). such person is allotted additional units without any payment on the basis of holding of such units on such record date;
- (iii). such person sells or transfers all or any of the units within a period of nine months after the record date, while continuing to hold all or any of the additional units referred in clause (ii) above,

then, the loss, if any, arising from the sale and purchase of all or any of the units shall be ignored for computing income chargeable to tax and notwithstanding anything contained in any other provision of the IT Act, the amount of loss so ignored shall be deemed to be the cost of purchase or acquisition of such additional units referred to in clause (ii) above as are held on the date of such sale or transfer.

The Investment Manager has not determined the impact of such existing or proposed legislations on our business. We may incur increased costs relating to compliance with any new requirements, which may also require management time and other resources, and any failure to comply may adversely affect our business, results of operations and prospects. Uncertainty in the applicability, interpretation or implementation of any amendment to, or change in, governing law, regulation or policy, including by reason of an absence, or a limited body, of administrative or judicial precedent may be time consuming as well as costly for us to resolve, and may impact the viability of our current business or restrict our ability to grow our business in the future.

**87. *Investors may be subject to Indian taxes arising out of capital gains on the sale of Units and on any dividend or interest component of any returns from the Units***

Under current Indian tax laws, units of a business trust held for more than 36 months are considered as long-term capital assets. In case of sale of such units through a recognised stock exchange in India and subject to payment of securities transaction tax (“STT”), any gain arising in excess of ₹ 0.10 million is subject to long term capital gains tax at a concessional rate of 10% (plus applicable surcharge and cess). However, if the said units are sold in any other manner, the same shall be subject to long term capital gains tax at the rate of 20% with indexation benefit (plus applicable surcharge and cess).

In case the units are held for less than or up to 36 months, the same shall be regarded as short-term capital asset. Any gain arising in case of sale of such units through a recognised stock exchange in India and subject to payment of STT, is subject to short-term capital gains tax at concessional rate of 15% (plus applicable surcharge and cess). However, if the said units are sold in any other manner, the same shall be subject to short-term capital gains tax at applicable tax rates of the holder (plus applicable surcharge and cess).

The aforesaid taxability in India is subject to tax treaty benefits in the case of a non-resident holder. Further, the applicable taxes on the sale of Units and on any dividend or interest component of any returns from the Unit will also be subject to the category of investor holding or selling the Units.

The Finance Act, 2020 amended the Income Tax Act to abolish the dividend distribution tax regime and shift the incidence of taxation of dividend (declared or distributed on or after April 1, 2020) to shareholder. Under the Finance Act, 2020, a distribution made by a business trust, being in nature dividend income received from a special purpose vehicle, will not be subject to tax in the hands of a unitholder, so long as the special purpose vehicle has not opted to pay corporate tax under the beneficial regime introduced under Section 115BAA of the Income Tax Act. Similarly, a business trust (which includes an infrastructure investment trust) will not be required to withhold tax on any distributions which are in the nature of dividend income received from a special purpose vehicle, so long as such special purpose vehicle has not opted to pay corporate tax under the beneficial regime introduced under Section 115BAA of the Income Tax Act. However, where the special purpose vehicle opts to pay tax under Section 115BAA of the Income Tax Act, dividend income distributed by the business trust would be taxed in the hands of a non-resident unitholder at 20% (plus applicable surcharge and cess) or the applicable treaty rate and at the ordinary rate for a resident unitholder. Further, the business trust would be required to withhold tax on such distributions made from dividend received from the special purpose vehicle. Thus, the taxability of dividends distributed by the Highways Trust will depend on the taxation regime opted by the Project SPVs. It may also be noted that in terms of Section 194LBA(1) of the IT Act, any distributable income in the nature of interest income and dividend income (where the SPV has opted to pay corporate tax under the beneficial regime introduced under Section 115BAA of the IT Act) in the hands of a resident investor is subject to deduction of tax at the rate of 10%. Similarly, in terms of Section 194LBA(2) of the IT Act, any distributable income in the nature of interest income and dividend income (where the SPV has opted to pay corporate tax under the beneficial regime introduced under Section 115BAA of the IT Act) in the hands of a non-resident is subject to deduction of tax at the rate of 5% (plus applicable surcharge and cess) and 10% (plus applicable surcharge and cess) respectively. The final tax rate for the resident/ non-resident unit holder may also depend on other considerations.

Further, the Finance Act, has included a definition of “pooled investment vehicle” which comprises business trusts as defined under the IT Act. The IT Act defines business trusts as trusts registered with SEBI as an InvIT. This amendment has come into effect from April 1, 2021. The Finance Act recognises units, debentures and other instruments issued by infrastructure investment trusts as “securities” under the Securities Contracts (Regulation) Act, 1956. This may have further implications under various regulations issued by SEBI, governing securities, including under the Securities and Exchange Board of India (Listing Obligations and Disclosure Requirements) Regulations, 2015 and the Securities and Exchange Board of India (Prohibition of Insider Trading) Regulations, 2015. As announced in previous budgets, the dividend distribution tax applicable on InvITs was abolished and replaced with dividend withholding tax. The Finance Act has also exempted payment of tax deducted at source on dividend paid to InvITs, with effect from April 1, 2020.

Furthermore, the Highways Trust might not be able to pay or maintain the levels of distributions or ensure that the level of distributions will increase over time, or that future acquisitions will increase the Highways Trust's distributable free cash flow to the Unitholders. Any reduction in, or elimination or taxation of, payments of distributions could materially and adversely affect the market price of the Units.

**88. *Tax laws are subject to changes and differing interpretations, which may adversely affect our operations***

Tax laws and regulations are subject to differing interpretations by tax authorities. Differing interpretations of tax and other fiscal laws and regulations may exist within governmental ministries, including tax administrations and appellate authorities, thus creating uncertainty and potential unexpected results. The degree of uncertainty in tax laws and regulations, combined with significant penalties for default and a risk of aggressive action, including by retrospective legislation, by the governmental or tax authorities, may result in tax risks in the jurisdictions in which we operate being significantly higher than expected. These events may result in a material, adverse effect on our business, financial condition, results of operations and prospects. Tax authorities in India may also introduce additional or new regulations applicable to our business which could adversely affect our business and profitability.

The Investment Manager intends to take measures to ensure that it is in compliance with all relevant tax laws. However, the tax authorities might take a position that differs from the position taken by us with regard to our tax treatment of various items. For instance, our Asset SPVs are subject to tax assessments and notices from time to time which if determined against us may result in an adverse impact on our financial position and prospects. For details of such actions, please see the section entitled "*Legal and Other Information - Taxation Proceedings*" on page 278

**89. *The Highways Trust and the Project SPVs may be subject to certain tax related risks under the provisions of the IT Act.***

Shortfall in the determination of fair market value of the equity shares at the time of transfer of the Project SPVs to the Highways Trust may be subject to taxation in the hands of the acquirer. The equity shares of the Project SPVs are proposed to be transferred to the Highways Trust. Under the provisions of section 56(2)(x) of the IT Act, where a purchase of shares is undertaken at a value which is lower than the fair market value of the shares, such shortfall in value is subject to be taxed as income from other sources in the hands of the acquirer. The manner of determination of fair market value as provided under the Income Tax Rules, 1962, includes the value determined by net asset method, subject to the prescribed adjustments.

The Highways Trust is under an obligation to distribute to the Unitholders, the surplus of the income earned from receipt of cash flows from the interest and dividend received from the Project SPVs, after the deduction of the various expenses incurred in connection with earning such income and general-purpose expenses. The provisions of the IT Act provide that the Highways Trust should disclose the nature of the amount distributed to the Unitholders, i.e., whether from dividends received from the Project SPVs, interest income earned, etc. However, there is lack of clarity on the method to be adopted by the Highways Trust for the allocation of various expenses incurred towards earning each specific stream of income by the Highways Trust.

**90. *The Project SPVs enjoy certain benefits under Section 80-IA of the IT Act in relation to the Project SPVs and any change in these tax benefits applicable to the Highways Trust may adversely affect its results of operations.***

Under the provisions of section 80-IA of the IT Act, the Project SPVs are eligible for tax holiday for any 10 consecutive assessment years out of 20 years beginning from the year in which the undertaking or enterprise develops and begins to operate any infrastructure facility. As a result of the tax holiday available to the Project SPVs, the taxable profits derived by the Project SPVs from developing, operating and maintaining any infrastructure facility (including toll roads) will not be taxable under the normal provisions of the IT Act during the tax holiday period. Any other taxable income (for example, interest income, profit on sale of mutual funds) from deployment of temporary funds or otherwise would also be taxable under the terms of the IT Act. The Project SPVs will only be subject to MAT if the Project SPVs have a book profit as required to be computed under section 115JB of the IT Act. Any change in the tax benefits under section 80-IA and/or the provisions of MAT may have an impact on the income tax liability of the Project

SPVs and may consequently affect the amount available for distribution by the Project SPVs to the Highways Trust. Furthermore, if the relevant conditions under section 80-IA of the IT Act are not met and the manner of computation of profits and gains are not as permitted, the Project SPVs will not be able to enjoy the benefits of such tax holiday.

Benefits under section 80-IA of the IT Act shall not be available to Project SPVs in case they have opted to pay corporate tax under the beneficial regime introduced under Section 115BAA of the IT Act. Further, in such case, provisions of MAT shall not be applicable.

**91. *The income of the Highways Trust in relation to which pass through status is not granted under the IT Act may be chargeable to Indian taxes.***

Under the provisions of the IT Act, the total income of the Highways Trust other than capital gain, interest and dividend income from the Project SPVs would be tax chargeable at the maximum marginal rate (“MMR”). MMR is defined under the provisions of the IT Act to mean the rate of income-tax (including surcharge on income-tax, if any) applicable in relation to the highest slab of income.

In accordance with section 115UA of the IT Act, the MMR applicable to the Highways Trust, a separately assessable resident entity, is 30.0% (plus applicable surcharge and cess). However, the relevant authorities may view the Highways Trust as a “pass through” entity and the applicable tax rate will be the MMR applicable to its beneficiaries. If any beneficiary is chargeable to MMR at a rate higher than the rate applicable to other beneficiaries, the income of the Highways Trust attributable to the share of such beneficiary will be taxed at a higher applicable rate. For example, if any Unitholder is a non-resident, the MMR of 40.0% (plus applicable surcharge and cess) would apply.

As there are two divergent views, there is a possibility that the matter may be litigated if the latter view is taken up by the tax authorities of India.

**92. *Depreciation may not be claimed on the capitalised cost of a road constructed on a BOT basis.***

The Project SPVs have regarded the toll -based Projects constructed on a BOT basis as capital assets and claimed depreciation on the capitalised cost of the Projects, while for the annuity based Projects an amortization method is used. Under the provisions of the IT Act, the following conditions must be satisfied if depreciation is claimed on any asset:

- the asset is a capital asset;
- the party seeking to claim depreciation on an asset is the owner of the asset; and
- the asset has been used for the purpose of the business.

In respect of BOT projects, the possession of land is handed over to the developer by the GoI without actual transfer of ownership, and such a developer takes the land on lease for construction and operation of the road for a concession period.

Based on various judicial decisions, it may be inferred that depreciation is allowed if a party has dominant control over the asset during the concession period and is entitled to use it in its own right. Accordingly, a Project SPV may be considered as the owner of a road constructed on a BOT basis. Further, there are previous high court or tribunal decisions which held that road constructed by a taxpayer on a BOT basis is eligible for depreciation even though the taxpayer is not the legal owner of the road.

However, while the provisions of the IT Act specifically provide that a building constructed on leasehold land is regarded as being owned by the lessee and depreciation may be claimed, there is no similar specific provision in respect of the Projects constructed on a BOT basis. An Apex Court decision has held that ownership is necessary for a party to claim depreciation.

The Central Board of Direct Taxes issued Circular No. 9 of 2014 in response to litigation on claims of tax depreciation in respect of BOT projects (the “**Circular**”). The Circular stated that the total project cost incurred on an infrastructure project would be amortised equally across the remaining period of time in which toll collections are received. Consequently, the cost of constructed roads is considered “amortisation” and not “depreciation” for income tax purposes. This has an effect on the financial projections of the Project SPVs and in turn, the financial position of the Highways Trust.

The Project SPVs are eligible to claim tax deduction under section 80-IA(4)(i) of the IT Act. Therefore, adjustment on account of depreciation may not have any income tax impact during the tax holiday period. However, if a higher depreciation is allowed during the tax holiday period as compared to the depreciation claimed in the return of income, tax liability in the post-tax holiday period will be higher as against the tax liability.

**93. *The Ministry of Finance, GoI, has constituted a task force to draft new direct tax legislation, the provisions of which may have an unfavourable implication for us.***

The Ministry of Finance, GoI, has set up a panel to review the IT Act and to draft a new direct tax legislation (“**Panel**”). The Panel has been tasked with drafting appropriate direct tax legislation aimed at (i) aligning India’s domestic direct tax regime in line with international best practices; and (ii) ensuring and encouraging compliance. The impact of the report by the Panel, including findings and recommendations in their report and the provisions of the proposed direct tax legislation could have an unfavourable implication on us. Since the Panel and its report, including their recommendations and the draft of the new direct tax legislation has not been released yet, the possible impact on us is not clear. Any new direct tax legislation may materially and adversely affect our business, prospects, financial condition, results of operations and cash flows.

## GENERAL INFORMATION

The Highways Trust has been settled by the Investment Manager (acting as the settlor) on the instructions of the Sponsor, as a contributory, determinate and irrevocable trust under the provisions of the Indian Trusts Act, 1882 in Mumbai, India pursuant to the Trust Deed. The Highways Trust has been registered with the SEBI as an infrastructure investment trust under the InvIT Regulations on December 23, 2021 having registration number IN/InvIT/21-22/0019. The Investment Manager irrevocably transferred to the Trustee an amount of ₹ 10,000 towards the initial corpus of the Highways Trust, with an intention to settle and establish the Highways Trust. The initial sum of Highways Trust shall in no event be distributed to the Investment Manager.

For further details, please see the sections entitled “*Formation Transactions in the Highways Trust*” and “*Business*” on pages 20 and 168.

### **Principal place of business and correspondence address of the Highways Trust:**

#### **Highways Infrastructure Trust**

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E-mail: [invit@virescent.co.in](mailto:invit@virescent.co.in)  
SEBI registration number: IN/InvIT/21-22/0019  
Date of registration with the SEBI: December 23, 2021

### **Contact Person and Compliance Officer**

Ms. Charmy Bhoot has been designated by the Investment Manager as the Compliance Officer with respect to the Highways Trust and is the relevant contact person with respect to the Highways Trust. The contact details are as follows:

Ms. Charmy Bhoot  
10<sup>th</sup> Floor, Parinee Crescenzo  
C-30, ‘G’ Block,  
Bandra Kurla Complex  
Bandra (East), Mumbai 400051  
Maharashtra, India  
Tel: +91 9833849735  
E-mail: [charmy.bhoot@virescent.co.in](mailto:charmy.bhoot@virescent.co.in)

Bidders can contact the Compliance Officer or the Lead Manager in case of any pre-Issue or post-Issue related problems such as non-credit of Allotted Units in the respective beneficiary account of Bidders after Allocation or non-receipt of refunds.

### **Sponsor**

#### **Galaxy Investments II Pte. Ltd.**

10 Changi Business Park, Central 2  
#01-02, Hansapoint  
Singapore 486 030  
Tel: +65 6922 5800  
Email: [sgfunds@kk.com](mailto:sgfunds@kk.com)  
Contact person: Board of Directors

## **Project Manager**

### **Virescent Renewable Energy Project Manager Private Limited**

10<sup>th</sup> Floor, Parinee Crescenzo  
C-30, 'G' Block,  
Bandra Kurla Complex  
Bandra (East), Mumbai 400051  
Maharashtra, India  
Tel: +91 99716 22660  
Email: sanjay.grewal@virescent.co.in  
Contact person: Mr. Sanjay Grewal

## **Trustee**

### **Axis Trustee Services Limited**

Axis House, Bombay Dyeing Mills Compound  
Pandurang Budhkar Marg, Worli  
Mumbai 400 025  
Maharashtra, India  
Tel: +91 22 6230 0451  
Email: debenturetrustee@axistrustee.in  
Contact Person: Mr. Anil Grover  
SEBI registration number: IND000000494

## **Trustee Correspondence Office**

### **Axis Trustee Services Limited**

The Ruby, 2<sup>nd</sup> Floor, SW  
29 Senapati Bapat Marg, Dadar West  
Mumbai 400 028  
Maharashtra, India  
Tel: +91 22 6230 0431

## **Investment Manager**

### **Virescent Infrastructure Investment Manager Private Limited**

10<sup>th</sup> Floor, Parinee Crescenzo  
C-30, 'G' Block, Bandra Kurla Complex  
Bandra (East), Mumbai 400 051  
Maharashtra, India  
Tel: +91 99716 22660  
Email: sanjay.grewal@virescent.co.in  
Contact person: Mr. Sanjay Grewal

## **Other Parties involved in the Trust**

### **Lead Manager to the Issue**

#### **Axis Capital Limited**

1<sup>st</sup> Floor, Axis House  
C-2 Wadia International Centre  
P. B. Marg, Worli  
Mumbai 400 025  
Maharashtra, India  
Tel: +91 22 4325 2183

### **Escrow Collection Bank**

#### **Axis Bank Limited**

1<sup>st</sup> Floor, Broadways Co-op Society  
Above Babubhai Jagjivandas showroom  
Dadar TT, Dadar East  
Mumbai 400 014

Tel: +91 9167001241  
Email: dadar.branchhead@axisbank.com

**Legal Advisor to the Issue, as to Indian law**

**Cyril Amarchand Mangaldas**  
5<sup>th</sup> Floor, Peninsula Chambers  
Peninsula Corporate Park  
Ganpatrao Kadam Marg  
Mumbai 400 013  
Maharashtra, India  
Tel: +91 22 2496 4455

**Auditor to the Highways Trust**

**Walker Chandiok & Co LLP**  
21st floor, DLF Square  
Jacaranda Marg, DLF Phase II  
Gurugram, Haryana – 122002  
Tel: +91 124 462 8000  
E-mail: Manish.Agrawal@walkerchandiok.in  
ICAI Firm registration number: 001076N/N500013  
Peer Review Certificate Number: 014158

**Valuer**

**Mr. S. Sundararaman**  
5B, "A" Block, 5th Floor  
Mena Kampala Arcade  
New #18 & 20, Thiagaraya Road  
T.Nagar  
Chennai – 600 017  
Tel: +91 044 2815 4192  
Email: chennaissr@gmail.com

**Technical Consultant**

**For GEPL, JPEPL, UEPL and SEPL**

**Samarth Infraengg Technocrats Pvt. Ltd.**  
Malapaka Mansion  
2nd Floor, 6-3-1100/5  
Rajbhavan Road, Somajiguda  
Hyderabad 500 082  
Telangana, India  
Tel: +91 40 2341 2731

**For DBCPL and NBL**

**Resotech Consultancy Services Pvt. Ltd.**  
58, Shri Mangal Nagar  
Near Elite Anmol Multi  
Bicholi Hapsi Road  
Indore 452 018,  
Tel: +91 731- 4006024

**Traffic Study Consultant**

**Ramboll India Private Limited**  
Level 17 Building No. 5 Tower B  
DLF Cyber City, Phase - III

Gurugram,  
Haryana 122 002, India  
Tel: +91 124 461 1999

### **Registrar and Unit Transfer Agent**

#### **Link Intime India Private Limited**

247 Park C-101, 1st Floor  
LBS Marg  
Vikhroli (West),  
Mumbai 400 083  
Maharashtra, India  
Tel: +91 22 4918 6000  
Email: [ajit.patankar@linkintime.co.in](mailto:ajit.patankar@linkintime.co.in)  
SEBI registration number: INR000004058  
Contact person: Ajit Patankar  
Website: [www.linkintime.co.in](http://www.linkintime.co.in)

### **Credit rating**

The Highways Trust has been given a rating of ‘Provisional CRISIL AAA/Stable (Assigned)’ by CRISIL Ratings, for bank loan facilities aggregating to ₹ 10,000 million and a rating of ‘Provisional CRISIL AAA/Stable (pronounced as Provisional CRISIL triple A rating with Stable outlook) for non-convertible debentures aggregating to ₹ 9,000 million, each by way of its letters dated March 14, 2022, the rationale for which is available at [https://www.crisil.com/mnt/winshare/Ratings/RatingList/RatingDocs/HighwaysInfrastructureTrust\\_March%2011,%202022\\_RR\\_288671.html](https://www.crisil.com/mnt/winshare/Ratings/RatingList/RatingDocs/HighwaysInfrastructureTrust_March%2011,%202022_RR_288671.html) their

Additionally, the Highways Trust has been given an rating of ‘Provisional IND AAA/Stable’ by India Ratings, for bank loan facilities aggregating to ₹ 10,000 million , and non-convertible debentures aggregating to ₹ 9,000 million, by way of its letter dated March 11, 2022, the rationale for which is available at their website <https://www.indiaratings.co.in/pressrelease?pressreleaseid=57769&title=india%20ratings%20assigns%20national%20highways%20infra%20trust%20final%20ind%20aaastable>.

## **PARTIES TO THE HIGHWAYS TRUST**

*The summaries of the key terms of certain material contracts and agreements included in this section are not complete and are subject to, and are qualified in their entirety by reference to, the provisions of the respective material contracts and agreements. Copies of the material contracts and agreements described in this section will be available for inspection at the principal place of business of the Highways Trust. For further details, please see the section entitled “Material Contracts and Documents for Inspection” on page 402.*

### **A. The Sponsor**

#### **Galaxy Investments II Pte. Ltd.**

##### ***History and Certain Corporate Matters***

Galaxy Investments II Pte. Ltd. is the Sponsor of the Highways Trust. The Sponsor was incorporated on June 11, 2021 in Singapore with registration number 202120533M. The Sponsor is a private company limited by shares. The Sponsor’s registered office is situated at 10 Changi Business Park, Central 2, #01-02, Hansapoint, Singapore 486 030. For further details, please see the section entitled “General Information” on page 97.

##### ***Background and Past Experience of Sponsor***

##### **Principal Activities of Galaxy**

Galaxy Investments II Pte. Ltd. (“**Galaxy**”) is a newly incorporated entity and shall be engaged in investment activities primarily with an objective of earning long term capital appreciation. Galaxy seeks to invest in companies incorporated in India that operate in the “infrastructure” sector.

##### **Brief description of the Group**

As on date, Galaxy is a 100% subsidiary of Galaxy Investments Pte. Ltd., which is majority owned and controlled by KKR Asia Pacific Infrastructure Holdings Pte. Ltd. Galaxy is affiliated with funds, vehicles and/or entities managed and/or advised by affiliates of KKR.

Founded in 1976, KKR is a leading global investment firm with US\$491 billion of assets under management as of June 30, 2022, that offers alternative asset management as well as capital markets and insurance solutions. KKR sponsors investment funds that invest in private equity, credit and real assets and has strategic partners that manage hedge funds. KKR’s insurance subsidiaries offer retirement, life and reinsurance products under the management of Global Atlantic Financial Group. KKR aims to generate attractive investment returns by following a patient and disciplined investment approach, employing world-class people, and supporting growth in its portfolio companies and communities.

##### ***KKR’s Global Infrastructure Strategy***

In 2008, KKR established a dedicated infrastructure team and strategy focused on global investment opportunities. KKR has been one of the more active infrastructure investors globally over the past several years, having made approximately 65 infrastructure investments globally and more than US\$40 billion in assets under management within infrastructure.

Today, KKR’s Infrastructure platform has expanded to include approximately 75 dedicated investment professionals across 10 offices covering a broad spectrum of investment opportunities in various infrastructure subsectors, including: midstream energy, renewables, power & utilities, water and wastewater, waste, telecommunications and transportation, among others. KKR continually monitors infrastructure sectors and infrastructure-related investments for emerging trends, and may identify and prioritize investments in other sectors as conditions change or cycles evolve. Among KKR’s focus areas are investments in assets related to the global roads sector.

##### ***KKR’s Track Record in India***

KKR has invested or committed over US\$6.7 billion of equity in private equity and infrastructure deals in India since 2010 with over 20 investments made and more than a dozen active portfolio companies today. We believe

the long-term economic outlook in India is positive given structural reforms, despite recent volatility and continue to see attractive investment opportunities in the country.

India is one of the key markets that KKR's Asia Pacific Infrastructure strategy will actively seek to invest in. We believe that population growth is expected to drive significant demand for infrastructure in India over the next 25 years. This, combined with stable macroeconomic indicators, structural reforms, thrust on infrastructure development, and constructive FDI regime will continue to result in high foreign capital inflows and provide the needed impetus to make India a favored infrastructure investment destination.

***KKR's private equity current and past investments in India include, but are not limited to:***

- Aricent Group (2009)
- Dalmia Cement (2010)
- Coffee Day Resorts Private Limited (2010)
- Magma Fincorp Limited (2011)
- TVS Logistics Services (2012)
- Alliance Tire Group (2013)
- Gland Pharma (2014)
- Emerald Media (2015)
- Max Financial Services (2016)
- Avendus Capital (2016)
- SBI Life Insurance (2016)
- Indus Towers Limited (f.k.a. Bharti Infratel) (2017 & 2008)
- Max Healthcare Institute (2017)
- Ramky Enviro Engineers (2018)
- Lighthouse Learning (f.k.a. Eurokids) (2019)
- Reliance Jio Platforms (2020)
- Reliance Retail (2020)
- JB Chemicals (2020)
- Five-Star Business Finance (2021)
- Lenskart (2021)
- Vini Cosmetics (2021)

***KKR's Infrastructure investments in India include:***

- IndiGrid (2019)
- Virescent Infrastructure (2020)
- Shapoorji Solar Assets (2020)
- Sindicatum Solar Assets (2021)
- Highway Concessions One (2021)

The net worth of the Sponsor as at December 31, 2021 stood at approximately ₹ 14,644.4 million. The Sponsor shall comply with the minimum net worth requirement set out in Regulation 4(2)(d)(ii) of the InvIT Regulations.

***Other Confirmations***

As of the date of this Final Placement Memorandum, the Sponsor is in compliance with the eligibility criteria provided under Regulation 4 of the InvIT Regulations and is a "fit and proper person" as prescribed under SEBI Intermediaries Regulations.

***Details of the Holding or the Proposed Holding by Sponsor in the Highways Trust***

The Sponsor proposes to hold 89.99% of the Units of the Highways Trust on a post-Issue basis, subject to approval of allotment of Units by the Board or a committee thereof and the fulfillment of certain terms and conditions. Further, the Units held by the Sponsor will be subject to lock-in requirements in accordance with the InvIT Regulations. For further details, please see the section entitled "*Related Party Transactions - Acquisition of the Project SPVs by the Trust*" on page 258.

## **B. The Trustee – Axis Trustee Services Limited**

### ***History and Certain Corporate Matters***

Axis Trustee Services Limited is the Trustee of the Highways Trust. The Trustee is a registered intermediary with SEBI under the Securities and Exchange Board of India (Debtenture Trustees) Regulations, 1993, as a debenture trustee since January 31, 2014, having registration number IND000000494 and is valid until suspended or cancelled by SEBI. The Trustee's registered office is Axis House, Bombay Dyeing Mills Compound, Pandhurang Budhkar Marg, Worli Mumbai - 400 025, Maharashtra, India. The Trustee's address for correspondence is The Ruby, 2<sup>nd</sup> Floor, SW, 29 Senapati Bapat Marg, Dadar West, Mumbai – 400 028, Maharashtra, India. For further details, please see the section entitled “*General Information*” on page 97.

### ***Background of the Trustee***

The Trustee is a trusteeship company which has been registered with SEBI as a Debenture Trustee and has been promoted by Axis Bank Limited for providing corporate and other trusteeship services. The Trustee is a wholly-owned subsidiary of Axis Bank Limited. The Trustee also acts as a security trustee and is involved in providing services in relation to security creation, compliance and holding security on behalf of lenders. The Trustee is also authorised to provide services such as: (i) a facility agent for complex structured transactions; (ii) an escrow agent; (iii) a trustee to alternative investment funds and venture capital funds; (iv) custodian of documents as a safe-keeper; and (v) a trustee to real estate investment trust, etc.

The Trustee confirms that it has maintained, and undertakes to ensure that it will at all times maintain, adequate infrastructure personnel and resources to perform its functions, duties and responsibilities with respect to the Highways Trust, in accordance with the Trust Deed, the InvIT Regulations and other applicable law.

### ***Other Confirmations***

The Trustee is not an Associate of the Sponsor or the Investment Manager. Further, as of the date of this Final Placement Memorandum, the Trustee is in compliance with the eligibility criteria provided under Regulation 4 of the InvIT Regulations and is a “fit and proper person” as prescribed under SEBI Intermediaries Regulations.

### ***Details of the Holding or the Proposed Holding by Trustee in the Highways Trust***

The Trustee does not propose to hold the Units of the Highways Trust.

### ***Board of Directors of the Trustee***

The board of directors of the Trustee is entrusted with the responsibility for the overall management of the Trustee. Please see below the details in relation of the board of directors of the Trustee:

<b>Sr. No.</b>	<b>Name</b>	<b>Age (years)</b>	<b>DIN</b>	<b>Designation</b>
1.	Ms. Deepa Rath	45	09163254	Managing Director and Chief Executive Officer
2.	Mr. Rajesh Kumar Dahiya	54	07508488	Non-Executive Director
3.	Mr. Ganesh Sankaran	52	07580955	Non-Executive Director

### ***Key Terms of the Trust Deed***

The Trustee has entered into the Trust Deed, in terms of the InvIT Regulations, the key terms of which, are provided below:

#### ***1. Powers of the Trustee***

The Trustee has been provided with various powers under the Trust Deed in accordance with the Indian Trusts Act, 1882 and the InvIT Regulations, including but not limited to:

- (a) The Trustee shall, in relation to the Trust Fund, have the same powers as a natural Person acting as the legal and beneficial owner of such property and such powers shall not be restricted by any principle of construction or rule or requirement other than Applicable Law, but shall operate according to the widest generality of which the foregoing words are capable. Subject to the provisions of the Deed and the InvIT Regulations, the Trustee shall have the power to appoint the Investment Manager as the investment manager of the InvIT and shall have the power to delegate all or any of the powers of the Trustee, as set out in this Deed and as permitted under Applicable Law, to the Investment Manager. The Trustee shall have the power to execute the Investment Management Agreement with the Investment Manager, the Project Management Agreement with the Project Manager, or any other agreement or arrangement, from time to time, with the Investment Manager or any of its nominees.
- (b) the Trustee shall be authorised and empowered on behalf of the InvIT either by itself (in consultation or upon the recommendation of the Investment Manager) or through the Investment Manager, to:
- (i) make all decisions, concerning the investigation, selection, development, negotiation, structuring, restructuring, monitoring, divestment of Investments (including any additions or accretions thereto) and the appointment of various advisors and service providers in connection with such Investments;
  - (ii) direct and approve the formulation of investment policies and strategies for the InvIT and to direct and approve the investment of the Trust Fund, in accordance with the Investment Strategy;
  - (iii) manage, acquire, hold, sell, securitize, transfer, exchange, pledge and dispose of Investments (including any additions or accretions thereto), and exercise all rights, powers, privileges and other incidents of ownership or possession with respect to Investments;
  - (iv) institute, conduct, compromise, enforce, compound, defend, answer, oppose or abandon any legal proceedings, for or on behalf of or in the name of the InvIT or the Trustee (in its capacity as the trustee of the InvIT), and to defend, compound or otherwise deal with any such proceedings against the InvIT or Trustee (in its capacity as the trustee of the InvIT) or its officers or concerning the affairs of the InvIT, and also to compound and allow time for payment or satisfaction of any equity due and of any claims or demands by or against the InvIT and to refer any differences to arbitration and observe and perform any awards thereof;
  - (v) appoint counsel or appear before the relevant authorities, submit information, seek clarifications from any Governmental Agency and complete, sign and submit any applications or documents for any approvals, permissions, or actions that may be necessary or desirable;
  - (vi) open, maintain and close bank accounts and draw cheques or other orders for the payment of money and open, maintain and close demat, brokerage, mutual fund and similar accounts; and
  - (vii) enter into, execute and/or terminate any investment pooling agreements, agreements related to strategic investments, co-investment agreements, and any and all documents and instruments of a similar nature in the name of the InvIT.
- (c) The Trustee shall have the power, whether directly (in consultation or upon the recommendation of the Investment Manager) or through the Investment Manager where the Investment Manager has been so authorised by the Trustee under the Investment Management Agreement, to appoint, determine the remuneration of and enter into, execute, deliver, perform, modify or terminate all documents, agreements and instruments containing customary terms including contractual indemnities with Valuers, Auditors, registrar and transfer agents, merchant bankers, credit rating agencies, search agents, Custodians, property consultants, brokers, legal, financial and

tax consultants or any other intermediary or professional service provider or agent as may be required in connection with the activities of the InvIT in a timely manner and as per the provisions of the InvIT Regulations and other Applicable Law.

- (d) The Trustee shall, as may be recommended by the Investment Manager, from time to time, in the interests of administrative and operational convenience, delegate to any committee or Person, any powers and duties including management of the Trust Fund vested in it under this Deed, provided, however, that the Trustee shall remain liable for all the acts of commission or omission of such Person being the delegate (such liability as may be determined finally by a court of competent jurisdiction, whose decision is final and non-appealable) except in cases of gross negligence, misconduct, wilful default and fraud by such Person or committee, as determined finally by a court of competent jurisdiction, whose decision is final and non-appealable. Any action taken by such committee or Person in respect of the Trust Fund shall be construed as an act done by the Trustee.
- (e) Subject to the provisions of this Deed and the InvIT Regulations, the Trustee shall, in consultation with, and on the recommendation of the Investment Manager, have the power to create such reserves in respect of the InvIT, as it may deem proper, in order to meet the expenses, liabilities (including potential tax liability) or contingent liabilities of the InvIT.
- (f) The Trustee shall have the power to cause the offering of Units of the InvIT, and issue and allot Units to the Unitholders of the InvIT, which power shall be exercised by the Investment Manager in terms of the Investment Management Agreement.
- (g) The Trustee shall in consultation with, and on the recommendation of the Investment Manager, have the power to incur and pay expenses (including any taxes or other statutory charges) out of the Trust Fund, on behalf of the InvIT, in accordance with the terms of the InvIT Documents. The Trustee shall also have the power to utilise any tax credits available to the InvIT, prior to making any such payment of taxes or expenses.
- (h) Subject to Applicable Law and the applicable provisions of the Trust Deed, the Trustee shall, on receipt of advice from the Investment Manager, have the power to borrow monies for the purpose of fulfilling the InvIT Objectives (through any mode, including by way of issuance of debt securities, subordinated debt, equity or other Securities or instruments permitted under the InvIT Regulations or other Applicable Law) from any Person or authority (whether government or otherwise, whether Indian or overseas) on such terms and conditions, and for such periods and purpose, as may be permitted under the InvIT Regulations and approved by the Unitholders, and offer such security as it may deem fit, for the purpose of making such borrowing. Further, the Trustee (acting in capacity of the trustee of the InvIT) shall have the power to create charge, security interest and/or lien over any or all of the assets of the InvIT (both, present or future), to secure and/or guarantee the performance of any of the obligations of the Holdcos/SPVs, as it may deem fit.
- (i) Subject to Applicable Law and the applicable provisions of the Trust Deed, for so long as the Units of the InvIT are not listed on a Stock Exchange, (i) the Trustee shall have the power to borrow (on behalf of the of the InvIT) such amounts of money, on such terms and conditions and for such periods and purpose as may be decided upon by the Investment Manager; and (ii) in the event that the aggregate borrowing of the InvIT (net of cash and cash equivalents) exceeds 70% (Seventy percent) of the value of the InvIT Assets (or such other threshold as may be agreed to by not less than 51% (Fifty one percent) of the Unitholders (by value)), then for any further borrowing, the Trustee shall obtain an approval of 51% (Fifty one percent) of the Unitholders (by value). In the event the Units of the InvIT are listed on a Stock Exchange, the borrowing shall be undertaken in accordance with the InvIT Regulations and shall be subject to approvals as set out under the InvIT Regulations.
- (j) The Trustee shall have the power, apart from acting personally, to employ and pay at the expense of the InvIT, any agent in any jurisdiction, whether attorneys, solicitors, brokers, banks, trust companies or other agents, whether associated or connected in any way with the Trustee

or not, without being responsible for the default of any agent if employed in good faith to transact any business.

- (k) The Trustee may permit any property comprised in the InvIT, or any documents in relation thereto, to be, and remain, deposited with a Custodian or with any Person in India subject to such deposit being permissible under Applicable Law. In the event that any capital gains tax, income tax, stamp duty or other duties, fees, cess or other taxes (and any interest or penalty chargeable thereon), become payable on any amounts payable by SPVs/ Holdco in any jurisdiction, the Trustee may, on the recommendation of the Investment Manager, pay all such duties, fees, cess or other taxes (and any interest or penalty chargeable thereon), out of the Trust Fund in accordance with Applicable Law and the advice of tax consultants. The Trustee may, on the recommendation of the Investment Manager, file tax returns with the relevant Governmental Agencies, in accordance with Applicable Law and the advice of tax consultants.
- (l) The Trustee shall have the power to take the opinion of legal and tax counsel in any jurisdiction concerning any disputes or differences arising under this Deed, in connection with any Investments or any matter incidental thereto and the fees of such counsel shall be paid out of the Trust Fund.
- (m) The Trustee may, from time to time and in consultation with the Investment Manager, make rules to give effect to, and carry out the purposes of the InvIT and secure effective control over the affairs thereof, subject to the provisions of Applicable Law.
- (n) The Trustee shall cause the Investment Manager to insure the InvIT Assets against any loss or damage from any peril, any assets and property forming part of the InvIT for any amount, as per the InvIT Regulations, and to pay the premiums out of the Trust Funds.
- (o) The Trustee may maintain, or cause the Investment Manager or the registrar and transfer agent to maintain a register of the Units of the InvIT.
- (p) Subject to restrictions contained in the InvIT Documents and Applicable Laws (including the limits and restrictions prescribed under the InvIT Regulations), the Trustee may, in consultation with, and upon the recommendation of the Investment Manager, extend loans from the Trust Fund to the Holdco/ SPVs and also subscribe to debt securities or quasi debt securities or any similar kind of Securities issued by the Holdco/ SPVs or any other Person permitted under the Applicable Law from the Trust Fund.
- (q) Subject to Applicable Law, the Trustee may at any time, buyback the Units from the Unitholders.
- (r) Subject to Applicable Law, the Trustee shall have the right (to be exercised in consultation with the Investment Manager) (i) to pay interest, prepay or repay any and all debt raised from any Person, in accordance with the terms therein and (ii) to redeem any debt securities or other securities, obligations or instruments in accordance with the terms thereof issued to Persons in compliance with the InvIT Regulations and other Applicable Law.
- (s) Other Powers of Trustee:
  - (i) to make and give receipts, releases and other discharges for moneys payable to the InvIT and for the claims and demands of the InvIT;
  - (ii) to enter into all such negotiations and contracts, and, execute and do all such acts, deeds and things for or on behalf of or in the name of the InvIT as the Trustee may consider expedient for or in relation to any of the matters or otherwise for the purposes of the InvIT;
  - (iii) to sign, seal, execute, deliver and register according to law all deeds, documents, and assurances in respect of the InvIT;

- (iv) to take into their custody and/or control all the capital, assets, property of the InvIT and hold the same in trust for the Unit Holders in accordance with this Deed and the InvIT Regulations; and
- (v) generally, to exercise all such powers as it may be required to exercise under the InvIT Regulations for the time being in force and do all such matters and things as may promote the InvIT or as may be incidental to or consequential upon the discharge of its functions and the exercise and enforcement of all or any of the powers and rights under this Deed.

2. *Duties of the Trustee*

(a) Applications to Governmental Agencies

Subject to applicable provisions of the Trust Deed, the Trustee shall, with the assistance of the Investment Manager, in accordance with the Investment Management Agreement, make all necessary applications to such Governmental Agencies as may be required for the InvIT to carry on its activities after the InvIT is registered with SEBI.

(b) Interests of the Unitholders

- (i) The Trustee shall at all times exercise due diligence in carrying out its duties and use best endeavours to carry on and conduct its business in a proper and efficient manner to protect the interests of the Unitholders and in accordance with the InvIT Regulations.
- (ii) The Trustee shall periodically review the status of Unitholders' complaints and their redressal undertaken by the Investment Manager in accordance with the InvIT Regulations.

(c) Receivables due to the InvIT

The Trustee shall, through the Investment Manager, ensure prompt and proper collection of the receivables due to the InvIT in accordance with Applicable Law.

(d) Transactions by certain Persons

The Trustee shall ensure that all transactions executed by the Investment Manager and any service provider to whom the Trustee has delegated any powers or duties, are done in accordance with this Deed, the Investment Management Agreement, the InvIT Regulations and the agreement executed with such service provider.

(e) Trust Fund

- (i) The Trustee shall hold the Trust Fund and all assets comprised thereunder, in trust for the benefit of the Unitholders in accordance with this Deed and the InvIT Regulations.
- (ii) The Trustee shall also be responsible for opening and operating bank accounts on behalf of the InvIT. It is hereby clarified that, to the extent the authority under the Trust Deed has been delegated to the Investment Manager in accordance with the Investment Management Agreement, the Investment Manager shall be responsible for undertaking the actions.
- (iii) The Trustee shall ensure that the Capital Contribution received whether by way of (I) Private Placement through a Placement Memorandum; or (II) Public Issue of Units through an Offer Document, as the case may be, is kept in a separate bank account in the name of the InvIT and is only utilised for adjustment against allotment of Units or refund of money to the applicants in the manner set out in the InvIT Regulations, and

the same will be utilised for the objectives stated in the Placement Memorandum or the Offer Document (as the case may be).

(f) Books of Accounts and Records

The Trustee shall maintain all the records that are required to be maintained pursuant to Regulation 26(2) of the InvIT Regulations or otherwise required under Applicable Law. The Trustee shall also ensure that the Investment Manager maintains the books of accounts of the InvIT in accordance with this Deed.

(g) Statutory charges or levies payable by the InvIT

The Trustee shall, in accordance with the Applicable Law and on receipt of advice from the Investment Manager, pay all taxes, duties and any other statutory charges or levies that may be payable by the InvIT on behalf of the Unitholders from the Trust Fund, subject to the provisions of the InvIT Documents.

(h) Reports to be filed by the InvIT

The Trustee, either by itself or through the Investment Manager, shall from time to time file such reports and provide such information as may be required by the SEBI or stock exchanges (if applicable) or other Governmental Agencies, with respect to the activities carried on by the InvIT.

(i) Documents and information to be provided to the Unitholders

The Trustee shall, through the Investment Manager, from time to time provide such documents and information to the Unitholders, as may be required by the SEBI, stock exchanges (if applicable) or other Governmental Agencies, with respect to the activities carried on by the InvIT. The Trustee shall comply with intimation requirements under the InvIT Regulations, including in relation to intimating SEBI in case of any discrepancy in the operation of the InvIT with the InvIT Regulations and the Placement Memorandum or Offer Document (as applicable). The Trustee shall also immediately inform SEBI in case (i) the Investment Manager fails to submit to the Trustee the information or reports as specified under the InvIT Regulations, within the timelines set out under the InvIT Regulations; and (ii) any act which is detrimental to the interest of the Unitholders is noted.

(j) Segregation of Assets & Liabilities

The assets and liabilities of the InvIT shall at all times be segregated from the assets and liabilities of any other trusts managed by the Trustee. The assets held under the InvIT shall be held for the exclusive benefit of the Unitholders of the InvIT and such assets shall not be subject to the claims of any creditor or other Person claiming under any other trust or fund administered by the Trustee or managed by the Investment Manager, as the case may be.

(k) Attainment of objects of the InvIT

The Trustee shall ensure that all acts, deeds and things are done with a view to attain the objects of the InvIT as set out in this Deed, Applicable Law and the InvIT Documents, in order to secure the best interests of the Unitholders.

(l) Activities of the Investment Manager

(i) The Trustee shall delegate all such powers to the Investment Manager as may be required by the Investment Manager to carry out its obligations under the Investment Management Agreement and under Applicable Law.

(ii) The Trustee shall oversee activities of the Investment Manager in the interest of the Unitholders, ensure that the Investment Manager complies with the InvIT Regulations

and obtain a compliance certificate from the Investment Manager on a quarterly basis, in the form prescribed by SEBI, if any.

- (iii) The Trustee shall ensure that the Investment Manager complies with all applicable reporting and disclosure requirements in accordance with the InvIT Regulations, and other Applicable Law and in case of any delay or discrepancy, require the Investment Manager to rectify such delay or discrepancy on an urgent basis.
  - (iv) The Trustee shall require the Investment Manager to set up such systems and procedures and submit such reports to the Trustee, as may be necessary for effective monitoring of the functioning of the InvIT.
  - (v) The Trustee shall ensure that the activity of the InvIT is being operated in accordance with the provisions of this Deed, the InvIT Regulations and the InvIT Document (as applicable), and in the event that any discrepancy is noted, the Trustee shall inform the same to the SEBI immediately in writing.
  - (vi) The Trustee shall review all documents, reports, records and information submitted by the Investment Manager to the Trustee in accordance with Regulation 10 of the InvIT Regulations.
- (m) Activities of the Project Manager
- (i) The Trustee shall delegate all such powers to the Project Manager as may be required by the Project Manager to carry out its obligations under the Project Management Agreement and under Applicable Law.
  - (ii) The Trustee shall oversee activities of the Project Manager in the interest of the Unitholders, ensure that the Project Manager complies with the InvIT Regulations and the Project Management Agreement and obtain a compliance certificate from the Project Manager on a quarterly basis, in the form prescribed by SEBI, if any.
- (n) Meetings of Unitholders
- (i) The Trustee shall ensure that the Investment Manager (i) convenes meetings of the Unitholders in accordance with the InvIT Regulations and (ii) shall oversee the voting by the Unitholders and declare the outcome of such meetings;

Provided that, where there is:

- (a) a change or removal of the Investment Manager, or a Change in Control of the Investment Manager of the InvIT, the Trustee shall be responsible for convening and conducting of the meetings of the Unitholders, as provided in the InvIT Regulations and the InvIT Documents; and
  - (b) any issue pertaining to the Trustee, such as change in the Trustee, the Trustee shall not be involved in any manner in the conduct of the meetings of the Unitholders.
- (ii) The Trustee shall ensure that the Investment Manager convenes meetings of the Unitholders at least once every year within requisite number of days from the end of a financial year (as prescribed under the InvIT Regulations) with the period between such meetings not exceeding such number of months as is prescribed under the InvIT Regulations.
  - (iii) The Trustee shall take up with SEBI or with the stock exchanges (if applicable), any matter which has been approved in any meeting of Unitholders, if the matter requires such action.

(o) Related Party Transactions

The Trustee shall review and oversee the transactions carried on between the Investment Manager and its Associates and where the Investment Manager has advised that there may be a conflict of interest, the Trustee must obtain a certificate from a practicing chartered accountant or a Valuer as applicable specifying that such transactions are on an arms' length basis.

(p) Change and Change in Control of the Investment Manager

The Trustee hereby confirms that it shall (i) obtain the prior approval of the Unitholders in accordance with the requirements of the InvIT Regulations for a proposed change in the Investment Manager or Change In Control of the Investment Manager; and (ii) to the extent applicable, obtain prior approval of the SEBI in the event of a proposed change in the Investment Manager or Change in Control of the Investment Manager.

(q) Change and Change in Control of the Project Manager

The Trustee hereby confirms that (i) it shall appoint a new project manager within 3 (Three) months from the date of termination of the relevant Project Management Agreement in case of a change of Project Manager due to removal or otherwise; and (ii) in case of a Change in Control of the Project Manager in a PPP Project, it shall ensure that the written consent of the relevant concessioning authority is obtained in terms of the Concession Agreement prior to such change, where applicable.

(r) Suspension of Trustee's Registration

The Trustee shall, promptly on occurrence, inform the Investment Manager and the Unitholders of a cancellation, revocation or suspension of its registration to act as a trustee under Applicable Law or a breach of the terms of such registration that will materially impair its ability to perform its obligations and exercise its powers under this Deed.

(s) Investment by Trustee

The Trustee and its Associates shall not invest in Units of the InvIT.

(t) Confidentiality

The Trustee and its directors, officers, employees and agents shall at all times maintain the greatest amount of confidentiality with respect to the activities and assets of the InvIT, the Sponsor and/or their respective Associates and such other matter connected with them and the InvIT generally and shall not disclose any confidential information to any other Person, other than the Sponsor, Investment Manager, or the Project Manager, unless such information is required to be disclosed to some regulatory authority, court or any other Person under any order of court or any law in force in India;

(u) Ethical Business Practices

The Trustee shall not use any InvIT Assets or any portion of the Trust Fund, in violation of any Anti-Corruption Laws, Anti-Money Laundering Laws or Sanctions, and shall not directly, or knowingly indirectly transfer such assets or proceeds to or for the benefit of any Sanctioned Person or otherwise in violation of Sanctions.

(v) General Duties

Without limiting the foregoing general duties, the Trustee shall perform all the duties and obligations set out in the InvIT Regulations, including those applicable duties and obligations set out in Regulation 9 of the InvIT Regulations, as may be amended, modified or supplemented from time to time.

3. *Rights of the Trustee*

- (a) The Trustee shall have the right to receive trusteeship fees from the Trust Fund for services to be rendered in relation to the administration and management of the InvIT, as agreed in the offer letter dated August 9, 2021, issued by the Trustee, as amended from time to time.
- (b) The Trustee may, in the discharge of its duties, act upon any advice obtained in writing from any qualified bankers, accountants, brokers, lawyers, professionals, consultants, or other experts acting as advisors to the Trustee. The Trustee shall not be bound to supervise or verify advice of the advisors and not be liable for any bona fide act or omission or consequence suffered as a result of the reliance upon such advice or information. The Trustee shall also not be responsible for any loss occasioned by so acting, nor for the consequences of any bona fide mistake, oversight or error of judgement on the part of such advisors.
- (c) The Trustee may, on the recommendation of the Investment Manager, appoint any scheduled commercial bank to act as the banker to the InvIT, on the same terms and conditions extended by such a bank to similar customers.
- (d) The Trustee shall be entitled to the reimbursement of all reasonable expenses incurred by the Trustee on behalf of the InvIT, including any direct or indirect tax or duty, which has become or may become leviable under Applicable Law. Such expenses shall be paid out of the Trust Fund.
- (e) Subject to Applicable Law, the Trustee acknowledges that no Unitholder (acting in its capacity as a Unitholder) shall be entitled to inspect or examine the InvIT's premises or properties (or documents relating thereto) without the prior permission of the Investment Manager. Further, no Unitholder (acting in its capacity as a Unitholder) shall be entitled to require discovery of any information with respect to any detail of the InvIT's activities or any matter which may be related to the conduct of the business of the InvIT and which information may, in the opinion of the Investment Manager adversely affect the interest of other Unitholders.

4. *Liabilities of the Trustee*

- (a) Assets received by the Trustee: The Trustee shall only be liable for such monies, stocks, funds, shares, Securities, investment or property as the Trustee shall have actually received and shall not be liable or responsible for any banker, broker, Custodian or other Person in whose hands the same may be deposited or placed, nor for the deficiency or insufficiency in the value of the Trust Fund nor otherwise for any involuntary loss provided that the Trustee or such Person shall have acted in good faith, without gross negligence and shall have used their best efforts in connection with such dealings and matters. Any receipt signed by the Trustee for any monies, stocks, funds, shares, Securities, investment or property, paid, delivered or transferred to the Trustee by virtue of this Deed or in exercise of the duties, functions and powers as Trustee, shall effectively discharge the Trustee or the Person paying, delivering or transferring the same provided that the Trustee or such Person shall have acted in good faith, without gross negligence and shall have used their best efforts in connection with such dealings and matters.
- (b) Acts done in good faith: The Trustee shall not be under any liability on account of anything done or omitted to be done or suffered by the Trustee in good faith in accordance with, or in pursuance of any request or advice of the Investment Manager.
- (c) Authenticity of signature and seal: The Trustee shall not be responsible for the authenticity of any signature or of any seal affixed to any endorsement on any certificate or to any transfer or form of application endorsement or other document effecting the title to or transmission of interests in the InvIT or of any of the Investments or be in any way liable for any forged or unauthorised signature on or any seal affixed to such endorsement transfer or other document or for acting upon or giving effect to any such forged or unauthorised signature or seal. The Trustee shall be entitled but not bound to require that the signature of any Unitholder to any document required to be signed by such Unitholder under or in connection with these presents, be verified to the reasonable satisfaction of the Trustee.

- (d) Depletion in the value of the Trust Assets: The Trustee shall not be liable for any act or omission that may result in a loss to an Unitholder by way of depletion in the value of the Trust Fund or otherwise, except in the event that such depletion is a result of fraud, gross negligence or misconduct on the part of the Trustee or results from a breach by the Trustee of this Deed, as conclusively determined by a court of competent jurisdiction.
- (e) Indemnity: The Sponsor, Trustee, and their respective officers, directors or employees (“Indemnitees”) shall be entitled to be indemnified by the InvIT out of the Trust Fund in respect of all claims, liabilities, damages and expenses, including legal fees, by reason of their activities on behalf of the InvIT or any of the powers, authorities and discretion exercised by them in each case, provided that such claims liabilities, damages or expenses do not arise from any violation of this Deed and do not involve gross negligence, fraud, misconduct or violation of laws by the Indemnitees or their agents and representatives, as determined finally by a court of competent jurisdiction.
- (f) Obligations as per the Indian Trusts Act: Nothing in this Deed exempts or indemnifies the Trustee against liability for: (i) breach of trust under the Indian Trusts Act, 1882; or (ii) fraud, gross negligence or misconduct by the Trustee.
- (g) Acts or things required to be done by the Trustee under law: The Trustee shall not be liable to the Unitholders for doing or failing to do any act or thing which by reason of any provision of Applicable Law, or of any decree, order or judgment of any court, or by reason of any direction made by any Person acting with or purporting to exercise the authority of any Governmental Agency, it is directed or requested to do or perform or to forbear from doing or performing. If, for any reason it becomes impossible or impracticable to carry out any act or thing under the provisions of this Deed, the Trustee shall not be under any obligation to perform such act or thing.
- (h) Bona fide action by the Trustee: The Trustee shall not be liable in respect of any action taken or damage suffered by the Unitholders on reliance upon any notice, resolution, direction, consent, certificate, affidavit, statement, certificate of stock, plan of reorganization or (without being limited in any way by the foregoing) other paper or document believed to be genuine and to have been passed, sealed or signed by appropriate authorities or entities.
- (i) Suits, proceedings or claims against the Trust: The Trustee shall not be under any obligation to institute, acknowledge the service of, appear in, prosecute or defend any action, suit, proceedings or claim (including tax proceedings) in respect of the provisions hereof or in respect of the assets of the InvIT or any part thereof or any corporate action which in its opinion, acting on advice of the Investment Manager would or might involve an expense or a liability, unless the Investment Manager shall so request in writing and the Trustee is satisfied that the value of the investment is sufficient to provide adequate indemnity against costs, claims, damages, expenses or demands to which it may be put as the trustee as a result thereof. The costs in relation to such action, suit, proceedings or claims (whether undertaken upon request of Investment Manager or otherwise) incurred by the Trustee in connection with or arising out of the InvIT, shall be borne by the InvIT.
- (j) Trustee to act as trustee of other trusts: Nothing herein contained shall be construed to preclude the Trustee from acting as trustee of other trusts, alternate investment funds, venture capital funds, private equity funds, real estate investments trusts, infrastructure investment trusts, private trusts or customized fiduciary trusts separate and distinct from the InvIT, and retaining for its own use and benefit all remuneration, profits and advantages which it may derive therefrom, as permitted under Applicable Law.
- (k) Information regarding the Trust, etc.: If the Trustee is required by the InvIT Regulations or any other Applicable Law to provide information regarding the InvIT, the Sponsor, Unitholders, the Investments and income therefrom and provisions of this Deed and complies with such request in good faith after having consulted with the Investment Manager, whether or not it was in fact enforceable, the Trustee shall not be liable to the Unitholders or to any other party as a result of or in connection with such compliance.

- (l) **Limited Liability:** The Trustee shall not be personally liable for any losses (including indirect or consequential losses), costs, damages or expenses incurred in any way arising from anything which the Trustee, in its capacity as trustee of the Trust does or fails to do. It is hereby clarified that the liability of the Trustee shall not exceed the fees received by the Trustee, except in case of fraud, gross negligence or misconduct on the part of the Trustee, as may be determined finally by a court of competent jurisdiction.
- (m) **Trustee to not risk its monies:** If the Trustee engages any external advisors or experts after having obtained the consent of the Investment Manager (in accordance with this Deed), to discharge its obligations under this Deed, or undertakes any work (after having obtained the consent of the Investment Manager, in the interest of the Unitholders) which is not covered within the scope of work of the Trustee under this Deed and such additional work is beyond the obligations of the Trustee under Applicable Laws, the Trustee shall be entitled to recover such costs, charges and expenses which the Trustee may incur in this regard, from the Trust Fund. Further, it is clarified that, the Trustee will not be required to utilize funds held by the Trustee under this Deed, for any other trust for which, Axis Trustee Services Limited is appointed as a trustee.

5. *Term, discharge and removal of the Trustee and appointment of new Trustee*

- (a) The Trustee shall hold the office of trustee of the InvIT under this Deed till the occurrence of the earlier of the following:
  - (i) the winding up, dissolution or termination of the InvIT as set out in the Trust Deed; or
  - (ii) discharge of the Trustee in accordance with the provisions of the Trust Deed below.
- (b) The Trustee shall stand discharged from its office on the occurrence of any of the following events:
  - (i) resignation by the Trustee from its office in accordance with the Trust Deed (Resignation by and Removal of the Trustee);
  - (ii) if the Unitholders so decide with requisite majority, in accordance with the InvIT Regulations;
  - (iii) passing of a resolution by the board of directors of the Trustee for the voluntarily winding up of the Trustee, or passing of an order of winding up against the Trustee by a court of competent jurisdiction;
  - (iv) passing of a direction by the SEBI or any other governmental or regulatory authority to remove the Trustee; or
  - (v) expiry or revocation of registration of the Trustee.
- (c) In the event the Trustee desires to resign from its office, it may submit its resignation to the Sponsor, or in the absence of the Sponsor, the Unitholders, setting out reasons for such resignation. The Sponsor or the Unitholders, as the case may be, may approve the resignation in accordance with the InvIT Regulations, on the condition that a new trustee shall be appointed to hold office in its place from the date of acceptance of the resignation in accordance with terms and conditions of this Deed. The date of acceptance of the Trustee's resignation shall be deemed to be the date of discharge of the Trustee.
- (d) In any event, the Trustee shall not be discharged unless a new trustee is appointed by the Sponsor or the Unitholders in its place by the execution of a deed of appointment and on such appointment the Trustee shall be deemed to have vacated office as trustee of the InvIT. Notwithstanding anything contained herein, in the event the Sponsor fails to appoint a trustee within a period of 60 (Sixty) days from the date of notice of resignation of the Trustee, the Trustee shall to the best of its ability guide the Sponsor and/or the Unitholders on the

appointment of a reputed Person with the requisite expertise and experience as successor Trustee and the Trustee shall continue as trustee until such appointment of the successor Trustee. Provided that, the Sponsor and/or the Unitholders will not be obligated to appoint the Person recommended by the Trustee, as the new trustee of the InvIT.

- (e) In the event of the occurrence of any of the events set out in applicable provisions of the Trust Deed, a new trustee as nominated by the Sponsor, shall be appointed in its place on the terms and conditions of this Deed.
- (f) Such appointment of a new trustee shall be made by execution of a deed of appointment.
- (g) On such appointment, the Trust Fund shall vest with the new trustee.
- (h) On such appointment, the Trust shall be conveyed and transferred to the new trustee so as to legally vest in such new trustee, which, subject to Applicable Law, shall not be construed to be a conveyance of property of the Trust.

6. *Provisions Related to Unitholders*

- (a) The Unitholders shall be entitled to receive the Distributions made by the InvIT in the proportion of their respective Beneficial Interest. The Beneficial Interest of each Unitholder shall be equal and limited to the proportion of the number of Units held by that Unitholder to the total number of Units issued by the InvIT as on a relevant date.
- (b) No Unitholder shall participate or take part in the control of the affairs of the InvIT or have a right or authority to act for, or bind, the InvIT. Further, no Unitholder shall have a right to make decisions with respect to the InvIT, save and except to the extent provided in the InvIT Documents (as applicable) and the InvIT Regulations. The approval of the Unitholders will be obtained in the manner and to the extent specified in the InvIT Regulations.
- (c) The liability of each Unitholder towards the payment of any amount (that may arise in relation to the Trust Fund including any taxes, duties, fines, levies, liabilities, costs or expenses) shall be limited only to the extent of the Capital Contribution of such Unitholder and after such Capital Contribution shall have been paid in full by the Unitholder, the Unitholder shall not be obligated to make any further payments pursuant to this liability. For the avoidance of doubt, no Unitholder shall have any personal liability or obligation with respect to the InvIT.
- (d) Each Unit allotted to the Unitholders shall have one vote for any decisions requiring a vote of Unitholders.
- (e) No Unitholder shall enjoy superior voting or any other rights over another Unitholder.
- (f) In no event shall a Unitholder have or acquire any rights against the Trustee and the Investment Manager except as expressly conferred on such Unitholder hereby or in the other InvIT Documents, nor shall the Trustee or the Investment Manager be bound to make payment to any Unitholder, except out of the funds held by it for that purpose under the provisions of this Deed.
- (g) A Unitholder whose name and account details are entered in the Depository Register shall be the only Person entitled to be recognized by the Trustee as having a right, title, interest in or to the Units registered in his name and the Trustee shall recognize such holder as an absolute owner. Provided that the Trustee shall be required to recognize and give effect to the terms of any voting arrangements, power of attorneys and proxies executed by Unitholders in respect of their Units, in respect of which the Trustee has been notified.
- (h) The Unitholders (acting in their capacity as unitholders of the InvIT) shall not give any directions to the Trustee, the Investment Manager or the Project Manager (whether in a meeting of Unitholders or otherwise) if it would require the Trustee, the Investment Manager or the Project Manager to do or omit doing anything which may result in:

- (i) the InvIT or the Trustee, in its capacity as the trustee of the InvIT or the Investment Manager, in its capacity as the investment manager of the InvIT or the Project Manager, in its capacity as the project manager of the InvIT ceasing to comply with Applicable Law; or
- (j) interference with the exercise of any discretion expressly conferred on the Trustee by this Deed or the Investment Manager or the Project Manager by the Investment Management Agreement or the Project Management Agreement, respectively, or the determination of any matter which requires the agreement of the Trustee or the Investment Manager, provided that nothing shall limit the right of the Unitholder to require the due administration of the InvIT in accordance with this Deed.
- (k) The Depository Register shall (save in case of manifest error) be conclusive evidence of the number of Units held by each depositor and in the event of any discrepancy between the entries of the Depository Register and any statement issued by the depository, the entries in the Depository Register shall prevail unless the depositor proves to the satisfaction of the Trustee and the depository that the Depository Register is incorrect.
- (l) The Unitholders shall have the right to call for certain matters to be subject to their consent, in accordance with the InvIT Regulations and Applicable Law.
- (m) Subject to the restrictions set out (a) under Applicable Law; (b) in the InvIT Documents; or (c) in any arrangement entered into between the Unitholders (“Unitholder Arrangement”), the Unitholders may, in accordance with the provisions of the InvIT Documents, Applicable Law and/or such Unitholder Arrangement (to the extent applicable), transfer any of the Units to an investor where such investor accepts all the rights and obligations of the transferor and the Trustee or the Investment Manager shall give effect to such transfer in accordance with Applicable Law.
- (n) The Trustee shall and shall ensure that the Investment Manager obtains the consent of the Unitholders for the matters prescribed under the InvIT Regulations and/or the InvIT Documents, in accordance with the provisions of the InvIT Regulations. For matters requiring approval under the InvIT Documents and InvIT Regulations, consent or vote of the Unitholders, the approval, consent or vote shall be on the basis of the relevant threshold in terms of the Beneficial Interest.

## 7. *Termination*

The InvIT may be terminated early and dissolved automatically without any further action on the part of the Unitholders, in the circumstances as specified below:

- (a) in the event of the InvIT becoming illegal;
- (b) if it is impossible to continue with the InvIT or if the Trustee on advice of the Investment Manager deems it impracticable to continue the InvIT;
- (c) in case the Units of the InvIT are listed, if the Units of the InvIT are delisted from the stock exchanges (other than if the Trustee and the Investment Manager propose to convert the InvIT into a privately placed unlisted infrastructure investment trust, in accordance with the InvIT Regulations);
- (d) where SEBI has passed a direction for the winding up of the InvIT or if the InvIT is required to be wound up pursuant to the InvIT Regulations;
- (e) in the event SEBI refuses to grant a certificate of registration to the InvIT, due to any reason whatsoever; or
- (f) if the InvIT fails to make any offer of Units by way of Private Placement or Public issue (as applicable) within the time period stipulated in the InvIT Regulations or any other time period as specified by SEBI (whichever is earlier), in which case the InvIT shall surrender its certificate

to SEBI and cease to operate as an infrastructure investment trust, unless the period is extended by SEBI.

- (i) Winding up of the InvIT on circumstances other than (i) in accordance with the Term; and (ii) those stated in provisions of the Trust deed shall require a consent from the Unitholders by Super Majority.
  - (ii) The net assets of the InvIT remaining after settlement of all liabilities as on the date of dissolution shall be paid to the Unitholders in accordance with the provisions contained in the Trust Deed.
- (g) Other than as set out herein and/or in the InvIT Documents and/or as may be decided by the Investment Manager, a Unitholder shall not have any right to demand the return of its Capital Contribution. None of the Trustee, Sponsor, the Investment Manager, any committee of the Trust or the Trustee or the Investment Manager working on the investment activity of the Trust, the Project Manager or their affiliates or each of their respective managers, officers, directors, shareholders, sponsors, partners, members, employees, advisors and/or agents shall have any personal liability to the Unitholders for the return of their Capital Contribution. Further, other than as expressly set out herein and/or in the InvIT Documents, none of the aforementioned Persons shall be under any obligation to distribute or pay any amount to a Unitholder. All liabilities of the InvIT to Persons other than the Unitholders shall be paid, or in good faith determination of the Trustee or the Investment Manager, there shall remain in the property of the Trust sufficient resources to pay such liabilities.
- (h) Immediately upon the happening of any of the events referred to in the Trust Deed, the Trustee shall:
- (i) ensure that no further Investments are made out of the Trust Fund;
  - (ii) redeem all outstanding Units and distribute any remaining non-cash assets in the Trust Fund and the cash proceeds (net of liquidation and distribution costs) from the sales to the Unitholders;
  - (iii) within a reasonable period of time thereafter, take such other actions as may be necessary to ensure that the InvIT is wound up by executing such documents and taking such steps as may be necessary; and
  - (iv) surrender the certificate of registration of the InvIT to SEBI.
- (i) It is hereby clarified that, upon the occurrence of the events set out in the Trust Deed, the Trustee shall continue to hold office as the trustee of the InvIT under this Deed until the completion of all actions set out in the Trust Deed.

## **C. The Investment Manager – Virescent Infrastructure Investment Manager Private Limited**

### ***History and Certain Corporate Matters***

Virescent Infrastructure Investment Manager Private Limited (“**Virescent Infrastructure or Investment Manager**”) is the Investment Manager of the Highways Trust. Virescent Infrastructure was incorporated in India as a private limited company on August 22, 2020 under the Companies Act, 2013 with corporate identification number U74999MH2020PTC344288. The Investment Manager’s registered office and address for correspondence is 10<sup>th</sup> Floor, Parinee Crescenzo, C-30, ‘G’ Block, Bandra Kurla Complex, Bandra (East), Mumbai 400051, Maharashtra, India. For further details, please see the section entitled ‘*General Information*’ on page 97.

### ***Background and Past Experience of the Investment Manager***

Virescent Infrastructure has the infrastructure for acting as the manager, and to manage the assets and investments of the Highways Trust. Virescent Infrastructure was incorporated as a private limited company, and each of its

key managerial personnel currently has over five years of experience in providing advisory services in the infrastructure sector. Therefore, it will be relying on the experience and expertise of its employees in the financial management, advisory and/or infrastructure development sectors, to comply with the eligibility requirements under the InvIT Regulations. Accordingly, the Investment Manager is in compliance with the eligibility requirements prescribed under the InvIT Regulations. The Investment Manager also acts as the investment manager to the “Virescent Renewable Energy Trust”, an infrastructure investment trust, which has obtained a certificate of registration from SEBI on February 25, 2021, bearing registration number IN/InvIT/20-21/0018.

The net worth of Virescent Infrastructure as on December 31, 2021, was ₹ 132.98 million on a standalone basis. Virescent Infrastructure shall (i) comply with the minimum net worth requirement set out in Regulation 4(2)(e)(i) of the InvIT Regulations.

The equity shareholding pattern of the Investment Manager is as follows:

S. No.	Name of the shareholder	No. of equity shares held	Percentage (%)
1.	Terra Asia Holdings II Pte. Ltd.	11,009,999	86.37
2.	Terra Asia Holdings I Pte. Ltd., as a nominee of Terra Asia Holdings II Pte. Ltd.	1	-
3.	PIP7 Peacock SARL	17,37,753	13.63
<b>Total</b>		<b>1,27,47,753</b>	<b>100</b>

#### ***Key Terms of the Investment Management Agreement***

The Investment Manager has entered into the Investment Management Agreement, in terms of the InvIT Regulations, the key terms of which, are provided below.

##### ***1. Powers of the Investment Manager***

The Investment Manager has been provided with various powers under the Investment Management Agreement in accordance with the InvIT Regulations, including but not limited to:

- (a) Power to manage and administer the InvIT and its Investments: The Investment Manager shall take all decisions in relation to the management and administration of the InvIT, the Trust Funds and the Investments of the InvIT as may be incidental or necessary for the advancement or fulfilment of the InvIT Objectives and Investment Strategy in accordance with the InvIT Regulations and the InvIT Documents.
- (b) Power to make investment and divestment decisions: The Investment Manager shall make the investment decisions with respect to the InvIT and the Trust Fund including any Investments or divestments, subject to InvIT Regulations and in accordance with the relevant InvIT Documents, and in this regard is also empowered to do the following acts on behalf of the InvIT:
  - (i) acquire, hold, manage, trade and dispose of the Infrastructure Assets, shares, stocks, convertibles, debentures, bonds, equity, equity-related securities, debt or mezzanine securities of all kinds issued by any Holdco or SPV (including loans convertible into equity), whether in physical or dematerialised form, including power to hypothecate, pledge or create Encumbrances of any kind on such Securities held by the InvIT in such Holdco / SPV to be used as collateral security for any borrowings by the InvIT or the Holdco/ SPV;
  - (ii) without limiting the generality of the foregoing, to decide, in the manner set out in the InvIT Documents and InvIT Objectives and in compliance with the InvIT Regulations, (A) the amounts to be invested in each new entity or Infrastructure asset or any other asset, as permitted under the InvIT Regulations, that is to form part of the InvIT and the mode, manner, terms and conditions for making such Investment; and (B) to realize such Investments and the income therefrom, and distribute the same to the Unitholders

- or reinvest the same, as may be decided by the Investment Manager as per the terms contained herein and the InvIT Documents and in compliance with the InvIT Regulations;
- (iii) use the Infrastructure Assets and Trust Fund to provide loans and other support as may be required by a HoldCo / SPV
  - (iv) keep the Trust Fund in deposits with banks or in such other instruments or form as permitted under the InvIT Regulations in the name of the InvIT;
  - (v) collect and receive the profit, interest, repayment of principal of debt or debt-like or equity or equity-like mezzanine securities, dividend, return of capital of any type by the SPVs/ Holdco or of the Infrastructure Assets or any other InvIT Asset and any other income of the InvIT;
  - (vi) make Investments, including investments in liquid mutual funds, government securities, money market instruments and cash equivalents, as set out in the InvIT Documents and InvIT Objectives and in the manner and to the extent permitted under the InvIT Regulations;
  - (vii) to give, provide and agree to provide to any SPV or Holdco, financial assistance in the form of investment in share capital of any class including ordinary, preference, participating, non-participating, voting, non-voting or other class, and in the form of investment in securities convertible into share capital; and
  - (viii) keep the capital and monies of the InvIT in deposit with banks or other institutions.
- (c) Objects of the InvIT: The Investment Manager is hereby authorized to do all such other acts, deeds and things as may be incidental or necessary for the advancement or fulfillment of the InvIT Objectives, as set out in the Deed and the relevant InvIT Documents.
  - (d) Power to issue and to accept subscription to Units of the InvIT: The Investment Manager shall have the power to cause the issue and allotment of the Units, including specifically in accordance with Chapter VIA and Regulation 14 of the InvIT Regulations, to the extent applicable. The Investment Manager shall have the power to accept Capital Contributions for the InvIT and subscriptions to Units of the InvIT and undertake all related activities.
  - (e) Power to apportion between income and capital: The Investment Manager shall make such reserves out of the income or capital as it may deem proper and any directions of the Trustee in this behalf whether made in writing or implied from their acts shall, so far as the law may permit, be conclusive and binding. Any Distribution made from such reserves shall be in accordance with the InvIT Regulations.
  - (f) Power to maintain register of Unitholders: The Investment Manager shall cause the depository to maintain a register of Unitholders.
  - (g) Power to make reserves: Subject to the provisions of the InvIT Regulations (including particularly the requirements to make Distributions in accordance with Regulation 18(6) of the InvIT Regulations) and other Applicable Law, the Investment Manager shall, as it may deem proper make such reserves as may be required from time to time.
  - (h) Power to borrow: The Investment Manager may cause the InvIT to issue debentures, borrow or to defer payments or raise funds in any other form as per Applicable Law, and offer such security or contractual comfort as may be required for such borrowing subject to the conditions laid down in the InvIT Documents and InvIT Regulations (including the requirement to procure approvals from the investors/ Unitholders, as may be required, in accordance with the InvIT Documents and InvIT Regulations).
  - (i) Power to exercise rights in respect of the Trust Fund: Subject to and in compliance with any

conditions laid out in the InvIT Regulations and other Applicable Law, the Investment Manager shall have the power to exercise all rights in relation to the shareholding of the InvIT in the Holdco/ SPVs and other assets underlying the Trust Fund, including voting rights, rights to appoint directors (in consultation with the Trustee), whether pursuant to Securities held by the InvIT, or otherwise.

- (j) Power to employ a Project Manager: The Trustee, in consultation with the Investment Manager shall, on behalf of the InvIT, appoint the Project Manager to undertake, by itself or through appropriate agents, operations and management of the Infrastructure Assets of the InvIT in accordance with the InvIT Documents and Applicable Law and shall, for this purpose, execute the Project Management Agreement with the Project Manager.
- (k) Power to appoint professional service providers, intermediaries and agents:
  - (i) The Investment Manager, in consultation with the Trustee, shall have the power to appoint, determine the remuneration of and enter into, execute, deliver, perform, modify or terminate all documents, agreements and instruments containing customary terms including contractual indemnities with Valuers, Auditors, registrar and transfer agents, merchant bankers, Custodians and any other intermediary or service provider or agent as may be required for managing the assets of the InvIT and as per the provisions of the InvIT Regulations and other Applicable Law.
  - (ii) The Investment Manager shall not be responsible for the default or violation by any such professional service provider, intermediary or agent of their terms of service, if employed in good faith to transact any business identified in the arrangement with them.
  - (iii) All fees in relation to such professional service providers, intermediaries and agents shall be determined by the Investment Manager and shall be to the account of the InvIT, to be paid out of the Trust Fund or in such manner as may be permitted under Applicable Law. *Provided however*, the remuneration of the Valuer shall not be linked to or based on the value of the assets underlying the Trust Fund being valued by the Valuer. The Investment Manager shall be entitled to rely on the information, data, opinions and reports provided by such professional service providers, intermediaries and agents.
  - (iv) The Investment Manager shall not appoint an Auditor, Valuer and such other intermediaries or agents (as applicable) for consecutive periods greater than as permitted under the InvIT Regulations, without the consent of the Unitholders or Governmental Agencies, as may be required under the InvIT Regulations or other Applicable Law.
- (l) Power to appoint Custodians: The Investment Manager may, in consultation with the Trustee, appoint any Custodian in order to provide custodian services, oversee the activities of the Custodian, and may permit any asset (and/ or any documents pertaining thereto, as applicable) forming part of the Trust Fund to be and remain deposited with a Custodian, subject to such deposit as authorised by the Trustee and permissible under Applicable Law.
- (m) Power to pay duties and Taxes: In the event of any duties, fees or Taxes (and any interest or penalty chargeable thereon) whatsoever becoming payable in any jurisdiction in respect of the InvIT or in respect of documents issued or executed in pursuance of the Deed in any circumstances whatsoever, the Investment Manager, shall have the power and duty to pay all such duties, fees or Taxes and any interest or penalty thereon as well as to create any reserves for future potential Tax liability. For the avoidance of doubt, it is clarified that pursuant to this, no Unitholder will be required to make a Capital Contribution to the InvIT (other than the issue price for Units allotted). The Investment Manager shall also have the power to file any income-Tax returns on behalf of the InvIT, and ensure compliance with income tax provisions, as may be required under Applicable Law.

- (n) Power to spend on behalf of the InvIT: The Investment Manager shall have the power to pay InvIT Expenses that are required to be paid by the InvIT out of the Trust Fund.
- (o) Power to take counsel's opinion: The Investment Manager shall have the power to take the opinion of legal / tax counsel in any jurisdiction concerning any disputes or difference arising under the Investment Manager Agreement or any matter in any way relating to the Investment Manager Agreement or to its duties in connection with the Investment Manager Agreement.
- (p) Power to re-invest: Subject to the conditions laid down in any of the InvIT Documents and InvIT Objectives and as permissible under the InvIT Regulations, the Investment Manager, may retain for reinvestment into a potential InvIT Asset or Holdco/ SPV, any proceeds received by the InvIT from any sale of any Infrastructure Assets or any Holdco / SPV or any shares or interest in the Holdco or SPV or the other Investments held by the InvIT in accordance with the InvIT Regulations. In such circumstances, the Investment Manager shall not be required to distribute any amounts retained for re-investment to the Unitholders.
- (q) Power to effect compromises: The Investment Manager shall have the power to:
  - (i) accept any property before the time at which it is transferable or payable;
  - (ii) accept any composition or any security movable or immovable for any equity or other property;
  - (iii) allow any time of payment of any equity; and
  - (iv) compromise, compound, abandon, submit to arbitration or otherwise pay and settle any equity account, claim or thing whatsoever relating to the InvIT or SPV/ Holdco under the Investment Manager Agreement.
- (r) Power to make policies: The Investment Manager may, make internal policies to generally evolve, formulate and adopt from time to time such policies and procedures as may be conducive for the effective administration and management of the InvIT and the attainment of the InvIT Objectives, in accordance with the InvIT Documents and the InvIT Regulations. In particular, and without prejudice to the generality of such power, the Investment Manager may provide for all or any of the following matters namely:
  - (i) norms of investment by the InvIT in accordance with the InvIT Objectives and in accordance with the powers and authorities of the Trustee as set out in the Deed and those delegated to the Investment Manager;
  - (ii) matters relating to entrustment / deposit or handing over of any documents, etc. pertaining to the Investments of the InvIT in the Holdco/ SPVs or other assets, to one or more Custodians and the procedure relating to the holding thereof by the Custodian;
  - (iii) such other administrative, procedural or other matters relating to the administration or management of the affairs of the InvIT thereof and which matters are not by the very nature required to be included or provided for in the Deed or the Investment Manager Agreement;
  - (iv) procedure for seeking approval of the Unitholders in compliance with the InvIT Regulations; and
  - (v) procedure for summoning and conducting of meetings of Unitholders.

Provided that, in case of any inconsistencies between the rules or policies framed by the Investment Manager under the Trust Deed and the InvIT Documents, the terms of the InvIT Documents shall prevail.

- (s) Power to insure property: The Investment Manager shall arrange for and ensure that assets forming part of the Trust Fund are adequately insured. The Investment Manager shall (as applicable), out of the Trust Fund, pay the requisite premiums in relation to the insurances procured for the assets forming part of the Trust Fund directly held by the InvIT and shall ensure that the Holdco/ SPVs (as applicable) pay the requisite premiums in relation to the insurances procured for their respective assets.
- (t) Power to restrict right to inspect: Subject to Applicable Law, the Trustee acknowledges that no Unitholder (acting in its capacity as a Unitholder) shall be entitled to inspect or examine the InvIT's premises or properties without the prior written permission of the Investment Manager. Further, no Unitholder (acting in its capacity as a Unitholder) shall be entitled to require discovery of any information with respect to any detail of the InvIT's activities or any matter which may be related to the conduct of the business of the InvIT.
- (u) Power to buyback Units: The Investment Manager may facilitate the redemption of Units, return of capital to the Unitholders and / or buyback of Units from the Unitholders by the InvIT in any manner in accordance with Applicable Law.
- (v) Other powers: The Investment Manager shall also have the following powers and authorities, subject to the terms of the InvIT Regulations:
  - (i) to pay or satisfy or to compromise or compound upon such terms which the Investment Manager may deem expedient, any debt or damages owing to or claimed by or from the InvIT or for which the InvIT may or may be alleged to be liable in respect of the transactions done by the Investment Manager under the InvIT;
  - (ii) to make and give receipts, releases and other discharges for moneys payable to the InvIT and for the claims and demands made or to be made by the InvIT;
  - (iii) negotiate and execute contracts, and/or terminate or modify such contracts and do all such acts, deeds and things for or on behalf of or in the name of the InvIT as the Investment Manager may consider expedient for managing the InvIT (including without limitation entering into Asset Acquisition Agreements for acquisition of assets or entities that are to be included as SPVs under the InvIT, indemnity agreements, deed of right of first offer and refusal, escrow agreements, debt documentation, underwriting agreements, any investment pooling agreement, agreement relating to strategic investments, co-investment agreements, brand licensing agreements or such other agreements as may be required to be executed by the InvIT);
  - (iv) to vary, alter, postpone, extend or cancel the terms and conditions of agreements in relation to the Investments, as entered into with the relevant parties, such as the SPVs;
  - (v) to ascertain, appropriate, declare and distribute or reinvest the surplus in the Trust Fund in compliance with the InvIT Regulations, to determine and allocate income, profits, gains and expenses in respect of the InvIT to and amongst the Unitholders;
  - (vi) to open one or more bank accounts for the purposes of the InvIT, to deposit and withdraw money and fully operate the same;
  - (vii) to sign, seal, execute, deliver and register according to law all deeds, documents, and assurances in respect of the InvIT;
  - (viii) along with the Trustee, initiate, prosecute and/or defend any action or other proceedings in any court of law or through arbitration or in any other manner for recovery of debts or sums of money, for any claim, actions or suits in respect of and pertaining to the InvIT, right, title or interest in the assets forming part of the Trust Fund or any other matter in connection therewith, and to discontinue or settle any of the above, as the Investment Manager shall in its best judgment or discretion deem fit;

- (ix) to sign and verify all written statements, petitions, appeals, declarations, revisions and applications in connection with any proceedings and have the power to refer any claim to arbitration and to perform, observe and challenge the awards;
- (x) to issue Statement of Accounts to the Unitholders on behalf of the Trustee;
- (xi) to retain and pay to the relevant Governmental Agencies, any amounts that the Trustee or the Investment Manager is required to, or may deem prudent to, withhold from the amounts to be distributed to the Unitholders;
- (xii) to open and operate demat accounts for the InvIT to hold the Investments (where applicable);
- (xiii) to set up such systems and procedures, and submit such reports, as may be required by the Trustee as necessary for effective monitoring of the functioning of the InvIT; and

generally to exercise all such powers as it may be required to exercise under the InvIT Regulations for the time being in force and do all such matters and things as may promote the InvIT Objectives or as may be incidental to or consequential upon the discharge of its functions and the exercise and enforcement of all or any of the powers and rights under the Investment Manager Agreement and the InvIT Regulations

## 2. *Duties of the Investment Manager*

The Investment Manager shall perform its duties as required under the Investment Management Agreement in accordance with the InvIT Regulations, including but not limited to:

- (a) **Duty to manage the InvIT:** The Investment Manager shall coordinate with the Trustee, as may be necessary, with respect to the operations of the InvIT. The Investment Manager shall undertake the management of the InvIT Assets including all decisions in relation to the administration and operation of the InvIT and the Trust Fund as may be incidental and necessary for the advancement or fulfilment of the InvIT Objective.
- (b) **Duty to undertake valuation:** The Investment Manager shall have the InvIT Assets valued by an independent valuer and submit the same to the Trustee and Unitholders either electronically or through physical copies, or to the extent applicable, to the Stock Exchange in such form and within the timeframes as prescribed in the InvIT Regulations (including particularly Regulation 21 therein). The Investment Manager shall ensure that the computation and declaration of Net Asset Value of the InvIT is undertaken based on the valuation done by the Valuer and to the extent applicable, declared to the Stock Exchange, in accordance with the InvIT Regulations.
- (c) **Insurance:** The Investment Manager shall maintain adequate insurance coverage for the InvIT Assets comprised in the Trust Fund in accordance with the InvIT Regulations (and as may be required under the InvIT Documents or any material contracts entered into by HoldCo/SPVs and/or the InvIT in relation to the InvIT Assets) and shall ensure that assets (including the Infrastructure Assets) held by the SPVs and the Holdco are adequately insured.
- (d) **Accounts, audit and reporting:** The Investment Manager shall maintain (for such periods as may be prescribed under the InvIT Regulations) proper books of accounts, documents and records with respect to the InvIT, in the manner set out in the Deed, to give a true, fair and accurate account of the investments, expenses, earnings, profits, etc. of the InvIT. The Investment Manager shall ensure that audit of the accounts of the InvIT by the Auditors is undertaken in accordance with the InvIT Regulations and its report is submitted to the Trustee and Unitholders either electronically or through physical copies, or to the extent applicable, to the Stock Exchange in such form and within the time period specified in the InvIT Regulations.
- (e) **Distributions:** The Investment Manager shall declare Distribution to Unitholders in accordance with Regulation 18 of the InvIT Regulations and the InvIT Documents. Subject to Applicable Law, such percentage of the Net Distributable Cash Flows of the Holdco/ SPVs shall be

distributed to the InvIT/ HoldCo. and such percentages of the Net Distributable Cash Flows of the InvIT shall be distributed to the Unitholders (in the ratio of the Beneficial Interest of the Unitholders), and within such time periods, as may be prescribed in the InvIT Regulations. The Investment Manager shall maintain a record (for such periods as may be prescribed by the InvIT Regulations) of the Distributions declared and made to the Unitholders.

- (f) Meeting of Unitholders:
  - (i) The Investment Manager shall convene meetings of the Unitholders in accordance with the InvIT Regulations (including specifically Regulation 22 therein) and maintain records pertaining to the meetings in accordance with the InvIT Regulations (including specifically Regulation 26 therein).
  - (ii) The Investment Manager shall convene meetings of the Unitholders at least once every year within requisite number of days from the end of a financial year (as prescribed under the InvIT Regulations) with the period between such meetings not exceeding such number of months as is prescribed under the InvIT Regulations.
  - (iii) The Investment Manager shall be responsible for all the activities pertaining to conducting of meeting of the Unitholders, subject to overseeing by the Trustee in all cases other than where the meetings are on issues pertaining to the Trustee. Provided that, for Unitholder meeting related to issues related to Investment Manager such as change, removal or Change in Control of the Investment Manager, the Unitholder meetings shall be convened and conducted by the Trustee.
- (g) Change in control: The Investment Manager shall intimate the Trustee prior to any Change in Control of the Investment Manager to enable the Trustee to seek approval from the Unitholders and SEBI (to the extent applicable) in this regard and shall ensure that any change is given effect to in compliance with the provisions of the InvIT Regulations and Applicable Law.
- (h) Monitoring: The Investment Manager will monitor the InvIT, including monitoring financial position of the InvIT and the Trust Fund including the Holdco / SPVs. The Investment Manager shall place before its Board of Directors (and/or any committee(s) constituted by the Board of Directors), a report on the activity and performance of the InvIT, in accordance with and in the manner and at the frequency prescribed in the InvIT Regulations. The Investment Manager shall designate an employee from the Core Team as the compliance officer for monitoring of compliance with the InvIT Regulations and any circulars or guidelines issued thereunder and intimating the SEBI in case of any non-compliance.
- (i) Maintenance of records: The Investment Manager shall maintain records pertaining to the activity of the InvIT in terms of the InvIT Regulations (including specifically Regulation 26 therein).
- (j) Duty in relation to the InvIT Objectives: The Investment Manager shall manage the InvIT in accordance with the InvIT Regulations and the InvIT Objectives, and shall ensure that the Investments made by the InvIT are in accordance with the applicable investment conditions enumerated in the InvIT Regulations, in accordance with the InvIT Objectives and the Investment Strategy.
- (k) Activities of the Project Manager: The Investment Manager shall oversee activities of the Project Manager with respect to compliance with the InvIT Regulations and the Project Management Agreement and shall obtain a compliance certificate from the Project Manager, in the form as may be specified under the InvIT Regulations, on a quarterly basis.
- (l) Conflict of Interest: The Investment Manager shall review the transactions carried out between the Project Manager and its Associates and where the Project Manager has advised that there may be a conflict of interest, shall obtain confirmation from the practicing chartered accountant or the Valuer, as applicable, that such transaction is on arm's length basis.

- (m) Redressal of Complaints: The Investment Manager shall ensure adequate and timely redressal of all Unitholders' grievances pertaining to the activities of the InvIT in accordance with Applicable Laws.
- (n) Submissions to Trustee: The Investment Manager shall submit to the Trustee:
  - (i) quarterly reports on the activities of the InvIT including receipts for all funds received by it and for all payments made, status of compliance with the InvIT Regulations, specifically, to the extent applicable, Regulations 18, 19 and 20 therein, performance report, status of development of under-construction projects, within the time periods specified under the InvIT Regulations;
  - (ii) valuation reports as required under the InvIT Regulations within the time period specified under the InvIT Regulations;
  - (iii) decision to acquire or sell or develop or bid for any asset or project or expand existing completed assets or projects along with rationale for the same;
  - (iv) details of complaints received from the Unitholders and their redressal of the complaints;
  - (v) details of any action which requires approval from the Unitholders as may be stipulated under the InvIT Regulations;
  - (vi) details of transactions it enters into with its Associates;
  - (vii) details of any breach of the investment conditions specified under the InvIT Regulations on account of market movements of the price of the Investments;
  - (viii) details of any borrowings exceeding such percentage of the value of the Trust Assets as may be prescribed by the InvIT Regulations on account of market movements of the price of the Investments;
  - (ix) details of any other material fact including change in its directors, change in its shareholding, any legal proceedings that may have a significant bearing on the activity of the InvIT, within the time period specified under the InvIT Regulations; and
  - (x) such other information, document, reports and records as pertaining to the activities of the InvIT as may be reasonably necessary for the Trustee with respect to its responsibilities under the Deed or for effective monitoring of the functioning of the InvIT or the InvIT Regulations and as may be required by the SEBI, or stock exchanges (as applicable) or any other Governmental Agency, with respect to the activities carried on by the InvIT.

In the event the Investment Manager fails to timely submit to the Trustee the foregoing information, the Trustee shall intimate SEBI of such failure.

- (o) Issue and Listing of Units: The Investment Manager shall be responsible for all activities pertaining to the issue of the Units and listing of the Units (to the extent applicable), in accordance with the InvIT Regulations and other Applicable Laws, including:
  - (i) preparation of the draft Placement Memorandum or Offer Document (as the case may be) in compliance with the provisions of the InvIT Regulations and other Applicable Law;
  - (ii) filing of the Placement Memorandum with the SEBI and the stock exchanges, if so required, within the prescribed time period;

- (iii) filing of the Offer Document with the SEBI and the stock exchanges within the prescribed time period;
  - (iv) to ensure that the merchant banker and all other service providers as may be appointed for listing of the Units, comply with the InvIT Regulations, as applicable;
  - (v) dealing with all matters up to allotment of Units to the Unitholders;
  - (vi) obtaining in-principle approval, and final listing and trading approvals from the stock exchanges;
  - (vii) ensuring that the minimum Public holding of the Units of the InvIT, value of the assets of the InvIT and number of Unitholders forming part of the Public, is at all times after listing in accordance with the InvIT Regulations; and
  - (viii) dealing with all matters relating to the issue of the Units and listing of the Units (to the extent applicable) as specified under the InvIT Regulations and any guidelines as may be issued by SEBI in this regard. The Investment Manager (together with the merchant bankers, if applicable) shall be responsible to ensure that all relevant provisions of the InvIT Regulations and other Applicable Law have been complied with and all statements and disclosures made in the Placement Memorandum or Offer Document (as the case may be) comply with the InvIT Regulations and other Applicable Law, contain material, true, correct, not misleading and adequate disclosures in order to enable the investors to make an informed decision, do not provide guaranteed returns to the investors, not be misleading and not contain any untrue statements or mis-statements and shall include such other disclosures as may be specified by the SEBI.
- (p) **Delisting of Units:** If the Units of the InvIT are listed, then in case of the occurrence of any event specified in Regulation 17(1) of the InvIT Regulations, the Investment Manager shall apply for delisting of Units of the InvIT to SEBI and the Stock Exchange in accordance with the InvIT Regulations and Applicable Law.
  - (q) **Submission of half yearly and annual report:** The Investment Manager shall within the time period prescribed under the InvIT Regulations, submit half yearly, annual reports and valuation report to the Trustee and all the Unitholders electronically or by physical copies, and to the extent applicable, to the stock exchanges, in the manner required under Applicable Law and the InvIT Documents.
  - (r) **Compliance Certificate:** The Investment Manager shall provide a compliance certificate to the Trustee on a quarterly basis in accordance with the InvIT Regulations.
  - (s) **Continuous disclosures to the stock exchanges:** To the extent applicable, the Investment Manager shall, in accordance with the requirements of the InvIT Regulations, and other Applicable Laws, including any requirements prescribed by the SEBI or the stock exchanges, from time to time, disclose to the stock exchanges any information having a bearing on the operation or performance of the InvIT as well as price sensitive information and other information that is required in terms of the InvIT Regulations and Applicable Law (including particularly the requirements under Regulation 23(6) of the InvIT Regulations).
  - (t) **Title to the Trust Assets:** The Investment Manager shall ensure that the InvIT Assets have proper legal title, if applicable, and that all the material contracts entered into on behalf of the InvIT or the Holdco/SPV are legal, valid, binding and enforceable by and on behalf of the InvIT or the Holdco/SPV.
  - (u) **Related Party Transactions:**
    - (i) The Investment Manager (along with the Trustee) shall ensure that all Related Party Transactions in relation to the InvIT are on an arms-length basis as per the InvIT Regulations and are consistent with the Investment Strategy and InvIT Objectives of

the InvIT and shall be disclosed to the Unitholders and the Stock Exchange (if applicable) periodically in accordance with the InvIT Regulations and to the extent applicable, the listing agreement of the InvIT. Details of fees and commissions received by Related Parties are required to be disclosed to Unitholders and the Stock Exchange (if applicable), in accordance with the InvIT Regulations.

- (ii) Transactions between the InvIT and another infrastructure investment trust which has a common investment manager or sponsor shall, under the InvIT Regulations, be deemed to be Related Party Transactions for each of the InvIT and the other infrastructure investment trust. This shall also apply if the investment managers or sponsors of the infrastructure investment trusts are different entities but are Associates.
- (v) Other Duties: Without prejudice to any other provision of the Investment Manager Agreement or the InvIT Documents, the Investment Manager will also have the following duties and obligations:
- (i) maintain regular interaction with the Trustee on performance of the InvIT and providing the Trustee with any information in relation to the operations of the InvIT, as maybe required;
  - (ii) keep the Unitholders updated on investment activities of the InvIT in compliance with the InvIT Regulations and in accordance with the terms of the InvIT Documents;
  - (iii) collecting all dividends, fees, property and other payments due and receivable by the InvIT, and declaring Distribution to the Unitholders in the manner set out in the Deed and in terms of the InvIT Regulations;
  - (iv) ensuring that no commission or rebate or any other remuneration or payment, by whatever name called, arising out of a transaction pertaining to the InvIT is collected by itself or its Associates, other than as specified in the Placement Memorandum or the Offer Document (as the case may be) or any other document as may be specified by SEBI for the purpose of the issue of units of an infrastructure investment trust;
- (w) other than to the extent disclosed in the Placement Memorandum or Offer Document (as the case may be), to ensure that the Infrastructure Assets of the InvIT or the Holdco / SPVs have proper legal titles, if applicable, and that all the material contracts entered into on behalf of the InvIT or the SPVs or the Holdco are legal, valid, binding and enforceable by and on behalf of the InvIT or the SPVs or the Holdco, as applicable;
- (i) to ensure that it has and continues to have adequate infrastructure and sufficient key personnel with adequate experience and qualification to undertake management of the InvIT;
  - (ii) agrees to undertake/ assist Trustee in undertaking all the compliances including signing and verifying any Tax returns that the InvIT may be required to file under the Applicable Law;
  - (iii) to ensure that all activities of management of the InvIT and the InvIT Assets and the activities of the intermediaries or agents or service providers appointed by the Investment Management for such management are in accordance with the InvIT Regulations or any guidelines or circulars issued thereunder;
  - (iv) to ensure that any possible conflict of interest involving its role as Investment Manager is reported to the Trustee;
  - (v) to ensure that disclosures or reporting to the Unitholders, the SEBI, the Trustee, and to the extent applicable, the stock exchanges, are in accordance with the InvIT Regulations, guidelines or circulars issued under the InvIT Regulations and any other Applicable Laws;

- (vi) (provide SEBI, Trustee, and the stock exchanges where applicable, such information as may be sought by SEBI or by the Trustee or stock exchanges (as applicable), pertaining to the activities of the InvIT;
- (vii) ensure the compliance with laws, as may be applicable, of the state or the local body with respect to the activity of the InvIT including local building laws;
- (viii) in consultation with the Trustee, to appoint the majority of the board of directors or the governing board of the Holdco and/or SPVs, as applicable;
- (ix) ensure that the InvIT does not undertake lending to any Person other than the Holdco/ SPV(s) in which the InvIT has invested in, subject to disclosures required to be made in accordance with the InvIT Regulations. Provided that, Investment in debt securities shall not be considered as lending;
- (x) ensure that no scheme is launched under the InvIT;
- (xi) to inform the Trustee in writing about any change in the representations and warranties provided by it as per the Trust Deed;
- (xii) to ensure that it does not take or refrains from taking any measures, that will adversely impact the benefits available to the InvIT, including on account of being an infrastructure investment trust registered with the SEBI;
- (xiii) taking any other actions reasonably incidental to any of the foregoing or necessary or convenient in order to fully effect or evidence any action or transaction contemplated under the Investment Manager Agreement; and
- (xiv) to fulfil any other duty, obligation and responsibility that may be required of the Investment Manager, in accordance with, and within the timelines prescribed under (if any) the provisions of the InvIT Regulations.
- (xv) The Investment Manager shall provide to the Trustee such assistance as may be required by the Trustee in fulfilling its obligation towards the InvIT under Applicable Law or as may be required by any regulatory authority with respect to the InvIT.

### 3. *Liabilities of the Investment Manager*

The liabilities of the Investment Manager in terms of the Investment Management Agreement are as follows:

- (a) **Bona fide action by the Investment Manager:** The Investment Manager shall not be liable in respect of any action taken or damage suffered by the Unitholders on reliance upon any notice, resolution, direction, consent, certificate, affidavit, statement, certificate of stock, plan of reorganization or (without being limited in any way by the foregoing) other paper or document believed to be genuine in good faith and to have been passed, sealed or signed by appropriate Governmental Agencies or authorised Persons (as the case may be).
- (b) **Acts or things required to be done by the Investment Manager under law:** Notwithstanding anything to the contrary contained herein, the Investment Manager shall not incur any liability for any act or omission, as the case may be, which by reason of any:
  - (i) Force Majeure;
  - (ii) provision of Applicable Law or regulation made pursuant thereto;
  - (iii) decree, order or judgment of any court; or

- (iv) request, announcement or similar action (whether of binding legal effect or not) which may be taken or made by any Person or body acting with or purporting to exercise the authority of any Governmental Agency (whether legally or otherwise),

the Investment Manager has been directed or requested to do or perform or to forbear from doing or performing. In such event, if for any reason it becomes impossible or impracticable to carry out any of the provisions of the Investment Manager Agreement, the Investment Manager shall not be liable for the same. However, the Investment Manager shall duly inform the Trustee and the Unitholders of the same.

- (c) Assets received by the Investment Manager: The Investment Manager shall only be liable or responsible for such monies, stocks, funds, shares, assets, investments, properties or securities as the Investment Manager shall have actually received and shall not be liable or responsible for any banker, broker, administrator, custodian or other Person in whose hands the same may be deposited or placed, nor for the deficiency or insufficiency in the value of any Investments of the InvIT nor otherwise for any involuntary loss. Any receipt signed by the Investment Manager for any monies, stocks, funds, shares, assets, securities, investments or properties, paid, delivered or transferred to the Investment Manager under or by virtue of the presents or in exercise of the duties, functions and powers of the Investment Manager shall effectively discharge the Investment Manager or the Person or Persons paying, delivering or transferring the same therefrom or from being bound to see to the application thereof, or being answerable for the loss or misapplication thereof, provided that the Investment Manager and such Persons shall have acted in good faith, without negligence (to be finally determined by a court of competent jurisdiction) and shall have used their reasonable best efforts in connection with such dealings and matters.
- (d) Acts done in good faith: The Investment Manager shall not be under any liability on account of anything done or omitted to be done by the Investment Manager in good faith.
- (e) Information regarding the InvIT /Unitholders, etc.: If the Investment Manager is required by any Governmental Agency or under the InvIT Regulations or any Applicable Law to provide information regarding the InvIT and/or the Unitholders, the Investments and income therefrom and provisions of these presents and complies with such request in good faith, whether or not the request was in fact justified, the Investment Manager shall not be liable to the Unitholder or any of them or to any other party as a result of such compliance or in connection with such compliance. However, if so required under Applicable Law, the Investment Manager shall duly inform the Trustee and the Unitholders about the same.
- (f) Depletion in the value of the InvIT corpus: The Investment Manager shall not incur any liability for any act or omission which may result in a loss to a Unitholder (by reason of any depletion in the value of the Trust Fund, for the non-recoverability or non-realizability of any of the Investments or other assets forming part of the Trust Fund or otherwise), except in the event that such loss is a direct result of Disabling Conduct on the part of the Investment Manager.
- (g) Suits, proceedings or claims against the Trust: The Investment Manager shall not be under any obligation to institute, acknowledge the service of, appear in, prosecute or defend any action, suit, proceedings or claim (including Tax proceedings) in respect of the provisions of the Investment Manager Agreement or other InvIT Documents in respect of the Investments or any part of such Investments or any corporate or shareholders' action which in its opinion would or might involve expense or liability unless it is satisfied that the value of the Investment is sufficient to provide adequate indemnity against costs, claims, damages, expenses or demands to which it may be put as the trustee as a result thereof.
- (h) Refund: The Investment Manager, in consultation with the Trustee shall:
  - (i) In case the InvIT has raised funds through a Public Issue, cause the InvIT to refund money:
    - (I) to all the applicants, in case the InvIT fails to collect subscription of the

requisite percentage of fresh issue size as specified in the Offer Document;

- (II) to the applicants to the extent of the over subscription, in case the moneys received is in excess of the permissible over subscription as specified in the Offer Document, such that the money shall be refunded to the extent of the oversubscription;

Provided that, the right to retain such over subscription cannot exceed the maximum permissible percentage of the issue size as prescribed under the InvIT Regulations.

Provided further, that the Offer Document shall contain adequate disclosures towards the utilisation of such oversubscription proceeds for purposes permitted under the InvIT Regulations (being any purpose other than general purposes);

- (III) to all the applicants, in case the number of subscribers to the initial Public Issue forming part of the Public is less than the requisite minimum number, as prescribed by the InvIT Regulations.

- (ii) In case of non-receipt of listing permission or withdrawal of the observation letter issued by the SEBI, wherever applicable, cause the InvIT to refund the subscription monies, if any to the respective allottees of such units.

- (i) Investment Manager entitled to reimbursement: If the Investment Manager engages any external advisors or experts (in accordance with the InvIT Documents), to discharge its obligations under the presents, or undertakes any work (in the interest of the Unitholders) which is not covered within the scope of work of the Investment Manager under these presents and such additional work is beyond the obligations of the Investment Manager under Applicable Laws, the Investment Manager shall be entitled to recover such costs, charges and expenses which the Investment Manager may incur in this regard, from the funds of the InvIT.
- (j) Interest for Delayed Listing, Allotment or Refund: If the Investment Manager fails to allot or list the Units or refund the money (as the case may be) within the time prescribed under the InvIT Regulations, then the Investment Manager shall pay interest to the Unitholders at the rate specified under the InvIT Regulations, till such allotment or listing or refund, and such interest shall not be recovered in the form of fees or any other form payable to the Investment Manager by the InvIT.
- (k) Distribution: If the Distributions after declaration are not made within the period prescribed in the InvIT Regulations, the Investment Manger shall be liable to pay interest to the Unitholders at the rate as may be prescribed in the InvIT Regulations or other Applicable Laws, until the Distribution is made, and such interest shall not be recovered by the Investment Manager in the form of fees payable to the Investment Manager by the InvIT or in any other form.
- (l) Authenticity of signature and seal: The Investment Manager shall not be liable to any Unitholder for the authenticity of any signature or of any seal affixed to any endorsement or other document affecting title to or the transmission of the Units or interests in the Units or interests in the InvIT or of any Investments or be in any way liable for any forged or unauthorized signature or seal affixed to such endorsement, transfer or other document or for acting upon or giving effect to any such forged or unauthorized signature or seal. The Investment Manager shall be bound to require that the signature of any Unitholder to any document required to be signed by such Unitholders, under or in connection with these presents, shall be verified to the Investment Manager's reasonable satisfaction.
- (m) Limited Liability: The Investment Manager shall not be personally liable for any losses (including indirect or consequential losses), costs, damages or expenses incurred in any way arising from anything which the Investment Manager does or fails to do during the course of discharge of its duties as an Investment Manager to the InvIT. Further, the liability of the

Investment Manager during each financial year shall not exceed the fees received by the Investment Manager as Investment Management Fees.

3.2 The Investment Manager shall not be liable for any failure or delay in performing its obligations or duties under the Investment Manager Agreement, if and to the extent that such failure or delay is caused by a Force Majeure event.

4. *Indemnity*

The Investment Manager, its affiliates and their respective officers, Board of Directors, employees, advisors and agents (“Indemnified Parties”) shall be indemnified (by the Trustee), out of the Trust Fund against any claims, losses, costs, damages, liabilities, suits, proceedings and expenses, including legal fees (“Losses”) incurred by them by reason of their activities on behalf of the InvIT, unless such Losses resulted from Disabling Conduct of such Indemnified Parties.

The right of any Indemnified Party to indemnification as provided under the Investment Manager Agreement and other the InvIT Documents shall be cumulative of, and in addition to, any and all rights to which such Indemnified Party may otherwise be entitled by contract or as a matter of law or equity and will extend to such Indemnified Party’s successors, assigns and legal representatives.

5. *Termination*

The Investment Manager Agreement (along with the appointment of the Investment Manager), may be terminated:

- (a) by the Investment Manager, by delivery of a written notice to the Trustee at any time, subject to the approval of the Unitholders and SEBI (as applicable) in accordance with the InvIT Regulations; or
- (b) by the Trustee, by delivery of a written notice to the Investment Manager, upon the bankruptcy of the Investment Manager; or
- (c) if winding up or liquidation proceedings are commenced against the Investment Manager; or
- (d) if a receiver is appointed to all or a substantial portion of the assets of the Investment Manager; or
- (e) if SEBI does not grant a certificate of registration to the InvIT, in accordance with the InvIT Regulations; or
- (f) if SEBI cancels the registration of the InvIT; or
- (g) if the InvIT is wound up; or
- (h) subject to receipt of approval from the SEBI (if applicable), by the Trustee upon resolution of the Unitholders by requisite majority as specified in the InvIT Regulations, for removal of the Investment Manager (which resolution shall identify the grounds for removal), by delivery of a written notice to the Investment Manager (with a certified true copy of the Unitholder resolution). Simultaneously with or promptly after requisition for the meeting of the Unitholders for removal of the Investment Manager, the Trustee shall notify the Investment Manager of the meeting and the grounds on which the Investment Manager’s removal is proposed. The Investment Manager will be given a reasonable opportunity to refute the grounds for removal and represent the same before a meeting of the Unitholders; or
- (i) subject to receipt of approval from the Unitholders and SEBI (if applicable) in accordance with the InvIT Regulations, by the Trustee if it deems it necessary, by delivery of a written notice to the Investment Manager identifying grounds for removal. Prior to seeking approval from SEBI and the Unitholders as aforesaid, the Trustee shall give reasonable opportunity to the Investment Manager (in any case with no less than a 90 (Ninety) day period calculated from the date of

receipt of the aforesaid written notice by the Investment Manager) to refute the grounds for removal before the Trustee and the Unitholders at their meeting convened for this purpose.

Upon termination of the appointment of the Investment Manager:

- (i) the Trustee shall appoint a new investment manager within such time periods of termination of the earlier investment management agreement, as may be specified in the InvIT Regulations. The Investment Manager shall be required to remain in office and continue to discharge the role of the Investment Manger under the Investment Manager Agreement, until the appointment of a new investment manager. Notwithstanding its termination, the Trustee shall ensure that the outgoing Investment Manager continues to be liable for all its acts and omissions and commissions until the termination is effected and the outgoing Investment Manager vacates its office;
- (ii) every new investment manager appointed shall have the powers, authorities and discretion, and shall in all respects act and be liable as if originally appointed as an investment manager under the Investment Manager Agreement. The Trustee shall also ensure that the new investment manager stands substituted as a party in all documents to which the Investment Manager was a party.
- (iii) the Investment Manager shall transfer all correspondence and records relating to the InvIT, which the Investment Manager possesses, to the new investment manager;
- (iv) the Parties in relation to whom the Investment Manager Agreement has terminated, shall (except for any rights accruing or liability/obligations arising before or in relation to such termination and except as otherwise provided herein including payment of any outstanding Investment Management Fees) be released and discharged from their respective obligations under or pursuant to the Investment Manager Agreement; and
- (v) prior to or failing which, simultaneously with the vacating of its office by the Investment Manager, the Investment Manager shall be paid its Investment Management Fees such that there is no outstanding amount payable any more.

#### ***Board of Directors of the Investment Manager***

The board of directors of Virescent Infrastructure is entrusted with the responsibility for the overall management of the Investment Manager. Please see below the details in relation of the board of directors of the Virescent Infrastructure:

<b>Sr. No.</b>	<b>Name</b>	<b>Age (years)</b>	<b>DIN</b>	<b>Designation</b>
1.	Mr. Hardik Bhadrik Shah	37	06648474	Non-Executive Director
2.	Mr. Sanjay Grewal	54	01971866	Executive Director
3.	Mr. Panja Pradeep Kumar	66	03614568	Independent Non-Executive Director
4.	Mr. Akshay Jaitly	55	00042036	Independent Non-Executive Director
5.	Ms. Daisy Devassy Chittilapilly	49	09577569	Independent Non-Executive Director
6.	Mr. Aditya Narayan	70	00012084	Non-Executive Director

#### ***Brief profiles of the Directors of the Investment Manager***

Please see below brief profiles of the directors of the Investment Manager:

**Mr. Hardik Bhadrik Shah**, aged 37 years, is a non-executive director on the board of the Investment Manager since August 22, 2020. He holds a bachelor's degree in management studies from University of Mumbai and a post graduate diploma in business management from S.P Jain Institute of Management & Research. He is also a Chartered Financial Analyst as recognised by the CFA Institute. He was previously associated with companies

including Brookfield Advisors India Private Limited, Macquarie Infrastructure and Real Assets (India) Private Limited, Macquarie Capital (India) Private Limited, Macquarie Corporate Holdings Pty Limited, Macquarie Bank Limited and is a Partner at KKR India Advisors Private Limited.

**Mr. Sanjay Grewal**, aged 54 years, is an executive director on the board of the Investment Manager since September 1, 2020. He is also the chief executive officer of the Investment Manager. He holds a master's degree in business administration from University of Hartford and a bachelor's degree in commerce from Shri Ram College of Commerce. He has over 2 decades of experience and is previously associated with companies including Altico Capital India Limited, Citicorp International Limited, and Lehman Brothers Asia Holdings Limited. Additionally, he was also associated with the International Finance Corporation as the Regional Head (Principal Investment Officer).

**Mr. Akshay Jaitly** aged 55 years is an independent non-executive director on the board of the Investment Manager since November 12, 2021. He is a Principal at 262 Advisors, based in Paris. He has advised Indian, French and other international businesses with an interest in India on cross-border strategy and risk management. He is also involved with research initiatives on policy reform in the Indian power and infrastructure sectors and writes columns for Bloomberg Quint. He previously worked as a transactional lawyer for over 25 years, in the UK, Japan and India. He was rated as one of India's top energy and Infrastructure lawyers for over a decade. In 2000, he co-founded Trilegal, which has become a leading Indian law firm, and was the head of their energy and infrastructure practice. He remains senior advisor to Trilegal and is a member of their board. Akshay has a bachelors of arts degree in history from St. Stephen's College, Delhi, a master's in international affairs from Columbia University and a law degree from Oxford University.

**Mr. Panja Pradeep Kumar**, aged 66 years, is an independent non-executive director on the board of the Investment Manager since January 8, 2021. He holds a master's degree in science from University of Madras and is a certified associate of the Indian Institute of Banks. He was previously associated with State Bank of India. He is also a director on the board of, amongst others, Shriam Transport Finance Company Limited, Trigyn Technologies Limited, Karnataka Bank Limited and Brigade Enterprises Limited. He has been appointed as the chairman of Karnataka Bank Ltd. for a period of 3 years with effect from November 14, 2021.

**Ms. Daisy Devassy Chittilapilly**, aged 49, is an independent non-executive director on the board of the Investment Manager since April 19, 2022. She is the Vice President of Cisco's India and SAARC Theatre. Before joining Cisco, Daisy worked with Wipro Limited across multiple sales management roles. She also serves on the Executive Council for NASSCOM, and as the Co-Chair on the FICCI National Committee for Artificial Intelligence and Digital Transformation. She is a governing body member of Woxsen University, and an advisory board member of the non-profit 'Dragonflies Everywhere'. She holds a bachelors' degree in technology from the College of Engineering, Trivandrum and holds a post graduate certificate in general management from XLRI, Jamshedpur.

**Mr. Aditya Narayan**, aged 70, is a non-executive director on the board of the Investment Manager since April 22, 2022 and an Independent Director of the board of Sanofi India Limited. He has served as the Managing Director of ICI India as well as its non-executive Chairman. He has also served as the Managing Director of the public listed Hindustan Zinc Limited, the President and Chief Executive Officer and non-executive Chairman of BHP Billiton India. He was also an Independent Director of Hindustan Unilever Limited, non-official Director of LIC Nomura Mutual Fund Asset Management Company Limited, an Independent Director of Linde India Limited, and an Independent Director of Chambal Fertiliser and Chemicals Limited. He also served as a non-executive member of the Supervisory Board of the Anand Group, New Delhi. He holds a bachelors' degree in technology from Indian Institute of Technology, Kanpur. He has also completed his LL.B. from Kanpur University. He has been a university fellow at a masters programme in interdisciplinary sciences at the University of Rochester, New York, United States of America and a commonwealth scholar at the senior executive programme at the Manchester Business School, United Kingdom. He has also attended the leadership seminar at the Aspen Institute, United States of America.

#### ***Other Confirmations***

The Investment Manager confirms that it has, and undertakes to ensure that it will, at all times, maintain, adequate infrastructure, personnel and resources to perform its functions, duties and responsibilities with respect to the management of the Highways Trust, in accordance with InvIT Regulations, the Investment Management Agreement and applicable law. None of the directors of the Investment Manager hold or propose to hold any Units in this Issue.

Further, as of the date of this Final Placement Memorandum, the Investment Manager is in compliance with the eligibility criteria provided under Regulation 4 of the InvIT Regulations and is a “fit and proper person” as prescribed under SEBI Intermediaries Regulations.

The Investment Manager is currently acting as the investment manager for the “Virescent Renewable Energy Trust” which has obtained a certificate of registration to operate as an infrastructure investment trust from SEBI on February 25, 2021, bearing registration number IN/InvIT/20-21/0018.

#### ***Details of the Holding or the Proposed Holding by the Investment Manager in the Highways Trust***

Virescent Infrastructure does not propose to hold any Units of the Highways Trust.

#### ***Brief profiles of the key personnel of the Investment Manager***

In addition to Mr. Sanjay Grewal, whose details is provided in above in the section entitled “*Parties to the Highways Trust - Brief profiles of the Directors of the Investment Manager*” on page 131, the details of the other key personnel of the Investment Manager are set forth below:

**Mr. Parin Mehta**, aged 41 years, is the chief financial officer of Virescent Infrastructure. He holds a bachelor’s degree in commerce from University of Mumbai and is an affiliate member of the Association of Chartered Certified Accountants. He has over 18 years of experience in investment banking, corporate finance and project finance functions having been previously associated with companies including Edelweiss Financial Services Limited, PricewaterhouseCoopers Private Limited, IDFC Group, Standard Chartered Bank, Morgan Stanley Advantages Services Private Limited, and Grant Thornton India Private Limited.

**Mr. Atul Raizada**, aged 52 years, is the chief operating officer of Virescent Infrastructure. He holds a bachelor’s degree in Electronics Engineering from Nagpur University. He has further completed various programmes including, senior management programme at the Indian Institute of Management, Indore, finance for non-executives programme at London School of Business. He is also a certified PMP in Operational Excellence from XLRI. He has over 28 years of experience in projects and operations management in the renewable energy sector having been previously associated with Flex Industries Limited, Jindal Poly Films, Orient Press Limited, Converting Services and Supplies, Suzlon Infrastructure Services Limited, Green Infra Limited, Hero Future Energies Private Limited.

#### **D. The Project Manager – Virescent Renewable Energy Project Manager Private Limited**

##### ***History and Certain Corporate Matters***

Virescent Renewable Energy Project Manager Private Limited (“**Virescent Renewable or Project Manager**”) is the Project Manager of the Highways Trust appointed pursuant to the project management agreement entered into amongst the Project Manager, the Trustee, the Investment Manager. (“**Project Management Agreement**”) Virescent Renewable was incorporated as a private limited company in India on November 27, 2020 under the provisions of the Companies Act, 2013 with the corporate identification number U74999MH2020PTC350874. The Project Manager’s registered office and address for correspondence is 10<sup>th</sup> Floor, Parinee Crescenzo, C-30, ‘G’ Block, Bandra Kurla Complex, Bandra (East), Mumbai 400 051, Maharashtra, India. For further details, please see the section entitled ‘*General Information*’ on page 97.

##### ***Background and past experience of the Project Manager***

The Project Manager is responsible for managing and operating the assets of the Highways Trust and undertaking other operational activities of the Highways Trust in accordance with the InvIT Regulations and the Project Management Agreement. The Project Manager has the relevant experience in managing infrastructure assets and shall undertake operations and management through supervision of third party contractors engaged pursuant to the O&M Agreements. The Project Manager shall, if so required by the Trustee (in consultation with the Investment Manager) and the Project SPVs, either directly or through appropriate agents or Contractors, (i) oversee the progress of development, approval status and other aspects of any under-construction projects being executed by the Project SPVs, or any expansion of the Projects, or, of any new project proposed to be executed by the Project SPVs:(ii) provide compliance certificate(s) to the Investment Manager and the Trustee in accordance with Applicable Law, on a quarterly basis, in the form prescribed by the SEBI, if any (iii) seek requisite approval from the relevant Governmental Agency and/ or any third parties, etc.

### ***Other Confirmations***

As of the date of this Final Placement Memorandum, The Project Manager is in compliance with the eligibility criteria provided under Regulation 4 of the InvIT Regulations and is a “fit and proper person” as prescribed under SEBI Intermediaries Regulations.

### ***Key terms of the Project Management Agreement***

The Project Manager shall enter into a Project Management Agreement with the Trustee (acting on behalf of the Highways Trust), Investment Manager, and Project SPVs effective from the date on which the Highways Trust acquires one or more of the Project SPVs, in accordance with the Securities Purchase Agreement, to provide project operations and maintenance services in relation to the Project SPVs. Further, the Project Manager will enter into a deed of adherence with the Trustee (acting on behalf of the Highways Trust), Investment Manager, Project SPVs and the Specified SPVs wherein the Specified SPVs have undertaken that they shall be bound by and shall abide by, the provisions of the project management agreement, as if it was an original party with respect to the terms, conditions, stipulations, obligations, covenants, undertakings, representations and warranties of the “Project SPVs” set out in the project management agreement (project management agreement together with the deed of adherence referred to as “**Project Management Agreement**”). The key terms of the Project Management Agreement are provided below:

1. **Services:** The Trustee, in consultation with the Investment Manager intends to appoint Virescent Renewable as the Project Manager to the InvIT and set out the obligations of the Project Manager with respect to execution and management of the Project SPVs in accordance with the provisions of the InvIT Regulations and the Agreement.
2. **Covenants:**
  - (i) The Project Manager has agreed to certain covenants, including:
    - a) at all times act in good faith;
    - b) provide access to the Trustee (acting on behalf of the Highways Trust) and the Investment Manager to all data and information pertaining to the Project SPVs, in a proper and timely manner, including submission of compliance certificates as may be required under the InvIT Regulations;
    - c) exercise the level of skill, care, attention and diligence as may reasonably be expected of an experienced, professional, prudent and competent third party skilled in providing project management services, such as the Services, in relation to the Project SPVs;
    - d) not cause to be done or taken any act in violation of, or infringing, the Highways Trust Documents or applicable law; and
    - e) discharge all obligations in respect of achieving timely completion of any infrastructure project of the Highways Trust, and wherever applicable, implementation, operation, maintenance and management of such infrastructure project.
  - (ii) In the event of a change in control of the Project Manager, the Trustee (on behalf of the Highways Trust), in consultation with the Investment Manager, shall ensure that it has obtained the written consent of the relevant governmental agencies (and/or any third parties, in each case, if applicable) prior to such change in control.
3. **Duties:** The Project Manager has agreed to undertake certain duties, including:
  - (i) The Project Manager shall undertake operations and management of the Project SPVs and it shall be liable for making arrangements for fulfillment of the Services either directly or through the appointment and supervision of agents and / or Contractors, if any, as may be necessary for discharge of its duties under the terms of the Project Management Agreement and under applicable law.
  - (ii) The Project Manager shall, if so required by the Trustee (in consultation with the Investment Manager) and the Project SPVs, either directly or through appropriate agents or Contractors,

oversee the progress of development, approval status and other aspects of any under-construction projects being executed by the Project SPVs, or any expansion of the Projects, or, of any new project proposed to be executed by the Project SPVs (collectively, the “**SPV Under-construction Projects**”), until their respective completion in accordance with any agreement that may be entered into in this regard, including the supervision of the agents appointed for such purpose. The Project Manager shall discharge its obligations in respect of achieving timely completion, implementation and development of the SPV Under-construction Projects in accordance with the relevant agreements (by whatever name called), the Project Management Agreement and applicable law.

- (iii) The Project Manager shall provide compliance certificate(s) to the Investment Manager and the Trustee in accordance with applicable law, on a quarterly basis, in the form prescribed by the SEBI, if any. The Project Manager acknowledges that the Trustee and the Investment Manager will oversee the activities undertaken by the Project Manager in accordance with the InvIT Regulations and accordingly, the Project Manager shall extend co-ordination as required, to enable the Trustee and the Investment Manager to perform such obligations in accordance with the InvIT Regulation.
- (iv) The Project Manager shall provide the Investment Manager with details of transactions carried out between itself and its associates and disclose any conflict of interest in such cases to the Investment Manager, in accordance with the InvIT Regulations and applicable law.
- (v) The Project Manager shall intimate the Trustee prior to any change in control of the Project Manager to enable the Trustee and the Project SPVs, to seek requisite approval from the relevant governmental agency and/or any third person in accordance with applicable law or the Highways Trust documents, or contracts/agreements with such third parties, if applicable.
- (vi) The Project Manager shall provide to the Trustee and the Investment Manager or to such other person as the Trustee and / or the Investment Manager may direct, all information that may be necessary for each of them to maintain the records of the Highways Trust and as may be required for making submissions to SEBI or other governmental agencies, including with respect to relevant approvals, consents and other documents required in relation to the Project SPVs and the reporting requirements under the InvIT Regulations, in a proper and timely manner, and in the format prescribed (if any), as required by the Trustee and / or Investment Manager.
- (vii) The Project Manager shall ensure that the transactions or arrangement entered into by the Project Manager with any related party is on an arm’s-length basis. The Project Manager shall promptly inform the Trustee and the Investment Manager regarding any actual (or potential) conflict of interest and shall obtain and submit to the Investment Manager a certificate issued by a practicing chartered accountant or a valuer (as applicable) confirming that such transaction is on arm’s length basis.
- (viii) The duties of Project Manager shall also include the following:
  - a) exercising diligence and vigilance in carrying out its duties and protecting the commercial interests of the Project SPVs;
  - b) complying with the InvIT Regulations and take all actions as may be required to be taken in accordance with the InvIT Regulations as applicable to the Project Manager;
  - c) keeping the Investment Manager informed on all matters which have or may have a material bearing on the operations of the Project SPVs;
  - d) where required, liaising with governmental agencies in respect of its obligations under this Project Management Agreement as applicable to the Project Manager;
  - e) taking all reasonable steps to mitigate the risks which may be encountered by the Highways Trust in respect of the Project SPVs;

- f) ensuring compliance with applicable laws, by the Project SPVs;
  - g) keeping proper records of actions taken in respect of the Project SPVs; and
  - h) complying with the instructions of the Investment Manager and the Trustee, in accordance with the InvIT Regulations.
- (ix) The Project Manager shall upon request by the Project SPVs or the Investment Manager, whether during the term or after termination of this Agreement, at its own expense, make the records referred to in in the Agreement, available for inspection and audit (including copies and extracts of records as required) by the relevant Project SPVs and/or the Investment Manager. Such records shall be made available to the relevant Project SPVs and/or the Investment Manager during normal business hours at the office or place of business of the Project Manager upon 3 (Three) days written notice. In the event that no such location is available, then the financial records, together with the supporting or underlying documents and records, shall be made available for audit at a time and location that is convenient for the relevant Project SPVs and/or the Investment Manager. The Project Manager shall ensure that its employees, agents, assigns, successors and subcontractors are aware of the rights of the Project SPVs under this Agreement, and these rights shall be explicitly included in any agreements executed between the Project Manager and/ or any Contractors and or the Project SPVs to the extent those agreements relate to fulfilment of the Project Manager's obligations under the Project Management Agreement.
- (x) The Parties may, from time to time, agree to provisions for additional services to be rendered by the Project Manager. If, in the assessment of the Project Manager, additional services are required for the purposes of carrying out its duties and obligations under this Agreement and applicable law, the Project Manager shall notify the Parties in writing of such requirement, including the fee payable and terms and conditions for such additional services, and obtain prior written approval of the Parties in this regard.
4. **Obligations of the Project SPVs:** The Project SPVs shall ensure that all information reasonably required by the Project Manager or contractor, including with respect to relevant approvals, consents, powers of attorney, authorisations, and other documents required in relation to the Projects, is provided to the Project Manager in a timely manner and without charge, as and when required.
5. **Compensation:** The Project SPVs have agreed to pay the fees, as specified in the Project Management Agreement, to the Project Manager, in consideration of the services provided by the Project Manager. The Service Fees shall be paid on a quarterly basis, or in the manner and process of payment of such fees shall be as mutually determined by the Project Manager and each of the Project SPVs.
6. **Representations and Warranties:**
- (i) Each party represents and warrants to the other Party that as of the date of the Project Management Agreement.
    - a) It has the full power and authority to enter into, execute and deliver the Project Management Agreement and to perform the transactions contemplated thereby and is duly incorporated or organized and validly existing under the laws of the jurisdiction of its incorporation or organization;
    - b) the execution and delivery by it of the Project Management Agreement and the performance by it of the obligations contained herein has been duly authorized by all necessary corporate or other action ;
    - c) The Project Management Agreement constitutes legal, valid and binding obligations, enforceable against it in accordance with its terms, except to the extent such enforceability may be limited by (i) applicable bankruptcy, insolvency, reorganization, moratorium or other laws of general application affecting the enforcement of creditors' rights generally; and (ii) general principles of equity;
    - d) the execution, delivery and performance of the Project Management Agreement by the Party and the consummation of the transactions contemplated hereby will not result in-

- a. a breach of, or constitute a default under, any, agreement or instrument to which it is a party or by which it is bound; or
    - b. violation of its constitutional documents or contravene any provision of any Applicable Law, including but not limited to Anti-Corruption Laws, or any order, writ, injunction or decree of any Governmental Agencies to which the Party may be subject
    - e) no liquidation, dissolution, winding up, commencement of bankruptcy, insolvency, liquidation or similar proceedings, whether voluntary or involuntary, with respect to it is pending or has been pending, or to the knowledge of the Party, threatened.
7. **Representations and Warranties by the Project Manager:** The Project Manager has provided certain representations and warranties, such as:
- (i) no disciplinary action has been taken against it by the SEBI or any other governmental agencies;
  - (ii) neither it nor any of its promoter(s) or directors is debarred from accessing the securities market by the SEBI;
  - (iii) neither it nor any of its promoter(s) or directors is a promoter, director or person in control of any other company or a sponsor, investment manager or trustee of any other InvIT or InvIT which is debarred from accessing the capital market under any order or directions made by the SEBI;
  - (iv) neither it nor any of its promoter(s) or directors is in the list of wilful defaulters published by the RBI;
  - (v) to the best of its knowledge, there are no claims, investigations or proceedings before any governmental agency in progress or, pending against or relating to the Project Manager, which could reasonably be expected to prevent the Project Manager from fulfilling its obligations set out in the Project Management Agreement or arising from the Project Management Agreement ; and
  - (vi) it has no knowledge of any existing ground on which any such claim, investigation or proceeding might be commenced with any reasonable likelihood of success.
8. **Term & Termination:** The Project Management Agreement shall remain effective from the effective date on which the Highways Trust acquires one or more of the Project SPVs, in accordance with the asset acquisition agreements, provided the Project SPVs have executed appropriate deeds of adherence to the Project Management Agreement unless terminated in accordance with the provisions of the Project Management Agreement and the InvIT Regulations:
- (i) automatically, with respect to a particular Project SPV, upon the InvIT ceasing to hold any equity shares of such Project SPV;
  - (ii) by the Investment Manager, after consultation with the Trustee, by delivery of a written notice to the Project Manager at any time (with prior intimation to the Project SPVs), upon breach of any of the terms, covenants, conditions or provisions of the Project Management Agreement by the Project Manager and failure of the Project Manager to remedy the said breach within a period of 30 days or such other period as may be mutually agreed by the Parties, subject to the appointment of a new project manager in accordance with the InvIT Regulations;
  - (iii) by any party, by delivery of a written notice to the other Party upon the bankruptcy of such other Party or if winding up or liquidation proceedings are commenced against such other Party (and such proceedings persist for a period of more than three months);
  - (iv) by the Project Manager, by delivery of a written notice of not less than three months to the Trustee, the Project SPVs and the Investment Manager, subject to InvIT Regulations and applicable law; or
  - (v) on mutual written agreement between the parties for such termination

9. **Indemnity:** The Trustee, the Investment Manager, the Project SPVs and their respective directors, employees, officers and the InvIT (“**Indemnified Parties**”) shall be indemnified by the Project Manager against any actions, claims, suits, proceedings, direct losses (for the avoidance of doubt, does not include indirect, remote, special, punitive and inconsequential losses), costs, damages, liabilities and expenses, including reasonable and documented legal fee from and incurred or suffered by the Indemnified Parties in connection with the breach of any of the terms of the Project Management Agreement by the Project Manager, or arising out of gross negligence, wilful default or fraud on part of the Project Manager, in carrying out its obligations under the Project Management Agreement, the other Highways Trust Documents and applicable law. Notwithstanding anything to the contrary contained herein and/or in any other agreement or writing, the Trustee, the Project SPVs and the Investment Manager acknowledge and agree that the aggregate maximum liability of the Project Manager in any financial year pursuant to any provision of the Project Management Agreement shall cumulatively not exceed the service fee payable to the Project Manager in such financial year in accordance with the terms of the Project Management Agreement, provided further that such aggregate maximum liability shall not be applicable in the event such liability of the Project Manager arises out of any gross negligence, wilful default or fraud of the Project Manager.

***Details of the Holding or the Proposed Holding by Project Manager in the Highways Trust***

The Project Manager does not propose to hold the Units of the Highways Trust.

## **OTHER PARTIES INVOLVED IN THE HIGHWAYS TRUST**

### **The Auditors**

#### ***Background and terms of appointment***

The Investment Manager, in consultation with the Trustee, pursuant to a resolution passed by its Board dated March 13, 2022, has appointed Walker Chandiook & Co LLP as the Highways Trust's Auditor for a period of five years. The Auditor has audited the Special Purpose Combined Financial Statements and have certified the Projections of Revenue from Operations and Cash Flow from Operating Activities, and their report in relation to such Special Purpose Combined Financial Statements dated July 8, 2022 and Projections of Revenue from Operations and Cash Flow from Operating Activities dated July 8, 2022, has been included in this Final Placement Memorandum.

#### ***Functions, Duties and Responsibilities***

The Investment Manager has appointed the auditor of the Highways Trust for a period of five consecutive years

The Investment Manager shall ensure that the auditor carries out an audit of the accounts of the Highways Trust, not less than once a year and such report is submitted to the Unitholders and the Trustee, either electronically or through physical copies.

In accordance with the InvIT Regulations, the auditor of the Highways Trust shall:

- conduct an audit of the accounts of the Highways Trust and draft the audit report based on the accounts examined by him, and after taking into account the relevant accounting and auditing standards, as may be specified by SEBI;
- to the best of its information and knowledge, ensure that the accounts and financial statements give a true and fair view of the state of the affairs of the Highways Trust, including profit or loss and cash flow for the period and such other matters as may be specified;
- have a right of access at all times to the books of accounts and vouchers pertaining to activities of the Highways Trust; and
- have a right to require such information and explanation pertaining to activities of the Highways Trust, as it may consider necessary for the performance of its duties as an auditor from the employees of Highways Trust or Parties to the Highways Trust or the Project SPVs or any other person in possession of such information.

### **The Valuer**

#### ***Background and terms of appointment***

The Investment Manager, in consultation with the Trustee, pursuant to a resolution passed by its Board dated February 21, 2022 has appointed Mr. S. Sundararaman as the Valuer of the Highways Trust. In accordance with the InvIT Regulations, the Valuer has undertaken a full valuation of the Project SPVs which are proposed to be acquired by the Highways Trust pursuant to the formation transactions and his report in relation to such valuation dated June 30, 2022 has been included in this Final Placement Memorandum.

The Valuer is not an Associate of the Sponsor, the Investment Manager or the Trustee, and has not less than five years of experience in the valuation of infrastructure assets.

#### ***Functions of the Valuer***

The functions, duties and responsibilities of the Valuer will be in accordance with the InvIT Regulations. Presently, in terms of the InvIT Regulations, the Valuer is required to comply with the following conditions at all times:

- the Valuer shall ensure that the valuation of the Highways Trust Assets is impartial, true and fair and is in accordance with Regulation 21 of the InvIT Regulations;

- the Valuer shall ensure adequate and robust internal controls to ensure the integrity of its valuation reports;
- the Valuer shall ensure that it has sufficient key personnel with adequate experience and qualification to perform valuations;
- the Valuer shall ensure that it has sufficient financial resources to enable it to conduct its business effectively and meet its liabilities;
- the Valuer and any of its employees involved in valuing of the assets of the Highways Trust, shall not, (i) invest in Units of the Highways Trust or in the assets being valued; and (ii) sell the assets or Units of Highways Trust held prior to being appointed as the Valuer, till the time such person is designated as Valuer of the Highways Trust and not less than six months after ceasing to be valuer of the Highways Trust;
- the Valuer shall conduct valuation of the Highways Trust Assets with transparency and fairness and shall render, at all times, high standards of service, exercise due diligence, ensure proper care and exercise independent professional judgment;
- the Valuer shall act with independence, objectivity and impartiality in performing the valuation;
- the Valuer shall discharge its duties towards the Highways Trust in an efficient and competent manner, utilising its knowledge, skills and experience in best possible way to complete given assignment;
- the Valuer shall not accept remuneration, in any form, for performing a valuation of the Highways Trust Assets from any person other than the Highways Trust or its authorised representative;
- the Valuer shall before accepting any assignment, from any related party of the Highways Trust, disclose to the Highways Trust any direct or indirect consideration which the Valuer may have in respect of such assignment;
- the Valuer shall disclose to the Highways Trust any pending business transactions, contracts under negotiation and other arrangements with the Investment Manager or any other party whom the Highways Trust is contracting with and any other factors that may interfere with the Valuer’s ability to give an independent and professional valuation of the assets;
- the Valuer shall not make false, misleading or exaggerated claims in order to secure assignments;
- the Valuer shall not provide misleading valuation, either by providing incorrect information or by withholding relevant information;
- the Valuer shall not accept an assignment which interferes with its ability to do fair valuation; and
- the Valuer shall, prior to performing a valuation, acquaint itself with all laws or regulations relevant to such valuation.

**Policy on Appointment of Auditor and Valuer (“Appointment Policy”)**

The Investment Manager has adopted a policy on the appointment of auditor and valuer of the Highways Trust, pursuant to its resolution dated March 15, 2022. The key terms of the Appointment Policy are set out below:

***Appointment and role of the auditor of the Trust***

- (i). The Investment Manager, in consultation with the Trustee, shall appoint the Auditor in a timely manner and in accordance with the InvIT Regulations. Such appointment shall be carried out by the Board or the Audit Committee of the Investment Manager, with the approval of the Unitholders as required under the InvIT Regulations. The Investment Manager shall ensure that the appointment of the Auditor and the fees payable to the Auditor is approved by the Unitholders of the Trust in accordance with the InvIT Regulations.
- (ii). The Investment Manager shall appoint the Auditor for a period of not more than 5 (five) consecutive years, provided that the Auditor, not being an individual, may be reappointed for a period of another 5

(five) consecutive years, subject to approval of the Unitholders in the annual meeting in accordance with provisions of the InvIT Regulations. Such report is submitted to the stock exchanges within the timelines prescribed under the InvIT Regulations.

- (iii). Investment Manager shall ensure that the audit of accounts of the Highways Trust by the Auditor is done not less once in a year and such report is submitted to the Unitholders and the Trustee, either electronically or through physical copies.
- (iv). The Auditor shall comply with the following conditions at all times –
  - a. the Auditor shall conduct audit of the accounts of the Highways Trust and draft the audit report based on the accounts examined by him and after taking into account the relevant accounting and auditing standards, as may be specified by SEBI or any other regulatory authority as may be applicable;
  - b. the Auditor shall, to the best of his information and knowledge, ensure that the accounts and financial statements give a true and fair view of the state of the affairs of the Highways Trust, including profit or loss and cash flow for the period and such other matters as may be specified;
  - c. the Auditor shall have a right of access at all times to the books of accounts and vouchers pertaining to activities of the Highways Trust ;
  - d. the Auditor shall have a right to require such information and explanation pertaining to activities of the Highways Trust as it may consider necessary for the performance of its duties as an auditor from the employees of the Highways Trust or the Parties to the Highways Trust or the Project SPVs or any other person in possession of such information.

#### ***Appointment and role of the Valuer of the Trust***

- (i). The Investment Manager, in consultation with Trustee, shall appoint the Valuer of the Highways Trust, in a timely manner and shall determine the remuneration of such valuer, in accordance with the InvIT Regulations.
- (ii). The remuneration of the Valuer shall not be linked to or based on the value of the assets being valued.
- (iii). The Valuer shall not be an associate of the Sponsor or the Investment Manager or Trustee.
- (iv). The Valuer shall have not less than 5 years of experience in valuation of infrastructure assets and shall be eligible to act as a valuer in accordance with the InvIT Regulations or any clarifications, guidelines, notifications or exemptions issued by SEBI.
- (v). The Valuer shall not undertake valuation of the same project for more than 4 years consecutively, provided that the Valuer may be reappointed after a period of not less than 2 years from the date it ceases to be the valuer of the Highways Trust.
- (vi). The Valuer shall not undertake valuation of any assets in which it has either been involved with the acquisition or disposal within the last 12 months other than such cases where the Valuer was engaged by the Highways Trust for such acquisition or disposal
- (vii). The Valuer shall comply with the following conditions at all times:
  - c. The Valuer shall ensure that the valuation of the Trust assets is impartial, true and fair and is in accordance with the InvIT Regulations;
  - d. the Valuer shall ensure adequate and robust internal controls to ensure the integrity of its valuation reports;
  - e. the Valuer shall ensure that it has sufficient key personnel with adequate experience and qualification to perform valuations;

- f. the Valuer shall ensure that it has sufficient financial resources to enable it to conduct its business effectively and meet its liabilities;
- g. the Valuer and any of its employees involved in valuing of the assets of the Trust, shall not:
  - A. invest in units of the Trust or in the assets being valued; and
  - B. sell the assets or units of the Trust held prior to being appointed as the Valuer,
- h. until the time such person is designated as Valuer of the Trust and not less than six months after ceasing to be Valuer of the Trust;
- i. the Valuer shall conduct valuation of the Trust assets with transparency and fairness and shall render, at all times, high standards of service, exercise due diligence, ensure proper care and exercise independent professional judgment;
- j. the Valuer shall act with independence, objectivity and impartiality in performing the valuation;
- k. the Valuer shall discharge its duties towards the Trust in an efficient and competent manner, utilizing its knowledge, skills and experience in best possible way to complete given assignment;
- l. the Valuer shall not accept remuneration, in any form, for performing a valuation of the Trust assets from any person other than the Trust or its authorized representative;
- m. the Valuer shall before accepting any assignment, from any related party of the Trust, disclose to the Trust, by disclosing to the Investment Manager or the Trustee, any direct or indirect consideration which the Valuer may have in respect of such assignment;
- n. the Valuer shall disclose to the Trust, through the Investment Manager, any pending business transactions, contracts under negotiation and other arrangements with the Investment Manager or any other party whom the Trust is contracting with and any other factors that may interfere with the Valuer's ability to give an independent and professional valuation of the assets, and other necessary disclosures required under the InvIT Regulations;
- o. the Valuer shall not make false, misleading or exaggerated claims in order to secure assignments;
- p. the Valuer shall not provide misleading valuation, either by providing incorrect information or by withholding relevant information;
- q. the Valuer shall not accept an assignment which interferes with its ability to do fair valuation; and
- r. the Valuer shall, prior to performing a valuation, acquaint itself with all laws or regulations relevant to such valuation

Investment Manager in consultation with the Trustee shall have the right to take all necessary steps to remove the Valuer who ceases to comply with the eligibility criteria required under the InvIT Regulations and applicable law. If the removal of the Valuer and appointment of another valuer to the Trust is taken up at a meeting of the Unitholders at the request of the Unitholders, such removal of the Valuer shall be approved by the Unitholders in accordance with the InvIT Regulations.

## CORPORATE GOVERNANCE

The section below is a summary of the corporate governance framework in relation to Highways Trust, implemented by or to be implemented by the Investment Manager, and the Project SPVs, as applicable and as specified in this section.

### The Investment Manager

Virescent Infrastructure Investment Manager Private Limited is the investment manager of the Highways Trust. For further details on the background of the Investment Manager, please see the section entitled “Parties to the Highways Trust – The Investment Manager - Virescent Infrastructure Investment Manager Private Limited” on page 116.

### Composition of the Board

As on date of this Final Placement Memorandum, not less than 50% of the board of directors of the Investment Manager comprises of independent directors and are not directors or members of the governing board of the Investment Manager of another infrastructure investment trust registered under the InvIT Regulations.

The Board comprises of:

Sr. No.	Name	DIN	Designation
1.	Mr. Sanjay Grewal	01971866	Executive Director
2.	Mr. Hardik Bhadrak Shah	06648474	Non-Executive Director
3.	Mr. Panja Pradeep Kumar	03614568	Independent Director
4.	Mr. Akshay Jaitly	00042036	Independent Director
5.	Ms. Daisy Devassy Chittilapilly	09577569	Independent Non-Executive Director
6.	Mr. Aditya Narayan	00012084	Non-Executive Director

### InvIT Committee

The Board has constituted the InvIT Committee pursuant to a resolution dated March 15, 2022, for the purpose of managing, operating and supervising the functioning of the Highways Trust. The InvIT Committee consists of the following members:

1. Mr. Hardik Shah; and
2. Mr. Sanjay Grewal

Amongst others, the Board has delegated to the InvIT Committee the authority and responsibility of performing all activities in relation to the proposed Issue by the Highways Trust and any future issues that may be undertaken by the Highways Trust. The InvIT Committee shall perform and discharge (under the overall supervision of the Board) the authority and responsibility so granted to it, in the manner it may deem fit and proper, in the best interest of the Highways Trust, and in accordance with the policies adopted by the Investment Manager from time to time. The key terms of reference of the InvIT Committee are set out below:

- (i). To decide and finalise the issue opening and issue closing dates of the Issue and any future issues that the Highways Trust may undertake;
- (ii). To decide and finalise the issue price in relation to the Issue and any future issues that the Highways Trust may undertake;
- (iii). To decide on all matters in relation to allotment of units to investors; and
- (iv). To decide on any other matter that may be routed through the InvIT Committee in relation to any fund raising by the Highways Trust.

## **Investment Committee**

The Board has constituted the Investment Committee pursuant to a resolution dated March 15, 2022, for the purpose of formulating the strategic investments plan, to review every investment and divestment decision of the Highways Trust and the Project SPVs, to evaluate, analyse and execute various mergers and acquisitions. The Investment Committee consists of the following members:

1. Akshay Jaitly;
2. Hardik Shah; and
3. Sanjay Grewal.

The Investment Committee shall perform and discharge (under the supervision of the Board) the authority and responsibility so granted to it, in the manner it may deem fit and proper, in the best interest of the Highways Trust, and in accordance with the policies adopted by the Investment Manager from time to time. The key terms of reference of the Investment Committee are set out below:

- (i). To formulate strategic investment decisions and the expenditures to be involved;
- (ii). To review every investment and divestment transaction, including the terms of such transaction, with respect to the underlying assets or projects of the Highways Trust and the Project SPVs including any further investment or divestment;
- (iii). To review any transactions that are proposed to be entered into by the Highways Trust that have a potential for a conflict-of-interest in the assessment by the members of the Investment Committee or Board or Sponsor or KKR group and refer to the Board for a final resolution thereof;
- (iv). To evaluate, review and recommend to the Board the various mergers and amalgamations or takeover or acquisitions opportunities;
- (v). To review periodically the portfolio investments and monitor the assets of the Project SPVs;
- (vi). To receive reports from the valuers with respect to valuation of any assets or projects of the Highways Trust;
- (vii). To identify insurance agencies and enter into contract to secure the underlying assets and projects from any financial losses; and
- (viii). To consider any other additional matters, as may be delegated by the Board.

## **Audit and Risk Management Committee**

The Board has constituted the Audit and Risk Management Committee pursuant to a resolution dated March 15, 2022 (“**Resolution**”), for the purpose of assisting the Board in fulfilling its fiduciary responsibilities towards the Investment Manager in the best interest of all stakeholders of the Highways Trust and the Project SPVs. The Audit and Risk Management Committee consists of the following members:

1. Panja Pradeep Kumar;
2. Akshay Jaitly; and
3. Hardik Shah.

The Audit and Risk Management Committee shall perform and discharge (under the overall supervision of the Board) the authority and responsibility so granted to it, in the manner it may deem fit and proper, in the best interest of the Highways Trust, and in accordance with the policies adopted by the Investment Manager from time to time. The key terms of reference of the Audit and Risk Management Committee are set out below:

- (i). To monitor the financial reporting process and disclosure of financial information to ensure that the financial statements are correct, sufficient and credible;

- (ii). To review the interim financial statements to be submitted by the Highway Trust or the special purpose vehicles or companies owned by the Highway Trust and as further specified in the Resolution;
- (iii). To monitor the net distributable cashflows payable to the shareholders of the Project SPVs and from the Highways Trust to person holding units in the Highways Trust in accordance with the InvIT Regulations;
- (iv). To evaluate the financial controls and risk management systems of the Project SPVs;
- (v). To review and recommend the appointment, re-appointment, replacement or removal, remuneration and terms of appointment of the statutory auditors, internal auditors, cost auditors and secretarial auditors, as may be applicable for the Project SPVs and the remuneration payable to the auditors for their services;
- (vi). To review and approve the draft annual financial statements and auditor's report of the Project SPVs and the Highways Trust before submitting it to the Board for approval;
- (vii). To recommend to the Board for its approval a related party transaction policy;
- (viii). To review, approve and recommend to the Board the borrowings to be availed by the Highways Trust and Project SPVs (either singly or together) from banks or financial institutions or related parties including entering into hedging instruments or derivative transactions or risk mitigation instruments, which may be required from time to time and which will be subject to the limits prescribed under the Companies Act 2013, InvIT Regulations and the applicable regulations, if any;
- (ix). To review and oversee the functioning of the whistle blower or vigil mechanism;
- (x). To review the risks that could be faced by the Highways Trust including but not limited to strategic risks, business environment risk, operational risk, regulatory risk, technology risk, litigation risk and review the adequacy and completeness of the risk management process of the Highways Trust and recommend to the Board the improvements, where deemed necessary;
- (xi). To look into any show cause, demand, prosecution and penalty notices which are materially important and may hamper the business on an on-going concern basis, issued to the Investment Manager (in connection with the Highways Trust) or the Project SPVs and bring the same immediately to the notice of the Board with suitable remedial measures to combat the same;
- (xii). To monitor compliance and maintain necessary thresholds and other requirements under the Companies Act 2013, InvIT Regulations and the applicable regulations, if any and intimate the Board in case of any non-compliances immediately;
- (xiii). To do all such acts, deeds and things as may be required to be undertaken in accordance with the applicable law, rules and regulations applicable to the Project SPVs; and
- (xiv). To consider any other additional matters, as may be delegated, from time to time, by the Board.

#### **Policies Adopted in Relation to the Highways Trust**

The Board will adopt policies for corporate governance as may be required from time to time in accordance with applicable law and the InvIT Regulations. The Board has adopted the following policies under the corporate governance framework of the Highways Trust, however all these policies will be effective from the Completion Date:

##### ***Distribution Policy***

The Board has adopted the distribution policy pursuant to a resolution of dated March 15, 2022, in relation to the Highways Trust. For details of the Distribution Policy, see the section entitled “*Distributions*” on page 220.

### ***Code of Conduct (the “Code”)***

The Board has adopted the Code pursuant to a resolution dated March 15, 2022, in relation to the Highways Trust and conduct of the Highways Trust and the Parties to the Highways Trust. Please see below a summary of the Code:

The Investment Manager has adopted the Code pursuant to a resolution of its board of directors dated March 15, 2022, in relation to the Trust. Trust and the parties to the Trust shall comply with the Code at all times, in accordance with the InvIT Regulations.

The key principles of the Code are set out below:

- (i). the Highways Trust and Parties to the Highways Trust shall conduct all affairs of the Highways Trust in the interest of all the Unitholders.
- (ii). the Highways Trust and Parties to the Highways Trust shall make adequate, accurate, explicit and timely disclosure of relevant material information to all Unitholders, exchange(s) and SEBI in accordance with the InvIT Regulations and as may be specified by the stock exchange(s) from time to time.;
- (iii). the Highways Trust and Parties to the Highways Trust should try to avoid conflicts of interest, as far as possible, in managing the affairs of the Highways Trust and keep the interest of all Unitholders paramount in all matters. In case a conflict of interest that is unavoidable arises, it shall be ensured that appropriate disclosures are made to the Unitholders and they are fairly treated;
- (iv). the Highways Trust and Parties to the Highways Trust shall ensure that fees charged by them with respect to activities of the Highways Trust shall be fair and reasonable.;
- (v). the Investment Manager shall carry out the business of the Highways Trust in accordance with the Trust Deed and the Investment Management Agreement and invest in accordance with the investment objectives stated in the Offer Document or placement memorandum, and take investment decisions solely in the interest of Unitholders.
- (vi). the Highways Trust, Parties to the Highways Trust and any third party appointed by the Investment Manager shall not use any unethical means to sell, market or induce any person to buy Units of the Highways Trust and where a third party appointed by the Investment Manager fails to comply with this condition, the Investment Manager shall be held liable for the same;
- (vii). the Highways Trust and Parties to the Highways Trust shall maintain high standards of integrity and fairness in all their dealings and in the conduct of their business;
- (viii). the Highways Trust and Parties to the Highways Trust shall render at all times high standards of service, exercise due diligence, ensure proper care and exercise independent professional judgment; and
- (ix). the Highways Trust and Parties to the Highways Trust shall not make any exaggerated statement, whether oral or written, either about their qualifications or capabilities or experience.

### **Borrowing Policy**

The Board has adopted the borrowing policy pursuant to a resolution of dated March 15, 2022, in relation to the Highways Trust. The key terms of the Borrowing Policy include, amongst others:

The Investment Manager shall ensure that all funds borrowed in relation to the Trust are in compliance with the InvIT Regulations. Accordingly, the Investment Manager has formulated the Borrowing Policy to outline the process for borrowing monies in relation to the Trust. The key terms of the Borrowing Policy include, among other things, the following:

- (i). The Highways Trust may raise debt and avail borrowings and deferred payments from time to time, including through issuance of debt securities, in the manner specified by SEBI and availing loans from banks and financial institutions, by any instrument, in Indian or foreign currency in accordance with Applicable Law.

- (ii). The Trustee shall, on receipt of advice from the Investment Manager, have the power to borrow monies (through any mode, including by way of issuance of debt securities, subordinated debt, equity or other securities as permitted under Applicable Laws and the Trust Deed or instruments permitted under the InvIT Regulations or other Applicable Law) from any person or authority (whether government or otherwise, whether Indian or overseas) on such terms and conditions, and for such periods and purpose, as may be permitted under the InvIT Regulations, and offer such security as it may deem fit, for the purpose of making such borrowing. However, the aggregate consolidated borrowings and deferred payments of the Highways Trust, net of cash and cash equivalents shall not exceed seventy percent of the Value of the Project SPVs. Further, the Trustee (acting in capacity of the trustee of the Highways Trust) shall have the power to create charge, security interest and/or lien over any or all of the assets of the Highways Trust (both, present or future), to secure and/or guarantee the performance of any of the obligations of the SPVs, as it may deem fit.
- (iii). The Highways Trust also has the power to create, mortgage or secure any of its Project SPVs (Highways Trust Assets) or provide guarantees in order to borrow funds in accordance with Applicable Law.
- (iv). The borrowings made by the related parties shall be in line with the InvIT Regulations.
- (v). The Policy shall not contradict with the provisions of any Applicable Law. In case of any discrepancy, the provisions of Applicable Law shall prevail over the provisions of this Policy.
- (vi). The Investment Manager shall submit an annual report to the Trustee, the designated stock exchange and Unitholders of the Highways Trust, either electronically or through physical copies, with the following:
  - a. Details of changes during the year pertaining to borrowings or repayment of borrowings (standalone at Project SPV level and consolidated at the Highways Trust level); and
  - b. Details of outstanding borrowings and deferred payments of Highways Trust including but not limited to any credit rating(s), debt maturity profiles, and debt service coverage ratio of the Highways Trust on a consolidated and standalone basis as at the end of the year.

#### ***Appointment of Auditor and Valuer Policy***

The Board has adopted the Appointment of Auditor and Valuer Policy pursuant to a resolution of dated March 15, 2022, in relation to the Highways Trust. The key terms of the Appointment of Auditor and Valuer Policy are provided in the section entitled “*Other Parties to the Highways Trust*” on page 139.

#### ***Policy for Determining Materiality of Information (“Materiality of Information Policy”)***

The Investment Manager has adopted the Materiality of Information Policy pursuant to a resolution of its board of directors dated March 15, 2022, in relation to Trust. The Materiality of Information Policy aims to outline process and procedures for determining materiality of information in relation to periodic disclosures on the Highways Trust’s website, to the stock exchange and to all stakeholders at large, in relation to the Highways Trust. The key principles of the Materiality of Information Policy are set out below:

- (i). any information concerning the Trust is considered material to the business and affairs of a Trust if (i) it results in, or would reasonably be expected to result in a significant change in the market price or value of units of the Trust; or (ii) if there is a substantial likelihood that a reasonable unitholder would consider it important in determining whether to buy, sell or hold, or engage in other transactions concerning the Trust’s units; or (iii) the investor would consider important in making an investment decision.
- (ii). The Investment Manager or the Trustee shall provide to Securities and Exchange Board of India (“SEBI”) and to the stock exchanges, wherever applicable, such information as may be sought by SEBI or by the stock exchanges pertaining to the activity of the Trust.
- (iii). certain events or information concerning the business and affairs of the Trust if (i) it results in, or would reasonably be expected to result in a significant change in the market price or value of units of the Trust; or (ii) if there is a substantial likelihood that a reasonable unitholder would consider it important in determining whether to buy, sell or hold, or engage in other transactions concerning the Trust’s units; or

- (iii) the investor would consider important in making an investment decision shall be deemed to be material information and against which Trust shall not be required to apply the criteria for determining materiality of information;
- (iv). the Trust shall also submit such information to the designated stock exchange(s) and Unitholders on a periodical basis as may be required under the listing agreement. Further, the Trust shall disclose all such information as may be specified by SEBI to the designated stock exchange(s), Unitholders and SEBI, in the manner as may be specified by SEBI.; and
- (v). the Materiality of Information for Periodic Disclosures Policy also provides for the approval process for disclosure or dissemination of any material or unpublished price sensitive information on behalf of the Trust and authorises the compliance officer and other authorised persons to make the disclosures, as may be required.

***Policy on Unpublished Price Sensitive Information and Dealing in Units by Parties to the Trust (“UPSI Policy”)***

The Investment Manager has adopted the UPSI Policy pursuant to a resolution of its board of directors on March 15, 2022. The purpose of the policy is, *inter alia*, to ensure that the Trust complies with applicable law, including the InvIT Regulations or such other laws, regulations, rules or guidelines prohibiting insider trading and governing disclosure of material, unpublished price sensitive information (“UPSI”).

The key principles of the UPSI Policy are set out below:

- (i). the Investment Manager shall promptly disclose to the relevant stock exchanges all UPSI that would impact price discovery no sooner than credible and concrete information comes into being in order to make such information generally available;
- (ii). the Investment Manager shall follow uniform and universal dissemination of UPSI to avoid selective disclosure;
- (iii). the Compliance Officer shall be responsible for deciding whether a public announcement is necessary for verifying or denying rumours and then making the disclosure, in accordance with the procedure specified in the Policy for Determining Materiality of Information for Periodic Disclosures;
- (iv). the Compliance Officer shall also make an appropriate and fair response to the queries on news reports and requests for verification of market rumours by regulatory authorities, in accordance with applicable law. Further, no employee or representative of the Investment Manager who is in receipt of any inquiries relating to the Trust, including from any investors, shall respond to such inquiries. Such employee or representative of the Investment Manager shall refer the inquirer to the Compliance Officer or an any person authorised by the Board to deal with inquiries;
- (v). while dealing with analysts or research persons or large investors like institutions, the Investment Manager shall provide only public information. Alternatively, the information given to analysts or research persons shall be simultaneously made public at the earliest;
- (vi). the Investment Manager shall handle all UPSI on a “need to know” basis, provided that UPSI may be disclosed to persons who need such information for furtherance of legitimate purposes, performance of duties or discharge of legal obligations in relation to the Trust; and
- (vii). the Policy shall not contradict with the provisions of Securities and Exchange Board of India (Listing Obligations and Disclosure Requirements) Regulations, 2015, or Insider Trading Regulations, as amended, to the extent applicable, or any other applicable law. In case of any discrepancy, the provisions of applicable law shall prevail over the provisions of this Policy.

### ***Other Policies***

In addition to the above mentioned policies as required under the InvIT Regulations, the Board has also adopted, among others, an anti-bribery and corruption policy, a health, safety and environment policy, a prevention of sexual harassment policy, a risk management policy and a vigil mechanism policy.

### **Representatives on the board of directors of each Project SPV**

The Investment Manager, in consultation with the Trustee, shall appoint the majority of the members of the board of directors of each of the Project SPVs, in accordance with the requirements prescribed under the InvIT Regulations.

## INDUSTRY OVERVIEW

The information contained in this section is derived from the CRISIL Report. The information contained in the CRISIL Report has been obtained by CRISIL from sources believed by it to be reliable. The information contained herein was prepared expressly for use herein and was based on certain assumptions and information available at the time the CRISIL Report was prepared. As with any attempt to estimate future events, the forecasts, projections, conclusions, and other information included herein are subject to certain risks and uncertainties, and are not to be considered guarantees of any particular outcome. The CRISIL Report, in part or in whole, is not intended to constitute investment advice, and is not a recommendation to purchase or not purchase, an endorsement of, or an opinion as to the value of, any security or any investment instrument of any entity. The CRISIL Report is not a comprehensive evaluation of the industry, the Highways Trust or the Units and all material within the CRISIL Report should be deemed as expressions of opinion which are subject to change without notice. All references to years refer to calendar years except as otherwise stated. References to Indian financial years are to the one year period ending March 31 of the named year.

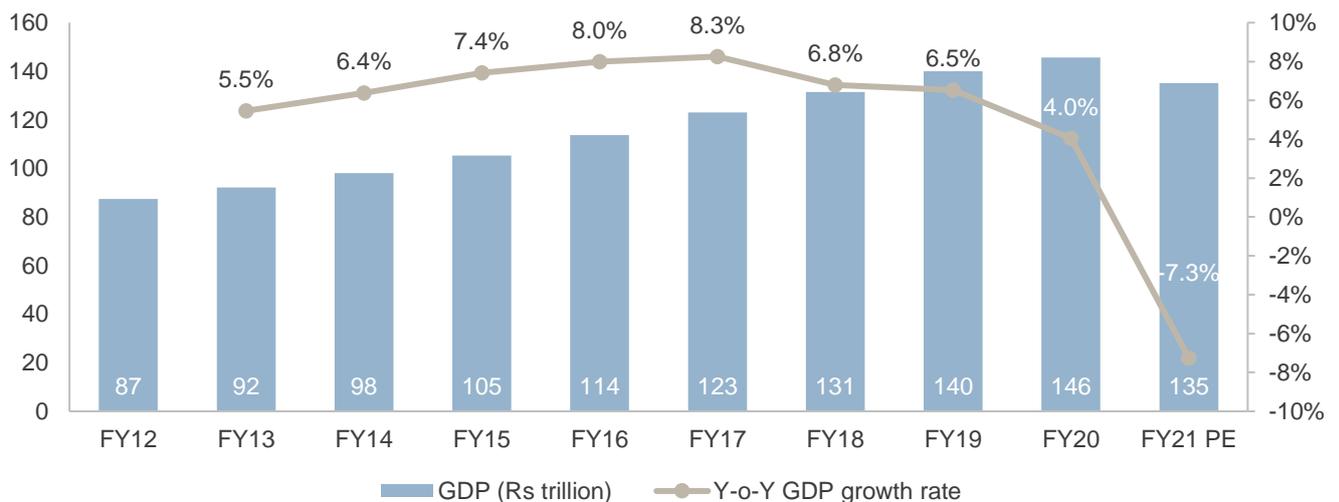
### Macro-economic overview of India

#### Review of India's GDP growth

#### GDP grew 6.6% CAGR from fiscals 2012 to 2020

Fiscal 2021 has been a challenging year for the Indian economy, which was already experiencing a slowdown before the pandemic struck. GDP contracted 7.3% (in real terms) last fiscal, after growing 4.0% in fiscal 2020.

#### Real GDP growth in India (new GDP series)

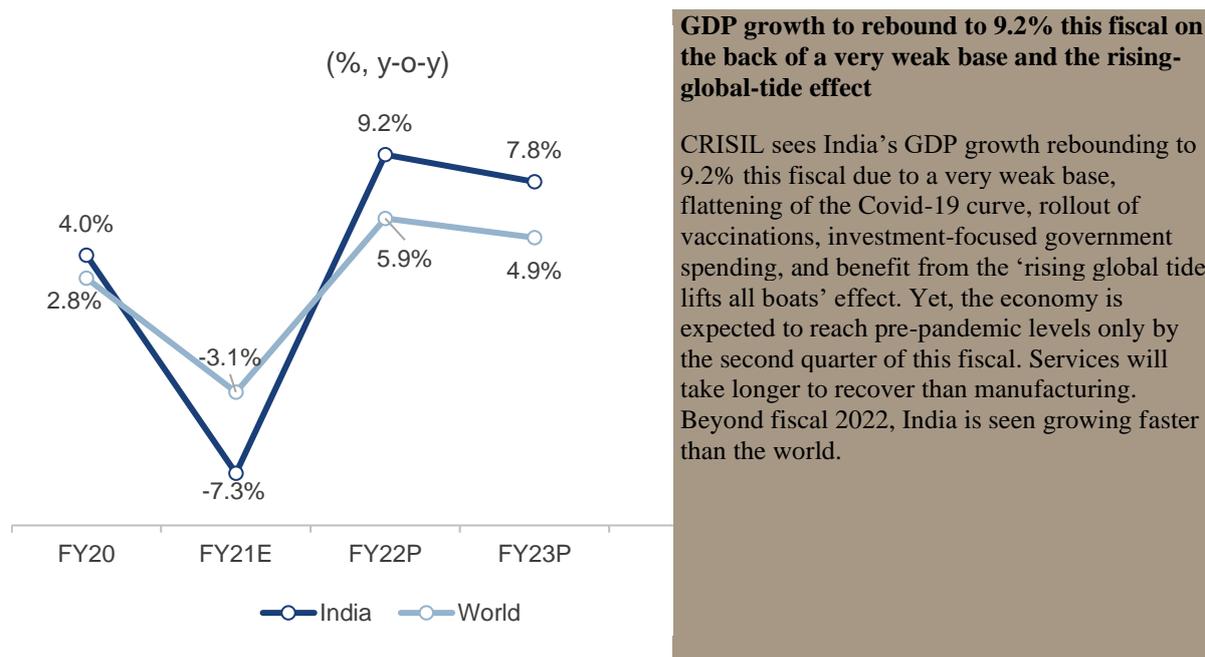


PE: Provisional estimates

Source: Provisional estimates of Annual National Income 2020-21, Central Statistics Office (CSO), Ministry of Statistics and Programme Implementation (MoSPI), CRISIL Research

The economy is in recover mode, with GDP expanding 20.1% on-year in the first quarter of fiscal 2022 and 8.4% on-year in the second quarter of fiscal 2022. In absolute terms GDP for the second quarter of fiscal 2022 has just crossed the GDP value reported in first quarter of fiscal 2020 (pre-covid), reporting a rise of 0.2%. The economic rebound comes on the back of reduced pandemic restrictions and improving vaccination coverage.

## India to surpass global GDP growth in next three fiscals



**GDP growth to rebound to 9.2% this fiscal on the back of a very weak base and the rising-global-tide effect**

CRISIL sees India's GDP growth rebounding to 9.2% this fiscal due to a very weak base, flattening of the Covid-19 curve, rollout of vaccinations, investment-focused government spending, and benefit from the 'rising global tide lifts all boats' effect. Yet, the economy is expected to reach pre-pandemic levels only by the second quarter of this fiscal. Services will take longer to recover than manufacturing. Beyond fiscal 2022, India is seen growing faster than the world.

Note: Forecasts for World are for calendar year; FY20 corresponds to 2019 and so on; P: Projected; updated as of June 2021; India numbers for FY20 and FY21 are based on MoSPI's latest GDP estimates and FY22 onwards are CRISIL Research's forecast. World GDP growth rates are from IMF world economic outlook update as of April 2021.

– Source: S&P Global Ratings, CRISIL

### Key Fiscal Measures announced by government for Infrastructure sector to deal with Covid-19

The government announced a series of fiscal measures under the Atmanirbhar Bharat initiative to contain the human and economic damage from the COVID-19 pandemic. Following are the details of key measures announced under three packages announced in the months of May, October and November of fiscal 2021.

#### Fiscal stimulus 1.0:

The government announced measures worth Rs 11 trillion in five tranches. This was in addition to the earlier announced measures worth Rs 9.9 trillion (RBI liquidity support and others), taking the total financial support amount to Rs 20.9 trillion. It was announced by Government of India with the aim to revive the economy by liquidity infusion and income support. The actual committed fiscal outgo of Rs 1 trillion, translating to 9% of the Rs 11 trillion of measures outlined over the five tranches. The bulk of this direct support was through the Pradhan Mantri Garib Kisan Yojana. The government also ploughed in some earlier discussed structural reforms, especially in tranches 4 and 5, to help drive India's medium-term growth story. The announcements pertained especially to sectors such as mining, aviation, urban infrastructure, power, and agriculture.

Further, the government increased the borrowing limit for state governments from 3% of their GDP to 5% of GDP. However, of this additional 2 percentage points, 1.5 percentage point is conditional upon states achieving certain targets.

For addressing near-term issues, apart from direct benefit transfers and additional spending through MNREGA, the government mobilised credit to micro, small and medium enterprises (MSMEs), agriculture, and the affordable housing sector. Like the 100% guarantee on Rs 3 trillion loans to MSMEs with one year moratorium to help these units, which are typically strapped for working capital. It was also aimed at spurring credit growth for both banks and non-banks in fiscal 2021 and contain delinquencies in the segment, which would have increased otherwise.

#### Fiscal stimulus 2.0:

The government measures targeted increasing the demand in the economy. Government has proposed a scheme where central government employees can spend their tax-exempt travel concessions on certain goods and services.

It also made provisions for them to receive a part of their wages in advance to spend on their choice of festival before the end of March 2021. The stimulus also includes infrastructure spending of Rs.250 billion and interest free loan to states which stands at Rs.120 billion. The measures announced under this package amounted to Rs 0.7 trillion.

### **Fiscal stimulus 3.0:**

This Rs 2.65 trillion stimulus package is aimed at job creation, access to credit and farm support with. The key highlight of this stimulus is to provide production linked incentives to 10 sectors which is estimated at around 1.45 trillion. This is proposed to be spent over the next 4-6 years i.e. till FY28 to encourage domestic manufacturing across 10 sectors – namely, textiles, food, pharma, consumer durables, auto, telecom, specialty steel, solar, electronic, and battery. The stimulus package also provides Rs.650 billion additional outlay for subsidy towards fertilisers sector. The stimulus also includes outlay of Rs.180 billion for housing for all plan besides it also includes package of Rs.100 billion to support rural economy.

### **Key Measures announced by government for Infrastructure sector to deal with Covid-19**

Central government have announced some key measures to address the implications caused by Covid-19. Some of the key measures announced by government are as follows:

- Up to 6 month extensions for completion of infrastructure projects: Central government has given extension of up to 6 months to contractors whose operations are hit by Covid-19. This extension is given with no additional penalty for missing out on milestones. All central agencies like Railways, Ministry of Road transport and highways and central public works department will grant extensions to its contractors engaged in different projects work under PPP mode.
- Revenue Shortfall Loan provisions under the concession agreement were extended by NHAI to BOT concessionaires at Bank Rate + 2% to provide relief from the Covid-19 impact. The loan amount would be lower of i) Debt obligation plus the O&M expenses; or ii) Estimated toll collection minus actual collection during the period. NHAI had tried to reduce impact on toll collection due to suspension of tolling operations from 26<sup>th</sup> March-19<sup>th</sup> April, 2020 by NHAI as well as disruption in traffic post 19<sup>th</sup> April due to lockdown in major parts of the country.
- Extension in concession period was granted to road asset operators due to suspension in tolling activity from 26<sup>th</sup> March to 19<sup>th</sup> April, 2020. Extension in concession period would be in proportion for period where daily toll collection would be less than 90% of average daily collection. Also waiver of concession fee/premium was announced for 26<sup>th</sup> March to 19<sup>th</sup> April period. Extension and waiver of premium/concession fee helped mitigate the extent of impact on decline in return on the assets.
- Release of retention money in proportion of work done and no further deduction of retention money for 3-6 months from contractors
- Enabled monthly payments based on work completed instead of milestone based payments
- Performance security on contracts reduced to 3% instead of 5-10%. The rate of deposits have been slashed in view of Covid-19 pandemic. As these fees usually have to be paid upfront, reduction in the rate of deposit is expected to bring respite to stressed construction companies
- Earnest Money Deposit (EMD) for tenders to be replaced by bid security self-declaration: Government of India have provided relaxation on Earnest money deposit on government tenders. EMD is to be replaced by bid security self-declaration.

### **Key budgetary proposals for Infrastructure sector**

The Union Budget 2022-23 bet big on an investment push to lift economic growth, two years and three waves into the pandemic. The total capex of the government (budgetary capex plus revenue grants for capital creation and capex by central public sector enterprises) is budgeted to rise 14.5% as compared with only 3.1% in the current fiscal. The government thus has tightened the belt around revenue expenditure and frontloaded infrastructure spending that would lead to faster economic growth.

Among the sectors, infrastructure continues to be in the bright spot with a 30% hike in budgetary support.

Key budget announcements concerning infrastructure are,

- At Rs 7.5 trillion, aggregate budgetary support (gross budgetary support or GBS) for capex next fiscal is up 39% over fiscal 2022RE. For infrastructure sectors, budgetary support is 30% up at Rs 4.3 trillion. These exclude Rs 620.57 billion equity infusion into AI Assets Holding Ltd (AIAHL) in fiscal 2022RE
- PM Gati Shakti Master Plan for expressways is to be formulated. The national highways network will be expanded by 25,000 km next fiscal
- In the railways sector, 2,000 km of tracks will be brought under train collision avoidance system, Kavach; 400 new generation Vande Bharat trains will be introduced in the next three years
- Four multi-modal logistics parks will be awarded through the PPP mode next fiscal

Asset monetisation as an infrastructure funding mechanism was largely missing in the budget proposals. It found mention only in the roads sector, where it is expected to generate Rs 200 billion and fund 10% of the National Highways Authority of India's (NHAI) requirement for the next fiscal. This fiscal, the share is estimated to be 5-8% dependent on the realisation of toll-operate-transfer (TOT) bundles 6-8.

### Review of roads infrastructure in India

#### Road sector's contribution to Indian gross value added (GVA)

The road transport sector's share in Indian GDP stood at 3.0% in fiscal 2020. The share of road transport in India's GDP has hovered between 2.9% to 3.1% from fiscals 2012 to 2020.

GVA share (%)	FY12	FY13	FY14	FY15	FY16	FY17	FY18	FY19	FY20
Road transport (at constant prices)	3.0%	3.1%	3.1%	3.0%	3.0%	2.9%	3.0%	3.0%	3.0%

Source: Ministry of Statistics and Programme Implementation (MoSPI), CRISIL Research

#### Road network in India

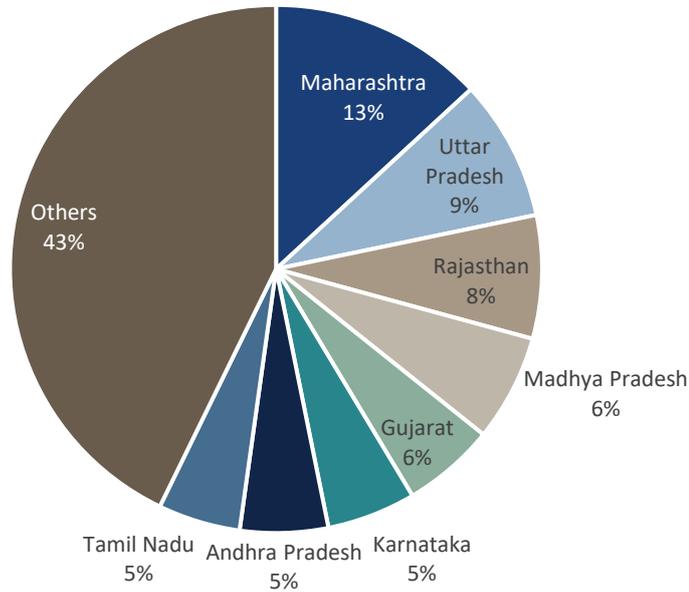
India has the second-largest road network in the world, spanning 6.2 million km.

#### Road network in India in fiscal 2021

Road network	Length ('000km)	Percentage of total - length	Percentage of total - traffic	Connectivity to
National highways	136.4	~2%	40%	Union capital, state capitals, major ports, foreign highways
State highways	176.8	~3%	60%	Major centres within the states, national highways
Other roads	5,902.5	95%		Major and other district roads, rural roads - production centres, markets, highways, railway stations

Source: MoRTH Annual Report 2020-21, CRISIL Research

**State-wise length of national highways in India as of FY21**



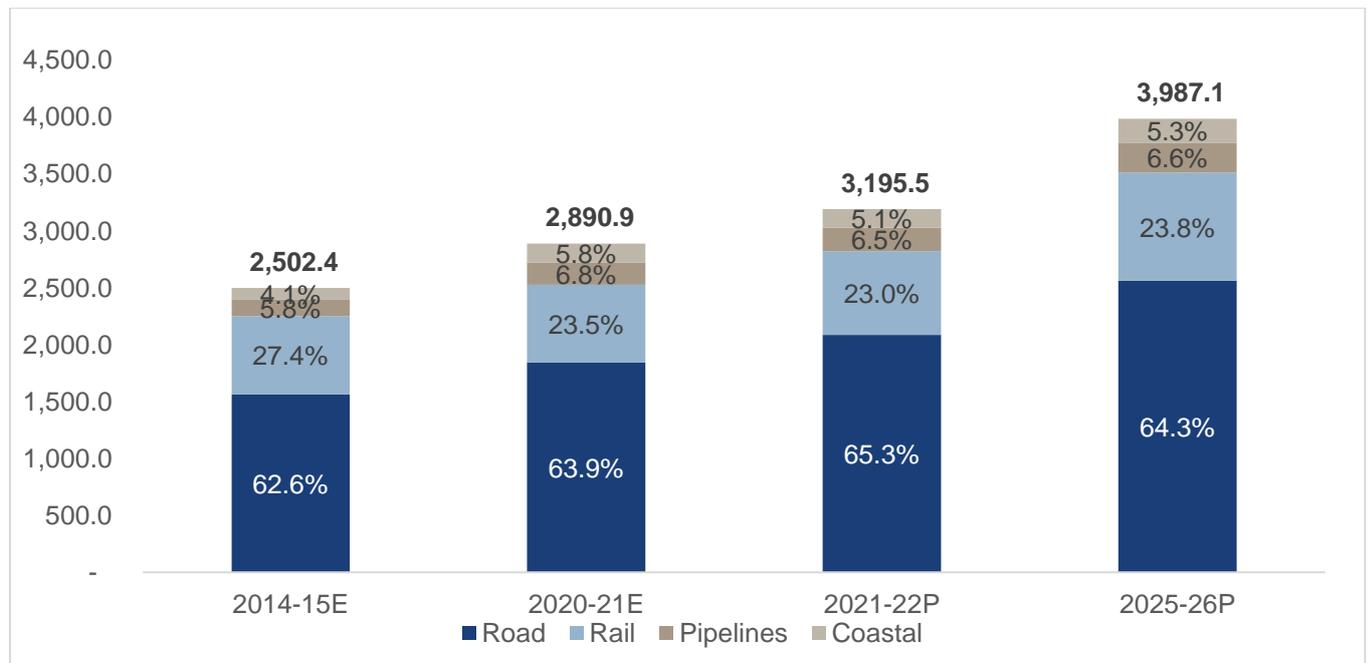
– Source: MoRTH Annual Report 2020-21, CRISIL Research

**Indian freight traffic scenario**

**Roads to continue to have a dominant share in the overall freight movement**

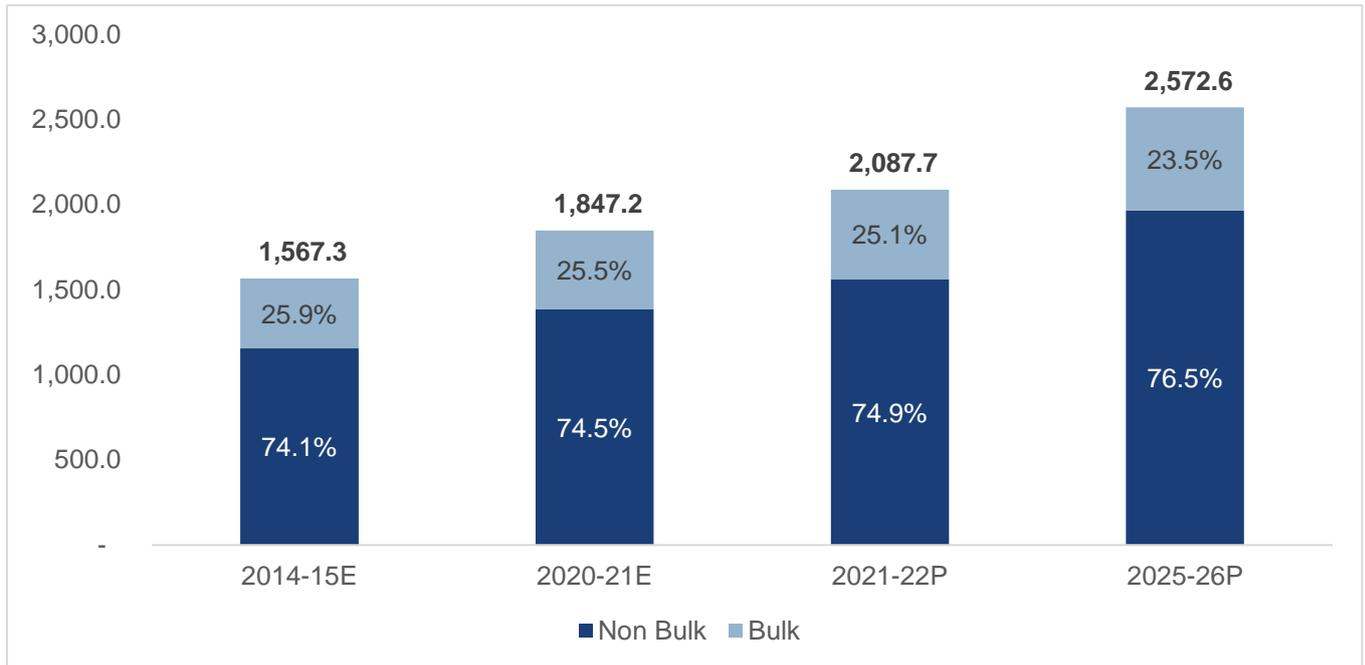
CRISIL Research expects growth in road freight traffic to increase at a compounded annual growth rate (CAGR) of 6-8% in billion-tonne-kilometre (BTKM) terms between fiscals 2021 and 2026, on a low base.

**Share of roads in total freight movement (in terms of BTKM)**



– E: Estimated; P: Projected  
 – Source: CRISIL Research

**Roads predominantly transfer non-bulk freight (in terms of BTKM)**



- E: Estimated; P: Projected
- Source: CRISIL Research

**Overview of PPP framework and models in operations**

**Design and build contracts**

In this type of contract, the authority does a conceptual study of the project to be awarded and specifies the technical output details, based on which the specifications of the project will be decided. The developer has to undertake the detail designing and execution of these projects. Both EPC and BOT models were design and build models.

A few operational models:

- I. BOT-toll/-annuity/-hybrid annuity model (HAM)
- II. EPC
- III. Toll collection
- IV. Operate, maintain and transfer (OMT)
- V. Toll, operate and transfer (TOT)

## Types of PPP models

Type of project	Description	Development risk	Financing risk	Traffic risk and accrual of toll fee collection	Net cash outflow for the government	Revenue for private party	Concession period	Award criteria
BOT-toll	Private party builds road, undertakes O&M and collects toll	Concessionaire	Concessionaire	Concessionaire	Yes (In form of grant/equity support)	Toll	Around 20-30 years for the NHAI** and other authorities	Highest revenue sharing bid / highest premium/ lowest equity support
BOT-annuity	Private party builds road, undertakes O&M* and collects annuity from the granting authority	Concessionaire	Concessionaire	Authority	Yes, net payment to be made is the difference between the toll collection and the annuity payable	Annuity payment	Around 15-20 years for NHAI and other authorities	Lowest annuity
BOT-HAM	Private party builds road, undertakes O&M. Gets 40% of payment during construction and 60% as annuity along with interest	Concessionaire	Concessionaire	Authority	40% during construction and 60% as semi-annual annuity along with interest, net of toll collected	Construction grant plus annuity payments, interest on annuities, inflation indexed O&M payments	Around 15 years of operations plus additional construction period	Lowest project cost plus O&M cost

Type of project	Description	Development risk	Financing risk	Traffic risk and accrual of toll fee collection	Net cash outflow for the government	Revenue for private party	Concession period	Award criteria
EPC	Private party builds road, based on the cost incurred by the government	Concessionaire	Authority	Authority	Yes	Contract amount	Not required	Lowest contract price requested
OMT	Private party collects toll and undertakes O&M and major maintenance	No development risk except minimal risk in case of paved shoulders	Concessionaire	Concessionaire	No	Toll	Up to nine years for NHAI projects	Highest % of toll revenue share or highest premium per year
Tolling	Private party pays the estimated toll upfront to the authority and collects the toll during concession period	No development	Concessionaire	Concessionaire	No	Toll	Around one year for NHAI projects	Highest revenue-sharing bid
TOT	Private party pays the estimated toll (revenue share) upfront to the authority, undertakes O&M plus certain capex and collects the toll during concession period	Authority (in case upgradation of lanes is taken up during the concession period)	Concessionaire	Concessionaire	No	Toll	20 years <sup>#</sup>	Highest upfront payment

- *Note: Development risk refers to construction risk in developing a road project*
- *\*Operations and maintenance*
- *\*\* National Highways Authority of India*
- *# As per TOT bundles of NHAI in 2021*
- *Source: CRISIL Research, NHAI*

### **Toll, operate and transfer (TOT)**

As of April 2021, the NHAI has successfully awarded three bundles under the TOT framework, i.e. TOT Bundles 1,3 & 5 . Under the Asset Monetisation plan, NHAI expects to monetise road assets worth Rs 1000 billion over the next 5 years through TOT. The immediate targets are Rs 300-400 billion in the next 2 years, with a target of Rs 100 billion worth assets monetised in FY22 itself.

#### ***Asset Monetisation***

The Union Finance Minister announced “National Monetization Pipeline” of potential brownfield infrastructure assets under the union budget 2021-22, stating that monetizing operating public infrastructure assets is a very important financing option for new infrastructure construction.

The National Highways Authority of India (NHAI) had plans to raise at least ₹100.0 Bn in 2021 calendar year by monetizing its assets. The NHAI had plans to monetize about 1,200km of roads in 2021 calendar year.

The first asset monetisation model is the InvIT (infrastructure investment trust), which NHAI launched in November 2021. NHAI had filed for application for InvIT with SEBI in June 2020. A total of 5 roads have been included whose total enterprise value is nearly Rs 80.11 Bn and a total length of 390 km. The money raised will be further invested again into road sector with some part being used for operation and maintenance of roads. The roads are located in Gujarat, Karnataka, Rajasthan and Telangana

The first tranche was expected to be about 400-600 km and depending on how much interest it generates among investors, more assets could be added later. NHAI announced plans to raise Rs. 350 Bn from 19-20 projects under InvIT model over the next few years. Government expects the InvIT would attract investments having long-term perspective which includes pension funds and sovereign funds as these projects come with zero construction risk attached to them when compared to that of greenfield highway stretches.

The second tranche in 2021 included Bundle 6, 7, and 8 whose bids were submitted in January 2022. NHAI focuses on smaller bundles with lower concession period than in previous rounds to suit investors. Unlike the InvIT, responsibility of operations and maintenance in TOT model is in the hands of the contractor.

In the first round of TOT model, during 2018, joint venture of Macquarie and Ashoka Buildcon picked up the projects for nine national highway stretches with an upfront fee of Rs.96.8 billion. However, the second TOT bundle has been scrapped because of want of bidders. In the third bundle, cube highways has emerged as the winner by quoting price just above the base price prescribed the NHAI with a total bid of Rs 50.1 billion. Later on, similar to second bundle fourth TOT bundle was also cancelled due to muted investor response.

With respect to TOT bundle 5, the government has split the complete bundle into two parts, 5A-1 and 5A-2. As of April 2021, Adani Enterprises and DP Jain & Co Infrastructure have emerged as highest bidders for bundles 5A-1 & 5A-2 and with respective bids of Rs 10.1 billion and Rs 12.5 billion. The highest bids for both bundle 5A-1 and 5A-2 were above NHAI’s reserve price of Rs 8 billion and Rs 8.2 billion respectively.

### **Overview of government initiatives**

#### **New tolling policy (2011)**

##### ***Toll Act***

The central government is authorised to levy a fee (toll) under Section 7 of the National Highways Act, 1956, for public-funded projects and under Section 8-A of the said Act, for private investment projects. The government can levy fees on all sections of national highways (irrespective of four or two lanes), tunnels, bypasses and bridges with specific cost criteria.

### **Fee structure**

Toll charges are based on rates notified by the government. The fee for use of a section of the national highways of four or more lanes for the base year fiscal 2008 shall be the product of the length of such a section multiplied by the rates specified hereunder.

#### **Toll rates for four-lane national highways**

<b>Vehicle category</b>	<b>Rs/ km</b>
Car, jeep, van, light motor vehicle	0.65
Light commercial vehicle	1.05
Bus or truck	2.2
3-axle commercial vehicle	2.4
Heavy construction machinery, multi-axle vehicles (MAV) 4-6 axles	3.45
Oversized vehicles 7 or more	4.2

– *Source: PIB, CRISIL Research*

The rates will be revised every year. Effective April 1, 2008, they will be an aggregate of following rules:

Increase of 3% without compounding (on base rates of fiscal 2008)

40% of the increase in wholesale price index (WPI) over the previous year.

### **Overview of National Highways Development Project (NHDP)**

NHDP encompasses building, upgradation, rehabilitation and broadening of existing national highways. The project is executed by NHAI, in coordination with the public works departments of various states. NHAI also collaborates with the Border Roads Organisation for the development of certain stretches. NHDP is being implemented in seven phases.

The projects are awarded to private players either on EPC (cash) or on build-operate-transfer (BOT) basis and now on the newly introduced hybrid annuity model (HAM).

The residual projects under the existing NHDP phases involves 5,000-5,500 km and their awarding target year was fiscal 2021. These residual projects would dominate 50% of investments over the next five years. According to CRISIL estimates, the Bharatmala awarding was ~5,500-6,000 km over fiscals 2018 and 2019. Investments under the Bharatmala Pariyojana (BMP) would be slow to pick up and will account for ~30% of total investments. As projects awarded under the scheme are 60% EPC and 40% HAM, NHAI's ability to raise funds to execute these projects would be a key monitorable.

### **Bharatmala Pariyojana**

Bharatmala Pariyojana is expected to supersede the National Highways Development Project (NHDP) and envisages the construction of 65,000 km of highways. As per the ministry, Bharatmala, along with the schemes currently undertaken, could require a total outlay of Rs 6.9 trillion.

Phase-I of the scheme envisages development of about 24,800 km length of national highways/roads, plus residual 10,000 km of NHDP between fiscals 2018 and 2022.

### Components of BMP Phase -I

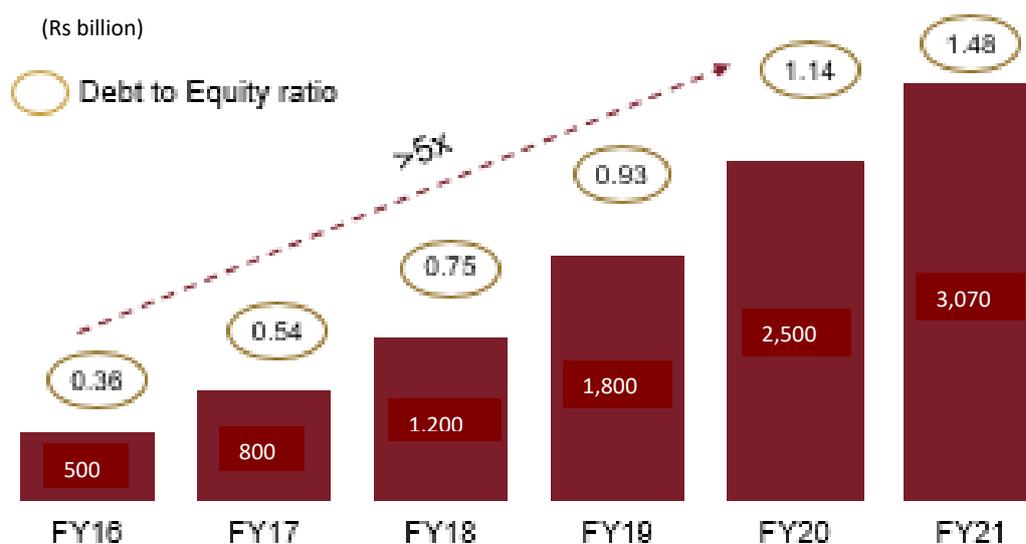
Category	Description	Total length (Km)	Upgrade proposed in Phase I (Km)
National Corridor efficiency improvement	Lane expansion, de-congestion of existing National corridor	13,100	5,000
Economic Corridors development	Connecting economically important production & consumption centres	26,200	9,000
Inter-corridor and feeder routes development	Inter-connection between economic corridors, first mile and last mile connectivity	15,500	6,000
Border and international roads	Connectivity to border areas and boosting trades with neighbouring countries	5,300	2,000
Coastal and port connectivity roads	Connectivity to coastal areas to enable port-led economic development	4,100	2,000
Expressways	Greenfield expressways	1,900	800
Total		66,100	24,800

– Source: NHAI, CRISIL Research

### Review and outlook of NHAI funding

With the high dependence on market borrowings to fund asset creation through EPC and HAM projects, NHAI's debt to equity has risen to ~1.5 times in FY21.

### NHAI borrowings on the rise



– Source: NHAI, CRISIL Research

To limit the growth in NHAI's borrowings, NHAI's budgetary support in the form of cess funds (budgetary allocation) & toll plough back were increased by 17% for fiscal 2022 (budgeted) and its IEBR has been kept constant at Rs 650 billion. However, in the latest budget, NHAI's budgetary support rose by ~106% in FY23 budget while IEBR has been made negligible.

Other modes of funding for NHAI such as TOT bundles have seen only limited success, over the past 4 years. NHAI has been able to successfully monetise ~14,000 kms and raise ~Rs 170 billion.

RFPs for TOT 6, 7 and 8 have been released in August 2021 and bids for the same were submitted in January 2022.

### **Investments by private sector to grow 2x times over the next 5 years**

CRISIL Research expects private construction investments in national highways to increase 2x to Rs 1.5 trillion over fiscals 2022 to 2026 compared with the previous five years. This is expected to be mainly through the hybrid annuity model (HAM) mode, as the build-operate-transfer (BOT) toll mode may have only a few takers.

A policy push in the form of changes in Model Concession Agreements (MCA) for HAM and BOT projects and reduction in bid eligibility criteria across all national highway projects would bode well for private participation. However, the share of HAM in total awarding is constrained by the cautious approach employed by banks in lending to HAM projects.

Amidst the COVID-19 pandemic, NHAI and the ministry have taken various steps under the "Atmanirbhar" package to ease issues faced by developers. Releasing monthly payments, instead of milestone based payments; extension of timelines for completion of projects, etc have sustained private participation in the sector.

### **Asset monetisation, equity infusion key to support private investment in the long run**

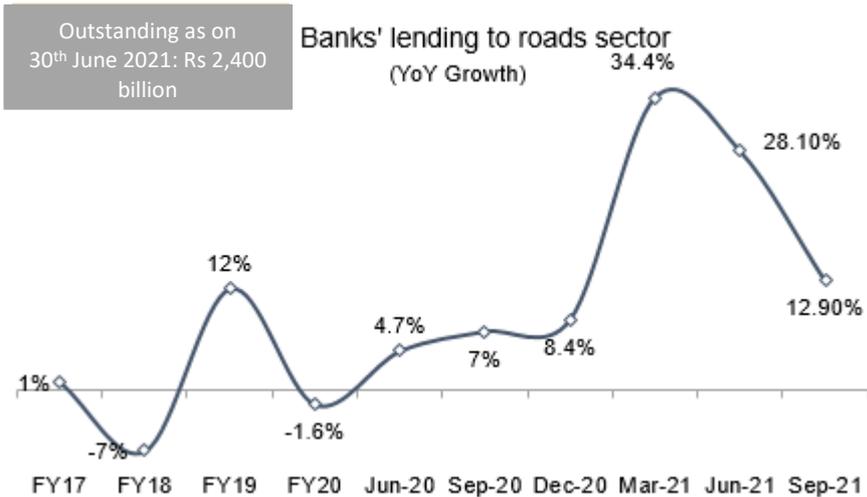
The players present in HAM are currently selling off HAM assets to participate further in upcoming HAM projects. Some players intend to sell off under-construction projects to financial investors with projects being executed by the same player. Thus, they are able to convert HAM projects to EPC without facing the cut-throat competition they deal with currently in the EPC mode. This will help them retain margins.

About Rs 600-700 billion has already been invested through HAM and BOT models. CRISIL's analysis of BOT and HAM projects indicates a potential of ~Rs 2 trillion in terms of Enterprise Value.

### **Improvement in bank credit growth; sustainability a key monitorable**

After increasing 12% in fiscal 2019, bank credit to the roads sector witnessed some pressure in fiscal 2020. However, with higher awards and construction in fiscal 2021, bank lending to the roads sector witnessed a 34% jump.

### **Banks' credit to the roads sector:**



Source: RBI, CRISIL Research

## Review and outlook of investments in national highways

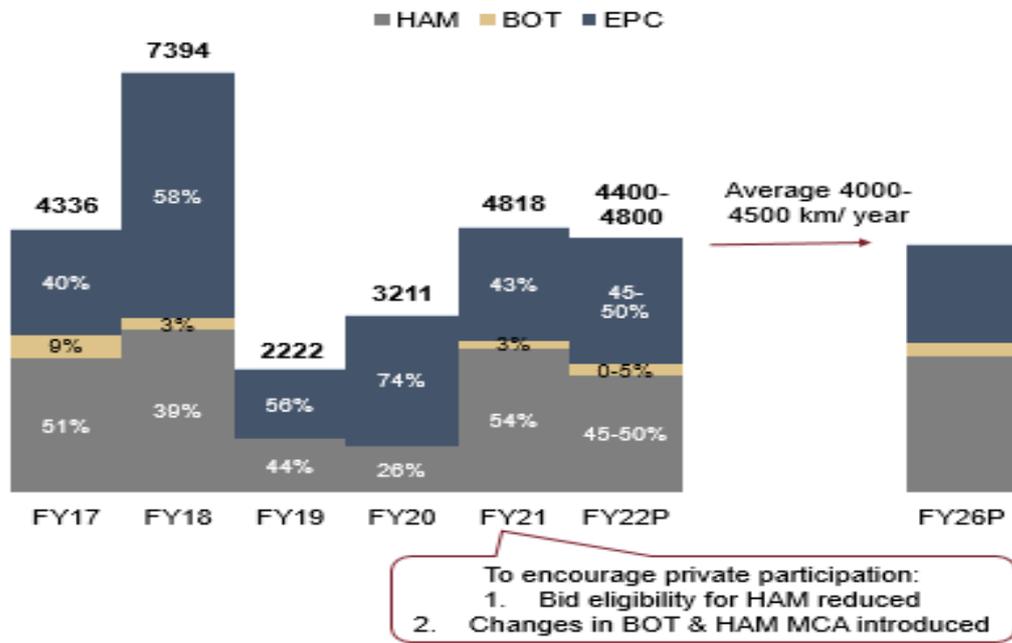
### Awarding momentum to continue with higher private participation

In order to revive the roads sector, amidst the pandemic-led disruption – NHAI awarded 4,818 kms in fiscal 2021 - a three fiscal high. Of these, 54% were awarded under the Hybrid Annuity Model (HAM), 3% under the Build-Operate-Toll (BOT) mode and rest under the Engineering, Procurement and Construction (EPC) mode. Favourable changes in the BOT and HAM agreements, and relaxation of bidder eligibility criteria indicated a clear policy shift last fiscal to improve private-sector participation.

The trend is expected to continue in fiscal 2022 with awards to be in the range of 4400-4800 kms and over the medium term at 4000-4500 km per year, as developers will be able to free up capital through stake sales supported by the strong pipeline of projects under Bharatmala and the NIP.

### Higher awards: HAM gaining share, BOT making a comeback:

(Kms)



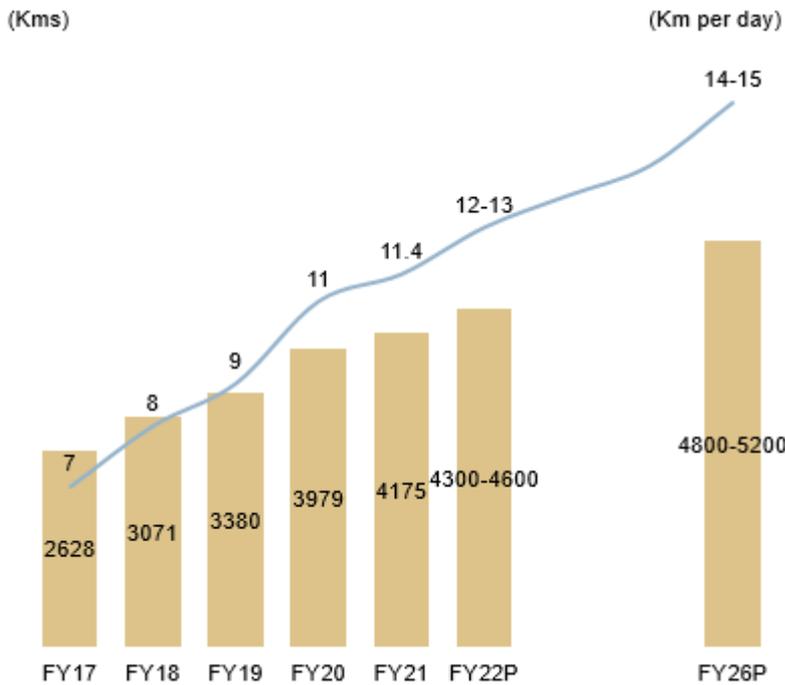
- P: Projected

- Source: NHAI, CRISIL Research

**National Highway construction is also rising steadily with focus on swifter execution**

CRISIL Research expects fiscal 2022 NHAI construction to be in the range of 4300-4600 kms and rise steadily to 14-15 km per day by fiscal 2026.

**NHAI’s pace of construction rising steadily, despite pandemic saw 5% growth in FY21:**



- Source: NHAI, CRISIL Research

### Policy push for HAM enabled higher share in awarding

The Ministry and NHAI, post multiple suggestions from various stakeholders have amended the HAM Model Concession Agreement across the below mentioned parameters in Oct 2020. These are largely aimed to protect developers' returns and ease their liquidity.

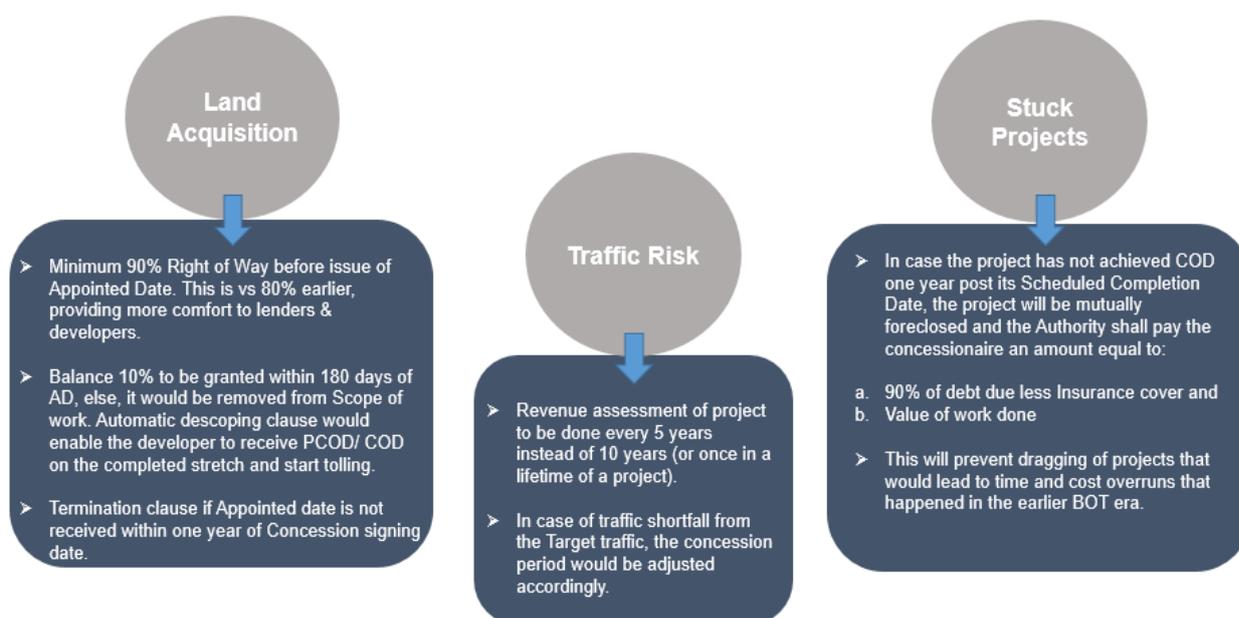
### Recent changes in HAM MCA incorporate developers' concerns

	Old Clause	Revised Clause	Impact
Annuity Payments	Interest on annuity payment linked to <b>RBI determined Bank Rate + 3%</b>	Interest on annuity payment linked to <b>average of one year MCLR of top 5 Scheduled Commercial Banks + 1.25%</b>	Differential between cost of borrowing and interest on annuity reduced, thus preventing erosion of developers' returns due to RBI repo rate changes
Milestone Payments	<b>5</b> instalments, each equal to <b>8%</b> of the Bid Project Cost	<b>10</b> instalments, each equal to <b>4%</b> of the Bid Project Cost	Quicker payments helping developers' liquidity
Change in ownership	Original sponsor/ concessionaire shall hold at least 26% of equity during construction period and <b>2 years thereafter</b>	Original sponsor/ concessionaire shall hold at least 26% of equity during construction period and <b>6 months thereafter</b>	Quicker stake sell-off would ease up developers' balance sheets to bid for new projects
Financial Closure	No clarity on amount on FC	FC to be undertaken for an amount no lower than either: 1. <b>Total Project Cost (60% of BPC);</b> or 2. <b>10% less than (Estimated Project Cost minus 40% of Bid Project Cost)</b>	Would likely prevent termination of projects due to inadequate financing
Dispute resolution board	In case of a dispute, either party may call upon the Independent Engineer to mediate.	Failing mediation by the IE, either party may require such dispute to be referred to the <b>Dispute Resolution Board (DRB)</b> .	Quicker dispute resolution mechanism to prevent stuck projects.
Others	Interest mobilization advance linked to bank rate. Termination payments based on previous milestone payments.	Interest on mobilization advance linked to MCLR. Termination payments based on new milestone payments.	NA

### Changes in BOT MCA were also introduced

In order to improve private participation via the BOT-toll mode, NHAI & the ministry also introduced changes to the BOT MCA aimed at key issues such as land acquisition, revenue assessment in case of traffic shortfall and stuck projects.

## BOT MCA revamped to reinstate interest in the model



Source: MoRTH, NHAI, CRISIL Research

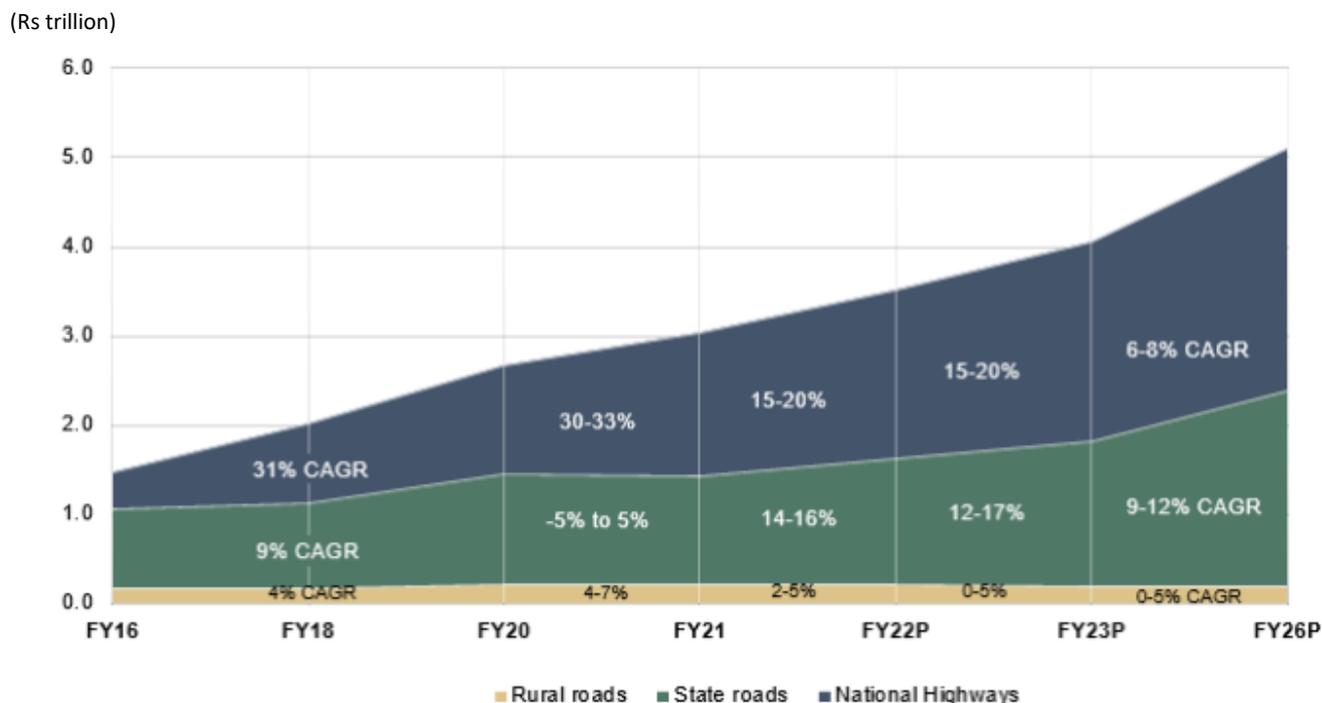
## Amendments to EPC contracts effective November 2018

Key implications	Progress
<b>To enable quicker execution by increasing obligations of the authority</b>	Right of Way: Deadline reduced from 240 days to 180 days for approvals/ clearances for area under forest or sanctuary
	If Appointed date is not received within 90 days of signing the agreement, contract may be terminated. Authority will pay contractor damages = 1% of the contract price to contractor
<b>Ensure effective competition, focus on timely project completion</b>	If the project is not completed within 90 days of SCD, contractors would be ineligible to bid for projects till such is complete.
<b>Increased working capital requirement for contractors</b>	Increased interest on mobilization advance paid to authority. Earlier recovery of mobilization advance. Release of retention money against bank guarantees discontinued
<b>Increased maintenance obligations of the contractor</b>	Lower compensation and higher tenure for maintenance obligations of contractor. Defect liability period increased from 4 years to 10 years.

## Despite COVID-19 induced lockdowns, investments in National Highways have sustained the sector

Last fiscal, the national highways sector thumbed nose at Covid-19 and delivered a stellar performance, riding on higher project awards, record construction, and traffic that surpassed pre-pandemic levels once the lockdowns were lifted in the second half. Though the second wave of infections dampened this momentum, it is estimated that it did not have a material bearing on growth in fiscal 2022. Through the fiscal 2021, EPC contractors gained learnings from the first wave and insights on scale-up and on the recovery as the economy opens up.

**Investments towards National Highways have portrayed resilience during the pandemic**



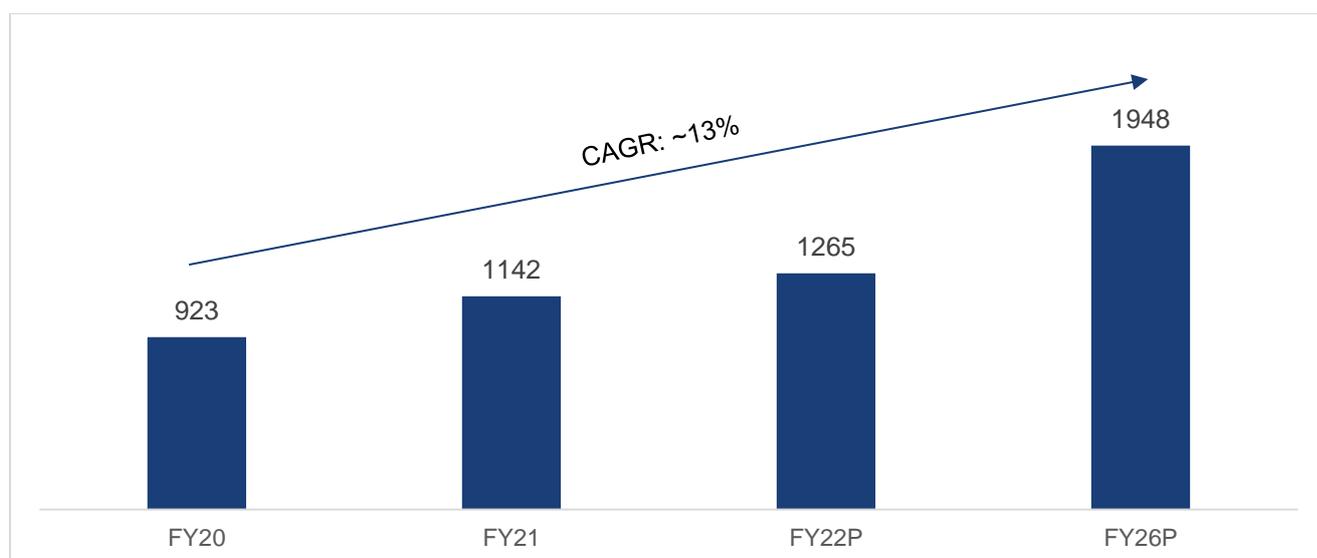
E: Estimated, P: Projected

Note: Capex excludes land acquisition costs

Source: NHAI, MoRTH, State budget documents, PMGSY, CRISIL Research

CRISIL Research estimates that National Highway capex grew by 30-33% in fiscal 2021 due to higher construction and the momentum is expected to continue in fiscal 2022 on the back of higher awards. CRISIL Research further projects the investments in national highways to increase nearly 2 times over the next six years from fiscal 2020 to 2026.

**Capex outlook in national highways (in Rs billion)**



E: Estimated, P: Projected

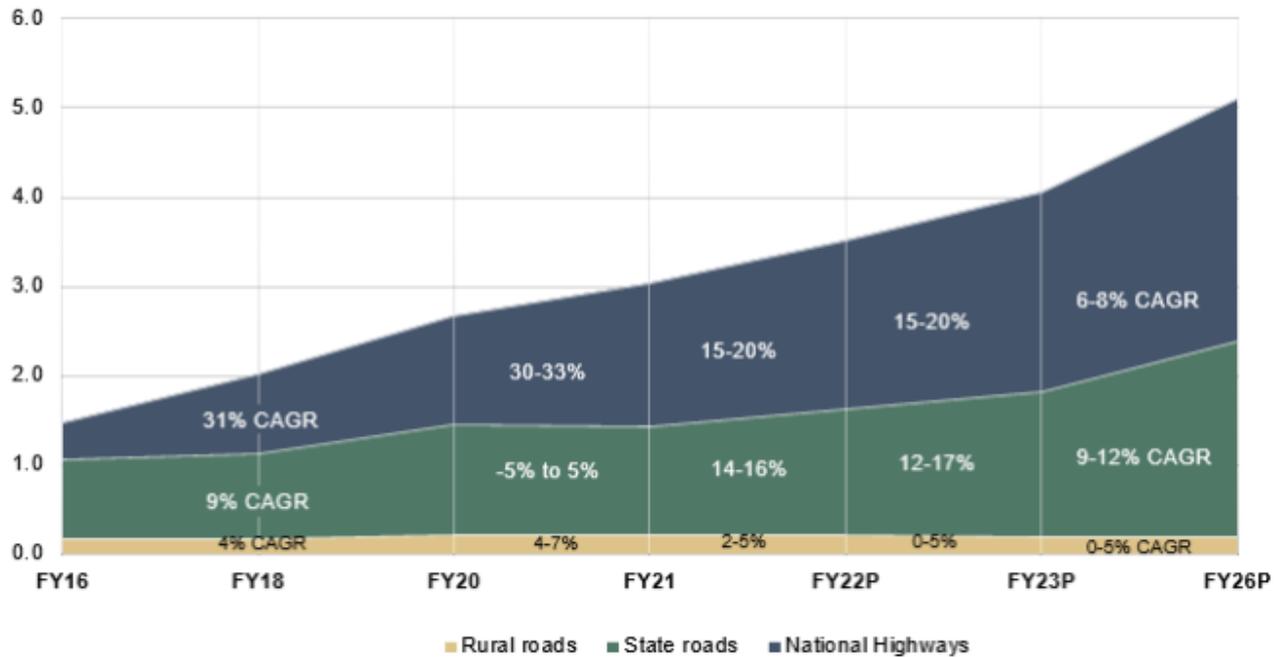
Source: CRISIL Research

### State highways

Budgetary allocations for Roads Capex by key states were anyway lower in fiscal 2021. With the virus spreading across India, the states diverted funds from the budgeted roads capex to health & social sectors.

### State road capex upside would be limited due to second wave impact

(Rs trillion)



E: Estimated, P: Projected

Source: State budget documents, CRISIL Research

### Outlook of toll collection and remittance on national highways

Toll collection and remittance to grow at CAGR (FY 20-26) of 9-9.5% on a like-to-like basis and to grow at 15.5-16% considering new road additions and subsequent tolling on them. CRISIL Research expects total toll collection and remittance revenue to reach Rs 640-655 bn in the year fiscal 2026 considering both the existing tolled highways and the additional highways to be executed over the subsequent years. The forecast has been achieved by considering improvement in economic activity, efficiency gains due to removal of check posts post implementations of GST, growth in vehicle population in both PV & CV segments, strong execution pipeline, better compliance and blocking of leakages due to implementation of ETC.

## BUSINESS

*This section should be read in conjunction with, and is qualified in its entirety by, the sections entitled “Risk Factors”, “Summary of Concession Agreements”, “Special Purpose Combined Financial Statements” and “Discussion and Analysis by the Directors of the Investment Manager of the Financial Condition, Results of Operations and Cash Flows of the Project SPVs of the Highways Trust” on pages 54, 189, 310 and 223, respectively, and the Technical Reports and Traffic Reports at Annexure II and III, respectively as well as all other information contained in this Final Placement Memorandum.*

*References to “we”, “us” and “our” are to the Highways Trust and its subsidiaries i.e. the Project SPVs, on a consolidated basis.*

### Overview

Highway Infrastructure Trust (the “**Highways Trust**”) is an Indian infrastructure investment trust which proposes to invest in road infrastructure assets and is sponsored by Galaxy Investments II Pte. Ltd. (the “**Sponsor**”). Highways Trust will have an initial portfolio consisting of the six Project SPVs having an aggregate of 451.98 kms (1,710 lane kms), located across six states in India

The Sponsor is affiliated with funds, vehicles and/or entities managed and/or advised by affiliates of KKR. As on date, the Sponsor is a 100% subsidiary of Galaxy Investments Pte. Ltd., which is majority owned and controlled by KKR Asia Pacific Infrastructure Holdings Pte. Ltd.

Founded in 1976, KKR is a leading global investment firm that offers alternative asset management and capital markets and insurance solutions with approximately US\$ 491 billion of assets under management as of June 30, 2022. KKR sponsors investment funds that invest in private equity, credit and real assets and has strategic partners that manage hedge funds. KKR’s insurance subsidiaries offer retirement, life and reinsurance products under the management of The Global Atlantic Financial Group LLC. KKR aims to generate attractive investment returns by following a patient and disciplined investment approach, employing world-class people, and supporting growth in its portfolio companies and communities.

In 2008, KKR established a dedicated infrastructure team and strategy focused on global investment opportunities. KKR has been one of the more active infrastructure investors globally over the past several years, having made approximately 65 infrastructure investments globally and more than US\$40 billion in assets under management within infrastructure.

Currently, KKR’s Infrastructure platform has expanded to include approximately 75 dedicated investment professionals across 10 offices covering a broad spectrum of investment opportunities in various infrastructure subsectors, including: midstream energy, renewables, power & utilities, water and wastewater, waste, telecommunications and transportation, among others. KKR continually monitors infrastructure sectors and infrastructure-related investments for emerging trends, and may identify and prioritize investments in other sectors as conditions change or cycles evolve. Among KKR’s focus areas are investments in assets related to the global roads sector. KKR has invested or committed over US\$6.7 billion of equity in private equity and infrastructure deals in India since 2010 with over 20 investments made and more than a dozen active portfolio companies today. For further details in relation to the Sponsor, please see the section entitled “*Parties to the Highways Trust*” on page 101.

### *Our Projects*

Our initial portfolio of assets includes the following six Projects, comprise both, National Highways and State Highways, and are located in the states of Telangana, Gujarat, Madhya Pradesh, Meghalaya, Rajasthan and Tamil Nadu to be acquired by way of 100% shareholding in six Project SPVs:

- the DBCPL Project, a four lane highway with an aggregate length of 140.79 kilometres, between Bhopal to Dewas on State Highway 18\* in Madhya Pradesh, operated by DBCPL;
- the GEPL Project, a four lane highway with an aggregate length of 87.10 kilometres, on the Godhra and the border between Madhya Pradesh and Gujarat on National Highway 59\* in Gujarat, operated by GEPL;

- the JPEPL Project, a four lane highway with an aggregate length of 71.54 kilometres, between the Jodhpur and Pali section on National Highway 65\* in Rajasthan, operated by JPEPL;
- the NBL Project, a four lane highway with an aggregate length of 30.89 kilometres, between the Kadtal and Armur section on National Highway 7\* in Telangana, operated by NBL;
- the SEPL Project, a two lane highway with an aggregate length of 48.77 kilometres, comprising the Shillong bypass connecting National Highway 40\* with National Highway 44\* in Meghalaya, operated by SEPL; and
- the UEPL Project, a four lane highway with an aggregate length of 72.90 kilometres, between the Tindivanam and Ulundurpet section on National Highway 45\* in Tamil Nadu, operated by UEPL;

*\*Note: The State Highway and National Highway numbers and chainages mentioned in this Final Placement Memorandum are old Highway numbers and chainages, as per the concession agreements. The actual SH/NH numbers and chainages at site may differ based on subsequent changes.*

Through these six SPVs, we will maintain and operate road assets aggregating to 451.98 kms (1,710 lane kms).

The combined operating revenue of the Project SPVs for Fiscals 2022, 2021 and 2020 was ₹ 5,866.56 million, ₹ 5,085.04 million, and ₹ 5,008.80 million, respectively.

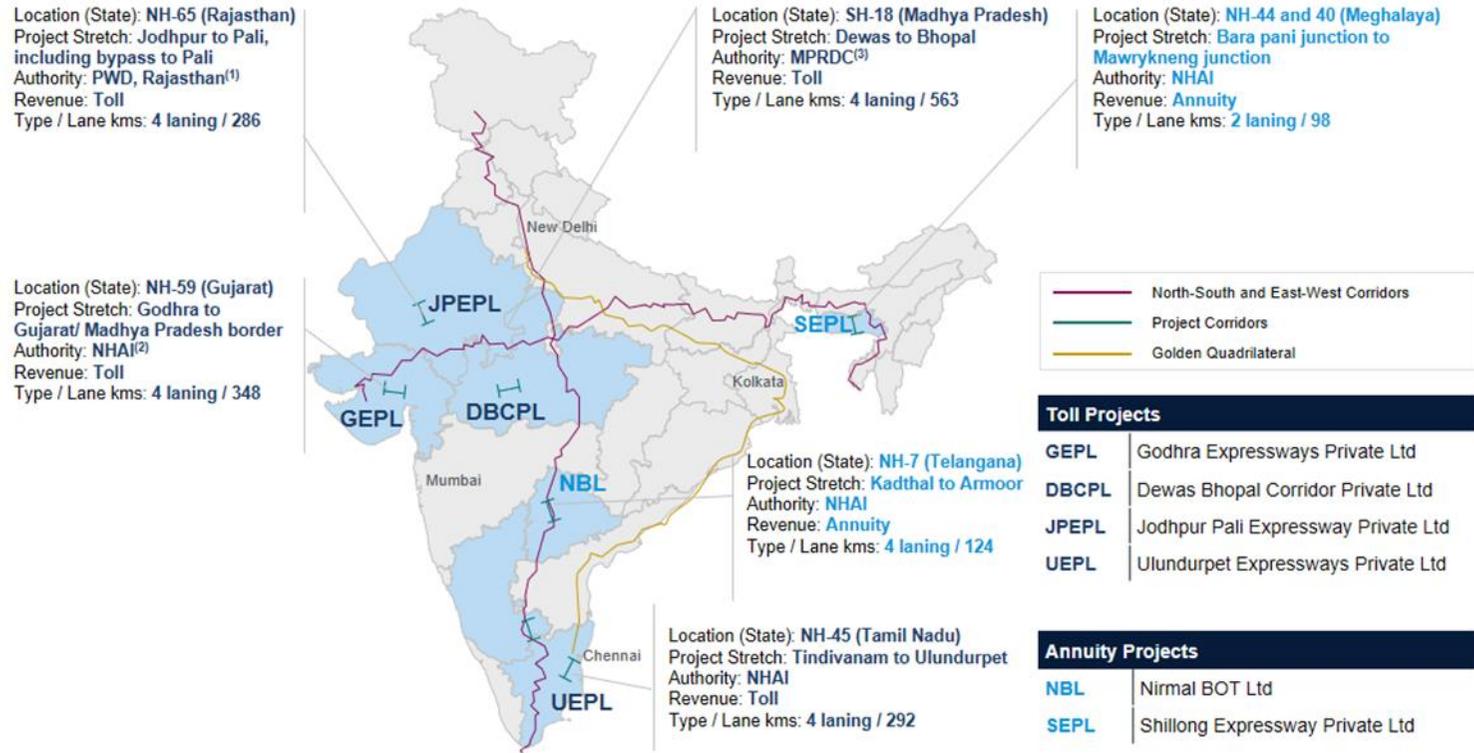
The Projects are divided into two types on the basis of the implementation mode: (i) toll and (iii) annuity. Key details of these models are set out below:

**Annuity-based Projects:** Under this model, the concessionaire is responsible for the construction and maintenance of the project during the concession period. The concessionaire generates revenue through fixed annuity payments received from the concessioning authority, over the concession period. Since this annuity payment is a cost to the concessioning authority, the contract is awarded to the lowest bidder.

**Toll-based Projects:** Under this model too, the concessionaire is responsible for the construction, operation and maintenance of the project during the concession period, post which the project is transferred to the concessioning authority. During the concession period, the concessionaire realises its returns by way of toll collection rights under the concession agreement. Therefore, the concessionaire bears the revenue risk during the concession period. The toll charged under these contracts is generally regulated by a policy or a public agency.

For further details, please see the section entitled “*Industry Overview*” on page 150.

The map below illustrates the locations of the Projects:



1. Public Works Department, Rajasthan; 2. National Highways Authority of India; 3. Madhya Pradesh Road Development Corporation Limited.

\*Map not drawn to scale

The Investment Manager will also have the flexibility to acquire new projects through acquisitions from the Sponsor and third parties.

Virescent Infrastructure Investment Manager Private Limited is the Investment Manager for the Highways Trust. The Investment Manager is a private limited company incorporated on August 22, 2020 under the Companies Act, 2013, having CIN U74999MH2020PTC344288.

Virescent Renewable Energy Project Manager Private Limited, is the Project Manager and is a private limited company incorporated on November 27, 2020 under the Companies Act, 2013, having U74999MH2020PTC350874.

Axis Trustee Services Limited is the Trustee of the Highways Trust. The Trustee is a registered intermediary with SEBI under the Securities and Exchange Board of India (Debenture Trustees) Regulations, 1993, as a debenture trustee.

For further details of the Sponsor, the Investment Manager, the Project Manager and the Trustee, please see the section entitled “Parties to the Highways Trust” on page 101.

### **Strengths**

The Investment Manager believes the following to be the key strengths of the Highways Trust:

#### ***Sizeable and Diversified Portfolio - Strategically located Projects and variety of Concessioning Authorities***

Highways Trust will have a sizeable initial portfolio consisting of the six Project SPVs having an aggregate of 451.98 kms (1,710 lane kms), located across six states in India. The portfolio of the Highways Trust has toll assets with operating histories of 7 to 13 years and each Project SPV has entered into a long term concession agreement with the NHAI and other state authorities, having terms of between 15 and 27 years, thereby providing long term cash flows to the Highways Trust.

The Concessioning Authorities for these Projects include the NHAI, MPRDC and PWD, Government of Rajasthan. Further, the initial portfolio of assets comprises a mix of both toll and annuity road projects bringing in diversity in the earnings of the Project SPVs as well. We believe that the diversified revenue streams from our Projects provide us with steady cash flow during the course of the year. The Projects are located in corridors that have a mix of high commercial and passenger vehicular traffic, located in parts of India with high gross state domestic product growth. The principal features of the Projects are as follows:

- the DBCPL Project connects two major cities of Madhya Pradesh – Bhopal (political capital of Madhya Pradesh) and Indore (business and trading capital of Madhya Pradesh) via Dewas and serves the regional traffic demand. Additionally, the Project Road provides connectivity to the mobility requirements of smaller towns/cities along the project corridor such as, amongst other, Sehore, Ashta and Sonkatch;
- the GEPL Project serves the long-distance traffic majorly plying from Godhra and beyond to Madhya Pradesh and beyond. Apart from long distance traffic, it also serves the short distance traffic which is mainly generated between Godhra and Dahod and surrounding areas;
- the JPEPL Project is a part of the national highway that connects the states of Punjab and Rajasthan with western states of Gujarat and Maharashtra. Apart from long distance traffic, it also serves the short distance traffic which is mainly generated between Jodhpur and Pali areas;
- the UEPL Project acts as one of the primary life-line corridor in the state of Tamil Nadu connecting the Chennai (the state capital) with various industrial towns and tourist places in the southern, eastern, western parts of Tamil Nadu. The UEPL Project serves long-distance distance traffic which is majorly plying between Tindivanam/north of Tindivanam (Chengalpattu/Chennai) and eastern/southern and western Tamil Nadu districts (amongst other, Trichy, Madurai, Cuddalore, Salem and Thanjavur). Apart from long distance traffic, it also serves the short distance traffic which is mainly generated between Tindivanam and Villupuram, Madapattu and Kadilam areas;
- the NBL Project is a part of the Nagpur – Hyderabad section of NH-7 and also part of the 4,000 km North-South Corridor that connects Srinagar in Jammu and Kashmir with Kanyakumari in Tamil Nadu; and

- the SEPL Project is part of one of the important road links in North-Eastern India and connects Guwahati, the largest city of Assam with state capitals of Tripura, Mizoram and Manipur.

The concession periods of the Project SPVs started at different times and they are expected to expire at different times, thereby ensuring continuous cash flows. The residual terms of the concession agreements range between approximately 4 years and 21 years as of March 31, 2022 (including any potential extensions on account of shortfall of actual traffic against target traffic. For further details, please see the Traffic Reports in Annexure III). We believe that our temporally and geographically diverse project portfolio provides us with an advantage in capitalizing on new opportunities available in the Indian roads and highways sector and reduces our dependence on select state geographies. We believe that this diversification strengthens our business by reducing our reliance on any specific project and reducing the potential impact on our business of any economic slowdown or Project-specific *force majeure* event or with respect to any particular project.

The Investment Manager believes that the Projects cater to growth sectors and population densities that will utilise these Projects on an increasing basis, thereby contributing to expected growth in the Highways Trusts' toll revenues.

#### ***Stable income through annuity assets and toll income generating assets with high traffic volume***

We believe that the diversified revenue streams from our Projects provide us with steady cash flow during the course of the year. Approximately 17.63% of our combined revenue received in cash in the financial year ended March 31, 2022 came from annuities paid by the relevant Concessioneing Authorities while approximately 82.37% of our combined total revenue received in cash in the financial year ended March 31, 2022 was generated from toll collections.

The earliest operating toll-based Project SPV started collecting toll from 2009. The aggregate toll collections were ₹ 4,549.06 million, ₹ 3,919.12 million and ₹ 3,922.85 million in Fiscal 2022, Fiscal 2021 and Fiscal 2020 respectively. While, there was no growth in aggregate toll collections by the four toll based Project SPVs in Fiscal 2021, due to, amongst other things, the impact of COVID-19 in the first two quarters of Fiscal 2021, some of the main reasons for the increase in toll collections historically were the increase in traffic volumes on the Project stretches over the relevant period and the revision of the applicable toll rates with WPI growth on an annual basis as per the terms of concession agreements. According to the Traffic Reports, it is expected that toll collections will continue to increase for the same reasons. Our toll-based Projects are located in strategic areas and connect, amongst others, industrial areas, ports, tourist places and economically important cities. This allows our toll-linked Project SPVs to exhibit a stable growth in toll collections. For further details, please see the section entitled "*Discussion and analysis by the Directors of the Investment Manager of the financial condition, results of operations and cash flows of the Project SPVs of the Highways Trust*" on page 223 and the Traffic Reports in Annexure III.

Our two annuity based Project SPVs, SEPL and NBL have received semi-annual annuities until March 31, 2022. As per the concession agreements, the relevant Concessioneing Authorities are required to make payments on the dates set out in the concession agreements. However, average collection days on all annuities is 2 days from the due date, excluding the first annuity. Our annuity-based Project SPVs have predictable cash flows and bring stable income to the Highways Trust.

#### ***Strong support from the Sponsor, Project Manager and Investment Manager***

We intend to leverage the experience and expertise of our Sponsor and its affiliates, to gain a competitive advantage within the road infrastructure industry. Our Sponsor is engaged in investment activities primarily with an objective of generating stable returns and earning long term capital appreciation. Our Sponsor is affiliated with funds, vehicles and/or entities managed and/or advised by affiliates of KKR.

KKR is a leading global investment firm with approximately US\$491 billion of assets under management as of June 30, 2022, that offers alternative asset management as well as capital markets and insurance solutions. KKR sponsors investment funds that invest in private equity, credit and real assets and has strategic partners that manage hedge funds. KKR's insurance subsidiaries offer retirement, life and reinsurance products under the management of The Global Atlantic Financial Group LLC. KKR aims to generate attractive investment returns by following a patient and disciplined investment approach, employing world-class people, and supporting growth in its portfolio

companies and communities. In 2008, KKR established a dedicated infrastructure team and strategy focused on global investment opportunities. KKR has been one of the more active infrastructure investors globally over the past several years, having made over 60 infrastructure investments globally and more than US\$40 billion in assets under management within infrastructure. Currently, KKR's infrastructure platform has expanded to include over 75 dedicated investment professionals across 10 offices covering a broad spectrum of investment opportunities in various infrastructure subsectors, including: midstream energy, renewables, power & utilities, water and wastewater, waste, telecommunications and transportation, among others. KKR continually monitors infrastructure sectors and infrastructure-related investments for emerging trends, and may identify and prioritize investments in other sectors as conditions change or cycles evolve. Among KKR's focus areas are investments in assets related to the global roads sector. KKR has invested or committed US\$6.7 billion of equity in private equity and infrastructure deals in India since 2010 with over 20 investments made and more than a dozen active portfolio companies today.

KKR's Asia Pacific infrastructure portfolio other than Highways Trust, includes, amongst others, the Terra InvIT, India Grid Trust, and recently, HC1. KKR's experienced team is well positioned to capture compelling opportunities and add value to its portfolio to generate attractive, risk adjusted returns for its investors. Drawing upon this depth of experience, our Sponsor has established a strong track record of operating and managing large-scale projects, which will benefit us across all stages of project operations and acquisitions within India's complex regulatory framework (including, for example, strategic acquisition, O&M, and receivables management). Our Sponsor also provides us the ability to leverage its parentage and long-term industry relationships with stakeholders to gain cost efficient access to financing from institutions and capital markets. Further, our Investment Manager and Project Manager are also affiliates of the Sponsor. We believe our affiliation to KKR will allow us to pursue marque and high quality road infrastructure assets and engage effectively with regulators and concessioning authorities.

#### ***Attractive industry sector with favourable government policies***

Further development of the infrastructure sector, in particular road infrastructure, is a priority for the GoI and many state governments and has been the subject of enhanced investment from the public sector through traditional means of public investment and new channels such as PPPs. Roads have been the key focus area for budget allocations over the years. Under Union Budget 2022-23, the Government has allocated ₹ 1,99,107.71 crore under the Ministry of Road Transport and Highways. Between FY2016-17 and FY2022-23, budget allocation for road transport and highways increased at a robust CAGR of 24.90%. Huge investment have been made in the sector with total investment increasing more than three times from ₹ 51,914 crore (US\$ 7.43 billion) in 2014-15 to ₹ 158,839 crore (US\$ 22.73 billion) in 2018 – 2019. As of December 2021, road projects with an aggregate length of 19,265 km has been awarded under Bharatmala Pariyojna, of which road length of 6,750 km has already been completed. Through the PPP model, among others, the Investment Manager believes that the Highways Trust has acquired, and will continue to capture through further acquisitions, a significant share in the PPP format of the road infrastructure sector.

For further details on the market opportunity for the road infrastructure industry in India, please see the section entitled "*Industry Overview*" on page 150.

#### ***Skilled and experienced management team with a focus on corporate governance***

We have a strong management team with several years of experience in the infrastructure sector providing us an ability to pursue our growth strategies in a seamless manner. We draw on the knowledge of our Board of Directors and key personnel, who bring us expertise in the areas of risk management, business strategy and operational and financial capabilities, amongst others. We believe this will be key to the execution of our growth strategies. Our Board comprises of 6 directors, as on the date of this Final Placement Memorandum with extensive experience in management, finance and infrastructure.

Further, the Project Manager will also entered into a business support services agreement with HC1, an affiliate of the Investment Manager, for provision of certain services to the Project SPVs including, amongst others, corporate accounting, banking and financing services, payroll management services, corporate secretarial services and tax and statutory compliance. For further details in relation to the business support services agreement, please see the section entitled "*Related Party Transactions – Business Support Services Agreement*" on page 255. HC1 houses a team of individuals with an in-depth understanding of the road sector and cumulative experience in the road sector of more than 150 years which we believe will contribute to our growth and success.

We believe that the experience of our management team (Investment Manager and Project Manager) in the infrastructure sector will ensure that the Project SPVs and the Highways Trust are operated and managed in an efficient manner. The team is supported by other qualified operational personnel, through appropriate contractual arrangements, who have an in-depth understanding of the sector in which we operate. We have contracted a significant number of qualified personnel (including the experienced contractors and service provider identified by the Investment Manager and the Project Manager) who are engaged in operating and managing our projects as on the date of this Final Placement Memorandum.

With the aim of enshrining principles of good corporate governance and effective management and operations of the Highways Trust, the Investment Manager has constituted various committees and adopted policies such as anti-bribery and corruption policy, a health, safety and environment policy, a prevention of sexual harassment policy, a risk management policy and a vigil mechanism policy to manage the activities of the Highways Trust. The Investment Manager has further created separate audit and risk management committee and investment committee for managing the decision-making process for the Highways Trust. In accordance with the SEBI InvIT Regulations, the Investment Manager has also adopted the (a) distributions policy pursuant to which distributions are required to be made to the Unitholders at least once a year for periods after Allotment and (b) borrowing policy which aims to outline the borrowing thresholds and process in relation to the Highways Trust. Further, the Investment Manager has also adopted appointment of auditor and valuer policy which aims at formulating a structure for ensuring compliance by the Highways Trust in appointment of its auditor and the auditing standards followed and the appointment of its valuer, in accordance with applicable law including the SEBI InvIT Regulations and code of conduct policy which aims at formulating a framework for ensuring interest of the Unitholders and proper conduct in carrying out the business and affairs of the Highways Trust in accordance with SEBI InvIT Regulations. For details in relation to the corporate governance framework of the Investment Manager, please see the section entitled “*Corporate Governance*” on page 143.

We believe that our governance process will ensure adherence and enforcement of principles of sound corporate governance with the objectives of fairness, transparency, professionalism, trusteeship and accountability, while facilitating effective management of the businesses and efficiency in operations.

### **Business Strategies**

The Investment Manager believes the following to be the key strategies of the Highways Trust:

#### ***Continue to pursue accretive growth by expanding the portfolio of road assets***

The Investment Manager intends to be selective with respect to any projects it acquires in the future and will consider factors such as access to important locations in the vicinity, connecting roads, industrial and manufacturing hubs, connectivity with raw materials, ports, availability of the relevant approvals, ease of complying with laws and also evaluating competing modes of transportation.

The Investment Manager believes that it will be able to leverage the Sponsor’s established network of relationships and contacts, extensive knowledge and experience in the roads sector in India to implement its acquisition strategy, which is to acquire eligible infrastructure assets, operational road projects and road projects that are in advanced stages of construction. In this regard, it may be noted that the Sponsor has entered into the Sponsor SPA 1 and Sponsor SPA 2 for acquisition of certain assets held by Ashoka Concessions Limited and/ or its affiliates and India Infrastructure Fund II, respectively. Upon completion of such acquisitions by the Sponsor, these assets may be made available by the Sponsor for acquisition to the Highways Trust in the future, whether directly or indirectly, subject to various conditions precedents specified in the Sponsor SPA 1 and Sponsor SPA 2 and subject to certain conditions including the receipt of necessary regulatory and statutory approvals. . The Investment Manager intends to expand the portfolio of road projects without compromising on the returns on investment from the Projects while providing attractive cash flows and yields, and opportunities for future income and capital growth.

In addition, the Investment Manager believes that due to trends in the industry, a number of acquisition opportunities may be available. These trends include the potential divestment of assets by highly leveraged private companies and by financial and private equity investors seeking to exit their investments. Further, the Investment Manager (on behalf of the Highways Trust) may also consider expanding the portfolio of the Highways Trust by directly submitting bids to the relevant Governmental entities for the acquisition of assets. The Investment Manager hopes to take advantage of these opportunities by actively sourcing and acquiring quality assets from such third parties and the Government on a case-by-case basis, subject to its investment criteria as provided below:

- the asset having stable, predictable cash flow;
- the terms and duration of the concession agreement, the O&M agreements and other relevant agreements with respect to the asset;
- the location of the asset;
- the historical and expected traffic volume of the asset;
- the expected cash flows from the asset;
- the maintenance cost of the asset;
- the extent of any ongoing or potential disputes relating to the asset; and
- any other factor that may have an impact on the profitability of the asset.

***Maintain optimum capital structure to maximise distributions to Unitholders***

We focus on achieving an optimal capital structure for our projects and will continue to draw upon the experience, relationship and expertise of our Sponsor and its affiliates in sourcing funds from multiple sources, both from domestic and international markets. The Highways Trust's total outstanding consolidated net debt after full utilization of the Issue Proceeds, will be within the regulatory requirement of 49% of the value of the InvIT Assets upon completion of the Issue (net of cash and cash equivalents) as specified under the InvIT Regulations.

We also intend to optimise our leverage to retain enough flexibility to provide sustainable and predictable cash flows while also evaluating potential acquisition opportunities in the future. After the completion of the Issue, we believe that we will have sufficient equity capital and ability to add additional debt to support acquisition of additional assets while maintaining an optimum capital structure. We will seek to employ appropriate financing policies and also diversify our funding sources with an objective of minimising our overall cost of capital. We will seek to optimise our debt and equity mix in such a manner that the aggregate consolidated borrowings and deferred payments of the Highways Trust, net of cash and cash equivalents does not exceed 70% of the value of the Highways Trust Assets at any time subject to the approval of the unitholders as provided in accordance with the SEBI InvIT Regulations. Further, any additional debt beyond 49% of the value of the Highways Trust Assets will be raised only upon compliance with the conditions set out in the SEBI InvIT Regulations. In accordance with the Trust Deed, and subject to the Applicable Law permitting such additional debt, any additional debt will be raised only with consent of 51% of the Unitholders of the Highways Trust. If it is in the interests of the Unitholders, the Investment Manager may also pursue growth opportunities that require raising additional capital through the issuance of new Units.

***Continue to ensure efficient and active asset management***

We will appoint the Project Manager to undertake operations and management of the Project SPVs in furtherance of which the Project Manager will be added as a party to the existing O&M Agreements with O&M Contractors to provide operation and maintenance services in respect of the Project SPVs.

Our O&M Contractors undertaking toll operations will be professional and reputed toll collection agencies and performance of these O&M Contractors will be evaluated on a regular basis. Our Projects are maintained by contracting professional or expert highway maintenance contractors which undertake maintenance activities such as routine maintenance, repair of defects or damages, route operations and preventive maintenance. We will

continue to assess the performance of these O&M Contractors on a regular basis based on certain service level agreements fixed during signing of the O&M Agreements.

The Project Manager will engage a network of O&M Contractors for undertaking the O&M activities relating to the Projects. The principal objective is to incorporate industry best practices in operating and maintaining the Projects. This proactive approach to O&M activities seeks to employ both preventive and corrective measures in order to optimise the long term performance of each Project and reduce, as much as possible, any periods where the roads are unavailable for users (in whole or in part), which may result in a loss of revenue.

### **Structure of the Highways Trust**

The Sponsor has set up the Highways Trust on December 3, 2021, as an irrevocable trust, under the provisions of the Indian Trusts Act, 1882. The Highways Trust was registered as an infrastructure investment trust under the InvIT Regulations on December 23, 2021, having registration number In/ InvIT/21-22/0019. The Highways Trust's principal investment objectives to carry on the activity of an infrastructure investment trust under the InvIT Regulations. Investment by the Highways Trust shall be in any manner permissible under, and in accordance with, the InvIT Regulations and Applicable Law, including in such Holdcos and/or SPVs, securities in India as permitted under the InvIT Regulations and the Investment Strategy.

The Highways Trust will acquire the initial portfolio asset which comprises the Project SPVs consisting of the Projects. The Highways Trust will, subject to receiving the requisite approvals, acquire the Projects through the acquisition of 100.0% of the issued and paid-up equity share capital of the Project SPVs from third parties. Please see the section entitled "*Formation Transactions in relation to the Highways Trust*" on page 20, for a graphical representation of the structure of the Highways Trust

### **Brief description of the Projects**

The initial portfolio of the Highways Trust comprises six Projects that are operated and maintained by the Project SPVs. The Project SPVs have undertaken or are undertaking their respective Projects on a BOT or DBFOT basis, pursuant to which they design, build, finance, operate and maintain the Projects pursuant to concession agreements with the relevant Concessioneing Authorities.

The table below sets forth details of the Project SPVs:

S. No.	Project SPV	Type of Project model (Annuity or Toll)	Length (in km)	No. of lanes	State	Authority	COD	End of Concession Period	Residual Concession Period as of March 31, 2022 (in years)	Revenue for Fiscal 2022 (in ₹ million)*
1.	Dewas Bhopal Corridor Private Limited	Toll	140.79	4	Madhya Pradesh	MPRDC	February 10, 2009	December 1, 2033	11.70	1,511.12
2.	Godhra Expressways Private Limited	Toll	87.10	4	Gujarat	NHAI	October 31, 2013	July 23, 2043**	21.30**	1,728.70
3.	Jodhpur Pali Expressway Private Limited	Toll	71.54	4	Rajasthan	PWD, Government of Rajasthan	October 31, 2014	September 15, 2043***	21.50***	576.99
4.	Nirmal BOT Limited	Annuity	30.89	4	Telangana	NHAI	July 22, 2009	October 29, 2027	5.60	245.55
5.	Shillong Expressway Private Limited	Annuity	48.77	2	Meghalaya	NHAI	February 28, 2013	February 6, 2026	3.90	263.36
6.	Ulundurpet Expressways Private Limited	Toll	72.90	4	Tamil Nadu	NHAI	July 23, 2009	February 28, 2027	4.90	1,470.77

\* Includes income such as, amongst others, utility shifting income and claims from NHAI.

\*\* In accordance with the GEPL Concession Agreement, the concession period will end on February 28, 2038. However, the concession period may get extended until July 23, 2043 (by 5.4 years) in view of actual traffic being lower than the target traffic. Such extension has been recommended by the independent engineer and the NHAI project implementation unit but are subject to formal concurrence from the concessioning authority. For further details, please see the section entitled "Risk Factors - Notwithstanding that the concession periods granted to the Project SPVs are fixed, concession periods may be modified under particular circumstances and affect the Project SPVs' revenues" on page 65 and the Traffic Reports as Annexure III.

\*\*\* In accordance with the JPEPL Concession Agreement, the concession period will end on September 15, 2038. However, the concession period may get extended until September 15, 2043 (by 5 years) in view of actual traffic being lower than the target traffic. This extension is yet to be approved by the concessioning authority. This, however, remains subject to actual traffic volume tests to be undertaken on the specified dates in accordance with the JPEPL Concession Agreement. For further details, please see the section entitled "Risk Factors - Notwithstanding that the concession periods granted to the Project SPVs are fixed, concession periods may be modified under particular circumstances and affect the Project SPVs' revenues" on page 65 and the Traffic Reports as Annexure III.

## *The Projects*

### *Dewas Bhopal Corridor Private Limited (“DBCPL”)*

#### *Concession agreement*

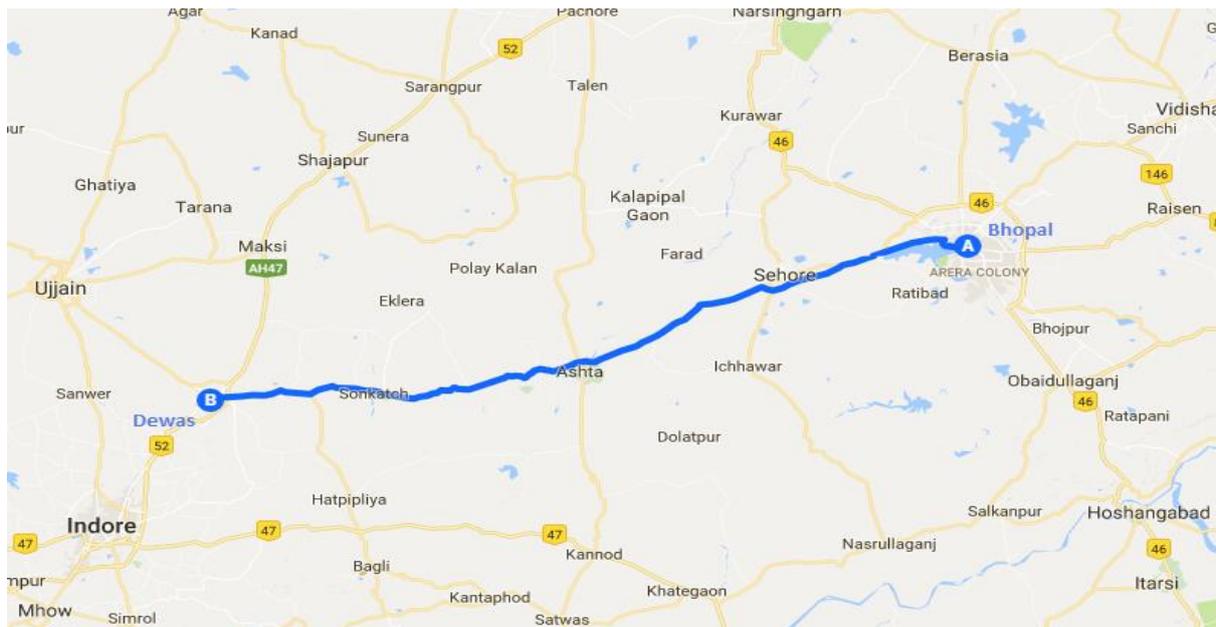
The MPRDC and DBCPL entered into the concession agreement dated June 30, 2007 (the “**DBCPL Concession Agreement**”). DBCPL was engaged, on a build, operate and transfer basis, under the DBCPL Concession Agreement for the reconstruction, strengthening, widening and rehabilitation of the Bhopal-Dewas section including (including all bypasses) from KM 6.800 to KM 151.600 on SH-18\* to 4-lane section in the State of Madhya Pradesh.

The DBCPL Concession Agreement was granted for a period of 25 years and certain extensions were granted by the concessioning authority. As consideration, DBCPL has the sole and exclusive right to demand, collect and appropriate tolls payable by vehicles using the Project in accordance with the DBCPL Concession Agreement and at the rates set out in the DBCPL Concession Agreement. DBCPL pays the MPRDC ₹ 1.00 per year, as concession fees, during the term of the DBCPL Concession Agreement. For further details on the DBCPL Concession Agreement, please see the section entitled “*Summary of the Concession Agreements*” on page 189.

#### *Corridor description*

State Highway 18\*, of which the DBCPL Project is a part of, runs from Bhopal to the border of Gujarat.

The map below illustrates the location of the Project and the corridor it covers:



*Note: Subsequent to signing of the DBCPL Concession Agreement, the State Highway number has been revised to SH-28.*

According to the Traffic Report, the factors that contribute to traffic growth on the Project include, among other things, (i) the lack of routes in vicinity of toll plazas preventing the avoidance of the Project road, (ii) the project being a part of the a part of the Kandla-Sagar economic corridor, and being an important highway for the movement from east to the west and (iii) the Project connecting Bhopal, the political capital of Madhya Pradesh to Indore, the business and trading capital of Madhya Pradesh.

#### *Traffic volume*

The table below sets forth the AADT by category of vehicles for Fiscals 2022, 2021 and 2020:

	Fiscal		
	2022	2021**	2020*
Car	7,536	7,425	7,079
LCV/ Minibus	1,578	1,596	1,329
Bus	447	363	573
Trucks	759	896	864
MAV of more than 2 axles	1,346	1,411	1,220
AADT	11,666	11,691	11,066

Note: For details, see Traffic Reports in Annexure III

\* Toll operations suspended for 6 days due to Covid-19 in March, 2020

\*\* Toll operations suspended for 33 days due to Covid-19 in April, 2020 and May, 2020

### Operation and maintenance

For details, please see the sections entitled “Summary of the Concession Agreements” and “Business – Key O&M Agreements” on pages 189 and 187.

### Financing

As of March 31, 2022, equity and securities premium was ₹ 619 million and debt outstanding to lenders, was ₹ 2,837.44 million. For details in relation to the debt outstanding, please see the section entitled “Financial Indebtedness” on page 216.

\*Note: The State Highway numbers and chainages mentioned in this Final Placement Memorandum are old Highway numbers and chainages, as per the concession agreements. The actual SH numbers and chainages at site may differ based on subsequent changes. Subsequent to signing of the DBCPL Concession Agreement, the State Highway number has been revised to SH-28

### Godhra Expressways Private Limited (“GEPL”)

#### Concession agreement

The NHAI and GEPL entered into the concession agreement dated February 25, 2010 (the “**GEPL Concession Agreement**”). GEPL was engaged, on a design, build, finance, operate and transfer basis, under the GEPL Concession Agreement for the four-laning of Godhra in Gujarat to Madhya Pradesh border section of National Highway 59\* from KM 129.300 to KM 215.900 in the state of Gujarat

The GEPL Concession Agreement was granted for a period of 27 years, with a provision that allows for extension or reduction of this term based on the variation between the actual traffic on the Project and the target set out in the GEPL Concession Agreement. As consideration, GEPL has the sole and exclusive right to demand, collect and appropriate tolls payable by vehicles using the Project in accordance with the GEPL Concession Agreement and at the rates set out in the National Highways Fee (Determination of Rates and Collection) Rules, 2008, as amended. GEPL pays the NHAI ₹ 1.00 per year, as concession fees, during the term of the GEPL Concession Agreement and subject to a premium in terms of the GEPL Concession Agreement.

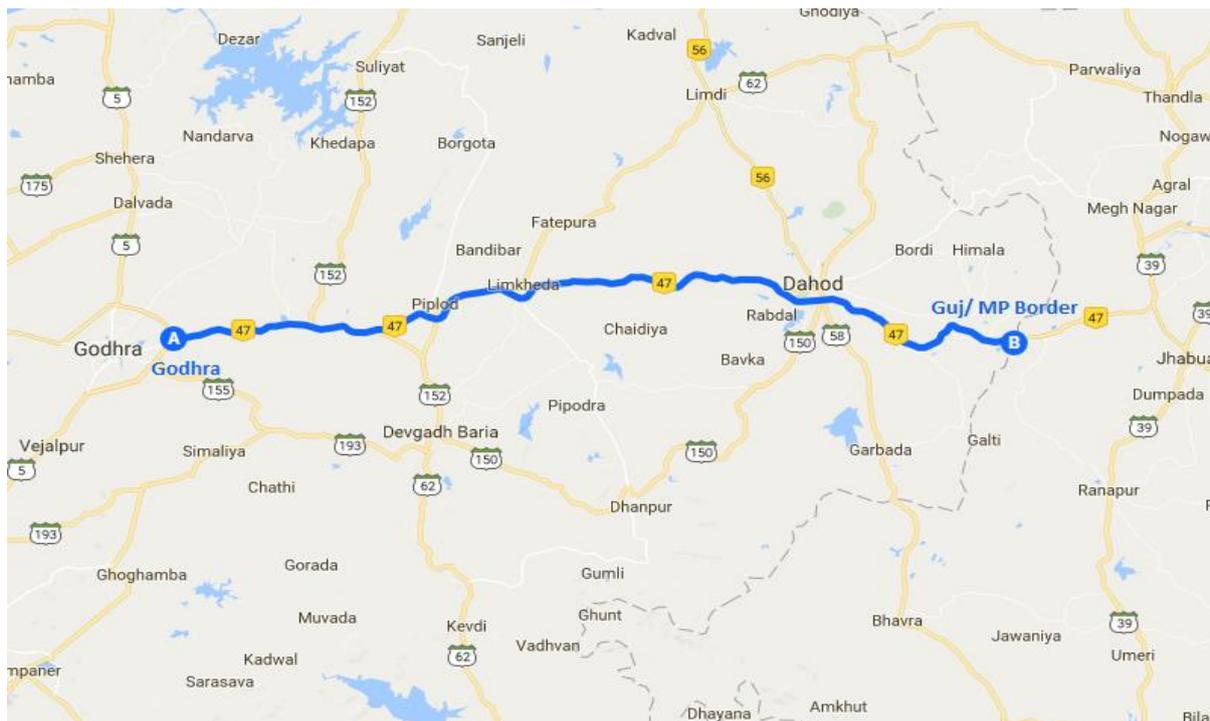
The GEPL Concession Agreement provides that, if the actual traffic volume differs from the target traffic volume, the concession period may be deemed to be extended or reduced, as the case may be. The GEPL Traffic Report provides that the actual traffic volume on the target date was approximately 30% lower than the target traffic volume. Accordingly, the concession period may be extended by 5.4 years. Such extension has been recommended by the independent engineer and the NHAI project implementation unit.

For further details on the GEPL Concession Agreement, please see the section entitled “Summary of the Concession Agreements” on page 189.

#### Corridor description

National Highway 59\* of which the GEPL Project is a part, connects Ahmedabad in Gujarat with Indore in Madhya Pradesh.

The map below illustrates the location of the GEPL Project and the corridor it covers:



Subsequent to signing of the GEPL Concession Agreement, the National Highway number has been revised to NH-47.

According to the Traffic Report, the factors that contribute to traffic growth on the GEPL Project include, among other things, (i) the fact that the tolling has been at place since 2013 and the travel pattern is well established, (ii) lack of alternate routes from/to where the traffic may divert, (iii) the Project corridor consisting of Devgadhi Baria, Dahod 1 and Dahod 2 (Kharedi) industrial estates; and (iv) the project being a part of the a part of the Kandla-Sagar economic corridor, and being an important highway for the movement from east to the west.

#### Traffic volume

The table below sets forth the AADT by category of vehicles for Fiscals 2022, 2021 and 2020:

	Fiscal		
	2022	2021**	2020*
Car	5,543	5,083	4,790
LCV	540	584	621
Bus / Truck	1,777	1,578	1,485
MAV	2,488	2,454	2,070
AADT	10,348	9,699	8,966

Note: For details, see Traffic Reports in Annexure III

\* Toll operations suspended for 6 days due to Covid-19 in March, 2020

\*\* Toll operations suspended for 19 days due to Covid-19 in April, 2020

#### Operation and maintenance

For details, please see the section entitled “Summary of the Concession Agreements” and “Business – Key O&M Agreements” on pages 189 and 187.

#### Financing

As of March 31, 2022, equity and securities premium was ₹2,250 million. Further, the compulsorily convertible debentures invested was ₹5,094.14 million and debt outstanding to lenders, was ₹4,079.03 million. For details in relation to the debt outstanding, please see the section entitled “Financial Indebtedness” on page 216.

*\*Note: The National Highway numbers and chainages mentioned in this Final Placement Memorandum are old National Highway numbers and chainages, as per the concession agreements. The actual NH numbers and chainages at site may differ based on subsequent changes. Subsequent to signing of the GEPL Concession Agreement, the National Highway number has been revised to NH-47.*

### ***Jodhpur Pali Expressway Private Limited (“JPEPL”)***

#### *Concession agreement*

The PWD (R) and JPEPL entered into the concession agreement dated February 28, 2013 (the “**JPEPL Concession Agreement**”). JPEPL was engaged, on a design, build, finance, operate and transfer basis, under the JPEPL Concession Agreement for the development and operation of Jodhpur-Pali section of National Highway 65\* from KM 308.00 to KM 366.00 and including bypass to Pali starting from KM 366.000 of National Highway 65\*, connecting National Highway 14 at KM 114 in State of Rajasthan.

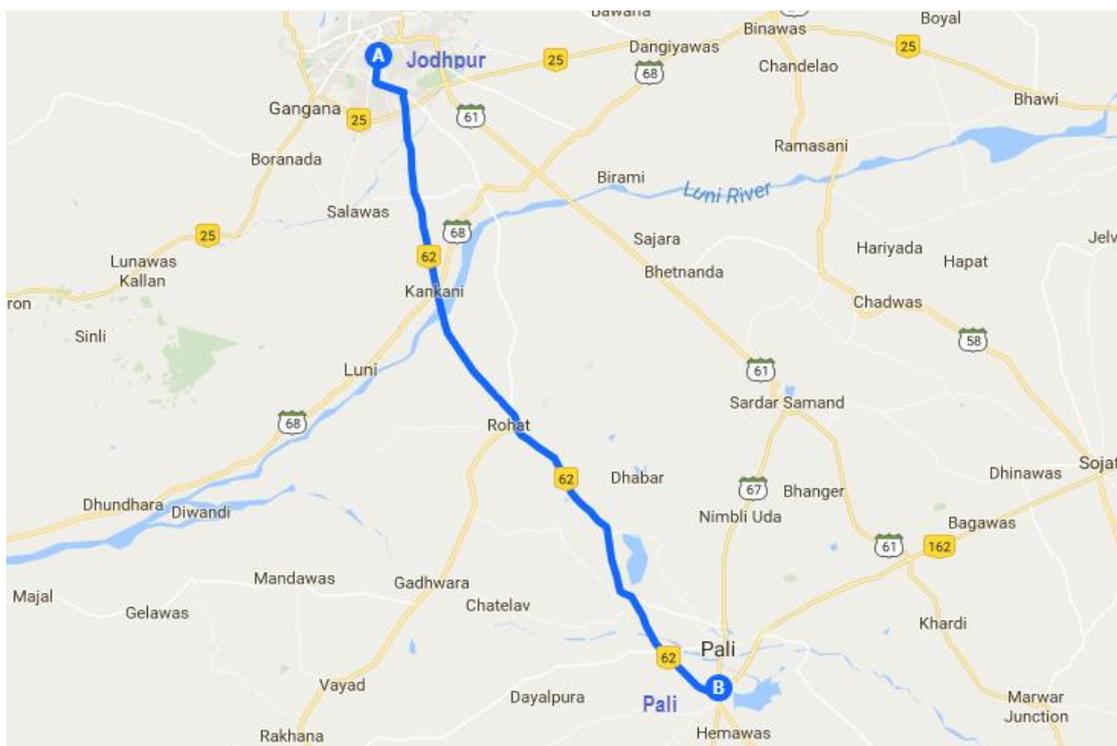
The JPEPL Concession Agreement was granted for a period of 25 years, with a provision that allows for extension or reduction of this term based on the variation between the actual traffic on the Project and the target set out in the JPEPL Concession Agreement. As consideration, JPEPL has the sole and exclusive right to demand, collect and appropriate tolls payable by vehicles using the Project in accordance with the JPEPL Concession Agreement and at the rates set out in the National Highways Fee (Determination of Rates and Collection) Rules, 2008, as amended. JPEPL pays the PWD(R) ₹ 1.00 per year, as concession fees, during the term of the JPEPL Concession Agreement and subject to a premium in terms of the JPEPL Concession Agreement.

The JPEPL Concession Agreement provides that, if the actual traffic volume differs from the target traffic volume, the concession period may be deemed to be extended or reduced, as the case may be. The JPEPL Traffic Report estimates that the traffic volume may be 23.2% lower than the targeted traffic volume. Accordingly, JPEPL the concession period may be extended by approximately 5 years. Such extension, however, remains subject to actual traffic volume tests to be undertaken in accordance with the JPEPL Concession Agreement. For further details on the JPEPL Concession Agreement, please see the section entitled “*Summary of the Concession Agreements*” on page 189.

#### *Corridor description*

National Highway 65\*, of which the JPEPL Project is a part, runs from Ambala in Haryana to Pali in Rajasthan.

The map below illustrates the location of the JPEPL Project and the corridor it covers:



Subsequent to signing of the JPEPL Concession Agreement, the National Highway number has been revised to NH-62

According to the Traffic Report, the factors that contribute to traffic growth on the JPEPL Project include, among other things, (i) the JPEPL Project being a connecting link between economic corridors and feeder roads. It is likely to remain an important national highway for movement from north to south, and (ii) the proposed Delhi-Mumbai Industrial Corridor forming part of the Western Dedicated Freight Corridor which may result in an upside with distributive traffic from railway node to surrounding areas along the Project.

#### Traffic volume

The table below sets forth the AADT by category of vehicles for Fiscals 2022, 2021 and 2020:

	Fiscal		
	2022	2021**	2020*
Car	5,150	4,698	4,943
LCV/ Minibus	285	535	813
Two-axle bus	404	4,01	571
Two-axle trucks	747	680	657
Three-axle trucks/bus	546	530	531
MAV (four -six axle)	1,289	1,177	1,046
AADT	8,420	8,021	8,561

Note: For details, see Traffic Reports in Annexure III

\* Toll operations suspended for 6 days due to Covid-19 in March, 2020

\*\* Toll operations suspended for 19 days due to Covid-19 in April, 2020

#### Operation and maintenance

For details, please see the section entitled “Summary of the Concession Agreements” and “Business – Key O&M Agreements” on pages 189 and 187.

#### Financing

As of March 31, 2022, equity and securities premium was ₹ 241.77 million. The compulsorily convertible debentures invested was ₹ 2,333.83 million and debt outstanding to lenders, was ₹ 2,597.84 million. For details in relation to the debt outstanding, please see the section entitled “Financial Indebtedness” on page 216.

*\*Note: The National Highway numbers and chainages mentioned in this Final Placement Memorandum are old National Highway numbers and chainages, as per the concession agreements. The actual NH numbers and chainages at site may differ based on subsequent changes. Subsequent to signing of the JPEPL Concession Agreement, the National Highway number has been revised to NH-62.*

### ***Nirmal BOT Limited (“NBL”)***

#### *Concession agreement*

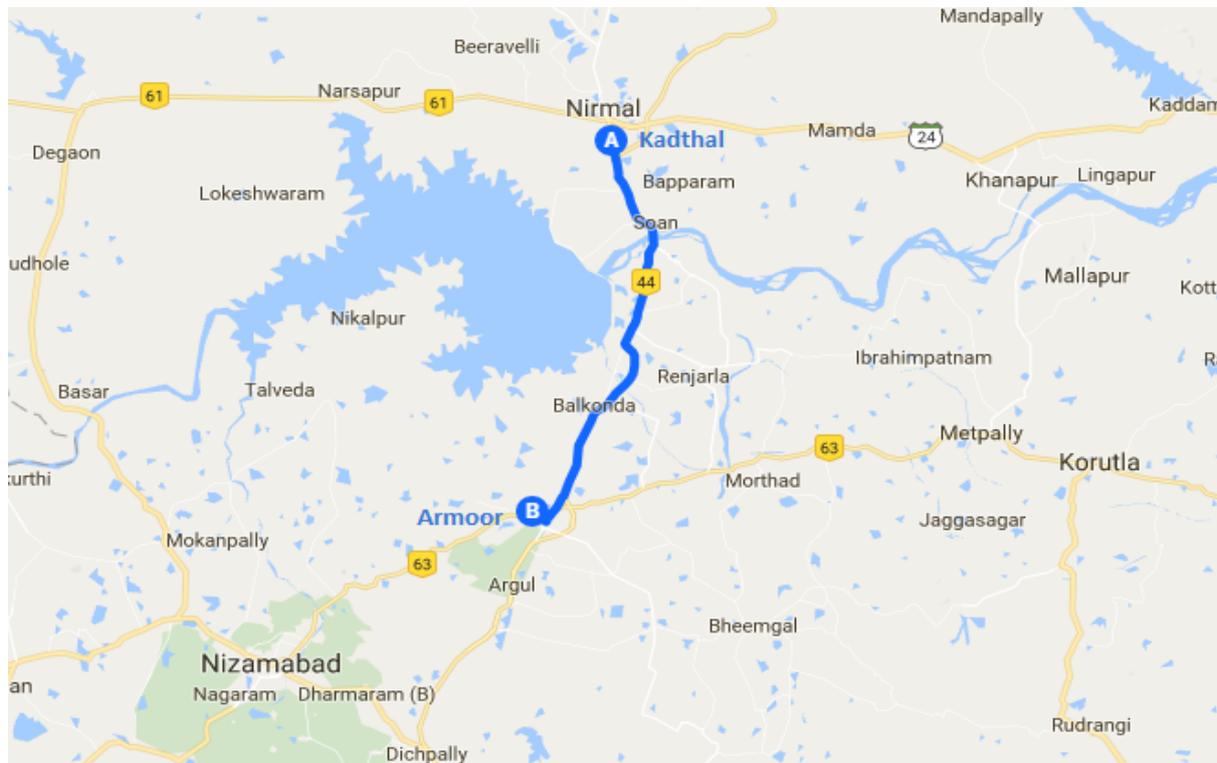
The NHAI and NBL entered into the concession agreement dated May 4, 2007 (the “**NBL Concession Agreement**”). NBL was engaged, on a build, operate and transfer basis, under the NBL Concession Agreement for the design, engineering, construction, development, finance, operation and maintenance of four-laning the existing two-lane section from KM 278 (Kadthal) to KM 308 (Armur) on National Highway 7\* in the state of Telangana.

The NBL Concession Agreement was granted for a period of 20 years. As consideration, NBL has the sole and exclusive right to demand, collect and appropriate annuities in accordance with the NBL Concession Agreement. As consideration, NBL shall a semi-annual annuity of ₹ 238 million, in accordance with the payment mechanism described in the NBL Concession Agreement. For further details on the NBL Concession Agreement, please see the section entitled “*Summary of the Concession Agreements*” on page 189.

#### *Corridor description*

National Highway 7\*, of which the NBL Project is a part, is a section of the North-South corridor, which starts from Varanasi and connects major cities like Jabalpur, Nagpur, Hyderabad, Kurnool, Bangalore, Salem and Madurai.

The map below illustrates the location of the NBL Project and the corridor it covers:



*Subsequent to signing of the NBL Concession Agreement, the National Highway number has been revised to NH-44*

#### *Operation and maintenance*

For details, please see the section entitled “*Summary of the Concession Agreements*” and “*Business – Key O&M Agreements*” on pages 189 and 187.

## Financing

As of March 31, 2022, equity was ₹ 315.00 million, compulsorily convertible debentures invested was ₹ 1,249.10 million and debt outstanding to lenders, was ₹ 331.12 million. For details in relation to the debt outstanding, please see the section entitled “*Financial Indebtedness*” on page 216.

*\*Note: The National Highway numbers and chainages mentioned in this Final Placement Memorandum are old National Highway numbers and chainages, as per the concession agreements. The actual NH numbers and chainages at site may differ based on subsequent changes. Subsequent to signing of the NBL Concession Agreement, the National Highway number has been revised to NH-44*

## Shillong Expressway Private Limited (“SEPL”)

### Concession agreement

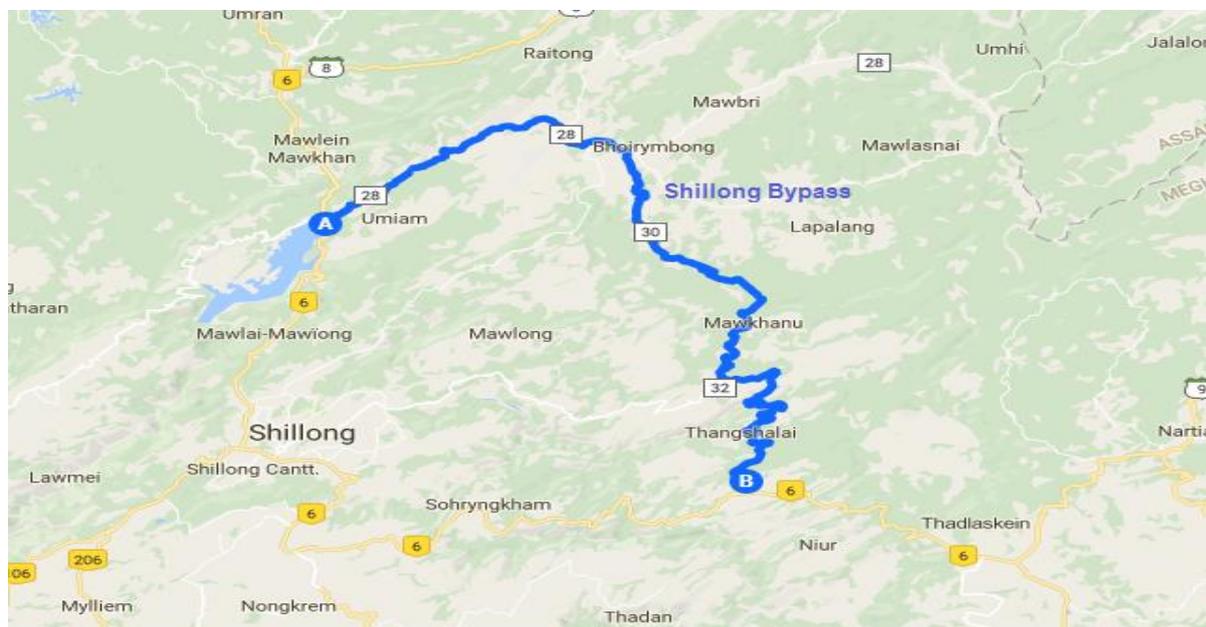
The NHAI and SEPL entered into the concession agreement dated July 14, 2010 (the “**SEPL Concession Agreement**”). SEPL was engaged, on a design, build, operate and transfer basis, under the SEPL Concession Agreement for the two laning of Shillong bypass connecting National Highway 40\* to National Highway 44\* from KM 61.800 of National Highway 40\* to KM 34.850 of National Highway 44\* in the state of Meghalaya.

The SEPL Concession Agreement was granted for a period of 15 years. As consideration, SEPL has the sole and exclusive right to demand, collect and appropriate annuities in accordance with the SEPL Concession Agreement. As consideration, SEPL shall a semi-annual annuity of ₹ 248.7 million, in accordance with the payment mechanism described in the SEPL Concession Agreement. For further details on the SEPL Concession Agreement, please see the section entitled “*Summary of the Concession Agreements*” on page 189.

### Corridor description

The SEPL Project is a part of National Highway 40\* and National Highway 44\* in the state of Meghalaya.

The map below illustrates the location of the SEPL Project and the corridor it covers:



*Subsequent to signing of the SEPL Concession Agreement, the National Highway number has been revised to NH-6.*

### Operation and maintenance

For details, please see the section entitled “*Summary of the Concession Agreements*” and “*Business – Key O&M Agreements*” on pages 189 and 187.

## Financing

As of March 31, 2022, equity was ₹ 5 million, preference share capital invested was ₹ 545.10 million and debt outstanding to lenders, was ₹ 701.55 million. For details in relation to the debt outstanding, please see the section entitled “*Financial Indebtedness*” on page 216.

*\*Note: The National Highway numbers and chainages mentioned in this Final Placement Memorandum are old National Highway numbers and chainages, as per the concession agreements. The actual NH numbers and chainages at site may differ based on subsequent changes. Subsequent to signing of the SEPL Concession Agreement, the National Highway number has been revised to NH-6*

***Ulundurpet Expressways Private Limited (formerly, GMR Ulundurpet Expressways Private Limited) (“UEPL”)***

*Concession agreement*

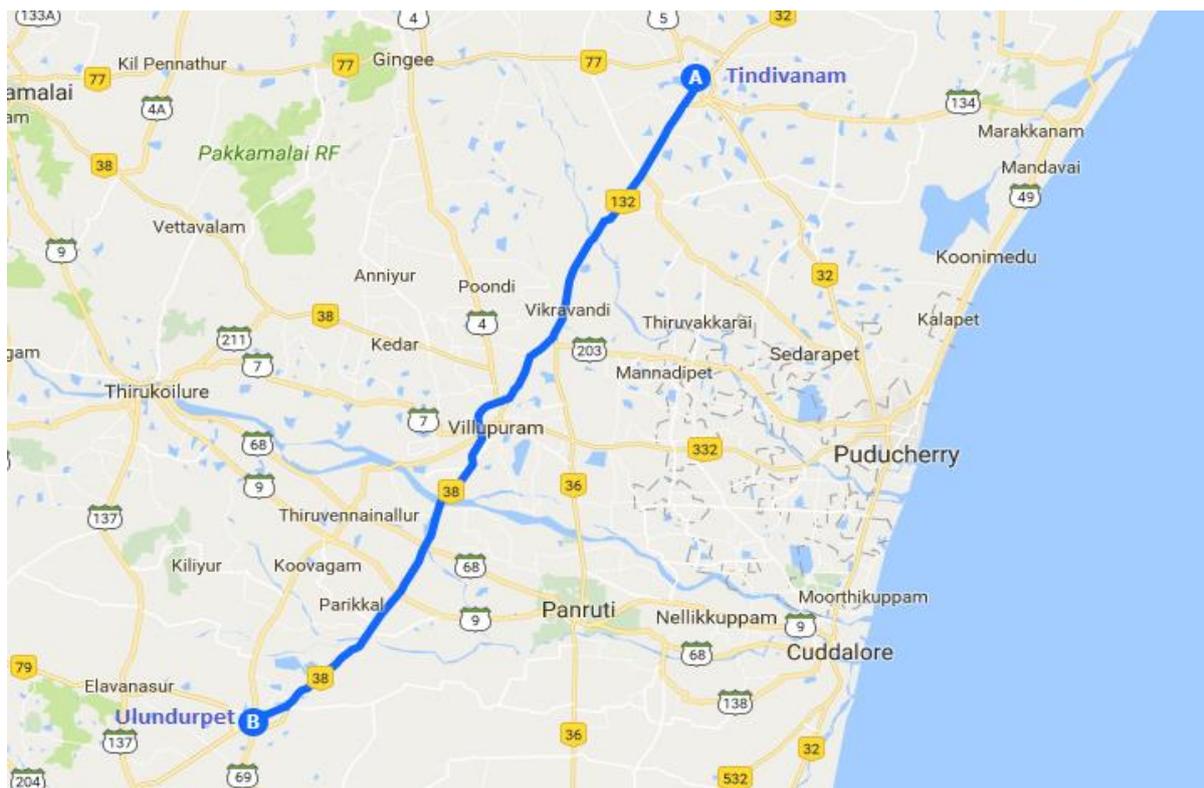
The NHAI and UEPL entered into the concession agreement dated April 19, 2006 (the “**UEPL Concession Agreement**”). UEPL was engaged, on a build, operate and transfer basis, under the UEPL Concession Agreement for the design, engineering, construction, development, finance, operation and maintenance of four-laning the existing two-lane section from KM 121 (near Trindivanam) to KM 192.25 (near Ulundurpet) on National Highway 45\* in the state of Tamil Nadu.

The UEPL Concession Agreement was granted for a period of 20 years and certain extensions were granted by the concessioning authority. As consideration, UEPL has the sole and exclusive right to demand, collect and appropriate tolls payable by vehicles using the Project in accordance with the UEPL Concession Agreement and at the rates set out in the National Highways (Collection of Fees by any Person for the Use of Section of National Highways/ Permanent Bridge/ Temporary Bridge On National Highways) Rules, 1997, as amended and the relevant fee notification. UEPL pays the NHAI ₹ 1.00 per year, as concession fees, during the term of the UEPL Concession Agreement and subject to a negative grant payment in terms of the UEPL Concession Agreement. For further details on the Concession Agreement, please see the section entitled “*Summary of the Concession Agreements*” on page 189.

*Corridor description*

National Highway 45\*, of which the UEPL Project is a part, runs within Tamil Nadu and starts from Kathipura junction in Guindy area (in Chennai) and extends up to Theni.

The map below illustrates the location of the UEPL Project and the corridor it covers:



Subsequent to signing of the UEPL Concession Agreement, National Highway number has been revised to NH-132 and NH-38.

According to the Traffic Report, the factors that contribute to traffic growth on the UEPL Project include, among other things, (i) the unavailability of an alternate route in the vicinity of the Project, (ii) The UEPL Project being a part of route connecting cities of Tamil Nadu with Chennai and (iii) the UEPL Project being a connecting link on the Chennai – Madurai/Kanyakumari economic corridor.

#### Traffic volume

The table below sets forth the AADT by category of vehicles for Fiscals 2022, 2021 and 2020:

	Fiscal		
	2022	2021**	2020*
Car	16,778	16,324	16,490
LCV	1,769	1,812	1,990
Bus	2,349	1,707	4,096
Two-axle trucks	1,619	1,555	1,468
MAV	2,864	2,762	2,825
AADT	25,379	24,160	26,869

Note: For details, see Traffic Reports in Annexure III

\* Toll operations suspended for 6 days due to Covid-19 in March, 2020

\*\* Toll operations suspended for 19 days due to Covid-19 in April, 2020

#### Operation and maintenance

For details, please see the section entitled “Summary of the Concession Agreements” and “Business – Key O&M Agreements” on pages 189 and 187.

#### Financing

As of March 31, 2022, equity was ₹ 2,645.52 million, compulsorily convertible debentures invested was ₹ 219.05 million, loan from others ₹ 470.62 million and debt outstanding to lenders, was ₹ 2,835.49 million. For details in relation to the debt outstanding, please see the section entitled “Financial Indebtedness” on page 216.

*\*Note: The National Highway numbers and chainages mentioned in this Final Placement Memorandum are old National Highway numbers and chainages, as per the concession agreements. The actual NH numbers and chainages at site may differ based on subsequent changes. Subsequent to signing of the UEPL Concession Agreement, the National Highway number has been revised to NH-132 and NH-38.*

## **Key O&M Agreements**

The operation and maintenance of the Project SPVs is the responsibility of the Project Manager and the various O&M Contractors, pursuant to their obligations under the Project Management Agreement and the O&M Agreements, respectively.

The Project SPVs have entered into various O&M agreements with the O&M Contractors including, (i) major maintenance contracts for undertaking periodic overlays, strengthening, repairs and rehabilitation of pavement/ structures of the Projects, (ii) routine maintenance and repair works contracts, for cleaning and maintaining the project highway including plantation/ horticulture and facilities and repairs of the Projects, (iii) security manpower contracts for supply of manpower for security and guarding of the toll plazas and Project SPVs, (iv) design, supply, upgradation, installation, integration, testing and commissioning and maintenance of toll collection and management systems agreements, (v) toll collection, route operations and incident management agreements for collection for user fee at the toll plazas on behalf of the Project SPVs and providing incident management services e.g. route patrolling, provision of ambulance and vehicle rescue/ crane services in case of any accident/ breakdown of vehicle on the project, (vi) national electronic toll collection service level agreements with various acquiring banks for electronic collection of toll payments through FASTag, and (vii) contracts for performance of various works awarded by respective concessioning authorities under change of scope to the Project SPVs. Additionally, Project SPV's have also entered into other short terms contracts for provisions of various services/ goods required at the Projects.

For further details in relation the Project Management Agreement, please refer to the section entitled "*Parties to the Highways Trust - Key terms of the Project Management Agreement*" on page 134.

## **Environment, health and safety**

The Project SPVs are required to meet certain health, safety and environmental specifications and standards in the operation and maintenance of the Projects and are subject to a number of laws and regulations relating to health, safety and environmental protection. The Project SPVs are also required to adhere to various labour and workplace related laws and regulations in India. The Project SPVs have policies and procedures in place to ensure that the operation and maintenance of the Projects conform to existing health, safety and environmental regulatory standards and that, amongst others, adequate workmen's compensation and group term life insurance are maintained.

We are committed to ensuring that our business activities are conducted safely, the health of our employees, contractors and the public are protected and the environmental impact resulting from our operations and maintenance are minimized, energy resources are utilized in a responsible and efficient manner to reduce emissions and statutory and regulatory requirements concerning health, safety and environment are complied with.

We have also adopted certain standards for health, safety and environmental and social sustainability and put in place policies and system in order to comply with such standards, including adequate safeguards for operational and personal safety of our employees and contractors, adverse impact on environment and risks to the community that arise due to our operations, responsible, waste disposal measures and compliance with statutory requirements on health, safety and environment. We also seek to improve our environmental practices and performance by reviewing and updating our systems and procedures regularly, conducting internal and external audits, investigating incidents relating to health, safety and environment and implementing corrective measures and training our employees and contractors as needed. We believe that our health, safety and environment systems are comparable to international standards and enables us to remain in compliance in all material respects with Indian legislation in relation to environment laws and regulations and employee health and safety.

## **Anti-Corruption and Anti Bribery**

We have a zero tolerance approach when it comes to bribery and corruption. All major contracts with contractors or vendors are strengthened with Anti-Corruption and Anti-Bribery Policies.

## **Competition**

The Highways Trust faces competition from other road operators, financial investors, private equity funds and from other InvITs, in acquiring lucrative concessions for existing and future projects. While service quality, technological capacity and performance, health and safety records and personnel, as well as reputation and experience, are important considerations in client decisions, price is a major factor for such acquisitions.

## **Insurance**

The Project SPVs maintain project-specific insurance coverage with various insurers in India. Some of the major risks covered in their all-risk policies for their assets, include, the risk of fire and natural calamities, such as earthquakes, landslides and floods. Further, some of the project-specific insurance policies also cover the Project SPVs against burglary, loss or damage to equipment or machinery, loss due war, riots, nuclear reaction, gradually developing flaws, pecuniary loss in respect of monies arising from fraud, forgery, theft or dishonesty, loss of money in transit by theft robbery etc.

## **Properties**

Under the terms of the concession agreements, title to the roads and related infrastructure such as toll plazas and monitoring posts remains with the concessioning authority for the duration of the concession period. During the concession period, the Project SPVs are licensed to use the roads and the related infrastructure which constitute the concession assets and the Project SPVs are entitled to an income from the collection of tolls. Upon the expiration of a concession period, each Project SPV is required to transfer possession of its concession assets to the relevant concessioning authority.

## **Employees**

As on March 31, 2022, the Project SPVs had 182 permanent employees and 5 contractual employees. Further, employees of the Investment Manager and Project Manager will be engaged in managing the Trust. For further details, please see section entitled "*Parties to the Highways Trust*" on page 101.

## SUMMARY OF CONCESSION AGREEMENTS

*Set out below are summaries of the concession agreements entered into by the Project SPVs in relation to their respective businesses. The descriptions and summaries of the agreements below are indicative and are not and nor do they purport to be complete descriptions or summaries of all terms of such agreements. Certain terms used in this section have the meaning as assigned to such terms in the respective concession agreements. Copies of these concession agreements have been made available for inspection at the office of the Highways Trust at Mumbai. For further details, please see the section entitled 'Material Contracts and Documents for Inspection' on page 402.*

### **Dewas Bhopal Corridor Private Limited (“DBCPL”) Concession Agreement dated June 30, 2007 executed amongst DBCPL and Madhya Pradesh Road Development Corporation Limited (“MPRDC”) (“DBCPL Concession Agreement”)**

*Fee:* DBCPL shall be entitled during the Toll Period, as defined in the DBCPL Concession Agreement, to levy, collect and appropriate the fee from the users of the Project Highway, as defined in the DBCPL Concession Agreement, pursuant to and in accordance with the fee notification in the DBCPL Concession Agreement. DBCPL acknowledges that the fee notification, inter alia, provides for revision in the fees by increase in the fees of, at the rate of 7% per year based on the fees charged in the previous accounting year, as per the fee notification in the DBCPL Concession Agreement, and DBCPL has confirmed that save and except as provide in the fee notification, DBCPL shall not be entitled to and shall not seek any relief whatsoever from MPRDC, Government of India or Government of Madhya Pradesh on account of increase or otherwise in wholesale price index or on any other account except in accordance with the express provisions of the DBCPL Concession Agreement. DBCPL shall collect fees from local personal traffic and local commercial traffic after reducing the fees by the following rates:

- For local personal traffic: 75% of the applicable fees for the specific category of vehicle; and
- For local commercial traffic: 50% of the applicable fees for the specific category of vehicle.

*Concession fee:* In consideration of the grant of concession under the DBCPL Concession Agreement, the concession fee payable by DBCPL to MPRDC shall be ₹ 1.00 per year during the term of the DBCPL Concession Agreement. Further, DBCPL shall pay to MPRDC an amount equivalent to 1% of the toll collected as a project monitoring fee (as defined in the DBCPL Concession Agreement) for the first ten years from the commencement date and thereafter to be increased as specified in the DBCPL Concession Agreement.

*Maintenance Security:* DBCPL shall, for due and faithful performance of its obligations under the DBCPL Concession Agreement, during the Toll Period, provide to MPRDC a security for a sum equivalent to ₹ 42.7 million in the form of an irrevocable and unconditional bank guarantee on or before the issue of completion certificate and start of toll date.

*Change of control provisions:* Aggregate shareholding of the bidder and its associates or the consortium members (as defined in the DBCPL Concession Agreement) , as may be applicable, in the issued and paid up equity share capital of DBCPL shall not be less than 78% during construction period and below 26% during toll period, in accordance with the DBCPL Concession Agreement.

*Change of scope:* MPRDC may require the provision of additional works and services on or about Project Highway which are beyond the scope of the project as contemplated by the DBCPL Concession Agreement (the “**Change of Scope**”), to be carried out by DBCPL at its own cost during the concession period and that there shall be no change in concession period or any compensation payable if such changes do not require expenditure exceeding ₹ 21.4 million (0.5% of the project cost) and do not adversely affect the toll date. All such changes shall be made by MPRDC by an order (the “**Change of Scope Order**”) issued in accordance with the procedure set forth in the DBCPL Concession Agreement. MPRDC shall not increase/decrease the scope of work under normal circumstances. However, in the exceptional circumstances any increase in the scope of work shall lead to increase in the concession period to the extent such changes require expenditure exceeding ₹ 21.4 million. However, in case the demand of grant is more than 20% of project cost, any reduction in the scope of work under exceptional circumstances shall not alter the concession period and will result in reduction in the subsidy to the extent that grant remains 20% of total project cost and beyond that the same will result in reduction in concession period, to the extent such change in scope requires reduction in expenditure exceeding ₹ 21.4 million. In case the demand of grant is equal or less than 20%, the reduction in change of scope under exceptional circumstances will result in reduction of concession period.

*O&M:* DBCPL shall operate and maintain the Project Highway in accordance with the DBCPL Concession Agreement either by itself, or through the O&M Contractor, as defined in the DBCPL Concession Agreement, and if required, modify, repair or otherwise make improvements to the Project Highway, and conform to specifications, standards and good industry practice. The obligations of DBCPL, among other things, shall include:

- permitting safe, smooth and uninterrupted flow of traffic on the Project Highway during normal operating conditions;
- charging, collecting and retaining the fee in accordance with the DBCPL Concession Agreement;
- carrying out periodic preventive maintenance of the Project Highway;
- undertaking routine maintenance including prompt repairs of potholes, cracks, joints, drains, embankments, structures, pavement markings, lighting, road signs and other traffic control devices; and
- undertaking major maintenance such as resurfacing of pavements, repairs to structures, and repairs and refurbishment of tolling system and other equipment.

*Grant/Subsidy:* MPRDC has agreed to pay DBCPL as cash support by way of an outright grant equal to the sum of ₹ 810 million in accordance with the DBCPL Concession Agreement. The Government of India shall be able to grant up to 20% of total project cost as per the provisions of scheme for support to public-private partnerships in infrastructure. The rest of the grant will be disbursed by MPRDC in accordance with DBCPL Concession Agreement. The grant shall be, in no case, more than 40% of the total project cost.

*Indemnities:*

- DBCPL shall be entirely responsible for and bear the cost of and shall indemnify, hold MPRDC not liable for and defend any and all proceedings, actions and, third party claims (other than a claim by Government of Madhya Pradesh or Government of India) for loss, damage and expense of whatever kind and nature arising out of the design, engineering, construction, procurement, operation and maintenance of entire Project Highway or any arising out of a breach by DBCPL of any of its obligations under the DBCPL Concession Agreement except to the extent that any such claim has arisen due to MPRDC event of default. It has been agreed that no liability or general indemnity would be upon MPRDC;
- DBCPL shall fully indemnify, defend, hold MPRDC not liable including its officers, servants, agents and subsidiaries, from and against any and all loss and damages arising out of or with respect to (a). failure of DBCPL to comply with applicable laws and applicable permits; (b). payments of taxes relating to DBCPL contractors, suppliers and representatives, income or other taxes required to be paid by DBCPL without reimbursement hereunder, or (c). non-payment of amounts due as a result of materials or services furnished to DBCPL or any of its contractors which are payable by DBCPL or any of its contractors.
- DBCPL shall be entirely responsible for and bear the cost of and shall indemnify, defend and hold MPRDC not liable from and against any and all damages which MPRDC, its officers, servants, agents, subsidiaries and contractors (“**MPRDC Indemnified Persons**”) may hereafter suffer, or pay by reason of any demands, claims, suits or proceedings arising out of claims of infringement of any domestic or foreign patent rights, copyrights or other intellectual property, proprietary or confidentiality rights with respect to any materials, information, design or process used by DBCPL or by DBCPL’s contractors, in performing the obligations of DBCPL or in any way incorporated in or related to the project. If in any such suit, claim or proceedings, a temporary restraint order or preliminary injunction, is granted, DBCPL shall make every reasonable effort, by giving a satisfactory bond or otherwise, to secure the suspension of the injunction or restraint order. If, in any such suit claim or proceedings, the project, or any part, thereof or comprised therein is held to constitute an infringement and its use is permanently enjoined, DBCPL shall promptly make every reasonable effort to secure for MPRDC a licence, at no cost to MPRDC, authoring continued use of the infringing work. If DBCPL is unable to secure such licence within a reasonable time, DBCPL shall, at its own expense and without impairing the specifications and standards either replace the affected work, or pail, or process thereof with non-infringing work or parts or process, or modify the same so that it becomes non-infringing.

*Material Breach and Suspension:* If DBCPL shall be in Material Breach, as defined in the DBCPL Concession Agreement, of the DBCPL Concession Agreement, MPRDC shall be entitled in its sole discretion and without prejudice to its other rights and remedies under the DBCPL Concession Agreement, including its right of Termination hereunder, to (i) suspend all or any rights of DBCPL under the DBCPL Concession Agreement including the DBCPL’s right to collect all Fees and other revenues from the project highway, and (ii) exercise such rights itself and perform the obligations hereunder or authorise any other person to exercise or perform the same on its behalf during such suspension (“**Suspension**”). At any time during the period of Suspension, the

Lenders' Representative, on behalf of Senior Lenders, each term as defined in the DBCPL Concession Agreement, shall be entitled to substitute DBCPL under and in accordance with the Substitution Agreement, as defined in the DBCPL Concession Agreement, and upon receipt of notice thereunder from the Lenders' Representative, MPRDC shall withhold termination for a period not exceeding 120 days from the date of Suspension, and any extension thereof pursuant to the DBCPL Concession Agreement, for enabling the Lenders' Representative to exercise its rights of substitution on behalf of Senior Lenders.

*Allocation of costs during subsistence of force majeure:*

- Upon occurrence of a Force Majeure Event, as defined in the DBCPL Concession Agreement, after financial closure, the costs arising out of such events (“**Force Majeure Costs**”) shall be allocated as follows:
  - When the Force Majeure Event is a Non-Political Event, as defined in the DBCPL Concession Agreement, the parties shall bear their respective costs and neither party shall be required to pay to the other party any costs arising of any such Force Majeure Event;
  - When the Force Majeure Event is an Indirect Political Event, as defined in the DBCPL Concession Agreement, the Force Majeure Costs attributable to such Indirect Political Event and directly relating to such project, shall be borne by DBCPL to the extent Force Majeure Costs exceed the insurance claims, one half of the same to the extent actually incurred and duly certified by the auditors of DBCPL shall be compensated to DBCPL; and
  - When the Force Majeure Event is a Political Event, as defined in the DBCPL Concession Agreement, all Force Majeure Costs to the extent actually incurred and certified by the auditors of DBCPL shall be compensated by MPRDC to DBCPL within 180 days of such amount accepted by MPRDC.

Force Majeure Costs shall not include loss of Fee revenues but shall include interest payments, debt repayment obligations on such debt in proportion to the period of Force Majeure Event subsisting, O&M expenses and all other costs directly attributable to the Force Majeure Event.

*Termination for DBCPL Default:* The following events, among others, shall constitute an event of default by DBCPL (“**DBCPL Event of Default**”) unless such DBCPL event of default has occurred as a result of MPRDC event of default or a force majeure event:

- DBCPL fails to achieve any project milestone other than scheduled project completion date within the period set forth in the DBCPL Concession Agreement and fails to cure such default within a period of 90 days from the date of its occurrence;
- DBCPL abandons the operations of the Project Highway for more than 15 consecutive days without the prior written consent of MPRDC, provided that DBCPL shall be deemed not to have abandoned such operation if such abandonment was (i). as a result of force majeure event and is only for the period such force majeure is continuing, or (ii). is on account of a breach of its obligations by MPRDC after due notice is given to MPRDC.
- DBCPL repudiates the DBCPL Concession Agreement or otherwise evidences an intention not to be bound by the DBCPL Concession Agreement; and
- DBCPL has delayed any payment that has fallen due under the DBCPL Concession Agreement, if such delay exceeds 90 days.

Upon the occurrence of any breach by DBCPL under the DBCPL Concession Agreement including any DBCPL Event of Default, MPRDC shall be entitled to encash and appropriate the performance guarantee and to terminate the DBCPL Concession Agreement by a communication in writing.

*Termination for MPRDC Default:* DBCPL may terminate the DBCPL Concession Agreement on account of occurrence of a default by the MPRDC which is not rectified within cure periods (the “**MPRDC Default**”) and includes: (i) material breach causing a material adverse effect on DBCPL; (ii) the failure to make any payment due to DBCPL; (iii) repudiation of the DBCPL Concession Agreement etc.

*Defects Liability:* Not less than 12 months or more than 15 months prior to the expiry of the concession period, DBCPL and the Independent Consultant, as defined in the DBCPL Concession Agreement, shall conduct a joint inspection (“**Initial Inspection**”) of the Project Highway and all project facilities. Within 90 days after the completion of the Initial Inspection, DBCPL shall provide to the Independent Consultant a report on the condition of the Project Highway and the project facilities, and a notice setting out proposals by DBCPL as to the renewal

works, pursuant to the provisions of the DBCPL Concession Agreement. DBCPL shall carry out the renewal works at its own cost. Not less than nine months nor more than 12 months prior to the expiry of the concession period, DBCPL and the Independent Consultant shall conduct a joint inspection (“**Second Inspection**”) of all elements of the Project Highway and the project facilities (whether or not the renewal works have been carried out). Within 30 days after the completion of the Second Inspection, DBCPL shall provide to the Independent Consultant a report on the condition of the Project Highway and Project Facilities and a notice setting out any revisions or additions to the renewal works, pursuant to the provisions of the DBCPL Concession Agreement. DBCPL shall carry out the revised renewal works at its own cost. From the date which is 1 year prior to the expiry of the concession period, a sum of 7,000 per day during the last 1 year, adjusted to wholesale price index or a higher sum estimated by the Independent Consultant for renewal works, will be retained in the escrow account or alternatively DBCPL can furnish a bank guarantee of an equivalent amount. Upon furnishing the bank guarantee for defect liability by DBCPL, no such retention will be made. If following the Second Inspection, it is agreed or determined that no renewal works are required, then within 14 days of such agreement, 50% of the sums retained for the purposes of defect liability shall be released to DBCPL. Within 14 days after the issue of the Vesting Certificate, as defined in the DBCPL Concession Agreement, the remaining sums retained for the purposes of defects liability shall be released to DBCPL.

**Godhra Expressways Private Limited (“GEPL”) Concession Agreement (“GEPL Concession Agreement”) dated February 25, 2010 executed amongst GEPL and National Highways Authority of India (“NHAI”).**

*Premium:* GEPL agrees to pay (on the COD date, as defined in the GEPL Concession Agreement) NHAI a premium in the form of an additional concession fee equal to ₹ 78.3 million and premium for subsequent year shall be increased by 5% p.a. as compared to immediate preceding year, in accordance with the GEPL Concession Agreement.

*Fee:* On and from the commercial operation date till the transfer date, GEPL shall have the sole and exclusive right to demand, collect and appropriate charge levied on and payable for a vehicle using the Project Highway, as defined in the GEPL Concession Agreement, or a part thereof (“**Fee**”) from the users subject to and in accordance with the GEPL Concession Agreement and the fee notification set forth therein.

*Concession fee:* In consideration of the grant of concession under the GEPL Concession Agreement, the concession fee payable by GEPL to NHAI shall be ₹ 1.00 per year.

*Change of scope:* NHAI may require the provision of additional works and services which are not included in the scope of the project as contemplated by the GEPL Concession Agreement (the “**Change of Scope**”). NHAI shall make an advance payment to GEPL in a sum equal to 20% of the cost of Change of Scope, and in the event of a dispute, 20% of the cost assessed by the Independent Engineer, as defined in the GEPL Concession Agreement. NHAI shall disburse to GEPL such amounts as are certified by the Independent Engineer, as reasonable and after making a proportionate deduction for the advance payment made. All costs arising out of any Change of Scope order issued during the Construction Period, as defined in the GEPL Concession Agreement, shall be borne by GEPL, subject to an aggregate ceiling of 0.25% of the total project cost. Any costs in excess of the ceiling shall be reimbursed by NHAI.

*O&M:* GEPL shall operate and maintain the Project Highway, as defined in the GEPL Concession Agreement, in accordance with the GEPL Concession Agreement either by itself, or through the O&M Contractor, as defined in the GEPL Concession Agreement, and if required, modify, repair or otherwise make improvements to the Project Highway, and conform to specifications, standards and good industry practice. The obligations of GEPL, among other things, shall include:

- permitting safe, smooth and uninterrupted flow of traffic on the Project Highway during normal operating conditions;
- carrying out periodic preventive maintenance of the Project Highway;
- undertaking routine maintenance including prompt repairs of potholes, cracks, joints, drains, embankments, structures, pavement markings, lighting, road signs and other traffic control devices;
- undertaking major maintenance such as resurfacing of pavements, repairs to structures, and repairs and refurbishment of tolling system and other equipment;
- protection of the environment and provision of equipment and materials therefor; and
- operation and maintenance of all communication, control and administrative systems necessary for the efficient operation of the Project Highway.

*Maintenance manual:* GEPL shall, in consultation with the Independent Engineer, evolve a repair and maintenance manual (the “**Maintenance Manual**”) for the regular and preventive maintenance of the Project Highway in conformity with the specifications, standards, maintenance requirements, safety requirements and good industry practice. The Maintenance Manual shall be revised and updated once every three years.

*Maintenance programme:* GEPL shall provide to NHAI and the Independent Engineer its proposed annual programme of preventive, urgent and other scheduled maintenance (the “**Maintenance Programme**”) to comply with the maintenance requirements, maintenance manual and safety requirements. Such Maintenance Programme shall include the following:

- preventive maintenance schedule;
- arrangements and procedures for carrying out urgent repairs;
- criteria to be adopted for deciding maintenance needs;
- intervals and procedures for carrying out inspection of all elements of the Project Highway;
- intervals at which GEPL shall carry out periodic maintenance;
- arrangements and procedures for carrying out safety related measures; and
- intervals for major maintenance works and the scope thereof.

*Effect of Variation in Traffic Growth:* In accordance with the GEPL Concession Agreement, the target traffic as on target date i.e. October 1, 2019 was estimated to be 26,839 PCUs. The traffic volume counts reported as per the surveys conducted by independent engineers appointed by NHAI in September 2018, September 2019 and September 2020 are 17,017 PCUs, 17,891 PCUs and 21,525 PCUs, respectively. The traffic on the project road determined as an average of these surveys is 18,881 PCUs is 30 percent lower than the target traffic. (*Source: Traffic Study Report dated February 2022 issued for GEPL*).

Pursuant to the GEPL Concession Agreement, if the actual average traffic shall have fallen short of or exceeded the target traffic by more than 2.5 percent, then there will modification in the concession period. Further, if the traffic in PCUs at target date is lower than the target traffic, then for every 1 percent decrease, the concession period shall be increased by 1.5 percent, however, such increase shall not be more than 20 % of the base concession period.

On the basis of the above information provided by GEPL, IE and NHAI Project Implementation Unit (PIU) has already recommended for extension of concession period by 5.4 years. (*Source: Traffic Study Report dated February 2022 issued for GEPL*).

*Restrictions on construction of additional tollway:* In accordance with the provisions of the GEPL Concession Agreement, NHAI shall not construct, and shall procure that no Government Instrumentality, as defined in the GEPL Concession Agreement, shall construct or cause to be constructed, any expressway or other toll road between, *inter alia* KM 129.30 to KM 215.90 Godhra to Gujarat/MP border section on National Highway no. 59 (collectively the “**Additional Tollway**”) for use by traffic at any time before the twelfth anniversary of the Appointed Date, as defined in the GEPL Concession Agreement. Additional Tollway does not include any expressway or other toll road connecting, *inter alia*, KM 129.30 to KM 215.90 Godhra to Gujarat/MP border section on National Highway no. 59 if the length of such expressway or toll road exceeds the length of the existing route comprising the Project Highway by 20%. If NHAI shall be in breach of this provision, GEPL shall, without prejudice to its other rights and remedies under the GEPL Concession Agreement, be entitled to receive compensation from NHAI.

*Obligations relating to competing roads:* NHAI shall procure that during the subsistence of the GEPL Concession Agreement, neither NHAI nor any Government Instrumentality shall, at any time before the tenth anniversary of the appointed date, construct or cause to be constructed any competing road, as defined in the GEPL Concession Agreement; provided that this restriction shall not apply if the average traffic on the Project Highway in any year exceeds 90% of its designed capacity specified in the GEPL Concession Agreement. Upon breach of its obligations hereunder, NHAI shall be liable to payment of compensation to GEPL in accordance with the GEPL Concession Agreement, and such compensation shall be the sole remedy of GEPL.

*Obligations relating to change in ownership:* GEPL shall not undertake or permit any change in ownership, except with the prior written approval of NHAI. Notwithstanding anything to the contrary contained in the GEPL Concession Agreement, GEPL agrees and acknowledges that:

- all acquisitions of equity by an acquirer, either by himself or with any person acting in concert, directly

or indirectly, including by transfer of the direct or indirect legal or beneficial ownership or control of any equity, in aggregate of not less than 15% of the total equity of GEPL; or

- acquisition of any control directly or indirectly of the board of directors of GEPL by any person either by himself or together with any person or persons acting in concert with him, shall constitute a change in ownership requiring prior approval of NHAI from national security and public interest perspective, the decision of NHAI in this behalf being final, conclusive and binding on GEPL, and undertakes that it shall not give effect to any such acquisition of equity or control of the board of directors of GEPL without such prior approval of NHAI. It has been expressly agreed that approval of NHAI hereunder shall be limited to national security and public interest perspective, and NHAI shall endeavour to convey its decision thereon expeditiously. It has also been agreed that NHAI shall not be liable in any manner on account of grant or otherwise of such approval and that such approval or denial thereof shall not in any manner absolve GEPL from any liability or obligation under the GEPL Concession Agreement.

*Indemnities:*

- GEPL shall indemnify, defend, save and hold harmless NHAI and its officers, servants, agents, Government Instrumentalities, as defined in the GEPL Concession Agreement, and Government owned and/or controlled entities/enterprises, (the “**NHAI Indemnified Persons**”) against any and all suits, proceedings, actions, demands and claims from third parties for any loss, damage, cost and expense of whatever kind and nature, whether arising out of any breach by GEPL of any of its obligations under the GEPL Concession Agreement or any related agreement or on account of any defect or deficiency in the provision of services by GEPL to any user or from any negligence of GEPL under contract or tort or on any other ground whatsoever, except to the extent that any such suits, proceedings, actions, demands and claims have arisen due to any negligent act or omission, or breach or default of the GEPL Concession Agreement on the part of NHAI Indemnified Persons;
- GEPL shall fully indemnify, hold harmless and defend NHAI and NHAI Indemnified Persons from and against any and all loss and/or damages arising out of or with respect to:
  - failure of GEPL to comply with applicable laws and applicable permits;
  - payment of taxes required to be made by GEPL in respect of the income or other taxes of GEPL’s contractors, suppliers and representatives; or
  - non-payment of amounts due as a result of materials or services furnished to GEPL or any of its contractors which are payable by GEPL or any of its contractors.
- GEPL shall fully indemnify, hold harmless and defend NHAI Indemnified Persons from and against any and all suits, proceedings, actions, claims, demands, liabilities and damages which NHAI Indemnified Persons may hereafter suffer, or pay by reason of any demands, claims, suits or proceedings arising out of claims of infringement of any domestic or foreign patent rights, copyrights or other intellectual property, proprietary or confidentiality rights with respect to any materials, information, design or process used by GEPL or by GEPL’s contractors in performing the obligations of GEPL or in any way incorporated in or related to the project. If in any such suit, action, claim or proceedings, a temporary restraint order or preliminary injunction is granted, GEPL shall make every reasonable effort, by giving a satisfactory bond or otherwise, to secure the revocation or suspension of the injunction or restraint order. If, in any such suit, action, claim or proceedings, the Project Highway, or any part thereof or comprised therein, is held to constitute an infringement and its use is permanently enjoined, GEPL shall promptly make every reasonable effort to secure for NHAI a licence, at no cost to NHAI, authorising continued use of the infringing work. If GEPL is unable to secure such licence within a reasonable time, GEPL shall, at its own expense, and without impairing the specifications and standards, either replace the affected work, or part, or process thereof with non-infringing work or part or process, or modify the same so that it becomes non-infringing.

*Suspension of GEPL’s rights:* Upon occurrence of a GEPL Default, NHAI shall be entitled, without prejudice to its other rights and remedies under the GEPL Concession Agreement including its rights of termination thereunder, to (i) suspend all rights of GEPL under the GEPL Concession Agreement, including GEPL’s right to collect Fee, and other revenues pursuant hereto, and (ii) exercise such rights itself and perform the obligations hereunder or authorise any other person to exercise or perform the same on its behalf during such suspension (“**Suspension**”). Suspension hereunder shall be effective forthwith upon issue of notice by NHAI to GEPL and may extend up to a period not exceeding 180 days from the date of issue of such notice; provided that upon written request from GEPL and the Lenders’ Representative, as defined in the GEPL Concession Agreement, NHAI shall extend the aforesaid period of 180 days by a further period not exceeding 90 days. At any time during the period of Suspension, the Lenders’ Representative, on behalf of Senior Lenders, each term as defined in the GEPL Concession Agreement, shall be entitled to substitute GEPL under and in accordance with the Substitution

Agreement, as defined in the GEPL Concession Agreement, and upon receipt of notice thereunder from the Lenders' Representative, NHAI shall withhold termination for a period not exceeding 180 days from the date of Suspension, and any extension thereof, for enabling the Lenders' Representative to exercise its rights of substitution on behalf of Senior Lenders.

*Effect of force majeure event on the Concession:*

- Upon the occurrence of any Force Majeure Event, as defined in the GEPL Concession Agreement, prior to the Appointed Date, as defined in the GEPL Concession Agreement, the period for achieving financial close shall be extended by a period equal in length to the duration of the Force Majeure Event.
- At any time after the Appointed Date, if any Force Majeure Event occurs:
  - before COD, the concession period and the dates set forth in the Project Completion Schedule, as defined in the GEPL Concession Agreement, shall be extended by a period equal in length to the duration for which such Force Majeure Event subsists; or
  - after COD, whereupon GEPL is unable to collect Fee despite making best efforts or it is directed by NHAI to suspend the collection thereof during the subsistence of such Force Majeure Event, the concession period shall be extended by a period, equal in length to the period during which GEPL was prevented from collection of Fee on account thereof; provided that in the event of partial collection of Fee where the daily collection is less than 90% of the average daily Fee, NHAI shall extend the concession period in proportion to the loss of Fee on a daily basis. Loss of 25% in collection of Fee as compared to the average daily Fee for four days shall entitle GEPL to extension of one day in the concession period.

*Allocation of costs arising out of Force Majeure:*

- Upon occurrence of any Force Majeure Event prior to the Appointed Date, the parties to the GEPL Concession Agreement shall bear their respective costs and no party shall be required to pay to the other party any costs thereof.
- Upon occurrence of a Force Majeure Event after the Appointed Date, the costs incurred and attributable to such event and directly relating to the project (“**Force Majeure Costs**”) shall be allocated and paid as follows:
  - upon occurrence of a Non-Political Event, as defined in the GEPL Concession Agreement, the parties shall bear their respective Force Majeure Costs and neither party shall be required to pay to the other party any costs thereof;
  - upon occurrence of an Indirect Political Event, as defined in the GEPL Concession Agreement, all Force Majeure Costs attributable to such Indirect Political Event, and not exceeding the insurance cover for such Indirect Political Event, shall be borne by GEPL, and to the extent Force Majeure Costs exceed such insurance cover, one half of such excess amount shall be reimbursed by NHAI to GEPL; and
  - upon occurrence of a Political Event, as defined in the GEPL Concession Agreement, all Force Majeure Costs attributable to such Political Event shall be reimbursed by NHAI to GEPL.

Force Majeure Costs may include interest payments on debt, O&M expenses, any increase in the cost of construction works on account of inflation and all other costs directly attributable to the Force Majeure Event, but shall not include loss of Fee revenues or debt repayment obligations, and for determining such costs, information contained in the Financial Package, as defined in the GEPL Concession Agreement, may be relied upon to the extent that such information is relevant.

*Hand-back Provisions:* Upon completion of GEPL Concession Agreement, GEPL shall comply with and conform to the following requirements, amongst others:-

- notify NHAI forthwith the location and particulars of all project assets;
- deliver forthwith the actual or constructive possession of the Project Highway, free and clear of all encumbrances, save and except to the extent set forth in the substitution agreement;
- cure all Project Assets, including the road, bridges, structures and equipment, of all defects and deficiencies so that the Project Highway is compliant with the Maintenance Requirements, except as specified in the GEPL Concession Agreement;
- deliver and transfer relevant records, reports, intellectual property and other licences pertaining to the Project Highway and its design, engineering, construction, operation and maintenance, including all programmes and manuals pertaining thereto, and complete ‘as built’ drawings as on the transfer date.

- transfer and/or deliver all applicable permits to the extent permissible under applicable laws;
- execute such deeds, conveyance, documents and other writings as the Authority may reasonably require for conveying, divesting and assigning all the rights, title and interest of GEPL in the Project Highway, including manufacturers' warranties in respect of any plant or equipment and the right to receive outstanding insurance claims to the extent due and payable to NHAI, absolutely unto NHAI or its nominee; and
- comply with all other requirements as may be prescribed or required under applicable laws for completing the concession period and assignment of all rights, title and interest of GEPL in the Project Highway, free from all encumbrances, absolutely unto NHAI or to its nominees.

*Termination for GEPL Default:* Subject to the provisions of the GEPL Concession Agreement, in the event that any of the defaults specified below shall have occurred, and GEPL fails to cure the default within the mentioned cure periods, or where no cure period is specified, then within a cure period of 60 days, GEPL shall be deemed to be in default of the GEPL Concession Agreement (the “**GEPL Default**”), unless the default has occurred solely as a result of any breach of the GEPL Concession Agreement by NHAI or due to force majeure. The defaults referred to shall include, among other things, the following:

- the Performance Security has been encashed and appropriated in accordance with the GEPL Concession Agreement and GEPL fails to replenish or provide fresh Performance Security within a cure period of 30 days;
- subsequent to the replenishment or furnishing of fresh Performance Security in accordance with the GEPL Concession Agreement, GEPL fails to cure, within a cure period of 90 days, the GEPL Default for which whole or part of the Performance Security was appropriated;
- GEPL does not achieve the latest outstanding project milestone due in accordance with the provisions of the GEPL Concession Agreement and continues to be in default for 120 days;
- upon occurrence of a Financial Default, the Lenders' Representative, each term as defined in the GEPL Concession Agreement, has by notice required NHAI to undertake Suspension or termination, as the case may be, in accordance with the Substitution Agreement, as defined in the GEPL Concession Agreement, and GEPL fails to cure the default within the cure period specified;
- GEPL abandons or manifests intention to abandon the construction or operation of the Project Highway without the prior written consent of NHAI;
- GEPL is in breach of the maintenance requirements or the safety requirements, as the case may be;
- GEPL has failed to make any payment to NHAI within the period specified in the GEPL Concession Agreement; and
- a change in ownership has occurred in breach of the provisions of the GEPL Concession Agreement.

Upon occurrence of a GEPL Default, NHAI shall be entitled to terminate the GEPL Concession Agreement by issuing a termination notice to GEPL; provided that before issuing the termination notice, NHAI shall by a notice inform GEPL of its intention to issue such termination notice and grant 15 days to GEPL to make a representation, and may, after the expiry of such 15 days, whether or not it is in receipt of such representation, issue the termination notice.

*Termination for NHAI Default:* GEPL may terminate the GEPL Concession Agreement on account of occurrence of a default by the NHAI which is not rectified within cure periods (the “**NHAI Default**”) and includes – (i) material breach causing a material adverse effect on GEPL; (ii) the failure to make any payment due to GEPL; (iii) repudiation of the GEPL Concession Agreement etc.

*Defects liability after termination:* GEPL shall be responsible for all defects and deficiencies in the Project Highway for a period of 120 days after termination, as defined in the GEPL Concession Agreement, and it shall have the obligation to repair or rectify, at its own cost, all defects and deficiencies observed by the Independent Engineer in the Project Highway during this period. In the event that GEPL fails to repair or rectify such defect or deficiency within a period of 15 days from the date of notice issued by NHAI, NHAI shall be entitled to get the same repaired or rectified at the risk and cost of GEPL so as to make the Project Highway conform to the maintenance requirements. All costs incurred by NHAI in this regard shall be reimbursed by GEPL to NHAI within 15 days of receipt of demand thereof, and in the event of default in reimbursing such costs, NHAI shall be entitled to recover the same in accordance with the provisions of the GEPL Concession Agreement. A sum equal to 5% of the total realisable fee for the year immediately preceding the transfer date will be retained in the escrow account for a period of 120 days after termination for meeting the liabilities, arising out of or in connection with the GEPL Concession Agreement. Independent Engineer will carry out an inspection of the Project Highway at any time between 210 and 180 days prior to the termination and if it recommends that the status of the Project

Highway is such that a sum larger than the amount of 5% as stipulated above will be retained in the escrow account and for a period longer than the aforesaid 120 days, the amount recommended by the Independent Engineer shall be retained in the escrow account for the period specified by it. GEPL will have option to provide to NHAI a performance bank guarantee of equal amount in lieu of retention in accordance with the GEPL Concession Agreement.

**Jodhpur Pali Expressways Private Limited (“JPEPL”) Concession Agreement (“JPEPL Concession Agreement”) dated February 28, 2013 executed amongst JPEPL and Public Works Department, Rajasthan (“PWD(R)”)**

*Premium:* JPEPL agrees to pay (on the COD date, as defined in the JPEPL Concession Agreement) PWD(R) a premium in the form of an additional concession fee equal to ₹ 10.8 million and premium for subsequent year shall be increased by 5% p.a. as compared to immediate preceding year in accordance with the JPEPL Concession Agreement.

*Fee:* On and from the commercial operation date till the transfer date, JPEPL shall have the sole and exclusive right to demand, collect and appropriate charge levied on and payable for a vehicle using the Project Highway, as defined in the JPEPL Concession Agreement, or a part thereof (“**Fee**”) from the users subject to and in accordance with the JPEPL Concession Agreement and the fee notification set forth therein.

*Concession fee:* In consideration of the grant of concession under the JPEPL Concession Agreement, the concession fee payable by JPEPL to PWD(R) shall be ₹ 1.00 per year along with certain premium amounts, as specified in the JPEPL Concession Agreement.

*Change of scope:* PWD(R) may require the provision of additional works and services which are not included in the scope of the project as contemplated by the JPEPL Concession Agreement (the “**Change of Scope**”) and the costs shall be expended by JPEPL and reimbursed by PWD(R). PWD(R) shall make an advance payment to JPEPL in a sum equal to 20% of the cost of Change of Scope, and in the event of a dispute, 20% of the cost assessed by the Independent Engineer, as defined in the JPEPL Concession Agreement. PWD(R) shall disburse to JPEPL such amounts as are certified by the Independent Engineer, as reasonable and after making a proportionate deduction for the advance payment made. All costs arising out of any Change of Scope order issued during the Construction Period, as defined in the JPEPL Concession Agreement, shall be borne by JPEPL, subject to an aggregate ceiling of 0.25% of the total project cost. Any costs in excess of the ceiling shall be reimbursed by PWD(R).

*O&M:* JPEPL shall operate and maintain the Project Highway, as defined in the JPEPL Concession Agreement, in accordance with the JPEPL Concession Agreement either by itself, or through the O&M Contractor, as defined in the JPEPL Concession Agreement, and if required, modify, repair or otherwise make improvements to the Project Highway, and conform to specifications, standards and good industry practice. The obligations of JPEPL, among other things, shall include:

- permitting safe, smooth and uninterrupted flow of traffic on the Project Highway during normal operating conditions;
- carrying out periodic preventive maintenance of the Project Highway;
- undertaking routine maintenance including prompt repairs of potholes, cracks, joints, drains, embankments, structures, pavement markings, lighting, road signs and other traffic control devices;
- undertaking major maintenance such as resurfacing of pavements, repairs to structures, and repairs and refurbishment of tolling system and other equipment;
- protection of the environment and provision of equipment and materials therefor; and
- operation and maintenance of all communication, control and administrative systems necessary for the efficient operation of the Project Highway.

*Maintenance manual:* JPEPL shall, in consultation with the Independent Engineer, evolve a repair and maintenance manual (the “**Maintenance Manual**”) for the regular and preventive maintenance of the Project Highway in conformity with the specifications, standards, maintenance requirements, safety requirements and good industry practice. The Maintenance Manual shall be revised and updated once every three years.

*Maintenance programme:* JPEPL shall provide to PWD(R) and the Independent Engineer its proposed annual programme of preventive, urgent and other scheduled maintenance (the “**Maintenance Programme**”) to comply with the maintenance requirements, maintenance manual and safety requirements. Such Maintenance Programme shall include the following:

- preventive maintenance schedule;
- arrangements and procedures for carrying out urgent repairs;
- criteria to be adopted for deciding maintenance needs;
- intervals and procedures for carrying out inspection of all elements of the Project Highway;
- intervals at which JPEPL shall carry out periodic maintenance;
- arrangements and procedures for carrying out safety related measures; and
- intervals for major maintenance works and the scope thereof.

*Effect of Variation in Traffic Growth:* As per JPEPL Concession Agreement, the target traffic on target date i.e. January 1, 2030 was estimated to be 35,938 PCUs. Based on the forecast the traffic estimated on the project road considering the average of both toll plazas and the average of the traffic for the three consecutive accounting years (FY29 to FY31) is estimated to be 27,612 PCUs which is 23.2 percent lower than the target traffic. (Source: Traffic Study Report dated February 2022 issued for JPEPL)

Pursuant to the JPEPL Concession Agreement, if the actual average traffic shall have fallen short of or exceeded the target traffic by more than 2.5 percent, then there will be an increase or reduction in the concession period. Further, if the traffic in PCUs at target date is lower than the target traffic, then for every 1 percent decrease, the concession period shall be increased by 1.5 percent, however, such increase shall not be more than 20 % of the base concession period. The concession period may, therefore, be subject to an increase by 5 to 30 years. (Source: Traffic Study Report dated February 2022 issued for JPEPL)

*Restrictions on construction of additional tollway:* In accordance with the provisions of the JPEPL Concession Agreement, PWD(R) shall not construct, and shall procure that no Government Instrumentality, as defined in the JPEPL Concession Agreement, shall construct or cause to be constructed, any expressway or other toll road between, *amongst others*, Jodhpur and Pali i.e. km 308.000 to km 366.000 on National Highway No.65, including Pali bypass starting from Km 366.00 of NH-65, connecting NH-14 at km 114.000 (collectively the “**Additional Tollway**”) for use by traffic at any time before the twelfth anniversary of the Appointed Date, as defined in the JPEPL Concession Agreement. Additional Tollway does not include any expressway or other toll road connecting, *inter alia*, km 308.000 to km 366.000 on National Highway No.65, including Pali bypass starting from km 366.00 of NH-65, connecting NH-14 at km 114.000 if the length of such expressway or toll road exceeds the length of the existing route comprising the Project Highway by 20%. If PWD(R) shall be in breach of this provision, JPEPL shall, without prejudice to its other rights and remedies under the JPEPL Concession Agreement, be entitled to receive compensation from PWD(R).

*Obligations relating to competing roads:* PWD(R) shall procure that during the subsistence of the JPEPL Concession Agreement, neither PWD(R) nor any Government Instrumentality shall, at any time before the tenth anniversary of the appointed date, construct or cause to be constructed any competing road, as defined in the JPEPL Concession Agreement; provided that this restriction shall not apply if the average traffic on the Project Highway in any year exceeds 90% of its designed capacity specified in the JPEPL Concession Agreement. Upon breach of its obligations hereunder, PWD(R) shall be liable to payment of compensation to JPEPL in accordance with the JPEPL Concession Agreement, and such compensation shall be the sole remedy of JPEPL.

*Obligations relating to change in ownership:* JPEPL shall not undertake or permit any change in ownership, except with the prior written approval of PWD(R). Notwithstanding anything to the contrary contained in the JPEPL Concession Agreement, JPEPL agrees and acknowledges that:

- all acquisitions of equity by an acquirer, either by himself or with any person acting in concert, directly or indirectly, including by transfer of the direct or indirect legal or beneficial ownership or control of any equity, in aggregate of not less than 15% of the total equity of JPEPL; or
- acquisition of any control directly or indirectly of the board of directors of JPEPL by any person either by himself or together with any person or persons acting in concert with him, shall constitute a change in ownership requiring prior approval of PWD(R) from national security and public interest perspective, the decision of PWD(R) in this behalf being final, conclusive and binding on JPEPL, and undertakes that it shall not give effect to any such acquisition of equity or control of the board of directors of JPEPL without such prior approval of PWD(R). It has been expressly agreed that approval of PWD(R) hereunder shall be limited to national security and public interest perspective, and PWD(R) shall endeavour to convey its decision thereon expeditiously. It has also been agreed that PWD(R) shall not be liable in any manner on account of grant or otherwise of such approval and that such approval or denial thereof shall not in any manner absolve JPEPL from any liability or obligation under the JPEPL Concession

Agreement.

*Indemnities:*

- JPEPL shall indemnify, defend, save and hold harmless PWD(R) and its officers, servants, agents, Government Instrumentalities, as defined in the JPEPL Concession Agreement, and Government owned and/or controlled entities/enterprises, (the “**PWD(R) Indemnified Persons**”) against any and all suits, proceedings, actions, demands and claims from third parties for any loss, damage, cost and expense of whatever kind and nature, whether arising out of any breach by JPEPL of any of its obligations under the JPEPL Concession Agreement or any related agreement or on account of any defect or deficiency in the provision of services by JPEPL to any user or from any negligence of JPEPL under contract or tort or on any other ground whatsoever, except to the extent that any such suits, proceedings, actions, demands and claims have arisen due to any negligent act or omission, or breach or default of the JPEPL Concession Agreement on the part of PWD(R) Indemnified Persons;
- JPEPL shall fully indemnify, hold harmless and defend PWD(R) and PWD(R) Indemnified Persons from and against any and all loss and/or damages arising out of or with respect to:
  - failure of JPEPL to comply with applicable laws and applicable permits;
  - payment of taxes required to be made by JPEPL in respect of the income or other taxes of JPEPL’s contractors, suppliers and representatives; or
  - non-payment of amounts due as a result of materials or services furnished to JPEPL or any of its contractors which are payable by JPEPL or any of its contractors.
- JPEPL shall fully indemnify, hold harmless and defend PWD(R) Indemnified Persons from and against any and all suits, proceedings, actions, claims, demands, liabilities and damages which PWD(R) Indemnified Persons may hereafter suffer, or pay by reason of any demands, claims, suits or proceedings arising out of claims of infringement of any domestic or foreign patent rights, copyrights or other intellectual property, proprietary or confidentiality rights with respect to any materials, information, design or process used by JPEPL or by JPEPL’s contractors in performing the obligations of JPEPL or in any way incorporated in or related to the project. If in any such suit, action, claim or proceedings, a temporary restraint order or preliminary injunction is granted, JPEPL shall make every reasonable effort, by giving a satisfactory bond or otherwise, to secure the revocation or suspension of the injunction or restraint order. If, in any such suit, action, claim or proceedings, the Project Highway, or any part thereof or comprised therein, is held to constitute an infringement and its use is permanently enjoined, JPEPL shall promptly make every reasonable effort to secure for PWD(R) a licence, at no cost to PWD(R), authorising continued use of the infringing work. If JPEPL is unable to secure such licence within a reasonable time, JPEPL shall, at its own expense, and without impairing the specifications and standards, either replace the affected work, or part, or process thereof with non-infringing work or part or process, or modify the same so that it becomes non-infringing.

*Suspension of JPEPL’s rights:* Upon occurrence of a JPEPL Default, PWD(R) shall be entitled, without prejudice to its other rights and remedies under the JPEPL Concession Agreement including its rights of termination thereunder, to (i) suspend all rights of JPEPL under the JPEPL Concession Agreement, including JPEPL’s right to collect Fee, and other revenues pursuant hereto, and (ii) exercise such rights itself and perform the obligations hereunder or authorise any other person to exercise or perform the same on its behalf during such suspension (“**Suspension**”). Suspension hereunder shall be effective forthwith upon issue of notice by PWD(R) to JPEPL and may extend up to a period not exceeding 180 days from the date of issue of such notice; provided that upon written request from JPEPL and the Lenders’ Representative, as defined in the JPEPL Concession Agreement, PWD(R) shall extend the aforesaid period of 180 days by a further period not exceeding 90 days.

*Effect of force majeure event on the Concession:*

- Upon the occurrence of any Force Majeure Event, as defined in the JPEPL Concession Agreement, prior to the Appointed Date, as defined in the JPEPL Concession Agreement, the period for achieving financial close shall be extended by a period equal in length to the duration of the Force Majeure Event.
- At any time after the Appointed Date, if any Force Majeure Event occurs:
  - before COD, the concession period and the dates set forth in the Project Completion Schedule, as defined in the JPEPL Concession Agreement, shall be extended by a period equal in length to the duration for which such Force Majeure Event subsists; or
  - after COD, whereupon JPEPL is unable to collect Fee despite making best efforts or it is directed by PWD(R) to suspend the collection thereof during the subsistence of such Force Majeure Event, the concession period shall be extended by a period, equal in length to the period during which

JPEPL was prevented from collection of Fee on account thereof; provided that in the event of partial collection of Fee where the daily collection is less than 90% of the average daily Fee, PWD(R) shall extend the concession period in proportion to the loss of Fee on a daily basis. Loss of 25% in collection of Fee as compared to the average daily Fee for four days shall entitle JPEPL to extension of one day in the concession period.

*Allocation of costs arising out of Force Majeure:*

- Upon occurrence of any Force Majeure Event prior to the Appointed Date, the parties to the JPEPL Concession Agreement shall bear their respective costs and no party shall be required to pay to the other party any costs thereof.
- Upon occurrence of a Force Majeure Event after the Appointed Date, the costs incurred and attributable to such event and directly relating to the project (“**Force Majeure Costs**”) shall be allocated and paid as follows:
  - upon occurrence of a Non-Political Event, as defined in the JPEPL Concession Agreement, the parties shall bear their respective Force Majeure Costs and neither party shall be required to pay to the other party any costs thereof;
  - upon occurrence of an Indirect Political Event, as defined in the JPEPL Concession Agreement, all Force Majeure Costs attributable to such Indirect Political Event, and not exceeding the insurance cover for such Indirect Political Event, shall be borne by JPEPL, and to the extent Force Majeure Costs exceed such insurance cover, one half of such excess amount shall be reimbursed by PWD(R) to JPEPL; and
  - upon occurrence of a Political Event, as defined in the JPEPL Concession Agreement, all Force Majeure Costs attributable to such Political Event shall be reimbursed by PWD(R) to JPEPL.

Force Majeure Costs may include interest payments on debt, O&M expenses, any increase in the cost of construction works on account of inflation and all other costs directly attributable to the Force Majeure Event, but shall not include loss of Fee revenues or debt repayment obligations, and for determining such costs, information contained in the Financial Package, as defined in the JPEPL Concession Agreement, may be relied upon to the extent that such information is relevant.

*Termination for JPEPL Default:* Subject to the provisions of the JPEPL Concession Agreement, in the event that any of the defaults specified below shall have occurred, and JPEPL fails to cure the default within the mentioned cure periods, or where no cure period is specified, then within a cure period of 60 days, JPEPL shall be deemed to be in default of the JPEPL Concession Agreement (the “**JPEPL Default**”), unless the default has occurred solely as a result of any breach of the JPEPL Concession Agreement by PWD(R) or due to force majeure. The defaults referred to shall include, among other things, the following:

- the Performance Security has been encashed and appropriated in accordance with the JPEPL Concession Agreement and JPEPL fails to replenish or provide fresh Performance Security within a cure period of 30 days;
- subsequent to the replenishment or furnishing of fresh Performance Security in accordance with the JPEPL Concession Agreement, JPEPL fails to cure, within a cure period of 90 days, the JPEPL Default for which whole or part of the Performance Security was appropriated;
- JPEPL does not achieve the latest outstanding project milestone due in accordance with the provisions of the JPEPL Concession Agreement and continues to be in default for 120 days;
- upon occurrence of a Financial Default, the Lenders’ Representative, each term as defined in the JPEPL Concession Agreement, has by notice required PWD(R) to undertake Suspension or termination, as the case may be, in accordance with the Substitution Agreement, as defined in the JPEPL Concession Agreement, and JPEPL fails to cure the default within the cure period specified;
- JPEPL abandons or manifests intention to abandon the construction or operation of the Project Highway without the prior written consent of PWD(R);
- JPEPL is in breach of the maintenance requirements or the safety requirements, as the case may be;
- JPEPL has failed to make any payment to PWD(R) within the period specified in the JPEPL Concession Agreement; and
- a change in ownership has occurred in breach of the provisions of the JPEPL Concession Agreement.

Upon occurrence of a JPEPL Default, PWD(R) shall be entitled to terminate the JPEPL Concession Agreement by issuing a termination notice to JPEPL; provided that before issuing the termination notice, PWD(R) shall by a notice inform JPEPL of its intention to issue such termination notice and grant 15 days to JPEPL to make a

representation, and may, after the expiry of such 15 days, whether or not it is in receipt of such representation, issue the termination notice.

*Termination for PWD(R) Default:* JPEPL may terminate the JPEPL Concession Agreement on account of occurrence of a default by the PWD(R) which is not rectified within cure periods (the “**PWD(R) Default**”) and includes – (i) material breach causing a material adverse effect on JPEPL; (ii) the failure to make any payment due to JPEPL; (iii) repudiation of the JPEPL Concession Agreement etc.

*Defects liability after termination:* JPEPL shall be responsible for all defects and deficiencies in the Project Highway for a period of 120 days after termination, as defined in the JPEPL Concession Agreement, and it shall have the obligation to repair or rectify, at its own cost, all defects and deficiencies observed by the Independent Engineer in the Project Highway during this period. The Independent Engineer appointed in terms of the JPEPL Concession Agreement will carry out an inspection of the Project Highway at any time between 210 and 180 days prior to the termination of the JPEPL Concession Agreement. In the event that JPEPL fails to repair or rectify such defect or deficiency within a period of 15 days from the date of notice issued by PWD(R), PWD(R) shall be entitled to get the same repaired or rectified at the risk and cost of JPEPL so as to make the Project Highway conform to the maintenance requirements. All costs incurred by PWD(R) in this regard shall be reimbursed by JPEPL to PWD(R) within 15 days of receipt of demand thereof, and in the event of default in reimbursing such costs, PWD(R) shall be entitled to recover the same in accordance with the provisions of the JPEPL Concession Agreement. A sum equal to 5% of the total realisable fee for the year immediately preceding the transfer date will be retained in the escrow account for a period of 120 days after termination for meeting the liabilities, arising out of or in connection with the JPEPL Concession Agreement. However, if the Independent Engineer recommends that a larger sum be retained or such sum be retained for a period longer than the aforesaid 120 days, the amount recommended by the Independent Engineer shall be retained in the escrow account for the period specified by the Independent Engineer. JPEPL will have option to provide to PWD(R) a performance bank guarantee of equal amount in lieu of retention in accordance with the JPEPL Concession Agreement.

On termination of the JPEPL Concession Agreement, the independent engineer may require JPEPL to carry out appropriate tests to verify compliance by JPEPL with the maintenance requirements at JPEPL's cost. In the event the JPEPL Concession Agreement is terminated due to a PWD (R) event of default, JPEPL will not be required to bear the cost of such tests.

**Nirmal BOT Limited (“NBL”) Concession Agreement (“NBL Concession Agreement”) dated May 4, 2007 executed amongst NBL and National Highways Authority of India (“NHAI”).**

*Annuity:* NHAI agrees and undertakes to pay NBL on each Annuity Payment Date, as defined in the NBL Concession Agreement, a sum equal to ₹ 238 million in accordance with the NBL Concession Agreement.

*Concession fee:* In consideration of the grant of concession under the NBL Concession Agreement, the concession fee payable by NBL to NHAI shall be ₹ 1.00 per year.

*Change of scope:* NHAI may require the provision of additional works and services which are not included in the scope of the project as contemplated by the NBL Concession Agreement, during the Construction Period, as defined in the NBL Concession Agreement (the “**Change of Scope**”) provided such changes do not require any increase/reduction in expenditure exceeding 10% of the Total Project Cost and do not affect the COD, each as defined in the NBL Concession Agreement. All such changes shall be made by NHAI by an order issued in accordance with the procedure set forth in the NBL Concession Agreement.

NHAI may request further improvements to the Project Assets and Project Highway, each as defined in the NBL Concession Agreement, subject to a limit to 20% of the Project Cost (as defined in the NBL Concession Agreement), during the operations period in the form of a Change of Scope order that is required to make the Project Highway comply with the latest specifications and standards, and other requirements as set out in the NBL Concession Agreement, good industry practice, applicable laws and permits during the entire operations period (“**Value Additions**”). The cost of such Value Additions shall be borne by NHAI and such costs shall be computed and the work for the same shall be carried out in the manner as set out specifically in the NBL Concession Agreement.

*O&M:* NBL shall operate and maintain the Project Highway in accordance with the NBL Concession Agreement either by itself, or through the O&M Contractor, as defined in the NBL Concession Agreement, and if required, modify, repair or otherwise make improvements to the Project Highway, and conform to specifications, standards and good industry practice. The obligations of NBL, among other things, shall include:

- permitting safe, smooth and uninterrupted flow of traffic on the Project Highway during normal operating conditions;
- carrying out periodic preventive maintenance of the Project Highway;
- undertaking routine maintenance including prompt repairs of potholes, cracks, joints, drains, embankments, structures, pavement markings, lighting, road signs and other traffic control devices; and
- undertaking major maintenance such as resurfacing of pavements, repairs to structures, and repairs and refurbishment of tolling system and other equipment.

*Maintenance manual:* NBL shall, in consultation with the Independent Engineer, evolve a repair and maintenance manual not later than 180 days before the Scheduled Project Completion Date, as defined in the NBL Concession Agreement (the “**Maintenance Manual**”) for the regular and periodic maintenance, and shall ensure that at all times during the Operations Period, as defined in the NBL Concession Agreement, the Project Highway is maintained in a manner that it complies with the Specifications and Standard, as defined in the NBL Concession Agreement and the minimum maintenance requirement as set forth in the NBL Concession Agreement.

*Maintenance programme:* NBL shall in consultation with the Independent Engineer not later than 45 days from the start of each Accounting Year, as defined in the NBL Concession Agreement, provide to NHAI and the Independent Engineer its proposed annual programme of preventive and other scheduled maintenance (the “**Maintenance Programme**”) to comply with the maintenance requirements, maintenance manual and safety requirements. Such Maintenance Programme shall include the following:

- preventive maintenance schedule;
- criteria to be adopted for deciding maintenance needs;
- intervals and procedures for carrying out inspection of all elements of the Project Highway;
- intervals at which NBL shall carry out periodic maintenance; and
- intervals for major maintenance works and the scope thereof.

*Obligations relating to change in ownership:* NBL shall not undertake or permit any change in ownership, except with the prior written approval of NHAI. Notwithstanding anything to the contrary contained in the NBL Concession Agreement, NBL agrees and acknowledges that:

- all acquisitions of equity by an acquirer, either by himself or with any person acting in concert, directly or indirectly, including by transfer of the direct or indirect legal or beneficial ownership or control of any equity, in aggregate of not less than 15% of the total equity of NBL; or
- acquisition of any control directly or indirectly of the board of directors of NBL by any person either by himself or together with any person or persons acting in concert with him, shall constitute a change in ownership requiring prior approval of NHAI from national security and public interest perspective, the decision of NHAI in this behalf being final, conclusive and binding on NBL, and undertakes that it shall not give effect to any such acquisition of equity or control of the board of directors of NBL without such prior approval of NHAI. It has been expressly agreed that approval of NHAI hereunder shall be limited to national security and public interest perspective, and NHAI shall endeavour to convey its decision thereon expeditiously. It has also been agreed that NHAI shall not be liable in any manner on account of grant or otherwise of such approval and that such approval or denial thereof shall not in any manner absolve NBL from any liability or obligation under the NBL Concession Agreement.

*Indemnities:*

- NBL shall indemnify, defend, save and hold harmless NHAI against any and all suits, proceedings, actions, demands and claims from third parties for any loss, damage, cost and expense of whatever kind and nature, arising out of the design, engineering, construction, procurement, Operation and Maintenance, as defined in the NBL Concession Agreement, of the Project Highway or arising out of any breach by NBL of any of its obligations under the NBL Concession Agreement except to the extent that any such claim has arisen due to NHAI Event of Default, as defined in the NBL Concession Agreement;

- NBL shall fully indemnify, hold harmless and defend NHAI and NHAI Indemnified Persons from and against any and all loss and/or damages arising out of or with respect to:
  - failure of NBL to comply with applicable laws and applicable permits;
  - payment of taxes required to be made by NBL in respect of the income or other taxes of NBL's contractors, suppliers and representatives; or
  - non-payment of amounts due as a result of materials or services furnished to NBL or any of its contractors which are payable by NBL or any of its contractors.
- NBL shall fully indemnify, hold harmless and defend NHAI Indemnified Persons from and against any and all suits, proceedings, actions, claims, demands, liabilities and damages which NHAI Indemnified Persons may hereafter suffer, or pay by reason of any demands, claims, suits or proceedings arising out of claims of infringement of any domestic or foreign patent rights, copyrights or other intellectual property, proprietary or confidentiality rights with respect to any materials, information, design or process used by NBL or by NBL's contractors in performing the obligations of NBL or in any way incorporated in or related to the project. If in any such suit, action, claim or proceedings, a temporary restraint order or preliminary injunction is granted, NBL shall make every reasonable effort, by giving a satisfactory bond or otherwise, to secure the revocation or suspension of the injunction or restraint order. If, in any such suit, action, claim or proceedings, the Project Highway, or any part thereof or comprised therein, is held to constitute an infringement and its use is permanently enjoined, NBL shall promptly make every reasonable effort to secure for NHAI a licence, at no cost to NHAI, authorising continued use of the infringing work. If NBL is unable to secure such licence within a reasonable time, NBL shall, at its own expense, and without impairing the specifications and standards, either replace the affected work, or part, or process thereof with non-infringing work or part or process, or modify the same so that it becomes non-infringing.

*Effect of force majeure event on the Concession:*

- Upon the occurrence of any Force Majeure Event, as defined in the NBL Concession Agreement, prior to the Financial Close, as defined in the NBL Concession Agreement, (i) there shall be no termination except as provided in the NBL Concession Agreement, (ii) the period for achieving Financial Close shall be extended by a period equal in length to the duration of the Force Majeure Event, and (iii) each party shall bear its own costs and no party shall be required to pay the other party, costs arising out of such Force Majeure Event.
- At any time after the Financial Close, if any Force Majeure Event occurs:
  - there shall be no termination except as provided in the NBL Concession Agreement;
  - before COD, the concession period and the dates set forth in the Project Completion Schedule, as defined in the NBL Concession Agreement, shall be extended by a period equal in length to the duration for which such Force Majeure Event subsists; or
  - after COD, NBL shall continue to make all reasonable efforts to maintain and operate the Project Highway; or
  - costs arising out of such Force Majeure Event shall be borne in accordance with the provisions of the NBL Concession Agreement.

*Allocation of costs arising out of Force Majeure:*

- Upon occurrence of a Force Majeure Event after the Financial Close, the costs incurred and attributable to such event and directly relating to the project ("**Force Majeure Costs**") shall be allocated and paid as follows:
  - upon occurrence of a Non-Political Event, as defined in the NBL Concession Agreement, the parties shall bear their respective Force Majeure Costs and neither party shall be required to pay to the other party any costs thereof;
  - upon occurrence of an Indirect Political Event, as defined in the NBL Concession Agreement, all Force Majeure Costs attributable to such Indirect Political Event, and not exceeding the insurance cover for such Indirect Political Event, shall be borne by NBL, and to the extent Force Majeure Costs exceed such insurance cover, one half of such excess amount shall be reimbursed by NHAI to NBL in accordance with the terms as set out in the NBL Concession Agreement; and
  - upon occurrence of a Political Event, as defined in the NBL Concession Agreement, all Force Majeure Costs attributable to such Political Event shall be reimbursed by NHAI to NBL in accordance with the terms as set out in the NBL Concession Agreement.

Force Majeure Costs shall not include any debt repayment obligations, but may include interest payments on debt, O&M expenses and all other costs directly attributable to the Force Majeure Event.

*Hand-back Provisions:* Upon completion of concession period, the NBL shall comply and conform to the following divestment requirements in respect of the Project Highway:

- all project assets including the road, pavement structure and equipment shall have been renewed and cured of all defects and deficiencies as necessary so that the Project Highway is compliant with the specifications and standards set out in the NBL Concession Agreement;
- all sections of each traffic lane of the Project Highway shall have a roughness index of not more than 2500 mm per km and shall be free from defects in accordance with O&M requirements;
- all lamps shall be in working condition;
- NBL delivers relevant records and reports pertaining to the Project Highway and its design, engineering, construction, operation, and maintenance including all operation and maintenance records and programmes and manuals pertaining thereto and complete as built drawings on the divestment date;
- NBL executes such deeds of conveyance, documents and other writings as the NHAI may reasonably require to convey, divest and assign all the rights, title and interest of NBL in the Project Highway free from all encumbrances absolutely and free of any charge or tax unto the NHAI or its nominee; and
- NBL complies with all other requirements as may be prescribed under applicable laws to complete the divestment and assignment of all the rights, title and interest of NBL in the Project Highway free from all encumbrances absolutely and free of any charge or tax to NHAI or its nominee.

*Termination for NBL Default:* Subject to the provisions of the NBL Concession Agreement, in the event that any of the defaults specified below shall have occurred, and NBL fails to cure the default within the mentioned cure periods, NBL shall be deemed to be in default of the NBL Concession Agreement (the “**NBL Default**”). The defaults referred to shall include, among other things, the following:

- NBL is in material breach of any of the Project Agreements, as defined in the NBL Concession Agreement;
- A resolution has been passed by the shareholders of NBL for voluntary winding up of NBL;
- NBL does not achieve the latest outstanding project milestone due in accordance with the provisions of the NBL Concession Agreement and continues to be in default for 180 days;
- NBL fails to achieve Financial Close in accordance with the terms of the NBL Concession Agreement;
- NBL has failed to make any payment under the NBL Concession Agreement within the period specified in the NBL Concession Agreement and if such delay exceeds 90 days.

Upon occurrence of a NBL Default, NHAI shall be entitled to terminate the NBL Concession Agreement by issuing a termination notice to NBL; provided that before issuing the termination notice, NHAI shall by a notice inform NBL of its intention to issue such termination notice and grant 15 days to NBL to make a representation, and may, after the expiry of such 15 days, whether or not it is in receipt of such representation, issue the termination notice.

*Termination for NHAI Default:* NBL may terminate the NBL Concession Agreement on account of occurrence of a default by the NHAI which is not rectified within cure periods (the “**NHAI Default**”) and includes – (i) material breach causing a material adverse effect on NBL and NHAI has failed to cure such breach within 90 days from receipt of notice in this behalf from NBL; (ii) the failure to make any payment due to NBL and if such delay exceeds 90 days; (iii) repudiation of the NBL Concession Agreement etc.

**Shillong Expressway Private Limited (“SEPL”) Concession Agreement (“SEPL Concession Agreement”) dated July 14, 2010 executed amongst SEPL and National Highways Authority of India (“NHAI”).**

*Annuity:* SEPL upon achieving COD for the Project Highway, each as defined in the SEPL Concession Agreement and in consideration of SEPL accepting the concession and undertaking to perform its obligations as set out in the SEPL Concession Agreement, NHAI agrees and undertakes to pay SEPL, for each Annuity Payment Period (as defined in the SEPL Concession Agreement), on each Annuity Payment Date (as defined in the SEPL Concession Agreement) a sum of ₹ 248.7 million in accordance with the SEPL Concession Agreement.

*Concession fee:* In consideration of the grant of concession under the SEPL Concession Agreement, the concession fee payable by SEPL to NHAI shall be ₹ 1.00 per year.

*Performance security:* SEPL shall, for the performance of its obligations under the SEPL Concession Agreement, during the Construction Period, as defined in the SEPL Concession Agreement, provide to NHAI no later than 180 (one hundred and eighty) days from the date of the SEPL Concession Agreement, an irrevocable and unconditional guarantee from a bank for a sum equivalent to ₹ 113.1 million in the form set forth in the SEPL Concession Agreement.

*Change of scope:* NHAI may require the provision of additional works and services which are not included in the scope of the project as contemplated by the SEPL Concession Agreement (the “**Change of Scope**”). NHAI shall make an advance payment to SEPL in a sum equal to 20% of the cost of Change of Scope, and in the event of a dispute, 20% of the cost assessed by the Independent Engineer, as defined in the SEPL Concession Agreement. NHAI shall disburse to SEPL such amounts as are certified by the Independent Engineer, as reasonable and after making a proportionate deduction for the advance payment made. All costs arising out of any Change of Scope order issued during the Construction Period, as defined in the SEPL Concession Agreement, shall be borne by SEPL, subject to an aggregate ceiling of 0.25% of the total project cost. Any costs in excess of the ceiling shall be reimbursed by NHAI.

*O&M:* SEPL shall operate and maintain the Project Highway, as defined in the SEPL Concession Agreement, in accordance with the SEPL Concession Agreement either by itself, or through the O&M Contractor, as defined in the SEPL Concession Agreement, and if required, modify, repair or otherwise make improvements to the Project Highway, and conform to specifications, standards and good industry practice. The obligations of SEPL, among other things, shall include:

- permitting safe, smooth and uninterrupted flow of traffic on the Project Highway during normal operating conditions;
- carrying out periodic preventive maintenance of the Project Highway;
- undertaking routine maintenance including prompt repairs of potholes, cracks, joints, drains, embankments, structures, pavement markings, lighting, road signs and other traffic control devices;
- undertaking major maintenance such as resurfacing of pavements, repairs to structures, and repairs and refurbishment of tolling system and other equipment;
- protection of the environment and provision of equipment and materials therefor; and
- operation and maintenance of all communication, control and administrative systems necessary for the efficient operation of the Project Highway.

*Maintenance manual:* SEPL shall, in consultation with the Independent Engineer, evolve a repair and maintenance manual (the “**Maintenance Manual**”) for the regular and preventive maintenance of the Project Highway in conformity with the specifications, standards, maintenance requirements, safety requirements and good industry practice. The Maintenance Manual shall be revised and updated once every three years.

*Maintenance programme:* SEPL shall provide to NHAI and the Independent Engineer its proposed annual programme of preventive, urgent and other scheduled maintenance (the “**Maintenance Programme**”) to comply with the maintenance requirements, maintenance manual and safety requirements. Such Maintenance Programme shall include the following:

- preventive maintenance schedule;
- arrangements and procedures for carrying out urgent repairs;
- criteria to be adopted for deciding maintenance needs;
- intervals and procedures for carrying out inspection of all elements of the Project Highway;
- intervals at which SEPL shall carry out periodic maintenance;
- arrangements and procedures for carrying out safety related measures; and
- intervals for major maintenance works and the scope thereof.

*Hand-back Provisions:* Upon completion of the SEPL Concession Agreement, SEPL shall comply with and conform to the following requirements, amongst others:

- notify NHAI forthwith the location and particulars of all Project assets;
- deliver forthwith the actual or constructive possession of the Project Highway, free and clear of all encumbrances, save and except to the extent set forth in the substitution agreement;
- cure all Project assets, including the road, bridges, structures and equipment, of all defects and

- deficiencies so that the Project Highway is compliant with the maintenance requirements;
- deliver and transfer relevant records, reports, intellectual property and other licences pertaining to the Project Highway and its design, engineering, construction, operation and maintenance, including all programmes and manuals pertaining thereto, and complete ‘as built’ drawings as on the transfer date.
- transfer and/or deliver all applicable permits to the extent permissible under applicable laws;
- execute such deeds, conveyance, documents and other writings as NHAI may reasonably require for conveying, divesting and assigning all the rights, title and interest of SEPL in the Project Highway, including manufacturers’ warranties in respect of any plant or equipment and the right to receive outstanding insurance claims to the extent due and payable to NHAI, absolutely unto the NHAI or its nominee; and
- comply with all other requirements as may be prescribed or required under applicable laws for completing the concession period and assignment of all rights, title and interest of SEPL in the Project Highway, free from all encumbrances, absolutely unto NHAI or to its nominees.

*Obligations relating to change in ownership:* SEPL shall not undertake or permit any change in ownership, except with the prior written approval of NHAI. Notwithstanding anything to the contrary contained in the SEPL Concession Agreement, SEPL agrees and acknowledges that:

- all acquisitions of equity by an acquirer, either by himself or with any person acting in concert, directly or indirectly, including by transfer of the direct or indirect legal or beneficial ownership or control of any equity, in aggregate of not less than 15% of the total equity of SEPL; or
- acquisition of any control directly or indirectly of the board of directors of SEPL by any person either by himself or together with any person or persons acting in concert with him, shall constitute a change in ownership requiring prior approval of NHAI from national security and public interest perspective, the decision of NHAI in this behalf being final, conclusive and binding on SEPL, and undertakes that it shall not give effect to any such acquisition of equity or control of the board of directors of SEPL without such prior approval of NHAI. It has been expressly agreed that approval of NHAI hereunder shall be limited to national security and public interest perspective, and NHAI shall endeavour to convey its decision thereon expeditiously. It has also been agreed that NHAI shall not be liable in any manner on account of grant or otherwise of such approval and that such approval or denial thereof shall not in any manner absolve SEPL from any liability or obligation under the SEPL Concession Agreement.

*Indemnities:*

- SEPL shall indemnify, defend, save and hold harmless NHAI and its officers, servants, agents, Government Instrumentalities, as defined in the SEPL Concession Agreement, and Government owned and/or controlled entities/enterprises, (the “**NHAI Indemnified Persons**”) against any and all suits, proceedings, actions, demands and claims from third parties for any loss, damage, cost and expense of whatever kind and nature, whether arising out of any breach by SEPL of any of its obligations under the SEPL Concession Agreement or any related agreement or on account of any defect or deficiency in the provision of services by SEPL to any user or from any negligence of SEPL under contract or tort or on any other ground whatsoever, except to the extent that any such suits, proceedings, actions, demands and claims have arisen due to any negligent act or omission, or breach or default of the SEPL Concession Agreement on the part of NHAI Indemnified Persons;
- SEPL shall fully indemnify, hold harmless and defend NHAI and NHAI Indemnified Persons from and against any and all loss and/or damages arising out of or with respect to:
  - failure of SEPL to comply with applicable laws and applicable permits;
  - payment of taxes required to be made by SEPL in respect of the income or other taxes of SEPL’s contractors, suppliers and representatives; or
  - non-payment of amounts due as a result of materials or services furnished to SEPL or any of its contractors which are payable by SEPL or any of its contractors.
- SEPL shall fully indemnify, hold harmless and defend NHAI Indemnified Persons from and against any and all suits, proceedings, actions, claims, demands, liabilities and damages which NHAI Indemnified Persons may hereafter suffer, or pay by reason of any demands, claims, suits or proceedings arising out of claims of infringement of any domestic or foreign patent rights, copyrights or other intellectual property, proprietary or confidentiality rights with respect to any materials, information, design or process used by SEPL or by SEPL’s contractors in performing the obligations of SEPL or in any way incorporated in or related to the project. If in any such suit, action, claim or proceedings, a temporary restraint order or preliminary injunction is granted, SEPL shall make every reasonable effort, by giving a satisfactory bond or otherwise, to secure the revocation or suspension of the injunction or restraint

order. If, in any such suit, action, claim or proceedings, the Project Highway, or any part thereof or comprised therein, is held to constitute an infringement and its use is permanently enjoined, SEPL shall promptly make every reasonable effort to secure for NHAI a licence, at no cost to NHAI, authorising continued use of the infringing work. If SEPL is unable to secure such licence within a reasonable time, SEPL shall, at its own expense, and without impairing the specifications and standards, either replace the affected work, or part, or process thereof with non-infringing work or part or process, or modify the same so that it becomes non-infringing.

*Suspension of SEPL's rights:* Upon occurrence of a SEPL Default, NHAI shall be entitled, without prejudice to its other rights and remedies under the SEPL Concession Agreement including its rights of termination thereunder, to (i) suspend all rights of SEPL under the SEPL Concession Agreement, including SEPL's right to collect Fee, and other revenues pursuant hereto, and (ii) exercise such rights itself and perform the obligations hereunder or authorise any other person to exercise or perform the same on its behalf during such suspension ("**Suspension**"). Suspension hereunder shall be effective forthwith upon issue of notice by NHAI to SEPL and may extend up to a period not exceeding 180 days from the date of issue of such notice; provided that upon written request from SEPL and the Lenders' Representative, as defined in the SEPL Concession Agreement, NHAI shall extend the aforesaid period of 180 days by a further period not exceeding 90 days. At any time during the period of Suspension, the Lenders' Representative, on behalf of Senior Lenders, each term as defined in the SEPL Concession Agreement, shall be entitled to substitute SEPL under and in accordance with the Substitution Agreement, as defined in the SEPL Concession Agreement, and upon receipt of notice thereunder from the Lenders' Representative, NHAI shall withhold termination for a period not exceeding 180 days from the date of Suspension, and any extension thereof, for enabling the Lenders' Representative to exercise its rights of substitution on behalf of Senior Lenders.

*Effect of force majeure event on the Concession:*

- Upon the occurrence of any Force Majeure Event, as defined in the SEPL Concession Agreement, prior to the Appointed Date, as defined in the SEPL Concession Agreement, the period for achieving financial close shall be extended by a period equal in length to the duration of the Force Majeure Event.
- At any time after the Appointed Date, if any Force Majeure Event occurs:
  - before COD, the concession period and the dates set forth in the Project Completion Schedule, as defined in the SEPL Concession Agreement, shall be extended by a period equal in length to the duration for which such Force Majeure Event subsists.

*Allocation of costs arising out of Force Majeure:*

- Upon occurrence of any Force Majeure Event prior to the Appointed Date, the parties to the SEPL Concession Agreement shall bear their respective costs and no party shall be required to pay to the other party any costs thereof.
- Upon occurrence of a Force Majeure Event after the Appointed Date, the costs incurred and attributable to such event and directly relating to the project ("**Force Majeure Costs**") shall be allocated and paid as follows:
  - upon occurrence of a Non-Political Event, as defined in the SEPL Concession Agreement, the parties shall bear their respective Force Majeure Costs and neither party shall be required to pay to the other party any costs thereof;
  - upon occurrence of an Indirect Political Event, as defined in the SEPL Concession Agreement, all Force Majeure Costs attributable to such Indirect Political Event, and not exceeding the insurance cover for such Indirect Political Event, shall be borne by SEPL, and to the extent Force Majeure Costs exceed such insurance cover, one half of such excess amount shall be reimbursed by NHAI to SEPL; and
  - upon occurrence of a Political Event, as defined in the SEPL Concession Agreement, all Force Majeure Costs attributable to such Political Event shall be reimbursed by NHAI to SEPL.

Force Majeure Costs may include interest payments on debt, O&M expenses, any increase in the cost of construction works on account of inflation and all other costs directly attributable to the Force Majeure Event, but shall not include loss of Fee revenues or debt repayment obligations, and for determining such costs, information contained in the Financial Package, as defined in the SEPL Concession Agreement, may be relied upon to the extent that such information is relevant.

*Termination for SEPL Default:* Subject to the provisions of the SEPL Concession Agreement, in the event that any of the defaults specified below shall have occurred, and SEPL fails to cure the default within the mentioned cure periods, or where no cure period is specified, then within a cure period of 60 days, SEPL shall be deemed to be in default of the SEPL Concession Agreement (the “**SEPL Default**”), unless the default has occurred solely as a result of any breach of the SEPL Concession Agreement by NHAI or due to force majeure. The defaults referred to shall include, among other things, the following:

- the Performance Security has been encashed and appropriated in accordance with the SEPL Concession Agreement and SEPL fails to replenish or provide fresh Performance Security within a cure period of 30 days;
- subsequent to the replenishment or furnishing of fresh Performance Security in accordance with the SEPL Concession Agreement, SEPL fails to cure, within a cure period of 90 days, the SEPL Default for which whole or part of the Performance Security was appropriated;
- SEPL does not achieve the latest outstanding project milestone due in accordance with the provisions of the SEPL Concession Agreement and continues to be in default for 90 days;
- upon occurrence of a Financial Default, the Lenders’ Representative, each term as defined in the SEPL Concession Agreement, has by notice required NHAI to undertake Suspension or termination, as the case may be, in accordance with the Substitution Agreement, as defined in the SEPL Concession Agreement, and SEPL fails to cure the default within the cure period specified;
- SEPL abandons or manifests intention to abandon the construction or operation of the Project Highway without the prior written consent of NHAI;
- SEPL is in breach of the maintenance requirements or the safety requirements, as the case may be;
- SEPL has failed to make any payment to NHAI within the period specified in the SEPL Concession Agreement; and
- a change in ownership has occurred in breach of the provisions of the SEPL Concession Agreement.

Upon occurrence of a SEPL Default, NHAI shall be entitled to terminate the SEPL Concession Agreement by issuing a termination notice to SEPL; provided that before issuing the termination notice, NHAI shall by a notice inform SEPL of its intention to issue such termination notice and grant 15 days to SEPL to make a representation, and may, after the expiry of such 15 days, whether or not it is in receipt of such representation, issue the termination notice.

*Termination for NHAI Default:* SEPL may terminate the SEPL Concession Agreement on account of occurrence of a default by the NHAI which is not rectified within cure periods (the “**NHAI Default**”) and includes – (i) material breach causing a material adverse effect on SEPL; (ii) the failure to make any payment due to SEPL; (iii) repudiation of the SEPL Concession Agreement etc.

*Defects liability after termination:* SEPL shall be responsible for all defects and deficiencies in the Project Highway for a period of 120 days after termination, as defined in the SEPL Concession Agreement, and it shall have the obligation to repair or rectify, at its own cost, all defects and deficiencies observed by the Independent Engineer in the Project Highway during this period. In the event that SEPL fails to repair or rectify such defect or deficiency within a period of 15 days from the date of notice issued by NHAI, NHAI shall be entitled to get the same repaired or rectified at the risk and cost of SEPL so as to make the Project Highway conform to the maintenance requirements. All costs incurred by NHAI in this regard shall be reimbursed by SEPL to NHAI within 15 days of receipt of demand thereof, and in the event of default in reimbursing such costs, NHAI shall be entitled to recover the same in accordance with the provisions of the SEPL Concession Agreement.

**Ulundurpet Expressways Private Limited (“UEPL”) Concession Agreement (“UEPL Concession Agreement”) dated April 19, 2006 executed amongst UEPL and National Highways Authority of India (“NHAI”)**

*Concession fee:* In consideration of the grant of concession under the UEPL Concession Agreement, the concession fee payable by UEPL to NHAI shall be ₹ 1.00 per year.

*Fee:* During the Operation Date, as defined in the UEPL Concession Agreement, UEPL shall have the sole and exclusive right to demand, collect and appropriate charge levied on and payable for a vehicle using the Project Highway, as defined in the UEPL Concession Agreement, or a part thereof (“**Fee**”) from the users subject to and in accordance with the UEPL Concession Agreement and the fee notification set forth therein.

*Change of scope:* NHAI may require the provision of additional works and services which are not included in the scope of the project as contemplated by the UEPL Concession Agreement, during the Construction Period, as defined in the UEPL Concession Agreement (the “**Change of Scope**”) provided such changes do not require any increase/reduction in expenditure exceeding 10% of the Total Project Cost and do not affect the COD, each as defined in the UEPL Concession Agreement. All such changes shall be made by NHAI by an order issued in accordance with the procedure set forth in the UEPL Concession Agreement.

NHAI may request further improvements to the Project assets and the Project Highway, as defined in the UEPL Concession Agreement, subject to a limit to 20% of the Project Cost, during the operations period in the form of a Change of Scope order that are required to make the Project Highway comply with the latest specifications and standards, and other requirements set forth in the UEPL Concession Agreement, good industry practice, applicable laws and applicable permits during the entire operations period (“**Value Additions**”). The cost of such Value Additions shall be borne by NHAI and such costs shall be computed and the work for such Value Additions shall be carried out in the manner as set out in the UEPL Concession Agreement.

*O&M:* UEPL shall operate and maintain the Project Highway, in accordance with the UEPL Concession Agreement either by itself, or through the O&M Contractor, as defined in the UEPL Concession Agreement, and if required, modify, repair or otherwise make improvements to the Project Highway, and conform to specifications, standards and good industry practice. The obligations of UEPL, among other things, shall include:

- permitting safe, smooth and uninterrupted flow of traffic on the Project Highway during normal operating conditions;
- carrying out periodic preventive maintenance of the Project Highway;
- undertaking routine maintenance including prompt repairs of potholes, cracks, joints, drains, embankments, structures, pavement markings, lighting, road signs and other traffic control devices; and
- undertaking major maintenance such as resurfacing of pavements, repairs to structures, and repairs and refurbishment of tolling system and other equipment.

*Maintenance manual:* UEPL shall, in consultation with the Independent Engineer, evolve a repair and maintenance manual not later than 180 days before the Scheduled Project Completion Date, as defined in the UEPL Concession Agreement (the “**Maintenance Manual**”) for the regular and periodic maintenance, and shall ensure that at all times during the Operations Period, as defined in the UEPL Concession Agreement, the Project Highway is maintained in a manner that it complies with the Specifications and Standard, as defined in the UEPL Concession Agreement and the minimum maintenance requirement as set forth in the UEPL Concession Agreement.

*Maintenance programme:* UEPL shall in consultation with the Independent Engineer not later than 45 days from the start of each Accounting Year, as defined in the UEPL Concession Agreement, provide to NHAI and the Independent Engineer its proposed annual programme of preventive and other scheduled maintenance (the “**Maintenance Programme**”) to comply with the maintenance requirements, maintenance manual and safety requirements. Such Maintenance Programme shall include the following:

- preventive maintenance schedule;
- criteria to be adopted for deciding maintenance needs;
- intervals and procedures for carrying out inspection of all elements of the Project Highway;
- intervals at which UEPL shall carry out periodic maintenance; and
- intervals for major maintenance works and the scope thereof.

*Obligations relating to change in ownership:* UEPL shall not undertake or permit any change in ownership, except with the prior written approval of NHAI. Notwithstanding anything to the contrary contained in the UEPL Concession Agreement, UEPL agrees and acknowledges that:

- all acquisitions of equity by an acquirer, either by himself or with any person acting in concert, directly or indirectly, including by transfer of the direct or indirect legal or beneficial ownership or control of any equity, in aggregate of not less than 15% of the total equity of UEPL; or
- acquisition of any control directly or indirectly of the board of directors of UEPL by any person either by himself or together with any person or persons acting in concert with him, shall constitute a change in ownership requiring prior approval of NHAI from national security and public interest perspective, the decision of NHAI in this behalf being final, conclusive and binding on UEPL, and undertakes that it shall not give effect to any such acquisition of equity or control of the board of directors of UEPL without

such prior approval of NHAI. It has been expressly agreed that approval of NHAI hereunder shall be limited to national security and public interest perspective, and NHAI shall endeavour to convey its decision thereon expeditiously. It has also been agreed that NHAI shall not be liable in any manner on account of grant or otherwise of such approval and that such approval or denial thereof shall not in any manner absolve UEPL from any liability or obligation under the UEPL Concession Agreement.

*Indemnities:*

- UEPL shall indemnify, defend, save and hold harmless NHAI against any and all suits, proceedings, actions, demands and claims from third parties for any loss, damage, cost and expense of whatever kind and nature, arising out of the design, engineering, construction, procurement, Operation and Maintenance, as defined in the UEPL Concession Agreement, of the Project Highway or arising out of any breach by UEPL of any of its obligations under the UEPL Concession Agreement except to the extent that any such claim has arisen due to NHAI Event of Default, as defined in the UEPL Concession Agreement;
- UEPL shall fully indemnify, hold harmless and defend NHAI and NHAI Indemnified Persons from and against any and all loss and/or damages arising out of or with respect to:
  - failure of UEPL to comply with applicable laws and applicable permits;
  - payment of taxes required to be made by UEPL in respect of the income or other taxes of UEPL's contractors, suppliers and representatives; or
  - non-payment of amounts due as a result of materials or services furnished to UEPL or any of its contractors which are payable by UEPL or any of its contractors.
- UEPL shall fully indemnify, hold harmless and defend NHAI Indemnified Persons from and against any and all suits, proceedings, actions, claims, demands, liabilities and damages which NHAI Indemnified Persons may hereafter suffer, or pay by reason of any demands, claims, suits or proceedings arising out of claims of infringement of any domestic or foreign patent rights, copyrights or other intellectual property, proprietary or confidentiality rights with respect to any materials, information, design or process used by UEPL or by UEPL's contractors in performing the obligations of UEPL or in any way incorporated in or related to the project. If in any such suit, action, claim or proceedings, a temporary restraint order or preliminary injunction is granted, UEPL shall make every reasonable effort, by giving a satisfactory bond or otherwise, to secure the revocation or suspension of the injunction or restraint order. If, in any such suit, action, claim or proceedings, the Project Highway, or any part thereof or comprised therein, is held to constitute an infringement and its use is permanently enjoined, UEPL shall promptly make every reasonable effort to secure for NHAI a licence, at no cost to NHAI, authorising continued use of the infringing work. If UEPL is unable to secure such licence within a reasonable time, UEPL shall, at its own expense, and without impairing the specifications and standards, either replace the affected work, or part, or process thereof with non-infringing work or part or process, or modify the same so that it becomes non-infringing.

*Effect of force majeure event on the Concession:*

- Upon the occurrence of any Force Majeure Event, as defined in the UEPL Concession Agreement, prior to the Financial Close, as defined in the UEPL Concession Agreement, (i) there shall be no termination except as provided in the UEPL Concession Agreement, (ii) the period for achieving Financial Close shall be extended by a period equal in length to the duration of the Force Majeure Event, and (iii) each party shall bear its own costs and no party shall be required to pay the other party, costs arising out of such Force Majeure Event.
- At any time after the Financial Close, if any Force Majeure Event occurs:
  - there shall be no termination except as provided in the UEPL Concession Agreement;
  - before COD, the concession period and the dates set forth in the Project Completion Schedule, as defined in the UEPL Concession Agreement, shall be extended by a period equal in length to the duration for which such Force Majeure Event subsists; or
  - after COD, UEPL shall continue to make all reasonable efforts to collect the Fee, but if UEPL is unable to collect Fee on account of the Force Majeure Event, the Concession Period shall be extended for such period for which the collection of Fee remains suspended on account of the Force Majeure Event; or
  - costs arising out of such Force Majeure Event shall be borne in accordance with the provisions of the UEPL Concession Agreement.

*Allocation of costs arising out of Force Majeure:*

- Upon occurrence of a Force Majeure Event after the Financial Close, the costs incurred and attributable to such event and directly relating to the project (“**Force Majeure Costs**”) shall be allocated and paid as follows:
  - upon occurrence of a Non-Political Event, as defined in the UEPL Concession Agreement, the parties shall bear their respective Force Majeure Costs and neither party shall be required to pay to the other party any costs thereof;
  - upon occurrence of an Indirect Political Event, as defined in the UEPL Concession Agreement, all Force Majeure Costs attributable to such Indirect Political Event, and not exceeding the insurance cover for such Indirect Political Event, shall be borne by UEPL, and to the extent Force Majeure Costs exceed such insurance cover, one half of such excess amount shall be reimbursed by NHAI to UEPL in accordance with the terms as set out in the UEPL Concession Agreement; and
  - upon occurrence of a Political Event, as defined in the UEPL Concession Agreement, all Force Majeure Costs attributable to such Political Event shall be reimbursed by NHAI to UEPL in accordance with the terms as set out in the UEPL Concession Agreement.

Force Majeure Costs shall not include any debt repayment obligations or loss of Fee revenue, but may include interest payments on debt, O&M expenses and all other costs directly attributable to the Force Majeure Event.

*Hand-back Provisions:* Between 30 to 36 months (initial inspection period) and between 9 to 12 months (second inspection period) prior to the expiry of the concession period, UEPL and the Independent Consultant will conduct a joint inspection of the Project Highway and all the project facilities. Post to the inspection, UEPL will provide to the Independent Consultant a report on the condition of the Project Highway and the project facilities along with a notice setting out its proposal to renewal of works in compliance with the divestment requirements.

2 years prior to the expiry of the concession period a sum equal to the fees realisable during the last 2 years of the concession period for a traffic volume calculated at the rate of 10,000 PCUs per day per year or a higher sum estimated by the Independent Consultant for renewal works, will be retained in the escrow account. Alternatively, UEPL may furnish a bank guarantee of an equivalent amount in the form of a performance guarantee. Upon furnishing the performance guarantee by UEPL, the retention amount in the escrow account will be dispensed with. If pursuant to the second inspection it is determined that no renewal of works is required, then within 14 days, 50% of the retention amount will be released from the escrow account to UEPL.

UEPL is also responsible for rectifying all defects and deficiencies in the Project Highway till the vesting certificate has been issued within 3 months of UEPL conforming to all the divestment requirements. After 14 days after the issuance of the vesting certificate the entire retention amount held in the escrow account as performance security will be released to UEPL.

*Termination for UEPL Default:* Subject to the provisions of the UEPL Concession Agreement, in the event that any of the defaults specified below shall have occurred, and UEPL fails to cure the default within the mentioned cure periods, UEPL shall be deemed to be in default of the UEPL Concession Agreement (the “**UEPL Default**”). The defaults referred to shall include, among other things, the following:

- UEPL is in material breach of any of the Project Agreements, as defined in the UEPL Concession Agreement;
- A resolution has been passed by the shareholders of UEPL for voluntary winding up of UEPL;
- UEPL does not achieve the latest outstanding project milestone due in accordance with the provisions of the UEPL Concession Agreement and continues to be in default for 180 days;
- UEPL fails to achieve Financial Close in accordance with the terms of the UEPL Concession Agreement; and
- UEPL has failed to make any payment under the UEPL Concession Agreement within the period specified in the UEPL Concession Agreement and if such delay exceeds 90 days.

Upon occurrence of a UEPL Default, NHAI shall be entitled to terminate the UEPL Concession Agreement by issuing a termination notice to UEPL; provided that before issuing the termination notice, NHAI shall by a notice inform UEPL of its intention to issue such termination notice and grant 15 days to UEPL to make a representation,

and may, after the expiry of such 15 days, whether or not it is in receipt of such representation, issue the termination notice.

*Termination for NHAI Default:* UEPL may terminate the UEPL Concession Agreement on account of occurrence of a default by the NHAI which is not rectified within cure periods (the “**NHAI Default**”) and includes – (i) material breach causing a material adverse effect on UEPL and NHAI has failed to cure such breach within 90 days from receipt of notice in this behalf from UEPL; (ii) the failure to make any payment due to UEPL and if such delay exceeds 90 days; (iii) repudiation of the UEPL Concession Agreement etc.

## INFORMATION CONCERNING THE UNITS

### Unitholding of the Highways Trust:

Particulars	Number of Units
Units issued and outstanding prior to this Issue	373,900,000*
Units issued and outstanding after this Issue*	415,500,000**

\*The first allotment of Units is proposed to be made to the Sponsor upon the fulfilment of certain conditions and subject to the Board or committee thereof passing a resolution for allotment of Units on or about August 23, 2022 in accordance with the Share Purchase Agreement (for further details, please see the section entitled "Related Party Transactions- Acquisition of the Project SPVs by the Trust" on page 258) after the Bid/ Issue Closing Date and prior to the Allotment of Units pursuant to the Issue.

\*\*Subject to the Board or a committee thereof passing a resolution for allotment of Units (i) to the Sponsor, subject to fulfilment of certain conditions; and (ii) pursuant to the Issue to the Eligible Investors, on or about August 23, 2022.

### Unitholders holding more than 5% of the Units

Sr. No.	Name of the Unit Holders	Pre-Issue*		Post Issue**	
		Number of Units	Percentage of holding (%)	Number of Units	Percentage of holding (%)
1.	Galaxy Investments II Pte. Ltd.	373,900,000*	100%	373,900,000*	89.99
2.	2452991 Ontario Limited	-	-	31,200,000	7.51

\*The first allotment of Units is proposed to be made to the Sponsor upon the fulfilment of certain conditions and subject to the Board or committee thereof passing a resolution for allotment of Units on or about August 23, 2022 in accordance with the Share Purchase Agreement (for further details, please see the section entitled "Related Party Transactions- Acquisition of the Project SPVs by the Trust" on page 258) after the Bid/ Issue Closing Date and prior to the Allotment of Units pursuant to the Issue.

\*\*Subject to the Board or a committee thereof passing a resolution for allotment of Units (i) to the Sponsor, subject to fulfilment of certain conditions; and (ii) pursuant to the Issue to the Eligible Investors, on or about August 23, 2022.

### Unitholding of the Sponsor, Investment Manager, Project Manager and Trustee

The Sponsor, shall be allotted Units of the Trust pursuant to the Share Purchase Agreement, prior to Allotment of Units in the Issue.

The Trustee, Investment Manager and Project Manager do not hold any Units and shall not acquire any Units in this Issue.

### Unitholding of the directors of the Investment Manager

As on the date of this Final Placement Memorandum, none of the directors of the Investment Manager hold any Units or propose to hold any Units in the Highways Trust.

### Sponsor lock-in

In terms of the InvIT Regulations, the Sponsor shall hold not less than 15% of Units on a post-Issue basis, aggregating up to 62,325,000 Units, which shall be locked-in for a period of three years from the date of listing of the Units. Further, unitholding of the Sponsor, exceeding 15% on a post-Issue basis, shall be locked-in for a period of not less than one year from the date of listing of the Units.

## USE OF PROCEEDS

The Issue Proceeds will be ₹ 4,160.00 million (the “**Issue Proceeds**”). The Issue Proceeds will be utilised towards the following objects:

- (i). Acquisition of non-cumulative redeemable preference shares issued by SEPL;
- (ii). Acquisition of compulsory convertible debentures issued by the Project SPVs; and
- (iii). General purposes.

### Requirements of Funds

The Issue Proceeds are proposed to be utilised in accordance with the details provided in the following table:

S. No.	Particulars	(In ₹ million) Amount*
(i)	Acquisition of non-cumulative redeemable preference shares issued by SEPL	545.65
(ii)	Acquisition of compulsory convertible debentures issued by the Project SPVs	3,060.00
(iii)	General purposes*	415.85
(iv)	Issue expenses	138.50
	<b>TOTAL</b>	<b>4,160.00</b>

\*Amount utilised for general corporate purposes shall not exceed the limits as prescribed under the InvIT Regulations.

The fund requirements mentioned above and the proposed deployment are based on the estimates of the Investment Manager and have not been appraised by any bank, financial institution or any other external agency. The fund requirements may vary due to factors beyond the Investment Manager’s control, such as market conditions, competitive environment, interest rate and exchange rate fluctuations. Consequently, the fund requirements are subject to revisions, in the future, at the discretion of the Investment Manager.

### Details of Utilisation of the Issue Proceeds

The details of utilisation of the Issue Proceeds are set forth herein below:

#### (i). **Acquisition of non-cumulative redeemable preferences shares issued by SEPL**

SEPL has issued 6% 18,17,000 non-cumulative redeemable preference shares (“**RPS**”) of face value of ₹ 10 each, to India Infrastructure II (“**IIF II**”). In accordance with and subject to the conditions set out in the amended and restated securities subscription and purchase agreement dated January 12, 2022 (“**SEPL SPA**”) entered into, amongst others, between the Sponsor and IIF II, the Sponsor shall assign its rights and obligations under the SEPL SPA (with the exception of certain payment obligations required to be discharged directly by the Sponsor) to the Highways Trust by way of assignment agreement. Upon such assignment, the Highways Trust shall purchase the RPS from IIF II. against payment of ₹ 545.65 million (₹ 545.10 million plus tax collected at source thereon @ 0.1% amounting to ₹ 0.55 million).

Accordingly, the Trust proposes to utilise the Issue Proceeds aggregating up to ₹ 545.10 million plus tax collected at source thereon @ 0.1% amounting to 0.55 million aggregating up to ₹ 545.65 million for acquisition of the RPS from IIF II. Credit of such tax collected at source shall be available to the Trust against its own tax liability. The indicative key terms of the RPS have been summarised below:

- (a) **Aggregate amount:** ₹ 545.10 million;
- (b) **Interest:** 6%
- (c) **Face value:** ₹ 10 or as may be mutually agreed; and
- (d) **Redemption period:** any time on or before September 30, 2022, subject to availability of cash, at the option of SEPL.

#### (ii). **Acquisition of compulsory convertible debentures issued by the Project SPVs**

The Project SPVs have issued certain compulsory convertible debentures (“**CCDs**”) which are currently held by the Sponsor. The Trust proposes to acquire a portion of these compulsory convertible debentures

from the Issue Proceeds, aggregating to ₹ 3,060.00 million, pursuant to the securities purchase agreement executed between the Highways Trust (acting through the Trustee), the Investment Manager, the Sponsor, and the Project SPVs. The indicative key terms of the CCDS have been summarised below:

- (a) **Form:** Dematerialised;
- (b) **Interest:** up to 14% per annum to be paid annually or as may be mutually agreed;
- (c) **Face value:** ₹ 100 or as may be mutually agreed;
- (d) **Security:** Unsecured;
- (e) **Tenure:** 30 years from the date of the issue;
- (f) **Transferability:** Freely transferable;
- (g) **Voting rights:** No voting rights until conversion into equity shares; and
- (h) **Conversion:** As specified in the securities purchase agreement.

For further details in relation to the securities purchase agreement, please see the section entitled “*Related Party Transactions – Securities Purchase Agreement*” on page 258.

(iii). **General purposes**

In terms of the InvIT Regulations, the Investment Manager shall, at its discretion, deploy the balance Issue Proceeds (excluding the Issue Expenses) aggregating up to ₹ 415.85 million towards general expenses for the operation of the Trust, subject to such utilization not exceeding 10% of the Issue Proceeds, in compliance with the InvIT Regulations. The general purposes for which the Trust proposes to utilise Issue Proceeds include meeting exigencies and expenses incurred in the ordinary course of business. In addition, the Trust may utilise the Issue Proceeds towards other expenditure (in the ordinary course of business) considered expedient and as approved by the Investment Manager or the Trustee, as the case may be, subject to compliance with applicable law.

In case of a shortfall in Issue Proceeds, the Investment Manager may, in compliance with the InvIT Regulations, have the flexibility to meet such shortfall including, by utilising the Trust’s internal accruals or availing facilities from lenders. The Investment Manager, in accordance with the Investment Objectives of the Trust, policies of its board of directors and the InvIT Regulations, will have flexibility in utilising any surplus amounts.

**Issue Expenses**

The total expenses of this Issue are estimated to be up to ₹ 138.50 million (“**Issue Expenses**”). The Issue Expenses consist of fee and commissions payable to the Lead Managers, fee payable to legal counsels, fee and commission payable to Escrow Collection Bank, banks, Registrar and other advisors or arrangers and all other incidental and miscellaneous expenses for undertaking the formation transactions and for listing the Units on the Stock Exchange(s). The Issue Expenses shall be borne by the Highways Trust.

For ease of operations, if required, the Issue Expenses as stated above, may be borne by the Investment Manager or HC1. Such expenses may be reimbursed by the Highways Trust to the Investment Manager in the future, as agreed between the Investment Manager and the Highways Trust in terms of the Investment Management Agreement. Further, for all expenses incurred by HC1 on behalf of the Highways Trust, the Investment Manager shall reimburse HC1 in the future, as agreed between such parties in accordance with the Reimbursement Agreement. For further details in relation to the Reimbursement Agreement, please see the section entitled “*Related Party Transactions-Reimbursement Agreement*” on page 258.

## FINANCIAL INDEBTEDNESS

The details of indebtedness of the Highways Trust as at March 31, 2022, together with a brief description of certain material covenants of the relevant financing agreements, are provided below:

*(Amounts in ₹ million)*

Category of borrowing	Amount Outstanding
<b>Highways Trust</b>	
Secured	-
Unsecured	-
<b>Total Borrowings</b>	-
<b>DBCPL</b>	
Secured	2,837.44
Unsecured	-
<b>Total Borrowings</b>	<b>2,837.44</b>
<b>GEPL</b>	
Secured	4,079.03
Unsecured	5,094.14
<b>Total Borrowings</b>	<b>9,173.17</b>
<b>JPEPL</b>	
Secured	2,597.84
Unsecured	2,333.83
<b>Total Borrowings</b>	<b>4,931.67</b>
<b>NBL</b>	
Secured	1,249.10
Unsecured	331.12
<b>Total Borrowings</b>	<b>1,580.22</b>
<b>SEPL</b>	
Secured*	701.70*
Unsecured	-
<b>Total Borrowings</b>	<b>701.70*</b>
<b>UEPL</b>	
Secured	2,835.49
Unsecured	689.67
<b>Total Borrowings</b>	<b>3,525.16</b>
<b>Total</b>	<b>22,749.36</b>

\*Please note that as of June 30, 2022, ₹701.70 million has been pre-paid.

### **Principal terms of the borrowings availed by, the Project SPVs:**

1. **Security:** The borrowings availed by the Project SPVs, are secured by, amongst others, a first ranking *pari passu* charge over:
  - (i). identified immovable assets of the Project SPVs (not including the project assets);
  - (ii). tangible and moveable assets of certain Project SPVs (present and future) except the project assets;
  - (iii). the intangible assets of certain Project SPVs;
  - (iv). pledge of a certain specified percentage of the equity shares of certain Project SPVs;
  - (v). accounts of certain Project SPVs, including escrow accounts and sub-accounts maintained in accordance with the financing arrangements, accounts created for maintaining reserves such as

major maintenance reserves, debt service reserve account and any other bank accounts of the Project SPV and all its receivables; and

- (vi). the assignment of all rights and interests of certain Project SPVs: (A) under the project agreements, (B) in the clearances obtained by the Project SPVs, (C) in any letter of credit, liquidation damages or performance bonds provided by any party to the project agreement, and (D) under the insurance contracts;
2. *Pre-payment:* Most of the loans availed by the SPVs may be prepaid in full or in part without the payment of any prepayment penalty, subject to certain conditions such as (i) the prepayment being affected at the instance of the lenders; (ii) the prepayment being on account of of reset in the 'Spread' on the facility by a lender which increase is not acceptable to the Project SPV, (iii) the prepayment being made within a specified time-period post any spread reset date, after giving a prior written notice to the lenders; and (iv) the prepayment being made from the internal accruals, after giving a prior written notice to the lenders. The Project SPVs may also be required to mandatorily prepay the loans availed by them in full or in part, immediately upon, amongst others, (i) receipt of certain amounts by the Project SPV, as set out in the financing arrangements such as amounts in the nature of termination payments under the project agreements, proceeds resulting from arbitral or judicial awards and any insurance proceeds received, and (ii) the Projects SPV accepting offers for capacity augmentation in accordance with the project agreements.
3. *Restrictive Covenants:* The borrowing arrangements entered into by the Project SPVs contain standard restrictive covenants affecting the Project SPVs, which prevent them from undertaking certain actions, including:
- (i). incurring any indebtedness without prior approval of certain lenders, other than as permitted in accordance with the financing documents;
  - (ii). effecting changes in its control or capital structure without prior approval of certain lenders;
  - (iii). making any 'Restricted Payments' which include amongst other things, payment of dividends, distributions, returns on equity, repayment or redemption for value and payment of interests;
  - (iv). amending its constitutional documents without the prior consent of certain lenders;
  - (v). making any changes to their names and addresses, without the prior consent of certain lenders;
  - (vi). making any capital expenditure or acquire fixed assets on lease without prior consent of certain lenders; and
  - (vii). taking any action towards amalgamation, reconstruction, merger, consolidation or re-organisation without the prior consent of certain lenders.
4. *Events of Default:* Borrowing arrangements entered into by the Project SPVs contain standard events of default affecting the Project SPVs, including, amongst others:
- (i). failure to pay any sum under the financing agreement;
  - (ii). non-compliance with the provisions of the financing agreements or any misrepresentations thereunder;
  - (iii). a default by the Project SPVs under any of their other financing documents;
  - (iv). the security interest provided to the lenders being in jeopardy, in the opinion of the lenders;
  - (v). initiation of insolvency or other analogous proceedings against the Project SPVs;
  - (vi). cessation of business of the Project SPVs; and
  - (vii). failure to maintain the debt service coverage ratio as may be set out in the financing agreements.

5. *Consequences of default:* In terms of the borrowing arrangements entered into by the Project SPVs, the following, amongst others, are the consequences of default:

- (i). cancellation or suspension the available commitments;
- (ii). acceleration of repayment obligations and declaration of amounts outstanding to be forthwith due and payable;
- (iii). enforcement of security interests; and
- (iv). exercise of other remedies as permitted or available under the borrowing arrangements.

This is an indicative list of the terms of the borrowings availed by the Project SPVs and there may be additional terms, conditions and requirements under the various borrowing arrangements entered into by the Project SPVs. Where applicable and in relation to any debentures issued by the Project SPVs, the term 'lenders' may include the relevant debenture trustee and/or the debenture holders.

Given the nature of these borrowings and the terms of prepayment, the aggregate outstanding borrowing amounts may vary from time to time. In addition to the above, the Project SPVs may, from time to time, enter into re-financing arrangements and draw down funds thereunder.

### ***Leverage***

In accordance with and subject to the InvIT Regulations, the provisions of the Trust Deed, and the borrowing policy adopted by the Investment Manager, the aggregate consolidated borrowings and deferred payments of the Trust may be up to 70% of the aggregate of the Trust Assets.

### **Indicative terms of the borrowings that may be availed by the Highways Trust**

The Investment Manager has, pursuant to a resolution passed by its board of directors dated May 26, 2022, is proposing to avail credit facilities aggregating to Rs. 15,000 million by the Trust, subject to receipt of any requisite third party approvals and the finalisation of the terms of the relevant financing documentation. The Highways Trust's total outstanding consolidated net debt after availing of such borrowings and other borrowings as may be approved by the board of directors, will be within the regulatory requirement of 49% of the value of the InvIT Assets as specified under the InvIT Regulations and the Highways Trust will obtain the necessary credit ratings as required in accordance with the InvIT Regulations. The indicative terms of such borrowings may be:

1. *Security:* The borrowings availed by the Highways Trust, is secured by, amongst others, a first ranking *pari passu* charge over:
  - (i). all immovable assets of the Highways Trust (present and future);
  - (ii). all moveable assets of the Highways Trust including accounts, receivables, inventories, contract rights, securities, patents, trademarks, other intellectual property, equipment, real estate and/or leasehold interests, etc. (present and future);
  - (iii). charge over debt service reserve account; and
  - (iv). corporate guarantee of all existing subsidiaries; and
  - (v). the escrow account opened by the Highways Trust.
2. *Pre-payment:* The loans availed by the Highways Trust may be prepaid, in full or in part, with the payment of a prepayment premium of 0.50% of the principal amount of the facility, unless (i) the prepayment is made at the instance of the lenders; or (ii) the prepayment is out of internal cash accruals with a 15 days prior notice. The Highways Trust may also be required to mandatorily prepay the loans availed by them on a pro-rata basis, of amounts received as, (i) any proceeds in connection of a breach of warranty or guarantee under any project documents to the extent not applied, repair or replace the defective component that is subject of such warranty, (ii) surplus cash if external rating falls below AA- by a rating agency; and (iii) cessation of business by any of the material project SPVs.

3. *Restrictive Covenants*: The financing arrangements entered into by the Highways Trust contain standard restrictive covenants, which prevent it from undertaking certain actions, including:
  - (i). diluting the stake of the Highways Trust in the Project SPVs;
  - (ii). any additional indebtedness exceeding permitted indebtedness; and,
  - (iii). change in control of any of the Project SPVs, except as permitted in the sanction letter; and
  - (iv). amending its constitutional documents without the prior consent of certain lenders.
4. *Events of Default*: financing arrangements entered into by the Highways Trust contain standard events of default affecting the Highways Trust, including, amongst others:
  - (i). any payment default including default in principal, interest or any other amounts remaining unpaid beyond due date to any lender;
  - (ii). breach of any terms of the transaction documents by the Highways Trust or the Project SPVs; and
  - (iii). failure to comply with any condition, covenant, or undertaking provided under the transaction documents.
5. *Consequences of default*: In terms of the financing arrangements entered into by the Highways Trust, the following, amongst others, are the consequences of default:
  - (i). declare all amounts payable by the Highways Trust in respect of the facilities to be due and payable immediately;
  - (ii). sue for the creditors' process and/or exercise rights with respect to the security, including enforcement of security, in accordance with the financing documents; and
  - (iii). declare the commitments under the facilities to be cancelled or suspended.

This is an indicative list of the terms of the borrowings that may be availed by the Highways Trust and there may be additional terms, conditions and requirements under the various financing arrangements proposed to be entered into by the Highways Trust.

#### **Status of lender consents**

The Project SPVs have availed debt from certain third-party lenders and consents from the respective lenders are required for and in connection with the Issue. As on the date of this Final Placement Memorandum, the Project SPVs have received consents from the relevant lenders in relation to the Issue. For further details, please see the section entitled "*Risk Factors – The acquisition by the Highways Trust of the Project SPVs from the Sponsor may be subject to certain risks, which may result in damages and losses. We may not be able to recover losses arising from the acquisition of the Project SPVs from the Sponsor or third parties under relevant contractual arrangements*" on page 61.

#### **Borrowing Policy**

The Investment Manager shall ensure that all funds borrowed in relation to the Highways Trust are in compliance with the InvIT Regulations. Accordingly, the Investment Manager has formulated a borrowing policy to outline the process for borrowing monies in relation to the Highways Trust. For further details, please see the section entitled "*Corporate Governance – Investment Manager – Policies adopted in relation to the Highways Trust – Borrowing Policy*" on page 146.

## DISTRIBUTIONS

*Statements contained in this section that are not historical facts are forward-looking statements. Such statements are subject to certain risks and uncertainties that could cause actual results to differ materially from those that may be projected. Under no circumstances should the inclusion of such information herein be regarded as a representation, warranty or prediction with respect to the accuracy of the underlying assumptions by the Highways Trust, the Trustee, the Sponsor, the Investment Manager, the Lead Manager or any other person. Bidders are cautioned not to place undue reliance on these forward-looking statements that are stated only as at the date of this Final Placement Memorandum. For details in relation to such forward-looking statements, please see the section entitled “Forward-Looking Statements” on page 14.*

The net distributable cash flows of the Highways Trust (the “**Distributable Income**”) are based on the cash flows generated from the underlying operations undertaken by the SPVs. For details of the business and operations presently undertaken by the SPVs, please see the section entitled “*Business*” on page 168. Currently, cash flows receivable by the Highways Trust may be in the form of dividend, capital reduction, interest income or principal repayment received from the SPVs in relation to any debt sanctioned by the Highways Trust, or a combination of both.

In terms of the InvIT Regulations, not less than 90% of the net distributable cash flows of the SPVs, shall be distributed to the Highways Trust, subject to applicable provisions in the Companies Act, 2013, as amended and not less than 90% of the net distributable cash flows of the Highways Trust shall be distributed to the Unitholders.

The Highways Trust shall declare and distribute at least 90% of the Distributable Income to the Unitholders. Such distribution shall be declared and made such that the time period between any two declarations of distribution shall not exceed one year. However, if any infrastructure asset is sold by the Highways Trust or the SPVs, or if the equity shares or interest in the SPVs are sold by the Highways Trust and if the Highways Trust proposes to re-invest the sale proceeds into another infrastructure asset within one year, it shall not be required to distribute any sales proceeds to the Highways Trust or to the Unitholders. Further, if the Highways Trust proposes not to invest the sale proceeds into any other infrastructure asset within one year, it shall be required to distribute the same in the manner specified above. In accordance with the InvIT Regulations, distributions by the Highways Trust shall be made no later than 15 days from the date of such declarations. The distribution, when made, shall be made in Indian Rupees. For details on the risks relating to distribution, please see the section entitled “*Risk Factors*” on page 54.

### **Distribution Policy**

#### ***Method of calculation of Distributable Income***

The Distributable Income of the Highways Trust shall be calculated in accordance with the InvIT Regulations. The Highways Trust proposes to calculate Distributable Income in the manner provided below:

- (a) Calculation of the Net Distributable Cash Flows at Project SPV level:

Description
<b>Profit after tax as per profit and loss account (standalone) (A)</b>
Add: Interest (including interest on unpaid interest), if any, on loans availed from / debentures issued to Highways Trust, as per profit and loss account
Add: Depreciation, impairment (in case of impairment reversal, same will be deducted) and amortisation as per profit and loss account.
Add/Less: Any other item of non-cash expense / non-cash income (net of actual cash flows for these items), including but not limited to <ul style="list-style-type: none"> <li>• any decrease/increase in carrying amount of an asset or a liability recognised in profit and loss account on measurement of the asset or the liability at fair value;</li> <li>• interest cost as per effective interest rate method (difference between accrued and actual paid);</li> <li>• deferred tax, lease rents, provisions, etc.</li> <li>• any other items charged / credited to the P&amp;L account which do not involve corresponding cash flows</li> </ul>
Add/Less: Decrease / increase in working capital
Add/Less: Loss / gain on sale of assets / investments
Add: Proceeds from sale of infrastructure assets adjusted for the following: <ul style="list-style-type: none"> <li>• related debts settled or due to be settled from sale proceeds;</li> <li>• directly attributable transaction costs;</li> <li>• directly attributable transaction costs proceeds reinvested or planned to be reinvested as per Regulation 18(7)(a) of the InvIT Regulations</li> </ul>

Add: Net proceeds (after applicable taxes) from sale of assets / investments adjusted for proceeds reinvested or planned to be reinvested.
Add: Any amount received from tolls or annuities not recognised as income for the purposes of working out the profit after tax
Add: Net proceeds (after applicable taxes) from sale of assets / investments not distributed pursuant to an earlier plan to reinvest, if such proceeds are not intended to be invested subsequently.
Add: amount released from DSRA/MMRA or any other reserve in lieu of providing bank guarantee.
Add: amount received from settlement of claim from NHAI or from any engineering, procurement and construction contractors to the extent not already considered in profit after tax
Add: Amount invested by the Trust in the Project Entity for service of debt or interest, through internal accruals to the extent allowed under the SEBI InvIT Regulations.
Add: Proceeds from loan raised from third parties
Add: Proceeds from loan raised from related party (other than Trust)
Less: Capital expenditure, if any
Less: Investments made in accordance with the investment objective, if any
Less: Repayments of loan raised from related parties (Other than Trust)
Less: Repayment of third-party debt (principal) / redeemable preference shares / debentures, etc., net of any debt raised by refinancing of existing debt
Less: Net cash set aside to comply with borrowing requirements such as DSRA, minimum cash balance, etc.
Add: Proceeds from additional borrowings (including debentures / other securities), fresh issuance of equity shares / preference shares, etc.
Less: Payment of any other liabilities (not covered under working capital)
Less: Any provision or reserve deemed necessary by the Investment Manager for expenses / liabilities which may be due in future
Add / Less: Amounts added or retained in accordance with the transaction documents or the loan agreements in relation to the Project SPV
Add / Less: Any other adjustment to be undertaken by the board of directors of the Investment Manager (the “ <b>IM Board</b> ”) to ensure that there is no double counting of the same item for the above calculations
Add / Less: Any other adjustment to be undertaken by the board of directors of the Investment Manager as deemed necessary
Add: Such portion of the existing cash balance available, if any, as deemed necessary by the Investment Manager in line with the SEBI InvIT Regulations
<b>Total Adjustments (B)</b>
<b>Net Distributable Cash Flows (C)=(A+B)</b>

(b) Calculation of the Distributable Income at the Highways Trust level:

Description
<b>Net Distributable cash flows from project entities as follows:</b>
a) in the form of interest / accrued interest / additional interest
b) in the form of dividend
c) in the form of proceeds towards repayment of the debt issued to the Project SPVs by the Trust
d) in the form of proceeds through capital reduction by way of a buy back or any other means as permitted, subject to applicable law
Add: Cash flows from sale of equity shares or any other investments in the Project SPV adjusted for amounts reinvested or planned to be reinvested
Add: Cash flows from the sale of the Project SPVs not distributed pursuant to an earlier plan to reinvest, or if such proceeds are not intended to be invested subsequently
Add: Cash flows from additional borrowings (including debentures / other securities), fresh issuance of units, etc.
Add: Any other income accruing at the Highways Trust and not captured above, as deemed necessary by the Investment Manager, including but not limited to interest / return on surplus cash invested by the Highways Trust
<b>Total cash inflow at the InvIT level (A)</b>
Less: Any payment of fees, interest and expenses incurred at the Trust, including but not limited to the fees of the Investment Manager, Project Manager, Trustee, Auditor, Valuer, Credit Rating Agency, etc.
Less: Any expenditure reimbursed to Investment Manager which the Investment Manager incurred on behalf of Trust
Less: Income tax (if applicable) for standalone Highways Trust and / or payment of other statutory dues
Less: Repayment of third-party debt (principal) / redeemable preference shares / debentures, etc., net of any debt raised by refinancing of existing debt
Less: Net cash set aside to comply with borrowing requirements such as DSRA, minimum cash balance, etc.
Less: Amount invested in any of the Project SPVs for service of debt or interest
Less: Proceeds reinvested or planned to be reinvested in accordance with Regulation 18(7)(a) of the InvIT Regulations

Less: Amounts set aside to be invested or planned to be invested, as deemed necessary by the Investment Manager in compliance with the SEBI InvIT Regulations
Less: Investments including acquisition of other Project SPVs
Less: Capital expenditure if any
Less: Costs/retention associated with sale of the Project Entity, being: (a) related debts settled or due to be settled from sale proceeds of SPV; (b) transaction costs paid on sale of the Project Entity; and (c) capital gains taxes on sale of the Project Entity, or other investments of the Trust.
Less: Any provision or reserve deemed necessary by the Investment Manager for expenses / liabilities which may be due in future
Less: Reserve for debentures / loans / capex expenditure in the intervening period till next proposed distribution if deemed necessary by the Investment Manager invested in permitted investments
Add / Less: Amounts added or retained in accordance with the transaction documents or the loan agreements in relation to the Highways Trust
Less: Any other expense of the InvIT not captured herein as deemed necessary by the Investment Manager
Add / Less: Any other adjustment to be undertaken by the board of directors of the Investment Manager to ensure that there is no double counting of the same item for the above calculations
Add / Less: Any other adjustment to be undertaken by the board of directors of the Investment Manager as deemed necessary.
<b>Total cash outflow/retention at the Highways Trust level (B)</b>
<b>Net Distributable Cash Flows (C) = (A+B)</b>

In terms of the InvIT Regulations, if the distribution is not made within 15 (fifteen) days from the date of declaration of the Distributable Income, the Investment Manager shall be liable to pay interest to the Unitholders at the rate of 15% (fifteen per cent) per annum till the distribution is made. Such interest shall not be recovered in the Management Fees of the Investment Manager or in the form of fee or any other form payable to the Investment Manager by the Highways Trust.

## **DISCUSSION AND ANALYSIS BY THE DIRECTORS OF THE INVESTMENT MANAGER OF THE FINANCIAL CONDITION, RESULTS OF OPERATIONS AND CASH FLOWS OF THE PROJECT SPVS OF THE HIGHWAYS TRUST**

*You should read the following discussion and analysis of our financial condition, results of operations and cash flows in conjunction with the sections entitled “Summary Combined Financial Information of the Highways Trust” and “Special Purpose Combined Financial Statements” on pages 25 and 310, respectively. This discussion contains forward-looking statements and involves numerous risks and uncertainties, including, but not limited to, those described in the section entitled “Risk Factors” on page 54. Actual results could differ materially from those contained in any forward-looking statements and for further details regarding forward-looking statements, kindly refer to the section entitled “Forward-Looking Statements” on page 14.*

*The Special Purpose Combined Financial Statements are prepared in accordance with Ind AS, which differs in certain respects from Indian GAAP, International Financial Reporting Standards and U.S. GAAP. Our fiscal year ends on March 31 of each year, and references to a particular fiscal are to the twelve-month period ended March 31 of that year. For the sole purposes of the Special Purpose Combined Financial Statements, references to “we”, “us” and “our” is to the Initial Portfolio Assets on a combined basis.*

### **Overview**

Highway Infrastructure Trust (the “**Highways Trust**”) is an Indian infrastructure investment trust which proposes to invest in road infrastructure assets and is sponsored by Galaxy Investments II Pte. Ltd. (the “**Sponsor**”). Highways Trust will have an initial portfolio consisting of the six Project SPVs having an aggregate of 451.98 kms (1,710 lane kms), located across six states in India

The Sponsor is affiliated with funds, vehicles and/or entities managed and/or advised by affiliates of KKR. As on date, the Sponsor is a 100% subsidiary of Galaxy Investments Pte. Ltd., which is majority owned and controlled by KKR Asia Pacific Infrastructure Holdings Pte. Ltd.

Founded in 1976, KKR is a leading global investment firm that offers alternative asset management and capital markets and insurance solutions with US\$ 491 billion of assets under management as of June 30, 2022. KKR sponsors investment funds that invest in private equity, credit and real assets and has strategic partners that manage hedge funds. KKR’s insurance subsidiaries offer retirement, life and reinsurance products under the management of Global Atlantic Financial Group. KKR aims to generate attractive investment returns by following a patient and disciplined investment approach, employing world-class people, and supporting growth in its portfolio companies and communities.

In 2008, KKR established a dedicated infrastructure team and strategy focused on global investment opportunities. KKR has been one of the more active infrastructure investors globally over the past several years, having made approximately 65 infrastructure investments globally and more than US\$40 billion in assets under management within infrastructure.

Currently, KKR’s Infrastructure platform has expanded to include approximately 75 dedicated investment professionals across 10 offices covering a broad spectrum of investment opportunities in various infrastructure subsectors, including: midstream energy, renewables, power & utilities, water and wastewater, waste, telecommunications and transportation, among others. KKR continually monitors infrastructure sectors and infrastructure-related investments for emerging trends, and may identify and prioritize investments in other sectors as conditions change or cycles evolve. Among KKR’s focus areas are investments in assets related to the global roads sector. KKR has invested or committed over US\$6.7 billion of equity in private equity and infrastructure deals in India since 2010 with over 20 investments made and more than a dozen active portfolio companies today. For further details in relation to the Sponsor, please see the section entitled “*Parties to the Highways Trust*” on page 101.

### *Our Projects*

Our initial portfolio of assets includes the following six Projects, comprise both, National Highways and State Highways, and are located in the states of Telangana, Gujarat, Madhya Pradesh, Meghalaya, Rajasthan and Tamil Nadu to be acquired by way of 100% shareholding in six Project SPVs:

- the DBCPL Project, a four lane highway with an aggregate length of 140.79 kilometres, between Bhopal

to Dewas on State Highway 18\* in Madhya Pradesh, operated by DBCPL;

- the GEPL Project, a four lane highway with an aggregate length of 87.10 kilometres, on the Godhra and the border between Madhya Pradesh and Gujarat on National Highway 59\* in Gujarat, operated by GEPL;
- the JPEPL Project, a four lane highway with an aggregate length of 71.54 kilometres, between the Jodhpur and Pali section on National Highway 65\* in Rajasthan, operated by JPEPL;
- the NBL Project, a four lane highway with an aggregate length of 30.89 kilometres, between the Kadtal and Armur section on National Highway 7\* in Telangana, operated by NBL;
- the SEPL Project, a two lane highway with an aggregate length of 48.77 kilometres, comprising the Shillong bypass connecting National Highway 40\* with National Highway 44\* in Meghalaya, operated by SEPL; and
- the UEPL Project, a four lane highway with an aggregate length of 72.90 kilometres, between the Tindivanam and Ulundurpet section on National Highway 45\* in Tamil Nadu, operated by UEPL;

*\*Note: The State Highway and National Highway numbers and chainages mentioned in this Final Placement Memorandum are old Highway numbers and chainages, as per the concession agreements. The actual SH/NH numbers and chainages at site may differ based on subsequent changes.*

Through these six SPVs, we will maintain and operate road assets aggregating to 451.98 kms (1,710 lane kms).

The combined operating revenue of the Project SPVs for Fiscals 2022, 2021 and 2020 was ₹ 5,866.56 million, ₹ 5,085.04 million, and ₹ 5,008.80 respectively.

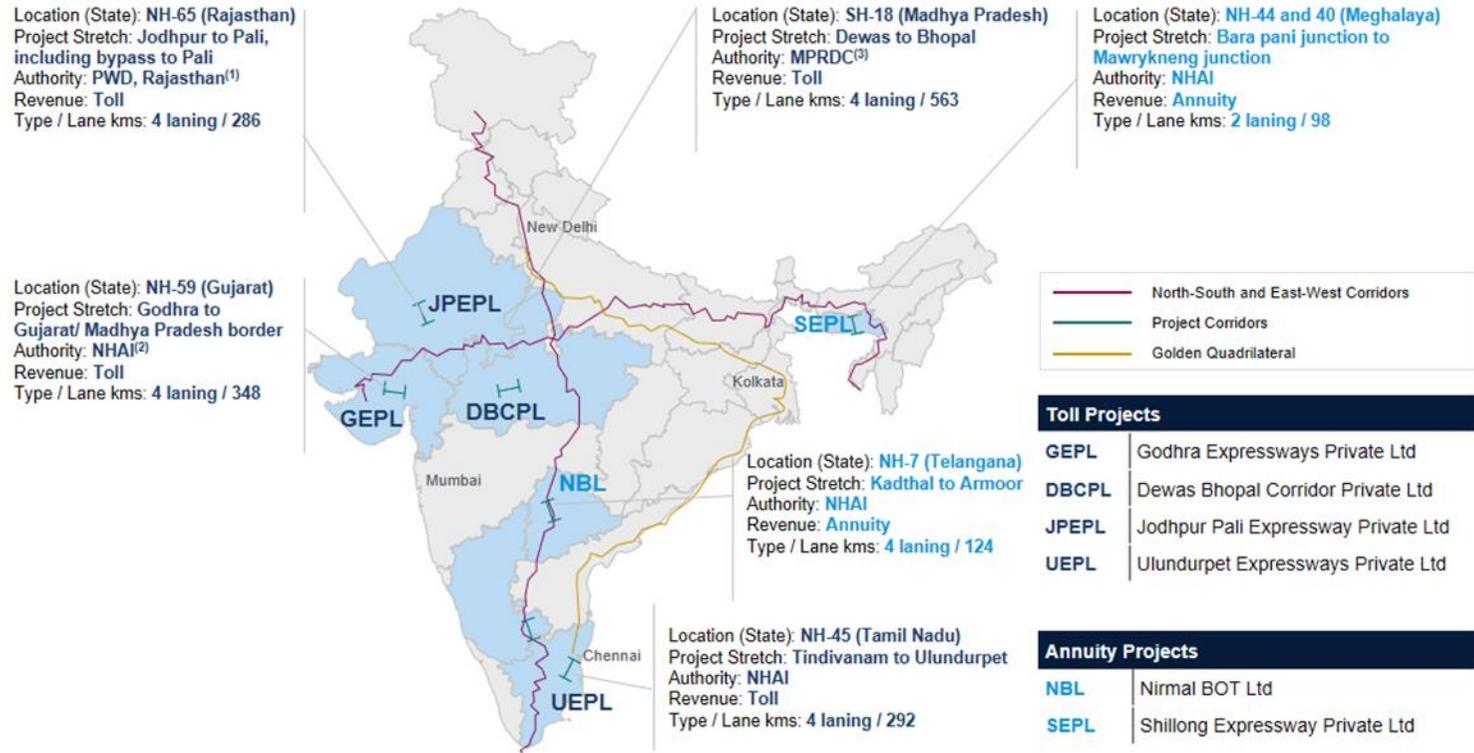
The Projects are divided into two types on the basis of the implementation mode: (i) toll and (iii) annuity. Key details of these models are set out below:

**Annuity-based Projects:** Under this model, the concessionaire is responsible for the construction and maintenance of the project during the concession period. The concessionaire generates revenue through fixed annuity payments received from the concessioning authority, over the concession period. Since this annuity payment is a cost to the concessioning authority, the contract is awarded to the lowest bidder.

**Toll-based Projects:** Under this model too, the concessionaire is responsible for the construction, operation and maintenance of the project during the concession period, post which the project is transferred to the concessioning authority. During the concession period, the concessionaire realises its returns by way of toll collection rights under the concession agreement. Therefore, the concessionaire bears the revenue risk during the concession period. The toll charged under these contracts is generally regulated by a policy or a public agency.

For further details, please see the section entitled “*Industry Overview*” on page 150.

The map below illustrates the locations of the Projects:



1. Public Works Department, Rajasthan; 2. National Highways Authority of India; 3. Madhya Pradesh Road Development Corporation Limited.

\*Map not drawn to scale

The Investment Manager will also have the flexibility to acquire new projects through acquisitions from the Sponsor and third parties.

Virescent Infrastructure Investment Manager Private Limited is the Investment Manager for the Highways Trust. The Investment Manager is a private limited company incorporated on August 22, 2020 under the Companies Act, 2013, having CIN U74999MH2020PTC344288.

Virescent Renewable Energy Project Manager Private Limited, is the Project Manager and is a private limited company incorporated on November 27, 2020 under the Companies Act, 2013, having U74999MH2020PTC350874.

Axis Trustee Services Limited is the Trustee of the Highways Trust. The Trustee is a registered intermediary with SEBI under the Securities and Exchange Board of India (Debenture Trustees) Regulations, 1993, as a debenture trustee.

For further details of the Sponsor, the Investment Manager, the Project Manager and the Trustee, please see the section entitled “*Parties to the Highways Trust*” on page 101.

### **Factors Affecting Results of Operations**

The Project SPVs’ business, prospects, results of operations and financial condition are affected by a number of factors, including the following key factors:

#### ***Lower than expected returns on our investment in our Projects***

In our annuity based projects, our revenue depends on the fixed amounts paid to us semi-annually by our government clients. The amount of annuity is not necessarily linked to investment and will only be calculated pursuant to the relevant concession agreements. In our toll-based projects or projects with a toll component, our toll revenue depends on the tolling rates set by the relevant concessioning authority in accordance with the relevant concession agreements and the actual traffic volume using our roads. Our decision to undertake BOT or DBFOT road projects is largely based on our estimate of our expected toll revenue, which in turn is partly based on our estimate of the traffic volume using our roads.

Traffic volume may be affected by a number of factors beyond our control, including general economic conditions, alternate routes, alternate means of transportation, location of toll plazas, weather conditions, demographic changes, fuel prices, reduction in commercial or industrial activities in the regions served by the roads and natural disasters. Thus the actual traffic volume may be lower than our estimate. Any decrease in traffic volume, could result in a significant loss of our toll revenue. In addition, our concession agreements typically limit and regulate increases in tolling rates. In accordance with the Concession Agreements, the NHAI or other applicable authority sets the applicable tolling rates which is revised by such authority and we may not be able to increase tolling rates to cover increases in our operational costs.

Further, there are no provisions in our concession agreements protecting us against increases in interest rates or cost of raw materials. Our lenders may have the right to periodically adjust our interest rates and our applicable interest rates may increase based on their review of our credit profile and perceived risks in our operations. Our operational costs may also increase substantially during the operation of our BOT or DBFOT projects due to shortage of raw materials or substantial increases in prices of raw materials required for operation and maintenance beyond the permitted scope of adjustment due to occurrence of certain events under the relevant provisions of the concession agreements. Many factors causing such adverse changes are beyond our control and we are usually not able to demand matching increases in our tolling rates over and above certain fixed increases, in accordance with the concession agreements.

Under the relevant concession agreements, our Project SPVs have rights to construct and operate the road projects exclusively for fixed periods of time and we receive annuities and/or collect tolls, as the case may be, for the use of our roads. However, we may be faced with competition from new roads developed by NHAI and/or State Governments, which are not within our control. For example, MPRDC has the right to construct competing roads after a prescribed period of time, pursuant to the terms of the concession agreements. State Governments may not always charge for the use of these roads. There can be no assurance that our road projects will compete effectively against such roads that connect the same locations. Any material decrease in the actual

traffic volume as compared to our forecasted traffic volume could have a material adverse effect on our cash flows from our tolling projects.

As our Projects often require significant capital investment with potential returns spread over a long period of time, inadequate toll revenues and annuities collected from our projects may result in a low return or even loss on our investment.

***Operating expenses are dependent on the routine and periodic major maintenance obligations contained in the concession agreements and are subject to fluctuations.***

The concession agreements provide that the Project SPVs are required to operate and maintain the Projects in accordance with the respective concession agreements. Accordingly, the Project SPVs prepare a maintenance manual and a maintenance program in consultation with an independent engineer appointed by the NHAI/State Authorities for each Project, and are required to abide by the same. The Project SPVs' maintenance obligations are primarily to operate and maintain the Projects in order to permit the safe, smooth and uninterrupted flow of traffic and the related work and maintenance that they are required to undertake in order to fulfil such obligations. Such maintenance obligations include the repair of wear and tear of roads including overlaying the surface of the roads, among other things. Please see the section entitled "Summary of the Concession Agreements" on page 189 for details on the Project SPVs' O&M obligations.

Routine and periodic major maintenance costs mainly comprise costs of raw materials and other items including fuel, equipment costs and labour expenses, besides maintenance and replacement of hardware, software and equipment. The prices and supply of raw materials depend upon factors that are beyond our control, including, but not limited to, general economic conditions, transportation costs, global and domestic market prices, competition, production levels and import duties, which could be cyclical in nature. Unanticipated increases in the price of materials, fuel costs, labour or other inputs will affect the results of operations of the Project SPVs, especially if the wear and tear on the relevant Project requires major work. The Project SPVs' ability to absorb increases in the purchase price of materials, fuel and other inputs is limited.

Further, our operational costs may also increase substantially if the relevant O&M Contractors fail to perform its duties as per the O&M Agreements.

***Inflation/deflation and interest rate risks.***

There are no specific provisions in our concession agreements protecting us against increases in interest rates or cost of raw materials. Our lenders may have the right to periodically adjust our interest rates and our applicable interest rates may increase based on their review of our credit profile and perceived risks in our operations. Many factors causing such adverse changes are beyond our control and we are usually not able to demand matching increases in our tolling rates or annuities. While our tolling rates may increase with an increase in WPI, any increase may not be adequate to offset the negative impact of increases in interest rates or O&M costs. Further, our tolling rates may decrease with a decrease in WPI and accordingly, the business, financial condition and results of operations of the Highways Trust may be adversely affected.

***The road sector in India***

We derive and expect to continue to derive in the foreseeable future, most of our revenues and operating profits from India. Changes in macroeconomic conditions generally impact the road industry and could negatively impact our business. Accordingly, our business is highly dependent on the state of development of the Indian economy and the macroeconomic environment prevailing in India. Since the use of our Projects, our expansion plans and future projects depend or will depend on macroeconomic factors that may negatively impact demand the development of road infrastructure projects in India, or the timely commencement of their operations could in turn have a material adverse effect on our growth prospects, business and cash flows. In addition, access to financing may be more expensive or not available on commercially acceptable terms during economic downturns.

***General economic conditions in India***

Our performance and the growth are dependent on the performance of the Indian economy, which, in turn, depends on various factors. The Indian economy has been affected by the recent global economic uncertainties, volatility in interest rates, currency exchange rates, commodity and electricity prices, adverse conditions affecting

agriculture and various other macroeconomic factors.

Conditions outside India, such as a slowdown or recession in the economic growth of other major countries and regions, especially in U.S., Europe and China, have an impact on the growth of the Indian economy, and GoI policy may change in response to such conditions. While recent Indian governments have been focused on encouraging private participation in the industrial sector, any adverse change in policy could result in a further slowdown of the Indian economy. The rate of economic liberalisation could decrease, and specific laws and policies affecting foreign investment, currency exchange rates and other matters affecting investment in India could change as well. In the road sector, there can be no assurance that the GoI's engagement with and outreach to private sector operators, including the Highways Trust, will continue in the future. A significant change in India's economic liberalisation and deregulation policies, in particular, those relating to the road sector, could disrupt business and economic conditions in India generally and our business in particular. In addition, adverse developments in the Indian economy could also impact companies and banks that provide services to us. For example, on March 5, 2020 and November 17, 2020, respectively, the GoI, in consultation with RBI placed Yes Bank Limited and Lakshmi Vilas Bank under moratorium, imposed limitations on their operations as well as on withdrawals by depositors and payments to creditors over certain specified amounts for a limited period of time from the date of such moratorium coming into effect. The limitations on operations and the moratorium were subsequently lifted in both cases. The occurrence of any such development in the future may impact our banking channels, and we may or may not be able to recover our deposits, in part or in full. This could result in potential write-offs on our books of accounts.

Additionally, an increase in trade deficit or a decline in India's foreign exchange reserves could negatively impact interest rates and liquidity, which could adversely impact the Indian economy and our business. Any downturn in the macroeconomic environment in India could materially and adversely affect our business.

#### ***Dependence on support from governmental entities***

The operations of the Projects and any future projects that the Highways Trust may acquire, are and will be significantly dependent on various central and state government entities, in terms of policies, incentives, budgetary allocations and other resources provided by these entities for the surface transportation industry, as well as the terms of the contractual arrangements, concessions and other incentives available from these government entities for the projects. Sustained increases in budgetary allocations by the GoI and various state governments for investments in the infrastructure sector, the development of structured and comprehensive infrastructure policies that encourage greater private sector participation and increased funding by international and multilateral development financial institutions in infrastructure projects in India have resulted in, and are expected to continue to result in, an increase in the amount of transportation infrastructure projects undertaken in India. Any adverse change in the focus or policy framework regarding infrastructure development or the surface transportation industry, or change in the Highways Trust's relationships with the GoI or various government entities in India, could adversely affect the Projects, the opportunities for the Highways Trust to secure new projects and the business, financial condition and results of operations of the Highways Trust.

#### ***Tax benefits for road infrastructure sector in India***

The Project SPVs are entitled for certain benefits under Section 80-IA of the Income Tax Act, 1961, as amended, if certain conditions are satisfied. However, the benefits to the Project SPVs may expire at various points of time. Any expiry, termination or Government of India withdrawal of these tax benefits could result in an increase in the Trust's tax expenses, thereby adversely affecting the Highways Trust's, or the Project SPVs' results of operations and cash flows.

#### ***Competition***

The Highways Trust faces competition from other road operators, financial investors and other InvITs in acquiring profitable concessions for future projects. The competition for road projects varies depending on the size, nature and complexity of the project and on the geographical region in which the project is to be executed. Some competitors may have greater financial resources, economies of scale and operating efficiencies than the Highways Trust.

## **Basis of Preparation and Presentation of Audited Special Purpose Combined Financial Statements**

The Special Purpose Combined Financial Statements of the Project SPV Group comprise the Combined Balance Sheets as on March 31, 2022, March 31, 2021 and March 31, 2020, Combined Statements of Profit and Loss, Combined Cash Flow Statements, Combined Statements of Changes in Equity for the financial years ended March 31, 2022, March 31, 2021 and March 31, 2020 and Combined Statement of Net Assets at Fair Value as at March 31, 2022 and the Combined Statement of Total Returns at Fair Value for the for the financial year ended March 31, 2022 and a Summary of Significant Accounting Policies and Other Explanatory Information .

The Special Purpose Combined Financial Statements were authorized for issue in accordance with resolutions passed by the Board of Directors of the Investment Manager on July 8, 2022.

The Special Purpose Combined Financial Statements have been prepared in accordance with Indian Accounting Standards as defined in Rule 2(1)(a) of the Companies (Indian Accounting Standards) Rules, 2015 prescribed under Section 133 of the Companies Act, 2013 ("Ind AS") read with SEBI (Infrastructure Investment Trusts) Regulations, 2014 and the circulars issued thereunder ("InvIT Regulations") and the Guidance Note on Combined and Carve-Out Financial Statements issued by the Institute of Chartered Accountants of India ("Guidance Note").

The Special Purpose Combined Financial Statements are special purpose financial statements and have been prepared by the Investment Manager to meet the requirements of InvIT Regulations and for inclusion in the preliminary placement memorandum, placement memorandum and final placement memorandum (collectively, 'the placement documents') prepared by the Investment Manager in connection with the proposed private placement of units of the Highways Infrastructure Trust (hereinafter referred to as the "Trust"). As a result, the Special Purpose Combined Financial Statements may not be suitable for another purpose. Further, the Special Purpose Combined Financial Statements are not fully prepared in accordance with the requirements of Schedule III notified under the Companies Act, 2013.

In accordance with the requirements of the InvIT Regulations, since the Trust is set up on December 3, 2021 and has been in existence for a period lesser than three completed financial years and the historical financial statements of Trust are not available for the entire portion of the reporting period of three years, the Special Purpose Combined Financial Statements have been disclosed for the periods when such historical financial statements were not available. Further, as required by the InvIT regulations, the Special Purpose Combined Financial Statements are prepared, based on an assumption that all Project SPV were part of Trust for such period when Trust was not in existence. However, the Special Purpose Combined Financial Statements may not be representative of the position which may prevail after the Project SPV Group is transferred to Trust.

The Special Purpose Combined Financial Statements are presented in India Rupees which is also the functional currency of the Project SPV Group. All values are rounded to the nearest millions, unless otherwise indicated. Certain amounts that are required to be disclosed and do not appear due to rounding-off are expressed as 0.00.

These Special Purpose Combined Financial Statements correspond to the classification provisions contained in Ind AS 1 'Presentation of Financial Statements'. For clarity purposes, various items are aggregated in the Combined Statement of Profit and Loss and Combined Balance Sheet. These items are disaggregated separately in the notes to the Special Purpose Combined Financial Statements, where applicable or required.

These Special Purpose Combined Financial Statements have been prepared on a historical cost convention and on an accrual basis except for certain financial assets and liabilities measured at fair value (refer accounting policy regarding financial instruments).

### **a) *Basis of Combination***

The Special Purpose Combined Financial Statements have been prepared using uniform accounting policies for like transactions and other events in similar circumstances. The financial statements of all the Project SPVs used for the purpose of combination are drawn up to the same reporting date i.e. financial years ended on March 31, 2022, March 31, 2021 and March 31, 2020. The financial statements of the Project SPVs have been prepared in accordance with the accounting standards notified under the Section 133 of the Companies Act, 2013 (the Act), Companies (Indian Accounting Standards) Rules, 2015 and other relevant provisions of the Act.

The procedure for preparing Special Purpose Combined Financial Statements of the Project SPV Group are stated

below –

- Combine like items of assets, liabilities, equity, income, expenses and cash flows of the Project SPVs; and
- Eliminate, if any, in full intragroup assets and liabilities, equity, income, expenses and cash flows (as applicable) relating to transactions between entities of the Project SPV Group (profits or losses resulting from intragroup transactions that are recognized in assets are eliminated in full). Ind AS 12 Income Taxes applies to temporary differences that arise from the elimination of profits and losses resulting from intragroup transactions.

**b) Date of commencement of commercial operations**

The details of incorporation and commencement of operations of UEPL, SEPL, JEPL, GEPL, DBCPL and NBL are as given below:

<b>Name of the entity</b>	<b>Date of incorporation</b>	<b>Commencement of operation</b>
Ulundurpet Expressways Private Limited	March 20, 2006	July 23, 2009
Shillong Expressway Private Limited	June 9, 2010	February 28, 2013
Jodhpur Pali Expressway Private Limited	January 10, 2013	October 31, 2014
Godhra Expressways Private Limited	January 21, 2010	October 31, 2013
Dewas Bhopal Corridor Private Limited	May 14, 2007	February 10, 2009
Nirmal BOT Limited	September 19, 2006	July 22, 2009

**c) Use of estimates and judgements**

The preparation of Special Purpose Combined Financial Statements requires management to make certain estimates and assumptions that affect the amounts reported in the Special Purpose Combined Financial Statements and notes thereto. The management believes that these estimates and assumptions are reasonable and prudent. However, actual results could differ from these estimates. Any revision to accounting estimates is recognized prospectively in the current and future period. An overview of the areas that involve a higher degree of judgement or complexity, and of items which are more likely to be materially adjusted due to estimates and assumptions turning out to be different than those originally assessed have been disclosed below. Detailed information about each of these estimates and judgments is included in the relevant notes together with information about the basis of calculation for each affected line item in the Special Purpose Combined Financial Statements.

Estimate and judgements are continually evaluated and are based on historical experience and other factors, including expectations of future events that may have a financial impact on the entity and that are believed to be reasonable under circumstances.

The Project SPV Group makes estimates and assumptions concerning the future. The resulting accounting estimates will, by definition, seldom be equal to the related actual results. The estimates and assumptions that have significant risk of causing a material adjustment to the carrying amount of assets and liabilities are disclosed below:

*i. Revenue Recognition - Applicability of service concession agreement accounting*

Appendix C of Ind AS 115 “Service concession arrangements” applies to “public to private” service concession arrangements, which can be defined as contracts under which the grantor transfers to a concession holder the right to deliver public services that give access to main public facilities for a

specified period of time in return of managing the infrastructure used to deliver those public services.

More specifically, it applies to public to private service concession arrangement if the grantor:

- Controls or regulates what services the operators must provide with the infrastructure, to whom it must provide them, and at what price; and
- Controls through ownership or otherwise –any significant residual interest in the infrastructure at the end of the term of the arrangement.

The Project SPV – Shillong Expressway Private Limited (“SEPL”) and Nirmal Bot Limited (“NBL”) have the right to receive fixed annuity payments from NHAI during the concession period and have adopted ‘Financial Asset Model’.

Accounting under “Financial Asset Model” involves extensive use of estimates. The management of Project SPV has allocated the contract revenues into distinct individual performance obligations i.e. Construction, operation and maintenance based on their relative stand-alone selling prices, which are derived in line with the amounts estimated by the Management of Project SPV basis the actual/estimated cost to be incurred. Accordingly, annuity payment receivable has been classified as a “Financial asset” at the inception of concession period at fair value. The future annuity payments have been bifurcated towards construction services and unearned finance income based on the effective interest rate model.

*ii. Provisions and liabilities*

Provisions and liabilities are recognized in the period when it becomes probable that there will be a future outflow of funds resulting from past operations or events and the amount of cash outflow can be reliably estimated. The timing of recognition and quantification of the liability requires the application of judgement to existing facts and circumstances, which can be subject to change.

*iii. Provision for major maintenance obligation*

The operating and maintenance cost includes routine, periodic/major maintenance, manpower costs and operational expenses, including, but not limited to, road and site work expenses, employee benefit expenses and other operating and maintenance costs. The provision for potential periodic / major maintenance cost is created based on the estimates provided by the management and the same is adjusted for actual expenditures in the year of occurrence.

*iv. Fair valuation of interest free loans taken/given at inception*

Interest free loan taken/given from related parties have been valued at fair value on inception at the applicable market rate of interest. The same is subsequently measured at amortized cost. The identification of applicable market rate of interest requires the application of judgement.

*v. Fair value measurements*

Management applies valuation techniques to determine the fair value of financial instruments (where active market quotes are not available). This involves developing estimates and assumptions consistent with how market participants would price the instrument. The Project SPV Group engages third party valuers, where required, to perform the valuation. Information about the valuation techniques and inputs used in determining the fair value of assets are disclosed in the notes to Special Purpose Combined Financial Statements.

*vi. Impairment of annuity and intangible assets*

Impairment exists when the carrying value of an asset exceeds its recoverable amount, which is the higher of its fair value less costs of disposal and its value in use. The recoverable amounts for the annuity and intangible assets are based on value in use of the underlying projects. The value in use calculation is based on a DCF model. The cash flows are derived from forecasts over the life of the projects of Project SPV.

*vii. Useful lives of depreciable/amortisable assets*

Management of each Project SPV reviews its estimate of the useful lives of depreciable/amortisable assets at each reporting date, based on the expected utility of the assets. Uncertainties in these estimates relate to technical and economic obsolescence that may change the utility of certain software, IT equipment and other plant and equipment.

*viii. Defined benefit obligations (DBO)*

Management of Project SPV's estimate of the DBO is based on a number of critical underlying assumptions such as standard rates of inflation, mortality, discount rate and anticipation of future salary increases. Variation in these assumptions may significantly impact the DBO amount and the annual defined benefit expenses.

*ix. Evaluation of indicators for impairment of assets*

The evaluation of applicability of indicators of impairment of assets requires assessment of several external and internal factors which could result in deterioration of recoverable amount of the assets.

*x. Recognition of deferred tax assets*

The extent to which deferred tax assets can be recognized is based on an assessment of the probability of the future taxable income against which the deferred tax assets can be utilized.

*xi. Recoverability of advances / receivables*

At each balance sheet date, based on historical default rates observed over expected life, the management of each Project SPV assesses the expected credit losses on outstanding receivables and advances.

*xii. Contingent liabilities*

The Project SPV Group is subject to legal proceedings and tax issues covering a range of matters, which are pending in various jurisdictions. Due to the uncertainty inherent in such matters, it is difficult to predict the final outcome of such matters. The cases and claims against the Project SPV Group often raise difficult and complex factual and legal issues, which are subject to many uncertainties, including but not limited to the facts and circumstances of each particular case and claim, the jurisdiction and the differences in applicable law. In the normal course of business management of each Project SPV consults with legal counsel and certain other experts on matters related to litigation and taxes. The Project SPV Group accrues a liability when it is determined that an adverse outcome is probable and the amount of the loss can be reasonably estimated.

*xiii. Income taxes*

Significant judgements are involved in estimating budgeted profits for the purpose of paying advance tax, determining the provision for income taxes, including amount expected to be paid / recovered for uncertain tax positions. The extent to which deferred tax assets/minimum alternate tax credit can be recognized is based on management's assessment of the probability of the future taxable income against which the deferred tax assets/minimum alternate tax credit can be utilized.

## **Summary of Significant Accounting Policies**

The following is the summary of significant accounting policies applied by the Project SPVs in preparing its Special Purpose Combined Financial Statements:

**a) *Basis of classification as current and non-current***

The Project SPV Group presents assets and liabilities in the combined balance sheet based on current/non-current classification.

An asset is current when it is:

- Expected to be realized or intended to be sold or consumed in the normal operating cycle
- Held primarily for the purpose of trading
- Expected to be realized within twelve months after the reporting period or
- Cash or cash equivalent unless restricted from being exchanged or used to settle a liability for at least twelve months after the reporting period.

All other assets have been classified as non-current.

A liability is current when:

- It is expected to be settled in the normal operating cycle
- It is held primarily for the purpose of trading
- It is due to be settled within twelve months after the reporting period or
- There is no unconditional right to defer the settlement of the liability for at least twelve months after the reporting period.

The Project SPV Group classifies all other liabilities as non-current.

Deferred tax assets and liabilities are classified as non-current assets and liabilities.

Operating cycle of the Project SPV Group is the time between the acquisition of assets for processing and their realization in cash or cash equivalents. As the Project SPV Group's normal operating cycle is not clearly identifiable, it is assumed to be twelve months.

#### **b) Fair value measurement**

The Project SPV Group measures financial instruments at fair value at each balance sheet date.

Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. The fair value measurement is based on the presumption that the transaction to sell the asset or transfer the liability takes place either:

- In the principal market for the asset or liability, or
- In the absence of a principal market, in the most advantageous market for the asset or liability.

The principal or the most advantageous market must be accessible by the Project SPV Group.

The fair value of an asset or a liability is measured using the assumptions that market participants would use when pricing the asset or liability, assuming that market participants act in their economic best interest. Please refer to Note 37 of the Special Purpose Combined Financial Statements for fair value hierarchy.

All assets and liabilities for which fair value is measured or disclosed in the Special Purpose Combined Financial Statements are categorized within the fair value hierarchy, described as follows, based on the lowest level input that is significant to the fair value measurement as a whole:

Level 1 — Quoted (unadjusted) market prices in active markets for identical assets or liabilities.

Level 2 — Valuation techniques for which the lowest level input that is significant to the fair value measurement is directly or indirectly observable.

Level 3 — Valuation techniques for which the lowest level input that is significant to the fair value measurement is unobservable.

For assets and liabilities that are recognized in the Special Purpose Combined Financial Statements on a recurring basis, the Project SPV Group determines whether transfers have occurred between levels in the hierarchy by re-assessing categorization (based on the lowest level input that is significant to the fair value

measurement as a whole) at the end of each reporting period.

External valuers are involved for valuation of significant assets such as annuity receivable and intangible assets, where required. Involvement of external valuers is decided by each Project SPV management on a need basis and relevant approvals. The valuers involved are selected based on criteria like market knowledge, reputation, independence and professional standards. The management of each Project SPV decides after discussion with the external valuers, which valuation techniques and inputs to use for each case.

At each reporting date, the management of each Project SPV analysis the movement of assets and liabilities which are required to be re-measured or reassessed as per the Project SPV's accounting policies. For this analysis, the management of each Project SPV verifies the major inputs applied in the latest valuation by agreeing the information in the valuation computation to contracts and other relevant documents.

The management in conjunction with each Project SPV's external valuers also compares the change in fair value of each asset and liability with relevant external sources to determine whether the change is reasonable.

For the purpose of fair value disclosures, the Project SPV Group has determined classes of assets and liabilities on the basis of the nature, characteristics and risks of the asset or liability and the level of the fair value hierarchy, as explained above.

This note summarizes the accounting policy for fair value. Other fair value related disclosures are given in the relevant notes in the Special Purpose Combined Financial Statements

- i. Disclosures of Statement of Net Assets at fair value and Statement of total returns at fair value
- ii. Quantitative disclosures of fair value measurement hierarchy (note 37)
- iii. Investment in quoted mutual fund (note 11)
- iv. Financial instruments (including those carried at amortized cost) (note 38).

### **c) Revenue Recognition**

Effective 01 April 2018, the Project SPV Group adopted Ind AS 115 “*Revenue from Contracts with customers*” using the modified retrospective method. Under the modified retrospective method, an entity applies Ind AS 115 only for contracts that are not completed on or before 31 March 2018.

To determine whether to recognize revenue, the Project SPV Group follows a 5-step process:

1. Identifying the contract with a customer;
2. Identifying the performance obligations;
3. Determining the transaction price;
4. Allocating the transaction price to the performance obligations; and
5. Recognising revenue when/as performance obligation(s) are satisfied.

In all cases, the total transaction price is allocated amongst the various performance obligations based on their relative standalone selling price. The transaction price excludes amounts collected on behalf of third parties. The consideration promised include fixed amounts, variable amounts, or both.

Revenue is recognised to the extent that it is probable that the economic benefits will flow to the Project SPV Group and the revenue can be reliably measured, regardless of when the payment is being made.

Revenue is recognised either at a point in time or over time, when (or as) the Project SPV Group satisfies performance obligations by transferring the promised goods or services to its customers.

While this represents significant new guidance, the implementation of this new guidance had no impact on the timing or amount of revenue recognised by the Project SPV Group in any year.

### *Toll Collections*

The income from Toll Contracts on BOT basis are recognised on actual collection of toll revenue (net of revenue share payable to NHAI) as per the Concession Agreements. Revenue from electronic toll collection is recognised on accrual basis.

#### *Claims with NHAI/MPRDC*

Claims with NHAI and other Government Authorities are accounted as revenue as and when it becomes probable that such claims will be received and which can be measured reliably.

In cases where the SPV Group has a contractual right to an extension in the concession period as per the concession agreement, for any losses incurred by the SPV Group, such claims are recognized as other operating income when the right for the compensation is established based on the facts and circumstances.

#### *Contract revenue (Construction contracts)*

Contract revenue associated with the construction of roads is recognized at cost of work performed on the contract plus proportionate margin, where required, using the percentage of completion method.

Percentage of completion is the proportion of cost of work performed to-date, to the total estimated contract costs. Percentage of completion is determined based on the proportion of actual cost incurred to the total estimated cost of the project. The percentage of completion method is applied on a cumulative basis in each accounting period to the current estimates of contract revenue and contract costs. The effect of a change in the estimate of contract revenue or contract costs, or the effect of a change in the estimate of the outcome of a contract, is accounted for as a change in accounting estimate and the effect of which are recognized in the statement of profit or loss in the period in which the change is made and in subsequent periods.

Contract cost include costs that relate directly to the specific contract and allocated cost that are attributable to the construction of the road.

#### *Rendering of services*

Revenue from major maintenance obligation and regular operation and maintenance is recognized over the period of contract as and when the services are rendered.

#### *Interest income*

Interest income from a financial asset is recognized when it is probable that the economic benefits will flow to the Project SPV Group and the amount of income can be measured reliably. Interest is accrued on time proportion basis, by reference to the principle outstanding at the effective interest rate.

#### *Dividends*

Income from dividend on investments is accrued in the year in which it is declared, whereby the Project SPV Group's right to receive is established.

#### *Other operating income/other income*

All other operating income/income is recognized on accrual basis when no significant uncertainty exists on their receipt.

### **d) *Taxation***

#### *Current income tax*

Current income tax assets and liabilities are measured at the amount expected to be recovered from or paid to the tax authorities. The tax rates and tax laws used to compute the amount are those that are enacted or substantively enacted at the reporting date.

Current income tax relating to items recognized outside statement of profit or loss is recognized outside statement of profit or loss (either in other comprehensive income or in equity). Current tax items are recognized in correlation to the underlying transaction either in OCI or directly in equity. Management periodically evaluates positions taken in the tax returns with respect to situations in which applicable tax

regulations are subject to interpretation and establishes provisions where appropriate.

#### *Deferred tax*

Deferred tax is provided using the liability method on temporary differences between the tax bases of assets and liabilities and their carrying amounts for financial reporting purposes at the reporting date.

Deferred tax assets are recognized for all deductible temporary differences, the carry forward of unused tax credits and any unused tax losses. Deferred tax assets are recognized to the extent that it is probable that taxable profit will be available against which the deductible temporary differences, and the carry forward of unused tax credits and unused tax losses can be utilized.

The carrying amount of deferred tax assets is reviewed at each reporting date and reduced to the extent that it is no longer probable that sufficient taxable profit will be available to allow all or part of the deferred tax asset to be utilized. Unrecognized deferred tax assets are re-assessed at each reporting date and are recognized to the extent that it has become probable that future taxable profits will allow the deferred tax asset to be recovered.

Deferred tax assets and liabilities are measured at the tax rates that are expected to apply in the year when the asset is realized or the liability is settled, based on tax rates (and tax laws) that have been enacted or substantively enacted at the reporting date.

Deferred tax relating to items recognized outside statement of profit or loss is recognized outside statement of profit or loss. Deferred tax items are recognized in correlation to the underlying transaction either in OCI or directly in equity.

Deferred tax assets and deferred tax liabilities are offset if a legally enforceable right exists to set off current tax assets against current tax liabilities and the deferred taxes relate to the same taxable Project SPV Group and the same taxation authority.

#### *Minimum Alternate Tax (MAT)*

Minimum Alternate Tax (“MAT”) paid as per Indian Income Tax Act, 1961 is in the nature of unused tax credit which can be carried forward and utilised when the Project SPV Group will pay normal income tax during the specified period. MAT credit entitlement is recognized as an asset only when and to the extent there is convincing evidence that normal income tax will be paid during the specified period. The net amount of tax recoverable from, or payable to, the taxation authority is included as part of receivables or payables in the balance sheet.

#### **e) *Property, plant and equipment (PPE)***

On transition to Ind AS, the Project SPV Group has elected to continue with the carrying value of all of its property, plant and equipment recognized as at April 01, 2015 for all Project SPVs other than DBCPL and April 01, 2018 for DBCPL measured as per the previous GAAP and use that carrying value as the deemed cost of the property, plant and equipment on the date of transition i.e. April 01, 2015 and April 01, 2018 respectively.

Freehold land is carried as historical cost. All other items of property, plant and equipment and capital work in progress are stated at cost, net of recoverable taxes, trade discount and rebates less accumulated depreciation and impairment loss, if any. Such cost includes purchase price, borrowing cost and any cost directly attributable to bringing the assets to its working condition for its intended use.

Subsequent costs are included in the asset’s carrying amount or recognized as a separate asset, as appropriate, only when it is probable that future economic benefits associated with the item will flow to the Project SPV Group and the cost of the item can be measured reliably. The carrying amount of any component accounted for as a separate asset is derecognized when replaced.

Depreciation on property, plant and equipment held by Ulundurpet Expressways Private Limited (“UEPL”), Shillong Expressway Private Limited (“SEPL”), Jodhpur Pali Expressway Private Limited (“JPEPL”),

Godhra Expressways Private Limited (“**GEPL**”) and Nirmal Bot Limited (“**NBL**”) is calculated on a straight-line basis over the estimated useful lives of respective assets as estimated by the management and is charged to the Statement of profit and loss as per the requirement of Part C of Schedule II of the Act.

Depreciation on property, plant and equipment held by Dewas Bhopal Corridor Private Limited (“**DBCPL**”) is provided on written down value method at the rates determined based on the useful lives of respective assets as prescribed in the Schedule II of the Act.

Depreciation on additions / (disposals) during the year is provided on a pro-rata basis i.e., from the date on which asset is ready for use and up to the date on which the asset is disposed of/fully depreciated.

An item of property, plant and equipment and any significant part initially recognized is derecognized upon disposal or when no future economic benefits are expected from its use or disposal. Any gain or loss arising on de-recognition of the asset (calculated as the difference between the net disposal proceeds and the carrying amount of the asset) is included in the statement of profit or loss when the asset is derecognized. The residual values, useful lives and methods of depreciation of property, plant and equipment are reviewed at each financial year end and adjusted prospectively, if appropriate. Machinery spares which are specific to a particular item of PPE and whose use is expected to be irregular are capitalized as PPE. Spare parts are capitalized when they meet the definition of PPE, i.e., when the Project SPV Group intends to use these during more than a period of 12 months.

Freehold land held by Project SPV Group as per the requirement of NHAI/various Government Authorities and the amount of land is nominal hence it is not treated as investment property as per Ind AS 40.

**f) Intangible assets**

On transition to Ind AS, the Project SPV Group exercised first time adoption under Ind AS 101 “First-time Adoption of Indian Accounting Standards” and has elected to continue with the carrying value of its “Toll Collection Rights” (Intangible Assets), as recognised in the Special Purpose Combined Financial Statements as at the date of transition (i.e. 01 April 2015 for all SPVs other than DBCPL and 01 April 2018 for DBCPL) measured as per the previous GAAP and uses that as its deemed cost as at date of transition.

*Accounting of intangible assets under Service Concession agreement*

Toll collection rights obtained in consideration for rendering construction services, represent the right to collect toll revenue during the concession period in respect of Build-Operate-Transfer (BOT) and design, build, finance, operate and transfer (DBFOT) project undertaken by the Project SPV’s. Toll collection rights are capitalized as intangible assets upon completion of the project at the cumulative construction costs plus the present value of obligation towards negative grants and additional concession fee payable to NHAI/MPRDC, if any. Till the completion of the project, the same is recognized under intangible assets under development. The revenue from toll collection/other income during the construction period is reduced from the carrying amount of intangible assets under development.

Extension of concession period by the authority in compensation for claims made by the Project SPV are capitalized as part of Toll Collection Rights when it is probable that such claims will be received and can be measured reliably.

Pre-operative expenses including administrative and other general overhead expenses that are directly attributable to the development or acquisition of intangible assets are allocated and capitalized as part of cost of the intangible assets.

Grant received if any are considered as a part of total outlay of the construction project. The same shall be recognized when the entity complies with the conditions attaching to the collection of grant considered as a financial asset and it shall be simultaneously reduced from the cost of acquisition of the intangible asset and are recognized.

Intangible assets that are not ready for the intended use on the date of the Balance Sheet are disclosed as "Intangible assets under development.

### *Other intangible assets*

Other intangible assets comprise of cost for software and other application software acquired / developed for in house use. These assets are stated at cost, only when it is probable that future economic benefits associated with the item will flow to the Project SPV Group and the cost of the item can be measured reliably, less accumulated amortization and accumulated impairment losses, if any. Intangible assets are derecognized when no future economic benefits are expected from use or disposal.

### *Amortisation of intangible assets under Service Concession agreement*

Toll collection rights in respect of road projects are amortized over the period of concession using the revenue based amortization method prescribed under Schedule II to the Companies Act, 2013. Under the revenue based method, amortization is provided based on proportion of actual revenue to reflect the pattern in which the assets economic benefits will be consumed. At each balance sheet date, the projected revenue for the balance toll period is reviewed by the management. If there is any change in the projected revenue from previous estimates, the amortisation of toll collection rights is changed prospectively to reflect any changes in the estimates.

Amortization on impaired assets is provided by adjusting the amortization charge in the remaining periods so as to allocate the assets revised carrying amount over its remaining useful life.

### *Amortization of other intangible assets*

Other Intangible assets with finite lives are amortised over the useful economic life and assessed for impairment whenever there is an indication that the intangible asset may be impaired. The amortisation period and the amortisation method for an intangible asset with a finite useful life are reviewed at least at the end of each reporting period. Changes in the expected useful life or the expected pattern of consumption of future economic benefits embodied in the asset are considered to modify the amortisation period or method, as appropriate, and are treated as changes in accounting estimates. The amortisation expense on intangible assets with finite lives is recognised in the statement of profit and loss unless such expenditure forms part of carrying value of another asset.

Specialized software held by the Project SPV Group is amortized over a period of six years on straight line basis from the month in which the addition is made.

Gains or losses arising from derecognition of an intangible asset are measured as the difference between the net disposal proceeds and the carrying amount of the asset and are recognised in the statement of profit or loss when the asset is derecognised.

The above periods also represent the management estimated economic useful life of the respective intangible assets.

### **g) *Accounting of financial asset under Service Concession Agreement***

The management has determined that the “Financial Asset” model under Appendix C of Ind AS 115 “Service Concession Agreements” is applicable to the concession of SEPL and NBL. In particular, they note that grantor (NHAI/State authorities) has the primary responsibility to pay to the operator (“SPV”).

Under the arrangement, the SPV recognizes a financial asset arising from service concession agreement as it has an unconditional right to receive cash from grantor (NHAI/State authorities) for the construction service, major maintenance obligations and regular operation and maintenance services over the concession period. Such financial asset is measured at fair value on initial recognition and classified under the head “Trade Receivable”. Subsequent to initial recognition, the financial asset is measured at amortized cost. Under this model, the financial asset will be reduced as and when grant is received from Grantor (NHAI/State authorities).

As per the salient feature of the arrangement, the operator (“SPV”) has a two-fold activity based on which revenue is recognized in the Special Purpose Combined Financial Statements in line with the requirement of Appendix C of Ind AS 115. The activities are given below:

- a. a construction activity in respect of its obligation to design, build, finance an asset that it makes available to the Grantor (NHAI/State authorities);
- b. Revenue from major maintenance obligation and operation and maintenance activity in respect of the assets during the concession period in accordance with Ind AS 115.

#### ***h) Lease***

##### *Where the SPV Group is the lessee*

A lease is defined as ‘a contract, or part of a contract, that conveys the right to control the use of an identified asset for a period of time in exchange for consideration’. To assess whether a contract conveys the right to control the use of an identified asset, the Project SPV Group assesses whether: (i) the contract involves the use of an identified asset (ii) the Project SPV Group obtains substantially all of the economic benefits from use of the asset through the period of the lease and (iii) the Project SPV Group has the right to direct the use of the asset.

##### *Recognition and initial measurement*

At lease commencement date, the Project SPV Group recognises a right-of-use asset and a lease liability. The right-of-use asset is measured at cost, which is made up of the initial measurement of the lease liability, any initial direct costs incurred by the Project SPV Group, an estimate of any costs to dismantle and remove the asset at the end of the lease (if any), and any lease payments made in advance of the lease commencement date (net of any incentives received).

The Project SPV Group measures the lease liability at the present value of the lease payments unpaid at that date, discounted using the interest rate implicit in the lease if that rate is readily available or the Project SPV Group’s incremental borrowing rate. Lease payments included in the measurement of the lease liability are made up of fixed payments (including in substance fixed payments) and variable payments based on an index or rate.

##### *Subsequent measurement*

The Project SPV Group depreciates the right-of-use assets on a straight-line basis from the lease commencement date to the earlier of the end of the useful life of the right-of-use asset or the end of the lease term. The Project SPV Group also assesses the right-of-use asset for impairment when such indicators exist.

The liability will be reduced for payments made and increased for interest. It is re-measured to reflect any reassessment or modification, or if there are changes in in-substance fixed payments. When the lease liability is re-measured, the corresponding adjustment is reflected in the right-of-use asset.

The Project SPV Group has elected to account for short-term leases and leases of low-value assets using the practical expedients. Instead of recognising a right-of-use asset and lease liability, the payments in relation to these are recognised as an expense in statement of profit and loss on a straight-line basis over the lease term.

##### *Where the Project SPV Group is the lessor*

Leases which effectively transfer to the lessee substantially all the risks and benefits incidental to ownership of the leased item are classified and accounted for as finance lease. Amounts due from lessees under finance leases are recorded as receivables at the Project SPV Group’s net investment in the leases. Finance lease income is allocated to accounting periods so as to reflect a constant periodic rate of return on the net investment outstanding in respect of the lease. Contingent rents are recognized as revenue in the period in which they are earned.

Leases in which the Project SPV Group does not transfer substantially all the risks and rewards of ownership of an asset are classified as operating leases. The respective leased assets are included in the balance sheet based on their nature. Rental income is recognized on straight-line basis over the lease term. Rental income from operating lease is recognized on a straight-line basis or another systematic basis as per the terms of the relevant lease.

**i) Impairment of non-financial assets**

At each reporting date, the Project SPV Group assesses whether there is any indication based on internal/external factors, that an asset (tangible and intangible) may be impaired. If any such indication exists, an estimate the recoverable amount of the asset / cash generating unit. Recoverable amount is higher of an asset's or cash generating unit's net selling price and its value in use. Value in use is the present value of estimated future cash flows expected to arise from the continuing use of an asset and from its disposal at the end of its useful life. For the purpose of assessing impairment, the recoverable amount is determined for an individual asset, unless the asset does not generate cash inflows that are largely independent of those from other assets or groups of assets. The smallest identifiable group of assets that generates cash inflows from continuing use that are largely independent of the cash inflows from other assets or groups of assets, is considered as a cash generating unit (CGU). An asset or CGU whose carrying value exceeds its recoverable amount is considered impaired and is written down to its recoverable amount.

Impairment losses of continuing operations are recognized in the statement of profit and loss.

Assessment is also done at each Balance Sheet date as to whether there is any indication that an impairment loss recognized for an asset in prior accounting periods may no longer exist or may have decreased.

**j) Provisions, contingent liabilities and contingent assets**

Provisions are recognized when the Project SPV Group has a present obligation (legal or constructive) as a result of a past event, it is probable that an outflow of resources embodying economic benefits will be required to settle the obligation and a reliable estimate can be made of the amount of the obligation. When the Project SPV Group expects some or all of a provision to be reimbursed, the reimbursement is recognized as a separate asset, but only when the reimbursement is virtually certain. The expense relating to a provision is presented in the statement of profit and loss net of any reimbursement.

If the effect of the time value of money is material, provisions are discounted using a current pre-tax rate that reflects, when appropriate, the risks specific to the liability. When discounting is used, the increase in the provision due to the passage of time is recognized as a finance cost.

A contingent liability is disclosed when there is a possible obligation that arises from events and whose existence is only confirmed by one or more doubtful future events or when there is an obligation that is not recognized as a liability or provision because it is not likely that an outflow of resources will be required. Contingent assets are disclosed only when inflow of economic benefits therefrom is probable and recognised only when realization of income is virtually certain.

**k) Financial Instruments**

*Financial Asset*

*Initial recognition and measurement*

Financial instruments are recognised when the Project SPV Group becomes a party to the contractual provisions of the instrument and are measured initially at fair value adjusted for transaction costs, except for those carried at fair value through profit or loss which are measured initially at fair value.

*Subsequent measurement*

- i. Financial assets at amortised cost**- A financial instrument is measured at amortised cost if both the following conditions are met:
- The asset is held within a business model whose objective is to hold assets for collecting contractual cash flows; and
  - Contractual terms of the asset give rise on specified dates to cash flows that are solely payments of principal and interest (SPPI) on the principal amount outstanding.

After initial measurement, such financial assets are subsequently measured at amortised cost using the effective interest method.

ii. Financial assets at fair value

- Mutual funds – All mutual funds in scope of Ind-AS 109 are measured at fair value through profit and loss (FVTPL).

*De-recognition of financial assets*

A financial asset is primarily de-recognised when the rights to receive cash flows from the asset have expired or the Project SPV Group has transferred its rights to receive cash flows from the asset.

*Financial liabilities*

Initial recognition and measurement

All financial liabilities are recognised initially at fair value and transaction cost that is attributable to the acquisition of the financial liabilities is also adjusted

Subsequent measurement

After initial recognition, the financial liabilities are subsequently measured at amortised cost using effective interest method. Amortised cost is calculated after considering any discount or premium on acquisition and fees or costs that are an integral part of the EIR. The effect of EIR amortisation is included as finance costs in the statement of profit and loss.

De-recognition of financial liabilities

A financial liability is de-recognised when the obligation under the liability is discharged or cancelled or expires. When an existing financial liability is replaced by another from the same lender on substantially different terms, or the terms of an existing liability are substantially modified, such an exchange or modification is treated as the de-recognition of the original liability and the recognition of a new liability. The difference in the respective carrying amounts is recognised in the statement of profit and loss.

*Offsetting of financial instruments*

Financial assets and financial liabilities are offset and the net amount is reported in the balance sheet if there is a currently enforceable legal right to offset the recognised amounts and there is an intention to settle on a net basis, to realise the assets and settle the liabilities simultaneously.

**l) *Impairment of financial assets***

All financial assets except for those at FVTPL are subject to review for impairment at least at each reporting date to identify whether there is any objective evidence that a financial asset or a Project SPV group of financial assets is impaired. Different criteria to determine impairment are applied for each category of financial assets.

In accordance with Ind-AS 109, the Project SPV Group applies expected credit loss (ECL) model for measurement and recognition of impairment loss for financial assets carried at amortised cost.

ECL is the weighted average of difference between all contractual cash flows that are due to the Project SPV Group in accordance with the contract and all the cash flows that the Project SPV Group expects to receive, discounted at the original effective interest rate, with the respective risks of default occurring as the weights. When estimating the cash flows, the Project SPV Group is required to consider:

- All contractual terms of the financial assets (including prepayment and extension) over the expected life of the assets; and
- Cash flows from the sale of collateral held or other credit enhancements that are integral to the contractual terms.
- Trade receivables:  
In respect of trade receivables, the Project SPV Group applies the simplified approach of Ind AS 109 'Financial Instruments', which requires measurement of loss allowance at an amount equal to lifetime expected credit losses. Lifetime expected credit losses are the expected credit losses that result from all

possible default events over the expected life of a financial instrument.

- **Other financial assets:**

In respect of its other financial assets, the Project SPV Group assesses if the credit risk on those financial assets has increased significantly since initial recognition. If the credit risk has not increased significantly since initial recognition, the Project SPV Group measures the loss allowance at an amount equal to 12-month expected credit losses, else at an amount equal to the lifetime expected credit losses.

When making this assessment, the Project SPV Group uses the change in the risk of a default occurring over the expected life of the financial asset. To make that assessment, the Project SPV Group compares the risk of a default occurring on the financial asset as at the balance sheet date with the risk of a default occurring on the financial asset as at the date of initial recognition and considers reasonable and supportable information, that is available without undue cost or effort, that is indicative of significant increases in credit risk since initial recognition. The Project SPV Group assumes that the credit risk on a financial asset has not increased significantly since initial recognition if the financial asset is determined to have low credit risk at the balance sheet date.

**m) Segment reporting**

The Project SPV Group is engaged in “Road Infrastructure Projects” which in the context of Ind AS 108 “Operating Segment” is considered as the only segment. The Project SPV Group’s activities are restricted within India and hence, no separate geographical segment disclosure is considered necessary.

**n) Employee benefits**

The Project SPV Group provides post-employment benefits through various defined contribution and defined benefit plans.

*Defined contribution plans*

A defined contribution plan is a plan under which the Project SPV Group pays fixed contributions into an independent fund administered by the government. The Project SPV Group has no legal or constructive obligations to pay further contributions after its payment of the fixed contribution, which are recognised as an expense in the year in which the related employee services are received.

*Defined benefit plans*

The defined benefit plans sponsored by the Project SPV Group define the amount of the benefit that an employee will receive on completion of services by reference to length of service and last drawn salary. The legal obligation for any benefits remains with the Project SPV Group.

Gratuity is post-employment benefit and is in the nature of a defined benefit plan. The liability recognised in the Special Purpose Combined Financial Statements in respect of gratuity is the present value of the defined benefit obligation at the reporting date, together with adjustments for unrecognised actuarial gains or losses and past service costs. The defined benefit obligation is calculated at or near the reporting date by an independent actuary using the projected unit credit method.

Actuarial gains and losses arising from past experience and changes in actuarial assumptions are credited or charged to the statement of OCI in the year in which such gains or losses are determined.

*Other long-term employee benefits*

Liability in respect of compensated absences becoming due or expected to be availed more than one year after the balance sheet date is estimated on the basis of an actuarial valuation performed by an independent actuary using the projected unit credit method.

Actuarial gains and losses arising from past experience and changes in actuarial assumptions are charged to statement of profit and loss in the year in which such gains or losses are determined.

#### *Short-term employee benefits*

Expense in respect of other short term benefits is recognised on the basis of the amount paid or payable for the period during which services are rendered by the employee.

#### ***o) Borrowing costs***

Borrowing cost include interest calculated using the effective interest method, amortization of ancillary costs and other costs the Project SPV Group incurs in connection with the borrowing of funds. Borrowing costs directly attributable to the acquisition, construction or production of a qualifying asset are capitalized during the period of time that is necessary to complete and prepare the asset for its intended use or sale. A qualifying asset is one that necessarily takes substantial period of time to get ready for its intended use. Capitalisation of borrowing costs is suspended in the period during which the active development is delayed due to, other than temporary, interruption. All other borrowing costs are charged to the statement of profit and loss as incurred.

#### ***p) Cash and cash equivalents***

Cash and cash equivalent in the balance sheet comprise cash at banks and on hand and short-term deposits with an original maturity of three months or less, which are subject to an insignificant risk of changes in value.

#### ***q) Cash flow statement***

Cash flow statement is prepared segregating the cash flows from operating, investing and financing activities. Cash flow from operating activities is reported using indirect method. Under the indirect method, the net profit/(loss) is adjusted for the effects of:

- a. transactions of a non-cash nature;
- b. any deferrals or accruals of past or future operating cash receipts or payments and,
- c. all other items of income or expense associated with investing or financing cash flows.

The cash flows from operating, investing and financing activities of the Project SPV Group are segregated based on the available information. Cash and cash equivalents (including bank balances) are reflected as such in the Cash Flow Statement. Those cash and cash equivalents which are not available for general use as on the date of Balance Sheet are also included under this category with a specific disclosure.

#### ***r) Prior period error***

a) As per Ind AS -8, Accounting Policies, Change in Accounting Estimates & prior period Item an entity shall correct material prior period errors retrospectively in the first set of financial statements approved for issue after their discovery by:

- Restating the comparative amounts for the prior period(s) presented in which the error occurred; or
- If the error occurred before the earliest prior period presented, restating the opening balances of assets, liabilities and equity for the earliest prior period presented.

#### ***s) Recent accounting pronouncements issued but not made effective***

##### **Amendment to Ind AS 16, Property, Plant and Equipment**

The Ministry of Corporate Affairs ("MCA") vide notification dated 23 March 2022, has issued an amendment to Ind AS 16 which specifies that an entity shall deduct from the cost of an item of property, plant and equipment any proceeds received from selling items produced while the entity is preparing the asset for its intended use (for example, the proceeds from selling samples produced when testing a machine to see if it is functioning properly).

##### **Amendment to Ind AS 37, Provisions, Contingent Liabilities and Contingent Assets**

The Ministry of Corporate Affairs ("MCA") vide notification dated 23 March 2022, has issued an amendment

to Ind AS 37 which specifies that the cost of fulfilling a contract comprises: the incremental costs of fulfilling that contract and an allocation of other costs that relate directly to fulfilling contracts.

#### **Amendment to Ind AS 103, Business Combinations**

The Ministry of Corporate Affairs ("MCA") vide notification dated 23 March 2022, has issued an amendment to Ind AS 103 and has added a new exception in the standard for liabilities and contingent liabilities.

#### **Amendment to Ind AS 109, Financial Instruments**

The Ministry of Corporate Affairs ("MCA") vide notification dated 23 March 2022, has issued an amendment to Ind AS 109 which clarifies that which fees an entity should include when it applies the '10%' test in assessing whether to derecognise a financial liability. An entity includes only fees paid or received between the entity (the borrower) and the lender, including fees paid or received by either the entity or the lender on the other's behalf.

Group is evaluating the impact of the above amendments on the Special Purpose Combined Financial Statements.

### **Principal Components of Combined Statement of Profit and Loss**

#### **Income**

Our total income consists of revenue from operations and other income.

#### **Revenue from operations**

Revenue from operations primarily comprises revenue from toll collections, interest income on annuity, revenue from operations and maintenance, periodic maintenance, interest on annuity, utility shifting and change in scope and claims from NHAI.

- **Revenue from Toll Collections:** Revenue from toll collections represents toll revenue collected by the Project SPVs as per the respective concession agreements in respect of different categories of vehicles using the Projects.
- **Interest Income on Annuity:** Interest income from an annuity project is recognized when it is probable that economic benefits (annuity) will flow to the relevant Project SPVs in accordance with the concession agreements and the amount of income can be measured reliably. Interest is accrued on time proportion basis, by reference to the principle outstanding at the effective interest rate.
- **Revenue from Operations and Maintenance and Period Maintenance:** Revenue from operations and maintenance and periodic maintenance is the revenue from the maintenance work carried out in relation to the Projects in accordance with the terms of the concession agreement. Revenue from major maintenance obligation and regular operation and maintenance is recognized over the period of contract as and when the services are rendered.
- **Other operating revenue:** Other operating revenue primarily consists of the revenue from (i) utility shifting services, being, compensation receivable by the Project SPVs for shifting certain utilities that are located on construction sites and which is not part of the scope of work as per the concession agreements, (ii) change in scope, being, compensation for cost incurred for additional work which is not mentioned in scope of the concession agreements, (iii) revenue from claims made to NHAI, and (iv) any modification gains on annuity.

#### **Other income**

Other income primarily consists of interest income, which comprises interest on bank deposits and income tax refund, insurance claims, gain on investments carried at fair value through profit or loss, gain on sale of property, plants and equipment, express provisions written back, gain on sale of investments, gain on modification of liability and others.

## Expenses

Our expenses consist of claim expenses, toll operations and maintenance expenses, provision for major maintenance obligation, change of scope and utility shifting, employee benefits expense, finance costs, depreciation and amortization expense, and other expenses.

- **Claim Expenses:** It is the cost in relation to the any claims made to the NHAI or made by NHAI or other concessioning authorities.
- **Toll Operations and Maintenance Expenses:** It is the cost in relation to the toll operations and O&M work carried out for the purposes of the Projects in accordance with the terms of the concession agreements.
- **Provision for major maintenance obligation:** Provision for major maintenance obligation includes accruals for expenses which will be incurred for periodic maintenance in future periods based on the concession agreements.
- **Change of Scope and Utility Shifting Costs:** It is the cost in relation to the shifting of certain utilities that are located on construction sites and other works which are not part of the scope of work as per the concession agreements.
- **Employee benefits expense:** Employee benefits expenses primarily comprise salaries, wages and bonus, contribution towards provident and other funds and staff welfare expense.
- **Finance costs:** Finance costs primarily comprise interest on borrowings, unwinding cost on deferred payment to NHAI for purchase of right to charge users of toll roads, unwinding cost on provision for major maintenance obligations, unwinding cost of discount on provisions and financial liabilities carried at amortised cost, loss on modification of liability and finance and bank charges.
- **Depreciation and amortization expenses:** Depreciation and amortization expenses include depreciation on property, plant and equipment and amortization of intangible assets.
- **Other expenses:** Other expenses primarily comprise, amongst others, power, fuel and water expense, legal and professional charges, insurance cost and other expenses.

## Result of Operations

The following table sets forth certain information with respect to the results of operations of the Project SPVs for the periods indicated: (in ` million)

Particulars	March 31, 2022	Percentage of Total Income	March 31, 2021	Percentage of Total Income	March 31, 2020	Percentage of Total Income
Revenue from operations	5,866.56	94.96	5,085.04	95.47	5,008.80	95.58
Other income	311.09	5.04	241.09	4.53	231.43	4.42
<b>Total Income</b>	<b>6,177.65</b>	<b>100.00</b>	<b>5,326.13</b>	<b>100.00</b>	<b>5,240.23</b>	<b>100.00</b>
<b>Expenses</b>						
Operating expenses	1,437.60	23.27	1,377.29	25.86	1,388.02	26.49
Employee benefits expense	128.35	2.08	117.56	2.21	116.19	2.22
Finance costs	2,775.55	44.93	2,740.51	51.45	2,774.77	52.95
Depreciation and amortization expense	1,017.44	16.47	919.81	17.27	1,038.67	19.82
Other expenses	459.15	7.43	393.69	7.39	349.50	6.67
<b>Total expenses</b>	<b>5,818.09</b>	<b>94.18</b>	<b>5,548.86</b>	<b>104.18</b>	<b>5,667.15</b>	<b>108.15</b>
<b>Profit/ (Loss) before tax</b>	<b>359.56</b>	<b>5.82</b>	<b>(222.73)</b>	<b>(4.18)</b>	<b>(426.92)</b>	<b>(8.15)</b>
<b>Tax expense:</b>						
(i) Current tax (including earlier period/years)	189.97	3.08	127.00	2.38	91.10	1.74
(ii) Tax adjustments relating to earlier period / years	-	-	-	-	-	-
(iii) Deferred tax	514.79	8.33	(155.54)	(2.92)	(2.41)	(0.05)
<b>Total tax expense</b>	<b>704.76</b>	<b>11.41</b>	<b>(28.54)</b>	<b>(0.54)</b>	<b>88.69</b>	<b>1.69</b>
<b>Net Loss for the period/ year</b>	<b>(345.20)</b>	<b>(5.59)</b>	<b>(194.19)</b>	<b>(3.65)</b>	<b>(515.61)</b>	<b>(9.84)</b>
<b>Other comprehensive income/ (loss)</b>						
Items that will not be reclassified to profit or loss						
(i) Re-measurement gains /(losses) on defined benefit obligations	0.24	0.00	0.57	0.01	(1.25)	(0.02)
(ii) Income tax relating to these items	-	-	-	-	-	-
<b>Total other comprehensive income/ (loss) for the period/ year</b>	<b>0.24</b>	<b>0.00</b>	<b>0.57</b>	<b>0.01</b>	<b>(1.25)</b>	<b>(0.02)</b>
<b>Total comprehensive loss for the period/ year</b>	<b>(344.96)</b>	<b>(5.58)</b>	<b>(193.62)</b>	<b>(3.64)</b>	<b>(516.86)</b>	<b>(9.86)</b>

## ***Financial year ended March 31, 2022 compared to financial year ended March 31, 202***

### **Total Income**

Total income increased by 15.99% from ₹ 5,326.13 million in Fiscal 2021 to ₹ 6,177.65 million in Fiscal 2022, primarily due to an increase in income arising out of toll collection, and claims from NHAI.

### ***Revenue from operations***

Revenue from operations increased by 15.37% from ₹ 5,085.04 million for Fiscal 2021 to ₹ 5,866.56 million for Fiscal 2022, principally attributable to certain claims in relation to demonetisation, force majeure and arbitration claims in relation to construction ( pass through to erstwhile shareholders). Revenue from claims from NHAI represented 10.26% of our total operating income for the year ended 31, 2022.

### ***Claims from NHAI***

Revenue from claims received from NHAI increased by 58.90% from ₹378.72 million for Fiscal 2021 to ₹ 601.80 million in Fiscal 2022.

### ***Income from Toll Collections***

Income from toll collections increased by 16.07%, from ₹ 3,919.12 million for Fiscal 2021 to ₹ 4,549.06 million for Fiscal 2022.

### ***Other income***

Other income increased by 29.04% from ₹ 241.09 million for Fiscal 2021 to ₹ 311.09 million for Fiscal 2022, primarily on account of an increase in insurance claims and interest on bank deposits.

### **Total Expenses**

Total expenses increased by 4.85% from ₹ 5,548.86 million for Fiscal 2021 to ₹ 5,818.09 million for Fiscal 2022, on account of increase in operating expenses and depreciation and amortization expenses.

### ***Operating Expenses***

Operating expenses increased by 4.38% from ₹ 1,377.29 million for Fiscal 2021 to ₹ 1,437.60 million for Fiscal 2022, primarily due to an increase in expenses related to claim from NHAI. Expenses related to claims from NHAI increased by 46.02% from ₹ 378.72 million for Fiscal 2021 to ₹ 553.00 million for Fiscal 2022.

### ***Employee benefit expense***

Employee benefits expenses increased by 9.18% from ₹ 117.56 million for Fiscal 2021 to ₹ 128.35 million for Fiscal 2022, due to an increase in the payment of salary, wages and bonus. Expenses related to salary, wages and bonus increased by 10.21% from ₹ 93.10 million for Fiscal 2021 to ₹ 102.60 million for Fiscal 2022, primarily due to yearly increments and bonus given in financial year ended March 31, 2022.

### ***Finance costs***

Finance costs increased by 1.28% from ₹ 2,740.51 million for Fiscal 2021 to ₹ 2,775.55 million for Fiscal 2022, primarily attributable to interest expense on compulsorily convertible debentures and the increase in unwinding of discounts on major maintenance provisions.

### ***Depreciation and Amortization Expense***

Depreciation and amortization increased by 10.61% from ₹ 919.81 million for Fiscal 2021 to ₹ 1,017.44 million for Fiscal 2022 primarily attributable to an increase in amortization of intangible assets due to an increase in toll income as compared to the toll income in financial year ended March 31, 2021 and the implementation of the requirements of Schedule II of the Companies Act to amortisation based on revenue method, which is in the normal course of business operations.

### ***Other expenses***

Other expenses increased by 16.62% from ₹ 393.69 million for Fiscal 2021 to ₹ 459.15 million for Fiscal 2022, primarily due to bad debts written off and an increase in management support services fee.

### **Loss before and after tax**

As a result of the factors outlined above, our profit before tax increased by 261.43% from ₹ (222.73) million for Fiscal 2021 to ₹ 359.56 million for Fiscal 2022. Our loss after tax increased by 77.77% from ₹ (194.19) million for Fiscal 2021 to ₹ (345.20) million for Fiscal 2022.

### **Other comprehensive income/(Loss)**

Other comprehensive income reduced by 57.24% from ₹ 0.57 million for Fiscal 2021 to ₹ 0.24 million for Fiscal 2022.

### **Total comprehensive income/(loss)**

As a result of the factors outlined above, our total comprehensive loss increased by 78.16% from ₹(193.62) million for Fiscal 2021 to ₹(344.96) million for Fiscal 2022.

### ***Financial year ended March 31, 2021 compared to financial year ended March 31, 2020***

#### **Total Income**

Total income increased by 1.63% from ₹ 5,240.23 million in Fiscal 2020 to ₹ 5,326.13 million in Fiscal 2021, primarily due to claims from NHAI and gain on modification of annuity.

#### ***Revenue from operations***

Revenue from operations increased by 1.52% from ₹ 5,008.80 million for Fiscal 2020 to ₹ 5,085.04 million for Fiscal 2021, primarily due to claims from NHAI and gain on modification of annuity .

#### ***Income arising out of toll collections***

Income arising out of toll collections decreased by 0.10%, from ₹ 3,922.85 million for Fiscal 2020 to ₹ 3,919.12 million for Fiscal 2021. This decrease was attributable to toll suspension on account of Covid-19.

#### ***Other income***

Other income increased by 4.17% from ₹ 231.43 million for Fiscal 2020 to ₹ 241.09 million for Fiscal 2021, primarily on account of an increase in the gain on modification of financial liability and miscellaneous income.

#### **Total Expenses**

Total expenses decreased by 2.09% from ₹ 5,667.15 million for Fiscal 2020 to ₹ 5,548.86 million for Fiscal 2021, primarily on account of decrease in depreciation and amortization expenses, finance costs, and operating expenses.

#### ***Operating Expenses***

Operating expenses decreased by 0.77% from ₹ 1,388.02 million for Fiscal 2020 to ₹ 1,377.29 million for Fiscal 2021, primarily due to the decrease in the provision for major maintenance. Provision for major maintenance obligations decreased by 45.87% from ₹ 834.11 million for Fiscal 2020 to ₹ 451.45 million for Fiscal 2021, primarily due to provisioning for scheduled spend on periodic maintenance as per the concession agreements.

#### ***Employee benefit expense***

Employee benefits expenses increased by 1.18% from ₹ 116.19 million for Fiscal 2020 to ₹ 117.56 million for Fiscal 2021, due to a slight increase in staff welfare expenses.

### **Finance costs**

Finance costs decreased by 1.23% from 2,774.77 million for Fiscal 2020 to ₹ 2,740.51 million for Fiscal 2021, primarily attributable to a decrease in interest expenses, finance and bank charges and unwinding of discount on major maintenance provision.

### **Depreciation and Amortization Expense**

Depreciation and amortization expense decreased by 11.44% from ₹ 1,038.67 million for Fiscal 2020 to ₹ 919.81 million for Fiscal 2021, primarily attributable to a decrease in the amortization of intangible assets due to decrease in toll collection as compared to previous financial year on account of Covid-19, extension of concession period for Covid-19, considered while calculating amortisation of intangible assets and the implementation of the requirements of Schedule II of the Companies Act to amortisation based on revenue method, which is in the normal course of business operations.

### **Other expenses**

Other expenses increase by 12.65% from ₹ 349.50 million for Fiscal 2020 to ₹ 393.69 million for Fiscal 2021, primarily due to an increase in insurance and independent consultancy and project monitoring fee .

### **Loss before and after tax**

As a result of the factors outlined above, our loss before tax reduced by 47.83% from ₹ (426.92) million for Fiscal 2020 to ₹ (222.73) million for Fiscal 2021. Our loss after tax reduced by 62.34% from ₹ (515.61) million for Fiscal 2020 to ₹ (194.19) million for Fiscal 2021.

### **Other comprehensive income/(Loss)**

Other comprehensive loss decreased by 145.49% from ₹ (1.25) million for Fiscal 2020 to ₹ 0.57 million for Fiscal 2021.

### **Total comprehensive income/(loss)**

As a result of the factors outlined above, our total comprehensive loss reduced by 62.54% from ₹ (516.86) million for Fiscal 2020 to ₹ (193.62) million for Fiscal 2021.

### **Cash Flows**

The following table sets forth certain information relating to the cash flows of the Project SPVs on a combined basis for the periods indicated:

(In ₹ million)

Particulars	Financial Year ended March 31,		
	2022	2021	2020
Net cash generated from operating activities	3,704.44	2,845.33	2,659.32
Net cash (used in) / flow from investing activities	(241.92)	269.93	(61.55)
Net cash used in financing activities	(3,176.51)	(3,210.36)	(2,610.38)

### **Net cash generated from operating activities**

Net cash from operating activities for Fiscal 2022 was ₹ 3,704.44 million, primarily arising out of tolling operations.

Net cash from operating activities for Fiscal 2021 was ₹ 2,845.33 million, primarily arising out of tolling operations.

Net cash used in operating activities for Fiscal 2020 was ₹ 2,659.32 million, primarily arising out of tolling operations.

### **Net cash (used in)/ flow from investing activities**

Net cash flowing from investing activities for Fiscal 2022 was ₹ (241.92) million, primarily due to proceeds from

sale of current investments.

Net cash flowing from investing activities for Fiscal 2021 was ₹ 269.93 million, primarily due to proceeds from sale of current investments.

Net cash used in investing activities for Fiscal 2020 was ₹ (61.55) million, primarily due to purchase of current investments.

#### **Net cash from / (used) by / in financing activities**

Net cash from financing activities for Fiscal 2022 was ₹ (3,176.51) million, primarily due to repayment of borrowings, interest paid and finance costs, issue of CCD, redemption of OCD along with IIR.

Net cash used in financing activities for Fiscal 2021 was ₹ (3,210.36) million, primarily due to repayment of borrowings, interest paid and finance costs.

Net cash used in financing activities for Fiscal 2020 was ₹ (2,610.38) million, primarily due to repayment of borrowings, interest paid and finance costs.

#### **Capital Expenditure**

The Project SPVs capital expenditure has historically been principally for construction and O&M costs. In the Fiscals 2022, 2021 and 2020, the combined capital expenditure of the Project SPVs was as follows:

(In ₹ million)

Particulars	As at March 31, 2022	As at March 31, 2021	As at March 31, 2020
Intangible Assets	1.19	1.09	17.07
Property, Plant and Equipment	72.81	20.46	9.17
Capital work in progress	2.39	9.40	5.40

#### **Indebtedness**

The following table provides the types and amounts of the Project SPVs outstanding indebtedness for financial years March 31, 2022, March 31, 2021 and March 31, 2020:

(In ₹ million)

Particulars	As at March 31, 2022	As at March 31, 2021	As at March 31, 2020
<b>Non-Current</b>			
<b>Secured</b>			
Term loan from banks	1,720.97	2,043.30	2,250.78
Term loan from financial institutions	2,753.37	3,177.74	3,232.18
Non-convertible debentures	8,337.70	9,413.25	9,967.02
<b>Unsecured</b>			
Loan from related parties	-	325.91	324.92
Loan from others	470.62	427.83	388.94
Optionally convertible debentures from related parties	-	6,864.12	6,300.25
Compulsory convertible debentures from related parties	7,978.14	-	-
<b>Total Non-Current Borrowings</b>	<b>21,260.80</b>	<b>22,252.15</b>	<b>22,464.09</b>
<b>Current</b>			
Liability Component of Compound Financials Instruments	519.08	519.08	531.84
<b>Current Maturities of Long Term Borrowings</b>			
Term loans from banks	324.21	293.65	261.25
Term loan from financial institutions	422.72	55.81	43.40
Non-convertible debentures	741.62	873.67	825.07
<b>Total Current Borrowings</b>	<b>2,007.63</b>	<b>1,742.21</b>	<b>1,661.56</b>
<b>Total Long Term Borrowings</b>	<b>23,268.43</b>	<b>23,994.36</b>	<b>24,125.65</b>

As on March 31, 2022, the Project SPVs' total borrowings, comprising unsecured loans and secured loans and current maturities of the long term borrowings of the Project SPVs, was ₹ 23,268.43 million, consisting of unsecured loans of ₹ 8,967.83 million and secured loans of ₹ 14,300.60 million. Most of the Project SPVs' financing arrangements are secured by their movable and immovable assets, including charges on their equipment and intangible assets relating to toll collection rights and financial assets relating to their respective projects.

### **Sufficiency of Working Capital**

The Highways Trust will raise funds through appropriate manner to meet its working capital requirements. The Investment Manager has confirmed that the Highways Trust has the ability to meet its working capital requirements for at least 12 months from the date of allotment of the Units through such fund raise.

### **Related Party Transactions**

We have in the past engaged, and in the future may engage, in related party transactions. For a description of our related party transactions, see the section entitled “*Related Party Transactions*” on page 253.

### **Seasonality**

Our business model is predominantly toll based and is subject to seasonality of traffic and toll revenue. Traffic volumes tend to increase at the beginning and end of holiday seasons, but decrease during the monsoon season and on the day of a holiday. The monsoon season may also restrict our ability to carry on activities related to our operation and maintenance of the Project SPVs. Such events may result in delays in periodic maintenance and reduce productivity, thereby materially and adversely affecting our business, financial condition and results of operations.

### **Unusual or Infrequent Events or Transactions**

Except as described in this Final Placement Memorandum, there have been no events or transactions to our knowledge which may be described as “unusual” or “infrequent”.

### **Total Turnover of each Major Industry Segment in which we operate**

We have one primary business segment, namely the road sector. For further information, please see the section entitled “*Industry Overview*” and “*Business*” on pages 150 and 168, respectively.

### **Known Trends or Uncertainties**

Other than as described in the section entitled “*Risk Factors*” on page 54 and this section entitled “*Discussion and Analysis by the Directors of the Investment Manager of the Financial Condition, Results of Operations and Cash Flows of the Project SPVs of the Highways Trust*” on page 223, to our knowledge there are no known trends or uncertainties that have or had or are expected to have a material adverse impact on our revenues or income from continuing operations.

### **Quantitative and Qualitative Disclosure about Market Risks**

The Project SPVs’ activities expose them to a variety of financial risks, including market risk, credit risk and liquidity risk. The Project SPVs’ primary risk management focus is to minimize potential adverse effects of market risk on its financial performance. The Project SPVs’ risk management assessment and policies and processes are established to identify and analyses the risks faced by the Project SPVs, to set appropriate risk limits and controls, and to monitor such risks and compliance with the same. Risk assessment and management policies and the Project SPVs’ board of directors have overall responsibility for the establishment and oversight of the Project SPVs’ risk management framework. This section presents information about the risks associated with their financial instruments, the Project SPVs’ objectives, policies and processes for measuring and managing risk, and the Project SPVs’ management of capital.

#### ***Credit Risk***

The Highways Trusts’ exposure to credit risk primarily relates to investments, accounts receivable and cash and cash equivalents. The Highways Trust monitors and limits its exposure to credit risk on a continuous basis.

#### ***Liquidity risk***

The Highways Trust is exposed to liquidity risk related to its ability to fund its obligations as they become due. The Highways Trust monitors and manages its liquidity risk to ensure access to sufficient funds to meet operational and financial requirements. The Highways Trust has access to credit facilities and debt capital markets and monitors cash balances daily. In relation to the Highways Trust’s liquidity risk, the Highways Trust’s policy is to ensure, as far as possible, that it will always have sufficient liquidity to meet its liabilities when due, under both normal and stressed conditions as they fall due while minimizing finance costs, without incurring unacceptable losses or risking damage to the Highways Trusts’ reputation.

## Significant Developments since March 31, 2022

Except as disclosed in this Final Placement Memorandum and except for the ordinary course of business of the Project SPVs, we are not aware of any circumstances that have arisen since March 31, 2022 that materially and adversely affect, or are likely to affect, our operations or profitability, the value of our respective assets, or our ability to pay our respective liabilities within the next twelve months.

The Highways Trust and the Investment Manager confirm that there has been no material change in the contingent liabilities since March 31, 2022, being the date of latest financial information included by way of the Audited Special Purpose Combined Financial Statements.

The Highways Trust and the Investment Manager confirm that there has been no material change in the capital and other commitments since March 31, 2022 being the date of latest financial information included by way of the Audited Special Purpose Combined Financial Statements.

The month-wise unaudited revenue for certain of the Project SPVs from the date of the latest financial statements included in this Final Placement Memorandum until the completed month before the filing of this Final Placement Memorandum has been provided below.

*(In ₹ million)*

Sr. No.	Project SPVs	April 2022	May 2022	June 2022	July 2022
1.	DBCPL	163.2	161.3	150.5	142.6
2.	GEPL	123.3	121.4	114.8	110.3
3.	UEPL	124.5	128.3	130.1	123.6
4.	JPEPL	56.8	54.5	52.2	51.4
5.	NBL*	21.1	28.4	24.0	23.3
6.	SEPL*	27.1	08.2	17.5	20.1

\*Revenue includes toll income and annuity income receipt. Revenue for annuity projects considered as per IndAS.

## Capitalization Statement

*(In ₹ million)*

	Pre issue as at March 31, 2022	Post issue as at March 31, 2022*
Non Current Borrowing	21,260.80	21,260.80
Current Borrowing	2,007.63	2,007.63
<b>Total Debt (A)</b>	<b>23,268.43</b>	<b>23,268.43</b>
Equity Share Capital***	3,200.95	-
Unit Capital**	-	41,550.00
Other Equity	(2,812.09)	-
<b>Total Equity (B)</b>	<b>388.86</b>	<b>41,550.00</b>
<b>Debt Equity Ratio (A/ (A+B))</b>	<b>59.84****</b>	<b>0.56</b>

\*As adjusted to reflect the number of Units to be issued pursuant to the Issue and proceeds from the Issue.

\*\*Including ₹4,160 million raised by way of fresh issue through private placement.

\*\*\*Being face value of equity shares of Project SPVs as on March 31, 2022.

\*\*\*\*Debt equity ratio is calculated by divided aggregate debt by face value of equity shares and reserves or face value of Units, as applicable

## RELATED PARTY TRANSACTIONS

In terms of Regulation 2(1)(zv) of the InvIT Regulations, related parties to the Highways Trust, shall be as defined as under the Companies Act, 2013 or under the applicable accounting standards and shall also include: (i) Parties to the Trust; and (ii) promoters, directors, and partners of the Parties to the Trust. Further, related parties also include such persons and entities as defined in terms of the applicable accounting standards, being Ind AS 24 on “*Related Party Disclosures*” (“**Related Parties**”) in relation to related party transactions. The Parties to the Trust, may, from time to time, enter into related party transactions, in accordance with applicable law.

### Procedure for dealing with Related Party Transactions

To ensure proper approval, supervision and reporting of the transactions between the Trust and its Related Parties, the board of directors of the Investment Manager has adopted the Policy in relation to Related Party Transactions and conflict of interests, pursuant to its resolution dated March 15, 2022, to regulate the transactions between the Trust and its Related Parties. The key terms of the RPT Policy are provided below:

- (i). In accordance with the InvIT Regulations, the Investment Manager will ensure that all future Related Party Transactions shall be:
  - (a). on an arm’s length basis;
  - (b). in accordance with the relevant accounting standards;
  - (c). in the best interest of the Unitholders;
  - (d). consistent with the strategy and investment objectives of the Trust; and
  - (e). compliant with applicable law including InvIT Regulations.
- (ii). Framework for approval of Related Party Transactions:
  - (a). All transactions with Related Parties shall be referred to the Audit and Risk Management Committee for prior approval.
  - (b). All Related Party transactions as approved by the Committee may be noted by the Board and the Related Party transaction that are not in ordinary course of business and/or not on arm’s length basis are mandatorily required to be approved by the Board at a duly constituted meeting. In addition, the following kinds of transactions with related parties will also be placed before the Board for its approval:
    - i. Transactions in respect of which the Committee is unable to determine whether or not they are in the ordinary course of business and/or at arm’s length basis and decides to refer the same to the Board for approval;
    - ii. Transactions which are in the ordinary course of business and at arm’s length basis, but which as per Committee requires Board approval.
  - (c). Every Material Related Party Transaction involving the Investment Manager (as defined under the policy) shall require approval of the shareholders except Related Party transaction that are in ordinary course of business and on arm’s length basis. Separately, all Related Party Transactions involving the Highways Trust which require approval from the unit holders under the terms of the InvIT Regulations shall be referred to the unit holders for approval.
- (iii). The Investment Manager will establish an internal control system so as to ensure that future InvIT Related Party Transactions are compliant with the InvIT Regulations and applicable accounting standards. The Investment Manager will convene meetings of the Unitholders in accordance with InvIT Regulations, and maintain records pertaining to such meetings in the manner prescribed under applicable law. The Investment Manager shall also ensure compliance with any additional guidelines issued in this regard by SEBI and other relevant regulatory or governmental authorities from time to time.

- (iv). In addition to any other requirement that may be prescribed in terms of the InvIT Regulations or other applicable laws, all InvIT Related Party Transactions to be entered into in the future will be.
  - (a) decided by a majority vote of the Board, including the vote of majority of independent directors after satisfying itself that the transactions are conducted in accordance with the parameters set out in the policy; and
  - (b) reviewed and approved by the Committee.
- (v). As a general rule, the Investment Manager must demonstrate to the Committee that future InvIT Related Party Transactions satisfy the criteria set out in in policy at the time of recommending the same for the approval of the Committee.
- (vi). The Investment Manager will maintain a register to record all InvIT Related Party Transactions entered into by the Trust and the basis on which they are entered into.
- (vii). The Investment Manager will also incorporate into its internal audit plan a review of all InvIT Related Party Transactions entered into by the Trust during each financial year.
- (viii). The Committee shall review at least quarterly in each financial year the InvIT Related Party Transactions entered into during such quarter to ascertain that the guidelines and procedures established to monitor the InvIT Related Party Transactions have been complied with.
- (ix). The review by the Committee will include the examination of the nature of the transaction and its supporting documents or such other data as may be deemed necessary by the Committee, including the following. Any member of the Committee who has a potential interest in any InvIT Related Party Transaction will recuse himself or herself and abstain from discussion and review of the InvIT Related Party Transaction.
- (x). While considering a InvIT Related Party Transaction, any Director of the Board who has a potential interest in any InvIT Related Party Transaction will recuse himself or herself and abstain from discussion and voting on the InvIT Related Party Transaction.

### ***Disclosure and Reporting***

- (i). InvIT Related Party Transactions shall be disclosed to the Trustee, stock exchanges and the Unitholders periodically, in accordance with the InvIT Regulations and the agreement to be entered into with the stock exchanges in relation to the listing of the Units. The Investment Manager shall adequately disclose the details of any fees or commissions received or to be received by any person or entity which is an associate of the Related Party to the stock exchanges.
- (ii). Related Party Transactions shall be disclosed: (a) in the offer document with respect to any such transactions entered into prior to the offer of units and any such proposed transactions subsequent to the offer; and (b) to the stock exchanges and the Unitholders periodically, in accordance with the InvIT Regulations and the agreements to be entered into with the stock exchanges in relation to the listing of the Units.
- (iii). In terms of the InvIT Regulations, the annual report to be submitted by the Investment Manager to all Unitholders, electronically or by physical copies, and to the stock exchanges within three months from the end of the financial year, shall contain, inter alia, details of all InvIT Related Party Transactions.

### **Related Party Transactions**

#### ***Present and On-going Related Party Transactions***

##### *Related Party Transactions of the Trust in relation to the setting up of the Trust and this Issue*

A number of present and on-going transactions with certain Related Parties have been, or will be, entered into in relation to the setting up of the Trust. The Trustee and the Investment Manager confirm that the following related

party transactions have been, or shall be, entered into, on an arm's length basis in accordance with the relevant accounting standards, in the best interest of the Unitholders, consistent with:

**(A) Securities Purchase Agreement**

Please see the section entitled "*Related Party Transactions – Acquisition of the Project SPVs by the Trust*" on page 258 for a description of the terms of the Securities Purchase Agreement.

**(B) Trust Deed**

Please see the section entitled "*Parties to the Highways Trust – Key Terms of the Trust Deed*" on page 103 for a description of the terms of the Trust Deed. The Trustee has received a sum ₹ 10,000 towards the initial settlement of the Trust from the Investment Manager.

**(C) Investment Management Agreement**

Please see the section entitled "*Parties to the Highways Trust – Key Terms of the Investment Management Agreement*" on page 117 for a description of the terms of the Investment Management Agreement.

**(D) Project Management Agreement**

Please see the section entitled "*Parties to the Highways Trust – Key terms of the Project Management Agreement*" on page 134 for a description of the terms of the Project Management Agreement.

The Securities Purchase Agreements, the Investment Management Agreement and the Project Management Agreement will take effect prior to the Allotment of Units.

**(E) Business Support Services Agreement**

The Project Manager shall enter into a business support services agreement with the Project SPVs and HC1, in relation to provision of certain services (*as defined hereinafter*) by HC1 to the Project SPVs (the "**Service Agreement**"). The key terms of the Service Agreement are specified below:

(i). **Appointment:**

The Project SPVs, in consultation with the Project Manager, in accordance with the Project Management Agreement has appointed HC1 (as the "**Service Provider**"), to provide services to the Project SPV for such fee as agreement in the Service Agreement.

(ii). **Provision of Services:**

- The Service Provider shall provide business support services to the Project SPVs, including but not limited to, (a) corporate accounting, banking and financing services in order to assist the Project SPVs to maintain appropriate financial records, (b) allowing registered office of the Project SPVs at the premises of the Service Provider and issuing the necessary NOC for all registrations required to be maintained using such address, (c) payroll management services, (d) assisting with corporate secretarial services, (e) direct and indirect tax compliance, (f) concession agreement and financing agreement management and taking steps for ensuring compliance with all the provisions thereof, (g) documentation or statutory compliance services, and (h) general monitoring and administration services (Collectively referred to as "**Services**").
- The Service Provider shall at all times perform, or use its commercially reasonable efforts to cause any third-party providers to perform, the Services in a manner that is at least consistent in scope, nature, quality standards, timeliness and operational, performance and technical specifications for a person or business providing services of such nature;
- Without the prior written consent of the Project Manager, the Service Provider shall not represent itself as the agent or the power of attorney holder of the Project SPV or the Project Manager before any authority and the Service Provider shall not take any action or decision on behalf of the Project SPV or the Project Manager vis-a-vis any third party,

unless specifically authorized by the Project SPV or the Project Manager, respectively, to do so; and

- The Project Manager and the Project SPVs agree that the Service Provider shall have the right to take (and consents to the Service Provider taking), such reasonable actions and decisions with respect to the Project SPVs and its affairs, as may be necessary in order to discharge the Services.

(iii). **Resources:**

The Service Provider agrees that it will, and/or will use commercially reasonable efforts to cause its third-party providers (to whom it has sub-contracted any of the Services) to, maintain such resources, systems, facilities and equipment throughout the term as are reasonably necessary to provide the Services in accordance with this Service Agreement.

(iv). **Performance of Services:**

- The Service Provider shall, and/or shall use its commercially reasonable efforts to cause its third-party providers to, provide the Services, (i) in a workmanlike manner and in accordance with the Scope of Services (*as defined in the Service Agreement*); (ii) in a standard and manner that is materially consistent (in nature, quality, degree of care, skill, diligence and scope) with market standards; and (iii) in compliance with applicable Laws, subject, in each case, to any limitations or restrictions imposed by or resulting from: (a) any change in scope (as agreed in writing by the parties from time-to-time during the services term); (b) any restrictions imposed on the Service Provider by applicable Laws that would directly influence the Service Provider's ability to provide the Services; and (c) the mutual written agreement of the parties.
- The Service Provider shall also be solely responsible for providing all the necessary compensations, payments, fees and statutory benefits to employees, consultants, contractors or agents, engaged by it to provide the Services (including for deployment as whole time key managerial personnel required to be engaged by the Project SPVs under Applicable Laws), unless agreed otherwise and as further specified in the Service Agreement.

(v). **Project Manager Supervision and Management Reporting:**

The Service Provider has acknowledged and agreed that it shall provide the Services under the overall supervision of the Project Manager and shall accept any instruction provided by the Project Manager in this regard. The Service Provider shall provide management reporting to Project Manager and the Project SPVs as may be mutually agreed between the Parties or otherwise may be required by the Project Manager or the Project SPVs for any reporting or compliances under Applicable Law.

(vi). **Third Party Licenses and Consents:**

The Service Provider shall keep and maintain in effect, all governmental or third-party licenses, consents or amendments required for the provision of the Services by the Service Provider in accordance with the terms hereof; provided, that, if, in using such efforts, the Service Provider is unable to obtain any such license, consent or amendment, the Service Provider shall promptly notify the Company and the Project Manager in writing and shall, and shall cause its Affiliates to, use reasonable best efforts to implement a commercially reasonable alternative arrangement, as specified in the Service Agreement.

(vii). **Covenants:**

- (a) The Service Provider shall at all times perform the Services strictly in accordance with the Service Agreement and applicable laws, and in carrying out the Services under the terms of the Service Provider, the Service Provider shall, amongst others:

- at all times act in good faith;
  - ensure compliance by the Project SPVs of all applicable laws, to the extent under the scope of services;
  - provide access to the Project Manager to all data and information pertaining to the Project SPVs, in a proper and timely manner as mutually agreed;
  - exercise the level of skill, care, attention and diligence as may reasonably be expected of an experienced, professional, prudent and competent third party skilled in providing the Services;
  - keeping the Project Manager informed on all matters which have or may have a material bearing on the operations of the Project SPVs;
  - keeping proper records of actions taken in respect of the Project SVs and upon request, with reasonable notice, by the Project Manager, whether during the term or after termination of the Service Agreement, at its own expense, make such records, available for inspection and audit (including copies and extracts of records as required) by the Project Manager;
  - complying with the instructions of the Project Manager, in accordance with the applicable laws.
- (b) The Service Provider has acknowledged that the Project Manager shall supervise the activities undertaken by the Service Provider in accordance with applicable laws and accordingly, the Service Provider shall accept instructions from the Project Manager and provide necessary information as required, to enable the Project Manager to perform such obligations in accordance with applicable laws.
- (c) The Service Provider shall provide to the Project Manager, all information that may be necessary for the Project Manager for making submissions to any governmental authorities or the 'Investment Manager' or 'Trustee' of the Highways Trust, including with respect to relevant approvals, consents and other documents required in relation to the Project SPVs and the reporting requirements under applicable laws, in a proper and timely manner, and in the format prescribed (if any), as required by the Project Manager.

(viii). ***Term and Termination:***

The Service Agreement shall remain valid and subsisting between the Parties until it is terminated by the parties (As specified below). The Service Agreement shall be terminated in accordance with the following:

- upon the mutual written agreement of the parties; or
- by any party, without cause, on providing a written notice of 90 (ninety) days-to the other party.

(ix). ***Indemnity:***

Each party shall indemnify, hold harmless, and defend the other party and/or such other party's affiliates from and against any and all costs and expenses that are incurred by such party or any of its affiliates as a result of the other party's breach of any of the terms of the Service Agreement.

**(F) Reimbursement Agreement**

The Investment Manager shall enter into a reimbursement agreement with HC1 in relation to reimbursement of certain costs (the “**Reimbursement Agreement**”). Pursuant to the Issue, certain costs which are usually to be incurred by the Investment Manager of the Trust, will be initially discharged by HC1 and subsequently be reimbursed by the Investment Manager. The key terms of the Reimbursement Agreement are specified below:

(i). **Reimbursement:**

- The Investment Manager on behalf of the Trust, has agreed and undertaken to reimburse HC1, for any third party costs and expenses (and excluding all employee related and internal costs of HC1), at actuals, that HC1 is requested to undertake from time to time, by the Investment Manager, solely in connection with the set-up of the Trust and/ or for the Issue (“**Costs**”), in the manner set out below, it being clarified that no amounts shall be considered ‘Costs’ unless incurred in connection with the set-up of the Trust and/ or the Issue, and requested to be undertaken by the Investment Manager, in writing.
- HC1 shall be entitled, to issue at the end of each month, issue a notice (via an email) to the Investment Manager for any Costs incurred by it (each such notice, a “**Reimbursement Notice**”). The Investment Manager shall, within 15 Business Days of the listing of the units issued pursuant to the Issue, deposit an amount equivalent to the undisputed portion of Costs plus Taxes and shall be subject to withholding of appropriate Taxes (if applicable) (“**Reimbursement Amount**”), via wire transfer of immediately available funds, in a bank account designated by HC1 in the relevant Reimbursement Notice(s). In case the Investment Manager disputes any portion of the Costs, such amounts shall be paid subject to resolution of the dispute in accordance with the Reimbursement Agreement.
- HC1 agrees that Reimbursement Notice(s) shall be accompanied by all relevant documents and information necessary for the Investment Manager to verify the Costs (including without limitation the engagement letters, invoices, requests from the Investment Manager and payment receipts), and further agrees to promptly provide, upon reasonable request by the Investment Manager, any further documentation to support the Costs, it has listed in the relevant Reimbursement Notice. Further, HC1 agrees that all the costs paid by it shall be subject to appropriate withholding of taxes (if applicable) and consequently, HC1 shall deposit such withheld taxes on or before the due date with the government treasury and furnish tax withholding certificates to the respective vendors on or before the due date.

(ii). **Term:** The Reimbursement Agreement shall remain valid and subsisting between the parties until mutually terminated in writing. Liabilities and obligations of the parties arising prior to termination of the Reimbursement Agreement shall not be affected by termination of such agreement.

**(G) InvIT Assignment Agreement**

As contemplated under the Securities Purchase Agreement the Sponsor and the Highways Trust (represented by the Trustee) will enter into an assignment agreement (“**Assignment Agreement**”). For further details the Assignment Agreement, please see the section entitled “*Related Party Transactions – Securities Purchase Agreement*” on page 258.

**Acquisition of the Project SPVs by the Trust**

**Securities Purchase Agreement**

Prior to the Allotment subject to the fulfilment of certain terms and conditions and in accordance with the InvIT Regulations, the Highways Trust, acting through its Trustee, proposes to acquire the shareholding of the Sponsor in the issued and paid-up equity share capital of each of the Project SPVs (“**Sale Shares**”) from the Sponsor and certain outstanding CCDS (“**Transferor CCDS**”, along with the Sale Shares referred to as the “**Transferor Securities**”) pursuant to the Securities Purchase Agreement (the “**SPA**”). Pursuant to Completion under the Securities Purchase Agreement, the Highways Trust will acquire 100% interest (directly or indirectly) in the

Project SPVs. As consideration for acquisition of the Sale Shares, the Highways Trust will allot such number of Units as mutually agreed in writing between the Sponsor and the Highways Trust, as specified in the SPA. Further, as consideration of the Transferor CCDS, Highways Trust shall allot such number of Units, or pay such amounts, or a combination of both, as may be agreed between the Highways Trust and the Sponsor, as specified in the SPA.

**The key terms of the SPA are specified below:**

**Transfer and Acquisition of Transferor Securities:** in accordance with the terms of the SPA, the Sponsor has agreed to sell the Sale Shares and the Transferor CCDS to the Highways Trust, together with all legal and beneficial interest and free and clear of all encumbrances (other than Permitted Encumbrances (as defined in the SPA), by way of a swap arrangement and for a cash consideration, on the terms and conditions set out in the SPA.

**Consideration:** The Highways Trust has agreed to issue and allot such number of Units as mutually agreed in writing between the Sponsor and the Highways Trust as consideration amount for the Sale Shares. In addition, the Highways Trust shall allot such number of Units, or pay such amounts, or a combination of both, as may be agreed between the Highways Trust and the Sponsor, as consideration amount for the Transferor CCDS, as specified in the SPA.

**Conditions Precedent:** The Sale Shares and Transferor CCDs will stand transferred to the Highways Trust subject to the satisfaction of the condition precedent as set out in the SPA, by the Sponsor and the Project SPVs to the satisfaction of the Highways Trust, such as that the Fundamental Warranties (as defined in the SPA) provided by the Sponsor and the Project SPVs under the SPA are true, accurate, correct, and complete in all material respects as on SPA Closing Date, (as defined below) other than as disclosed in the Placement Memorandum.

**Closing:** Closing shall occur within seven business days of the Highways Trust issuing a certificate confirming satisfaction of the conditions precedent or on such other date, as may be mutually agreed between the parties to the SPA (such date “**SPA Closing Date**”). On the SPA Closing Date, each of the Sponsor, Highways Trust and the Project SPVs shall deliver relevant instructions for the transfer of the respective Sale Shares and Transferor CCDS as specified in the SPA. Further, each of the Project SPV shall approve and take note of the transfer of the relevant Sale Shares and/or Transferor CCDS in its meeting of the board of directors.

**Post-Closing Actions:** On or after the SPA Closing Date, amongst other things, the Highways Trust shall take all necessary steps to ensure that necessary filings with the relevant governmental authorities are duly made in relation to the acquisition of the Sale Shares and Transferor CCDs by the Highways Trust including to record the name of the Highways Trust as the true, legal and beneficial owner of the Sale Shares and Transferor CCDS.

**Representations and Warranties:** The representations and warranties provided by the Sponsor, the Highways Trust, the Investment Manager and the Project SPVs, include, amongst others:

- due incorporation and valid existence;
- due authorisation for the consummation of the SPA;
- execution of the SPA and transactions contemplated in the SPA does not violate its charter documents, or material breach or violation of material contract or applicable law; and
- representations in relation to solvency.

Further, the Sponsor represents and warrants that as of the date of the signing of the SPA and the SPA Closing Date, amongst others, that:

- each of the Specified Agreements (as defined in the SPA), has been duly executed by the Sponsor, duly stamped, and is in full force and effect, and upon execution of the assignment deed, all rights and obligations under the Specified Agreements shall be legally transferred to and shall be enforceable against the parties thereto (including certain erstwhile seller indemnified parties specified in the SPA) by the Highways Trust without any further actions or prior approval from such indemnified parties. The Sponsor confirms that it is not subject to any deferred payment or consideration holdback obligations under the Specified Agreements or the Sale Agreements (as defined in the SPA);

- the Fundamental Warranties are true, accurate and not misleading. Further, the Sponsor extends to the Highways Trust the benefit of each of the warranties provided by the erstwhile sellers (as of dates to which they pertain as per the Specified Agreements) to the Sponsor under such agreements; and
- the consideration for the Sale Shares and the Transferor CCDS when issued under the SPA, (a) shall be duly authorised, validly issued, fully paid-up and free and clear of all encumbrances; and (b) shall provide clear and marketable title and rights to the Sponsor in respect thereof.

**Indemnity:**

- On and from the Closing Date (as defined in the Securities Purchase Agreement), the Sponsor will indemnify the Highways Trust (acting through its Trustee), the Investment Manager and the Project SPVs (if the Terra InvIT so requests) and their respective directors and employees (“**Indemnified Parties**”) from and against any and all losses actually suffered or incurred by the Indemnified Parties resulting from (i) any misrepresentation in or breach of any Fundamental Warranties (as defined in the Securities Purchase Agreement) of the Indemnifying Party; and (ii) any breach of any covenant or obligation of the Project SPV and/ or the Sponsor contained in the Securities Purchase Agreement which occurs on or prior to the Closing Date. The indemnification obligations of the Sponsor will be the exclusive monetary remedy available to the indemnified parties for any loss that they may suffer on account of any of the Indemnification Events (as defined in the Securities Purchase Agreement). Any indemnification payments or other payments made by the Sponsor shall be made subject to withholding or deduction of any tax, as may be required under applicable law. Further, the liability for any loss actually suffered or incurred will be limited to, amongst other limitations, 100% of the value of the Consideration Units (as defined in the Securities Purchase Agreement) as on the Closing Date and CCDs Consideration Cash (as defined in the Securities Purchase Agreement).
- The Sponsor will have the right to assign all its rights and obligations (including the right to make indemnity claims) under the Specified Agreements (as defined in the Securities Purchase Agreement) to the Highways Trust. On assignment by the Sponsor of all its rights and obligations under the Specified Agreements to the Highways Trust, then the Highways Trust shall make all indemnity claims (apart from the claims set out in point (i) above) directly against the IIF Indemnifying Party(ies) (as defined in the Securities Purchase Agreement and being the erstwhile sellers of the Project SPVs) under the Specified Agreements and will not have any recourse against the Sponsor in relation to such indemnity claims.

**Termination:** The SPA shall stand terminated by either of the parties to the SPA by (i) by mutual consent of the parties, (ii) by a notice in writing if closing does not take place by the long top date (as specified in the SPA); or (iii) automatically, in the event SEBI revokes the registration granted to the Highways Trust.

**InvIT Assignment Agreement**

As contemplated under the Securities Purchase Agreement the Sponsor and the Highways Trust (represented by the Trustee) will enter into an assignment agreement (“**Assignment Agreement**”), pursuant to which the Sponsor shall assign its rights and obligations under the Securities Purchase Agreement to the Highways Trust, subject to certain terms and conditions. Each of the parties to the Assignment Agreement have provided certain representations and warranties, which include, amongst others, (i) due incorporation and valid existence, (ii) due authorisation for the consummation of the Assignment Agreement, and (iii) execution of the Assignment Agreement and transactions contemplated therein do not violate (a) applicable law or the terms of any order or license issued by any governmental or regulatory authority; or (b) conflict with, or result in a breach under any agreement by which the party is bound and/or the constitutional documents of any party; or (c) require the consent of any third party, except as may be identified under the Assignment Agreement.

**Borrowings from Related Parties**

Depending upon market conditions and other considerations, the Highways Trust may infuse funds, by way of debt, into the Project SPVs in accordance with applicable law.

## **Potential Future Related Party Transactions**

Certain transactions may be entered with Related Parties in the future and the Trustee and the Investment Manager confirm that such related party transactions shall be, entered into, in compliance with the InvIT Regulations and the Related Party Transactions Policy. An indication of potential related party transactions is set out below:

Pursuant to letter March 22, 2022 dated issued by the Sponsor to the Highways Trust and the Investment Manager, the Sponsor has intimated that it has entered into the Sponsor SPA 1 and Sponsor SPA 2 for acquisition of (i) 100% equity share capital of five entities held by Ashoka Concessions Limited and/ or its affiliates; and (ii) 76% of the equity share capital of an asset held by India Infrastructure Fund II , respectively (the “**Target Assets**”). The consummation of the transactions contemplated under the Sponsor SPA 1 and Sponsor SPA 2 are subject to various conditions precedents specified thereunder. The Sponsor SPA 1 and Sponsor SPA 2 contain standard representations, warranties and indemnities from the relevant counterparties that are customary and appropriate for a transaction of such type and nature. The Sponsor may make available such Target Assets for acquisition to the Highways Trust in the future, whether directly or indirectly.

Additionally, in terms of the InvIT Regulations, any transactions between two or more InvITs with a common investment manager or sponsor, shall be deemed to be related party transactions. The Investment Manager is also the investment manager of the Virescent Renewable Energy Trust (“**Terra InvIT**”), an irrevocable trust set up under the Indian Trusts Act, 1882 and registered as an infrastructure investment trust under the InvIT Regulations on February 25, 2021, having registration number IN/InvIT/20-21/0018. Additionally, Terra Asia Holdings II Pte. Ltd., the Sponsor of the Terra InvIT is also an affiliate of our Sponsor. Accordingly, any transactions, between the Terra InvIT and the Highways Trust shall be considered as a related party transaction and shall be entered into in accordance with the Related Party Transactions Policy.

The Highways Trust may, directly or through the Investment Manager, avail advisory and/ or support services from Sponsor and/ or the affiliates of KKR and/ or the Sponsor which may be considered a related party to the Highways Trust.

## **Potential Conflicts of Interest**

The Investment Manager has established certain procedures to deal with conflict of interest issues. For further details on management of potential conflicts of interest, please see the section entitled “*Related Party Transactions – Procedure for dealing with Related Party Transactions*” on page 253.

## REGULATIONS AND POLICIES

*The following description is a summary of certain sector specific laws currently in force in India, which are applicable to the operations of the Highways Trust and the Project SPVs. The information detailed in this section has been obtained from statutes, regulations, sector-specific policies and publications available in the public domain. The description below may not be exhaustive, and is only intended to provide general information to Bidders and is neither designed as, nor intended to substitute, professional legal advice. The information in this section is based on the current provisions of applicable law that are subject to change or modification by subsequent legislative, regulatory, administrative or judicial decisions in India. For information regarding regulatory approvals obtained by the Project SPVs, please see the section entitled “Regulatory Approvals” on page 270.*

### **Laws Relating to the Business and Operations of the Highways Trust and the Project SPVs**

The regulatory framework in India in the highways sector, implemented on a public-private partnership (“PPP”) basis, mainly derives its source from the primary legislations of National Highways Authority of India Act, 1988 (the “NHAI Act”) and the National Highways Act, 1956 (the “NH Act”) enacted by the Indian parliament, each as amended or supplemented.

#### ***The National Highways Act, 1956***

The policy of the MoRTH, in implementing the NH Act, is to vest the MoRTH with the power to declare a national highway and for acquisition of land for this purpose. The GoI, by notification, can declare the intention to acquire any land for a ‘public purpose’ as envisaged by the law and such land can be used for the purposes of building, maintenance and operation of the declared national highways throughout the country. The NH Act prescribes the procedure for such land acquisition. The procedure includes, *inter alia*, a declaration of an intention to acquire, entering and inspecting such land, hearing of objections, a declaration of the acquisition and the power to take possession. The NH Act also provides for payment of compensation to owners and any other person whose right of enjoyment or ownership in the land has been affected. The NH Act vests MoRTH with the power to appoint a competent authority for the effective implementation of the NH Act and its policies. The said appointed authority retains the right and power to (a) survey, make any inspection, valuation or enquiry; (b) take levels; (c) dig or bore into sub-soil; (d) set out boundaries and intended lines of work; (e) mark such levels, boundaries and lines placing marks and cutting trenches; or (f) do such other acts or things as may be laid down by rules made in this behalf by that government. All the notified national highways shall vest in the name of the Union and for the purposes, shall include all lands appurtenant thereto and all the bridges, culverts, tunnels and other enlisted constructions under the said NH Act. The Central Government shall assume the responsibility of maintaining and construction of national highways in proper condition in accordance to the law. The Central Government also retains the right to levy fee over the services and benefits rendered in relation to the use of such national highways.

The GoI is responsible for the development and maintenance of national highways. However, it may direct that such functions may also be exercised by the government of a state in which the highway is located or by any officer or authority subordinate to the GoI or to the state government. Further, the GoI has the power to enter into an agreement with any person for the development and maintenance of a part or whole of the highway. Such person would have the right to collect and retain fees at such rates as may be notified by the GoI and will also have the powers to regulate and control the traffic, for proper management of the highway, in accordance with the provisions of the Motor Vehicles Act, 1988, as amended. The GoI also has the power to make rules for carrying out the purposes of the NH Act.

The National Highways (Amendment) Act, 2017, entails the competent authority to issue reports to the Central Government in respect of any land (either acquired or proposed to be acquired) which is, either under incorrect revenue record or which is not required due to change in geometry or alignment of the construction, to issue order for the de-notification of such land from the acquisition for development and maintenance of the national highway. In pursuance of the foregoing amendment to the statute, the National Highways Rules, 1957, have been amended to ensure the exercise of the power under the NH Act. These rules provide for periodic regulatory compliance and reporting standards to be followed by the competent authority in reporting to the Central Government.

#### ***The National Highways Authority of India Act, 1988***

The NHAI Act was enacted in pursuance of the powers of the Central Government for appointing a competent authority under the NH Act and provides for the constitution of an authority for the development, maintenance and management of national highways and for matters connected therewith or incidental thereto. In accordance with the NHAI Act, the GoI carries out development and maintenance of the national highways through NHAI. Subject to the provisions of the NHAI Act, the NHAI has the power to enter into and perform any contract

necessary for the discharge of its functions. The NHAI has the power to acquire any land to discharge its functions, and such acquired land will be deemed to be land needed for a 'public purpose'. The NHAI Act prescribes a limit in relation to the value of the contracts that may be entered into by NHAI. However, the NHAI may enter into contracts exceeding the specified value, on obtaining prior approval of the GoI. The NHAI Act provides that the contracts for acquisition, sale, or lease of immovable property on behalf of the NHAI cannot exceed a term of 30 years unless previously approved by the GoI. NHAI's objective is to ensure that all contract awards and procurements conform to the best industry practices with regard to transparency of process, adoption of bid criteria to ensure healthy competition in award of contracts. In accordance with the NHAI Act, the NHAI shall consist of a full time chairman, not more than 6 full time members and not more than 6 part time members who are being appointed by the Central Government. Additionally, various project implementation units headed by project director have been set at various sites to oversee timely completion of the projects.

In view of the challenging task of construction, development, and management of national highways being undertaken by NHAI, the Committee on Public Undertakings selected the subject "National Highways Authority of India (NHAI)" for comprehensive examination and report. The National Highways Authority of India (Amendment) Act, 2013, received the assent of the President of India on September 10, 2013, and aimed at increasing the institutional capacity of NHAI to help execute the powers delegated to it. National Highways Development Project ("NHDP") was launched in 1998 with the objective of developing roads of international standards which facilitate smooth flow of traffic. The NHDP envisages creation of roads with enhanced safety features, better riding surface, grade separator and other salient features.

As per the NHAI Works Manual, 2006, NHAI's mandate is the time and cost bound implementation of the NHDP. In an effort to attract private sector participation in the NHDP, the NHAI has issued model concession agreements ("MCAs") which have been formulated by Planning Commission of India or NITI Aayog and other departments of Central Government where a private entity, being the concessionaire, is, through an international competitive bidding process, awarded a concession (in form of a license) to build, own, operate and collect toll on a highway for a specified period of time. The concession to develop highway projects is given by the NHAI or other governmental authorities under various models of PPP like:

- (i) Build, Operate, Transfer (BOT)/ Design, Build, Finance, Operate and Transfer (DBFOT) – In this model, the entire designing, financing and construction is undertaken by the concessionaire at its own cost. The concessionaire is entitled to collect toll or receive annuity payments from the NHAI, as the case may be, during the concession period after the construction of the highway project. The bid for the project may either be selected basis the lowest grant wanted by the private developer from the NHAI or the highest premium the private developer is willing to pay to NHAI, in the form of additional concession fee. The concessionaire at the end of the concession period transfers the highway project to the NHAI (free of charge and clear of all encumbrances). The concessionaire's investment in the highway project is recovered directly through user fees collected by way of tolls. Under the BOT model, the projects which are generally not viable based on toll revenue alone, the NHAI or the relevant governmental authority provides concessionaire with a capital grant upto certain percentage of the project cost to increase the viability of projects and the quantum of such grant is determined on a case to case basis. For certain projects with high traffic volumes, concessionaire also offers a negative grant (i.e., premium) to the NHAI.
- (ii) Toll, Operate and Transfer (TOT) – In this model, the road projects which are in operational phase are awarded by the NHAI or relevant governmental authorities to the concessionaire. The NHAI passes on the toll collection rights and operation and maintenance obligations to the concessionaire against payment of upfront concession fees quoted by the concessionaire as a part of the bidding process.

The bidding for the projects takes place in two stages as per the process provided below:

1. in the qualification (RFQ) stage, the NHAI selects certain applicants on the basis of technical and financial expertise, prior experience in implementing similar projects and previous track record; and
2. in the proposal (RFP) stage, the NHAI invites financial bids from the applicants qualified at the RFQ stage on the basis of which the concession is awarded to the successful bidder by the NHAI for implementation of the project.

The GoI, under the Central Road and Infrastructure Fund Act, 2000 created a fund which is required to be utilized for the development and maintenance of national highways (the "Central Road Fund"). Section 18 of the NHAI Act also provides for the creation of a separate NHAI Fund. Any capital grant or aid received, loan taken, borrowing made, or any other sum received by the NHAI is credited to the NHAI Fund. Certain sources for

financing of the NHDP are through dedicated accruals under the Central Road Fund by levy of cess on fuel as well as involving the private sector and encouraging public private partnerships. The sources of finance available to the NHAI also include fund assistance from external funding agencies like the International Bank of Reconstruction and Development and the Asian Development Bank. NHAI's role encompasses involving the private sector in provision, maintenance, and operation of the national highways.

### ***Exit Policy***

The CCEA in May 2015 approved a comprehensive exit policy framework with the objective to mobilize funds in the market. In pursuance thereto, NHAI, vide Circular No. NHAI/1103/CGM(FA)/4/2015 dated June 9, 2015 permitted divestment of 100% equity by concessionaires/developers after two years of completion of construction to facilitate unlocking of funds for new infrastructure projects. The equity divested is required to be invested by promoters in their new projects. This comprehensive exit policy framework is expected to harmonize certain conditions across all concessions signed prior to 2009 with the policy framework for post 2009 contracts which permit divestment of equity up to 100%, two years after completion of construction. In line with the spirit of quoted circular, the NHAI issued another circular dated September 9, 2015 followed by the circular dated November 19, 2015, on the same subject, allowing the promoter to use the proceeds from the sale of divested equity of the concessionaire in one or more of the following:

- (i). to reinvest in incomplete NHAI projects;
- (ii). To reinvest any other highway projects;
- (iii).any other power sector projects; or
- (iv).to retire their debt to financial institutions in any other infrastructure projects.

### ***Rationalized Compensation***

The CCEA in November 2015 approved a policy for rationalized compensation to concessionaires for languishing national highway projects in BOT mode for delays that are not attributable to the concessionaires. Under the policy, the NHAI is authorized to allow an extension of the concession period for BOT (Toll) projects while the tenure for the operations period as envisaged originally in the concession agreement may remain unchanged which would result in a corresponding increase in concession period. The NHAI has also been authorised to pay compensatory annuities to the concessionaire corresponding to the actual period of delay that is not attributable to the concessionaire upon successful completion of the project.

### ***One Time Fund Infusion Scheme***

The CCEA in October 2015 gave its approval to the NHAI for a one-time infusion of funds with the purpose of reviving and physically completing stalled projects in the advanced stages of completion. As per the policy, the amount of funds required in each case shall be approved by NHAI on a case to case basis.

### ***Bidder Information***

MoRTH has developed the Bidder Information Management System (“**BIMS**”) to streamline the process of pre-qualification of bidders for EPC mode of contracts for all national highway works, with enhanced transparency and objectivity. BIMS works as a data base of bidder information that covers basic details, civil works experience, cash accruals and network, and annual turnover so that bidders' pre-qualification can be assessed based on evaluation parameters like threshold capacity and bid capacity from already stored data and the technical evaluation can be carried out in a faster manner.

### ***Land Acquisition***

While land is acquired for national highway projects under the NH Act, the Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013 (the “**Land Acquisition Act**”) must also be complied with. MoRTH has issued comprehensive guidelines on land acquisition for national highways taking into account the applicability of the Land Acquisition Act.

### ***Arbitral Awards***

CCEA on August 31, 2016 approved various measures to revive the construction sector. An office memorandum dated September 5, 2016 was issued by the National Institute for Transforming India with certain proposals. On

November 20, 2019, the CCEA approved certain proposals in relation to the arbitrations by or against government entities, for the effective implementation of the CCEA's decision on August 31, 2016 on its initiatives to revive the construction sector. Initially, the CCEA had approved the proposal that government agencies will be required to pay 75% of the arbitral award to the concessionaire against a bank guarantee, in cases where the award already announced is challenged. However, pursuant to a press release dated November 20, 2019, the CCEA approved, inter-alia, that where a government entity has challenged an arbitral award, resultant of which the amount of the arbitral award has not been paid, 75% of such award will be paid by the government entity to the contractor or the concessionaire against a bank guarantee only for the said 75% and not for its interest component. In relation to interest payable to the government entity, if a subsequent court order required the refund of 75% of the amount, the payment of such amounts will be required to be made as per the court orders.

### ***Applicable Rules***

As per the NH Act and the NHAI Act, the Central Government is empowered to make rules in order to further the objects of NH Act and NHAI Act. In exercise of such power, the Central Government has framed certain rules which are as follows:

- The National Highways Rules, 1957, as amended;
- National Highways Authority of India (Budget, Accounts Audit, Investment of Funds and Powers to enter Premises) Rules, 1990, as amended;
- The National Highways (Manner of Depositing the Amount by the Central Government with Competent Authority for Acquisition of Land) Rules, 1998;
- The National Highways Tribunal (Procedure for Appointment as Presiding Officer of the Tribunal) Rules, 2003, as amended;
- The Central Road Fund (State Roads) Rules, 2007;
- The National Highways Tribunal (Procedure) Rules 2003;
- National Highways Authority of India (The Term of Office and Other Conditions of Service of Members) Rules, 2003, as amended;
- The National Highways Tribunal (Financial and Administrative Powers) Rules, 2004;
- The National Highways Tribunal (Procedure for Investigation of Misbehaviour or Incapacity of Presiding Officer) Rules, 2003;
- The National Highways Fee (Determination of Rates and Collection) Rules, 2008, as amended;
- The Highway Administration Rules, 2004;
- The National Highways (Collection of Fees by any person for the use of Section of National Highways/Permanent Bridges/Temporary bridge on National Highways) Rules, 1997;
- The National Highways (Fee for the use of National Highways and Permanent Bridge public Funded Project) Rules, 1997; and
- The National Highways (Rate of Fee) Rules, 1997.
- Construction Workers (Regulation of Employment and Conditions of Services) Act, 1996 and Central Rule, 1998
- C.E.A. (Measures Relating to Safety and Electric Supply) Regulations, 2010
- Central Electrical Authority (Measures Relating to Safety and Electric Supply) Regulations, 2020
- Indian Electricity Rules, 1956

### ***Environmental Compliances and Regulations***

Infrastructure projects must also ensure compliance with environmental legislations such as the Water (Prevention and Control of Pollution) Act, 1974 ("**Water Pollution Act**"), the Air (Prevention and Control of Pollution) Act, 1981 ("**Air Pollution Act**") and the Environment Protection Act, 1986 ("**Environment Act**", together with the Water Pollution Act and the Air Pollution Act, the "**Environment Protection Acts**"). The Water Pollution Act aims to prevent and control water pollution. This legislation provides for the constitution of a central pollution control board ("**Central Pollution Control Board**" or "**CPCB**") at the Central level and state pollution control boards ("**State Pollution Control Boards**" or "**SPCBs**", together with the Central Pollution Control Board, the "**PCBs**") at the State levels. The functions of the CPCB includes, among other things, coordination of activities of the SPCBs, collecting data relating to water pollution and the measures devised for the prevention and control of water pollution and prescription of standards for streams or wells. The SPCBs are responsible for, among other things, the planning for programmes for prevention and control of pollution of streams and wells, collecting and disseminating information relating to water pollution and its prevention and control, inspection of sewage or trade effluents, works and plants for their treatment and to review the specifications and data relating to plants set up

for treatment and purification of water, laying down or annulling the effluent standards for trade effluents and for the quality of the receiving waters, and laying down standards for treatment of trade effluents to be discharged. These authorities issue consent to establish and consent to operate which are to be required to be renewed periodically. These authorities also have the power of search, seizure and investigation if the authorities are aware of or suspect violation of such regulations. This legislation prohibits any person from establishing any industry, operation or process or any treatment and disposal system, which is likely to discharge trade effluent into a stream, well or sewer, or bring into use any new or altered outlet for discharge of sewage, or begin to make any new discharge of sewage without taking prior consent of the SPCBs.

In context of the environmental compliances and regulations, the National Green Tribunal Act, 2010 (the “**NGT Act**”) is an important legislation which provides for the establishment of a National Green Tribunal (“**NGT**”) for the effective and expeditious disposal of cases relating to environmental protection and conservation of forests and other natural resources including enforcement of any legal right relating to environment and giving relief and compensation for damages to persons and property and for matters connected therewith or incidental thereto. In accordance with the Forest (Conservation) Act, 1980, state governments are not permitted to make any order directing the use of forest land for a non-forest purpose, or assignment of any forest land through lease or otherwise to any private person or corporation without the approval of the GoI. The Ministry of Environment, Forest and Climate Change (“**MoEF**”) mandates the Environment Impact Assessment (“**EIA**”) must be conducted for specified projects. In the process, the MoEF receives proposals or the setting up of projects and assesses their impact on the environment before granting clearances to the projects. The EIA Notification S.O. 1533, issued on September 14, 2006 (the “**EIA Notification**”) and amended from time to time, under the provisions of the Environment Protection Act, prescribes that new construction of specified projects require prior environmental clearance from the MoEF. The environment clearance must be obtained from MoEF according to the procedure specified in the EIA Notification. No construction work or preparation of land by the project management except for securing the land, relating to the setting up of a specified project can be undertaken until such clearance is obtained. Under the EIA Notification, the environmental clearance process for new projects consists of four stages – screening, scoping, public consultation and appraisal. After completion of public consultation, the applicant is required to make appropriate changes in the draft ‘EIA Report’ and the ‘Environment Management Plan.’ The final EIA Report has to be submitted to the concerned regulatory authority for appraisal. The regulatory authority is required to give its decision within 105 days of the receipt of the final EIA Report. The EIA Guidance Manual for Highways, 2010 explains the four stages of the environmental clearance process and the contents of the EIA Report required to be submitted by highway projects.

#### ***Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016***

The Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016, impose an obligation and duty on the owners and operators of any facility or industry with a capability to create hazardous materials to safely dispose of such material in transport and other means of collecting and storing. Each occupier and operator of any facility generating hazardous waste is required to obtain an approval from the relevant state pollution control board for collecting, storing and treating the hazardous waste.

#### ***Green Highways (Plantation, Transplantation, Beautification and Maintenance) Policy, 2015***

In September 2015, MoRTH has launched Green Highways (Plantation, Transplantation, Beautification and Maintenance) Policy, 2015, which will require road developers to earmark 1% of a project’s total cost for planting of trees and shrubs along the national highways. Under this policy, the maintenance of such plantations will be outsourced through a bidding process to plantation agencies. MoRTH/NHAI will appoint the authorized agency for empanelment of such plantation agencies. ***Public Liability Insurance Act, 1991***

The Public Liability Insurance Act, 1991 (the “**Public Liability Act**”), imposes liability on the owner or controller of hazardous substances for any damage arising out of an accident involving such hazardous substances. A list of ‘hazardous substances’ covered by the legislation has been enumerated by the GoI by way of a notification. The owner or handler is also required to take out an insurance policy insuring against liability under the legislation. The rules made under the Public Liability Act mandate that the employer has to contribute towards the Environment Relief Fund, a sum equal to the premium paid on the insurance policies. This amount is payable to the insurer.

#### **Other applicable law**

##### ***The Motor Vehicles Act, 1988***

The development, maintenance and management as well as control of the National Highways are regulated by the NH Act and the NHAI Act. Under the Motor Vehicles Act, 1988, some powers have been delegated to the

Transport Department of the State Governments. Section 138 of the Motor Vehicles Act, 1988 further empowers the State Governments to make rules for the control of traffic, including for the purpose of the removal and the safe custody of vehicles including their loads which have broken down or which have been left standing or have been abandoned on roads; the installation and use of weighing devices; the maintenance and management of wayside amenities complexes; the exemption from all or any of the provisions of relating to fire brigade vehicles, ambulances and other special classes or descriptions of vehicle, subject to such conditions as may be prescribed; the maintenance and management of parking places and stands and the fee, if any, which may be charged for their use; prohibiting the taking hold of or mounting of a motor vehicle in motion; prohibiting the use of foot-paths or pavements by motor vehicles, generally, the prevention of danger, injury or annoyance to the public or any person, or of danger or injury to property or of obstruction to traffic. The Motor Vehicles (Amendment) Act, 2019 is targeted towards bringing changes in the transport sector to encourage safer driving practices among Indian motor vehicle drivers. The draft for the amendment was put forward in the lower house of the Parliament, with a proposal to impose strict fines on the violators of traffic rules. The Act proposes to create a National Road Safety Board to be created by the Central Government through a notification. The Board will advise the Central and State governments on all aspects of road safety and traffic management.

### ***Indian Trusts Act, 1882***

The Indian Trusts Act, 1882 (“**Trusts Act**”) governs all private trusts in India. The Trusts Act sets out the purpose for which private trusts can be established, the manner in which they may be created, executed and extinguished. The person creating a trust under the Trusts Act is the author of such trust, the person to whom the author grants the power and authority to regulate the trust is the trustee and the persons for whose benefit such trust has been created are the beneficiaries of such trust. The Trust Act sets out the rights, duties, liabilities and powers of the trustees and the beneficiaries *vis-a-vis* the trust. The Trust has been settled in accordance with the provisions of the Trusts Act.

### ***Control of National Highways (Land and Traffic) Act, 2002***

The Control of National Highways (Land and Traffic) Act, 2002 (the “**Control of NH Act**”) provides for control of land within national highways, right of way and traffic moving on national highways and also for removal of unauthorised occupation thereon.

In accordance with the provisions of the Control of NH Act, the Central Government has established Highway Administrations. Under the Control of NH Act, all land that forms part of a highway which vests in the Central Government, or that which does not already vest in the Central Government but has been acquired for the purpose of highways shall be deemed to be the property of the Central Government. The Control of NH Act prohibits any person from occupying any highway land or discharging any material through on such land without the permission of the Highway Administration or any officer authorised by such administration. The Control of NH Act permits the grant of lease and license for use of highway land for temporary use.

### ***Indian Tolls Act, 1851***

In accordance with the Indian Tolls Act, 1851 (the “**Tolls Act**”), the state governments have been vested with the power to levy tolls at such rates as they deem fit, to be levied upon any road or bridge, made or repaired at the expense of the Central or any state government. The tolls levied under the Tolls Act, are deemed to be ‘public revenue’ and the collection of tolls can be placed under any person the State governments’ deem fit. Such persons are enjoined with the same responsibilities as if they were employed in the collection of land revenue. Further, all police officers are bound to assist the toll collectors when required in the implementation of the Tolls Act. The Tolls Act further gives power for recovery of toll and exempts certain category of people from payment of toll.

### ***National Highways Fee (Determination of Rates and Collection) Rules, 2008***

The National Highways Fee (Determination of Rates and Collection) Rules, 2008 (the “**NH Fee Rules**”), regulates the collection of fee for the use of national highways. In accordance with the NH Fee Rules, the GoI may, by a notification, levy fee for use of any section of a national highway, permanent bridge, bypass or tunnel forming part of a national highway, as the case may be. However, the GoI may, by notification, exempt any section of a national highway, permanent bridge, bypass or tunnel constructed through a public funded project from levy of such fee. The NH Fee Rules supersede the National Highways (Temporary Bridges) Rules, 1964, the National Highways (Collection of Fees by any Person for the Use of Section of National Highways/ Permanent Bridge/ Temporary Bridge on National Highways) Rules, 1997, the National Highways (Fees for the use of National Highways Section and Permanent Bridges Public Funded Project) Rules, 1997 and the National Highways (Rate of Fees) Rules, 1997 other than in respect of things done or omitted to be done under such rules prior to supersession. The NH Fee Rules do not apply to agreements and contracts executed or bids invited prior to the

publication of such rules i.e. prior to December 5, 2008. The collection of fee in case of a public funded project shall commence within 45 days from the date of completion of the project. The NH Fee Rules further provide for the base rate of fee applicable for the use of a section of the national highway for different categories of vehicles and the fees collected by the executing authority shall be remitted to the GoI. However, the GoI may, by notification, allow any or all of the executing authorities to appropriate the whole, or part of such fees for purposes as may be specified.

FASTag lanes on fee plazas is an initiative of the GoI in which there is an exclusive lane in the fee plaza for movement of vehicles fitted with FASTag. The FASTag is a device which is fitted on the front windscreen of vehicles to indicate online toll payment. The amended NH Fee Rules impose a penalty equivalent to two times the fee applicable if a vehicle not fitted with FASTag enters the exclusive FASTag lane. However, in case a user is unable to pay, due to malfunctioning electronic toll collection infrastructure, the user will be permitted to pass the fee plaza without payment. The NH Fee rules were also amended to provide that the driver or owner of a mechanical vehicle which is loaded in excess of permissible load specified for its category, (i) shall be liable to pay fee at such rate which is applicable for the next higher category of mechanical vehicles, and (ii) Payment of such fee shall not entitle the driver or owner, to use the national highway until the excess load has been removed from such mechanical vehicle. . However, in case no weighbridge has been installed at the toll plaza, no fee for overloading shall be levied.

### ***The National Highways Rules, 1957 (the “NH Rules”)***

The NH Rules provide that in situations where the estimate cost of the execution of any original work on a national highway exceeds ₹ 1,000,000, a detailed estimate of the cost is to be forwarded to the GoI. An application for allotment of funds for meeting expenditure on an original work on a national highway must also be made to the GoI. The executing agency of the highway is required to furnish monthly progress reports and a completion report on the conclusion of the work. The NH Rules also give the consulting engineer of the GoI the right to inspect the work while it is in progress or after completion. Provisions under the Constitution of India and other legislations in relation to collection of toll Entry 59, List II of Schedule VII read with Article 246 of the Constitution of India vests state governments with the power to levy tolls. Further, in accordance with the Tolls Act, state governments have been vested with the power to levy tolls at such rates as they deem fit.

### **Foreign Investment Regulations**

Foreign investment in Indian securities is governed by the provisions of the FEMA, read with the applicable FEMA Rules, the FEMA (Mode of payment and Reporting of Non-Debt Instruments) Regulations, 2019 and the consolidated FDI Policy issued by the Department for Promotion of Industry and Internal Trade, Ministry of Commerce and Industry, Government. Foreign investment is permitted (except in the prohibited sectors) either through the automatic route or the approval route, depending upon the sector in which foreign investment is sought to be made. Under the FEMA Rules and the current consolidated FDI Policy, effective from October 15, 2020, an infrastructure investment trust registered and regulated by the SEBI under the InvIT Regulations, being an ‘investment vehicle’, is permitted to receive foreign investment from a person resident outside India (subject to Press Note 3 (2020 series)), including an FPI or an NRI subject to the terms and conditions specified in the FEMA Rules.

Downstream investment by an infrastructure investment trust shall be regarded as indirect foreign investment if neither the sponsor nor the investment manager of such an infrastructure investment trust is Indian ‘owned and controlled’ as defined in FEMA Rules.

Downstream investment by an ‘investment vehicle’ shall have to conform to the sectoral caps and conditions/restrictions, if any, as applicable to the company in which the downstream investment is made as per the FDI Policy. Foreign investment of up to 100% through the automatic route is permitted in the infrastructure sector in India. An infrastructure investment trust that receives foreign investment shall be required to make such report and in such format to the RBI or to the SEBI as may be prescribed by them from time to time.

The payment for the units of an infrastructure investment trust acquired by a person resident or registered/incorporated outside India shall be made by an inward remittance from abroad through banking channels or by way of swap of shares of an SPV, or out of funds held in a Non-resident External (“NRE”) or Foreign Currency Non-resident Bank (“FCNR(B)”) account maintained in accordance with the Foreign Exchange Management (Deposit) Regulations, 2016.

Further, any person who is a non-resident and holds units of an infrastructure investment trust in accordance with the FEMA Rules may pledge such units (i) in favour of a bank in India to secure the credit facilities being extended to the Indian company for bona fide purposes; (ii) in favour of an overseas bank to secure the credit facilities

being extended to the person, or a person resident outside India who is the promoter of the Indian company or the overseas group company of the Indian company; (iii) in favour of a Non-Banking Financial Company registered with the RBI to secure credit facilities being extended to the Indian company for bona fide purposes; and (iv) subject to the authorized dealer bank satisfying itself of the compliance of the conditions stipulated by the RBI in this regard.

### ***Other Laws and Regulations***

In addition to the aforementioned, the other laws and regulations that may be applicable to the Highways Trust and the Project SPVs include the following:

- *Factories Act, 1948\**
- *The Contract Labour (Regulation and Abolition) Act, 1970\**
- *The Child Labour (Prohibition and Regulation) Act, 1986*
- *The Employees' Compensation Act, 1923\*\**
- *The Employees' State Insurance Act, 1948\*\**
- *The Employee's Provident Fund and Miscellaneous Provisions Act, 1952\*\**
- *The Equal Remuneration Act, 1976\*\*\**
- *The Maternity Benefit Act, 1961\*\**
- *The Minimum Wages Act, 1948\*\*\**
- *The Payment of Gratuity Act, 1972\*\**
- *The Payment of Bonus Act, 1965\*\*\**
- *The Payment of Wages Act, 1936\*\*\**
- *The Sexual Harassment of Women at Workplace (Prevention, Prohibition, and Redressal) Act, 2013*
- *Industrial Disputes Act, 1917*
- *Shops and Commercial Establishments Acts, where applicable*

*\*The Occupational Safety, Health and Working Conditions Code, 2020 (enacted by the Parliament of India and assented to by the President of India on September 28, 2020) will come into force on such date as may be notified in the official gazette by the Central Government and different dates may be appointed for different provisions of the Occupational Safety, Health and Working Conditions Code, 2020. Once effective, it will subsume, inter alia, the Factories Act, 1948 and the Contract Labour (Regulation and Abolition) Act, 1970.*

*\*\*The Code on Social Security, 2020 (enacted by the Parliament of India and assented to by the President of India on September 28, 2020) has been notified to the extent of Section 142 of the Code and will come into force in its entirety on such date as may be notified in the official gazette by the Central Government and different date may be appointed for different provisions of the Code on Social Security, 2020. Once effective, it will subsume, inter alia, the Employees' Compensation Act, 1923, the Employees' State Insurance Act, 1948, the Employee's Provident Fund and Miscellaneous Provisions Act, 1952, the Maternity Benefit Act, 1961 and the Payment of Gratuity Act, 1972.*

*\*\*\*The Code on Wages, 2019 (enacted by the parliament of India and assented to by the President of India on August 8, 2019) was notified in the official gazette by the Central Government on September 28, 2020 to the extent of the rules governing the constitution and functions of the central advisory board under the Code on Wages once notified and effective in its entirety, it will subsume the Equal Remuneration Act, 1976, the Minimum Wages Act, 1948, the Payment of Bonus Act, 1965 and the Payment of Wages Act, 1936.*

In addition to the above, compliance with the provisions of various tax-related legislations, intellectual-property related legislations and other applicable law for our day-to-day operations is also required.

## REGULATORY APPROVALS

*Provided below are the material approvals, consents, licenses, registrations and permissions from the government, various governmental agencies and other statutory and/or regulatory authorities with which the Highways Trust can undertake the Issue and the Highways Trust and the Project SPVs can undertake their respective current business activities, as applicable. Unless otherwise stated, these approvals are valid as of the date of this Final Placement Memorandum. In the event that any of the approvals and licenses that are required for the Project SPVs' business operations expire in the ordinary course of business, the relevant Project SPV will apply for such renewal from time to time. For details in connection with the regulatory and legal framework within which the Highways Trust and the Project SPVs operate, please see the section entitled "Regulations and Policies" on page 262.*

### **A. Approvals in relation to the Issue**

1. Resolutions dated March 22, 2022 and March 24, 2022, passed by the board of directors and InvIT committee of the Investment Manager respectively in relation to the Issue and other incidental matters.
2. In-principle listing approval from NSE dated April 27, 2022 and addendum to in-principle approval extending the in-principle approval by three months, dated July 15, 2022.

### **B. Approvals in relation to the Highways Trust**

1. Certificate of registration dated December 23, 2021 bearing registration number IN/InvIT/21-22/0019 issued by SEBI under Regulation 3 of the InvIT Regulations, for registration of the Highways Trust as an infrastructure investment trust.
2. The Project SPVs have received approvals from their respective Concessioneing Authorities in relation to the transfer of their 100% shareholding from Galaxy Investments II Pte. Ltd. to the Highways Trust. The approvals in that respect have been received from (i) NHAI in respect of four Project SPVs namely, UEPL, NBL, SEPL and GEPL, (ii) MPRDC in respect of one Project SPV namely, DBCPL; and (ii) PWD (R) in respect of one Project SPV namely, JPEPL.

### **C. Material Business Approvals in Relation to the Project SPVs**

#### ***I. JPEPL***

1. Completion certificate dated March 8, 2018 issued by Office of the Project Director Cum Superintending Engineer, PWD, NH Circle, Jodhpur certifying March 8, 2018 as the date of commencement of commercial operations of the project highway.
2. Registration certificate dated November 25, 2014 under the provisions of the Contract Labour (Registration and Abolition) Act, 1970 valid until November 24, 2022.
3. Registration certificate dated December 20, 2019 under the provisions of the Building and other Construction Workers (Regulation of Employment and Condition of Service) Central Rules, 1996.
4. Permission dated July 8, 2021 under Regulation 32 of the C.E.A. (Measures Relating to Safety and Electric Supply) Regulations, 2010 for energization of DG sets.

#### ***II. DBCPL***

1. Provisional completion certificate dated February 10, 2009 issued by MPRDC certifying February 10, 2009 as the date of commencement of commercial operations of section one of the project highway.
2. Completion certificate dated August 7, 2009 issued by MPRDC certifying June 27, 2009 as the date of completion of commercial operations of section one of the project highway.
3. Provisional completion certificate dated September 17, 2009 issued by MPRDC certifying September 17, 2009 as the date of commencement of commercial operations of section two of the project highway.

4. Completion certificate dated February 3, 2010 issued by MPRDC certifying December 15, 2009 as the date of completion of commercial operations of section two of the project highway.
5. Provisional completion certificate dated April 30, 2009 issued by MPRDC certifying April 30, 2009 as the date of commencement of commercial operations of section three of the project highway.
6. Completion certificate dated September 23, 2010 issued by MPRDC certifying August 12, 2010 as the date of completion of commercial operations of section three of the project highway.
7. Environmental clearance dated January 31, 2007 issued by the MOEFCC for the widening and strengthening of existing 2 lane SH-18 Sehere bypass to Dewas bypass.
8. Consents to establish dated August 2, 2019 issued by the Madhya Pradesh Pollution Control Board under the provisions of the Air (Prevention & Control of Pollution) Act, 1981 in relation to the Amlaha Toll Plaza and the Phanda Toll Plaza.
9. License dated January 5, 2022 issued by the Office of Licensing Officer, Government of Madhya Pradesh, under the provisions of the Contract Labour (Regulation and Abolition) Act, 1970, valid until December 31, 2022.
10. Approval to install a DG set dated June 7, 2012 issued by Office of Executive Engineer, Electrical Safety and Divisional Electrical Inspector, Madhya Pradesh, Government, under the provisions of the Electricity Act, 2003, Indian Electricity Rules, 1956 and Madhya Pradesh Electricity Charges Act, 1949.
11. No Objection Certificates for ground water abstraction issued by the Government of India, Ministry of Jal Shakti, Department of Water Resources, River Development & Ganga Rejuvenation Central Ground Water Authority.

### ***III. UEPL***

1. Provisional completion certificate dated July 22, 2009 issued by Intercontinental Consultants and Technocrats Pvt. Ltd. certifying July 23, 2009 as the date of commencement of commercial operations of the project highway.
2. Completion certificate dated August 4, 2016 issued by CDM Smith India Private Limited certifying completion of commercial operations of the project highway.
3. Environmental clearance dated June 13, 2005 issued by the MOEFCC for the national highway development projects- 4 lane and strengthening of the NH-45 from km 121 (Tindivanam) to km 325 (Trichy bypass end) section in Tamil Nadu.
4. Consent to establish dated October 30, 2018 issued by the Tamil Nadu Pollution Control Board under the provisions of the Air (Prevention & Control of Pollution) Act, 1981, valid until March 31, 2023.
5. Consent to establish dated October 30, 2018 issued by the Tamil Nadu Pollution Control Board under the provisions of the Water (Prevention & Control of Pollution) Act, 1974, valid until March 31, 2023.
6. Certificate of registration dated December 10, 2019 issued by the Ministry of Labour and Employment under the provisions of the Building and Other Construction Workers (Regulation of Employment and Conditions of Services) Act, 1996 and Central Rule, 1998, valid until December 31, 2027.
7. Certificate dated June 22, 2022 for registration of captive generating plant issued by the Electrical Inspectorate, Government of Tamil Nadu, valid until June 22, 2025.
8. Fire service license dated September 27, 2021 issued by the Tamil Nadu Fire and Rescue Service Department under the provisions of the Tamil Nadu Fire and Rescue Service Act, 1985, valid for one year from the date of issue.

#### **IV. GEPL**

1. Provisional certificates dated (i) October 31, 2013 and (ii) September 25, 2015, issued by Intercontinental Consultants and Technocrats Pvt. Ltd. in relation to commencement of commercial operations of the project highway.
2. Completion certificate dated June 29, 2016 issued by MSV International Inc. certifying June 29, 2016 as the date of completion of commercial operations of the project highway.
3. Environmental clearance dated June 3, 2009 issued by the MOEFCC for widening and strengthening of existing 2 lane to 4/6 lane from Ahmedabad, Gujarat to the Madhya Pradesh/Gujarat border.
4. Environmental clearance dated June 3, 2009 issued by the MOEFCC for widening and strengthening of NH-59 Ahmedabad Gujarat/Madhya Pradesh Border to 4 lane in favour of NHAI in Panchmehal and Dahod District of Gujarat.
5. License dated February 7, 2022 issued by the Office of the Deputy Chief Labour Commissioner (Central) under the provisions of the Contract Labour (Registration and Abolition) Act, 1970, valid until February 27, 2023.
6. Approval to install a DG set dated March 12, 2018 issued by Office of the Electrical Inspector under the provisions of the Central Electrical Authority (Measures Relating to Safety and Electric Supply) Regulations, 2020.
7. Certificate of verification of weights, measures, etc. issued by the Office of the Controller, Legal Metrology, Gujrat State dated April 11, 2022 bearing stamping certificate (2285633/DAH/2022/01).
8. No Objection Certificates for ground water abstraction issued by the Government of India, Ministry of Jal Shakti, Department of Water Resources, River Development & Ganga Rejuvenation Central Ground Water Authority.

#### **V. NBL**

1. Provisional completion certificate dated July 22, 2009 issued by Aarvee Associates certifying July 22, 2009 as the date of commencement of commercial operations of the project highway.
2. Completion certificate dated October 3, 2018 issued by MSV International Inc. certifying completion of commercial operations of the project highway.
3. Environmental clearance dated June 11, 2007 issued by the MOEFCC for widening and strengthening of existing 2 lane to 4/6 lane from MH/AP border to Armur in Nagpur-Hyderabad section of NH7.
4. Registration certificate of establishment dated December 1, 2021 issued by the Labour Department, Government of Telangana under the provisions of the Shops and Establishments Act, valid until December 31, 2022.
5. Certificate for installation of a DG set dated September 8, 2009 issued by Government of Andhra Pradesh, Electrical Inspectorate under the provisions of the Indian Electricity Rules, 1956.
6. No Objection Certificate for ground water for construction of bore wells in the premises of toll plaza office, Gamjal, Nirmal district issued by the Government of Telangana, Ground Water Department dated June 19, 2020.

#### **VI. SEPL**

1. Provisional completion certificate dated July 12, 2013 issued by URS Scott Wilson India Pvt. Ltd. certifying March 25, 2013 as the date of commencement of commercial operations of the project highway.

2. Completion certificate dated March 30, 2017 issued by Feedback Infra Private Limited certifying March 30, 2016 as the date of commencement of commercial operations of the project highway.
3. License dated July 26, 2021 issued by Office of the Deputy Chief Labour Commissioner (Central) under the provisions of the Contract Labour (Registration and Abolition) Act, 1970, valid until August 9, 2022.
4. Provisional approval for installation of a DG set dated July 30, 2021 issued by Government of Meghalaya, Inspectorate of Electricity under the provisions of the Central Electrical Authority (Measures Relating to Safety and Electric Supply) Regulations, 2020, valid until July 29, 2022.

**J. Approvals applied for, but not yet received**

As of the date of this Final Placement Memorandum, except as disclosed below, there are no approvals required to be obtained by the Highways Trust and the Project SPVs, for which applications have been made, but approvals have not been received:

1. Application for a no-objection certificate from the Tamil Nadu Pollution Control Board by UEPL.

Apart from this, as of the date of this Final Placement Memorandum, there are no material approvals required to be obtained by the Highways Trust or the Project SPVs for which applications are yet to be made.

## LEGAL AND OTHER INFORMATION

*Except as stated in this section, there are no outstanding material litigation or non-ordinary course regulatory action involving the Project SPVs and against the Highways Trust, the Sponsor, the Investment Manager, the Project Manager or any of their Associates and the Trustee that are currently pending.*

*For purposes of this section, on the basis described below, details of all non-ordinary course regulatory actions and criminal matters that are currently pending, involving Project SPVs or against the Highways Trust, the Sponsor, the Investment Manager, the Project Manager or their respective Associates (collectively referred to as the “**Relevant Parties**”) and the Trustee have been disclosed. Further, all material litigations (on the basis described below) with respect to the Project SPVs and against the Highways Trust, the Sponsor, the Investment Manager, the Project Manager or each of their respective Associates and the Trustee have been disclosed. For this purpose, all civil litigation involving an amount equivalent to, or more than the amount as disclosed below, have been considered material.*

*Outstanding litigation against any of the Project SPVs before any judicial forum involving a claim amount exceeding ₹ 92.65 million, i.e. 1.5% of the total revenue from operations of the Project SPVs as for the period ended March 31, 2022, shall be considered material. In relation to outstanding litigation and/or non-ordinary course regulatory actions where the monetary liability is not quantifiable, such litigation shall be considered material in the event that the outcome of such litigation would have a material adverse effect on the position of the Project SPVs.*

*The disclosures with respect to material litigations and non-ordinary course regulatory actions relating to the Sponsor and its Associates (other than the Highways Trust and its Associates, the Project SPVs, the Investment Manager, and the Project Manager and their Associates), have been made solely on the basis of the public disclosures made by KKR & Co. Inc. (“**KKR & Co.**”) in the most recent quarterly report on Form 10-Q filed with U.S. Securities and Exchange Commission on August 5, 2022 relating to the quarter ended June 30, 2022 with respect to all entities, which are consolidated for financial reporting purposes with KKR & Co., which is listed on the New York Stock Exchange. In accordance with applicable securities law and stock exchange rules, KKR & Co., is required to disclose material litigations through applicable securities filings and KKR & Co., and has made no public filings after May 6, 2022 which materially changes the disclosures made in that regard in such quarterly report. The threshold for identifying material litigations in such disclosures is based, among other considerations, on management judgment and periodically reviewed thresholds applied by the independent auditor of KKR & Co., in expressing its opinion on the financial statements.*

*In relation to the Trustee, all litigation involving an amount equivalent to or exceeding ₹11.61 million (being 5% of the profit after tax for the period ended March 31, 2022 based on the unaudited standalone financial statements of the Trustee for the period ended March 31, 2022) shall be considered material.*

*Taxation proceedings against the Relevant Parties (and, in case of the Project SPVs, involving the Project SPVs) have been disclosed in a consolidated manner on the basis of the above.*

### **I. Litigation and Regulatory Actions against the Highways Trust and its Associates**

As at the date of this Final Placement Memorandum, there are no outstanding criminal litigation, non-ordinary course regulatory actions or material civil litigation against the Highways Trust and its Associates, except as disclosed below.

### **II. Litigation and Regulatory Actions against the Sponsor and its Associates (other than the Highways Trust and its Associates, the Project SPVs the Investment Manager, and the Project Manager and their Associates)**

In accordance with the abovementioned, except as stated below, there are no outstanding criminal litigation, non-ordinary course regulatory actions or material civil litigation against the Sponsor solely on the basis described above.

From time to time, KKR (including Global Atlantic Financial Group LLC and its subsidiaries (“**Global Atlantic**”)) is involved in various legal proceedings, lawsuits, arbitration and claims incidental to the conduct of KKR's businesses. KKR's asset management and insurance businesses are also subject to extensive regulation, which may result in regulatory proceedings against them.

In December 2017, KKR & Co. L.P. (which is now KKR & Co. Inc.) and its then Co-Chief Executive Officers

were named as defendants in a lawsuit filed in Kentucky state court alleging, among other things, the violation of fiduciary and other duties in connection with certain separately managed accounts that Prisma Capital Partners LP, a former subsidiary of KKR, manages for the Kentucky Retirement Systems. Also named as defendants in the lawsuit are certain current and former trustees and officers of the Kentucky Retirement Systems, Prisma Capital Partners LP, and various other service providers to the Kentucky Retirement Systems and their related persons. KKR and other defendants' motions to dismiss were denied by the trial court in November 2018, but in April 2019 the Kentucky Court of Appeals vacated the trial court's opinion and order denying the motions to dismiss the case for lack of standing. The decision of the Court of Appeals was appealed by plaintiffs to the Supreme Court of Kentucky. On July 9, 2020, the Supreme Court of Kentucky reversed the trial court's order and remanded the case to the trial court with direction to dismiss the complaint for lack of constitutional standing. On July 20, 2020, the Office of the Attorney General, on behalf of the Commonwealth of Kentucky, filed a motion to intervene as a plaintiff in the lawsuit and on July 21, 2020 filed a new lawsuit in the same Kentucky trial court making essentially the same allegations against the defendants, including KKR & Co. Inc. and Messrs. Kravis and Roberts. On July 29, 2020, certain private plaintiffs in the original lawsuit filed a motion to further amend their original complaint and to add new plaintiffs. On July 30, 2020, KKR and other defendants filed objections to the Attorney General's motion to intervene. On December 28, 2020, the trial court dismissed the complaint filed by the original plaintiffs and denied their motion to amend their original complaint and add new plaintiffs, but granted the Office of the Attorney General's motion to intervene. In January 2021, some of the attorneys for the private plaintiffs in the original lawsuit filed a new lawsuit, and a motion to intervene in the original lawsuit, on behalf of a new set of plaintiffs, who claim to be "Tier 3" members of Kentucky Retirement Systems, alleging substantially the same allegations as in the original lawsuit. The motion to intervene in the original lawsuit was denied. These "Tier 3" plaintiffs appealed the denial of their motion to intervene but then voluntarily dismissed their appeal on January 31, 2022. In addition, the Kentucky Retirement Systems had commissioned an investigation into certain matters alleged in the Attorney General's complaint. The trial court ordered that this investigation be completed by May 17, 2021, and the Attorney General was permitted to amend its complaint after reviewing the investigation's report within ten days of the Attorney General's receipt of it. On May 24, 2021, the Attorney General filed a First Amended Complaint on behalf of the Commonwealth of Kentucky. This complaint continues to name KKR & Co. L.P. and its then Co-Chief Executive Officers, as defendants, and makes similar allegations against them. KKR and the other defendants moved to dismiss the First Amended Complaint on July 30, 2021. The court held oral argument on these motions to dismiss on December 14, 2021. On July 9, 2021, the individual plaintiffs served an amended complaint, which purports to assert, on behalf of a class of beneficiaries of Kentucky Retirement Systems, direct claims for breach of fiduciary duty and civil violations under the Racketeer Influenced and Corrupt Organizations Act ("RICO"). This complaint was removed to the U.S. District Court for the Eastern District of Kentucky, which has entered an order staying this case until the completion of the Attorney General's lawsuit on behalf of the Commonwealth. On August 20, 2021, the same and other individual plaintiffs filed a second complaint in Kentucky state court, purportedly on behalf of Kentucky Retirement Systems' funds, alleging the same claims against KKR & Co. Inc. and Messrs. Kravis and Roberts as in the July 9th amended complaint but without the RICO or class action allegations. KKR and the other defendants have moved to dismiss the August 20th complaint. On March 24, 2022, in a separate declaratory judgment action brought by the Commonwealth of Kentucky regarding the enforceability of certain indemnification provisions available to KKR & Co. Inc. and Prisma Capital Partners LP, the Kentucky state court found that it has personal jurisdiction over KKR & Co. Inc., and this finding is currently being appealed by KKR. On May 27, 2022, following a motion by KKR, the judge then adjudicating the lawsuits rescued himself from the original 2017 action and the second Tier 3 action, and a new judge was assigned.

KKR (including Global Atlantic) currently is and expects to continue to become, from time to time, subject to examinations, inquiries and investigations by various U.S. and non-U.S. governmental and regulatory agencies, including but not limited to the U.S. Securities and Exchange Commission, Department of Justice, U.S. state attorney generals, Financial Industry Regulatory Authority, the U.K. Financial Conduct Authority, Central Bank of Ireland, Monetary Authority of Singapore, U.S. state insurance regulatory authorities, and the Bermuda Monetary Authority. Such examinations, inquiries and investigations may result in the commencement of civil, criminal or administrative proceedings or fines against KKR or its personnel.

Moreover, in the ordinary course of business, KKR (including Global Atlantic) is and can be both the defendant and the plaintiff in numerous lawsuits with respect to acquisitions, bankruptcy, insolvency and other events. Such lawsuits may involve claims that adversely affect the value of certain investments owned by KKR's funds and Global Atlantic's insurance companies.

KKR establishes an accrued liability for legal proceedings only when those matters present loss contingencies that are both probable and reasonably estimable. In such cases, there may be an exposure to loss in excess of any amounts accrued. No loss contingency is recorded for matters where such losses are either not probable or

reasonably estimable (or both) at the time of determination. Such matters may be subject to many uncertainties, including among others: (i) the proceedings may be in early stages; (ii) damages sought may be unspecified, unsupported, unexplained or uncertain; (iii) discovery may not have been started or is incomplete; (iv) there may be uncertainty as to the outcome of pending appeals or motions; (v) there may be significant factual issues to be resolved or (vi) there may be novel legal issues or unsettled legal theories to be presented or a large number of parties. Consequently, management is unable to estimate a range of potential loss, if any, related to these matters. In addition, loss contingencies may be, in part or in whole, subject to insurance or other payments such as contributions and/or indemnity, which may reduce any ultimate loss. KKR has included in its financial statements the reserve for regulatory, litigation and related matters that Global Atlantic includes in its financial statements, including with respect to matters arising from the conversion of life insurance policies from systems previously managed by Athene Holdings Limited to the platform of one of Global Atlantic's third party service providers, Alliance-One, a subsidiary of DXC Technology Company.

It is not possible to predict the ultimate outcome of all pending legal proceedings, and some of the matters discussed above seek or may seek potentially large and/or indeterminate amounts. Based on information known by management, management has not concluded that the final resolutions of the matters above will have a material effect upon the financial statements. However, given the potentially large and/or indeterminate amounts sought or may be sought in certain of these matters and the inherent unpredictability of investigations and litigations, it is possible that an adverse outcome in certain matters could, from time to time, have a material effect on KKR's financial results in any particular period.

### III. Litigation and Regulatory Actions Involving the Project SPVs

#### *DBCPL*

##### *Proceedings against DBCPL*

1. Mukesh Chandravanshi and Manohar Singh Rajput (“**Complainants**”), erstwhile employees of DBCPL have filed two separate complaints before the Labour Court, Bhopal, under the Industrial Disputes Act, 1947, in relation to wrongful termination of their employment by DBCPL. DBCPL claimed that the termination of Complainants was due to (i) the Complainants stopping toll collection at DBCPL’s toll plazas and allowing vehicles to cross without payment of toll on December 30, 2015, and (ii) misbehaviour of Complainants with other senior employees of DBCPL. The matters are currently pending.

##### *Proceedings by DBCPL*

1. DBCPL has filed a criminal complaint before the court of L.D. Judicial Magistrate, First Class, Sonkutch (Dist. Dewas) against its erstwhile accountant, Sameer Kumar Jha under sections 408 and 420 of the Indian Penal Code, 1860, read with section 200 of the Code of Criminal Procedure, 1973, in relation to unauthorised absence from service and misappropriation of an amount of approximately ₹0.09 million. The matter is currently pending.
2. DBCPL (“**Petitioner**”) had filed a writ petition (“**Petition**”) before the High Court of Judicature at Jabalpur, (“**Court**”), against the State, the Department of Commercial Taxes and Madhya Pradesh Road Development Corporation Limited (“**MPRDC**”) (collectively, the “**Respondents**”) challenging the constitutionality of proviso (c) to Entry No. 33 of Schedule 1-A of the Indian Stamp Act, 1899 (“**Act**”) as amended by the Indian Stamp Act (M.P Amendment) Act, 2002 (Act No. 12 of 20220) (“**Proviso**”) which provides for levy of stamp duty at 2% on the amount likely to be spent under a B.O.T agreement by a lessee. The Petitioner claimed that in accordance to a 2002 resolution passed by the Council of Ministers and subsequently the chief secretary of state of Madhya Pradesh, the State had circulated a letter to not levy stamp duty on Bond/BOT projects. However, the subsequent amendment of the Act provided for the levy of stamp duty at 2% on the amount likely to be spent on a proposed project on the agreement to lease where the right to collect toll is given, going against its parent provision and hence being unconstitutional. Consequently, the concession agreement to be entered into between the Petitioner and MPRDC was in abeyance at the execution stage, on account of payment of stamp duty, wherein the cost of the project was estimated at ₹4,450 million with an alleged deficit stamp duty payable at ₹85.30 million. The Petitioner prayed that the Proviso be struck down as unconstitutional, invalid and inoperative, and the Court command the Respondents to execute the pending BOT agreement.

The Court however, through final order dated February 11, 2010 (“**Impugned Order**”), dismissed the Petition, regarding the Proviso as not *ultra vires* the Constitution of India. Subsequently, the Petitioner filed a Special Leave Petition before the civil appellate jurisdiction of the Supreme Court of India challenging the Impugned

Order for being erroneous on law and facts and against constitutional jurisprudence. The matter is currently pending.

3. DBCPL (“**Petitioner**”) filed a writ petition before the High Court of Madhya Pradesh at Jabalpur (“**High Court**”) against, amongst others, the State of Madhya Pradesh (“**Respondents**”), challenging the constitutionality of Rule 14(2)(b) of the Building and Other Construction Workers Cess Rules, 1988 (“**Cess Rules**”). Further, the Petitioner challenged (i) the inspection report issued by the Labour Inspector; and (ii) the show cause notices issued to it by the Labour Commission, Madhya Pradesh, in respect of submission of the project cost for assessment of cess and alleged non-payment of labour cess. The Petitioner submitted that the Cess Rules are not applicable to the Petitioner. The Petitioner prayed for the High Court to, amongst others (i) declare Rule 14(2)(b) of the Cess Rules as ultra vires to the constitution of India; (ii) quash the inspection report and show cause notices issued to the Petitioner; (iii) direct the Respondents to not proceed further on the show cause notices issued and not take any coercive steps against the Petitioner. The High Court, by way of its order dated September 9, 2015 (as modified by way of order dated September 30, 2015), directed that that, pending disposal of the writ petition, no coercive steps for recovery of cess shall be taken against the Petitioner. The estimated amount involved in this matter is ₹47.78 million. This matter is currently pending.

#### **NBL**

##### ***Proceedings by NBL***

1. NBL (“**Petitioner**”) has filed a writ petition (“**Petition**”) before the High Court of Judicature, Andhra Pradesh at Hyderabad (“**Court**”), against The District Registrar and the Inspector General of Stamps and Registration (collectively, the “**Respondents**”) in relation to payment of certain stamp duty on the NBL Concession Agreement. The District Registrar, Adilabad, through its letter dated December 16, 2008, had called upon the Petitioner to pay an alleged deficit stamp duty amount of approximately ₹ 135.86 million in relation to the NBL Concession Agreement. The Petitioner prayed that the demand for such stamp duty be set aside by the Court as the same is not required to be paid on concession agreements. The Respondents have filed their response to the Petition. Simultaneously, the Petitioner has also filed an interim application praying for a stay in respect of all further proceedings in relation to recovery of the alleged deficit stamp duty and other amounts until the disposal of the Petition. Subsequently, the Court by way of its order dated June 9, 2011 granted a stay in respect of all further proceedings and in relation to recovery of a token amount of ₹ 0.5 million from the Petitioner. The matter is currently pending.

#### **SEPL**

##### ***Proceedings by SEPL***

1. SEPL raised certain claims before the Arbitral Tribunal (“**Tribunal**”), against NHAI in relation to certain delays and defaults on part of NHAI, which resulted in breach of various provisions of the SEPL Concession Agreement. Such defaults by NHAI included, amongst others, (i) change in scope, (ii) faulty and factually incorrect drawings, and (iii) additional requirement of land (“**Defaults**”). Due to such Defaults, SEPL was not able to complete the relevant project highway as per the proposed timeline and in relation to which SEL also put forth eight claims before the Tribunal. The Tribunal by way of its award dated June 27, 2018, awarded a claim of ₹ 274.20 million in favour of SEL along with advancing the annuity dates as prayed by SEPL (“**Award**”). Subsequently, SEPL filed an execution petition dated October 26, 2018 (“**Execution Petition**”) before the High Court of Delhi (“**Court**”) for seeking the execution of the decree and direction to NHAI to pay the amount as sought by the Award. Thereafter, NHAI filed an application before the Court for setting aside the Award, which was dismissed by the Court by of its order dated November 2, 2018 (“**Court Order**”).

Thereafter, NHAI filed an appeal dated January 7, 2019 (“**NHAI Appeal**”) challenging the Court Order before the Commercial Appellate Divisional bench of the Court (“**Appellate Bench**”). The Appellate Bench by way of an interim order dated January 22, 2019 upheld the partial Award and directed NHAI to deposit the amount towards additional bonus annuity i.e. ₹ 106.30 million with an additional interest amount of ₹ 37.20 million within a period of four weeks with the Court. The direction was complied with by NHAI. The matter is currently pending in respect to the Execution Petition and the NHAI Appeal.

#### **UEPL**

##### ***Proceedings by UEPL***

1. UEPL (“**Petitioner**”) has filed a writ petition before the High Court of Judicature at Madras (“**High Court**”), against The Secretary (Transport), Government of Tamil Nadu (“**Respondent**”) in relation to certain pending toll fees from the Respondent. UEPL alleged that the Respondent was involved in plying buses enrolled under the monthly passes issued by the Petitioner more frequently than permitted and also plying different busses other than those enrolled with the monthly passes. The amount involved in this matter is approximately ₹ 128 million, along with an interest amount of 18% p.a. for the period between July 2009 until December 2011, which allegedly remains unpaid in relation to three depots of the Petitioner. The Respondent claims to have remitted a sum of ₹62.20 million towards the payment of the pending toll fee, however, the High Court has, vide order dated November 18, 2021, directed the Respondent to file the statement of accounts with regard to such payment. The Respondent is yet to file the same. The matter is currently pending.

#### **IV. Litigation and Regulatory Actions against the Investment Manager, Project Manager and their Associates**

As at the date of this Final Placement Memorandum, subject to the disclosures made in the section entitled “*Legal and Other Information – Litigation and Regulatory Actions against the Sponsor and its Associates (other than the Highways Trust and its Associates, the Project SPVs, the Investment Manager and the Project Manager and their Associates)*” on page 274, there are no outstanding criminal litigation, non-ordinary course regulatory actions or material civil litigation against the Investment Manager, Project Manager and their Associates.

#### **V. Litigation and Regulatory Actions against the Trustee**

As at the date of this Final Placement Memorandum, there are no material litigation or any outstanding criminal litigation or non-ordinary course regulatory actions against the Trustee.

#### **Taxation Proceedings**

The details of all outstanding tax disputes involving the Project SPVs and against the Highways Trust, Sponsor, the Project Manager, the Investment Manager, their respective Associates and the Trustee, on the basis of abovementioned, are set forth below:

<b>Name of the entity</b>	<b>Number of Proceedings</b>	<b>Amount Involved (in ₹ million)</b>
<b><i>Direct tax</i></b>		
i. Highways Trust	-	-
ii. Sponsor	-	-
iii. Investment Manager	-	-
iv. Project Manager	-	-
v. Associates of Sponsor / Project Manager / Investment Manager	-	-
vi. Project SPVs	5	103.08
vii. Trustee	-	-
<b><i>Indirect Tax</i></b>		
i. Highways Trust	-	-
ii. Sponsor	-	-
iii. Investment Manager	-	-
iv. Project Manager	-	-
v. Associates of Sponsor / Project Manager / Investment Manager	-	-
vi. Project SPVs	2	76.48
vii. Trustee	-	-

## SECURITIES MARKET OF INDIA

*The information in this section has been extracted from documents available on the website of SEBI and the Stock Exchange and has not been prepared or independently verified by the Parties to the Highways Trust or the Lead Managers or any of their respective affiliates or advisors.*

### **The Indian Securities Market**

India has a long history of organized securities trading. In 1875, the first stock exchange was established in Mumbai. The BSE and the NSE, together hold a dominant position among the stock exchanges in terms of the number of listed companies, market capitalisation and trading activity.

### **Stock Exchange Regulation**

Indian stock exchanges are regulated primarily by SEBI, as well as by the Government acting through the Ministry of Finance, Capital Markets Division, under the Securities Contracts (Regulation) Act, 1956 (“**SCRA**”) and the Securities Contracts (Regulation) Rules, 1957 (“**SCRR**”). SEBI, in exercise of its powers under the SCRA and the SEBI Act, notified the SCR (SECC) Regulations, which regulate *inter alia* the recognition, ownership and internal governance of stock exchanges and clearing corporations in India together with providing for minimum capitalisation requirements for stock exchanges. The SCRA, the SCRR and the SCR (SECC) Regulations along with various rules, bye-laws and regulations of the respective stock exchanges, regulate the recognition of stock exchanges, the qualifications for membership thereof and the manner, in which contracts are entered into, settled and enforced between members of the stock exchanges.

The SEBI Act empowers SEBI to regulate the Indian securities markets, including stock exchanges and intermediaries in the capital markets, promote and monitor self-regulatory organisations and prohibit fraudulent and unfair trade practices. Regulations concerning minimum disclosure requirements by public companies, rules and regulations concerning investor protection, insider trading, substantial acquisitions of shares and takeover of companies, buy-backs of securities, employee stock option schemes, stockbrokers, merchant bankers, underwriters, mutual funds, foreign institutional investors, credit rating agencies and other capital market participants have been notified by the relevant regulatory authority.

### **Listing and Delisting of Units**

The InvIT Regulations provide for listing and delisting of units of infrastructure investment trusts on the stock exchanges.

### **BSE**

Established in 1875, it is the oldest stock exchange in India. In 1956, it became the first stock exchange in India to obtain permanent recognition from the Government under the SCRA. It has evolved over the years into its present status as one of the premier stock exchanges of India.

### **NSE**

NSE was established by financial institutions and banks to provide nationwide online, satellite-linked, screen-based trading facilities with market-makers and electronic clearing and settlement for securities including government securities, debentures, public sector bonds and units. It has evolved over the years into its present status as one of the premier stock exchanges of India. NSE was recognised as a stock exchange under the SCRA in April 1993 and commenced operations in the wholesale debt market segment in June 1994. The capital market (equities) segment commenced operations in November 1994 and operations in the derivatives segment commenced in June 2000.

### **Internet-based Securities Trading and Services**

Internet trading takes place through order routing systems, which route client orders to exchange trading systems for execution. Stockbrokers interested in providing this service are required to apply for permission to the relevant stock exchange and also have to comply with certain minimum conditions stipulated by SEBI. The NSE became the first exchange to grant approval to its members for providing internet-based trading services. Internet trading is possible on both the “equities” as well as the “derivatives” segments of the NSE.

## **Trading Hours**

Trading on both the NSE and the BSE occurs from Monday to Friday, between 9:15 a.m. and 3:30 p.m. 1ST (excluding the 15 minutes pre-open session from 9:00 a.m. to 9:15 a.m. that has been introduced recently). The NSE and the BSE are closed on public holidays. The recognised stock exchanges have been permitted to set their own trading hours (in the cash and derivatives segments) subject to the condition that (i) the trading hours are between 9.00 a.m. and 5.00 p.m.; and (ii) the stock exchange has in place a risk management system and infrastructure commensurate to the trading hours.

## **Trading Procedure**

In order to facilitate smooth transactions, the BSE replaced its open outcry system with BSE On-line Trading facility in 1995. This totally automated screen-based trading in securities and was put into practice nationwide. This has enhanced transparency in dealings and has assisted considerably in smoothening settlement cycles and improving efficiency in back-office work.

NSE has introduced a fully automated trading system called NEAT, which operates on strict time/price priority besides enabling efficient trade. NEAT has provided depth in the market by enabling large number of members all over India to trade simultaneously, narrowing the spreads.

## **Depositories**

The Depositories Act provides a legal framework for the establishment of depositories to record ownership details and effect transfer in book-entry form. Further, SEBI framed regulations in relation to the registration of such depositories, the registration of participants as well as the rights and obligations of the depositories, participants, companies and beneficial owners. The depository system has significantly improved the operation of the Indian securities markets.

## SELLING AND TRANSFER RESTRICTIONS

*The distribution of this Final Placement Memorandum and the offer, sale or delivery of the Units is restricted by law in certain jurisdictions. Persons who may come into possession of this Final Placement Memorandum are advised to consult with their own legal advisors as to what restrictions may be applicable to them and to observe such restrictions. This Final Placement Memorandum may not be used for the purpose of an offer or invitation in any circumstances in which such offer or invitation is not authorized. Due to the following restrictions, investors are advised to consult legal counsel prior to purchasing Units or making any resale, pledge or transfer of the Units.*

*Each purchaser of the Units in this Issue will be deemed to have made acknowledgments and agreements as described under “Notice to Eligible Investors – Representations by the Eligible Investors” on page 2 of this Final Placement Memorandum.*

### **Republic of India**

This Final Placement Memorandum may not be distributed directly or indirectly in India or to residents of India and any Units may not be offered or sold directly or indirectly in India to, or for the account or benefit of, any resident of India except as permitted by applicable Indian laws and regulations, under which an offer is strictly on a private and confidential basis and is limited to Eligible Investors and is not an offer to the public. This Final Placement Memorandum is neither a public issue nor a prospectus under the Companies Act, 2013 or an advertisement and should not be circulated to any person other than to whom this Issue is made. Neither the Placement Memorandum nor this Final Placement Memorandum have been or shall be registered as a prospectus with any Registrar of Companies in India.

No action has been taken or will be taken by the Highways Trust, the Investment Manager or the Lead Managers that would permit a public offering of the Units to occur in any jurisdiction, or the possession, circulation or distribution of this Final Placement Memorandum or any other material relating to the Highways Trust or the Units in any jurisdiction where action for such purpose is required. Accordingly, the Units may not be offered or sold, directly or indirectly, and this Final Placement Memorandum, any offering materials and any advertisements in connection with the offering of the Units may be distributed or published in or from any country or jurisdiction except under circumstances that will result in compliance with any applicable rules and regulations of any such country or jurisdiction. The Issue will be made in compliance with the applicable InvIT Regulations. Each purchaser of the Units in this Issue will be deemed to have made acknowledgments and agreements as described under “Notice to Investors” on page 1, “Notice to Eligible Investors - Representations by the Eligible Investors” on page 2 and these Selling and Transfer Restrictions.

### **United States**

**The Units offered hereby have not been and will not be registered with, or approved or disapproved by the SEC or any State securities commission in the U.S. or any other U.S. regulatory authority. Accordingly, the Units may not be offered, sold, resold or otherwise transferred within the U.S. or the territories or possessions thereof, except in a transaction exempt from the registration requirements of the Securities Act. The Units referred to in this Final Placement Memorandum are being offered and sold in offshore transactions outside of the U.S. in compliance with Regulation S under the Securities Act to persons located in jurisdictions where such offer and sale of the Units is permitted under the laws of such jurisdictions. The offering to which this Final Placement Memorandum relates is not, and under no circumstances is to be construed as, an offering of any Units for sale in the U.S. or as a solicitation therein of an offer to buy any of the said securities. Accordingly, you should not forward or transmit this Final Placement Memorandum in or into the U.S. at any time. Furthermore, the foregoing authorities have not passed on or endorsed the merits of the offering or the accuracy or adequacy of this Final Placement Memorandum. Any representation to the contrary is a criminal offense in the U.S.**

### **Notice to Investors in certain other jurisdictions**

The distribution of the Draft Placement Memorandum, the Placement Memorandum, this Final Placement Memorandum and the issue of the Units in certain jurisdictions may be restricted by law. As such, the Draft Placement Memorandum, the Placement Memorandum, and this Final Placement Memorandum do not constitute, and may not be used for, or in connection with, an offer or solicitation by anyone in any jurisdiction in which such offer or solicitation is not authorized or to any person to whom it is unlawful to make such offer or solicitation. In particular, no action has been taken by the Investment Manager or the Lead Manager which would permit an issue

of the Units in any jurisdiction other than India. Accordingly, the Units may not be offered or sold, directly or indirectly, and neither the Draft Placement Memorandum, the Placement Memorandum, this Final Placement Memorandum nor any Issue materials in connection with the Units be distributed or published in or from any country or jurisdiction that would require registration of the Units in such country or jurisdiction.

## RIGHTS OF UNITHOLDERS

*The rights and interests of Unitholders are included in this Final Placement Memorandum and the InvIT Regulations. Under the Trust Deed and the Investment Management Agreement, these rights and interests are safeguarded by the Trustee and the Investment Manager, respectively. Any rights and interests of Unitholders as specified in this Final Placement Memorandum would stand qualified by and deemed to be amended to the extent of any amendment to the InvIT Regulations.*

### ***Beneficial Interest***

Each Unit represents an undivided beneficial interest in the Highways Trust. The beneficial interest of each Unitholder shall be equal and limited to the proportion of the number of Units held by the Unitholder to the total number of Units. A Unitholder has no equitable or proprietary interest in the InvIT Assets and is not entitled to transfer of the InvIT Assets (or any part thereof) or any interest in the InvIT Assets (or any part thereof) of the Highways Trust. A Unitholder's right is limited to the right to require due administration of the Highways Trust in accordance with the provisions of the Trust Deed and the Investment Management Agreement.

### ***Ranking***

No Unitholder of the Highways Trust shall enjoy superior voting or any other rights over another Unitholder. Further, the Units shall not have multiple classes. However, subordinate Units may be issued only to the Sponsor and its Associates, where such subordinate units carry only inferior voting or any other rights compared to other Units in the future in accordance with Regulation 4(2)(h) of the InvIT Regulations.

### ***Redressal of grievances***

The Investment Manager shall ensure adequate and timely redressal of all Unitholders' grievances pertaining to the activities of the Highways Trust, and the Trustee shall periodically review the status of Unitholders' complaints and their redressal undertaken by the Investment Manager. The Investment Manager shall maintain records of the Unitholders' grievances and the actions taken thereon, including copies of correspondences made with the Unitholders.

### ***Distribution***

The Unitholders shall have the right to receive distribution in accordance with the InvIT Regulations and in the manner provided in this Final Placement Memorandum. For details, please see the section entitled "*Distributions*" on page 220.

### ***Meeting of Unitholders***

Meetings of Unitholders will be conducted in accordance with the InvIT Regulations.

### ***Passing of resolutions***

1. With respect to any matter requiring approval of the Unitholders:
  - (i) a resolution shall be considered as passed when the votes cast by Unitholders, so entitled and voting, in favour of the resolution exceed a certain percentage as specified in the InvIT Regulations, of votes cast against;
  - (ii) the voting may be done by postal ballot or electronic mode;
  - (iii) a notice of not less than 21 days shall be provided to the Unitholders;
  - (iv) voting by any Unitholder (including, the Sponsor in its capacity as a Unitholder), who is a related party in such transaction, as well as associates of such Unitholder(s) shall not be considered on the specific issue; and
  - (v) the Investment Manager shall be responsible for all the activities pertaining to conducting of meeting of the Unitholder, subject to oversight by the Trustee. However, for issues pertaining to the Investment Manager, including a change in the Investment Manager, removal of Investment Manager or change in control of Investment Manager; the Trustee shall convene and handle all activities pertaining to conduct of the meetings. Additionally, for issues pertaining to the Trustee, including change in Trustee, the Trustee shall not be involved in any manner in the conduct of the meeting.

2. For the Highways Trust:
- (i) an annual meeting of all Unitholders shall be held not less than once a year within 120 days from the end of each financial year and the time between two meetings shall not exceed 15 months;
  - (ii) with respect to the annual meeting of Unitholders,
    - a) any information that is required to be disclosed to the Unitholders and any issue that, in the ordinary course of business, may require approval of the Unitholders may be taken up in the meeting including:
      - latest annual accounts and performance of the Highways Trust;
      - approval of auditors and fee of such auditors, as may be required;
      - latest valuation reports;
      - appointment of valuer, as may be required; and
      - any other issue; and
    - b) for any issue taken up in such meetings which require approval from the Unitholders other than as specified in Regulation 22(6) of the InvIT Regulations and paragraph 4 below, votes cast in favour of the resolution shall be more than the votes cast against the resolution.
3. Notwithstanding generally of the foregoing, in case of the following, approval from the Unitholders shall be required where the votes cast in favour of the resolution shall be more than the votes cast against the resolution:
- (i) any approval from the Unitholders required in terms of Regulation 18 (*Investment conditions and dividend policy*), Regulation 19 (*Related Party Transactions*) and Regulation 21 (*Valuation of assets*) of the InvIT Regulations to the extent applicable;
  - (ii) any borrowings, in excess of the limits specified under Regulation 20(2) of the InvIT Regulations;
  - (iii) any transaction, other than any borrowing, the value of which is equal to or greater than 25% of the Highways Trust Assets;
  - (iv) increasing period for compliance with investment conditions to one year in accordance with Regulation 18(5)(c) of the InvIT Regulations;
  - (v) any issue, in the ordinary course of business, which in the opinion of the Sponsor or the Highways Trust or the Investment Manager, is material and requires approval of the Unitholders, if any;
  - (vi) de-classification of the status of the Sponsor; and
  - (vii) any issue for which SEBI or the designated stock exchange requires approval.
4. In case of the following, approval from the Unitholders shall be required where the votes cast in favour of the resolution shall not be less than one and a half times the votes cast against the resolution:
- (i) any issue, not in the ordinary course of business, which in the opinion of the Sponsor or Investment Manager or the trustees of the Highways Trust requires approval of the Unitholders;
  - (ii) any issue for which SEBI or the designated stock exchange requires approval; and
  - (iii) any issue taken up on request of the Unitholders including:
    - a) removal of the Investment Manager and appointment of another investment manager to the Highways Trust;
    - b) removal of the Auditors and appointment of another auditors to the Highways Trust;

- c) removal of the Valuer and appointment of another valuer to the Highways Trust;
- d) delisting of the Highways Trust, if the Unitholders have sufficient reason to believe that such delisting would act in the interest of the Unitholders;
- e) any issue which the Unitholders have sufficient reason to believe that is detrimental to the interest of the Unitholders; and
- f) change in the Trustee, if Unitholders have sufficient reason to believe that acts of the Trustee are detrimental to the interest of Unitholders.

With respect to the rights of the Unitholders under clause 4(iii) above:

- (i) save as set out in (iii) below, not less than 25% of the Unitholders by value, other than any party related to the transactions and its associates, shall apply, in writing, to the Highways Trust for the purpose;
- (ii) on receipt of such application, the Highways Trust shall require, with the Investment Manager to place the issue for voting in the manner as specified in the InvIT Regulations; and
- (iii) with respect to clause 4(iii)(f) above, not less than 60% of the Unitholders by value shall apply, in writing, to the Highways Trust for the purpose.

#### ***Information rights***

The Investment Manager, on behalf of the Highways Trust, shall also submit such information to the Stock Exchange and the Unitholders, on a periodical basis as may be required under the InvIT Regulations and the Listing Agreement to be entered into with the Stock Exchange. The Investment Manager (on behalf of the Highways Trust) shall disclose to the Stock Exchange, the Unitholders and SEBI, all such information and in such manner as specified under the InvIT Regulations and such other requirements as may be specified by SEBI. The Investment Manager, on behalf of the Trust, shall also provide disclosures or reports specific to the sector or sub-sector in which the Trust has invested or proposes to invest, in the manner as may be specified by SEBI.

#### ***Buyback of Units***

Any buyback of Units shall be in accordance with the Trust Deed and the InvIT Regulations.

#### ***De-listing of Units***

Any delisting of Units shall be in accordance with the Trust Deed and the InvIT Regulations.

## DILUTION

Dilution is the amount by which the Issue Price exceeds the net asset value (“NAV”) per Unit, immediately after the completion of this Issue. NAV per Unit is determined by subtracting the total liabilities of the Highways Trust from the total assets of the Highways Trust and dividing by the number of Units issued and outstanding immediately before this Issue. There was no *pro forma* NAV before this Issue for the Units.

The Highways Trust will issue 4,16,00,000\* Units at an Issue Price of ₹ 100 for each Unit. The following provides the per Unit dilution as on March 31, 2022:

<b>Combined NAV per Unit before this Issue</b>	Not applicable
<b>Combined NAV per Unit after this Issue</b>	94.67
<b>Dilution in NAV per Unit to the Sponsor attributable to the Sponsor</b>	5.33
<b>Dilution in NAV per Unit to Unitholders (other than the Sponsor)</b>	5.33
<b>Dilution to Unitholders (other than the Sponsor) as a percentage of the Issue Price</b>	5.33%

\* Subject to allotment of Units by the Board or a committee thereof

## ISSUE STRUCTURE

Initial offer through a private placement of 4,16,00,000\* Units for cash at price of ₹ 100 per Unit, aggregating to ₹ 4,160 million by the Highways Trust. In accordance with Regulation 14(IA) of the InvIT Regulations, this Issue shall constitute at least 10% of the total outstanding Units on a post-Issue basis.

\* Subject to allotment of Units by the Board or a committee thereof

Particulars	Details
Number of Units available for Allotment/allocation	4,16,00,000* Units
Basis of Allotment/ allocation	Discretionary
Minimum Bid	Such number of Units that the Bid Amount is not less than ₹ 260 million, and in multiples of 2,00,000 Units thereafter
Maximum Bid	Such number of Units (in multiples of 2,00,000 Units) not exceeding the size of this Issue, subject to applicable investment limits
Mode of Allotment	Compulsorily in dematerialised form
Bid Lot	A minimum of 26,00,000 Units, and in multiples of 2,00,000 Units thereafter
Allotment Lot	A minimum of 26,00,000 Units, and in multiples of 2,00,000 Units thereafter
Trading Lot <sup>(1)</sup>	Upon listing, such number of Units, the value of which is, or exceeds, ₹ 20 million and in multiples thereafter.
Arrangements for Disposal of Odd Lots	The Stock Exchange will provide for an odd lot window to facilitate the trading of odd lots of Units that may be created from time to time on account of various events, including instances such as declaration of NAV and any distributions in respect of the Units
Who can apply	(i) Institutional Investors; and (ii) Bodies Corporate
Terms of Payment	Entire Bid Amount shall be payable along with the Application Form

<sup>(1)</sup> The trading lot post-listing of the Units may be modified in accordance with the InvIT Regulations and other applicable law.

\* Subject to allotment of Units by the Board or a committee thereof.

### Indicative Issue Timeline

Event	Indicative Date
Bid/Issue Opening Date	Friday, August 19, 2022
Bidders to submit completed Application Forms	Monday, August 22, 2022
Bid/Issue Closing Date	Monday, August 22, 2022
Dispatch of CANs to successful Bidders	On or about Tuesday, August 23, 2022
Closing Date	On or about Tuesday, August 23, 2022
Designated Date	On or about Tuesday, August 23, 2022
Initiation of refunds, if any, in the event of any failure to obtain final listing and trading approval within 6 Working Days from the Bid/Issue Closing Date	On or about Wednesday, August 24, 2022
Listing Date	Not later than Tuesday, August 30, 2022

The above timetable is indicative and does not constitute any obligation or liability on the Highways Trust, the Investment Manager, the Trustee or the Lead Manager.

While the Investment Manager shall ensure that all steps for the completion of the necessary formalities for the listing and the commencement of trading of the Units on the Stock Exchange is completed within 6 Working Days from the Bid/Issue Closing Date, the timetable may change due to various factors, such as, any delay in receiving the final listing and trading approval from the Stock Exchange. The commencement of trading of the Units will be entirely at the discretion of the Stock Exchange and in accordance with applicable law.

## ISSUE PROCEDURE

*Below is a summary, intended to provide a general outline of the procedures for the bidding, application, payment, Allocation and Allotment of the Units to be offered pursuant to the Issue.*

*Eligible Investors were advised to inform themselves of any restrictions or limitations that may be applicable to them under applicable law to which they are subject, and should consult their respective advisors in this regard. Eligible Investors that have applied in this Issue were required to confirm, and are deemed to have represented to the Trustee, the Investment Manager, the Lead Manager and their respective directors, officers, agents, affiliates and representatives, that they are eligible under all applicable laws, rules, regulations, guidelines and approvals to acquire the Units. The Investment Manager, the Sponsor and the Lead Manager and their respective directors, officers, agents, affiliates and representatives accept no responsibility or liability for advising any investor on whether such investor is eligible to acquire the Units.*

### **Authority for the Issue**

The Highways Trust is making this Issue in accordance with Regulation 14(2) of the InvIT Regulations. The Issue was authorised and approved by the Board on March 22, 2022 and July 23, 2022. The Board approved this Final Placement Memorandum in its meeting dated August 22, 2022.

The Highways Trust has received in-principle approval from NSE, for listing of the Units on NSE pursuant to a letter dated April 27, 2022 along with an extension letter dated July 15, 2022. The Investment Manager has filed a copy of the Draft Placement Memorandum, the Placement Memorandum, and this Final Placement Memorandum with the SEBI and the Stock Exchange, in compliance with the provisions of the InvIT Regulations.

**The Units have not been and will not be registered, listed or otherwise qualified in any jurisdiction outside India and may not be offered or sold, and Bids may not be made by persons in any such jurisdiction, except in compliance with the applicable law of such jurisdiction. The Units shall not be offered or sold where such offer or sale would require registration, qualification or listing.**

**The Bidders should note that Allotment to successful Bidders will only be in the dematerialised form. Application Forms which did not have the details of the Bidders' demat accounts including DP ID, PAN and Client ID have been treated as incomplete and rejected. Bidders will not have the option of receiving Allotment in physical form. On Allotment, the Units will be traded only on the dematerialized segment of the Stock Exchange.**

### **Issue Procedure**

1. The Lead Manager, in consultation with the Investment Manager has electronically or physically circulated serially numbered copies of the Placement Memorandum and the Application Form to Eligible Investors. The Application Form has been specifically addressed to each Eligible Investor. The list of Eligible Investors to whom the serially numbered copies of the Placement Memorandum and the Application Form have been circulated have been determined by the Investment Manager, in consultation with the Lead Manager.
2. **Unless a serially numbered Placement Memorandum along with an Application Form is addressed to a particular Eligible Investor, no invitation to subscribe shall be deemed to have been made to such Eligible Investor.** Even if such documentation were to come into the possession of any person other than the intended recipient, no offer or invitation to offer shall be deemed to have been made to such person and such person shall not be eligible to participate in the Issue.
3. Bidders were required to submit an Application Form to the Lead Manager only during the Bid/Issue Period and not later than the Bid/Issue Closing Date.
4. Bidders were required to, amongst other things, to indicate the following in the Application Form:
  - (a) name of the Bidder to whom the Units are to be Allotted;
  - (b) number of Units Bid for;
  - (c) the details of the Bid Amount deposited by the Bidder into the Designated Account;
  - (d) details of the demat accounts to which the Units should be credited;

- (e) a representation that such person is an “Institutional Investor” or a “Body Corporate” in terms of the InvIT Regulations;
- (f) the details of Bidder’s bank account along with fund transfer details, in case of any refund;
- (g) that it is permitted to acquire the Units under the laws of any applicable jurisdiction and that it has necessary capacity and authority, and have obtained all necessary consents and authorisations to enable it to commit to this participation in the Issue and to perform its obligations in relation thereto (including, without limitation, on behalf of any person) and honour such obligations;
- (h) it is eligible to invest in India and in the Units under applicable law, including the FEMA Rules, and has not been prohibited by the SEBI or any regulatory authority from buying, selling or dealing in units or securities; and
- (i) any other information which may be relevant to the Bid.

Bids made by asset management companies or custodians of Mutual Funds, if permitted under applicable law, have specifically stated the names of the concerned schemes for which the Bids were made. In case of a Mutual Fund, a separate Bid was made in respect of each scheme of the Mutual Fund registered with SEBI and such Bids in respect of more than one scheme of the Mutual Fund has not been treated as multiple Bids provided that the Bids clearly indicated the scheme for which the Bid had been made. Bidders were advised to ensure that any single Bid from them does not exceed the investment limits or maximum number of Units that can be held by them under applicable law.

5. Each Bidder was required to make payment of the entire Bid Amount for the Units at the Issue Price, only through electronic transfer to the Designated Account during the Bid/Issue Period, along with the completed Application Form.
6. No payment has been made by Bidders in cash. Please note that any payment of Bid Amount for Units has been made from the bank account of the relevant Bidder applying for Units and the Lead Manager, on behalf of the Investment Manager, has kept a record of the bank account from where such Bid Amounts have been received. The Bid Amount payable on Units to be held by joint holders has been paid from the bank account of the person whose name appears first in the completed Application Form. Pending listing of the Units, all Bid Amounts received from Bidders has been kept by in the Designated Account.
7. Once a duly completed Application Form was submitted by a Bidder on the basis of disclosures in the Placement Memorandum, such Application Form constituted an irrevocable offer and cannot be withdrawn, subject to terms contained therein and the Placement Memorandum.
8. Upon receipt of the completed Application Form and the receipt of Bid Amount in the Designated Account, the Investment Manager shall, after Bid/Issue Closing Date, determine the number of the Units to be Allotted pursuant to the Issue, in consultation with the Lead Manager.
9. Upon determination of the Bidders to whom Allocation shall be made, the Lead Manager, on behalf of the Investment Manager, has sent the CANs, along with serially numbered Final Placement Memorandums to the Bidders who have been Allocated Units. The dispatch of a CAN shall be deemed a valid, binding and irrevocable contract in respect of the number of Units Allocated to the Bidder. **Please note that the Allocation and Allotment will be at the absolute discretion of the Investment Manager, in consultation with the Lead Manager, and in accordance with the InvIT Regulations.**
10. Upon the dispatch of the CAN to successful Bidders, the Investment Manager shall Allot Units of the Highways Trust as per the details in the CAN sent to the successful Bidders. The Investment Manager will intimate the Stock Exchange about the details of the Allotment and apply for approvals of the Units for listing and trading of the Units on the Stock Exchange after the credit of Units into the demat accounts of the successful Bidders.
11. Allottees are advised to instruct their respective Depository Participants’ to accept the Units that may be Allotted to them pursuant to the Issue into their respective demat accounts.
12. In the event the Investment Manager is unable to Allot the Units or upon cancellation of the Issue, the Investment Manager shall be liable to refund the Bid Amounts with interest to the Bidders in accordance

with applicable law. For each Bidder to whom any amounts are to be refunded, the refund shall be made to the same bank account from which the Bid Amount was remitted by such Bidder.

13. The Units that have been credited to the demat accounts of the Bidders shall be eligible for trading on the Stock Exchange only upon the receipt of final listing and trading approvals from the Stock Exchange. Bidders are advised to apprise themselves of the status of the receipt of the permissions from the Stock Exchange or the Investment Manager.
14. The Bid Amounts will be transferred to the account of the Highways Trust from the Designated Account only after receipt of the final listing and trading approval for the Units from Stock Exchange.

#### **Who could Bid?**

Each Bidder must have checked if it is eligible to Bid under applicable law, including the FEMA Rules. Certain categories of Bidders may not have been permitted to Bid in the Issue or hold Units in excess of the limits specified under applicable law.

Only Institutional Investors and Bodies Corporate are eligible to participate in the Issue.

An Institutional Investor is defined in Regulation 2(1)(ya) of the InvIT Regulations.

A Body Corporate is defined in Section 2(11) of the Companies Act, 2013 to include a company incorporated outside India, but does not include (i) a co-operative society registered under any law relating to co-operative societies; and (ii) any other body corporate (not being a company as defined in the Companies Act, 2013) which the Central Government may, by notification, specify in this regard.

Bodies Corporate incorporated outside India are permitted to participate in the Issue subject to compliance with Schedule VIII of the FEMA Rules.

**The Trustee, the Valuer and the employees of the Valuer, who were involved in the valuation of the Project SPVs are not permitted to Bid in the Issue.**

#### ***Bids by FPIs***

Foreign Portfolio Investors (other than individuals, corporate bodies and family offices) are permitted to participate in the Issue subject to compliance with Schedule 8 of the FEMA Rules. In case of Bids by FPIs, the payment should have been made as inward remittance from abroad through banking channels or out of funds held in NRE, SNRR or FCNR(B) accounts maintained in accordance with the Foreign Exchange Management (Deposit) Regulations, 2016, along with documentary evidence in support of the remittance. In case of Bids made by FPIs, a copy of the certificate of registration under the SEBI FPI Regulations was required to be attached with the Application Form. In case of Bids made by FPIs, a copy of the certificate of registration issued by the designated depository participant under the SEBI FPI Regulations was required to be attached along with the Application Form, failing which the Investment Manager, in consultation with the Lead Manager, reserved the right to reject the Bid.

#### ***Bids by SEBI registered VCFs and AIFs***

The SEBI VCF Regulations prescribe, amongst others, the investment restrictions on VCFs registered with SEBI. Further, the SEBI AIF Regulations prescribe, amongst others, the investment restrictions on AIFs. Further, VCFs which have not re-registered as an AIF under the SEBI AIF Regulations shall continue to be regulated by the SEBI VCF Regulations until the existing fund or scheme managed by the fund is wound up and such funds shall not launch any new scheme after the notification of the SEBI AIF Regulations. VCFs and AIFs are subject to certain investment restrictions, including with respect to the percentage of investible funds held in each investee entity. Allotments made in respect of Bids by VCFs and AIFs in the Issue shall be subject to the rules and regulations that are applicable to each of them respectively.

#### ***Bids by Banking Companies***

Bids may be made by banks, as permitted by the RBI, and were subject to the conditions specified in the Prudential Guidelines – Banks' investment in units of REITs and InvITs dated April 18, 2017. In case of Bids made by banking companies registered with the RBI, certified copies of (i) the certificate of registration issued by the RBI, and (ii) the approval of such banking company's investment committee were required to be attached to the Application Form. Failing this, any such Bid was liable to be rejected.

### ***Bids by Provident Funds/Pension Funds***

On March 2, 2015, the Ministry of Finance issued a notification allowing investments by non-government provident funds, pension funds, super-annuation funds and gratuity funds up to 5% in infrastructure investment trusts, as specified. On June 26, 2015, the Ministry of Labour and Employment issued a notification allowing investments by provident funds up to 5% in infrastructure investment trusts, as specified. The Pension Fund Regulatory and Development Authority issued circulars dated June 3, 2015, September 2, 2015, November 4, 2016 and May 4, 2017, respectively, allowing investments by national pension funds up to 5% in infrastructure investment trusts, as specified. However, such investments by provident funds and pension funds will be subject to, amongst others, the sponsor or in some cases the securities having a minimum of AA or equivalent rating from at least two credit rating agencies registered with SEBI. In case of Bids made by provident funds/ pension funds, subject to applicable law, with minimum corpus of ₹ 250 million, a certified copy of certificate from a chartered accountant certifying the corpus of the provident fund/pension fund must have been attached to the Application Form. Failing this, any such Bid is liable to be rejected.

### ***Bids by NPS Schemes***

The Pension Fund Regulatory and Development Authority issued circulars dated June 3, 2015 and September 2, 2015, respectively, allowing investments by national pension fund schemes (“NPS Schemes”) up to 5% in infrastructure investment trusts, as specified. However, in accordance with the circular dated May 4, 2017 (effective from May 8, 2017), as amended by the circular dated May 8, 2018, issued by PFRDA, such investments by NPS Schemes will be subject to, amongst others, such securities having a minimum of ‘A’ or an equivalent rating in the applicable rating scale from at least two credit rating agencies registered with SEBI, subject to the maximum permissible amount of investments in securities rated between A- and AA. In case of Bids made by NPS Schemes, with minimum corpus of ₹ 250 million, a certified copy of certificate from a chartered accountant certifying the corpus of the provident fund/pension fund must have been attached to the Application Form. Failing this, any such Bid is liable to be rejected.

### ***Bids by Mutual Funds***

Bids may have been made by mutual funds under all its schemes, existing and future, subject to the investment conditions and other restrictions prescribed under the Securities and Exchange Board of India (Mutual Funds) Regulations, 1996 (including, the circular on mutual funds dated February 28, 2017 and any other circulars, notifications and guidelines issued thereunder).

### ***Bids by Insurance Companies***

Bids may have been made by insurance companies as permitted by the Insurance Regulatory and Development Authority of India in terms of the Master Circular – Investments, 2016 and the circular issued by the IRDAI entitled, Investment in Units of Real Estate Investment Trusts (REIT) & Infrastructure Investment Trusts (InvIT) dated March 14, 2017 read along with the Circular entitled, Amendments to Investments Master Circular dated August 3, 2022.

### ***Bids under Power of Attorney***

In case of Bids made pursuant to a power of attorney by Institutional Investors or Bodies Corporate, a certified copy of the power of attorney or the relevant resolution or authority, as the case may be, along with a certified copy of the memorandum of association and articles of association and/or bye laws must have been submitted along with the Application Form. Failing this, any such Bid is liable to be rejected.

The Investment Manager, in consultation with the Lead Manager, in its absolute discretion, reserves the right to relax the above condition of simultaneous lodging of the power of attorney along with the Application Form.

Allotments, if any, made to FVCIs in the Issue are subject to the respective rules and regulations that are applicable to each of them.

**The Parties to the Highways Trust and the Lead Manager are not liable for any amendment or modification or change to applicable law or regulations, which may occur after the date of this Final Placement Memorandum. Eligible Investors were advised to make their independent investigations and satisfy themselves that they are eligible to apply in the Issue. Eligible Investors were advised to ensure that any single application from them does not exceed the investment limits or maximum number of Units that can be held by them under applicable law or regulation or as specified in the Placement Memorandum.**

*Note: Affiliates or associates of the Lead Manager who were Eligible Investors may have participated in the Issue in compliance with applicable law.*

### **Maximum and Minimum Bid Size**

- (i) Each Bidder was required to Bid for a Minimum Bid Size of ₹ 260 million and in multiples of 2,00,000 Units, thereafter.
- (ii) No Bidder shall have Bid for that number of Units which exceeds the Issue size.

### **Application Process**

#### **Application Form**

Bidders shall have only used the Application Forms provided by the Investment Manager for the purpose of making a Bid in terms of the Placement Memorandum.

A Bidder applying for the Units to be issued pursuant to the Issue must have at least one beneficiary account with a Depository Participant of either NSDL or CDSL prior to making the Bid. Allotment to a successful Bidder will be credited in electronic form directly to the beneficiary account (with the Depository Participant) of such Bidder.

By making a Bid for the Units through Application Forms, Bidders were deemed to have made the following representations and warranties, respectively:

1. The Bidder confirms that it is an Institutional Investor or a Body Corporate, and is eligible to participate in the Issue;
2. The Bidder has deposited the Bid Amount in the Designated Account;
3. Subject to the terms of the Application Form and the Placement Memorandum and applicable law, the Bidder has no right to withdraw its Bid once such Bid is submitted to the Lead Manager;
4. The Bidder confirms that it is eligible to apply for, and hold, any Units that may be Allotted to the Bidder pursuant to the Issue. The Bidder further confirms that any such Allotment of Units to, and the holding of Units by, the Bidder does not, and shall not, exceed the level permissible as per any law applicable to the Bidder;
5. The Bidder understands and agrees that the Units offered hereby have not been registered with, or approved or disapproved by the SEC or any State securities commission in the U.S. or any other U.S. regulatory authority, and that the Units may not be offered, sold or resold or otherwise transferred within the U.S., except in a transaction exempt from the registration requirements of the Securities Act, and the Units are being offered and sold in an offshore transaction outside the U.S. in compliance with Regulation S to persons located in jurisdictions where such offer and sale of the Units is permitted under the laws of such jurisdiction. Accordingly, the Bidder confirms that it is outside the United States and it is purchasing the Units in an offshore transaction in reliance on Regulation S under the U.S. Securities Act.
6. The Bidder further confirms that no offer or sale of the Units is the result of any “directed selling efforts” in the United States (as such term is defined in Regulation S) and that Highways Trust and the Lead Manager, and their respective affiliates and representatives (including legal counsels to each of the foregoing), will rely upon the truth and accuracy of the foregoing acknowledgements, representations, warranties and agreements and agree that, if at any time any of the acknowledgements, representations, warranties and agreements made in connection with the Units is no longer accurate, it shall immediately notify Highways Trust and the Lead Manager in writing.

**ELIGIBLE INVESTORS HAVE PROVIDED THEIR DEMAT ACCOUNT DETAILS, THEIR DEPOSITORY PARTICIPANT'S NAME, DEPOSITORY PARTICIPANT IDENTIFICATION NUMBER, BENEFICIARY ACCOUNT NUMBER AND BANK ACCOUNT DETAILS IN THE APPLICATION FORM. ELIGIBLE INVESTORS ARE EXPECTED TO HAVE ENSURED THAT THE NAME GIVEN IN THE APPLICATION FORM IS EXACTLY THE SAME AS THE NAME IN WHICH THE DEMAT ACCOUNT IS HELD.**

Demographic details such as address and bank account details will be obtained from the Depositories as per the demat account details given in the Application Form.

#### **Instructions for completing the Application Form**

Bidders may note that forms not filled completely or correctly as per instructions provided in the Placement Memorandum and the Application Form were liable to be rejected. The Bids should have adhered to the following:

- (i) Bids must have been made only in the prescribed application form;
- (ii) Application Form must have been completed in full, in BLOCK LETTERS in ENGLISH and in accordance with the instructions contained herein and in the Application Form. Incomplete Application Forms were liable to be rejected. Bidders must have provided details of valid and active DP ID, Client ID and PAN clearly and without error. Invalid accounts, suspended accounts or where such account is classified as invalid or suspended shall not be considered for Allotment. Bidders should note that the Lead Manager, Registrar and the Investment Manager will not be liable for errors in data entry due to incomplete or illegible Application Forms; and
- (iii) Bidders were required to sign the Application Form. Bidders should have ensured that the thumb impressions and signatures other than in the languages specified in the Eighth Schedule to the Constitution of India, are attested by a Magistrate or a Notary Public or a Special Executive Magistrate under official seal.

#### ***Submission of Application Form***

All Application Forms had to be duly completed with information including the name of the Bidder, the number of the Units applied for and the Bid Amount deposited in the Designated Account, and include details of the bank account from which payment of the Bid Amount was made as well as a confirmation of funds transfer. The Application Form should have been submitted to the Lead Manager either through electronic form or through physical delivery at the following address:

#### **Axis Capital Limited**

1<sup>st</sup> Floor, Axis House

C 2 Wadia International Centre

P. B. Marg, Worli

Mumbai 400 025

Maharashtra, India

**Tel:** +91 22 4325 2183

**Email:** highways.invit@axiscap.in

**Contact person:** Harish Patel/Akash Aggarwal

The Lead Manager shall not be required to provide any written acknowledgement of the Application Form.

#### ***PAN***

**Each Eligible Investor must have mentioned its PAN allotted under the IT Act. Each Eligible Investor was required to submit a copy of its PAN card along with the Application Form.** Eligible Investors should not have submitted the general index registrar number (“GIR”) instead of the PAN. Applications without this information have been considered incomplete and were liable to be rejected, except from Eligible Investors which are not required to hold a PAN under applicable law.

#### ***Bank Account for Payment of Bid Amount***

The Investment Manager will open the Designated Account with Axis Bank Limited, acting as the Escrow Collection Bank in terms of the arrangement among the Highways Trust, the Investment Manager, the Lead Manager and the Escrow Collection Bank. Bidders were required to deposit the entire Bid Amount during the Bid/Issue Period, together with the completed Application Form, in favour of “HIGHWAYS INFRASTRUCTURE TRUST – ESCROW ACCOUNT”.

If the payment of the Bid Amount was not made favouring the Designated Account within the Bid/Issue Period, the Application Form of the Bidder was liable to be rejected.

The Trustee and the Investment Manager shall utilize the amount deposited in the Designated Account only for the purposes of: (i) adjustment against Allotment; or (ii) refund of application monies in case of any failure to allot Units in the Issue. For further details, please see the section entitled “*Issue Procedure – Refunds*” on page 295.

#### ***Payment Instructions***

The payment of Bid Amount shall have been made by the Bidders in the name of the Designated Account as per the payment instructions provided in the Placement Memorandum and the Application Form. Payments were to be made only through electronic fund transfer. Payments through cheques or cash or any mode other than electronic mode have been rejected.

#### ***Bidders' Demat Account and Bank Account Details***

Bidders should note that on the basis of Bidders' PAN, DP ID and Client ID provided by them in the Application Form, the Registrar has obtained from the Depository the demographic details including the Bidders' address and bank account details (including the nine-digit Magnetic Ink Character Recognition ("MICR") code as appearing on a cheque leaf) (the "**Demographic Details**"), from the Depository. The Demographic Details will be used for giving refunds (including through direct credit, NACH, NECS, NEFT and RTGS) to the Bidders. It is mandatory to provide the bank account details in the space provided in the Application Form and Application Forms that do not contain such details were liable to be rejected. Hence, Bidders were advised to immediately update their bank account details, PAN and Demographic Details as appearing on the records of the Depository Participant and ensure that they are true and correct. Failure to do so could result in delays in credit of refunds to Bidders at their sole risk and none of the Lead Manager, Registrar, the Investment Manager or the Trustee will have any responsibility or undertake any liability for this. Accordingly, Bidders have carefully filled in their demat account details in the Application Form.

By signing the Application Form, the Bidder is deemed to have authorised the Depositories to provide to the Investment Manager and the Registrar, on request, the required Demographic Details as available in their records.

The Trustee, the Investment Manager or the Lead Manager will not be responsible or liable for the delay in the credit of the Units to be issued and transferred pursuant to the Issue due to errors in the Application Form, delay in payment of Bid Amount or otherwise on part of the Bidders.

#### **Allocation**

##### ***Build-up of the book***

The Bidders were required to submit their Bids for the Units within the Bid/Issue Period to the Lead Manager. The book shall be maintained by the Lead Manager.

##### ***Method of Allocation***

The Investment Manager has determined the Allocation in consultation with the Lead Manager on a discretionary basis. After finalization of the Allocation, the Investment Manager has updated the Placement Memorandum with the Issue details and has filed this Final Placement Memorandum with SEBI and the Stock Exchange, and dispatched the CAN, together with a serially numbered Final Placement Memorandum to each successful Bidder.

**THE DECISION OF THE INVESTMENT MANAGER, IN CONSULTATION WITH THE LEAD MANAGER, IN RESPECT OF ALLOCATION SHALL BE FINAL AND BINDING ON ALL BIDDERS. BIDDERS MAY NOTE THAT ALLOCATION OF THE UNITS IS AT THE SOLE AND ABSOLUTE DISCRETION OF THE INVESTMENT MANAGER, IN CONSULTATION WITH THE LEAD MANAGER, AND BIDDERS MAY NOT RECEIVE ANY ALLOCATION EVEN IF THEY HAVE SUBMITTED VALID APPLICATION FORMS. NEITHER THE INVESTMENT MANAGER NOR THE LEAD MANAGER ARE OBLIGED TO ASSIGN ANY REASON FOR ANY SUCH NON-ALLOCATION.**

#### **Confirmation of Allocation Note or CAN**

Based on the Application Forms and Bid Amounts received from Bidders, the Investment Manager, in consultation with the Lead Manager, in their sole and absolute discretion, has decided the Bidders to whom the serially numbered CANs shall be sent, pursuant to which the details of Units Allocated to them shall be notified to such Bidders. Further, details of the amounts payable for Allotment of the Units in their respective names shall be notified to such Bidders. Additionally, the CAN will include the probable designated date, being the date of credit of the Units to the respective Bidder's demat account ("**Designated Date**").

Bidders, who have been Allocated Units, would also be sent a serially numbered Final Placement Memorandum either in electronic form or by physical delivery along with the serially numbered CAN. The dispatch of the serially numbered Final Placement Memorandum and the CAN to Bidders shall be deemed a valid, binding and irrevocable contract in respect of the number of Units Allocated to each successful Bidder.

Bidders are advised to instruct their Depository Participant to accept the Units that may be Allotted to them pursuant to the Issue.

### ***Allotment of the Units***

The Trustee and the Investment Manager will endeavour to complete the Allotment by the Closing Date.

In accordance with the InvIT Regulations, the Units will be issued and Allotment shall be made only in dematerialised form to the Allottees. The Investment Manager (on behalf of the Highways Trust) and the Registrar have entered into:

- (a) Agreement dated March 7, 2022 with NSDL; and
- (b) Agreement dated March 3, 2022 with CDSL.

After the Bid/Issue Closing Date and the completion of the Formation Transactions, the Investment Manager has updated the Placement Memorandum with the Issue details and filed this Final Placement Memorandum with the SEBI and the Stock Exchange, within the timelines specified under applicable law.

Following the Allotment of Units, the Investment Manager will apply for final listing and trading approval from the Stock Exchange. The Investment Manager and the Lead Manager shall endeavour to list the Units on the Stock Exchange within 6 Working Days from the Bid/Issue Closing Date.

### ***Refunds***

In the event of non-receipt of listing permission from the Stock Exchange, the Units shall not be eligible for listing. The Highways Trust will ensure that refunds are made to the Bidders, along with interest at the rate of 15% per annum from the date of Allotment, in accordance with and subject to applicable law.

### **Other Instructions**

#### ***Right to Reject Applications***

The Investment Manager, in consultation with the Lead Manager, may reject Bids, in part or in full, without assigning any reason whatsoever. The decision of the Investment Manager and the Lead Manager in relation to the rejection of Bids shall be final and binding.

#### ***Units in Dematerialised form with NSDL or CDSL***

The Allotment shall be only in dematerialised form (i.e., not in physical certificates but represented by the statement issued through the electronic mode).

A Bidder applying for the Units to be issued pursuant to the Issue must have at least one beneficiary account with a Depository Participant of either NSDL or CDSL prior to making the Bid. Allotment to a successful Bidder will be credited in electronic form directly to the beneficiary account (with the Depository Participant) of such Bidder.

Units in electronic form can be traded only on the stock exchanges having electronic connectivity with NSDL and CDSL. NSE has electronic connectivity with NSDL and CDSL. The trading of the Units would be in dematerialised form only for all Unitholders in the respective demat segment of NSE. For details in respect of the minimum trading lot, please see the section entitled "*Issue Structure*" on page 187.

The Trustee, the Investment Manager or the Lead Manager, will not be responsible or liable for the delay in the credit of the Units to be issued and transferred pursuant to the Issue due to errors in the Application Form, delay in payment of Bid Amount or otherwise on part of the Bidders.

## STATEMENT OF TAX BENEFITS

### CERTIFICATE ON STATEMENT OF TAX BENEFITS

Date: 08.08.2022

To:

**Highways Infrastructure Trust**

acting through Axis Trustee Services Limited, as the trustee (the “Trustee”)  
2nd Floor, Piramal Tower  
Peninsula Corporate Park  
Lower Parel  
Mumbai 400 013  
Maharashtra, India  
(the “Trust”)

**Virescent Infrastructure Investment Manager Private Limited**

in its capacity as an investment manager of the Highways Trust  
10th Floor, Parinee Crescenzo  
C- 30 'G' Block  
Bandra Kurla Complex  
Bandra (East)  
Mumbai 400051  
Maharashtra, India  
(the “Investment Manager”)

**Galaxy Investments II Pte. Ltd.**

10 Changi Business Park, Central 2  
#01-02, Hansapoint,  
Singapore - 486030  
(“Sponsor”)

**Axis Capital Limited**

1st Floor, Axis House  
C 2 Wadia International Centre  
P. B. Marg, Worli  
Mumbai 400 025  
Maharashtra, India  
(“Lead Manager”)

Dear Sir,

**Ref: Statement of possible tax benefits available to the Highways Infrastructure Trust and its unitholders on proposed offering of units (“Issue”).**

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1. The accompanying Statement of Possible Special Tax Benefits available to the Highways Infrastructure Trust (“the Trust”) and its unitholders (hereinafter referred to as “the Statement”) under the Income Tax Act, 1961 (read with Income Tax Rules, circulars, notifications) as amended by the Finance Act, 2021 (hereinafter referred to as the “Indian Income Tax Regulations”) has been prepared by the Trust (acting through the Investment Manager) in connection with the Issue, which we have initialed for identification purposes.
2. The preparation of this Statement as of the date of our report which is to be included in the Draft Placement Memorandum, Placement Memorandum and Final Placement Memorandum (collectively, the “Issue Documents”) is the responsibility of the Trust (acting through the Investment Manager). The Trust’s responsibility includes designing, implementing and maintaining internal control relevant to the preparation and presentation of the Statement, and applying an appropriate basis of preparation; and making estimates that are reasonable in the circumstances. The Trust (acting through the Investment Manager) is also responsible for identifying and ensuring that it complies with the laws and regulations applicable to its activities.

3. Our work has been carried out in accordance with Standards on Auditing, the ‘Guidance Note on Reports or Certificates for Special Purposes (Revised 2016)’ and other applicable authoritative pronouncements issued by the Institute of Chartered Accountants of India.
4. Our work was carried out to report whether the Statement prepared by the Trust (acting through the Investment Manager), presents, in all material respects, the possible special tax benefits as of 24 March 2022 available to the Trust and the unitholders in accordance with the Indian Income Tax Regulations as at the date of our report.

### **Inherent Limitations**

5. We draw attention to the fact that the Statement includes certain inherent limitations that can influence the reliability of the information.

Several of the benefits mentioned in the accompanying statement are dependent on the Trust or its unitholders fulfilling the conditions prescribed under the relevant provisions of the tax laws. Hence, the ability of the Trust or its unitholders to derive the tax benefits is dependent upon fulfilling such conditions, which may or may not be fulfilled. The benefits discussed in the accompanying statement are not exhaustive

The Statement is only intended to provide general information to the investors and is neither designed nor intended to be a substitute for professional tax advice. In view of the individual nature of the tax consequences and the changing tax laws, each investor is advised to consult his or her own tax consultant with respect to the specific tax implications arising out of their participation in the Issue.

Further, we give no assurance that the Revenue Authorities/ Courts will concur with our views expressed herein. Our views are based on the existing provisions of law and its interpretation, which are subject to change from time to time. We do not assume responsibility to update the views consequent to such changes.

### **Opinion**

6. In our opinion, the Statement prepared by the Trust presents, in all material respects, the possible special tax benefits available as of 24 March 2022, to the Trust and its unitholders in accordance with the Indian Income Tax Regulations as at the date of our report.

Considering the matter referred to in paragraph 5 above, we are unable to express any opinion or provide any assurance as to whether:

- (i) The Trust or its unitholders will continue to obtain the benefits per the Statement in future; or
  - (ii) The conditions prescribed for availing the benefits per the Statement have been/ would be met with.
7. This report is addressed to and provided to the Board of Directors of the Investment Manager of the Trust solely in connection with the Issue and for the purpose of inclusion in the Issue Documents and other documents in connection with the proposed Issue by the Trust and should not be used by any other person or for any other purpose. Further it should not be used, referred to or distributed for any other purpose or to any other party without our prior written consent. We will not accept or assume any liability or any duty of care for any other purpose for which or to any other person to whom the report is shown or into whose hands it may come without our prior consent in writing. save as set out in this report.

Yours faithfully,  
For Sunil Vankawala & Associates

### **Authorized Signatory**

Name: Sunil T.Vankawala

Designation: Proprietor

Membership No.: 033461

Firm Registration No.: 110616W

**UDIN: 22033461A00KJW9330**

**CC:**

**Legal Advisor to the Issue**

**Cyril Amarchand Mangaldas**

5<sup>th</sup> Floor, Peninsula Chambers

Peninsula Corporate Park

Ganpatrao Kadam Marg

Lower Parel

Mumbai 400 013

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## Statement of Tax Benefits

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### 1. In case of InvIT

#### ***Tax benefits available to InvITs in respect to income received from the Special Purpose Vehicle(s) ('SPVs') – 10(23FC) of the IT Act***

Any income of the Trust (as a business trust) in the nature of interest or dividend received or receivable from a SPV (including the Project SPVs) shall be exempt from income tax and accordingly not to be included in the total income of the Trust. For the purposes of this section, SPV means an Indian company in which the business trust holds controlling interest and any specific percentage of shareholding or interest, as may be required by the regulations under which such trust is granted registration.

The above is on account of the tax pass through status accorded by the Indian Income-tax Act, 1961 ('IT Act') to InvITs as business trusts. The interest income is taxable in the hands of Unitholders of the InvIT directly in the same manner and same nature as it would have been taxable in the hands of the Trust.

The Finance Act, 2020 has abolished Dividend Distribution Tax ('DDT') and hence there shall be no DDT on profits distributed by SPVs to business trust on or after April 1, 2020. However, with the removal of DDT, dividend income would be taxable in the hands of unitholders of the InvIT based on whether the SPVs have opted for the old tax regime or the concessional tax regime u/s 115BAA of the IT Act. In case, the SPV has opted for a concessional tax rate specified under section 115BAA of the IT Act, dividend income will be taxable in the hands of the unitholders. Therefore, withholding tax obligation would need to be assessed at the time of distribution of dividend income by the Business Trust to the unit holders based on the tax regime (i.e. old tax regime/ concessional tax regime) adopted by the respective SPV.

The Finance Act 2021 extends the benefit of non-withholding of tax on the dividend income credited or paid to REIT/ InvIT by specified SPV. This amendment will take effect retrospectively from 01 April 2020. Accordingly, with respect to dividend income distributed by the SPVs to the Business Trust, SPVs may not be liable to withhold tax while making payment to the Business Trust.

As per section 14A of the Indian Income-tax Act, 1961, any expenditure incurred in relation to earning the above exempt income shall not be tax deductible. The provision of Rule 8D of the Income-tax Rules, 1962 read with section 14A of the Indian Income-tax Act, 1961 shall be followed for calculating the quantum of disallowance.

#### ***Income from buy back of shares – Section 10(34A) of the Indian Income-tax Act, 1961 read with section 115QA***

Income arising to the Trust as an InvIT from buy-back of shares held in SPVs (including Project SPVs) shall not be taxable as per section 10(34A) of the Indian Income-tax Act, 1961 in the hands of the Trust as an InvIT. However, the provisions of section 14A of the Indian Income-tax Act, 1961 shall apply as stated above.

#### ***Section 115UA(2) read with section 111A, section 112 and 112A of the Indian Income-tax Act, 1961 - Taxability of capital gains at concessional rates***

Subject to the provisions of section 111A and section 112 of the Indian Income-tax Act, 1961, the total chargeable income of a business trust shall be taxable at maximum marginal rate as per Section 115UA(2) of Income-tax Act, 1961. MMR is defined under the provisions of IT Act to mean the rate of income-tax (including surcharge on income-tax, if any) applicable in relation to the highest slab of income as per the relevant Finance Act.

In accordance with Section 2(29A) of the Indian Income-tax Act, 1961, the following assets on meeting the respective period of holding shall be classified as long-term capital asset otherwise the same shall be classified as short-term capital asset:

S No	Asset	Period of Holding
1	Security (other than a unit) listed on a recognized stock exchange in India or unit of the UTI or unit of an equity-oriented fund or zero-coupon bond	> 12 months

2	Shares of a company not being listed on a recognized stock exchange or immovable property	> 24 months
3	Other assets including a unit of a mutual fund other than equity oriented mutual fund or unit of a business trust	> 36 months

As per the provisions of section 111A of the Indian Income-tax Act, 1961, any income arising from transfer of short-term capital asset being an equity share in a company or a unit of an equity-oriented fund or a unit of an eligible business trust, transacted through a recognized stock exchange and subject to Securities Transaction Tax ('STT'), will be taxable at a concessional rate of 15% (plus applicable surcharge and cess if any).

As per the provisions of section 112(1) of the Indian Income-tax Act, 1961, gains arising on the transfer of long-term capital assets being equity shares of an unlisted company shall be chargeable to tax in the hands of the business trust at the rate of 20% (plus applicable surcharge and cess).

Section 48 of the Indian Income-tax Act, 1961 prescribes the mode of computation of Capital Gains and provides for deduction of cost of acquisition/ improvement and expenses incurred in connection with the transfer of a capital asset, from the sale consideration to arrive at the amount of capital gains. However, in respect of long-term capital gains, section 48 provides for substitution of cost of acquisition/ improvement with indexed cost of acquisition/ improvement, which adjusts the cost of acquisition/ improvement by a cost inflation index as prescribed from time to time. Such indexation benefit would not be available on bonds and debentures.

Please note that the Finance Act, 2018 has made amendments in connection with the capital gains tax that accrue post 1<sup>st</sup> Apr 2018. Salient features of the same are as follows:

The erstwhile exemption from capital gains tax on long-term capital assets being specified listed securities sold in a stock exchange has been withdrawn. Where the quantum of gains exceeds INR 0.1 Million, the same will be taxable u/s 112A of the Indian Income-tax Act, 1961 at the rate of 10% (plus applicable surcharge and cess).

With a view to grandfather gains notionally realized by investors up to 31 January 2018, for units acquired till such date, it has been provided that taxable gains will be determined using the higher of:

- Actual cost of acquisition; or
- Lower of sale price and fair market value (as specifically defined under the Indian Income-tax Act, 1961)

Further, as per proviso to section 112 of the Indian Income-tax Act, 1961, capital gain in case of specified listed securities (other than a unit) where the conditions prescribed under section 112A of the Indian Income-tax Act, 1961 are not met or zero-coupon bond, shall be taxable at the rate of 10% without giving the benefit of indexation.

It is pertinent to note here that section 115UA provides that chargeable incomes other than capital gains covered under section 111A and 112 of IT Act, shall be taxed at MMR.

Therefore, long term capital gains on account of sale of listed securities which is taxable @ 10% under section 112A (subject to certain conditions) of the Indian Income-tax Act, 1961 will be taxable at MMR in the hands of business trust since specific carve out has not been provided for section 112A of the Indian Income-tax Act, 1961 under the provisions of section 115UA of the Indian Income-tax Act, 1961.

Rebate under section 87A of the Indian Income-tax Act, 1961 shall be allowed from the income-tax on the total income as produced by the tax payable on long-term capital gains.

In accordance with, and subject to the conditions, including the limit of investment of INR 5 Million, capital gains arising on transfer of a long term capital asset, being land or building or both, shall be exempt from capital gains under section 54EC if the gains are invested within 6 months from the date of transfer in purchase of specified bonds (redeemable after five years and issued on or after 1 April 2018) issued by National Highways Authority of India (NHAI) or Rural Electrification Corporation Ltd (RECL) or any other bond notified by the Central Government, if permitted to be invested by an Investment trust as per the extant governing regulations. In case the whole of the gains is not so invested, the exemption shall be allowed on a pro rata basis.

In accordance with, and subject to the conditions, including the limit of investment of INR 5 Million, capital gains arising on transfer of a long-term capital asset shall be exempt from capital gains tax under section 54EE if the gains are invested within 6 months from the date of transfer in the purchase of long-term specified assets if permitted to be invested by an Investment trust as per the extant governing regulations. In case the whole of the gains is not so invested, the exemption shall be allowed on a pro rata basis.

***Deduction in respect of certain intercorporate dividends – Section 80M inserted by Finance Act, 2020***

The Finance Act, 2020 has also inserted section 80M to eliminate the cascading tax effect in case of intercorporate dividends by providing a deduction in respect of dividends received by a company (including foreign company) and business trust to the extent such dividend is distributed.

**2. Tax benefits available to unit holders of InvITs**

***Section 10(23FD) of the Indian Income-tax Act, 1961***

As per the provisions of section 115UA(1) of the Indian Income-tax Act, 1961, the income distributed by InvIT shall be deemed to be of the same nature and in the same proportion in the hands of the unit holder as if such income was received by or accrued to InvIT. Therefore, income taxable in the hands of unit holders shall be taxed in the same manner and nature as it would have been taxed in the hands of InvIT.

The provisions of section 10(23FD) of the Indian Income Tax Act, 1961 provides for exemption in the hands of unitholders. However, the subject provisions carve out the following income from its exemption ambit:

- Distribution made by InvIT out of interest income as specified in 10(23FC)(a)
- Distribution made by InvIT which corresponds to the dividend income as specified in 10(23FC)(b) in the cases where SPV has opted for Section 115BAA.

In accordance with the provisions of section 115UA(3) of the Indian Income Tax Act, 1961, the aforesaid incomes shall be taxable in the hands of unitholders. However, in case of dividend income mentioned above, the interest expense against such income shall be allowable subject to the cap of 20%. We would also like to highlight that income distributed by InvIT which is corresponding to the dividend received from the SPV shall be exempt in the hands of unitholders in cases where SPV has not opted for concessional tax regime under section 115BAA of IT Act

***For unitholders who are Mutual Funds***

Under section 10(23D) of the IT Act, any income earned by a Mutual Fund registered under the Securities and Exchange Board of India Act, 1992, or a Mutual Fund set up by a public sector bank or a public financial institution, or a Mutual Fund authorized by the Reserve Bank of India would be exempt from income-tax, subject to such conditions as the Central Government may by notification in the Official Gazette specify in this behalf.

As per section 196 of the IT Act, the business trust is not required to withhold tax on interest or dividend payment or any other payment to Mutual Fund set up under section 10(23D) of the IT Act.

***Section 10(23FE): Income of a specified person in the nature of dividend, interest or long-term capital gains arising from an investment made by it in India.***

As per section 10(23FE) of the IT Act, dividend, interest and long-term capital gains arising from investments made by 'specified person' in India, whether in the form of debt or share capital or unit, shall be exempt, if such investment is:

- i. made on or after the 01 April 2020 but on or before the 31 March 2024
- ii. is held for at least 3 years
- iii. *inter-alia*, is in a business trust

Further, such specified person (subject to certain conditions prescribed in section 10(23FE)) shall include:

- i. Wholly owned subsidiary of Abu Dhabi Investment Authority (ADIA)

- ii. Sovereign Wealth Funds (SWF)
- iii. Pension funds

In this regard, please note that there are no amendments in the withholding tax provisions under the IT Act providing for exemption from withholding taxes on above mentioned income accruing to specified persons.

**General benefit and provisions**

Vide Finance Act, 2020, definition of ‘business trust’ has been amended to include those trusts which are registered as InvITs with SEBI as per relevant regulations and not listed on a recognised stock exchange in India.

Where the gains arising on the transfer of the units of InvIT are included in the business income of an assessee, assessable under the head – ‘Profits and Gains from Business or Profession’ and on which securities transaction tax has been charged, such securities transaction tax shall be a deductible expense from business income as per the provisions of section 36(1)(xv) of the Indian Income-tax Act, 1961. The characterization of gains/ losses, arising from sale of units, as capital gains or business income would depend on the nature of holding in the hands of the unitholder and various other factors.

Short-term capital gains arising on transfer of the units of InvIT will be chargeable to tax at the rate of 15% (plus applicable surcharge and cess) as per the provisions of section 111A of the Indian Income-tax Act, 1961 provided such transaction is subject to securities transaction tax. In case of a resident unit holder being an individual or HUF, where the total taxable income as reduced by short-term capital gains is below the basic exemption limit, the short-term capital gains will be reduced to the extent of the shortfall and only the balance short-term capital gains will be subjected to such tax in accordance with the proviso to sub-section (1) of section 111A of the Indian Income-tax Act, 1961. Short term capital gains on transfer of units of the business trust, not transacted through a recognized stock exchange and not subject to STT shall be taxable at the applicable rate of tax for respective unit holders.

A unit holder being a domestic company which has not exercised option of concessional tax regime under section 115BAB or 115BAA of IT Act will not be able to claim the above exemption / beneficial tax rates while computing the book profits under section 115JB of the Indian Income-tax Act, 1961 and income tax payable under the said section shall be available as credit under section 115JAA (subject to conditions) of the Indian Income-tax Act, 1961.

The erstwhile exemption from long term capital gains tax on sale of units on a stock exchange has been withdrawn. Where the quantum of gains exceeds INR 0.1 Million, the same will be taxable u/s 112A of the Indian Income-tax Act, 1961 at the rate of 10% (plus applicable surcharge and cess).

Further, the taxability regarding the long-term capital gains on sale of units in the hands of unit holders for cases other than covered under section 112A of the Indian Income-tax Act, 1961 shall be taxable in accordance with section 112 of the Indian Income-tax Act, 1961 and are encapsulated in the below table for reference

Case	Non-resident	Resident*
<b>Listed Securities (other than those covered in Section 112A) or Zero-Coupon bond</b>	10% after giving effect to first proviso (currency conversion)	Lower of: 20% or 10% without giving the benefit of indexation.
<b>Unlisted securities</b>	Taxable at the rate of 10% without giving the benefit of indexation (second proviso to section 48) and foreign currency conversion. (first proviso to section 48)	20%
<b>Other assets</b>	Taxable at the rate 10% after the effect of first proviso (currency conversion)	Taxable at the rate of 20% after the effect of second proviso (indexation).

*\* In case of individuals, where the total income is below minimum exemption limit, the capital gain shall be reduced to the extent of such difference.*

As per section 70 read with section 74 of the IT Act, short term capital loss arising during a year is allowed to be set-off against short term capital gains as well as long term capital gains. Balance loss, if any, shall be carried forward and set-off against any capital gains arising during subsequent eight assessment years. Also, as per section 70 of the IT Act, long term capital loss arising during a year is allowed to be set-off only against long term capital gains. Balance loss, if any, shall be carried forward and set-off against long term capital gains arising during subsequent eight assessment years.

Further, as per Section 71 of the IT Act, short term/ long term capital loss for the year cannot be set-off against income under any other head for the same year.

In case of FPIs registered under the FPI Regulations, as per section 2(14) of the Indian Income-tax Act, 1961, shares/ securities (other than those held as stock in trade) which were invested in accordance with the regulations made under the SEBI Act, 1992 shall be deemed to be capital assets. Accordingly, any income from such transfer shall be deemed as a capital gain.

As per section 196D of the Indian Income-tax Act, 1961, no tax is to be deducted from any income, by way of capital gains arising from the transfer of units to an FPI.

As per the provisions of section 90(2) of the Indian Income-tax Act, 1961, in case of non-resident unit holders, beneficial tax regime under a Double Taxation Avoidance Agreement (“DTAA”) entered into between India and the country in which the non-resident Investor is resident, if any, shall be available and can be explored. However, the availability of the benefit as per the provisions of section 90(2) of the Indian Income-tax Act, 1961 are subject to conditions. (obtaining and furnish a certificate of tax residency in a country outside India if the unitholder is resident of or is registered outside India etc.).

As per explanation 4 to section 115JB(2) of the Indian Income-tax Act, 1961, the provisions of section 115JB of the Indian Income-tax Act, 1961 shall not be applicable to a foreign company if the foreign company is a resident of a country having DTAA with India and such foreign company does not have a permanent establishment within the definition of the term in the relevant DTAA, or the foreign company is a resident of a country which does not have a DTAA with India and such foreign company is not required to seek registration under the legislation covering companies in India.

#### ***Section 94(7) of the IT Act (commonly known as dividend stripping)***

Vide Finance Act, 2022, the applicability of section 94(7) of the IT Act (commonly known as dividend stripping) has been extended to the units of Trust as well (that with effect from Financial Year 2022-23) which provides that where:

- i. any person buys or acquires any securities or unit within a period of three months prior to the record date (Record date means a date fixed to entitles the holder of such securities or units to receive dividend, income, or additional securities or unit without consideration, as the case may be);
- ii. such person sells or transfers such securities within three months after such record date or such units within a period of nine months after such record date;
- iii. the dividend or income on such securities or unit received or receivable by such person is exempt

then, the loss, if any, arising from the sale and purchase of securities and units, to the extent of dividend or income received or receivable on such securities or unit, shall be ignored for computing income chargeable to tax. ***Section 94(8) of the IT Act (commonly known as bonus stripping)***

Vide Finance Act, 2022, the applicability of section 94(8) of the IT Act (commonly known as bonus stripping) has been extended to the units of Trust as well (that with effect from Financial Year 2022-23) which provides that where:

- i. any person buys or acquires any units within a period of three months prior to the record date (Record date means a date fixed to entitles the holder of such securities or units to receive dividend, income, or additional securities or unit without consideration, as the case may be);

- ii. such person is allotted additional units without any payment on the basis of holding of such units on such record date;
- iii. such person sells or transfers all or any of the units within a period of nine months after the record date, while continuing to hold all or any of the additional units referred in clause (ii) above

then, the loss, if any, arising from the sale and purchase of all or any of the units shall be ignored for computing income chargeable to tax and notwithstanding anything contained in any other provision of the IT Act, the amount of loss so ignored shall be deemed to be the cost of purchase or acquisition of such additional units referred to in clause (ii) above as are held on the date of such sale or transfer.

***Transactions not regarded as transfer – 47(xvii)***

Any transfer of a capital asset, being share of a special purpose vehicle to a business trust in exchange of units allotted by that trust to the transferor shall not be regarded as transfer and accordingly not be liable to capital gains tax.

According to section 49(2AC) of the IT Act, the cost of units acquired in lieu of shares in SPV shall be deemed to be cost of acquisition of shares in SPV. Further, as per clause (hc) of explanation 1 of Section 2(42A), for ascertaining the period of holding of such units, the period of holding of shares in SPV shall also be included.

Similarly, notional gain or loss arising on transfer of share of special purpose vehicle to business trust in exchange of units allotted by that trust as referred u/s 47(xvii) or notional gain or loss arising upon change in carrying amount of the units are to be excluded in calculation of book profits for the purposes of minimum alternate tax under section 115JB of the Indian Income-tax Act, 1961. Further, actual gain or loss as referred to in section 47(xvii) are also excluded from the purview of minimum alternate tax under section 115JB of the Indian Income-tax Act, 1961.

Further, actual gain or loss on disposal of units held by the Unitholder as referred to in section 47 (xvii) are considered for the purpose of normal provisions of IT Act and MAT u/s 115JB. (clause (iif)/(k) to explanation 1 to section 115JB)

However, if the Unitholder opts for concessional tax regime u/s 115BAA/ 115BAB then provisions of MAT u/s 115JB shall not be applicable for the Unitholder and it shall forego its entire MAT credit available at the time of exercising concessional tax-regime.

***Section 194 – Withholding obligations on dividend declared***

Section 194 casts an obligation on an Indian company to deduct TDS at the rate of 10% on the dividend , before making any payment in cash or before issuing any cheque or warrant in respect of any dividend or before making any distribution or payment to a resident of any dividend prescribed under section 2(22), when the amount of dividend exceeds INR 5,000

Vide Finance Act, 2021, any dividend paid to business trusts or persons notified shall not be subject to withholding tax with retrospective effect from 1 April 2020.

***Section 194A – Withholding obligations on interest distributed***

With respect to interest income (as referred to in section 10(23FC) distributed by SPVs to the Business Trust, section 194A(3)(xi) exempts SPV from the provisions of tax deduction at source in respect of interest paid/payable to the business trust, provided such interest is in relation to interest other than ‘interest on securities’.

However, withholding tax in accordance with section 194LAB of the IT Act will arise on interest distributed to unit holders of the Business Trust.***Section 194LBA - Certain Income from Units of InvIT***

As per section 194LBA of the Indian Income Tax Act, 1961, where InvIT distributes any income to its unit-holders, it is liable to deduct taxes on the component of the distribution in the following manner:

Nature of income	Rate of TDS	
	Resident	Non-resident

Interest Income	10%	5% (plus applicable surcharge and cess)
Dividend Income (only in cases where SPV opts for section 115BAA)	10%	10% (plus applicable surcharge and cess)

***Other provision for tax deduction***

No income tax is deductible at source from income by way of capital gains arising to a resident unitholder under the present provisions of the Indian Income-tax Act, 1961.

In addition to above, as per the provisions of Section 195 of the Indian Income-tax Act, 1961, any income by way of capital gains payable to non-residents may be subject to withholding of tax at the rate under the domestic tax laws or under the Double Tax Avoidance Agreement (DTAA), whichever is beneficial to the assessee.

***Section 206AA of the Indian Income-tax Act, 1961 – No PAN Case***

As per Section 206AA of the Indian Income-tax Act, 1961, where a tax payer does not possess a PAN, taxes have to be withheld on payment of income to the tax payer (where chargeable to tax) at higher of the following:

- at the rate specified in the Indian Income-tax Act, 1961; or
- at the rate or rates in force; or
- at the rate of twenty per cent

The Finance Act, 2016 amended the aforementioned provision to provide an exemption to non-residents, subject to compliance of such conditions as may be prescribed by the CBDT. In addition, the CBDT issued a notification prescribing the rules for relaxation from withholding of tax at higher rates in the absence of PAN in the case of non-resident deductee and laid down the information and alternative documents required to claim such relaxation.

***Section 206AB of IT Act (introduced vide the Finance Act, 2021) – Where the return of income has not been furnished by the unitholder***

As per Section 206AB of IT Act, where taxes are required to be deducted on any sum (other than those referred to in section 192, 192A, 194B, 194BB, 194LBC or 194N) paid/ payable/ credited to a specified person, the taxes have to be withheld at higher of the following:

- at twice the rate specified in IT Act; or
- at twice the rate or rates in force; or
- at the rate of 5 percent

As amended vide Finance Act, 2022, specified person means a person, who –

(i) has not filed the return of income for the assessment year relevant to the previous year immediately preceding the financial year in which the tax is required to be deducted, for which time-limit of filing u/s 139(1) has expired; and

(ii) the aggregate of tax deducted at source and tax collected at source is INR 50,000 or more in the said previous year

The above provisions shall not be applicable in case of non-resident not having a permanent establishment in India.

Further, in cases where both Section 206AA and Section 206AB of IT Act are applicable, TDS shall be deducted at higher of the rate prescribed under both these sections.

### 3. General tax rates and provisions

- In accordance with newly inserted section 115BAA of the Indian Income-tax Act, 1961 (option available from FY 2019-20), the domestic companies are entitled to avail the concessional tax rate of 22% (as increased by surcharge of 10% and cess of 4%) subject to certain conditions. Further, provisions of MAT under section 115JB of the Indian Income-tax Act, 1961 shall not be applicable to such companies. Domestic companies which are not availing such option shall continue to be liable at the tax rate of 30% / 25% as the case may be as increased by applicable surcharge and cess. The rate of minimum alternate tax under section 115JB of the Indian Income-tax Act, 1961 has been reduced to 15% with effect from 1<sup>st</sup> April 2019.
- If the income of the domestic company is less than INR 10 million, there shall be no surcharge on the Income. However, if the income exceeds INR 10 million but is less than INR 100 million there shall be a surcharge at the rate of 7%. In furtherance to this, if the income of the domestic company exceeds INR 100 million the applicable rate of surcharge shall be at the rate of 12%
- In case of a company other than domestic company, where the income is less than INR 10 million, there shall be no surcharge on the Income. However, if the income exceeds INR 10 million but is less than INR 100 million there shall be a surcharge at the rate of 2%. In furtherance to this, if the income of the domestic company exceeds INR 100 million the applicable rate of surcharge shall be at the rate of 5%.
- In case of individuals, the applicable surcharge would be as follows:
  - i. If the total income does not exceed INR 5 million - Nil
  - ii. If the total income exceeds INR 5 million but does not exceed INR 10 million – 10%
  - iii. If the total income exceeds INR 10 million but does not exceed INR 20 million – 15%
  - iv. If the total income (excluding dividend income or income under the provision of section 111A and section 112A of the IT Act) exceeds INR 20 million but does not exceed INR 50 million – 25%
  - v. If the total income (excluding dividend income or income under the provision of section 111A and section 112A of the IT Act) exceeds INR 50 million – 37%
  - vi. If total income is above 20 million (including dividend income or income under the provision of section 111A and section 112A of IT Act) but is not covered under (iv) and (v) above – 15%

However, please note that the applicable surcharge does not exceed 15% in case of dividend income or income under the provision of section 111A and section 112A of the IT Act included in such total income.

Further, vide Finance Act, 2022, with effect from Financial Year 2022-23, the surcharge on long term capital gains under section 112 of the IT Act arising from transfer of long-term capital assets (including units of Trust) shall also be capped at 15%.

- The above surcharge is subject to marginal tax benefit as per the Income Tax Act, 1961.
- In case of taxpayers other than those as mentioned above, there shall be a surcharge at the rate of 12% where the income exceeds INR 10 million.
- Further, as per the Finance Act, 2018 the rate of education cess being 3% has been repealed and a health and education cess of 4% has been applied (which shall not be tax deductible).

#### Notes:

1. These special tax benefits are dependent on the Trust or its unitholders fulfilling the conditions prescribed under the relevant provisions of IT Act. Hence, the ability of the Trust or its unitholders to derive the tax benefits is dependent upon fulfilling such conditions, which based on the business imperatives, the Trust or its unitholders may or may not choose to fulfil.
  
2. The special tax benefits discussed in the Statement are not exhaustive and is only intended to provide general information to the Trust and its unitholders and hence, is neither designed nor intended to be a substitute for professional tax advice. In view of the individual nature of the tax consequences and the changing tax laws, each unitholder is advised to consult his or her own tax consultant with respect to the specific tax implications arising out of their participation in the issue.
  
3. The statement is prepared on the basis of information available with the Trust and there is no assurance that:
  - i. the Trust or its unitholders will continue to obtain these benefits in future;
  - ii. the conditions prescribed for availing the benefits have been/ would be met with; and
  - iii. the revenue authorities/courts will concur with the view expressed herein.

The above views are based on the existing provisions of law and its interpretation, which are subject to change from time to time.

## **LEGAL MATTERS**

Cyril Amarchand Mangaldas, does not make, or purport to make, any statement in this Final Placement Memorandum and is not aware of any statement in this Final Placement Memorandum which purports to be based on a statement made by each of them, and it makes no representation, express or implied, regarding, and to the extent permitted by law takes no responsibility for, any statement in or omission from this Final Placement Memorandum.

## **INDEPENDENT ACCOUNTANTS**

The Special Purpose Combined Financial Statements have been prepared in accordance with the requirements of the InvIT Regulations, the accounting principles generally accepted in India, including Ind AS. The Special Purpose Combined Financial Statements included in this Final Placement Memorandum have been audited by Walker Chandiok & Co LLP, Chartered Accountants, the statutory auditors of the Highways Trust, as stated in their audit report dated July 8, 2022 included in this Final Placement Memorandum.

**SPECIAL PURPOSE COMBINED FINANCIAL STATEMENTS**

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# Walker Chandiook & Co LLP

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India

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## **Independent Auditor's Report on Special Purpose Combined Financial Statements of the Project SPVs to be transferred to Highways Infrastructure Trust**

To

The Board of Directors of Virescent Infrastructure Investment Manager Private Limited (the 'Investment Manager') in its capacity as Investment Manager of Highways Infrastructure Trust

### **Report on the Audit of the Special Purpose Combined Financial Statements**

#### **Opinion**

1. We have audited the accompanying special purpose combined financial statements consisting of the following six companies:
  - a) Ulundurpet Expressways Private Limited
  - b) Nirmal BOT Limited
  - c) Godhra Expressways Private Limited
  - d) Jodhpur Pali Expressway Private Limited
  - e) Shillong Expressway Private Limited
  - f) Dewas Bhopal Corridor Private Limited

(together referred as 'Project SPVs' or 'Project SPV Group' and individually 'Project SPV') which are proposed to be transferred from Galaxy Investments II Pte Ltd (herein referred to as 'Sponsor') and other shareholders of Project SPVs to Highways Infrastructure Trust (the 'Trust') pursuant to the proposed private placement of Units of the Trust ('Private Placement'), and which comprises the:

- a. Combined Balance Sheets as at 31 March 2022, 31 March 2021 and 31 March 2020;
- b. Combined Statements of Profit and Loss (including Other comprehensive income) for the financial years ended 31 March 2022, 31 March 2021 and 31 March 2020;
- c. Combined Statements of Cash Flows for the financial years ended 31 March 2022, 31 March 2021 and 31 March 2020;
- d. Combined Statements of Changes in Equity for the financial years ended 31 March 2022, 31 March 2021 and 31 March 2020;
- e. Combined Statements of Net Assets at Fair Value as at 31 March 2022;
- f. Combined Statements of Total Returns at Fair Value for the financial year ended 31 March 2022; and
- g. a summary of significant accounting policies and other explanatory information.  
(together referred to as 'special purpose combined financial statements').

These special purpose combined financial statements have been prepared in accordance with Basis of preparation as specified in note 2.1 to the special purpose combined financial statements.

# Walker Chandiook & Co LLP

## Independent Auditor's Report on Special Purpose Combined Financial Statements of the Project SPVs to be transferred to Highways Infrastructure Trust (Cont'd)

2. In our opinion and to the best of our information and according to the explanations given to us, the aforesaid special purpose combined financial statements gives a true and fair view of the state of affairs (financial position) of the Project SPVs as at 31 March 2022, 31 March 2021 and 31 March 2020 and its losses (including other comprehensive income), its cash flows and the changes in equity for the financial years ended 31 March 2022, 31 March 2021 and 31 March 2020, the combined net assets at fair value as at 31 March 2022 and the combined total returns at fair value for the year ended 31 March 2022 and for the financial year ended 31 March 2021 in accordance with the basis of preparation as described in note 2.1 to these special purpose combined financial statements.

### Emphasis of matters - Basis of Preparation and Restriction on Distribution or Use

3. Without modifying our opinion, we draw attention to Note 2.1 to the accompanying special purpose combined financial statements, which describes the basis of its preparation. The special purpose combined financial statements have been prepared solely to comply with the Securities and Exchange Board of India (Infrastructure Investment Trust) Regulations, 2014, as amended including any guidelines and circulars issued thereunder (the "**InvIT Regulations**"). Consequently, these Special purpose combined financial statements may not necessarily be indicative of financial performance, financial position and cash flows of the Project SPV Group that would have occurred if it had operated as a single group of entities during the periods presented.
4. This report is addressed to and is provided to the Investment Manager solely for inclusion in the updated preliminary placement memorandum, placement memorandum and final placement memorandum (collectively, 'the placement documents') in connection with the proposed private placement and may not be suitable for any other purpose. Our report is issued solely for the aforementioned purpose, and accordingly, should not be used, referred to or distributed for any other purpose or to any other party without our prior written consent. Further, we do not accept or assume any liability or any duty of care for any other purpose for which or to any other person to whom this report is shown or into whose hands it may come without our prior consent in writing.

### Responsibilities of Management for the Special Purpose Combined Financial Statements

5. The accompanying special purpose combined financial statements have been approved by the board of directors of Investment Manager of the Trust. The Investment Manager of the Trust is responsible for preparation of these special purpose combined financial statements that give a true and fair view of the financial position, financial performance including other comprehensive income, changes in equity and cash flows, the combined statement of net assets at fair value and the combined statement of total returns at fair value of the Trust of the Trust in accordance with the basis of preparation described in note 2.1 to the Special Purpose Combined Financial Statements. The respective Board of Directors of the Project SPVs as included in the Project SPV Group are responsible for maintenance of adequate accounting records in accordance with the provisions of the Companies Act, 2013 for safeguarding of the assets of the Project SPV Group and for preventing and detecting frauds and other irregularities; selection and application of appropriate accounting policies; making judgments and estimates that are reasonable and prudent; and design, implementation and maintenance of adequate internal financial controls, that were operating effectively for ensuring the accuracy and completeness of the accounting records, relevant to the preparation and presentation of the financial statements that give a true and fair view, in accordance with the basis of preparation specified in aforementioned note 2.1, that are free from material misstatement, whether due to fraud or error which have been used for the purpose of preparation of the special purpose combined financial statements by the Directors of the Investment Manager of the Trust, as aforesaid.
6. In preparing the special purpose combined financial statements, the respective board of directors of the Investment Manager of the Trust and the Project SPVs is responsible for assessing the Project SPVs ability to continue as a going concern, disclosing, as applicable, matters related to going concern and using the going concern basis of accounting unless the respective Board of directors either intends to liquidate the Project SPV's or to cease operations, or has no realistic alternative but to do so.

# Walker Chandiook & Co LLP

## Independent Auditor's Report on Special Purpose Combined Financial Statements of the Project SPVs to be transferred to Highways Infrastructure Trust (Cont'd)

### Auditor's Responsibilities for the Audit of the Special Purpose Combined Financial Statements

7. Our objectives are to obtain reasonable assurance about whether the special purpose combined financial statements as a whole are free from material misstatement, whether due to fraud or error, and to issue an auditor's report that includes our opinion. Reasonable assurance is a high level of assurance, but is not a guarantee that an audit conducted in accordance with Standards on Auditing will always detect a material misstatement when it exists. Misstatements can arise from fraud or error and are considered material if, individually or in the aggregate, they could reasonably be expected to influence the economic decisions of users taken on the basis of these special purpose combined financial statements.
8. As part of an audit in accordance with Standards on Auditing, we exercise professional judgment and maintain professional skepticism throughout the audit. We also:
  - Identify and assess the risks of material misstatement of the financial Statements, whether due to fraud or error, design and perform audit procedures responsive to those risks, and obtain audit evidence that is sufficient and appropriate to provide a basis for our opinion. The risk of not detecting a material misstatement resulting from fraud is higher than for one resulting from error, as fraud may involve collusion, forgery, intentional omissions, misrepresentations, or the override of internal control;
  - Obtain an understanding of internal control relevant to the audit in order to design audit procedures that are appropriate in the circumstances but not for the purpose of expressing an opinion on whether the Project SPVs have in place adequate internal financial controls with reference to financial Statements and the operating effectiveness of such controls;
  - Evaluate the appropriateness of accounting policies used and the reasonableness of accounting estimates and related disclosures made by Investment Manager;
  - Conclude on the appropriateness of Investment Manager's use of the going concern basis of accounting and, based on the audit evidence obtained, whether a material uncertainty exists related to events or conditions that may cast significant doubt on the Project SPVs ability to continue as a going concern. If we conclude that a material uncertainty exists, we are required to draw attention in our auditor's report to the related disclosures in the financial statements or, if such disclosures are inadequate, to modify our opinion. Our conclusions are based on the audit evidence obtained up to the date of our auditor's report. However, future events or conditions may cause the Project SPVs to cease to continue as a going concern;
  - Evaluate the overall presentation, structure and content of the financial statements, including the disclosures, and whether the Special Purpose Combined Financial Statements represent the underlying transactions and events in a manner that achieves fair presentation; and
  - Obtain sufficient appropriate audit evidence regarding the financial information of the entities included in the Special Purpose Combined Financial Statements to express an opinion on the financial statements. We are responsible for the direction, supervision and performance of the audit of financial statements of such entities included in the special purpose combined financial statements, of which we are the independent auditors. For the other entities included in the special purpose combined financial statements, which have been audited by the other auditors, such other auditors remain responsible for the direction, supervision and performance of the audits carried out by them. We remain solely responsible for our audit opinion.
9. We communicate with those charged with governance regarding, among other matters, the planned scope and timing of the audit and significant audit findings, including any significant deficiencies in internal control that we identify during our audit.

### Other Matter

10. The special purpose financial statements of each of the Project SPV for the financial years ended 31 March 2022, 31 March 2021 and 31 March 2020 are prepared as per Indian Accounting Standards ('Ind AS') and have been audited by the respective auditors of the Project SPVs, which have been used for the purpose of

# Walker Chandiok & Co LLP

## Independent Auditor's Report on Special Purpose Combined Financial Statements of the Project SPVs to be transferred to Highways Infrastructure Trust (Cont'd)

preparation of the Special Purpose Combined Financial Statements by the Investment Manager of the Trust and have been relied upon by us for our audit of these combined financial statements.

The Projects SPVs and the periods which were audited by other auditors are as follows:

S. No	Project SPV	Period	Revenue (in ₹ millions)	Total Assets (in ₹ millions)	Cash flows (in ₹ millions)
1	Jodhpur Pali Expressway Private Limited	Financial year ended 31 March 2022	576.99	4,209.50	53.64
		Financial year ended 31 March 2021	536.70	4,446.48	(4.14)
		Financial year ended 31 March 2020	586.29	4,399.72	10.04
2	Ulundurpet Expressways Private Limited	Financial year ended 31 March 2022	1,470.77	5,923.23	4.59
		Financial year ended 31 March 2021	1,165.00	6,432.66	2.75
		Financial year ended 31 March 2020	1,307.58	6,670.32	(9.00)
3	Shillong Expressway Private Limited	Financial year ended 31 March 2022	275.87	1528.39	(36.19)
		Financial year ended 31 March 2021	274.37	1,657.88	28.84
		Financial year ended 31 March 2020	289.91	1,795.53	(120.21)

Our opinion is not modified in respect of aforesaid matter.

### Report on Other Legal and Regulatory Requirements

11. As required by circular number CIR/IMD/DF/114/2016 dated 20 October 2016 issued by Securities and Exchange Board of India; we report that:

- i. we have sought and obtained all information and explanations which, to the best of our knowledge and belief, were necessary for the purpose of our audit;
- ii. the special purpose combined financial statements are in agreement with the books of account of the respective Project SPV; and
- iii. In our opinion, the special purpose combined financial statements comply with the basis of preparation as specified in note 2.1 to these special purpose combined financial statements.

For **Walker Chandiok & Co LLP**  
Chartered Accountants  
Firm's Registration No.: 001076N/N500013

**Manish Agrawal**  
Partner  
Membership No.: 507000  
UDIN: 22507000AMNEBR9358

**Place:** New Delhi  
**Date:** 08 July 2022

## **Highways Infrastructure Trust**

### **Summary of significant accounting policies and other explanatory information**

#### **1. Corporate Information**

The Special Purpose Combined Financial Statements comprise financial statements of Ulundurpet Expressways Private Limited (“UEPL”), Shillong Expressway Private Limited (“SEPL”), Jodhpur Pali Expressway Private Limited (“JPEPL”), Godhra Expressways Private Limited (“GEPL”), Dewas Bhopal Corridor Private Limited (“DBCPL”) and Nirmal Bot Limited (“NBL”) (individually referred to as “Project SPV” and together referred to as “Project SPV Group” or “Project SPV’s”) (hereinafter referred as Special Purpose Combined Financial Statements). The Project SPV’s are companies domiciled in India.

UEPL has its registered office situated at Mumbai, Maharashtra. Its principal place of business is at 316-317, ‘C’ Wing, Kanakia Zillion, L.B.S Road, BKC Annex, Kurla (W), Mumbai -400 070.

SEPL was incorporated in New Delhi, India on 09 June 2010 as a private limited company under the Companies Act, 2013 (the ‘Act’) as ‘Shillong Expressway Private Limited’. The Company was converted into a public limited company and the name was changed to ‘Shillong Expressway Limited’ with effect from 15 December 2010 and again got converted into private limited company with name changed to ‘Shillong Expressway Private Limited’ w.e.f. 04 August 2017.

JPEPL was incorporated in New Delhi, India on 10 January 2013 as a public limited company under the Companies Act, 2013 (the ‘Act’). The Company was converted to private limited company w.e.f. 28 July 2017 and name changed to ‘Jodhpur Pali Expressway Private Limited’.

GEPL has its registered office situated at Mumbai, Maharashtra. Its principal place of business is as 316-317, ‘C’ Wing, Kanakia Zillion, L.B.S Road, BKC Annex, Kurla (W), Mumbai -400 070.

DBCPL has its registered office situated at Mumbai, Maharashtra. Its principal place of business is at 316-317, ‘C’ Wing, Kanakia Zillion, L.B.S Road, BKC Annex, Kurla (W), Mumbai -400 070.

NBL is subsidiary of Galaxy Investments II Pte. Ltd (hereinafter referred as “Sponsor”) and having its registered office situated at 316-317, C Wing, Kanakia Zillion, BKC Annexe, LBS Road, Kurla West, Mumbai - 400 070.

UEPL, SEPL, GEPL, and NBL are special purpose vehicles which have entered into concession agreements with National Highways Authority of India (NHAI), DBCPL with Madhya Pradesh Road Development Corporation Limited (MPRDC) and JPEPL with PWD Rajasthan to design, build, finance, operate and transfer (DBFOT) or build, operate and transfer (BOT) national or state highways in various locations.

Galaxy Investments II Pte. Ltd (hereinafter referred as “Sponsor”) constituted the Trust on 03 December 2021 as an irrevocable trust, pursuant to the Trust Deed, under the provisions of the Indian Trusts Act, 1882 and registered with Securities and Exchange Board of India (“SEBI”) vide Certificate of Registration dated 23 December 2021 as an Infrastructure Investment Trust under Regulation 3(1) of the Securities Exchange Board of India (Infrastructure Investment Trust) Regulations, 2014. The Trustee to Trust is Axis Trustee Services Limited (the “Trustee”) and the Investment Manager for Trust is Virescent Infrastructure Investment Manager Private Limited (the “Investment Manager”). Sponsors proposed to transfer their shareholding in UEPL, SEPL, JPEPL, GEPL, DBCPL and NBL to Highways Infrastructure Trust (the “Trust”). As required by the Guidance Note on Combined and Carve-Out Financial Statements issued by the Institute of Chartered Accountants of India, the details of various entities comprised in the Special Purpose Combined Financial Statements is as given below:

## Highways Infrastructure Trust

### Summary of significant accounting policies and other explanatory information

Name of Project SPV	Residual Concession Life*	Proposed Shareholding by Trust	Nature of Proposed Investment	Status	Principal Activities	Country of incorporation
Ulundurpet Expressways Private Limited ("UEPL")	4 years, 11 months	100%	Subsidiary	Operating	Construction and operation of roads and bridges including toll / annuity collection	India
Shillong Expressway Private Limited ("SEPL")	3 years, 11 months	100%	Subsidiary	Operating		India
Jodhpur Pali Expressway Private Limited ("JPEPL")	16 years, 6 months	100%	Subsidiary	Operating		India
Godhra Expressways Private Limited ("GEPL")	15 years, 11 months	100%	Subsidiary	Operating		India
Dewas Bhopal Corridor Private Limited ("DBCPL")	11 years, 2 months	100%	Subsidiary	Operating		India
Nirmal Bot Limited ("NBL")	5 years, 7 months	100%	Subsidiary	Operating		India

\* Residual useful life as on 31 March 2022

## 2. Significant Accounting Policies

### 2.1 Overall consideration

The Special Purpose Combined Financial Statements have been prepared using the significant accounting policies and measurement bases summarized below. These were used throughout all periods presented in the consolidated financial statements.

#### a) Basis of preparation and presentation

The Special Purpose Combined Financial Statements of the Project SPV Group comprise the Combined Balance Sheets as on 31 March 2022, 31 March 2021 and 31 March 2020, Combined Statements of Profit and Loss, Combined Cash Flow Statements, Combined Statements of Changes in Equity for the financial years ended 31 March 2022, 31 March 2021 and 31 March 2020 and Combined Statement of Net Assets at Fair Value as at 31 March 2022 and the Combined Statement of Total Returns at Fair Value for the for the financial year ended 31 March 2022 and a Summary of Significant Accounting Policies and Other Explanatory Information.

The Special Purpose Combined Financial Statements were authorized for issue in accordance with resolutions passed by the Board of Directors of the Investment Manager on 08 July 2022.

The Special Purpose Combined Financial Statements have been prepared in accordance with Indian Accounting Standards as defined in Rule 2(1)(a) of the Companies (Indian Accounting Standards) Rules, 2015 prescribed under Section 133 of the Companies Act, 2013 ("Ind AS") read with SEBI (Infrastructure Investment Trusts) Regulations, 2014 and the circulars issued thereunder ("InvIT Regulations") and the Guidance Note on Combined and Carve-Out Financial Statements issued by the Institute of Chartered Accountants of India ("Guidance Note").

The Special Purpose Combined Financial Statements are special purpose financial statements and have been prepared by the Investment Manager to meet the requirements of InvIT Regulations and for inclusion in the updated preliminary placement memorandum, placement memorandum and final placement memorandum (collectively, 'the placement documents') prepared by the Investment Manager in connection with the private placement of units of the Highways Infrastructure Trust (hereinafter referred to as the "Trust"). As a result, the Special Purpose Combined Financial Statements may not be suitable for another purpose. Further, the Special Purpose Combined Financial Statements are not fully prepared in accordance with the requirements of Schedule III notified under the Companies Act, 2013.

## **Highways Infrastructure Trust**

### **Summary of significant accounting policies and other explanatory information**

In accordance with the requirements of the InvIT Regulations, since the Trust is set up on 03 December 2021 and has been in existence for a period lesser than three completed financial years and the historical financial statements of Trust are not available for the entire portion of the reporting period of three years, the Special Purpose Combined Financial Statements have been disclosed for the periods when such historical financial statements were not available. Further, as required by the InvIT regulations, the Special Purpose Combined Financial Statements are prepared, based on an assumption that all Project SPV were part of Trust for such period when Trust was not in existence. However, the Special Purpose Combined Financial Statements may not be representative of the position which may prevail after the Project SPV Group is transferred to Trust.

The Special Purpose Combined Financial Statements are presented in India Rupees which is also the functional currency of the Project SPV Group. All values are rounded to the nearest millions, unless otherwise indicated. Certain amounts that are required to be disclosed and do not appear due to rounding-off are expressed as 0.00.

These Special Purpose Combined Financial Statements correspond to the classification provisions contained in Ind AS 1 'Presentation of Financial Statements'. For clarity purposes, various items are aggregated in the Combined Statement of Profit and Loss and Combined Balance Sheet. These items are disaggregated separately in the notes to the Special Purpose Combined Financial Statements, where applicable or required.

These Special Purpose Combined Financial Statements have been prepared on a historical cost convention and on an accrual basis except for certain financial assets and liabilities measured at fair value (refer accounting policy regarding financial instruments).

#### **b) Basis of Combination**

The Special Purpose Combined Financial Statements have been prepared using uniform accounting policies for like transactions and other events in similar circumstances. The financial statements of all the Project SPV used for the purpose of combination are drawn up to the same reporting date i.e. financial years ended on 31 March 2022, 31 March 2021 and 31 March 2020. The financial statements of the Project SPV have been prepared in accordance with the accounting standards notified under the Section 133 of the Companies Act, 2013 (the Act), Companies (Indian Accounting Standards) Rules, 2015 and other relevant provisions of the Act.

The procedure for preparing Special Purpose Combined Financial Statements of the Project SPV Group are stated below –

- Combine like items of assets, liabilities, equity, income, expenses and cash flows of the Project SPV; and
- Eliminate, if any, in full intragroup assets and liabilities, equity, income, expenses and cash flows (as applicable) relating to transactions between entities of the Project SPV Group (profits or losses resulting from intragroup transactions that are recognized in assets are eliminated in full). Ind AS 12 Income Taxes applies to temporary differences that arise from the elimination of profits and losses resulting from intragroup transactions.

#### **c) Date of commencement of commercial operations**

The details of incorporation and commencement of operations of UEPL, SEPL, JPEPL, GEPL, DBCPL and NBL are as given below:

<b>Name of the entity</b>	<b>Date of incorporation</b>	<b>Commencement of operation</b>
Ulundurpet Expressways Private Limited ("UEPL")	20 March 2006	23 July 2009
Shillong Expressway Private Limited ("SEPL")	09 June 2010	28 February 2013
Jodhpur Pali Expressway Private Limited ("JPEPL")	10 January 2013	31 October 2014
Godhra Expressways Private Limited ("GEPL")	21 January 2010	31 October 2013
Dewas Bhopal Corridor Private Limited ("DBCPL")	14 May 2007	10 February 2009

## **Highways Infrastructure Trust**

### **Summary of significant accounting policies and other explanatory information**

Nirmal Bot Limited (“NBL”)	19 September 2006	22 July 2009
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#### **d) Use of estimates and judgements**

The preparation of Special Purpose Combined Financial Statements requires management to make certain estimates and assumptions that affect the amounts reported in the Special Purpose Combined Financial Statements and notes thereto. The management believes that these estimates and assumptions are reasonable and prudent. However, actual results could differ from these estimates. Any revision to accounting estimates is recognized prospectively in the current and future period. An overview of the areas that involve a higher degree of judgement or complexity, and of items which are more likely to be materially adjusted due to estimates and assumptions turning out to be different than those originally assessed have been disclosed below. Detailed information about each of these estimates and judgments is included in the relevant notes together with information about the basis of calculation for each affected line item in the Special Purpose Combined Financial Statements.

Estimate and judgements are continually evaluated and are based on historical experience and other factors, including expectations of future events that may have a financial impact on the entity and that are believed to be reasonable under circumstances.

The Project SPV Group makes estimates and assumptions concerning the future. The resulting accounting estimates will, by definition, seldom be equal to the related actual results. The estimates and assumptions that have significant risk of causing a material adjustment to the carrying amount of assets and liabilities are disclosed below:

##### **i. Revenue Recognition - Applicability of service concession agreement accounting**

Appendix C of Ind AS 115 “Service concession arrangements” applies to “public to private” service concession arrangements, which can be defined as contracts under which the grantor transfers to a concession holder the right to deliver public services that give access to main public facilities for a specified period of time in return of managing the infrastructure used to deliver those public services.

More specifically, it applies to public to private service concession arrangement if the grantor:

- Controls or regulates what services the operators must provide with the infrastructure, to whom it must provide them, and at what price; and
- Controls through ownership or otherwise –any significant residual interest in the infrastructure at the end of the term of the arrangement.

The Project SPV – Shillong Expressway Private Limited (“SEPL”) and Nirmal Bot Limited (“NBL”) have the right to receive fixed annuity payments from NHAI during the concession period and have adopted ‘Financial Asset Model’.

Accounting under “Financial Asset Model” involves extensive use of estimates. The management of Project SPV has allocated the contract revenues into distinct individual performance obligations i.e. Construction, operation and maintenance based on their relative stand-alone selling prices, which are derived in line with the amounts estimated by the Management of Project SPV basis the actual/estimated cost to be incurred. Accordingly, annuity payment receivable has been classified as a “Financial asset” at the inception of concession period at fair value. The future annuity payments have been bifurcated towards construction services and unearned finance income based on the effective interest rate model.

##### **ii. Provisions and liabilities**

Provisions and liabilities are recognized in the period when it becomes probable that there will be a future outflow of funds resulting from past operations or events and the amount of cash outflow can be reliably estimated. The timing of recognition and quantification of the liability requires the application of judgement to existing facts and circumstances, which can be subject to change.

##### **iii. Provision for major maintenance obligation**

The operating and maintenance cost includes routine, periodic/major maintenance, manpower costs and operational expenses, including, but not limited to, road and site work expenses, employee benefit expenses and other operating and maintenance costs. The provision for potential periodic / major maintenance cost is created based on the estimates provided by the management and the same is adjusted for actual expenditures in the year of occurrence.

## **Highways Infrastructure Trust**

### **Summary of significant accounting policies and other explanatory information**

#### **iv. Fair valuation of interest free loans taken/given at inception**

Interest free loan taken/given from related parties have been valued at fair value on inception at the applicable market rate of interest. The same is subsequently measured at amortized cost. The identification of applicable market rate of interest requires the application of judgement.

#### **v. Fair value measurements**

Management applies valuation techniques to determine the fair value of financial instruments (where active market quotes are not available). This involves developing estimates and assumptions consistent with how market participants would price the instrument. The Project SPV Group engages third party valuers, where required, to perform the valuation. Information about the valuation techniques and inputs used in determining the fair value of assets are disclosed in the notes to Special Purpose Combined Financial Statements.

#### **vi. Impairment of annuity and intangible assets**

Impairment exists when the carrying value of an asset exceeds its recoverable amount, which is the higher of its fair value less costs of disposal and its value in use. The recoverable amounts for the annuity and intangible assets are based on value in use of the underlying projects. The value in use calculation is based on a DCF model. The cash flows are derived from forecasts over the life of the projects of Project SPV.

#### **vii. Useful lives of depreciable/amortisable assets**

Management of each Project SPV reviews its estimate of the useful lives of depreciable/amortisable assets at each reporting date, based on the expected utility of the assets. Uncertainties in these estimates relate to technical and economic obsolescence that may change the utility of certain software, IT equipment and other plant and equipment.

#### **viii. Defined benefit obligations (DBO)**

Management of Project SPV estimate of the DBO is based on a number of critical underlying assumptions such as standard rates of inflation, mortality, discount rate and anticipation of future salary increases. Variation in these assumptions may significantly impact the DBO amount and the annual defined benefit expenses.

#### **ix. Evaluation of indicators for impairment of assets**

The evaluation of applicability of indicators of impairment of assets requires assessment of several external and internal factors which could result in deterioration of recoverable amount of the assets.

#### **x. Recognition of deferred tax assets**

The extent to which deferred tax assets can be recognized is based on an assessment of the probability of the future taxable income against which the deferred tax assets can be utilized.

#### **xi. Recoverability of advances / receivables**

At each balance sheet date, based on historical default rates observed over expected life, the management of each Project SPV assesses the expected credit losses on outstanding receivables and advances.

#### **xii. Contingent liabilities**

The Project SPV Group is subject to legal proceedings and tax issues covering a range of matters, which are pending in various jurisdictions. Due to the uncertainty inherent in such matters, it is difficult to predict the final outcome of such matters. The cases and claims against the Project SPV Group often raise difficult and complex factual and legal issues, which are subject to many uncertainties, including but not limited to the facts and circumstances of each particular case and claim, the jurisdiction and the differences in applicable law. In the normal course of business management of each Project SPV consults with legal counsel and certain other experts on matters related to litigation and taxes. The Project SPV Group accrues a liability when it is determined that an adverse outcome is probable and the amount of the loss can be reasonably estimated.

#### **xiii. Income taxes**

Significant judgements are involved in estimating budgeted profits for the purpose of paying advance tax, determining the provision for income taxes, including amount expected to be paid / recovered for uncertain tax positions. The extent to which deferred tax assets/minimum alternate tax credit can be recognized is based on management's assessment of the probability of the future taxable income against which the deferred tax assets/minimum alternate tax credit can be utilized.

## **Highways Infrastructure Trust**

### **Summary of significant accounting policies and other explanatory information**

#### **2.2 Summary of significant accounting policies**

The following is the summary of significant accounting policies applied by the Project SPV Group in preparing its Special Purpose Combined Financial Statements:

##### **a) Basis of classification as current and non-current**

The Project SPV Group presents assets and liabilities in the combined balance sheet based on current/non-current classification.

An asset is current when it is:

- Expected to be realized or intended to be sold or consumed in the normal operating cycle
- Held primarily for the purpose of trading
- Expected to be realized within twelve months after the reporting period or
- Cash or cash equivalent unless restricted from being exchanged or used to settle a liability for at least twelve months after the reporting period.

All other assets have been classified as non-current.

A liability is current when:

- It is expected to be settled in the normal operating cycle
- It is held primarily for the purpose of trading
- It is due to be settled within twelve months after the reporting period or
- There is no unconditional right to defer the settlement of the liability for at least twelve months after the reporting period.

The Project SPV Group classifies all other liabilities as non-current.

Deferred tax assets and liabilities are classified as non-current assets and liabilities.

Operating cycle of the Project SPV Group is the time between the acquisition of assets for processing and their realization in cash or cash equivalents. As the Project SPV Group's normal operating cycle is not clearly identifiable, it is assumed to be twelve months.

##### **b) Fair value measurement**

The Project SPV Group measures financial instruments at fair value at each balance sheet date.

Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the measurement date. The fair value measurement is based on the presumption that the transaction to sell the asset or transfer the liability takes place either:

- In the principal market for the asset or liability, or
- In the absence of a principal market, in the most advantageous market for the asset or liability.

The principal or the most advantageous market must be accessible by the Project SPV Group.

The fair value of an asset or a liability is measured using the assumptions that market participants would use when pricing the asset or liability, assuming that market participants act in their economic best interest. Refer Note 37 for fair value hierarchy.

All assets and liabilities for which fair value is measured or disclosed in the Special Purpose Combined Financial Statements are categorized within the fair value hierarchy, described as follows, based on the lowest level input that is significant to the fair value measurement as a whole:

**Level 1** — Quoted (unadjusted) market prices in active markets for identical assets or liabilities.

**Level 2** — Valuation techniques for which the lowest level input that is significant to the fair value measurement is directly or indirectly observable.

**Level 3** — Valuation techniques for which the lowest level input that is significant to the fair value measurement is Unobservable.

## **Highways Infrastructure Trust**

### **Summary of significant accounting policies and other explanatory information**

For assets and liabilities that are recognized in the Special Purpose Combined Financial Statements on a recurring basis, the Project SPV Group determines whether transfers have occurred between levels in the hierarchy by re-assessing categorization (based on the lowest level input that is significant to the fair value measurement as a whole) at the end of each reporting period.

External valuers are involved for valuation of significant assets such as annuity receivable and intangible assets, where required. Involvement of external valuers is decided by each Project SPV management on a need basis and relevant approvals. The valuers involved are selected based on criteria like market knowledge, reputation, independence and professional standards. The management of each Project SPV decides after discussion with the external valuers, which valuation techniques and inputs to use for each case.

At each reporting date, the management of each Project SPV analysis the movement of assets and liabilities which are required to be re-measured or reassessed as per the Project SPV accounting policies. For this analysis, the management of each Project SPV verifies the major inputs applied in the latest valuation by agreeing the information in the valuation computation to contracts and other relevant documents.

The management in conjunction with each Project SPV external valuers also compares the change in fair value of each asset and liability with relevant external sources to determine whether the change is reasonable.

For the purpose of fair value disclosures, the Project SPV Group has determined classes of assets and liabilities on the basis of the nature, characteristics and risks of the asset or liability and the level of the fair value hierarchy, as explained above.

This note summarizes accounting policy for fair value. Other fair value related disclosures are given in the relevant notes:

- Disclosures of Statement of Net Assets at fair value and Statement of total returns at fair value
- Quantitative disclosures of fair value measurement hierarchy (note 37)
- Investment in quoted mutual fund (note 11)
- Financial instruments (including those carried at amortized cost) (note 38).

#### **c) Revenue Recognition**

Effective 01 April 2018, the Project SPV Group adopted Ind AS 115 “Revenue from Contracts with customers” using the modified retrospective method. Under the modified retrospective method, an entity applies Ind AS 115 only for contracts that are not completed on or before 31 March 2018.

To determine whether to recognize revenue, the Project SPV Group follows a 5-step process:

1. Identifying the contract with a customer
2. Identifying the performance obligations
3. Determining the transaction price
4. Allocating the transaction price to the performance obligations
5. Recognising revenue when/as performance obligation(s) are satisfied.

In all cases, the total transaction price is allocated amongst the various performance obligations based on their relative standalone selling price. The transaction price excludes amounts collected on behalf of third parties. The consideration promised include fixed amounts, variable amounts, or both.

Revenue is recognised to the extent that it is probable that the economic benefits will flow to the Project SPV Group and the revenue can be reliably measured, regardless of when the payment is being made.

Revenue is recognised either at a point in time or over time, when (or as) the Project SPV Group satisfies performance obligations by transferring the promised goods or services to its customers.

While this represents significant new guidance, the implementation of this new guidance had no impact on the timing or amount of revenue recognised by the Project SPV Group in any year.

#### **Toll Collections**

The income from Toll Contracts on BOT basis are recognised on actual collection of toll revenue (net of revenue share payable to NHAI) as per Concession Agreement. Revenue from electronic toll collection is recognised on accrual basis.

## **Highways Infrastructure Trust**

### **Summary of significant accounting policies and other explanatory information**

#### **Claims with ('NHAI')/ ('MPRDC')**

Claims with National Highways Authority of India ('NHAI') and other Government Authorities are accounted as revenue as and when it becomes probable that such claims will be received and which can be measured reliably.

In cases where the SPV Group has a contractual right to an extension in the concession period as per the concession agreement, for any losses incurred by the SPV Group, such claims are recognized as other operating income when the right for the compensation is established based on the facts and circumstances.

#### **Contract revenue (Construction contracts)**

Contract revenue associated with the construction of roads is recognized at cost of work performed on the contract plus proportionate margin, where required, using the percentage of completion method.

Percentage of completion is the proportion of cost of work performed to-date, to the total estimated contract costs. Percentage of completion is determined based on the proportion of actual cost incurred to the total estimated cost of the project. The percentage of completion method is applied on a cumulative basis in each accounting period to the current estimates of contract revenue and contract costs. The effect of a change in the estimate of contract revenue or contract costs, or the effect of a change in the estimate of the outcome of a contract, is accounted for as a change in accounting estimate and the effect of which are recognized in the statement of profit or loss in the period in which the change is made and in subsequent periods.

Contract cost include costs that relate directly to the specific contract and allocated cost that are attributable to the Construction of the road.

#### **Rendering of services**

Revenue from major maintenance obligation and regular operation and maintenance is recognized over the period of contract as and when the services are rendered.

#### **Interest income**

Interest income from a financial asset is recognized when it is probable that the economic benefits will flow to the Project SPV Group and the amount of income can be measured reliably. Interest is accrued on time proportion basis, by reference to the principle outstanding at the effective interest rate.

#### **Dividends**

Income from dividend on investments is accrued in the year in which it is declared, whereby the Project SPV Group's right to receive is established.

#### **Other operating income/other income**

All other operating income/income is recognized on accrual basis when no significant uncertainty exists on their receipt.

### **d) Taxation**

#### **Current income tax**

Current income tax assets and liabilities are measured at the amount expected to be recovered from or paid to the tax authorities. The tax rates and tax laws used to compute the amount are those that are enacted or substantively enacted at the reporting date.

Current income tax relating to items recognized outside statement of profit or loss is recognized outside statement of profit or loss (either in other comprehensive income or in equity). Current tax items are recognized in correlation to the underlying transaction either in OCI or directly in equity. Management periodically evaluates positions taken in the tax returns with respect to situations in which applicable tax regulations are subject to interpretation and establishes provisions where appropriate.

#### **Deferred tax**

Deferred tax is provided using the liability method on temporary differences between the tax bases of assets and liabilities and their carrying amounts for financial reporting purposes at the reporting date.

Deferred tax assets are recognized for all deductible temporary differences, the carry forward of unused tax credits and any unused tax losses. Deferred tax assets are recognized to the extent that it is probable that taxable profit will

## **Highways Infrastructure Trust**

### **Summary of significant accounting policies and other explanatory information**

be available against which the deductible temporary differences, and the carry forward of unused tax credits and unused tax losses can be utilized.

The carrying amount of deferred tax assets is reviewed at each reporting date and reduced to the extent that it is no longer probable that sufficient taxable profit will be available to allow all or part of the deferred tax asset to be utilized. Unrecognized deferred tax assets are re-assessed at each reporting date and are recognized to the extent that it has become probable that future taxable profits will allow the deferred tax asset to be recovered.

Deferred tax assets and liabilities are measured at the tax rates that are expected to apply in the year when the asset is realized or the liability is settled, based on tax rates (and tax laws) that have been enacted or substantively enacted at the reporting date.

Deferred tax relating to items recognized outside statement of profit or loss is recognized outside statement of profit or loss. Deferred tax items are recognized in correlation to the underlying transaction either in OCI or directly in equity.

Deferred tax assets and deferred tax liabilities are offset if a legally enforceable right exists to set off current tax assets against current tax liabilities and the deferred taxes relate to the same taxable Project SPV Group and the same taxation authority.

#### **Minimum Alternate Tax (MAT)**

Minimum Alternate Tax (MAT) paid as per Indian Income Tax Act, 1961 is in the nature of unused tax credit which can be carried forward and utilised when the Project SPV Group will pay normal income tax during the specified period. Minimum alternate tax ("MAT") credit entitlement is recognized as an asset only when and to the extent there is convincing evidence that normal income tax will be paid during the specified period. The net amount of tax recoverable from, or payable to, the taxation authority is included as part of receivables or payables in the balance sheet.

#### **e) Property, plant and equipment (PPE)**

On transition to Ind AS, the Project SPV Group has elected to continue with the carrying value of all of its property, plant and equipment recognized as at 01 April 2015 for all Project SPV other than DBCPL and 01 April 2018 for DBCPL measured as per the previous GAAP and use that carrying value as the deemed cost of the property, plant and equipment on the date of transition i.e. 01 April 2015 and 01 April 2018 respectively.

Freehold land is carried as historical cost. All other items of property, plant and equipment and capital work in progress are stated at cost, net of recoverable taxes, trade discount and rebates less accumulated depreciation and impairment loss, if any. Such cost includes purchase price, borrowing cost and any cost directly attributable to bringing the assets to its working condition for its intended use.

Subsequent costs are included in the asset's carrying amount or recognized as a separate asset, as appropriate, only when it is probable that future economic benefits associated with the item will flow to the Project SPV Group and the cost of the item can be measured reliably. The carrying amount of any component accounted for as a separate asset is derecognized when replaced.

Depreciation on property, plant and equipment held by UEPL, SEPL, JPEPL, GEPL and NBL is calculated on a straight-line basis over the estimated useful lives of respective assets as estimated by the management and is charged to the Statement of profit and loss as per the requirement of Part C of Schedule II of the Act.

Depreciation on property, plant and equipment held by DBCPL is provided on written down value method at the rates determined based on the useful lives of respective assets as prescribed in the Schedule II of the Act.

Depreciation on additions / (disposals) during the year is provided on a pro-rata basis i.e., from the date on which asset is ready for use and up to the date on which the asset is disposed of/fully depreciated.

An item of property, plant and equipment and any significant part initially recognized is derecognized upon disposal or when no future economic benefits are expected from its use or disposal. Any gain or loss arising on de-recognition of the asset (calculated as the difference between the net disposal proceeds and the carrying amount of the asset) is included in the statement of profit or loss when the asset is derecognized. The residual values, useful lives and methods

## **Highways Infrastructure Trust**

### **Summary of significant accounting policies and other explanatory information**

of depreciation of property, plant and equipment are reviewed at each financial year end and adjusted prospectively, if appropriate. Machinery spares which are specific to a particular item of PPE and whose use is expected to be irregular are capitalized as PPE. Spare parts are capitalized when they meet the definition of PPE, i.e., when the Project SPV Group intends to use these during more than a period of 12 months.

Freehold land held by Project SPV Group as per the requirement of NHAI/various Government Authorities and the amount of land is nominal hence it is not treated as investment property as per Ind AS 40.

#### **f) Intangible assets**

On transition to Ind AS, the Project SPV Group exercised first time adoption under Ind AS 101 "First-time Adoption of Indian Accounting Standards" and has elected to continue with the carrying value of its "Toll Collection Rights" (Intangible Assets), as recognised in the Special Purpose Combined Financial Statements as at the date of transition (i.e. 01 April 2015 for all SPVs other than DBCPL and 01 April 2018 for DBCPL) measured as per the previous GAAP and uses that as its deemed cost as at date of transition.

#### **Accounting of intangible assets under Service Concession agreement**

Toll collection rights obtained in consideration for rendering construction services, represent the right to collect toll revenue during the concession period in respect of Build-Operate-Transfer ("BOT") and design, build, finance, operate and transfer (DBFOT) project undertaken by the Project SPV. Toll collection rights are capitalized as intangible assets upon completion of the project at the cumulative construction costs plus the present value of obligation towards negative grants and additional concession fee payable to "NHAI"/"MPRDC", if any. Till the completion of the project, the same is recognized under intangible assets under development. The revenue from toll collection/other income during the construction period is reduced from the carrying amount of intangible assets under development. Extension of concession period by the authority in compensation for claims made by the Project SPV are capitalized as part of Toll Collection Rights when it is probable that such claims will be received and can be measured reliably.

Pre-operative expenses including administrative and other general overhead expenses that are directly attributable to the development or acquisition of intangible assets are allocated and capitalized as part of cost of the intangible assets.

Grant received if any are considered as a part of total outlay of the construction project. The same shall be recognized when the entity complies with the conditions attaching to the collection of grant considered as a financial asset and it shall be simultaneously reduced from the cost of acquisition of the intangible asset and are recognized.

Intangible assets that are not ready for the intended use on the date of the Balance Sheet are disclosed as "Intangible assets under development."

#### **Other intangible assets**

Other intangible assets comprise of cost for software and other application software acquired / developed for in-house use. These assets are stated at cost, only when it is probable that future economic benefits associated with the item will flow to the Project SPV Group and the cost of the item can be measured reliably, less accumulated amortization and accumulated impairment losses, if any. Intangible assets are derecognized when no future economic benefits are expected from use or disposal.

#### **Amortisation of intangible assets under Service Concession agreement**

Toll collection rights in respect of road projects are amortized over the period of concession using the revenue-based amortization method prescribed under Schedule II to the Companies Act, 2013. Under the revenue-based method, amortization is provided based on proportion of actual revenue to reflect the pattern in which the assets economic benefits will be consumed. At each balance sheet date, the projected revenue for the balance toll period is reviewed by the management. If there is any change in the projected revenue from previous estimates, the amortisation of toll collection rights is changed prospectively to reflect any changes in the estimates.

Amortization on impaired assets is provided by adjusting the amortization charge in the remaining periods so as to allocate the assets revised carrying amount over its remaining useful life.

## **Highways Infrastructure Trust**

### **Summary of significant accounting policies and other explanatory information**

#### **Amortization of other intangible assets**

Other Intangible assets with finite lives are amortised over the useful economic life and assessed for impairment whenever there is an indication that the intangible asset may be impaired. The amortisation period and the amortisation method for an intangible asset with a finite useful life are reviewed at least at the end of each reporting period. Changes in the expected useful life or the expected pattern of consumption of future economic benefits embodied in the asset are considered to modify the amortisation period or method, as appropriate, and are treated as changes in accounting estimates. The amortisation expense on intangible assets with finite lives is recognised in the statement of profit and loss unless such expenditure forms part of carrying value of another asset.

Specialized software held by the Project SPV Group is amortized over a period of six years on straight line basis from the month in which the addition is made.

Gains or losses arising from derecognition of an intangible asset are measured as the difference between the net disposal proceeds and the carrying amount of the asset and are recognised in the statement of profit or loss when the asset is derecognised.

The above periods also represent the management estimated economic useful life of the respective intangible assets.

#### **g) Accounting of financial asset under Service Concession Agreement**

The management has determined that the “Financial Asset” model under Appendix C of Ind AS 115 “Service Concession Agreements” is applicable to the concession of SEPL and NBL. In particular, they note that grantor (NHAI/State authorities) has the primary responsibility to pay to the operator (“SPV”).

Under the arrangement, the SPV recognizes a financial asset arising from service concession agreement as it has an unconditional right to receive cash from grantor (NHAI/State authorities) for the construction service, major maintenance obligations and regular operation and maintenance services over the concession period. Such financial asset is measured at fair value on initial recognition and classified under the head “Trade Receivable”. Subsequent to initial recognition, the financial asset is measured at amortized cost. Under this model, the financial asset will be reduced as and when grant is received from Grantor (NHAI/State authorities).

As per the salient feature of the arrangement, the operator (“SPV”) has a two-fold activity based on which revenue is recognized in the Special Purpose Combined Financial Statements in line with the requirement of Appendix C of Ind AS 115. The activities are given below:

- a. a construction activity in respect of its obligation to design, build, finance an asset that it makes available to the Grantor (NHAI/State authorities)
- b. Revenue from major maintenance obligation and operation and maintenance activity in respect of the assets during the concession period in accordance with Ind AS 115.

#### **h) Lease**

##### **Where the SPV Group is the lessee**

A lease is defined as ‘a contract, or part of a contract, that conveys the right to control the use of an identified asset for a period of time in exchange for consideration’. To assess whether a contract conveys the right to control the use of an identified asset, the Project SPV Group assesses whether: (i) the contract involves the use of an identified asset (ii) the Project SPV Group obtains substantially all of the economic benefits from use of the asset through the period of the lease and (iii) the Project SPV Group has the right to direct the use of the asset.

##### ***Recognition and initial measurement***

At lease commencement date, the Project SPV Group recognises a right-of-use asset and a lease liability. The right-of-use asset is measured at cost, which is made up of the initial measurement of the lease liability, any initial direct costs incurred by the Project SPV Group, an estimate of any costs to dismantle and remove the asset at the end of the lease (if any), and any lease payments made in advance of the lease commencement date (net of any incentives received).

## **Highways Infrastructure Trust**

### **Summary of significant accounting policies and other explanatory information**

The Project SPV Group measures the lease liability at the present value of the lease payments unpaid at that date, discounted using the interest rate implicit in the lease if that rate is readily available or the Project SPV Group's incremental borrowing rate. Lease payments included in the measurement of the lease liability are made up of fixed payments (including in substance fixed payments) and variable payments based on an index or rate.

#### ***Subsequent measurement***

The Project SPV Group depreciates the right-of-use assets on a straight-line basis from the lease commencement date to the earlier of the end of the useful life of the right-of-use asset or the end of the lease term. The Project SPV Group also assesses the right-of-use asset for impairment when such indicators exist.

The liability will be reduced for payments made and increased for interest. It is re-measured to reflect any reassessment or modification, or if there are changes in in-substance fixed payments. When the lease liability is re-measured, the corresponding adjustment is reflected in the right-of-use asset.

The Project SPV Group has elected to account for short-term leases and leases of low-value assets using the practical expedients. Instead of recognising a right-of-use asset and lease liability, the payments in relation to these are recognised as an expense in statement of profit and loss on a straight-line basis over the lease term.

#### **Where the Project SPV Group is the lessor**

Leases which effectively transfer to the lessee substantially all the risks and benefits incidental to ownership of the leased item are classified and accounted for as finance lease. Amounts due from lessees under finance leases are recorded as receivables at the Project SPV Group's net investment in the leases. Finance lease income is allocated to accounting periods so as to reflect a constant periodic rate of return on the net investment outstanding in respect of the lease. Contingent rents are recognized as revenue in the period in which they are earned.

Leases in which the Project SPV Group does not transfer substantially all the risks and rewards of ownership of an asset are classified as operating leases. The respective leased assets are included in the balance sheet based on their nature. Rental income is recognized on straight-line basis over the lease term. Rental income from operating lease is recognized on a straight-line basis or another systematic basis as per the terms of the relevant lease.

#### **i) Impairment of non-financial assets**

At each reporting date, the Project SPV Group assesses whether there is any indication based on internal/external factors, that an asset (tangible and intangible) may be impaired. If any such indication exists, estimate the recoverable amount of the asset / cash generating unit. Recoverable amount is higher of an asset's or cash generating unit's net selling price and its value in use. Value in use is the present value of estimated future cash flows expected to arise from the continuing use of an asset and from its disposal at the end of its useful life. For the purpose of assessing impairment, the recoverable amount is determined for an individual asset, unless the asset does not generate cash inflows that are largely independent of those from other assets or groups of assets. The smallest identifiable group of assets that generates cash inflows from continuing use that are largely independent of the cash inflows from other assets or groups of assets, is considered as a cash generating unit (CGU). An asset or CGU whose carrying value exceeds its recoverable amount is considered impaired and is written down to its recoverable amount.

Impairment losses of continuing operations are recognized in the statement of profit and loss.

Assessment is also done at each Balance Sheet date as to whether there is any indication that an impairment loss recognized for an asset in prior accounting periods may no longer exist or may have decreased.

#### **j) Provisions, contingent liabilities and contingent assets**

Provisions are recognized when the Project SPV Group has a present obligation (legal or constructive) as a result of a past event, it is probable that an outflow of resources embodying economic benefits will be required to settle the obligation and a reliable estimate can be made of the amount of the obligation. When the Project SPV Group expects some or all of a provision to be reimbursed, the reimbursement is recognized as a separate asset, but only when the reimbursement is virtually certain. The expense relating to a provision is presented in the statement of profit and loss net of any reimbursement.

## **Highways Infrastructure Trust**

### **Summary of significant accounting policies and other explanatory information**

If the effect of the time value of money is material, provisions are discounted using a current pre-tax rate that reflects, when appropriate, the risks specific to the liability. When discounting is used, the increase in the provision due to the passage of time is recognized as a finance cost.

A contingent liability is disclosed when there is a possible obligation that arises from events and whose existence is only confirmed by one or more doubtful future events or when there is an obligation that is not recognized as a liability or provision because it is not likely that an outflow of resources will be required.

Contingent assets are disclosed only when an inflow of economic benefits therefrom is probable and recognized only when realization of income is virtually certain.

#### **k) Financial Instruments**

##### **Financial assets**

###### *Initial recognition and measurement*

Financial instruments are recognised when the Project SPV Group becomes a party to the contractual provisions of the instrument and are measured initially at fair value adjusted for transaction costs, except for those carried at fair value through profit or loss which are measured initially at fair value.

###### *Subsequent measurement*

**i. Financial assets at amortised cost-** A financial instrument is measured at amortised cost if both the following conditions are met:

- The asset is held within a business model whose objective is to hold assets for collecting contractual cash flows; and
- Contractual terms of the asset give rise on specified dates to cash flows that are solely payments of principal and interest (SPPI) on the principal amount outstanding.

After initial measurement, such financial assets are subsequently measured at amortised cost using the effective interest method.

**ii. Financial assets at fair value**

Mutual funds – All mutual funds in scope of Ind-AS 109 are measured at fair value through profit and loss (FVTPL).

###### *De-recognition of financial assets*

A financial asset is primarily de-recognised when the rights to receive cash flows from the asset have expired or the Project SPV Group has transferred its rights to receive cash flows from the asset.

##### **Financial liabilities**

###### *Initial recognition and measurement*

All financial liabilities are recognised initially at fair value and transaction cost that is attributable to the acquisition of the financial liabilities is also adjusted

###### *Subsequent measurement*

After initial recognition, the financial liabilities are subsequently measured at amortised cost using effective interest method. Amortised cost is calculated after considering any discount or premium on acquisition and fees or costs that are an integral part of the EIR. The effect of EIR amortisation is included as finance costs in the statement of profit and loss.

###### *De-recognition of financial liabilities*

A financial liability is de-recognised when the obligation under the liability is discharged or cancelled or expires. When an existing financial liability is replaced by another from the same lender on substantially different terms, or the terms of an existing liability are substantially modified, such an exchange or modification is treated as the de-recognition of the original liability and the recognition of a new liability. The difference in the respective carrying amounts is recognised in the statement of profit and loss.

## **Highways Infrastructure Trust**

### **Summary of significant accounting policies and other explanatory information**

#### **Offsetting of financial instruments**

Financial assets and financial liabilities are offset and the net amount is reported in the balance sheet if there is a currently enforceable legal right to offset the recognised amounts and there is an intention to settle on a net basis, to realise the assets and settle the liabilities simultaneously.

#### **l) Impairment of financial assets**

All financial assets except for those at FVTPL are subject to review for impairment at least at each reporting date to identify whether there is any objective evidence that a financial asset or a Project SPV group of financial assets is impaired. Different criteria to determine impairment are applied for each category of financial assets.

In accordance with Ind-AS 109, the Project SPV Group applies expected credit loss (ECL) model for measurement and recognition of impairment loss for financial assets carried at amortised cost.

ECL is the weighted average of difference between all contractual cash flows that are due to the Project SPV Group in accordance with the contract and all the cash flows that the Project SPV Group expects to receive, discounted at the original effective interest rate, with the respective risks of default occurring as the weights. When estimating the cash flows, the Project SPV Group is required to consider:

- All contractual terms of the financial assets (including prepayment and extension) over the expected life of the assets; and
- Cash flows from the sale of collateral held or other credit enhancements that are integral to the contractual terms.

#### **m) Trade receivables:**

In respect of trade receivables, the Project SPV Group applies the simplified approach of Ind AS 109 'Financial Instruments', which requires measurement of loss allowance at an amount equal to lifetime expected credit losses. Lifetime expected credit losses are the expected credit losses that result from all possible default events over the expected life of a financial instrument.

#### **n) Other financial assets:**

In respect of its other financial assets, the Project SPV Group assesses if the credit risk on those financial assets has increased significantly since initial recognition. If the credit risk has not increased significantly since initial recognition, the Project SPV Group measures the loss allowance at an amount equal to 12-month expected credit losses, else at an amount equal to the lifetime expected credit losses.

When making this assessment, the Project SPV Group uses the change in the risk of a default occurring over the expected life of the financial asset. To make that assessment, the Project SPV Group compares the risk of a default occurring on the financial asset as at the balance sheet date with the risk of a default occurring on the financial asset as at the date of initial recognition and considers reasonable and supportable information, that is available without undue cost or effort, that is indicative of significant increases in credit risk since initial recognition. The Project SPV Group assumes that the credit risk on a financial asset has not increased significantly since initial recognition if the financial asset is determined to have low credit risk at the balance sheet date.

#### **o) Segment reporting**

The Project SPV Group is engaged in "Road Infrastructure Projects" which in the context of Ind AS 108 "Operating Segment" is considered as the only segment. The Project SPV Group's activities are restricted within India and hence, no separate geographical segment disclosure is considered necessary.

#### **p) Employee benefits**

## **Highways Infrastructure Trust**

### **Summary of significant accounting policies and other explanatory information**

The Project SPV Group provides post-employment benefits through various defined contribution and defined benefit plans.

#### **Defined contribution plans**

A defined contribution plan is a plan under which the Project SPV Group pays fixed contributions into an independent fund administered by the government. The Project SPV Group has no legal or constructive obligations to pay further contributions after its payment of the fixed contribution, which are recognised as an expense in the year in which the related employee services are received.

#### **Defined benefit plans**

The defined benefit plans sponsored by the Project SPV Group define the amount of the benefit that an employee will receive on completion of services by reference to length of service and last drawn salary. The legal obligation for any benefits remains with the Project SPV Group.

Gratuity is post-employment benefit and is in the nature of a defined benefit plan. The liability recognised in the Special Purpose Combined Financial Statements in respect of gratuity is the present value of the defined benefit obligation at the reporting date, together with adjustments for unrecognised actuarial gains or losses and past service costs. The defined benefit obligation is calculated at or near the reporting date by an independent actuary using the projected unit credit method.

Actuarial gains and losses arising from past experience and changes in actuarial assumptions are credited or charged to the statement of OCI in the year in which such gains or losses are determined.

#### **Other long-term employee benefits**

Liability in respect of compensated absences becoming due or expected to be availed more than one year after the balance sheet date is estimated on the basis of an actuarial valuation performed by an independent actuary using the projected unit credit method.

Actuarial gains and losses arising from past experience and changes in actuarial assumptions are charged to statement of profit and loss in the year in which such gains or losses are determined.

#### **Short-term employee benefits**

Expense in respect of other short term benefits is recognised on the basis of the amount paid or payable for the period during which services are rendered by the employee.

#### **q) Borrowing costs**

Borrowing cost include interest calculated using the effective interest method, amortization of ancillary costs and other costs the Project SPV Group incurs in connection with the borrowing of funds. Borrowing costs directly attributable to the acquisition, construction or production of a qualifying asset are capitalized during the period of time that is necessary to complete and prepare the asset for its intended use or sale. A qualifying asset is one that necessarily takes substantial period of time to get ready for its intended use. Capitalisation of borrowing costs is suspended in the period during which the active development is delayed due to, other than temporary, interruption. All other borrowing costs are charged to the statement of profit and loss as incurred.

#### **r) Cash and cash equivalents**

Cash and cash equivalent in the balance sheet comprise cash at banks and on hand and short-term deposits with an original maturity of three months or less, which are subject to an insignificant risk of changes in value.

#### **s) Cash flow statement**

Cash flow statement is prepared segregating the cash flows from operating, investing and financing activities. Cash flow from operating activities is reported using indirect method. Under the indirect method, the net profit/(loss) is adjusted for the effects of:

- a. transactions of a non-cash nature;
- b. any deferrals or accruals of past or future operating cash receipts or payments; and
- c. all other items of income or expense associated with investing or financing cash flows.

## **Highways Infrastructure Trust**

### **Summary of significant accounting policies and other explanatory information**

The cash flows from operating, investing and financing activities of the Project SPV Group are segregated based on the available information. Cash and cash equivalents (including bank balances) are reflected as such in the Cash Flow Statement. Those cash and cash equivalents which are not available for general use as on the date of Balance Sheet are also included under this category with a specific disclosure.

#### **t) Prior period error**

As per Ind AS -8, Accounting Policies, Change in Accounting Estimates & prior period Item an entity shall correct material prior period errors retrospectively in the first set of financial statements approved for issue after their discovery by:

- Restating the comparative amounts for the prior period(s) presented in which the error occurred; or
- If the error occurred before the earliest prior period presented, restating the opening balances of assets, liabilities and equity for the earliest prior period presented.

#### **u) Recent accounting pronouncements issued but not made effective**

##### **Amendment to Ind AS 16, Property, Plant and Equipment**

The Ministry of Corporate Affairs ("MCA") vide notification dated 23 March 2022, has issued an amendment to Ind AS 16 which specifies that an entity shall deduct from the cost of an item of property, plant and equipment any proceeds received from selling items produced while the entity is preparing the asset for its intended use (for example, the proceeds from selling samples produced when testing a machine to see if it is functioning properly).

##### **Amendment to Ind AS 37, Provisions, Contingent Liabilities and Contingent Assets**

The Ministry of Corporate Affairs ("MCA") vide notification dated 23 March 2022, has issued an amendment to Ind AS 37 which specifies that the cost of fulfilling a contract comprises: the incremental costs of fulfilling that contract and an allocation of other costs that relate directly to fulfilling contracts.

##### **Amendment to Ind AS 103, Business Combinations**

The Ministry of Corporate Affairs ("MCA") vide notification dated 23 March 2022, has issued an amendment to Ind AS 103 and has added a new exception in the standard for liabilities and contingent liabilities.

##### **Amendment to Ind AS 109, Financial Instruments**

The Ministry of Corporate Affairs ("MCA") vide notification dated 23 March 2022, has issued an amendment to Ind AS 109 which clarifies that which fees an entity should include when it applies the '10%' test in assessing whether to derecognise a financial liability. An entity includes only fees paid or received between the entity (the borrower) and the lender, including fees paid or received by either the entity or the lender on the other's behalf.

Group is evaluating the impact of the above amendments on the Special Purpose Combined Financial Statements.

**Highways Infrastructure Trust**  
**Combined Balance Sheet**  
(All amounts in ₹ millions unless otherwise stated)

	Note	As at 31 March 2022	As at 31 March 2021	As at 31 March 2020
<b>ASSETS</b>				
<b>Non-current assets</b>				
Property, plant and equipment	3	130.04	66.93	62.05
Capital work-in-progress	4	2.39	9.40	-
Intangible assets	5	20,246.56	21,249.03	22,159.81
<b>Financial assets</b>				
Other financial assets	6	1,382.88	1,626.38	1,861.32
Non-current tax assets (net)	8	89.40	74.29	77.52
Other non-current assets	9	-	0.45	0.45
<b>Total non-current assets</b>		<b>21,851.27</b>	<b>23,026.48</b>	<b>24,161.15</b>
<b>Current assets</b>				
<b>Financial assets</b>				
Investments	11	2,152.39	2,156.37	2,465.11
Trade receivables	12	37.30	68.92	87.48
Cash and cash equivalents	13	365.82	79.81	174.91
Bank balances other than cash and cash equivalents above	14	1,972.62	1,622.21	859.13
Other financial assets	7	941.61	949.80	939.68
Other current assets	10	72.56	122.14	109.84
<b>Total current assets</b>		<b>5,542.30</b>	<b>4,999.25</b>	<b>4,636.15</b>
<b>Total assets</b>		<b>27,393.57</b>	<b>28,025.73</b>	<b>28,797.30</b>
<b>EQUITY AND LIABILITIES</b>				
<b>EQUITY</b>				
Equity share capital	15	3,200.95	3,200.95	3,200.95
Other equity	16	(2,812.09)	(2,467.13)	(1,619.74)
<b>Total equity</b>		<b>388.86</b>	<b>733.82</b>	<b>1,581.21</b>
<b>LIABILITIES</b>				
<b>Non-current liabilities</b>				
<b>Financial liabilities</b>				
Borrowings	17A	21,260.80	22,252.15	22,464.09
Other financial liabilities	18A	1,276.93	1,265.55	1,243.06
Provisions	19A	324.55	571.96	587.46
Deferred tax liabilities (net)	20	849.36	334.57	490.12
<b>Total non-current liabilities</b>		<b>23,711.64</b>	<b>24,424.23</b>	<b>24,784.73</b>
<b>Current liabilities</b>				
<b>Financial liabilities</b>				
Borrowings	17B	2,007.63	1,742.21	1,661.56
Trade payables				
(a) Total outstanding dues of micro enterprises and small enterprises	21	18.66	0.08	14.94
(b) Total outstanding dues of creditors other than micro enterprises and small enterprises	21	302.14	211.24	198.33
Other financial liabilities	18B	649.37	303.19	260.50
Other current liabilities	22	31.16	15.82	30.95
Provisions	19B	279.82	580.08	262.63
Current tax liabilities (net)	23	4.29	15.06	2.45
<b>Total current liabilities</b>		<b>3,293.07</b>	<b>2,867.68</b>	<b>2,431.36</b>
<b>Total liabilities</b>		<b>27,004.71</b>	<b>27,291.91</b>	<b>27,216.09</b>
<b>Total equity and liabilities</b>		<b>27,393.57</b>	<b>28,025.73</b>	<b>28,797.30</b>

Significant accounting policies 2  
The accompanying notes form an integral part of the Special Purpose Combined Financial Statements.

This is the Combined Balance Sheet referred to in our report of even date.

For Walker Chandiok & Co LLP  
Chartered Accountants  
Firm's Registration No.: 001076N/N500013

For and on behalf of the Board of Directors of  
Virescent Infrastructure Investment Manager Private Limited  
(acting as Investment Manager to Highways Infrastructure Trust)

Manish Agrawal  
Partner  
Membership No.: 507000

Sanjay Grewal  
Director  
DIN: 01971866

Hardik Bhadrak Shah  
Director  
DIN: 06648474

Place: New Delhi  
Date: 08 July 2022

Place: New Delhi  
Date: 08 July 2022

Place: Mumbai  
Date: 08 July 2022

**Highways Infrastructure Trust**  
**Combined Statement of Profit and Loss**  
(All amounts in ₹ millions unless otherwise stated)

	Note	For the financial year ended 31 March 2022	For the financial year ended 31 March 2021	For the financial year ended 31 March 2020
<b>Income</b>				
Revenue from operations	24	5,866.56	5,085.04	5,008.80
Other income	25	311.09	241.09	231.43
<b>Total income</b>		<b>6,177.65</b>	<b>5,326.13</b>	<b>5,240.23</b>
<b>Expenses</b>				
Operating expenses	26	1,437.60	1,377.29	1,388.02
Employee benefits expense	27	128.35	117.56	116.19
Finance costs	28	2,775.55	2,740.51	2,774.77
Depreciation and amortisation expense	29	1,017.44	919.81	1,038.67
Other expenses	30	459.15	393.69	349.50
<b>Total expenses</b>		<b>5,818.09</b>	<b>5,548.86</b>	<b>5,667.15</b>
<b>Profit/ (loss) before tax</b>		<b>359.56</b>	<b>(222.73)</b>	<b>(426.92)</b>
<b>Tax expense</b>				
Current tax	32	189.97	127.00	91.10
Deferred tax	32	514.79	(155.54)	(2.41)
<b>Total tax expense</b>		<b>704.76</b>	<b>(28.54)</b>	<b>88.69</b>
<b>Net loss for the year</b>		<b>(345.20)</b>	<b>(194.19)</b>	<b>(515.61)</b>
<b>Other comprehensive income/(loss)</b>				
Items that will not be reclassified to profit or loss				
Re-measurement gains /(losses) on defined benefit obligations		0.24	0.57	(1.25)
Income tax relating to these items		-	-	-
<b>Total other comprehensive income / (loss) for the year</b>		<b>0.24</b>	<b>0.57</b>	<b>(1.25)</b>
<b>Total comprehensive loss for the year</b>		<b>(344.96)</b>	<b>(193.62)</b>	<b>(516.86)</b>

Earning per unit- Refer note 42

**Significant accounting policies**

2

The accompanying notes form an integral part of the Special Purpose Combined Financial Statements.

This is the Combined Statement of Profit and Loss referred to in our report of even date.

**For Walker Chandiok & Co LLP**

Chartered Accountants

Firm's Registration No.: 001076N/N500013

**Manish Agrawal**

Partner

Membership No.: 507000

**Place:** New Delhi

**Date:** 08 July 2022

**For and on behalf of the Board of Directors of**

**Virescent Infrastructure Investment Manager Private Limited**  
(acting as Investment Manager to Highways Infrastructure Trust)

**Sanjay Grewal**

Director

DIN: 01971866

**Place:** New Delhi

**Date:** 08 July 2022

**Hardik Bhadrik Shah**

Director

DIN: 06648474

**Place:** Mumbai

**Date:** 08 July 2022



Highways Infrastructure Trust  
 Combined Statement of Changes in Equity  
 (All amounts in ₹ millions unless otherwise stated)

Equity share capital\*

Particulars	Number of shares	Amount
Balance as at 01 April 2019	320,094,845	3,200.95
Changes in equity share capital	-	-
Balance as at 31 March 2020	320,094,845	3,200.95
Changes in equity share capital	-	-
Balance as at 31 March 2021	320,094,845	3,200.95
Changes in equity share capital	-	-
Balance as at 31 March 2022	320,094,845	3,200.95

Other equity\*\*

Particulars	Equity component of loan to related parties	Reserves and surplus				Total
		Securities premium	Debenture redemption reserve	Capital redemption reserve	Retained earnings	
Balance as at 01 April 2019	384.95	2,874.88	418.97	2.83	(4,784.51)	(1,102.88)
Net loss for the year	-	-	-	-	(515.61)	(515.61)
Other comprehensive income for the year	-	-	-	-	(1.25)	(1.25)
Remeasurement of defined benefit obligations (net of tax)	-	-	-	-	(1.25)	(1.25)
<b>Total comprehensive income for the year</b>	-	-	-	-	<b>(516.86)</b>	<b>(516.86)</b>
Transfer from debenture redemption reserve	-	-	(4.25)	-	4.25	-
Balance as at 31 March 2020	384.95	2,874.88	414.72	2.83	(5,297.12)	(1,619.74)

Particulars	Equity component of loan to related parties	Reserves and surplus				Total
		Securities premium	Debenture redemption reserve	Capital redemption reserve	Retained earnings	
Balance as at 31 March 2020	384.95	2,874.88	414.72	2.83	(5,297.12)	(1,619.74)
Net loss for the year	-	-	-	-	(194.19)	(194.19)
Other comprehensive income for the year	-	-	-	-	0.57	0.57
Remeasurement of defined benefit obligations (net of tax)	-	-	-	-	0.57	0.57
<b>Total comprehensive income for the year</b>	-	-	-	-	<b>(193.62)</b>	<b>(193.62)</b>
Transfer from debenture redemption reserve	-	-	(250.53)	-	250.53	-
Dividend distribution	-	-	-	-	(653.77)	(653.77)
Balance as at 31 March 2021	384.95	2,874.88	164.19	2.83	(5,893.98)	(2,467.13)

Particulars	Equity component of loan to related parties	Reserves and surplus				Total
		Securities premium	Debenture redemption reserve	Capital redemption reserve	Retained earnings	
Balance as at 31 March 2021	384.95	2,874.88	164.19	2.83	(5,893.98)	(2,467.13)
Net loss for the year	-	-	-	-	(345.20)	(345.20)
Other comprehensive income for the year	-	-	-	-	0.24	0.24
Remeasurement of defined benefit obligations (net of tax)	-	-	-	-	0.24	0.24
<b>Total comprehensive income for the year</b>	-	-	-	-	<b>(344.96)</b>	<b>(344.96)</b>
Transfer from debenture redemption reserve	-	-	10.72	-	(10.72)	-
Balance as at 31 March 2022	384.95	2,874.88	174.91	2.83	(6,249.66)	(2,812.09)

\* For details, refer note 15

\*\* The description of the purposes of each reserve within equity has been disclosed in note 16.

The accompanying notes form an integral part of the Special Purpose Combined Financial Statements.

This is the Combined Statement of Changes in Equity referred to in our report of even date.

For Walker Chandio & Co LLP

Chartered Accountants

Firm's Registration No.: 001076N/N500013

Manish Agrawal

Partner

Membership No.: 507000

Place: New Delhi

Date: 08 July 2022

For and on behalf of the Board of Directors of  
 Virescent Infrastructure Investment Manager Private Limited  
 (acting as Investment Manager to Highway Infrastructure Trust)

Sanjay Grewal

Director

DIN: 01971866

Place: New Delhi

Date: 08 July 2022

Hardik Bhadrik Shah

Director

DIN: 06648474

Place: Mumbai

Date: 08 July 2022

**Statement of net assets at fair value as at 31 March 2022: #**

Particulars	Book value	Fair value #
A. Assets	27,393.57	53,889.16
B. Liabilities (at book value)	27,004.71	27,004.71
<b>C. Net assets (A-B)</b>	<b>388.86</b>	<b>26,884.45</b>

**Note:** The number of units that Highways Infrastructure Trust will issue to investors in connection with the proposed private placement of units of the Trust in exchange of the shareholdings in the SPV Group is not presently ascertainable. Accordingly, disclosure in respect of Net Asset Value (NAV) per unit have not been given.

# Fair values of total assets relating to the SPV Group as at 31 March 2022 as disclosed above are based on the fair valuation report of the independent valuer appointed under SEBI (Infrastructure Investment Trusts) Regulations, 2014.

**Project wise break up of fair value of assets as at 31 March 2022:**

Particulars	Fair value* As at 31 March 2022
Jodhpur Pali Expressway Private limited	7,634.78
Ulunderpret Expressways Private Limited	7,009.33
Godhra Expressways Private Limited	19,579.95
Dewas Bhopal Corridor Private Limited	16,194.45
Nirmal Bot Limited	1,951.16
Shillong Expressways Private Limited	1,519.49
	<b>53,889.16</b>

\*Fair values of assets as disclosed above are the fair values of the total assets of the SPV Group which are included in the Special Purpose Combined Financial Statements.

**Statement of total return at fair value:**

Particulars	For the financial year ended 31 March 2022
Total comprehensive loss for the year (As per the Combined Statement of Profit and Loss)	(344.96)
Add: Other changes in fair value for the year *	2,482.11
<b>Total return</b>	<b>2,137.15</b>

\*In the above statement, other changes in fair value for the financial year ended 31 March 2022 has been computed based on the difference in fair values of total assets as at 31 March 2022 and as at 31 March 2021 which are based on the valuation report of the independent valuer appointed under SEBI (Infrastructure Investment Trusts) Regulations, 2014.

**The accompanying notes form an integral part of the Special Purpose Combined Financial Statements.**

This is the Combined Statement of Net Assets at Fair Value and Combined Statement of Total Return at Fair Value referred to in our report of even date.

For **Walker Chandiok & Co LLP**  
Chartered Accountants  
Firm's Registration No.: 001076N/N500013

For and on behalf of the Board of Directors of  
**Virescent Infrastructure Investment Manager Private Limited**  
(acting as Investment Manager to Highway Infrastructure Trust)

**Manish Agrawal**  
Partner  
Membership No.: 507000

**Sanjay Grewal**  
Director  
DIN: 01971866

**Hardik Bhadrak Shah**  
Director  
DIN: 06648474

**Place:** New Delhi  
**Date:** 08 July 2022

**Place:** New Delhi  
**Date:** 08 July 2022

**Place:** Mumbai  
**Date:** 08 July 2022

Highways Infrastructure Trust  
 Summary of significant accounting policies and other explanatory information  
 (All amounts in ₹ millions unless otherwise stated)

3. Property, plant and equipment

Property, plant and equipment

	As at 31 March 2022	As at 31 March 2021	As at 31 March 2020
	130.04	66.93	62.05
	<b>130.04</b>	<b>66.93</b>	<b>62.05</b>

The changes in the carrying value of property, plant and equipment for year ended 31 March 2022, 31 March 2021, 31 March 2020

Description	Freehold Land	Buildings	Plant and equipment	Furniture and fixtures	Vehicles	Office equipments	Computers	Total
<b>Gross block</b>								
<b>Balance as at 01 April 2019</b>	4.37	1.14	45.36	6.58	21.49	15.40	7.00	101.34
Additions for the year	-	-	2.30	0.96	2.63	1.99	1.29	9.17
Transfer from capital work in progress during the year	-	11.98	-	-	-	-	-	11.98
<b>Balance as at 31 March 2020</b>	4.37	13.12	47.66	7.54	24.12	17.39	8.29	122.49
Additions for the year	-	-	8.05	0.48	1.71	6.04	4.18	20.46
Disposals/adjustments for the year	-	-	-	(0.20)	-	(0.24)	(0.73)	(1.17)
<b>Balance as at 31 March 2021</b>	4.37	13.12	55.71	7.82	25.83	23.19	11.74	141.78
Additions for the year	-	1.85	27.55	0.76	6.50	33.82	2.33	72.81
Transfer from capital work-in-progress during the year	-	-	9.40	-	-	-	-	9.40
Disposals/adjustments for the year	-	-	(0.53)	(0.03)	(0.89)	(0.55)	(0.22)	(2.22)
<b>Balance as at 31 March 2022</b>	4.37	14.97	92.13	8.55	31.44	56.46	13.85	221.77
<b>Accumulated depreciation</b>								
<b>Balance as at 01 April 2019</b>	-	0.64	20.44	2.71	8.59	7.73	5.75	45.86
Charge for the year	-	0.21	7.39	0.25	2.94	2.82	0.97	14.58
Disposals/adjustments for the year	-	-	-	-	-	-	-	-
<b>Balance as at 31 March 2020</b>	-	0.85	27.83	2.96	11.53	10.55	6.72	60.44
Charge for the year	-	0.67	6.96	0.31	3.13	3.08	1.16	15.31
Disposals/adjustments for the year	-	-	-	(0.19)	-	(0.03)	(0.68)	(0.90)
<b>Balance as at 31 March 2021</b>	-	1.52	34.79	3.08	14.66	13.60	7.20	74.85
Charge for the year	-	0.70	6.74	0.46	3.47	4.90	2.21	18.47
Disposals/adjustments for the year	-	-	(0.31)	(0.03)	(0.67)	(0.37)	(0.22)	(1.59)
<b>Balance as at 31 March 2022</b>	-	2.22	41.22	3.51	17.46	18.13	9.19	91.73
<b>Net block as at 31 March 2020</b>	4.37	12.27	19.83	4.58	12.59	6.84	1.57	62.05
<b>Net block as at 31 March 2021</b>	4.37	11.60	20.92	4.74	11.17	9.59	4.54	66.93
<b>Net block as at 31 March 2022</b>	4.37	12.75	50.92	5.04	13.99	38.33	4.65	130.04

Notes:

(i) Contractual obligations :

Refer note 35 for disclosure of contractual commitments for the acquisition of property, plant and equipment.

(ii) For assets pledged as security, refer note 31 and 17(a)

Highways Infrastructure Trust

Summary of significant accounting policies and other explanatory information

(All amounts in ₹ millions unless otherwise stated)

	As at 31 March 2022	As at 31 March 2021	As at 31 March 2020
4. Capital work-in-progress			
Plant and equipment	2.39	9.40	-
	<b>2.39</b>	<b>9.40</b>	<b>-</b>

The changes in the carrying value of capital work-in-progress for year ended 31 March 2022, 31 March 2021 and 31 March 2020

Particulars	Amount
<b>Capital work-in-progress as at 01 April 2019</b>	<b>6.58</b>
Add: additions during the year	5.40
Less: transfer to property, plant and equipment during the year	(11.98)
<b>Capital work-in-progress as at 31 March 2020</b>	<b>-</b>
Add: additions during the year	9.40
<b>Capital work-in-progress as at 31 March 2021</b>	<b>9.40</b>
Add: additions during the year	2.30
Less: transfer to property, plant and equipment during the year	(9.40)
<b>Capital work-in-progress as at 31 March 2022</b>	<b>2.39</b>

**Note:**

(i.) Contractual obligations :

Refer note 35 for disclosure of contractual commitments for the acquisition of property, plant and equipment.

(ii.) For assets pledged as security, refer note 31 and 17(a)

*(This space has been intentionally left blank)*

5. Intangible assets

Intangible assets

	As at 31 March 2022	As at 31 March 2021	As at 31 March 2020
	20,246.56	21,249.03	22,159.81
	<b>20,246.56</b>	<b>21,249.03</b>	<b>22,159.81</b>

The changes in the carrying value of intangible assets for year ended 31 March 2022, 31 March 2021

Description	Toll collection rights	Software	Total intangible assets
<b>Gross block</b>			
<b>Balance as at 01 April 2019</b>	<b>28,705.60</b>	<b>12.90</b>	<b>28,718.50</b>
Additions for the year	16.81	0.26	17.07
<b>Balance as at 31 March 2020</b>	<b>28,722.41</b>	<b>13.16</b>	<b>28,735.57</b>
Additions for the year	0.57	0.52	1.09
Disposals/adjustments for the year	(7.36)	-	(7.36)
<b>Balance as at 31 March 2021</b>	<b>28,715.62</b>	<b>13.68</b>	<b>28,729.30</b>
Additions for the year	1.19	-	1.19
Disposals/adjustments for the year	(4.71)	-	(4.71)
<b>Balance as at 31 March 2022</b>	<b>28,712.09</b>	<b>13.68</b>	<b>28,725.78</b>
<b>Accumulated amortisation</b>			
<b>Balance as at 01 April 2019</b>	<b>5,549.85</b>	<b>1.82</b>	<b>5,551.67</b>
Charge for the year	1,022.70	1.39	1,024.09
<b>Balance as at 31 March 2020</b>	<b>6,572.55</b>	<b>3.21</b>	<b>6,575.76</b>
Charge for the year	903.07	1.43	904.50
<b>Balance as at 31 March 2021</b>	<b>7,475.62</b>	<b>4.64</b>	<b>7,480.26</b>
Charge for the year	997.48	1.49	998.97
<b>Balance as at 31 March 2022</b>	<b>8,473.10</b>	<b>6.13</b>	<b>8,479.22</b>
<b>Net block as at 31 March 2020</b>	<b>22,149.86</b>	<b>9.95</b>	<b>22,159.81</b>
<b>Net block as at 31 March 2021</b>	<b>21,240.00</b>	<b>9.03</b>	<b>21,249.03</b>
<b>Net block as at 31 March 2022</b>	<b>20,239.00</b>	<b>7.55</b>	<b>20,246.56</b>

Notes:

- (i) Contractual obligations  
 Refer note 35 for disclosure of capital and other commitments for the acquisition of intangible assets.
- (ii) For assets pledged as security, refer note 31 and 17(a)

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**Highways Infrastructure Trust**  
**Summary of significant accounting policies and other explanatory information**  
**(All amounts in ₹ millions unless otherwise stated)**

	As at 31 March 2022	As at 31 March 2021	As at 31 March 2020
<b>6 Others financial assets</b>			
<b>Non-current</b>			
<b>Unsecured, considered good</b>			
Receivables under service concession arrangements (refer note 7 (i) below)	1,024.92	1,492.53	1,861.32
Bank deposits with more than 12 months maturity*	357.96	133.85	-
	<b>1,382.88</b>	<b>1,626.38</b>	<b>1,861.32</b>
<i>*includes interest accrued but not due</i>			
<b>7 Others financial assets</b>			
<b>Current</b>			
<b>Unsecured, Considered good</b>			
Receivables under service concession arrangements (refer note 7 (i) below)	919.31	919.20	919.14
Other receivables	17.51	25.88	15.59
Security deposits	4.79	4.72	4.95
	<b>941.61</b>	<b>949.80</b>	<b>939.68</b>

**Notes:**

(i) **Movement in receivables under service concession arrangements during the financial year :**

<b>Opening balance</b>	2,411.73	2,780.46	2879.09
Add: Interest income on annuity receivable from National Highway Authority of India ('NHAI') (refer note 24)	256.17	300.73	338.18
Add: Revenue from operations and maintenance of road (refer note 24)	-	25.30	308.70
Add: Revenue from periodic maintenance of road (refer note 24)	198.01	134.97	136.78
Add: Modification gain on annuity	51.71	143.66	91.10
Less: Annuity received from NHAI	(973.39)	(973.39)	(973.39)
<b>Closing balance</b>	<b>1,944.23</b>	<b>2,411.73</b>	<b>2,780.46</b>

(ii) **Movement in receivables under service concession arrangements during the financial year :**

- Non-current (refer note 6)	1,024.92	1,492.53	1,861.32
- Current (refer note 7)	919.31	919.20	919.14
	<b>1,944.23</b>	<b>2,411.73</b>	<b>2,780.46</b>

(iii) Refer note 37 - Fair value disclosures for disclosure of fair value in respect of financial assets measured at amortised cost and note 38 - Financial risk management for assessment of expected credit losses.

(iv) For assets pledged as security, refer note 31 and 17(a)

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**Highways Infrastructure Trust**  
**Summary of significant accounting policies and other explanatory information**  
**(All amounts in ₹ millions unless otherwise stated)**

	As at 31 March 2022	As at 31 March 2021	As at 31 March 2020
<b>8 Non-current tax assets (net)</b>			
Advance income tax (net)	89.40	74.29	77.52
	<b>89.40</b>	<b>74.29</b>	<b>77.52</b>
<b>9 Other non-current assets</b> <i>(Unsecured, considered good)</i>			
Capital advances	-	0.45	0.45
	<b>-</b>	<b>0.45</b>	<b>0.45</b>
<b>10 Other current assets</b> <i>(Unsecured, considered good)</i>			
Supplier advances	1.80	43.18	10.88
Balances with statutory authorities	22.46	17.66	20.71
Prepaid expenses	48.08	61.29	78.23
Other receivables	0.22	0.01	0.02
	<b>72.56</b>	<b>122.14</b>	<b>109.84</b>
<b>11 Investments</b>			
<b>Current</b>			
Investment in mutual funds- quoted (fully paid)^	2,152.39	2,156.37	2,465.11
	<b>2,152.39</b>	<b>2,156.37</b>	<b>2,465.11</b>
<b>Notes:</b>			
Aggregate amount of quoted investments- at market value	2,152.39	2,156.37	2,465.11
Aggregate amount of quoted investments- at cost	2,102.25	2,112.45	2,379.23
For assets pledged as security, refer note 31 and 17(a)			
^ These are measured at fair value through profit and loss (FVTPL)			
<b>(a) Details of investment in mutual funds- quoted (fully paid)</b>			
IDFC Overnight Fund Direct Plan - Growth- 18,98,422 units as at 31 March 2022 (31 March 2021: 1,964,117 units; 31 March 2020: 2,301,276 units) (refer note a and b below)	2,152.39	2,156.37	2,465.11
<b>Notes</b>			
a Includes Rs 55.40 million ( 51,980.868 units) invested in mutual fund on 31 March 2020, however the units were received subsequently .			
b Includes Rs 9.50 million ( 8,649.485 units) invested in mutual fund on 31 March 2021, however the units were received subsequently .			

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**Highways Infrastructure Trust**  
**Summary of significant accounting policies and other explanatory information**  
**(All amounts in ₹ millions unless otherwise stated)**

	As at 31 March 2022	As at 31 March 2021	As at 31 March 2020
<b>12 Trade receivables</b>			
Unsecured, considered good	37.30	68.92	87.48
	<b>37.30</b>	<b>68.92</b>	<b>87.48</b>

**Notes:**

- (i) For assets pledged as security, refer note 31 and 17(a)
- (ii) The SPV Group does not have any receivables which are either credit impaired or where there is significant increase in credit risk.
- (ii) Refer note 38 - Financial risk management for assessment of expected credit losses.

**13 Cash and cash equivalents**

Balances with banks:			
- in current accounts	52.89	69.83	120.18
- deposits with original maturity less than three months*	308.92	-	50.23
Cash on hand	4.01	9.98	4.50
	<b>365.82</b>	<b>79.81</b>	<b>174.91</b>

\* Includes interest accrued but not due

**Notes:**

- (i) Refer note 31 and 17(a) for cash and cash equivalents which are under restriction or pledged.
- (ii) Other than as disclosed, there are no repatriation restrictions with respect to cash and cash equivalents as at the end of the respective reporting years.

**14 Bank balances other than cash and cash equivalents above**

**Fixed deposit with bank**

Deposits with original maturity more than three months but less than twelve months*	1,972.62	1,622.21	859.13
	<b>1,972.62</b>	<b>1,622.21</b>	<b>859.13</b>

\* Includes interest accrued but not due

**Notes:**

- (i) Refer note 31 and 17(a) for other bank balances which are under restriction/ pledged.
- (ii) Other than as disclosed, there are no repatriation restrictions with respect to other bank balances as at the end of the respective reporting periods.

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**Highways Infrastructure Trust**

**Summary of significant accounting policies and other explanatory information**

(All amounts in ₹ millions unless otherwise stated)

**15 Equity share capital**

**Authorised share capital**

414,750,000 (31 March 2021 : 414,750,000 ; 31 March 2020 : 414,750,000 ) equity shares of ₹10 each  
75,900,000 (31 March 2021 : 75,900,000 ; 31 March 2020 : 75,900,000 ) preference shares of ₹10 each

	As at 31 March 2022	As at 31 March 2021	As at 31 March 2020
	4,147.50	4,147.50	4,147.50
	759.00	759.00	759.00
	<b>4,906.50</b>	<b>4,906.50</b>	<b>4,906.50</b>

**Issued share capital**

320,094,845 (31 March 2021: 320,094,845 ; 31 March 2020 : 320,094,845 ) equity shares of ₹10 each

	3,200.95	3,200.95	3,200.95
	<b>3,200.95</b>	<b>3,200.95</b>	<b>3,200.95</b>

**(i) Terms/rights attached to equity share capital :**

The SPV Group has only one class of equity shares having a par value of ₹10 each. Each holder of equity shares is entitled to one vote per share. In the event of liquidation of the SPV Group, holders of equity shares will be entitled to receive the remaining assets of the SPV, after distribution of all preferential amounts. The distribution will be in proportion to the number of equity shares held by the shareholders.

**(ii) Reconciliation of equity shares outstanding at the beginning and at the end of the year :**

	31 March 2022		31 March 2021		31 March 2020	
	No. of shares	Amount	No. of shares	Amount	No. of shares	Amount
<b>Equity share capital of ₹ 10 each fully paid up</b>						
Balance at the beginning of the year	320,094,845	3,200.95	320,094,845	3,200.95	320,094,845	3,200.95
Add: Shares issued during the year	-	-	-	-	-	-
<b>Balance at the end of the year</b>	<b>320,094,845</b>	<b>3,200.95</b>	<b>320,094,845</b>	<b>3,200.95</b>	<b>320,094,845</b>	<b>3,200.95</b>

**(iii) Shareholders holding more than 5% of shares of the SPV Group as at balance sheet date**

	As on 31 March 2022		As on 31 March 2021		As on 31 March 2020	
	No. of shares	% of shareholding	No. of shares	% of shareholding	No. of shares	% of shareholding
India Infrastructure Fund and its nominees	-	-	264,552,365	82.65%	264,552,365	82.65%
India Infrastructure fund II and its nominees	-	-	24,042,280	7.51%	24,042,280	7.51%
Highway Concessions One Private Limited and its nominees.	-	-	31,500,000	9.84%	31,500,000	9.84%
Galaxy Investments II Pte. Ltd. and its nominees	320,094,845	100.00%	-	-	-	-

**(iv) No shares have been issued by the SPV Group for consideration other than cash, during the period of five years immediately preceding the reporting periods.**

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**Highways Infrastructure Trust**  
**Summary of significant accounting policies and other explanatory information**  
(All amounts in ₹ millions unless otherwise stated)

	As at 31 March 2022	As at 31 March 2021	As at 31 March 2020
<b>16 Other equity</b>			
Equity component of loan to related parties	384.95	384.95	384.95
Securities premium	2,874.88	2,874.88	2,874.88
Debenture redemption reserve	174.91	164.19	414.72
Capital redemption reserve	2.83	2.83	2.83
Retained earnings	(6,249.66)	(5,893.98)	(5,297.12)
	<b>(2,812.09)</b>	<b>(2,467.13)</b>	<b>(1,619.74)</b>

**Description of nature and purpose of each reserve:**

**Securities premium reserve**

Securities premium reserve represents premium received on issue of shares. The reserve is utilised in accordance with the provisions of the Act.

**Debenture redemption reserve**

Debenture redemption reserve is created out of the profits which is available for payment of dividend for the purpose of redemption of debentures.

**Capital redemption reserve**

Capital redemption reserve has been created as a result of transfer of the nominal value of shares upon buyback of shares, in accordance with Section 69 of the Act.

**Equity component of loan**

This includes the equity component of the long term loan taken from GMR Highway Limited and India Infrastructure Fund. The equity component represents the interest-free feature of the loan. The liability component is reflected in non-current borrowings. (refer note 17)

**Retained earnings**

Retained earnings are created from the profit / loss of the SPV Group, as adjusted for distributions to owners, transfers to other reserves, etc.

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**Highways Infrastructure Trust**  
**Summary of significant accounting policies and other explanatory information**  
(All amounts in ₹ millions unless otherwise stated)

	As at 31 March 2022	As at 31 March 2021	As at 31 March 2020
<b>17 Borrowings*</b>			
<b>A Non current</b>			
<b>Secured</b>			
Term loan from banks	1,720.97	2,043.30	2,250.78
Term loan from financial institutions	2,753.37	3,177.74	3,232.18
Non-convertible debentures	8,337.70	9,413.25	9,967.02
<b>Unsecured</b>			
Loan from			
- related parties	-	325.91	324.92
- others	470.62	427.83	388.94
Optionally convertible debentures (OCD's)	-	6,864.12	6,300.25
Compulsory convertible debentures (CCD's)	7,978.14	-	-
<b>Total Non-current borrowings (A)</b>	<b>21,260.80</b>	<b>22,252.15</b>	<b>22,464.09</b>
<b>B Current</b>			
Liability component of compound financial instruments	519.08	519.08	531.84
<i>Current maturities of long-term borrowings</i>			
- Term loans from banks	324.21	293.65	261.25
- Term loans from financial institutions	422.72	55.81	43.40
- Non-convertible debentures	741.62	873.67	825.07
<b>Total current borrowings (B)</b>	<b>2,007.63</b>	<b>1,742.21</b>	<b>1,661.56</b>
<b>Total borrowings (A+B)</b>	<b>23,268.43</b>	<b>23,994.36</b>	<b>24,125.65</b>

\*refer note 17(ii) for repayment terms and security details of the outstanding non-current borrowings (including current maturities)

**(i) Reconciliation of liabilities arising from financing activities pursuant to Ind AS 7 - Cash flows:**

Particulars	Non-current and current borrowings
<b>Balance as at 01 April 2019</b>	<b>24,216.83</b>
<i>Cash flows:</i>	
Proceeds	858.69
Repayment/Redemption	(1,800.01)
<i>Non-cash:</i>	
Interest on optionally convertible debentures ('OCD') and processing charges	850.14
<b>Balance as at 31 March 2020</b>	<b>24,125.65</b>
<i>Cash flows:</i>	
Proceeds	111.68
Repayment/Redemption	(1,103.30)
<i>Non-cash:</i>	
Interest on optionally convertible debentures ('OCD') and processing charges	860.33
<b>Balance as at 31 March 2021</b>	<b>23,994.36</b>
<i>Cash flows:</i>	
Proceeds	7,978.15
Repayment/Redemption	(9,511.00)
<i>Non-cash:</i>	
Interest on optionally convertible debentures ('OCD') and processing charges	806.92
<b>Balance as at 31 March 2022</b>	<b>23,268.43</b>

**Highways Infrastructure Trust**  
**Summary of significant accounting policies and other explanatory information**  
**(All amounts in ₹ millions unless otherwise stated)**

	As at 31 March 2022	As at 31 March 2021	As at 31 March 2020
<b>18 Other financial liabilities</b>			
<b>A Non current</b>			
Deferred payment liabilities-payable to concession authorities for toll collection rights	1,276.93	1,265.55	1,243.06
	<b>1,276.93</b>	<b>1,265.55</b>	<b>1,243.06</b>
<b>B Current</b>			
Deferred payment liabilities-payable to concession authorities for toll collection rights	130.04	123.85	117.44
Retention money	52.35	27.91	27.78
Interest accrued but not due borrowings	366.76	120.22	107.84
Employees payable	5.58	6.73	3.89
Other payables	94.64	24.48	3.55
	<b>649.37</b>	<b>303.19</b>	<b>260.50</b>

Refer note 37 - Fair value disclosures for disclosure of fair value in respect of financial assets measured at amortised cost and note 38 - Financial risk management for assessment of expected credit losses.

<b>19 Provisions</b>			
<b>A Non-current</b>			
<b>Provision for employee benefits</b>			
Gratuity (refer note 33)	8.06	7.43	6.79
Compensated absences	4.65	4.47	4.22
<b>Other provisions</b>			
Major maintenance obligation (refer note (i)(a) and (ii) below)	311.84	560.06	576.45
	<b>324.55</b>	<b>571.96</b>	<b>587.46</b>
<b>B Current</b>			
<b>Provision for employee benefits</b>			
Gratuity (refer note 33)	0.32	0.20	0.13
Compensated absences	0.45	0.38	0.40
<b>Other provisions</b>			
Major maintenance obligation (refer note (i)(a) and (ii) below)	279.05	579.50	262.10
	<b>279.82</b>	<b>580.08</b>	<b>262.63</b>

**Notes:**

**(i) Information about individual provisions and significant estimates**

**(a) Provision for major maintenance obligation**

Each SPV of the SPV Group is required to operate and maintain the project highway during the entire concession period and hand over the project back to NHAI/ State Government authorities as per the maintenance standards prescribed in respective concession arrangements. For this purpose, a regular maintenance along with periodic maintenances is required to be performed. Normally periodic maintenance includes resurface of pavements, repair of structures and other equipments and maintenance of service roads. The maintenance cost / bituminous overlay may vary based on the actual usage during maintenance period. Accordingly on the grounds of matching cost concept and based on technical estimates, a provision for major maintenance expenses is reviewed and is provided for in the accounts annually. Considering that the expense to be incurred depends on various factors including the usage, wear and tear of the highway, bituminous overlay, etc, is not possible to estimate the exact timing and the quantum of the cash flow. The management does not expect any re-imbursment towards the expenses to be incurred.

**(ii) Movement in major maintenance obligation during the financial year :**

	As at 31 March 2022	As at 31 March 2021	As at 31 March 2020
- Non-current	311.84	560.06	576.45
- Current	279.05	579.50	262.10
<b>Total provision</b>	<b>590.89</b>	<b>1,139.56</b>	<b>838.55</b>
<b>Balance as at 01 April 2019</b>			<b>779.61</b>
Additions during the year			323.51
Utilised during the year			(333.34)
Increase in the discounted amount arising from the passage of time and effect of any change in discount rate			68.78
<b>Balance as at 31 March 2020</b>			<b>838.55</b>
Additions during the year			428.45
Utilised during the year			(187.41)
Increase in the discounted amount arising from the passage of time and effect of any change in discount rate			59.97
<b>Balance as at 31 March 2021</b>			<b>1,139.56</b>
Additions during the year			310.20
Utilised during the year			(937.31)
Increase in the discounted amount arising from the passage of time and effect of any change in discount rate			78.44
<b>Balance as at 31 March 2022</b>			<b>590.89</b>

**Highways Infrastructure Trust**

**Summary of significant accounting policies and other explanatory information**

(All amounts in ₹ millions unless otherwise stated)

**Highways Infrastructure Trust**  
**Summary of significant accounting policies and other explanatory information**  
(All amounts in ₹ millions unless otherwise stated)

**Summary of significant accounting policies and other explanatory information**  
(All amounts in ₹ millions unless otherwise stated)

	As at 31 March 2022	As at 31 March 2021	As at 31 March 2020
<b>20 Deferred tax liabilities (net)*</b>			
<b>Deferred tax liability arising on account of :</b>			
Timing difference on amortisation of intangible assets and depreciation of property plant and equipment	1,632.90	1,513.92	1,446.42
Adjustment on account of interest free loan and upfront fees on borrowings	2.34	3.44	4.18
Fair valuation of investments	2.07	1.19	3.30
<b>Deferred tax asset arising on account of :</b>			
Adjustment on account of interest on Other Convertible Debentures ('OCD's)	-	297.54	240.46
Provision for major maintenance obligation	66.53	168.74	140.56
Amount payable to NHAI as per service concession agreement	287.52	280.30	267.30
Unused business loss	-	146.86	99.77
Tax credit (minimum alternative tax)	433.90	290.54	215.70
<b>Deferred tax liabilities (net)</b>	<b>849.36</b>	<b>334.57</b>	<b>490.12</b>

\* refer note 32 for details with respect to deferred tax not recognized on unused tax losses and credits

**Movement in deferred tax liabilities (net)**

Particulars	01 April 2019	Recognised in Statement of Profit and Loss	31 March 2020
<b>Liabilities</b>			
Temporary difference on amortisation of intangible assets and depreciation of property plant and equipment	1,310.66	135.76	1,446.42
Adjustment on account of interest free loan and upfront fees on borrowings	5.07	(0.89)	4.18
Fair valuation of investments	1.32	1.98	3.30
<b>Assets</b>			
Adjustment on account of interest on Other Convertible Debentures ('OCD's)	151.49	88.96	240.46
Provision for major maintenance obligation	98.62	41.94	140.56
Amount payable to NHAI as per service concession agreement	260.03	7.26	267.30
Unused business loss	137.24	(37.47)	99.77
Tax credit (minimum alternative tax)	177.14	38.57	215.70
	<b>492.53</b>	<b>(2.41)</b>	<b>490.12</b>

Particulars	01 April 2020	Recognised in Statement of Profit and Loss	31 March 2021
<b>Liabilities</b>			
Temporary difference on amortisation of intangible assets and depreciation of property plant and equipment	1,446.42	67.50	1,513.92
Adjustment on account of interest free loan and upfront fees on borrowings	4.18	(0.74)	3.44
Fair valuation of investments	3.30	(2.11)	1.19
<b>Assets</b>			
Adjustment on account of interest on Other Convertible Debentures ('OCD's)	240.46	57.08	297.54
Provision for major maintenance obligation	140.56	28.18	168.74
Amount payable to NHAI as per service concession agreement	267.30	13.00	280.30
Unused business loss	99.77	47.08	146.86
Tax credit (minimum alternative tax)	215.70	74.84	290.54
	<b>490.12</b>	<b>(155.54)</b>	<b>334.57</b>

Particulars	01 April 2021	Recognised in Statement of Profit and Loss	31 March 2022
<b>Liabilities</b>			
Temporary difference on amortisation of intangible assets and depreciation of property plant and equipment	1,513.92	118.98	1,632.90
Adjustment on account of interest free loan and upfront fees on borrowings	3.44	(1.10)	2.34
Fair valuation of investments	1.19	0.88	2.07
Other	-		-
<b>Assets</b>			
Adjustment on account of interest on Other Convertible Debentures ('OCD's)	297.54	(297.54)	-
Provision for major maintenance obligation	168.74	(102.21)	66.53
Amount payable to NHAI as per service concession agreement	280.30	7.20	287.52
Unused business loss	146.86	(146.86)	-
Tax credit (minimum alternative tax)	290.54	143.36	433.90
	<b>334.57</b>	<b>514.79</b>	<b>849.36</b>

**Highways Infrastructure Trust**  
**Summary of significant accounting policies and other explanatory information**  
**(All amounts in ₹ millions unless otherwise stated)**

	As at 31 March 2022	As at 31 March 2021	As at 31 March 2020
<b>21 Trade payables</b>			
Total outstanding dues of micro and small enterprises [refer note (i) below]	18.66	0.08	14.94
Total outstanding dues to others	302.14	211.24	198.33
	<b>320.80</b>	<b>211.32</b>	<b>213.27</b>
<b>Note:</b>			
<b>(i) Dues to micro and small enterprises pursuant to section 22 of the Micro, Small and Medium Enterprises Development Act (MSMED), 2006</b>			
On the basis of confirmation obtained from suppliers who have registered themselves under the Micro, Small and Medium Enterprises Development Act, 2006 (MSMED Act, 2006) and based on the information available with the SPV Group, the following are the details:			
a) the principal amount and the interest due thereon remaining unpaid to any supplier at the end of each accounting year	18.66	0.08	14.94
b) the amount of interest paid by the buyer in terms of section 16 of the Micro, Small and Medium Enterprises Development Act, 2006 (27 of 2006), along with the amount of the payment made to the supplier beyond the appointed day during each accounting year	-	-	-
c) the amount of interest due and payable for the period of delay in making payment (which has been paid but beyond the appointed day during the year) but without adding the interest specified under the Micro, Small and Medium Enterprises Development Act, 2006	-	-	-
d) the amount of interest accrued and remaining unpaid at the end of each accounting year; and	-	-	-
e) the amount of further interest remaining due and payable even in the succeeding years, until such date when the interest dues above are actually paid to the small enterprise, for the purpose of disallowance of a deductible expenditure under section 23 of the Micro, Small and Medium Enterprises Development Act, 2006.	-	-	-
<b>22 Other current liabilities</b>			
Advance from customers			
Mobilisation advance from concession authority	-	-	2.98
Payable to statutory authorities	30.15	14.82	23.24
Other payables	1.01	1.00	4.73
	<b>31.16</b>	<b>15.82</b>	<b>30.95</b>
<b>23 Current tax liabilities (net)</b>			
Provision for income tax (net)	4.29	15.06	2.45
	<b>4.29</b>	<b>15.06</b>	<b>2.45</b>

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**Highways Infrastructure Trust**  
**Summary of significant accounting policies and other explanatory information**  
**(All amounts in ₹ millions unless otherwise stated)**

**17(ii)-Notes:**

For repayment terms and security details of the outstanding non-current borrowings (including current maturities) refer the table below:

Sl. No.	Nature of borrowing	Name of SPV	31 March 2022	31 March 2021	31 March 2020	Repayment terms and security disclosure
1	Term loans from banks (secured)	Shillong Expressway Private Limited	701.70	928.74	-	<p><b>Rate of Interest and Repayment Terms</b>                      Indian rupee term loans from Bank as at 31 March 2022 of ₹ 701.70 millions (31 March 2021: ₹ 928.74 millions; 31 March 2020 - ₹. Nil.) which carries average interest rate of 7.6% (31 March 2021 - 7.6%, 31 March 2020 - Nil). Loan is repayable in percentage of facility at semi annually instalments.</p> <p><b>The Rupee Loan is secured by way of:</b>                      pari passu first charge by way of hypothecation of entire movable assets of the Project SPV, both present and future, including movable plant &amp; machinery, machinery spares, tools and accessories, furniture ,fixture, vehicles and all other movable assets, both present and future except project asset(as defined under concession agreement). First charge over all accounts of Project SPV including ESCROW account and Sub-Accounts but not limited to Major Maintenance reserve, Debt Service Reserve account and any other reserve and other bank accounts of the Project SPV wherever maintained that may be opened in accordance with the financing documents and all funds from time to time deposited therein. First Charge on all intangibles assets including but not limited to goodwill, rights, undertaking and uncalled capital present and future excluding the project assets (provided that all amounts received on account of any of these shall be deposited in the Escrow Account and that the charges on the same shall be subject to the extent permissible as per the priority specified in the concession agreement and relevant clauses of the Escrow Agreement.) Further, a charge on uncalled capital, as set in above, shall be subject however to the provision of the concession agreement. A first charge on assignment by way of Security in : (i) all the right, title, interest, benefits, claims, and demands whatsoever of the Project SPV in the project documents ; (ii) the right, title and interest of the Project SPV in, to and under all the government approvals; (iii) all the right, title, interest, benefits, claims and demands whatsoever of the Project SPV in any letter of credit, guarantee including contractor guarantees and liquidated damages and performance bond provided by any party to the project documents; (iv) all the right, title, interest, benefits, claims, and demands whatsoever of the Project SPV under all insurance contracts. Shares are required to pledged as a security for this. Previously, the shares of the Project SPV was pledged to the Lender (Axis Bank). Pursuant to the transfer, the Project SPV is under the process of pledging the shares again and is waiting for RBI approval on FC-GPR filing</p> <p>First pari-passu charge on Pledge of 30% each of equity shares and preference shares and Non Disposal Undertaking of 21% each of equity shares and preference shares of the Project SPV held by the sponsor in dematerialized form aggregating to 51% each of the total paid up equity share capital and preferences shares of the Project SPV. Provided that any enforcement of pledge over the shares shall be subject to the applicable provisions of the concession agreement and the prior written approval of NHAI as provided therein. The shares to be pledged shall be free from any restrictive covenants / lien or other encumbrance under any contract/ arrangement including shareholder agreement/ joint venture agreement/ financing arrangement</p> <p>Loan is repayable in percentage of facility at semi annually instalments</p>
2	Term loans from banks (secured)	Jodhpur Pali Expressway Private Limited	1,343.50	1,408.21	1,373.60	<p><b>Rate of Interest and Repayment Terms</b>                      Indian rupee term loans from banks as at 31 March 2022 of ₹ 1,343.50 millions (31 March 2021: ₹ 1,408.21 millions; 31 March 2020 - ₹. 1,373.60 millions) which carries average interest rate of 9.50% (31 March 2021 - 9.50%, 31 March 2020 - 10.20%). The loan is to be repaid in 67 unequal quarterly installments starting from 15 October 2017 and ending on 15 July 2034.</p> <p><b>The term loan is secured by the way of :</b>                      Pari passu first charge over SPV's movable properties, both present and future, including plant and machinery, the Receivables of the Borrower and Intangible Asset, except Project Assets as defined in the Concession Agreement. Further secured by by way of first pari passu charge on the rights, title, interest, benefit, claims, of the SPV in respect of the project agreements executed / to be executed, government approvals, insurance policies both present and future, Letter of Credit / guarantees / liquidated damages and performance bond provided by any party and all rights, title, interest, benefit, claims, demands of the SPV in respect of monies lying to the credit of Escrow account and other accounts. First pari passu pledge of 51% of equity share capital of the Borrower held by the Sponsor.</p> <p>To enable the change in ownership of the Project J13 from India Infrastructure Fund – II to Galaxy Investments II Pte. Ltd., the abovementioned pledge on the equity shares has been released on 10 December 2021. The Project SPV is currently awaiting No-Objection Certificate (NOC) from the Authorised Dealer (AD) Bank as per application filed on 6 June 2022 , in terms of the FEMA regulations and will recreate the pledge, once the said NOC is received from the AD bank.</p>
3	Term loans from banks (secured)	Shillong Expressway Private Limited	-	-	893.13	<p><b>Rate of Interest and Repayment Terms</b>                      Indian rupee term loans from Bank as at 31 March 2022 of ₹ Nil (31 March 2021: ₹ Nil; 31 March 2020 - ₹. 893.13 millions) which carries average interest rate of NA (31 March 2021 - NA, 31 March 2020 - 8%). Loan is repayable in percentage of facility at semi annually instalments.</p> <p><b>The term loan is secured by the way of :</b>                      Pari passu first charge over SPV's movable properties, both present and future, including plant and machinery, the Receivables of the Borrower and Intangible Asset, except Project Assets as defined in the Concession Agreement. Further secured by way of first pari passu charge on the rights, title, interest, benefit, claims, of the SPV in respect of the project agreements executed / to be executed, government approvals, insurance policies both present and future, Letter of Credit / guarantees / liquidated damages and performance bond provided by any party and all rights, title, interest, benefit, claims, demands of the SPV in respect of monies lying to the credit of Escrow account and other accounts.</p> <p>First pari passu pledge of 30% of equity share capital of the Borrower and 30% of the preference share capital of the Borrower held by the Sponsor. Non-disposal undertaking in relation to 21% of equity and preference share capital and 21% of the Sponsor Infusions (including OCDs issued by the Borrower).</p>

Highways Infrastructure Trust  
 Summary of significant accounting policies and other explanatory information  
 (All amounts in ₹ millions unless otherwise stated)

Sl. No.	Nature of borrowing	Name of SPV	31 March 2022	31 March 2021	31 March 2020	Repayment terms and security disclosure
4	Term loans from banks (secured)	Shillong Expressway Private Limited	-	-	245.29	<p><b>Rate of Interest and Repayment Terms</b>                      Indian rupee term loans from Bank as at 31 March 2022 of ₹ Nil (31 March 2021: ₹ Nil; 31 March 2020 - ₹ 245.29 millions) which carries average interest rate of Nil (31 March 2021 - Nil, 31 March 2020 - 8%). Loan is repayable in percentage of facility at semi annually instalments.</p> <p><b>The term loan is secured by the way of :-</b>                      Pari passu second charge over SPV's movable properties, both present and future, including plant and machinery, the Receivables of the Borrower and Intangible Asset, except Project Assets as defined in the Concession Agreement. Further secured by way of second pari passu charge on the rights, title, interest, benefit, claims, of the SPV in respect of the project agreements executed / to be executed, government approvals, insurance policies both present and future, Letter of Credit / guarantees / liquidated damages and performance bond provided by any party and all rights, title, interest, benefit, claims, demands of the SPV in respect of monies lying to the credit of Escrow account and other accounts. First pari passu pledge of 30% of equity share capital of the Borrower and 30% of the preference share capital of the Borrower held by the Sponsor. Non-disposal undertaking in relation to 21% of equity and preference share capital and 21% of the Sponsor Infusions (including O.C.Ds issued by the Borrower).</p>
5	Term loan from financial institutions (Secured)	Dewas Bhopal Corridor Private Limited	1,223.88	1,264.55	1,305.20	<p><b>Rate of Interest and Repayment Terms</b>                      Indian rupee term loans from Financial Institution as at 31 March 2022 of ₹ 1,233.88 millions (31 March 2021: ₹ 1,264.55 millions; 31 March 2020 - ₹ 1,305.20 millions) which carries rate of interest rate of 8.50% p.a (31 March 2021: 8.50% p.a for both RTL -I and RTL-II, 31 March 2020: 9.35% p.a for RTL -I and 9.65% for RTL II ). The interest rate is linked to 6-month MCLR of SBI plus spread of respective facility with MCLR reset on semi-annual basis and spread reset on annual basis. Both the term loans are repayable in 53 unequal quarterly installments starting from 31 March 2018 and ending on 31 March 2031.</p> <p><b>The loan is secured by first charge on :-</b>                      (a) all movable assets present and future except the project assets;                      (b) all revenues which may be received by the Borrower under the Project Documents or otherwise;                      (c) all bank accounts of the Borrower;                      (d) all intangibles including goodwill, undertaking of the Borrower, uncalled capital, trademarks, patents, present and future;                      (e) all the right, title, interest, benefits, claims and demands whatsoever of the Borrower in the Project Documents, all as amended, varied or supplemented from time to time;                      (f) all the right, title, interest, benefits, claims and demands whatsoever of the Borrower in any letter of credit, guarantee including contractor guarantees and liquidated damages and performance bond provided by any party to the Project Documents;                      (g) all the right, title, interest, benefits, claims and demands whatsoever of the Borrower under the insurance Contracts; and                      (h) by way of pledge of Shares of 51% of the Equity of the SPV and charge on 51% of Loans and Other Securities, subject to the terms of the financing agreements, the Concession Agreement and Escrow Agreement.</p> <p>To enable the change in ownership of the Project SPV from India Infrastructure Fund – II to Galaxy Investments II Pre. Ltd., the abovementioned pledge on the equity shares has been released on 13 December, 2021. The Project SPV had filed an application on 29 December 2021 for No-Objection Certificate (NOC) from the Authorised Dealer (AD) Bank, in terms of the FEMA regulations and will recreate the pledge, since it has received NOC from AD bank on 25 April 2022.</p>

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Highways Infrastructure Trust  
 Summary of significant accounting policies and other explanatory information  
 (All amounts in ₹ millions unless otherwise stated)

Sl. No.	Nature of borrowing	Name of SPV	31 March 2022	31 March 2021	31 March 2020	Repayment terms and security disclosure
6	Term loan from financial institutions (Secured)	Godhra Expressways Private Limited	156.62	156.73	158.40	<p><b>Rate of Interest and Repayment Terms</b></p> <p>Indian rupee term loans from Financial Institution as at 31 March 2022 of ₹ 156.62 millions (31 March 2021: ₹ 156.73 millions; 31 March 2020 - ₹. 158.40 millions) which carries interest rate of 31 March 2022: 10.50% (31 March 2021 - 10.50%, 31 March 2020 - 10.50%) per annum payable monthly. The loan is to be repaid in 67 unequal quarterly instalments starting from 30 September 2019 and ending on 28 February 2036.</p> <p><b>The term loan is secured by the way of :-</b></p> <p>a) first mortgage and charge on all the Borrower's Mortgaged Properties, immovable properties, both present and future, save and except the Project Assets;</p> <p>b) a first charge on all the Borrower's tangible movable assets, including moveable plant and machinery, machinery spares, tools and accessories, furniture, fixtures, vehicles and all other movable assets, current assets and non-current assets, both present and future, save and except the Project Assets;</p> <p>c) a first charge over all accounts of the Borrower, including, the Escrow Account and the Sub-Account(s) (including the DSRA and the MMRA) (or any account in substitution thereof) that may be opened in accordance with the Escrow Agreement and the Supplementary Escrow Agreement, or any of the other Project Documents and all funds from time to time deposited therein, the Receivables and all Permitted Investments or other securities representing all amounts credited to the Escrow Account, and a first charge on the receivables; and</p> <p>d) First charge by way of pledge of Shares held by the Sponsor representing 51% of Equity Share Capital till the Final Settlement Date.</p> <p>A Non-Disposal Undertaking by the Sponsor, undertaking non-disposal of 49% of Shares till March 31, 2023.</p> <p>Assignment of the Sponsor's rights in relation to 51% of Sponsor Contributions and 51% of Sponsor Debentures in favour of Project Security Trustee.</p> <p>To enable the change in ownership of the Project SPV from India Infrastructure Fund – II to Galaxy Investments II Pte. Ltd., the abovementioned pledge on the equity shares has been released on 13 December, 2021. The Project SPV had filed an application on 24 December 2021 for No-Objection Certificate (NOC) from the Authorised Dealer (AD) Bank, in terms of the FEMA regulations and will recreate the pledge, since it has received NOC from AD bank on 25 April 2022.</p>
7	Term loan from financial institutions (Secured)	Ulundurpet Expressways Private Limited	1,795.58	1,812.27	1,811.98	<p><b>Rate of Interest and Repayment Terms</b></p> <p>Indian rupee term loans from Financial Institution as at 31 March 2022 of ₹ 156.62 millions (31 March 2021: ₹ 156.73 millions; 31 March 2020 - ₹. 158.40 millions) which carries interest rate of 31 March 2022: 10.50% (31 March 2021 - 10.50%, 31 March 2020 - 10.50%) per annum payable monthly. The loan is to be repaid in 67 unequal quarterly instalments starting from 30 September 2019 and ending on 28 February 2036.</p> <p><b>The term loan is secured by the way of :-</b></p> <p>a) first mortgage and charge on all the Borrower's Mortgaged Properties, immovable properties, both present and future, save and except the Project Assets;</p> <p>b) a first charge on all the Borrower's tangible movable assets, including moveable plant and machinery, machinery spares, tools and accessories, furniture, fixtures, vehicles and all other movable assets, current assets and non-current assets, both present and future, save and except the Project Assets;</p> <p>c) a first charge over all accounts of the Borrower, including, the Escrow Account and the Sub-Account(s) (including the DSRA and the MMRA) (or any account in substitution thereof) that may be opened in accordance with the Escrow Agreement and the Supplementary Escrow Agreement, or any of the other Project Documents and all funds from time to time deposited therein, the Receivables and all Permitted Investments or other securities representing all amounts credited to the Escrow Account, and a first charge on the receivables; and</p> <p>d) First charge by way of pledge of Shares held by the Sponsor representing 51% of Equity Share Capital till the Final Settlement Date.</p> <p>A Non-Disposal Undertaking by the Sponsor, undertaking non-disposal of 49% of Shares till March 31, 2023.</p> <p>Assignment of the Sponsor's rights in relation to 51% of Sponsor Contributions and 51% of Sponsor Debentures in favour of Project Security Trustee.</p> <p>To enable the change in ownership of the Project SPV from India Infrastructure Fund – II to Galaxy Investments II Pte. Ltd., the abovementioned pledge on the equity shares has been released on 10 December 2021. The Project SPV is currently awaiting No-Objection Certificate (NOC) from the Authorised Dealer (AD) Bank as per application filed on 24 December 2021, in terms of the FEMA regulations and will recreate the pledge, once the said NOC is received from the AD bank.</p>

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Highways Infrastructure Trust  
Summary of significant accounting policies and other explanatory information  
(All amounts in ₹ millions unless otherwise stated)

Sl. No.	Nature of borrowing	Name of SPV	31 March 2022	31 March 2021	31 March 2020	Repayment terms and security disclosure
8	Non-convertible debentures (Secured)	Dewas Bhopal Corridor Private Limited	1,613.56	1,628.17	1,642.75	<p><b>Rate of Interest and Repayment Terms</b>  Non-Convertible Debentures from Financial Institution of ₹1,613.56 millions (31 March 2021; ₹ 1,628.17 millions; 31 March 2020 - ₹ 1,642.75 millions) which carries average interest rate of 8.28% (31 March 2021- 8.28%, 31 March 2020 - 8.28%). The NCDs are redeemable in 57 unequal quarterly instalments starting from 31 March 2016 and ending on 31 March 2030.</p> <p><b>The Non-Convertible Debentures are secured by the way of :-</b>  (a) SPV's movable properties, both present and future, except project assets;  (b) All accounts, both present and future including escrow account, major maintenance reserve, DSRA and other reserves and bank accounts of borrower;  (c) Intangibles assets including goodwill, rights, undertaking and uncalled capital, excluding project assets;  (d) by way of pledge of Shares of 51% of the Equity of the SPV, subject to the terms of the financing agreements, the Concession Agreement and Escrow Agreement; and  (e) all the rights, title interest, benefits, claims and demands of borrower in project agreements, government approvals, letter of credit, guarantees.  (f) a first charge by way of mortgage over identified immovable properties, save and except Project Assets  (g) a negative lien on 26% of the Equity of the Issuer by the Other Shareholders until Final Settlement Date or receipt of approval of MPRDC for divestment of such shareholding.</p> <p>Provided that the aforesaid mortgage, hypothecation charges, assignments and the pledge of Shares and negative lien on Shares shall rank pari passu inter se amongst  -The Debenture Holders without any preference or priority to one over the other or others; and  -The Debenture Holders and the Rupee Lenders (for Facility-I and Facility-II) without any preference or priority to one over the other or others, subject to and in accordance with the Concession Agreement and the IDF Tripartite Agreement (as approved by MPRDC);</p> <p>To enable the change in ownership of the Project SPV from India Infrastructure Fund – II to Galaxy Investments II Pte. Ltd., the abovementioned pledge on the equity shares has been released on 13 December, 2021. The Project SPV had filed an application on 29 December 2021 for No-Objection Certificate (NOC) from the Authorised Dealer (AD) Bank, in terms of the FEMA regulations and will recreate the pledge, since it has received NOC from AD bank on 25 April 2022.</p>
9	Non-convertible debentures (Secured)	Godhra Expressways Private Limited	3,922.40	4,043.81	4,128.41	<p><b>Rate of Interest and Repayment Terms</b>  Non-Convertible Debentures from Financial Institution as at 31 March 2022 of ₹ 3,922.40 millions (31 March 2021: ₹ 4,043.81 millions; 31 March 2020 - ₹ 4,128.41 millions) which carries average interest rate of 9.73% (31 March 2021 - 9.73%, 31 March 2020 - 9.73%). The NCDs are redeemable in 76 unequal quarterly instalments starting from 30 June 2017 and ending on 28 February 2036.</p> <p><b>The Non-Convertible Debentures are secured by the way of :-</b>  a) first mortgage and charge on all the Borrower's Mortgaged Properties, immovable properties, both present and future, save and except the Project Assets;  b) a first charge on all the Borrower's tangible movable assets, including moveable plant and machinery, machinery spares, tools and accessories, furniture, fixtures, vehicles and all other movable assets, current assets and non-current assets, both present and future, save and except the Project Assets;  c) a first charge over all accounts of the Borrower, including, the Escrow Account and the Sub-Account(s) (including the DSRA and the MMRA) (or any account in substitution thereof) that may be opened in accordance with the Escrow Agreement and the Supplementary Escrow Agreement, or any of the other Project Documents and all funds from time to time deposited therein, the Receivables and all Permitted Investments or other securities representing all amounts credited to the Escrow Account, and a first charge on the receivables; and  d) The Secured Debt is secured on a pari passu basis by a first ranking charge in relation to the Rupee Facility/ NCDs on Mortgaged Properties, all tangible movable assets, all intangible assets excluding Project Assets, all accounts of the SPV and by way of pledge of Shares of 51% of the Equity of the SPV/ Sponsor's Debentures and by way of assignment of 51% of other Sponsor Contributions, subject to the terms of the Concession Agreement and Escrow Agreement. The Debt is further secured by non-disposal undertaking for the balance 49% of the shares of the SPV until 31 March 2023.</p> <p>To enable the change in ownership of the Project SPV from India Infrastructure Fund – II to Galaxy Investments II Pte. Ltd., the abovementioned pledge on the equity shares has been released on 13 December, 2021. The Project SPV had filed an application on 24 December 2021 for No-Objection Certificate (NOC) from the Authorised Dealer (AD) Bank, in terms of the FEMA regulations and will recreate the pledge, since it has received NOC from AD bank on 25 April 2022.</p>

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**Highways Infrastructure Trust**  
**Summary of significant accounting policies and other explanatory information**  
**(All amounts in ₹ millions unless otherwise stated)**

Sl. No.	Nature of borrowing	Name of SPV	31 March 2022	31 March 2021	31 March 2020	Repayment terms and security disclosure
10	Non Convertible debentures (Secured)	Jodhpur Pali Expressway Private Limited	1,254.35	1,350.95	1,375.04	<p><b>Rate of Interest and Repayment Terms</b>  Non-Convertible Debentures from Financial Institution as at 31 March 2022 of ₹ 1,254.35 millions (31 March 2021: ₹ 1,350.95 millions; 31 March 2020 - ₹ 1,375.04 millions) which carries average interest rate of 9.35% (31 March 2021 - 9.35%, 31 March 2020 - 9.35%). NIIF NCD is redeemable in unequal quarterly instalments starting from 15 January 2018 and ending on 15 January 2034.</p> <p><b>The Non-Convertible Debentures are secured by the way of :-</b>  Pari passu first charge over SPV's movable properties, both present and future, including plant and machinery, the Receivables of the Borrower and Intangible Asset, except Project Assets as defined in the Concession Agreement. Further secured by way of first pari passu charge on the rights, title, interest, benefit, claims, of the Project SPV in respect of the project agreements executed / to be executed, government approvals, insurance policies both present and future, Letter of Credit / guarantees / liquidated damages and performance bond provided by any party and all rights, title, interest, benefit, claims, demands of the Project SPV in respect of monies lying to the credit of Escrow account and other accounts. First pari passu pledge of 51% of equity share capital of the Borrower held by the Sponsor.</p> <p>To enable the change in ownership of the Project SPV from India Infrastructure Fund – II to Galaxy Investments II Pte. Ltd., the abovementioned pledge on the equity shares has been released on 10 December 2021. The Project SPV is currently awaiting No-Objection Certificate (NOC) from the Authorised Dealer (AD) Bank as per application filed on 6 June 2022, in terms of the FEMA regulations and will recreate the pledge, once the said NOC is received from the AD bank.</p>
11	Non-convertible debentures (Secured)	Nirmal BOT Limited	1,249.10	1,420.10	1,563.80	<p><b>Rate of Interest and Repayment Terms</b>  Non-Convertible Debentures from Financial Institution as at 31 March 2022 of ₹ 1,249.10 millions (31 March 2021: ₹ 1,420.10 millions; 31 March 2020 - ₹ 1,563.80 millions) which carries average interest rate of 9.38% (31 March 2021 - 9.38%, 31 March 2020 - 9.38%). Debentures are redeemable semi annually (unevenly) starting from 18th November 2010 and ending on 18th May 2026.</p> <p><b>The Non-Convertible Debentures are secured by the way of :-</b>  a) The land is under lien by way of mortgage to Axis Trustee Services Limited acting as Debenture Trustee, by way of charge dated 16 December 2010; and  b) Debenture's are secured by way of first and exclusive charge on all assets both present and future and annuity receivables, excluding the project assets as defined in the Concession Agreement.</p> <p>Undertakings from the Sponsor to deposit the amount of difference between the actual O&amp;M costs and the O&amp;M costs as per the Trust and Retention Account and difference between the actual annuity received and annuity as per annuity schedule.</p>
12	Non-convertible debentures (Secured)	Ulundurpet Expressways Private Limited	1,039.91	1,794.05	2,032.08	<p><b>Rate of Interest and Repayment Terms</b>  Non-Convertible Debentures from Financial Institution as at 31 March 2022 of ₹ 1,039.91 millions (31 March 2021: ₹ 1,794.05 millions; 31 March 2020 - ₹ 2,032.08 millions) which carries average interest rate of 9.90% (31 March 2021 - 9.90%, 31 March 2020 - 9.90%). These are redeemable in 40 unequal quarterly instalments starting from 30 April 2015 and ending on 15 January 2025.</p> <p><b>The Non-Convertible Debentures are secured by the way of :-</b>  Pari passu first charge over SPV's movable properties, both present and future, including plant and machinery and Intangible Asset excluding project assets. Further secured by the rights, title, interest, benefit, claims, of the SPV in respect of the project agreements executed / to be executed, insurance policies both present and future, and all rights, title, interest, benefit, claims, demands of the SPV in respect of monies lying to the credit of Escrow account and other accounts. A first charge by way of pledge of Shares of 51% of Equity of the Issuer.</p> <p>To enable the change in ownership of the Project SPV from India Infrastructure Fund – II to Galaxy Investments II Pte. Ltd., the abovementioned pledge on the equity shares has been released on 10 December 2021. The Project SPV is currently awaiting No-Objection Certificate (NOC) from the Authorised Dealer (AD) Bank as per application filed on 24 December 2021, in terms of the FEMA regulations and will recreate the pledge, once the said NOC is received from the AD bank.</p> <p>Additionally, Non-Disposal Undertaking (NDU) has been marked over 51% of the CCDs of the Project SPV held by it in favour of IDBI Trusteeship Services Limited (for the benefit of existing lenders of the Project SPV).</p>
13	Non-convertible debentures (Unsecured)	Jodhpur Pali Expressway Private Limited	-	49.83	-	<p><b>Rate of Interest and Repayment Terms</b>  Non-Convertible Debentures from Financial Institution of ₹ NIL. (31 March 2021: ₹ 49.83 millions; 31 March 2020 - ₹. NIL) which carries average interest rate of Nil (31 March 2021 - 9.35%, 31 March 2020 - Nil). NIIF NCD is redeemable in unequal quarterly instalments starting from 15 January 2021 and ending on 15 January 2034.</p> <p><b>The Non-Convertible Debentures are secured by the way of :-</b>  Pari passu first charge over SPV's movable properties, both present and future, including plant and machinery, the Receivables of the Borrower and Intangible Asset, except Project Assets as defined in the Concession Agreement. Further secured by way of first pari passu charge on the rights, title, interest, benefit, claims, of the SPV in respect of the project agreements executed / to be executed, government approvals, insurance policies both present and future, Letter of Credit / guarantees / liquidated damages and performance bond provided by any party and all rights, title, interest, benefit, claims, demands of the SPV in respect of monies lying to the credit of Escrow account and other accounts. First pari passu pledge of 51% of equity share capital and 51% of preference share capital of the Borrower held by the Sponsor.</p> <p>To enable the change in ownership of the Project SPV from India Infrastructure Fund – II to Galaxy Investments II Pte. Ltd., the abovementioned pledge on the equity shares has been released on 10 December 2021. The Project SPV is currently awaiting No-Objection Certificate (NOC) from the Authorised Dealer (AD) Bank as per application filed on 6 June 2022, in terms of the FEMA regulations and will recreate the pledge, once the said NOC is received from the AD bank.</p>
14	Non-convertible debentures (secured)	Dewas Bhopal Corridor Private Limited	-	-	50.00	<p>The SPV has outstanding 100, 12% unsecured non-convertible debentures of INR 500,000 each carrying an interest rate of 12% p.a with quarterly compounded and payable within 90 days from closure of financial year and these instruments have a 10 years tenure, however, the NCDs can be repaid at the earlier date as per the option of the SPV. The said NCDs were repaid on 25 September 2020.</p> <p>To enable the change in ownership of the Project SPV from India Infrastructure Fund – II to Galaxy Investments II Pte. Ltd., the abovementioned pledge on the equity shares has been released on 13 December, 2021. The Project SPV had filed an application on 29 December 2021 for No-Objection Certificate (NOC) from the Authorised Dealer (AD) Bank, in terms of the FEMA regulations and will recreate the pledge, since it has received NOC from AD bank on 25 April 2022.</p>

**Highways Infrastructure Trust**  
**Summary of significant accounting policies and other explanatory information**  
**(All amounts in ₹ millions unless otherwise stated)**

S.No.	Nature of borrowing	Name of SPV	31 March 2022	31 March 2021	31 March 2020	Repayment terms and security disclosure
15	Loan from related parties	Nirmal BOT Limited	-	315.00	315.00	Subordinate debt facility carrying fixed interest rate of 12% per annum will be repaid after redemption of debentures. The principal amounts of the Facility shall be repaid by the Borrower to the Lender, subject to the terms of the Debenture Trust Deed dated 16 December 2010 executed between the Borrower and Axis Trustee Services Limited along with the amendment to the Debenture Trust Deed made on 11 February 2011 and shall be subject to the mutual agreement of the terms of parties hereto.
16	Loan from related parties	Ulundurpet Expressways Private Limited	-	10.91	9.92	Unsecured interest free loan from related party, India Infrastructure Fund (Being under common control/Ultimate holding) is repayable after repayment of term loans from banks and financial institutions, however in case surplus cash available as per the terms of such financing document, the same can also be prepaid. Loan from related parties is repayable after repayment of term loan, however in case surplus cash available as per the terms of financing document, the same can also be prepaid.
17	Loan from others (unsecured)	Ulundurpet Expressways Private Limited	470.62	427.83	388.94	<b>Rate of Interest and Repayment Terms</b> Interest free loans from GMR Highway Limited of 470.62 millions (31 March 2021: ₹ 427.83 millions; 31 March 2020 - ₹. 388.94 millions) repayable on or before 22 January 2027, however repayment can be made only after repayment of term loan, however in case surplus cash available as per the terms of financing document, the same can also be prepaid.
18	Compulsory convertible debentures (CCD's)	Ulundurpet Expressways Private Limited	219.05	-	-	The SPV has issued Compulsory Convertible Debentures (CCDs) having a term of 30 years from the date of issue. The outstanding CCD shall earn coupon at the rates of 14% p.a. payable annually every financial year starts from 31 March 2023 till 30 November 2051 or as may be mutually agreed between holder and issuer.  Upon maturity each CCDs shall be converted into equity shares in the following manner:- a. Convertible into equity shares of INR 10 based on fair market value of such equity shares as on the date of conversion (which shall not, unless otherwise permitted by Applicable Laws, be lower than the fair market value of the equity shares as on date of allotment of the CCDs), which will be mutually agreed; b. The CCDs shall be compulsorily converted, on the date falling at the expiry of Tenure or prior to the Conversion Date, at the option of the holder of the CCDs, into equity shares each with voting and economic rights at par with all other outstanding equity shares as on the Conversion Date; c. Upon conversion, the Equity Shares shall rank pari passu with the other Equity Shares without any preference or priority over them; and d. Each CCD shall be converted into such number of equity shares (subject to the CCDs not converting into Equity Shares at less than face value) as per the conversion formula given below:  [Face Value of the CCD] / [Fair market value of the equity shares as on date of conversion of the CCD on a fully diluted basis]
19	Compulsory convertible debentures (CCD's)	Jodhpur Pali Expressway Private Limited	2,333.83	-	-	The SPV has issued Compulsory Convertible Debentures (CCDs) having a term of 30 years from the date of issue. The outstanding CCD shall earn coupon at the rates of 14% p.a. payable annually every financial year starts from 31 March 2023 till 30 November 2051 or as may be mutually agreed between holder and issuer.  Upon maturity each CCDs shall be converted into equity shares in the following manner:- a. Convertible into equity shares of INR 10 based on fair market value of such equity shares as on the date of conversion (which shall not, unless otherwise permitted by Applicable Laws, be lower than the fair market value of the equity shares as on date of allotment of the CCDs), which will be mutually agreed; b. The CCDs shall be compulsorily converted, on the date falling at the expiry of Tenure or prior to the Conversion Date, at the option of the holder of the CCDs, into equity shares each with voting and economic rights at par with all other outstanding equity shares as on the Conversion Date; c. Upon conversion, the Equity Shares shall rank pari passu with the other Equity Shares without any preference or priority over them; and d. Each CCD shall be converted into such number of equity shares (subject to the CCDs not converting into Equity Shares at less than face value) as per the conversion formula given below:  [Face Value of the CCD] / [Fair market value of the equity shares as on date of conversion of the CCD on a fully diluted basis]

Highways Infrastructure Trust  
 Summary of significant accounting policies and other explanatory information  
 (All amounts in ₹ millions unless otherwise stated)

S.No.	Nature of borrowing	Name of SPV	31 March 2022	31 March 2021	31 March 2020	Repayment terms and security disclosure
20	Compulsory convertible debentures (CCD's)	Godhra Expressways Private Limited	5,094.14	-	-	<p>The SPV has issued Compulsory Convertible Debentures (CCDs) having a term of 30 years from the date of issue. The outstanding CCD shall earn coupon at the rates of 14% p.a. payable annually every financial year starts from 31 March 2023 till 30 November 2051 or as may be mutually agreed between holder and issuer.</p> <p>Upon maturity each CCDs shall be converted into equity shares in the following manner:-</p> <p>a. Convertible into Equity Shares of INR 10 based on fair market value of such Equity Shares as on the date of conversion (which shall not, unless otherwise permitted by Applicable Laws, be lower than the fair market value of the Equity Shares as on date of allotment of the CCDs), which will be mutually agreed;</p> <p>b. The CCDs shall be compulsorily converted, on the date falling at the expiry of Tenure or prior to the Conversion Date, at the option of the holder of the CCDs, into Equity Shares each with voting and economic rights at par with all other outstanding Equity Shares as on the Conversion Date;</p> <p>c. Upon conversion, the Equity Shares shall rank pari passu with the other Equity Shares without any preference or priority over them; and</p> <p>d. Each CCD shall be converted into such number of Equity Shares (subject to the CCDs not converting into Equity Shares at less than face value) as per the conversion formula given below:</p> <p>[Face Value of the CCD] / [Fair Market Value of the Equity Shares as on date of conversion of the CCD on a fully diluted basis]</p>
21	Compulsory convertible debentures (CCD's)	Nirmal BOT Limited	331.12	-	-	<p>The SPV has issued Compulsory Convertible Debentures (CCDs) having a term of 30 years from the date of issue. The outstanding CCD shall earn coupon at the rates of 14% p.a. payable annually every financial year starts from 31 March 2023 till 30 November 2051 or as may be mutually agreed between holder and issuer.</p> <p>Upon maturity each CCDs shall be converted into equity shares in the following manner:-</p> <p>a. Convertible into Equity Shares of INR 10 based on fair market value of such Equity Shares as on the date of conversion (which shall not, unless otherwise permitted by Applicable Laws, be lower than the fair market value of the Equity Shares as on date of allotment of the CCDs), which will be mutually agreed;</p> <p>b. The CCDs shall be compulsorily converted, on the date falling at the expiry of Tenure or prior to the Conversion Date, at the option of the holder of the CCDs, into Equity Shares each with voting and economic rights at par with all other outstanding Equity Shares as on the Conversion Date;</p> <p>c. Upon conversion, the Equity Shares shall rank pari passu with the other Equity Shares without any preference or priority over them; and</p> <p>d. Each CCD shall be converted into such number of Equity Shares (subject to the CCDs not converting into Equity Shares at less than face value) as per the conversion formula given below:</p> <p>[Face Value of the CCD] / [Fair Market Value of the Equity Shares as on date of conversion of the CCD on a fully diluted basis]</p>

**Highways Infrastructure Trust**  
**Summary of significant accounting policies and other explanatory information**  
**(All amounts in ₹ millions unless otherwise stated)**

S.No	Nature of borrowing	Name of SPV	31 March 2022	31 March 2021	31 March 2020	Terms
22	Optionally convertible debentures (OCD's)	Godhra Expressways Private Limited	-	3,769.63	3,565.57	The SPV issued Optionally Convertible Debentures ('OCD') of 38,298,808 face value of ₹ 75 each ("series A" consisting Tranche I - 16,164,365 OCDs & Tranche II 14,901,110 OCDs), ("series B" consisting Tranche I - 4,373,360 OCDs & Thanch II 2,193,306 OCDs) and ("series C" consisting Tranche I - 666,667 OCDs). OCDs can be converted into equity share with face value of INR 10 anytime during 21 (Twenty one) years ("Term") from the date of issue, unless converted or redeemed earlier as per the terms of issue. The OCD can be redeemed at face value plus a redemption premium on or before maturity at the in at the discretion of the holder. The OCD's are redeemable at such amount which provides the OCD holder an IRR of 14% considering the payments made on the OCDs till the maturity, subject to the terms and conditions stipulated in the financing documents of the senior lenders of the SPV. In case the OCDs are converted then redemption premium will not be payable. The said OCD's were repaid on 20 December 2021.
23	Optionally convertible debentures (OCD's)	Jodhpur Pali Expressway Private Limited	-	2,092.17	1,846.33	12,646 Optionally Convertible Debentures ('OCD') of face value of ₹ 100,000 each. The subscription of OCDs shall have a term of 21 years from the date of issue, unless converted, redeemed earlier as per the term of the agreement. The outstanding subscription of OCDs shall accrued and earn interest (unpaid interest shall be accumulated which is payable at the end of the year) at the following rates or such other rate as decided by SPV and the investor, till the subscription of OCD are converted into equity shares of the SPV or redeemed;  FY 19 till FY 26 : 1% FY 27 onwards : 8%  The subscription of OCDs shall be redeemed at the discretion of holder at the premium (redemption premium) such that price payable by the SPV on redemption of OCDs shall be that holder received an all-in IRR of 14%. The said OCD's were repaid on 20 December 2021.
24	Optionally convertible debentures (OCD's)	Godhra Expressways Private Limited	-	828.88	734.84	The Optionally Convertible Debentures ('OCD') of ₹ Nil (31 March 2021 - 828.88 millions, 31 March 2020 ₹ 734.84 millions) can be redeemed at face value plus redemption premium on or before maturity at the discretion of the holder. The Optionally Convertible Debentures are redeemable at such amount which provides the debentureholder an IRR of 14% considering the payments made on the Optionally Convertible Debentures till the maturity, subject to the terms and conditions stipulated in the financing documents of the senior lenders of the SPV. A charge over 51% of debentures issued by the SPV, (i.e. 19,532,393 optionally convertible debentures comprising of Series A - OCDs of 12,965,727 and Series B - OCDs of 6,566,666). The said OCD's were repaid on 20 December 2021.
25	Optionally convertible debentures (OCD's)	Ulundurpet Expressways Private Limited	-	173.44	153.51	The SPV has issued Optionally Convertible Debentures ('OCD') having a term of 10 years from the date of issue, unless converted or redeemed earlier. The outstanding OCD shall earn interest at the following rates or such other rate as decided by the SPV and the OCD holders, till the OCD are converted into Equity Shares or redeemed:  FY 19 and FY 20 : 2% FY 21 : 3% FY 22 onwards : 5%  Each OCD shall be convertible into Equity Share on or before the term of OCD upon the option of OCD holder. The redemption of the OCD shall be at the sole discretion of the OCD holder. The price payable by the SPV on redemption of the OCD shall be such that the holder receives an all-in IRR of 15% p.a. on its subscription value of OCD or such other IRR as determined in writing between the SPV and the OCD holder. The said OCD's were repaid on 20 December 2021.

Highways Infrastructure Trust  
Summary of significant accounting policies and other explanatory information

(All amounts in ₹ millions unless otherwise stated)

S.No.	Nature of borrowing	Name of SPV	31 March 2022	31 March 2021	31 March 2020	Repayment terms and security disclosure
26	Liability portion of compound instruments- Preference Shares	Shillong Expressway Private Limited	519.08	519.08	531.84	<p>The SPV has only one class of 2,100,000, Non cumulative Redeemable preference shares at par value of ₹ 10 per share . The SPV has classified Non cumulative redeemable preference shares as compound financial instrument and bifurcated equity and liability component with retrospective effect from its origination date. During the year 2018-19, the SPV has redeemed the 283,000 no. of 6% Non-Cumulative Redeemable Preference Shares (Preference shares) out of 2,100,000 preference shares at price of ₹ 300 each.. As per shareholders meeting held on 30 June 2020, the terms of preference shares are changed and the same are now redeemable at any time on or before 31 March 2021 subject to availability of cash at the option of the SPV i.e. Shillong Expressway Private Limited..</p> <p>As per Board meeting held on 31 March 2021, the terms of preference shares are changed again and the same are now redeemable at any time on or before 31 May 2021 subject to availability of cash at the option of the SPV i.e. Shillong Expressway Private Limited.</p> <p>As per Board meeting held on 13 May 2021, the terms of preference shares are changed again and the same are now redeemable at any time on or before 30 September 2021 subject to availability of cash at the option of the SPV i.e. Shillong Expressway Private Limited.</p> <p>As per Board meeting held on 24 September 2021, the terms of preference shares are changed as:1,817,000 nos. of Preference Shares issued on 4th January 2011 redeemable at a price of Rs. 300/- each, at any time on or before 31st December 2021 subject to availability of cash at the option of the Company i.e. Shillong Expressway Private Limited. These terms subsequently revised and the redemption date extended to 31 March 2022.</p> <p>As per resolution passed through circular by board of directors on 07 April 2022, the terms of preference shares are changed as:1,817,000 nos. of Preference Shares issued on 04 January 2011 redeemable at a price of Rs. 300/- each, at any time on or before 30th September 2022 subject to availability of cash at the option of the Company i.e. Shillong Expressway Private Limited."</p>
<b>Total</b>			<b>23,268.43</b>	<b>23,994.36</b>	<b>24,125.65</b>	

**Highways Infrastructure Trust**  
**Summary of significant accounting policies and other explanatory information**  
(All amounts in ₹ millions unless otherwise stated)

	For the financial year ended 31 March 2022	For the financial year ended 31 March 2021	For the financial year ended 31 March 2020
<b>24 Revenue from operations*</b>			
<b>Operating revenue</b>			
Income arising out of toll collection	4,549.06	3,919.12	3,922.85
Interest income on annuity receivable from NHAI	256.17	300.73	338.18
Revenue from operations and maintenance of road	198.01	134.97	136.78
Revenue from periodic maintenance of road	-	25.30	308.70
<b>Other operating revenues</b>			
Claim from NHAI	601.80	378.72	-
Change of scope and utility shifting expenses	209.81	182.54	211.19
Gain on modification of annuity	51.71	143.66	91.10
	<b>5,866.56</b>	<b>5,085.04</b>	<b>5,008.80</b>
*refer note 44			
<b>25 Other income</b>			
Interest income			
- Bank deposits	100.76	59.98	63.21
- Income tax refund	2.30	2.28	0.34
- Others	0.01	0.01	0.18
Insurance claims	59.84	4.01	3.65
Gain on investments carried at fair value through profit or loss (net)	7.26	6.61	24.31
Gain on sale of property, plant and equipment (net)	0.04	-	-
Excess provisions written back	1.40	2.26	0.99
Gain on sale of investments (net)	70.59	81.51	120.96
Gain on modification of financial liability	52.55	64.09	13.34
Miscellaneous income	16.34	20.34	4.45
	<b>311.09</b>	<b>241.09</b>	<b>231.43</b>
<b>26 Operating expenses</b>			
Expenses related to claim from NHAI	553.00	378.72	-
Toll operation and maintenance expense	375.21	386.50	362.33
Major maintenance provision	310.20	451.45	834.11
Change of scope and utility shifting expenses	199.19	160.62	191.58
	<b>1,437.60</b>	<b>1,377.29</b>	<b>1,388.02</b>
<b>27 Employee benefits expense</b>			
Salary, wages and bonus	102.60	93.10	94.82
Contribution to provident and other funds	9.58	10.76	10.99
Staff welfare expenses	16.17	13.70	10.38
	<b>128.35</b>	<b>117.56</b>	<b>116.19</b>
For disclosures related to provision for employee benefits, refer note 33 - Employee benefit obligations			
<b>28 Finance costs</b>			
Interest expense			
- term loans and debentures	1,386.51	1,527.93	1,638.30
- preference shares	52.55	51.32	49.76
- optionally convertible debentures	705.27	865.14	773.99
- late payment of statutory dues	1.70	0.10	0.88
- compulsory convertible debentures	312.13	-	-
- others	27.50	38.65	38.99
Unwinding finance cost on deferred payment to NHAI for purchase of right to charge user of toll roads	148.30	145.97	143.44
Unwinding of discount on major maintenance provision	78.44	59.97	68.75
Unwinding of discount on provisions and financial liabilities carried at amortised	49.15	41.74	38.65

**Highways Infrastructure Trust****Summary of significant accounting policies and other explanatory information**

(All amounts in ₹ millions unless otherwise stated)

	<b>For the financial year ended 31 March 2022</b>	<b>For the financial year ended 31 March 2021</b>	<b>For the financial year ended 31 March 2020</b>
Loss on modification of financial liability	-	-	-
Finance and bank charges	14.01	9.69	22.01
	<b>2,775.55</b>	<b>2,740.51</b>	<b>2,774.77</b>

**Highways Infrastructure Trust**  
**Summary of significant accounting policies and other explanatory information**  
(All amounts in ₹ millions unless otherwise stated)

	For the financial year ended 31 March 2022	For the financial year ended 31 March 2021	For the financial year ended 31 March 2020
<b>29 Depreciation and amortisation expense</b>			
Depreciation of property, plant and equipment (refer note 3)	18.47	15.31	14.58
Amortisation of intangible assets (refer note 5)	998.97	904.50	1,024.09
	<b>1,017.44</b>	<b>919.81</b>	<b>1,038.67</b>
<b>30 Other expenses</b>			
Power, fuel and water charge	32.35	32.19	32.41
Legal and professional expenses	49.14	59.47	51.51
Insurance	67.56	92.92	31.44
Management support services fee	187.87	111.39	144.90
Communication	3.26	2.81	2.20
Loss on investments carried at fair value through profit or loss (net)	0.75	12.20	23.05
Rates and taxes	0.07	0.80	0.97
Travelling and conveyance	7.93	3.69	7.71
Independent consultancy and project monitoring fees	57.90	50.65	18.70
Director sitting fees	1.09	1.19	0.85
Rent (refer note 34)	2.43	2.32	1.96
Bad debts written off	26.40	-	-
Printing and stationery	0.57	0.93	1.06
Miscellaneous expenses	21.83	23.13	32.74
	<b>459.15</b>	<b>393.69</b>	<b>349.50</b>

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**Highways Infrastructure Trust**  
**Summary of significant accounting policies and other explanatory information**  
**(All amounts in ₹ millions unless otherwise stated)**

**31 Assets pledged as security**

Particulars	As at 31 March 2022	As at 31 March 2021	As at 31 March 2020
<b>Current</b>			
Investments (refer note 11)	2,152.39	2,156.37	2,465.11
Trade receivables (refer note 12)	37.30	68.92	87.48
Cash and cash equivalents and other bank balances (refer note 13 and 14)	2,338.44	1,702.01	1,034.04
Other current financial assets (refer note 7)	941.61	949.80	939.68
<b>Total current assets pledged as security</b>	<b>5,469.74</b>	<b>4,877.10</b>	<b>4,526.31</b>
<b>Non-current</b>			
Property, plant and equipment (refer note 3)	130.04	66.93	62.05
Intangible assets (refer note 5)	20,246.56	21,249.03	22,159.81
Capital work-in-progress (refer note 4)	2.39	9.40	-
Other non-current financial assets (refer note 6)	1,382.88	1,626.38	1,861.32
<b>Total non-currents assets pledged as security</b>	<b>21,761.87</b>	<b>22,951.73</b>	<b>24,083.18</b>
<b>Total assets pledged as security</b>	<b>27,231.61</b>	<b>27,828.83</b>	<b>28,609.49</b>

For the financial year ended 31 March 2022	For the financial year ended 31 March 2021	For the financial year ended 31 March 2020
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**32 Tax expense**

**(i) Income tax expense recognised in Special Purpose Combined Statement of Profit and Loss**

Current tax	189.97	127.00	91.10
Deferred tax	514.79	(155.54)	(2.41)
	<b>704.76</b>	<b>(28.54)</b>	<b>88.69</b>

The major components of income tax expense and the reconciliation of expense based on the domestic effective tax rate and the reported tax expense in profit or loss are as follows :

Profit before tax	359.56	(222.73)	(426.92)
Income tax using the SPV Group's domestic tax rate *	29.12%	29.12%	29.12%
<b>Expected tax expense [A]</b>	<b>104.70</b>	<b>(64.86)</b>	<b>(124.32)</b>

**Tax effect of adjustment to reconcile expected income tax expense to reported income tax expense:**

Tax impact of exempt income pursuant to tax holiday	(107.66)	(74.92)	(62.85)
Deferred tax asset not recognised due to absence of certainty of realisability	821.23	136.83	273.57
Minimum Alternate Tax (MAT) credit recognized	(143.36)	(74.84)	(38.57)
Impact of MAT Credit not being availed due to uncertainty of realizability	27.90	50.10	41.94
Others	1.95	(0.85)	(1.08)
<b>Total adjustments [B]</b>	<b>600.06</b>	<b>36.33</b>	<b>213.01</b>
<b>Actual tax expense [C=A+B]</b>	<b>704.76</b>	<b>(28.54)</b>	<b>88.69</b>

\* Domestic tax rate applicable to the SPV Group has been computed as follows:

Base tax rate	25.00%	25.00%	25.00%
Surcharge (% of tax)	12.00%	12.00%	12.00%
Cess (% of tax)	4.00%	4.00%	4.00%
Applicable rate	29.12%	29.12%	29.12%

**Unused tax losses and credits:**

**- Unused tax losses and depreciation:**

The SPV Group has the following unused tax losses and unabsorbed depreciation which arose on incurrance of business losses under the Income-tax Act, 1961, for which no deferred tax asset has been recognised in the books of accounts considering the SPV Group believes that there is no probability which demonstrates realisation of such assets in the near future:

Particulars	As at 31 March 2022	As at 31 March 2021	As at 31 March 2020
Unused tax losses and unabsorbed depreciation for which no deferred tax asset has been recognised (Refer (a) and (b) below)	13,119.85	11,580.13	11,579.42
Potential tax benefit @ 29.12% (31 March 2021 : 29.12% and 31 March 2020 : 29.12%)	3,820.50	3,372.13	3,371.93

**Highways Infrastructure Trust**  
**Summary of significant accounting policies and other explanatory information**  
**(All amounts in ₹ millions unless otherwise stated)**

a) Unrecognised business loss can be carried forward based on the year of origination as follows:

Assessment year/period of origination	Financial year of expiry	As at 31 March 2022	As at 31 March 2021	As at 31 March 2020
AY 2017-18	AY 25-26	-	588.61	588.61
AY 2018-19	AY 26-27	-	142.66	142.66
AY 2019-20	AY 27-28	-	122.04	122.04
AY 2020-21	AY 28-29	-	244.31	244.31
AY 2021-22	AY 29-30	-	53.33	-
AY 2022-23	AY 30-31	2,899.80	-	-
		<b>2,899.80</b>	<b>1,150.95</b>	<b>1,097.62</b>

b) Unabsorbed depreciation can be carried forward based on the year of origination as follows:

Assessment year/period of origination	Financial year of expiry	As at 31 March 2022	As at 31 March 2021	As at 31 March 2020
AY 2010-11	Indefinitely	496.18	747.90	747.90
AY 2011-12	Indefinitely	833.84	833.84	833.84
AY 2012-13	Indefinitely	736.96	736.96	736.96
AY 2013-14	Indefinitely	558.61	558.61	638.12
AY 2014-15	Indefinitely	1,361.35	1,365.39	1,368.49
AY 2015-16	Indefinitely	1,894.20	1,950.38	1,950.38
AY 2016-17	Indefinitely	1,620.55	1,658.39	1,658.39
AY 2017-18	Indefinitely	1,196.37	1,196.37	1,196.37
AY 2018-19	Indefinitely	658.23	658.23	658.23
AY 2019-20	Indefinitely	383.77	383.77	383.77
AY 2020-21	Indefinitely	208.65	309.35	309.35
AY 2021-22	Indefinitely	29.99	29.99	-
AY 2022-23	Indefinitely	241.35	-	-
		<b>10,220.05</b>	<b>10,429.18</b>	<b>10,481.80</b>

**- Unused tax credits**

There are unused minimum alternate tax credits as mentioned below which have not been recognized as an asset in the books of accounts in the absence of convincing evidence of utilization during the specified allowable period against the future taxable profits to be computed as per the normal provisions of the Income Tax Act, 1961:

Assessment year/period of origination	Financial year of expiry	As at 31 March 2022	As at 31 March 2021	As at 31 March 2020
AY 2014-15	AY 2029-30	2.34	2.34	2.34
AY 2015-16	AY 2030-31	10.05	10.05	10.05
AY 2016-17	AY 2031-32	6.68	6.68	6.68
AY 2017-18	AY 2032-33	23.11	23.11	23.11
AY 2018-19	AY 2032-34	20.69	20.69	20.69
AY 2019-20	AY 2032-35	5.34	5.34	5.34
AY 2020-21	AY 2032-36	41.94	41.94	41.94
AY 2021-22	AY 2036-37	39.73	50.10	-
AY 2022-23	AY 2037-38	17.49	-	-
		<b>167.37</b>	<b>160.25</b>	<b>110.15</b>

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## 33 Disclosure relating to employee benefits pursuant to Ind AS 19 - Employee Benefits

Particulars	As at 31 March 2022		As at 31 March 2021		As at 31 March 2020	
	Current	Non-current	Current	Non-current	Current	Non-current
<b>Provisions:</b>						
Gratuity	0.32	8.06	0.20	7.43	0.13	6.79
Compensated absences	0.45	4.65	0.38	4.47	0.40	4.22
<b>Total</b>	<b>0.77</b>	<b>12.71</b>	<b>0.58</b>	<b>11.90</b>	<b>0.53</b>	<b>11.01</b>

## A Disclosure of gratuity

## Gratuity (Funded)

The SPV Group provides for gratuity, a defined benefit retirement plan covering eligible employees. The gratuity plan provides a lump sum payments to vested employees at retirement, death, incapacitation or termination of employment, of an amount equivalent to 15 days salary for each completed year of service. Vesting occurs on completion of 5 continuous years of service as per Payment of Gratuity Act, 1972. However, no vesting condition applies in case of death.

## Description of risk exposures:

Valuations are based on certain assumptions, which are dynamic in nature and vary over time. As such, the SPV Group is exposed to various risks as follows:

- (a) **Salary increases** - Actual salary increases will increase the plan's liability. Increase in salary increase rate assumption in future valuations will also increase the liability.
- (b) **Investment risk** - If plan is funded then assets/liabilities mismatch and actual investment return on assets lower than the discount rate assumed at the last valuation date can impact the liability.
- (c) **Discount rate** - Reduction in discount rate in subsequent valuations can increase the plan's liability.
- (d) **Mortality and disability** - Actual deaths and disability cases proving lower or higher than assumed in the valuation can impact the liabilities.
- (e) **Withdrawals** - Actual withdrawals proving higher or lower than assumed withdrawals and change of withdrawal rates at subsequent valuations can impact plan's liability.

## (i) Amount recognised in the Combined Statement of Profit and Loss is as under:

Description	For the year ended 31 March 2022	For the financial year ended 31 March 2021	For the financial year ended 31 March 2020
Current service cost	2.26	2.25	1.76
Interest cost	0.44	0.47	0.29
<b>Net impact on profit (before tax)</b>	<b>2.71</b>	<b>2.72</b>	<b>2.05</b>
Actuarial (gain)/loss recognised during the year	(0.24)	(0.57)	1.25
<b>Amount recognised in total comprehensive income</b>	<b>2.47</b>	<b>2.15</b>	<b>3.30</b>

Highways Infrastructure Trust  
 Summary of significant accounting policies and other explanatory information  
 (All amounts in ₹ millions unless otherwise stated)

(ii) Change in the present value of obligation:

Description	As at 31 March 2022	As at 31 March 2021	As at 31 March 2020
Present value of defined benefit obligation as at the beginning of the year	10.38	9.08	5.79
Transfer in/(out) obligation	(0.57)	-	-
Current service cost	2.26	2.24	1.76
Interest cost	0.64	0.48	0.29
Benefits paid	(0.99)	(0.85)	(0.02)
Actuarial (gain) / loss	(0.31)	(0.57)	1.25
<b>Present value of defined benefit obligation as at the end of the year</b>	<b>11.41</b>	<b>10.38</b>	<b>9.08</b>

(iii) Movement in the plan assets recognised in the Combined Balance Sheet is as under:

Description	As at 31 March 2022	As at 31 March 2021	As at 31 March 2020
Fair value of plan assets at the beginning of the year	2.75	2.16	1.71
Actual return on plan assets	0.20	0.16	0.14
Contributions	0.15	0.45	0.34
Actuarial gain	(0.07)	(0.01)	(0.02)
<b>Fair value of plan assets at the end of the year</b>	<b>3.03</b>	<b>2.75</b>	<b>2.16</b>

(iv) Reconciliation of present value of defined benefit obligation and the fair value of assets:

Description	As at 31 March 2022	As at 31 March 2021	As at 31 March 2020
Present value of funded obligation as at the end of the year	11.41	10.38	9.08
Fair value of plan assets as at the end of the period funded status	3.03	2.75	2.16
<b>Unfunded/funded net liability recognized in Combined Balance Sheet</b>	<b>8.38</b>	<b>7.63</b>	<b>6.92</b>

(v) Breakup of actuarial (gain)/loss:

Description	For the year ended 31 March 2022	For the financial year ended 31 March 2021	For the financial year ended 31 March 2020
Actuarial gain from change in demographic assumption	-	(0.00)	(0.00)
Actuarial (gain)/loss from change in financial assumption	(0.42)	0.22	0.68
Actuarial (gain)/loss from experience adjustment	0.12	(0.80)	0.55
Return on plan assets (excluding amounts included in net interest expense)	0.06	0.01	0.02
<b>Total actuarial (gain)/loss</b>	<b>(0.24)</b>	<b>(0.57)</b>	<b>1.25</b>

**Highways Infrastructure Trust**

**Summary of significant accounting policies and other explanatory information**

(All amounts in ₹ millions unless otherwise stated)

(vi) **Actuarial assumptions:**

Description	As at 31 March 2022	As at 31 March 2021	As at 31 March 2020
Discount rate range	6.35% to 7.75%	6.35% to 7.75%	6.35% to 7.75%
Rate of increase in compensation levels range	6% to 8%	6% to 8%	6% to 8%
Retirement age	58 years	58 years	58 years

**Notes:**

- 1) The discount rate is based on the prevailing market yield of Indian Government bonds as at the balance sheet date for the estimated terms of obligations.
- 2) The estimates of future salary increases considered takes into account the inflation, seniority, promotion and other relevant factor

(vii) **Sensitivity analysis for gratuity liability:**

Description	As at 31 March 2022	As at 31 March 2021	As at 31 March 2020
<b>Impact of change in discount rate</b>			
Present value of obligation at the end of the period/year	11.41	10.38	9.08
- Impact due to increase of 0.50% - 1 %	(0.57)	(0.53)	(0.47)
- Impact due to decrease of 0.50% - 1 %	0.62	0.57	0.48
<b>Impact of change in salary increase</b>			
Present value of obligation at the end of the period/year	11.41	10.35	9.08
- Impact due to increase of 0.50% - 1 %	0.47	0.43	0.38
- Impact due to decrease of 0.50% - 1 %	(0.49)	(0.41)	(0.35)

The above sensitivity analysis is based on a change an assumption while holding all other assumptions constant. In practice, this is unlikely to occur and changes in some of the assumptions may be correlated. When calculating the sensitivity of the defined benefit obligation to significant actuarial assumptions the same method (present value of the defined benefit obligation calculated with the projected unit credit method at the end of the reporting period) has been applied which was applied while calculating the defined benefit obligation liability recognised in the Combined Balance Sheet.

The methods and types of assumptions used in preparing the sensitivity analysis did not change compared to previous periods.

(viii) **Maturity profile of defined benefit obligation:**

Description	As at 31 March 2022	As at 31 March 2021	As at 31 March 2020
Within next 12 months	0.71	0.20	0.13
Between 1-5 years	3.07	3.00	2.76
Beyond 5 years	7.63	7.18	6.19
<b>Total</b>	<b>11.41</b>	<b>10.38</b>	<b>9.08</b>

**B Compensated absence**

Amount recognised in the Combined Statement of Profit and Loss is as under:

Description	For the year ended 31 March 2022	For the financial year ended 31 March 2021	For the financial year ended 31 March 2020
Current service cost	1.22	1.12	1.09
Interest cost	0.31	0.30	0.22
Actuarial (gain)/loss recognised during the year	(0.49)	0.18	0.36
<b>Amount recognised in the Combined Statement of Profit and Loss</b>	<b>1.04</b>	<b>1.60</b>	<b>1.67</b>

**Highways Infrastructure Trust****Summary of significant accounting policies and other explanatory information**

(All amounts in ₹ millions unless otherwise stated)

**34 Information on Lease transactions pursuant to Ind AS 116-Leases**

The SPV Group is a lessee under various short term leases. Rental expense on short term or low value leases for the financial years ended 31 March 2022, 31 March 2021 and 31 March 2020 are ₹ 2.43 million ₹ 2.32 million, ₹ 1.96 million respectively.

**35 Capital and other commitments**

Estimated amount of contracts remaining to be executed on capital account and not provided as at 31 March 2022 : ₹ 27.13 million 31 March 2021: ₹ 42.05 million, 31 March 2020: ₹ 27.44 million.

**36 Contingent liabilities and claims\***

<b>Particulars</b>	<b>As at 31 March 2022</b>	<b>As at 31 March 2021</b>	<b>As at 31 March 2020</b>
Sales tax / service tax and income tax cases in respect of which SPV Group is in appeals	138.19	3.76	26.29
Claims raised against the SPV Group for Stamp Duty dues under the Indian Stamp Act, 1899 under appeals	221.19	221.19	221.19
Labour welfare dues in respect of which SPV Group is in appeals	47.78	47.78	47.78
<b>Total</b>	<b>407.16</b>	<b>272.73</b>	<b>295.26</b>

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**Highways Infrastructure Trust****Summary of significant accounting policies and other explanatory information**

(All amounts in ₹ millions unless otherwise stated)

**37 Fair value disclosures****i) Fair values hierarchy**

Financial assets and financial liabilities measured at fair value in the Combined Balance Sheet are divided into three levels of a fair value hierarchy. The three levels are defined based on the observability of significant inputs to the measurement, as follows:

**Level 1:** Quoted prices (unadjusted) in active markets for financial instruments.

**Level 2:** The fair value of financial instruments that are not traded in an active market is determined using valuation techniques which maximise the use of observable market data rely as little as possible on entity specific estimates.

**Level 3:** If one or more of the significant inputs is not based on observable market data, the instrument is included in level 3.

**Financial assets measured at fair value - recurring fair value measurements:**

<b>As at 31 March 2020</b>	<b>Level 1</b>	<b>Level 2</b>	<b>Level 3</b>	<b>Total</b>
<b>Assets at fair value</b>				
Investments measured at fair value through profit and loss	2,465.11	-	-	2,465.11
<b>As at 31 March 2021</b>	<b>Level 1</b>	<b>Level 2</b>	<b>Level 3</b>	<b>Total</b>
<b>Assets at fair value</b>				
Investments measured at fair value through profit and loss	2,156.37	-	-	2,156.37
<b>As at 31 March 2022</b>	<b>Level 1</b>	<b>Level 2</b>	<b>Level 3</b>	<b>Total</b>
<b>Assets at fair value</b>				
Investments measured at fair value through profit and loss	2,152.39	-	-	2,152.39

**Valuation process and technique used to determine fair value**

The fair value of investments in mutual fund units are based on the net asset value ("NAV") as stated by the issuers of these mutual fund units in the published statements as at each reported balance sheet dates. NAV represents the price at which the issuer will issue further units of mutual fund and the price at which issuers will redeem such units from the investor.

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**Highways Infrastructure Trust**
**Summary of significant accounting policies and other explanatory information**

(All amounts in ₹ millions unless otherwise stated)

**(ii) Fair value of instruments measured at amortised cost:**

Fair value of long term instruments of financial assets and liabilities measured at amortised cost for which fair value is disclosed as follows using Level 3 inputs:

Particulars	As at 31 March 2022		As at 31 March 2021		As at 31 March 2020	
	Carrying value	Fair value	Carrying value	Fair value	Carrying value	Fair value
<b>Financial assets</b>						
Other current and non current financial assets	2,324.49	2,324.49	2,576.17	2,749.32	2,801.00	3,051.57
Trade receivables	37.30	37.30	68.92	68.92	87.48	87.48
Cash and cash equivalents	365.82	365.82	79.81	79.81	174.91	174.91
Bank balances other than cash and cash equivalents above	1,972.62	1,972.62	1,622.21	1,622.21	859.13	859.13
<b>Total financial assets</b>	<b>4,700.23</b>	<b>4,700.22</b>	<b>4,347.11</b>	<b>4,520.26</b>	<b>3,922.52</b>	<b>4,173.09</b>
<b>Financial liabilities</b>						
Borrowings	23,268.43	23,268.43	23,994.36	23,994.36	24,125.65	24,125.65
Trade payable	320.80	320.80	211.32	211.32	213.28	213.28
Other financial liabilities	1,926.30	1,926.30	1,568.74	1,568.74	1,503.55	1,503.55
<b>Total financial liabilities</b>	<b>25,515.54</b>	<b>25,515.54</b>	<b>25,774.42</b>	<b>25,774.42</b>	<b>25,842.48</b>	<b>25,842.48</b>

The carrying amount of financial assets and financial liabilities measured at amortised cost in these special purpose combined financial statements are a reasonable approximation of their fair values since the SPV Group does not anticipate that the carrying amounts would be significantly different from the values that would eventually be received or settled. The fair value of the financial assets and liabilities is included at the amount at which the instrument could be exchanged in a current transaction between willing parties, other than in a forced or liquidation sale. The following methods and assumptions were used to estimate the fair values:

(i) Long-term fixed rate receivables are evaluated by the SPV Group based on parameters such as interest rates, individual creditworthiness of the customer and other market risk factors.

(ii) The fair values of the SPV Group's loans and receivables from/to related parties and others are determined by applying discounted cash flows ("DCF") method, using discount rate that reflects the issuer's borrowing rate as at the end of the reporting period. The own non-performance risk as at the reporting period end was assessed to be insignificant.

(iii) All the other long term borrowing facilities availed by the SPV Group are variable rate facilities which are subject to changes in underlying interest rate indices. The management believes that the current rate of interest on these loans are in close approximation from market rates applicable to the SPV Group. Therefore, the management estimates that the fair value of these borrowings are approximate to their respective carrying values.

**38 Financial risk management**
**i) Financial instruments by category**

Particulars	As at 31 March 2022			As at 31 March 2021			As at 31 March 2020		
	FVTPL	FVOCI	Amortised cost	FVTPL	FVOCI	Amortised cost	FVTPL	FVOCI	Amortised cost
<b>Financial assets</b>									
Investments	2,152.39	-	-	2,156.37	-	-	2,465.11	-	-
Other current and non current financial assets	-	-	2,324.49	-	-	2,576.17	-	-	2,801.00
Trade receivables	-	-	37.30	-	-	68.92	-	-	87.48
Cash and cash equivalents	-	-	365.82	-	-	79.81	-	-	174.91
Bank balances other than cash and cash equivalents above	-	-	1,972.62	-	-	1,622.21	-	-	859.13
<b>Total</b>	<b>2,152.39</b>	<b>-</b>	<b>4,700.23</b>	<b>2,156.37</b>	<b>-</b>	<b>4,347.11</b>	<b>2,465.11</b>	<b>-</b>	<b>3,922.52</b>
<b>Financial liabilities</b>									
Borrowings	-	-	23,268.43	-	-	23,994.36	-	-	24,125.65
Trade payables	-	-	320.80	-	-	211.32	-	-	213.28
Other financial liabilities	-	-	1,926.30	-	-	1,568.74	-	-	1,503.55
<b>Total</b>	<b>-</b>	<b>-</b>	<b>25,515.54</b>	<b>-</b>	<b>-</b>	<b>25,774.42</b>	<b>-</b>	<b>-</b>	<b>25,842.48</b>

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**Highways Infrastructure Trust**

**Summary of significant accounting policies and other explanatory information**

(All amounts in ₹ millions unless otherwise stated)

**ii) Risk Management**

The SPV Group's activities expose it to market risk, liquidity risk and credit risk. The SPV Group's Board of Directors has overall responsibility for the establishment and oversight of the SPV Group's risk management framework. This note explains the sources of risk which the entity is exposed to and how the entity manages the risk and the related impact in the Combined Financial Statements :

<b>Risk</b>	<b>Exposure arising from</b>	<b>Measurement</b>	<b>Management of SPV Group manages risks by</b>
Credit risk	Cash and cash equivalents, bank balances other than cash and cash equivalents above, trade receivables, financial assets measured at amortised cost	Ageing analysis	Investing in bank deposits, diversification of asset base, credit limits and collateral.
Liquidity risk	Borrowings and other liabilities	Rolling cash flow forecasts	Availability of committed credit lines and borrowing facilities.
Market risk : interest rate risk	Borrowings at variable rates	Sensitivity analysis	Negotiation of terms that reflect the market factors.
Market risk : price risk	Investments at fair value through profit or loss	Sensitivity analysis	Diversification of its portfolio of assets.

The SPV Group's risk management is carried out by a project finance team and treasury team under policies approved by Board of Directors of respective SPVs. The management of the SPV Group provides principles for overall risk management, as well as policies covering specific areas, such as, interest rate risk, credit risk and investment of excess liquidity.

**A) Credit risk**

Credit risk is the risk that a counterparty fails to discharge an obligation to the SPV Group. The SPV Group is exposed to this risk for various financial instruments, for example by granting loans and receivables to customers, placing deposits, etc. The SPV Group's maximum exposure to credit risk is limited to the carrying amount of following types of financial assets:

- cash and cash equivalents,
- trade receivables,
- loans and receivables carried at amortised cost, and
- deposits with banks.

**a) Credit risk management**

The SPV Group assesses and manages credit risk based on internal credit rating system, continuously monitoring defaults of customers and other counterparties, identified either individually or by the SPV Group, and incorporates this information into its credit risk controls. Internal credit rating is performed for each class of financial instruments with different characteristics. The SPV Group assigns the following credit ratings to each class of financial assets based on the assumptions, inputs and factors specific to the class of financial assets.

- (i) Low credit risk
- (ii) Medium credit risk
- (iii) High credit risk

Assets under credit risk :

<b>Credit rating</b>	<b>Particulars</b>	<b>As at 31 March 2022</b>	<b>As at 31 March 2021</b>	<b>As at 31 March 2020</b>
A: Low	Other current and non-current financial assets	2,324.49	2,576.17	2,801.00
	Cash and cash equivalents	365.82	79.81	174.91
	Bank balances other than cash and cash equivalents above	1,972.62	1,622.21	859.13
B: Medium	Trade receivables	37.30	68.92	87.48

*Cash and cash equivalents and bank balances other than cash and cash equivalents*

Credit risk related to cash and cash equivalents and bank deposits is managed by only accepting highly rated banks and diversifying bank deposits and accounts in different banks.

*Trade receivables*

The SPV Group has trade receivables primarily from various government authorities. Credit risk related to these receivables is expected to be medium. Such receivables are managed by monitoring the recoverability of amounts continuously.

*Other financial assets measured at amortised cost*

Other financial assets measured at amortised cost includes security deposits, annuity receivable, receivable from related parties and others. Credit risk related to these other financial assets is managed by monitoring the recoverability of such amounts continuously, while at the same time internal control system in place ensure the amounts are within defined limits.

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## Highways Infrastructure Trust

### Summary of significant accounting policies and other explanatory information

(All amounts in ₹ millions unless otherwise stated)

#### b) Expected credit losses

##### Trade receivables

The SPV Group is engaged in infrastructure development business under Build-Operate-Transfer ("BOT") and design, build, finance, operate and transfer (DBFOT) project. It currently derives its revenue primarily from toll collection / annuity business. Other than collection in cash or by way of smart cards which are considered as low credit risk assets, since the annuity receivables are from NHAI and various Government authorities. The credit risk with respect to such receivables from government institutions is expected to be very low and hence, no provision for expected credit loss is deemed necessary except in the case where individual receivables are known to be uncollectable.

##### Financial assets (other than trade receivables)

The SPV Group provides for expected credit losses on loans and advances other than trade receivables by assessing individual financial instruments for expectation of any credit losses:

- For cash and cash equivalents and bank balances other than cash and cash equivalents - Since the SPV Group deals with only high-rated banks and financial institutions, credit risk in respect of cash and cash equivalents, other bank balances and bank deposits is evaluated as very low.
- For loans and other financial assets - Credit risk is evaluated based on the SPV Group's knowledge of the credit worthiness of those parties and loss allowance is measured. Since, this category includes loans and receivables of varied natures and purpose, there is no trend that the the SPV Group can draw to apply consistently to entire population.

#### B) Liquidity risk

Liquidity risk is the risk that the SPV Group may encounter difficulty in meeting its present and future obligations associated with financial liabilities that are required to be settled by delivering cash or another financial asset. The SPV Group's objective is to, at all times maintain optimum levels of liquidity to meet its cash and collateral obligations. The SPV Group requires funds both for short-term operational needs as well as for long-term investment programs mainly in growth projects. The SPV Group closely monitors its liquidity position and deploys a robust cash management system. It aims to minimise these risks by generating sufficient cash flows from its current operations, which in addition to the available cash and cash equivalents, liquid investments and sufficient committed fund facilities, will provide liquidity.

#### a) Financing arrangements

The SPV Group does not have access to any undrawn borrowing facilities as at 31 March 2022, 31 March 2021 or 31 March 2020 respectively.

#### b) Maturities of financial liabilities

The tables below analyse the SPV Group's financial liabilities into relevant maturity categories based on their contractual maturities for all non-derivative financial liabilities: The amounts disclosed in the table are the contractual undiscounted cash flows.

As at 31 March 2022	Less than 1 year	1-3 year	3-5 year	More than 5 years	Total
Borrowings including interest	4,190.79	7,755.67	6,746.95	33,795.74	52,489.14
Trade payable	320.79	-	-	-	320.79
Other financial liabilities	152.58	-	-	-	152.58
Deferred payment liabilities-payable to concession authorities for toll	137.44	295.83	326.15	2,537.30	3,296.72
<b>Total</b>	<b>4,801.59</b>	<b>8,051.50</b>	<b>7,073.10</b>	<b>36,333.04</b>	<b>56,259.23</b>
As at 31 March 2021	Less than 1 year	1-3 year	3-5 year	More than 5 years	Total
Borrowings including interest	6,199.77	5,460.65	5,241.05	20,559.63	37,461.10
Trade payable	211.32	-	-	-	211.32
Other financial liabilities	59.12	-	-	-	59.12
Deferred payment liabilities-payable to concession authorities for toll collection rights	130.89	281.74	310.62	2,704.35	3,427.61
<b>Total</b>	<b>6,601.10</b>	<b>5,742.39</b>	<b>5,551.67</b>	<b>23,263.99</b>	<b>41,159.15</b>
As at 31 March 2020	Less than 1 year	1-3 year	3-5 year	More than 5 years	Total
Borrowings including interest	6,201.08	5,531.00	5,667.59	22,447.61	39,847.27
Trade payable	213.28	-	-	-	213.28
Other financial liabilities	35.22	-	-	-	35.22
Deferred payment liabilities-payable to concession authorities for toll collection rights	124.66	268.33	295.83	2,814.50	3,503.32
<b>Total</b>	<b>6,574.23</b>	<b>5,799.32</b>	<b>5,963.42</b>	<b>25,262.11</b>	<b>43,599.09</b>

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## Highways Infrastructure Trust

### Summary of significant accounting policies and other explanatory information

(All amounts in ₹ millions unless otherwise stated)

#### C) Market risk

##### a) Interest rate risk

##### i) Liabilities

The SPV Group's policy is to minimise interest rate cash flow risk exposures on long-term financing. At the reporting periods end, the SPV Group is exposed to changes in market interest rates through bank borrowings at variable interest rates. The SPV Group's investments in fixed deposits pay fixed interest rates.

##### Interest rate risk exposure

Below is the overall exposure of the SPV Group to interest rate risk:

Particulars	As at 31 March 2022	As at 31 March 2021	As at 31 March 2020
Variable rate borrowing	4,525.45	6,302.72	6,274.93
Fixed rate borrowing	18,742.99	17,691.64	17,850.72
<b>Amount disclosed under borrowings</b>	<b>23,268.44</b>	<b>23,994.36</b>	<b>24,125.65</b>

##### Sensitivity

Below is the sensitivity of profit or loss and equity changes in interest rates.

Particulars	As at 31 March 2022	As at 31 March 2021	As at 31 March 2020
<b>Interest sensitivity*</b>			
Interest rates – increase by 100 bps*	45.25	63.03	62.75
Interest rates – increase by 100 bps*	(45.25)	(63.03)	(62.75)

\* Holding all other variables constant

##### ii) Assets

The SPV Group's fixed deposits are carried at amortised cost and are fixed rate deposits. They are therefore not subject to interest rate risk as defined in Ind AS 107 'Financial Instruments Disclosures', since neither the carrying amount nor the future cash flows will fluctuate because of a change in market interest rates.

##### b) Price risk

##### i) Exposure

The SPV Group's exposure to price risk arises from investments held and classified in the Combined Balance Sheet at fair value through profit or loss. To manage the price risk arising from investments, the SPV Group diversifies its portfolio of assets.

##### ii) Sensitivity

The table below summarises the impact of increase/decrease of the index on the SPV Group's profit for the period :

##### Impact on profit before tax

Particulars	As at 31 March 2022	As at 31 March 2021	As at 31 March 2020
<b>Mutual Funds</b>			
Net assets value – increase by 100 bps	21.52	21.56	24.65
Net assets value –	(21.52)	(21.56)	(24.65)

## 39 Capital management

For the purpose of the SPV Group's capital management, capital includes issued equity share capital and all other equity reserves attributable to the equity holders of the SPV Group. The primary objective of the SPV Group's capital management is to ensure that it maintains a strong credit rating and healthy capital ratios in order to support its business and maximise shareholder value.

The SPV Group manages its capital structure and makes adjustments to it in light of changes in economic conditions and the requirements of the financial covenants. To maintain or adjust the capital structure, the SPV Group may return capital to shareholders or issue new shares. The SPV Group monitors capital using a gearing ratio, which is net debt divided by total equity. The SPV Group's policy is to keep the gearing ratio optimum.

##### Debt equity ratio

Particulars	As at 31 March 2022	As at 31 March 2021	As at 31 March 2020
Net debts*	25,149.71	25,694.61	25,667.57
Total equity (refer note 15 and 16)	388.86	733.82	1,581.21
<b>Net debt to equity ratio</b>	<b>64.68</b>	<b>35.01</b>	<b>16.23</b>

##### \*Net debts

Particulars	As at 31 March 2022	As at 31 March 2021	As at 31 March 2020
Non current borrowings (refer note 17A)	21,260.80	22,252.15	22,464.09
Current borrowings (refer note 17B)	2,007.63	1,742.21	1,661.56
Trade payables (refer note 21)	320.80	211.32	213.27
Other financial liabilities (refer note 18A and 18B)	1,926.30	1,568.74	1,503.56
Less: Cash and cash equivalents (refer note 13)	(365.82)	(79.81)	(174.91)
<b>Net debts</b>	<b>25,149.71</b>	<b>25,694.61</b>	<b>25,667.57</b>

**40 Related Party Disclosures**

Information on related party transactions pursuant to Ind AS 24 - Related Party Disclosures and SEBI (Infrastructure Investment Trusts) Regulations, 2014 have been presented below. Following are the related parties and transactions entered with related parties for the year ended 31 March 2022 and financial years ended 31 March 2021, 31 March 2020 and 31 March 2019 :

**Parties to the InvIT pursuant to SEBI (Infrastructure Investment Trusts) Regulations, 2014**

**Galaxy Investments II Pte. Ltd. (Sponsor)**

**Directors**

Mr. Cecilio Velasco (Director) (uptill 26 January 2022)  
 Mr. Tang Jin Rong (Director)  
 Madhura Narawane (Director) (w.e.f 26 January 2022)

**Promoters**

Galaxy Investments Pte. Ltd.

**Virescent Infrastructure Investment Manager Private Limited  
 (Investment Manager)**

**Directors and KMP**

Mr. Akshay Jaitly, Additional Director  
 Mr. Sanjay Grewal, Wholetime Director  
 Mr. Vinay Kumar Pabba, Director w.e.f. 26 November 2020 till 01 February 2022  
 Mr. Panja Pradeep Kumar, Director  
 Mr. Hardik Bhadrak Shah, Director  
 Ms. Charmy Chandrakant Bhoot, Company Secretary

**Virescent Renewable Energy Project Manager Private Limited (Project  
 Manager)**

**Directors**

Mr. Sanjay Grewal, Director  
 Mr. Atul Raizada, Director

**Promoters**

Virescent Infrastructure Investment Manager Private Limited

**Axis Trustee Services Limited (Trustee)**

**Directors**

Mr. Rajesh Kumar Dahiya (Director)  
 Mr. Ganesh Sankaran (Director)  
 Ms. Deepa Rath CEO (KMP), Managing Director

**Promoters**

Axis Bank Limited

**Enterprises having significant influence over the SPV Group during the  
 periods presented in the Combined Financial Statements \***

India Infrastructure Fund II  
 India Infrastructure Fund  
 Highway Concessions One Private Limited  
 Galaxy Investment II Pte Ltd (w.e.f 17 December 2021)

**Key managerial personnel of the SPV Group:**

**Ulundurpet Expressways Private Limited ('UEPL')**

Mr. Narayanan Gopalakrishnan (Director) - till 17 December 2021  
 Mr. Ankur Rajender Srivastava (Director) - till 17 December 2021  
 Mr. Neeraj Sanghi (Director)  
 Mr. Rishi Mishra (Company Secretary) - till 10 February 2022  
 Ms. Nekata Jain (Company Secretary) - w.e.f. 10 February 2022  
 Mr. P.V. Durga Rao (Chief Financial Officer) - till 10 March 2021  
 Mr. Narayanan Doraiswamy (Director) - 17 December 2021

**Nirmal Bot Limited ('NBL')**

Mr. Milind Ghanshyam Agrawal (Director) till 31 July 2020  
 Mr. Narayanan Subramaniam (Director) -till 30 October 2020  
 Mr. Pramod Laxman Bongirwar (Independent Director) - till 17 December 2021  
 Mr. Praveen Kumar - CFO w.e.f 12 March 2020  
 Ms. Kunjal Shah (Company Secretary) - till 10 February 2022  
 Mr. Rishi Mishra (Company Secretary) - w.e.f. 10 February, 2022  
 Mr. Venkata Ramana Jannela (Manager) -till 31 October 2020  
 Mr. Narayanan Doraiswamy (Chief Financial Officer) - till 10 December 2019  
 Ms. Simran Sarabjit Singh (Director) - till 17 December 2021  
 Mr. Pranay Chander Ditavaar (Manager) w.e.f. 11 November 2020  
 Mr. Puneet Madan Kayastha (Independent Director) w.e.f 21 August 2018  
 Mr. Narayanan Doraiswamy (Director) - w.e.f. 11 November 2020  
 Mr. Neeraj Sanghi (Director) - w.e.f. 17 December 2021  
 Mr. Nihar Ranjan Dash (Independent Director) - w.e.f. 17 December 2021

Highways Infrastructure Trust

Summary of significant accounting policies and other explanatory information

(All amounts in ₹ millions unless otherwise stated)

**Jodhpur Pali Expressway Private Limited ('JEPL')**

Mr. Narayanan Gopalakrishnan (Director) - till 17 December 2021  
Mr. Neeraj Sanghi (Director) w.e.f. 31 March 2017  
Mr. Milind Ghanshyam Agrawal (Director) - till 31 July 2020  
Mr. Puneet Madan Kayastha (Independent Director) - till 17 December 2021  
Mr. Nihar Ranjan Dash (Independent Director) - till 17 December 2021  
Dr. Zafar Khan (Director) - w.e.f. 17 December 2021

**Shillong Expressway Private Limited ('SEPL')**

Mr. Neeraj Sanghi (Director) - till 17 December 2021  
Mr. Milind Ghanshyam Agrawal (Director) - w.e.f. 21 February 2018 till 31 July 2020  
Mr. Abhijit Chattopadhyay (Independent Director) - till 17 December 2021  
Mr. Nihar Ranjan Dash (Independent Director) - till 17 December 2021  
Mr. Narayanan Gopalakrishnan - till 13 January 2022  
Mr. Ankur Srivastava (Director) - w.e.f. 17 December 2021 till 13 January 2022  
Mr. Narayanan Doraiswamy (Director) - w.e.f. 13 January 2022  
Mr. Neeraj Sanghi (Director) - w.e.f. 13 January 2022

**Dewas Bhopal Corridor Private Limited ('DBCPL')**

Mr. Narayanan Gopalakrishnan (Director) - till 17 December 2021  
Mr. Neeraj Sanghi (Director)  
Mr. Ankur Rajender Srivastava (Director) - till 17 December 2021  
Dr. Zafar Khan (Director) - w.e.f. 17 December 2021

**Godhra Expressways Private Limited ('GEPL')**

Mr. Milind Ghanshyam Agrawal (Director) - till 31 July 2020  
Mr. Puneet Madan Kayastha (Independent Director) - till 17 December 2021  
Mr. Pramod Laxman Bongirwar (Independent Director) - till 17 December 2021  
Mr. Satish Viraji Bhanushali (Company Secretary) - till 13 May 2021  
Mr. Narayanan Gopalakrishnan (Director) till 17 December 2021  
Mr. Manish Jain (Company Secretary) -w.e.f. 3 June 2021  
Dr. Zafar Khan (Director) - w.e.f. 17 December 2021  
Mr. Neeraj Sanghi (Director)

\* With whom the SPV Group had transactions during the reported years

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**Highways Infrastructure Trust**  
**Summary of significant accounting policies and other explanatory information**  
**(All amounts in ₹ millions unless otherwise stated)**

**Transactions and outstanding balances with related parties in the ordinary course of business**

Particulars	Transactions with enterprises having significant influence over the SPV Group			Transactions with key managerial personnel of SPV Group / relatives of key managerial personnels of SPV Group		
	31 March 2022	31 March 2021	31 March 2020	31 March 2022	31 March 2021	31 March 2020
<b>Transactions during the year</b>						
<b>Interest on Non Convertible Debentures</b>						
India Infrastructure Fund -II	-	3.27	6.33	-	-	-
<b>Repayment of loan</b>						
India Infrastructure Fund	10.91	-	-	-	-	-
<b>Interest paid on Preference Share</b>						
India Infrastructure Fund -II	52.55	51.32	49.76	-	-	-
<b>Gain on modification liability of preference shares</b>						
India Infrastructure Fund -II	52.55	64.09	13.34	-	-	-
<b>Repayment of loan</b>						
Highway Concessions One Private Limited	315.00	-	-	-	-	-
<b>Proceeds from issue of Compulsory convertible debentures ('CCD's')</b>						
Galaxy Investments II Pte. Ltd.	7,978.14	-	-	-	-	-
<b>Redemption of OCD with IRR</b>						
India Infrastructure Fund -II	7,621.91	258.30	-	-	-	-
<b>IRR accrued on OCD</b>						
India Infrastructure Fund -II	611.97	846.87	755.72	-	-	-
India Infrastructure Fund	93.31	18.27	18.27	-	-	-
<b>IRR paid on OCD</b>						
India Infrastructure Fund -II	39.38	27.97	14.37	-	-	-
<b>Redemption of unsecured NCDs</b>						
India Infrastructure Fund - II	-	50.00	-	-	-	-
<b>Management support service fees</b>						
Highway Concessions One Private Limited	187.87	111.39	144.90	-	-	-
<b>Interest on compulsory convertible debentures ('CCD's')</b>						
Galaxy Investments II Pte. Ltd.	312.13	-	-	-	-	-
<b>Interest on Loan</b>						
Highway Concessions One Private Limited	27.03	37.80	37.80	-	-	-
India Infrastructure Fund	3.74	3.11	2.08	-	-	-
<b>Gratuity and Leave Benefit obligation of transferred employee</b>						
Highway Concessions One Private Ltd.	0.82	-	-	-	-	-

## Transactions and outstanding balances with related parties in the ordinary course of business

Particulars	Transactions with enterprises having significant influence over the SPV Group			Transactions with key managerial personnel of SPV Group / relatives of key managerial personnels of SPV Group		
	31 March 2022	31 March 2021	31 March 2020	31 March 2022	31 March 2021	31 March 2020
<b>Transactions with key management personnel</b>						
<b>Director Sitting fees</b>						
Mr. Puneet Madan Kavastha	-	-	-	0.47	0.39	0.30
Mr. Pramod Laxman Bongirwar	-	-	-	0.26	0.29	0.24
Mr. Nihar Ranjan Dash	-	-	-	0.21	0.25	0.11
Mr Abhijeet Chattopadhyay				0.05	0.11	0.07
<b>Remuneration</b>						
Mr. Venkata Ramana Jannela	-	-	-	-	1.54	2.01
Mr. P.V. Durga Rao	-	-	-	-	2.69	2.91
Mr. Rishi Mishra	-	-	-	-	0.86	1.09
Mr. Satish Viraji Bhanushali	-	-	-	-	0.81	0.82
Mr. Pranay Chander	-	-	-	2.11	0.70	-

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Highways Infrastructure Trust  
Summary of significant accounting policies and other explanatory information  
(All amounts in ₹ millions unless otherwise stated)

Transactions and outstanding balances with related parties in the ordinary course of business

Particulars	Transactions with enterprises having significant influence over the SPV Group			Transactions with key managerial personnel of SPV Group / relatives of key managerial personnels of SPV Group		
	31 March 2022	31 March 2021	31 March 2020	31 March 2022	31 March 2021	31 March 2020
<b>Balances outstanding at the end of the year</b>						
<b>Equity Share Capital</b>						
India Infrastructure Fund-II	-	240.42	240.42	-	-	-
Highway Concessions One Private Limited (Formerly known as Piramal Road Infra Private Limited) (HCOPL)	-	315.00	315.00	-	-	-
India Infrastructure Fund	-	2,645.52	2,645.52	-	-	-
Galaxy Investments II Pte. Ltd.	3,200.95	-	-	-	-	-
<b>Liability portion of compound instruments-Preference Shares</b>	519.08	519.08	531.84	-	-	-
India Infrastructure Fund -II						
<b>Optionally convertible debentures</b>						
India Infrastructure Fund-I	-	173.44	153.51	-	-	-
India Infrastructure Fund-II	-	6,690.68	6,146.74	-	-	-
<b>Compulsory Convertible Debenture</b>						
Galaxy Investments II Pte. Ltd.	7,978.14	-	-	-	-	-
<b>Interest payable</b>						
India Infrastructure Fund - II	-	25.29	12.65	-	-	-
<b>Non convertible debentures</b>						
India Infrastructure Fund - II	-	-	50.00	-	-	-
<b>Interest accrued on CCD</b>						
Galaxy Investments II Pte. Ltd.	312.13	-	-	-	-	-

Highways Infrastructure Trust

Summary of significant accounting policies and other explanatory information

(All amounts in ₹ millions unless otherwise stated)

Transactions and outstanding balances with related parties in the ordinary course of business

Particulars	Transactions with enterprises having significant influence over the SPV Group			Transactions with key managerial personnel of SPV Group / relatives of key managerial personnels of SPV Group		
	31 March 2022	31 March 2021	31 March 2020	31 March 2022	31 March 2021	31 March 2020
<b>Interest accrued but not due</b>						
India Infrastructure Fund - II	-	-	9.45	-	-	-
India Infrastructure Fund	-	6.60	3.73	-	-	-
<b>Trade and other payables</b>						
Highway Concessions One Private Limited	-	-	8.41	-	-	-
<b>Borrowings outstanding</b>						
Highway Concessions One Private Limited	-	315.00	315.00	-	-	-
India Infrastructure Fund	-	10.91	9.92	-	-	-
<b>Transfer out obligation as per actuarial Gratuity and Leave Benefit</b>						
Highway Concessions One Private Limited	0.82	-	-	-	-	-

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**Highways Infrastructure Trust**

**Summary of significant accounting policies and other explanatory information**

(All amounts in ₹ millions unless otherwise stated)

**41 Information on segment reporting pursuant to Ind AS 108 - Operating Segments**

The SPV Group's primary business segment is reflected based on principal business activities carried on by the SPV Group i.e. building, operating and management of road projects and all other related activities which as per Ind AS 108 on 'Operating Segments' is considered to be the only reportable business segment. The SPV Group derives its major revenues from operation and maintenance of highways. The SPV Group is operating in India which is considered as a single geographical segment.

**42 Earnings Per Unit**

The number of units that Highways Infrastructure Trust will issue to investors in the proposed private placement and to Galaxy Investments II Pte. Ltd. ('Sponsor') in exchange of the shareholding in the SPV Group and against the loan from Sponsors is not presently ascertainable. Hence the disclosures in respect of Earnings per Unit have not been given.

**43 Disclosures as required by SEBI Circular no. CIR/IMD/DF/114/2016 dated 20 October 2016**

**A Project wise operating cash flows**

**Project wise operating cash flows for the financial year ended 31 March 2020:**

Particulars	Ulundurpet Expressways Private Limited	Shillong Expressway Private Limited	Jodhpur Pali Expressway Private Limited	Godhra Expressways Private Limited	Dewas Bhopal Corridor Private Limited	Nirmal Bot Limited
<b>Loss/ Profit before tax</b>	<b>(144.77)</b>	<b>108.74</b>	<b>(310.61)</b>	<b>(465.58)</b>	<b>278.22</b>	<b>107.08</b>
<b>Adjustments for:</b>						
Depreciation and amortisation expense	690.16	0.12	62.63	133.34	151.37	1.05
Gain on sale of investments (net)	(19.14)	(7.34)	(13.90)	(24.44)	(22.73)	(33.41)
(Gain) / loss on investments carried at fair value through profit or loss (net)	(12.93)	(2.83)	3.41	(1.97)	(6.58)	19.63
Modification gain on annuity	-	(35.85)	-	-	-	(55.25)
Excess provisions written back	(0.93)	-	-	-	-	(0.06)
Interest income	(1.81)	(26.39)	(6.46)	(0.55)	(10.06)	(18.46)
Re-measurement losses / ( gains) on defined benefit obligations	(0.18)	(0.05)	(0.50)	(0.39)	(0.16)	0.04
Unwinding finance cost on deferred payment to NHAI for purchase of right to charge users of toll road	-	-	16.32	127.12	-	-
Unwinding of discount on provisions and financial liabilities carried at amortised cost	38.65	-	-	-	-	-
Unwinding of discount on major maintenance provision	19.61	-	14.14	17.61	17.39	-
Finance cost	421.97	148.38	506.51	967.56	289.24	190.28
Major maintenance provision	99.27	10.00	68.75	43.50	329.04	283.56
Gain on modification of financial liability	-	(13.34)	-	-	-	-
<b>Operating profit before working capital changes and other adjustments</b>	<b>1,089.90</b>	<b>181.44</b>	<b>340.29</b>	<b>796.20</b>	<b>1,025.73</b>	<b>494.46</b>
<b>Working capital changes and other adjustments:</b>						
Trade receivables	(21.31)	-	(2.42)	-	-	(1.69)
Other current and non-current financial assets	9.95	261.27	(0.09)	0.04	0.10	(267.27)
Other current and non-current assets	(35.09)	(0.27)	(19.44)	(19.96)	(12.01)	(32.53)
Trade payables	29.23	17.50	11.93	6.24	18.71	66.91
Provisions	(345.31)	(60.79)	1.83	1.30	(216.40)	(283.59)
Other current and non-current financial liabilities	(4.22)	(97.49)	(18.19)	(118.56)	(45.11)	(3.11)
Other current and non-current liabilities	3.32	(8.68)	(3.54)	2.56	2.17	3.88
<b>Cash flow from / (used in) operating activities post working capital changes</b>	<b>726.48</b>	<b>292.98</b>	<b>310.36</b>	<b>667.82</b>	<b>773.19</b>	<b>(22.94)</b>
Income tax paid (net)	(0.04)	(25.22)	(2.30)	2.21	(39.59)	(23.63)
<b>Net cash generated from / (used in) operating activities</b>	<b>726.44</b>	<b>267.76</b>	<b>308.06</b>	<b>670.03</b>	<b>733.60</b>	<b>(46.57)</b>

Highways Infrastructure Trust

Summary of significant accounting policies and other explanatory information

(All amounts in ₹ millions unless otherwise stated)

Project wise operating cash flows for the financial year ended 31 March 2021:

Particulars	Ulundurpet Expressways Private Limited	Shillong Expressway Private Limited	Jodhpur Pali Expressway Private Limited	Godhra Expressways Private Limited	Dewas Bhopal Corridor Private Limited	Nirmal Bot Limited
<b>Loss/Profit before tax</b>	<b>(173.64)</b>	<b>100.89</b>	<b>(378.23)</b>	<b>(364.62)</b>	<b>436.60</b>	<b>156.27</b>
Adjustments for:						
Depreciation and amortisation expense	574.07	0.10	75.91	149.45	119.11	1.17
Gain on sale of investments (net)	(18.30)	(10.22)	(7.05)	(11.08)	(26.20)	(8.66)
(Gain) / loss on investments carried at fair value through profit or loss (net)	(1.47)	1.80	0.79	(5.14)	7.25	2.36
Modification gain on annuity	-	(19.40)	-	-	-	(124.26)
Excess provisions written back	(1.79)	-	-	-	(0.47)	-
Interest income	(2.42)	(24.42)	(7.42)	(1.10)	(9.93)	(16.99)
Re-measurement losses / ( gains) on defined benefit obligations	0.01	(0.02)	0.40	(0.31)	0.40	0.10
Unwinding finance cost on deferred payment to NHAI for purchase of right to charge users of toll road	-	-	16.39	129.58	-	-
Unwinding of discount on provisions and financial liabilities carried at amortised cost	41.74	-	-	-	-	-
Unwinding of discount on major maintenance provision	6.95	-	22.78	-	30.24	-
Finance cost	380.08	130.47	539.67	1,004.26	262.11	176.24
Major maintenance provision	95.02	23.00	80.95	9.69	242.78	-
Gain on modification of financial liability	-	(64.09)	-	-	-	-
<b>Operating profit before working capital changes and other adjustments</b>	<b>900.26</b>	<b>138.10</b>	<b>344.20</b>	<b>910.73</b>	<b>1,061.89</b>	<b>186.23</b>
<b>Working capital changes and other adjustments:</b>						
Trade receivables	16.69	4.76	(3.76)	1.90	-	(1.03)
Other current and non-current financial assets	(8.02)	185.34	0.34	(4.46)	0.01	(352.72)
Other current and non-current assets	(6.19)	(3.00)	12.34	12.66	(11.26)	(4.00)
Trade payables	11.99	9.77	4.37	15.42	41.78	(13.15)
Provisions	(17.44)	(75.06)	0.08	(33.62)	(177.31)	15.03
Other current and non-current financial liabilities	15.71	(22.20)	(15.33)	(111.10)	(34.23)	(8.90)
Other current and non-current liabilities	(2.05)	0.98	(3.49)	(6.22)	(1.58)	(2.78)
<b>Cash flow from / (used in) operating activities post working capital changes</b>	<b>910.95</b>	<b>238.69</b>	<b>338.75</b>	<b>785.31</b>	<b>879.30</b>	<b>(181.32)</b>
Income tax paid (net)	0.06	(8.24)	1.16	0.27	(101.72)	(17.88)
<b>Net cash generated from / (used in) operating activities</b>	<b>911.01</b>	<b>230.45</b>	<b>339.91</b>	<b>785.58</b>	<b>777.58</b>	<b>(199.20)</b>

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Highways Infrastructure Trust  
 Summary of significant accounting policies and other explanatory information  
 (All amounts in ₹ millions unless otherwise stated)

Project wise operating cash flows for the year ended 31 March 2022:

Particulars	Ulundurpet Expressways Private Limited	Shillong Expressway Private Limited	Jodhpur Pali Expressway Private Limited	Godhra Expressways Private Limited	Dewas Bhopal Corridor Private Limited	Nirmal Bot Limited
<b>Profit/ (loss) before tax</b>	47.86	130.55	(304.83)	(333.25)	795.62	23.61
<b>Adjustments for:</b>						
Depreciation and amortisation expense	630.79	0.15	79.83	164.99	139.95	1.72
Gain on sale of property, plant and equipment (net)	(0.04)	-	-	-	-	-
Gain on sale of investments (net)	(15.81)	(8.52)	(3.17)	(18.61)	(20.47)	(4.01)
Loss / (gain) on investments carried at fair value through profit or loss (net)	-	-	0.75	(4.10)	(3.01)	(0.15)
Modification gain on annuity	-	(46.95)	-	-	-	(4.76)
Excess provisions written back	(0.84)	-	-	-	(0.56)	-
Interest income	(21.77)	(28.17)	(13.04)	(7.32)	(13.68)	(19.10)
Re-measurement losses / ( gains) on defined benefit obligations	(0.13)	(0.03)	0.04	0.29	(0.04)	0.10
Unwinding finance cost on deferred payment to NHAI for purchase of right to charge users of toll road	-	-	16.71	131.59	-	-
Unwinding of discount on provisions and financial liabilities carried at amortised cost	45.97	-	-	-	3.18	-
Unwinding of discount on major maintenance provision	13.13	-	24.24	1.64	39.42	-
Finance cost	332.26	111.79	564.59	1,078.82	246.85	165.36
Major maintenance provision	111.12	-	58.02	22.99	118.09	-
Gain on modification of financial liability	-	(52.55)	-	-	-	-
<b>Operating profit before working capital changes and other adjustments</b>	<b>1,142.53</b>	<b>106.28</b>	<b>423.15</b>	<b>1,037.04</b>	<b>1,305.34</b>	<b>162.77</b>
<b>Working capital changes and other adjustments:</b>						
Trade receivables	23.73	3.09	0.40	-	-	4.40
Other current and non-current financial assets	(1.27)	203.77	(96.27)	(1.63)	(0.04)	251.39
Other current and non-current assets	37.38	(1.08)	1.75	(1.28)	12.49	0.78
Trade payables	(16.50)	(11.69)	49.13	74.82	60.22	(46.50)
Provisions	0.81	0.26	(184.78)	(247.94)	(503.32)	0.05
Other current and non-current financial liabilities	27.55	1.67	22.49	37.73	17.97	8.94
Other current and non-current liabilities	3.42	(1.86)	2.80	4.98	7.27	(1.23)
<b>Cash flow from operating activities post working capital changes</b>	<b>1,217.66</b>	<b>300.43</b>	<b>218.68</b>	<b>903.72</b>	<b>899.93</b>	<b>380.60</b>
Income tax paid (net)	(6.71)	(22.04)	(1.39)	(21.79)	(149.29)	(15.36)
<b>Net cash generated from operating activities</b>	<b>1,210.95</b>	<b>278.39</b>	<b>217.29</b>	<b>881.93</b>	<b>750.64</b>	<b>365.24</b>

B Capitalisation statement

Particulars	Pre-issue as at 31 March 2022	As adjusted for issue*
Non-current borrowings (refer note 17A)	21,260.80	
Current borrowings (refer note 17B)	2,007.63	
<b>Total debt (A)</b>	<b>23,268.43</b>	
Equity share capital (refer note 15)	3,200.95	
Other equity (refer note 16)	(2,812.09)	
<b>Total equity (B)</b>	<b>388.86</b>	
<b>Debt equity ratio [A/(A+B)]</b>	<b>0.98</b>	

\* corresponding details post private placement are not available, hence the required disclosures in respect of the same have not been provided in the above table

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Highways Infrastructure Trust  
 Summary of significant accounting policies and other explanatory information  
 (All amounts in ₹ millions unless otherwise stated)

C Debt payment history as at 31 March 2020

1 Ulundurpet Expressways Private Limited

Particulars	As at 31 March 2020			
	Term loans	Debentures (external)	Liability portion of compound instruments	Loans from related parties / OCD/Other
Carrying amount of debt at the beginning of the year	1,811.90	2,455.22	-	499.83
Repayments during the year	(1.84)	(423.52)	-	-
Other adjustments/settlements during the year				
- Unwinding of interest	1.92	0.38	-	52.55
Carrying amount of debt at the end of the year	1,811.98	2,032.08	-	552.38

2 Shillong Expressway Private Limited

Particulars	As at 31 March 2020			
	Term loans	Debentures (external)	Liability portion of compound instruments	Loans from related parties / OCD/Other
Carrying amount of debt at the beginning of the year	1,433.99	-	410.52	-
Repayments during the year	(211.65)	-	-	-
Other adjustments/settlements during the year				
- Unwinding of interest	0.98	-	36.42	-
Carrying amount of debt at the end of the year	1,138.44	-	531.84	-

3 Jodhpur Pali Expressway Private Limited

Particulars	As at 31 March 2020			
	Term loans	Debentures (external)	Liability portion of compound instruments	Loans from related parties / OCD/Other
Carrying amount of debt at the beginning of the year	1,405.61	1,409.14	-	1,630.68
Repayments during the year	(34.80)	(34.08)	-	-
Other adjustments/settlements during the year				
- Unwinding of interest	1.38	1.38	-	215.65
Carrying amount of debt at the end of the year	1,372.19	1,376.45	-	1,846.33

4 Godhra Expressways Private Limited

Particulars	As at 31 March 2020			
	Term loans	Debentures (external)	Liability portion of compound instruments	Loans from related parties / OCD/Other
Carrying amount of debt at the beginning of the year	854.98	3,461.20	-	3,773.00
Additional borrowings during the year	158.69	700.00	-	-
Repayments during the year	(860.68)	(36.19)	-	-
Other adjustments/settlements during the year				
- Unwinding of interest	5.42	3.39	-	527.42
Carrying amount of debt at the end of the year	158.40	4,128.41	-	4,300.42

5 Dewas Bhopal Corridor Private Limited

Particulars	As at 31 March 2020			
	Term loans	Debentures (external)	Liability portion of compound instruments	Loans from related parties / OCD/Other
Carrying amount of debt at the beginning of the year	1,345.83	1,657.30	-	50.00
Repayments during the year	(41.46)	(17.00)	-	-
Other adjustments/settlements during the year				
- Unwinding of interest	0.82	2.44	-	-
Carrying amount of debt at the end of the year	1,305.19	1,642.74	-	50.00

6 Nirmal Bot Limited

Particulars	As at 31 March 2020			
	Term loans	Debentures (external)	Liability portion of compound instruments	Loans from related parties / OCD/Other
Carrying amount of debt at the beginning of the year	-	1,702.60	-	315.00
Repayments during the year	-	(138.80)	-	-
Carrying amount of debt at the end of the year	381	1,563.80	-	315.00

Highways Infrastructure Trust  
Summary of significant accounting policies and other explanatory information  
(All amounts in ₹ millions unless otherwise stated)

D Debt payment history as at 31 March 2021

1 Ulundurpet Expressways Private Limited

Particulars	As at 31 March 2021			
	Term loans	Debentures (external)	Liability portion of compound instruments	Loans from related parties / OCD/Other
Carrying amount of debt at the beginning of the year	1,811.98	2,032.08	-	552.38
Repayments during the year	(1.38)	(238.23)	-	-
Other adjustments/settlements during the year				
- Unwinding of interest	1.66	0.20	-	59.81
Carrying amount of debt at the end of the year	1,812.27	1,794.05	-	612.18

2 Shillong Expressway Private Limited

Particulars	As at 31 March 2021			
	Term loans	Debentures (external)	Liability portion of compound instruments	Loans from related parties / OCD/Other
Carrying amount of debt at the beginning of the year	1,138.44	-	531.84	-
Repayments during the year	(210.50)	-	-	-
Other adjustments/settlements during the year				
- Unwinding of interest	0.81	-	(12.77)	-
Carrying amount of debt at the end of the year	928.75	-	519.07	-

3 Jodhpur Pali Expressway Private Limited

Particulars	As at 31 March 2021			
	Term loans	Debentures (external)	Liability portion of compound instruments	Loans from related parties / OCD/Other
Carrying amount of debt at the beginning of the year	1,372.19	1,376.45	-	1,846.33
Additional borrowings during the year	111.68	-	-	-
Repayments during the year	(28.51)	(25.38)	-	-
Other adjustments/settlements during the year				
- Unwinding of interest	1.27	1.28	-	245.84
Carrying amount of debt at the end of the year	1,456.64	1,352.36	-	2,092.17

4 Godhra Expressways Private Limited

Particulars	As at 31 March 2021			
	Term loans	Debentures (external)	Liability portion of compound instruments	Loans from related parties / OCD/Other
Carrying amount of debt at the beginning of the year	158.40	4,128.42	-	4,300.42
Repayments during the year	(1.69)	(87.16)	-	(258.30)
Other adjustments/settlements during the year				
- Unwinding of interest	0.02	2.55	-	556.40
Carrying amount of debt at the end of the year	156.73	4,043.80	-	4,598.52

5 Dewas Bhopal Corridor Private Limited

Particulars	As at 31 March 2021			
	Term loans	Debentures (external)	Liability portion of compound instruments	Loans from related parties / OCD/Other
Carrying amount of debt at the beginning of the year	1,305.19	1,642.74	-	50.00
Repayments during the year	(41.46)	(17.00)	-	(50.00)
Other adjustments/settlements during the year				
- Unwinding of interest	0.81	2.42	-	-
Carrying amount of debt at the end of the year	1,264.54	1,628.16	-	-

6 Nirmal Bot Limited

Particulars	As at 31 March 2021			
	Term loans	Debentures (external)	Liability portion of compound instruments	Loans from related parties / OCD/Other
Carrying amount of debt at the beginning of the year	-	1,563.80	-	315.00
Repayments during the year	-	(143.70)	-	-
Other adjustments/settlements during the year	-	-	-	-

- Unwinding of interest	-	-	-	-
<b>Carrying amount of debt at the end of the year</b>	-	<b>1,420.10</b>	-	<b>315.00</b>

Highways Infrastructure Trust  
 Summary of significant accounting policies and other explanatory information  
 (All amounts in ₹ millions unless otherwise stated)

E Debt payment history as at 31 March 2022

1 Ulundurpet Expressways Private Limited

Particulars	As at 31 March 2022			
	Term loans	Debentures (external)	Liability portion of compound instruments	Loans from related parties / OCD/Other
Carrying amount of debt at the beginning of the year	1,812.27	1,794.05	-	612.18
Additional borrowings during the year	-	-	-	219.05
Repayments during the year	(18.83)	(754.40)	-	(201.54)
Other adjustments/settlements during the year				
- Unwinding of interest	2.14	0.26	-	58.46
<b>Carrying amount of debt at the end of the year</b>	<b>1,795.58</b>	<b>1,039.91</b>	<b>-</b>	<b>688.15</b>

2 Shillong Expressway Private Limited

Particulars	As at 31 March 2022			
	Term loans	Debentures (external)	Liability portion of compound instruments	Loans from related parties / OCD/Other
Carrying amount of debt at the beginning of the year	928.75	-	519.07	-
Repayments during the year	(227.68)	-	-	-
Other adjustments/settlements during the year				
- Unwinding of interest	0.62	-	-	-
<b>Carrying amount of debt at the end of the year</b>	<b>701.69</b>	<b>-</b>	<b>519.07</b>	<b>-</b>

3 Jodhpur Pali Expressway Private Limited

Particulars	As at 31 March 2022			
	Term loans	Debentures (external)	Liability portion of compound instruments	Loans from related parties / OCD/Other
Carrying amount of debt at the beginning of the year	1,456.64	1,352.36	-	2,092.17
Additional borrowings during the year	-	-	-	2,333.83
Repayments during the year	(65.69)	(146.44)	-	(2,333.83)
Other adjustments/settlements during the year				
- Unwinding of interest	1.57	0.96	-	241.66
<b>Carrying amount of debt at the end of the year</b>	<b>1,392.52</b>	<b>1,206.88</b>	<b>-</b>	<b>2,333.83</b>

4 Godhra Expressways Private Limited

Particulars	As at 31 March 2022			
	Term loans	Debentures (external)	Liability portion of compound instruments	Loans from related parties / OCD/Other
Carrying amount of debt at the beginning of the year	156.73	4,043.80	-	4,598.52
Additional borrowings during the year	-	-	-	5,094.14
Repayments during the year	(0.09)	(123.93)	-	(5,094.14)
Other adjustments/settlements during the year				
- Unwinding of interest	0.01	2.50	-	495.62
<b>Carrying amount of debt at the end of the year</b>	<b>156.65</b>	<b>3,922.37</b>	<b>-</b>	<b>5,094.14</b>

5 Dewas Bhopal Corridor Private Limited

Particulars	As at 31 March 2022			
	Term loans	Debentures (external)	Liability portion of compound instruments	Loans from related parties / OCD/Other
Carrying amount of debt at the beginning of the year	1,264.54	1,628.16	-	-
Repayments during the year	(41.46)	(17.00)	-	-
Other adjustments/settlements during the year				
- Unwinding of interest	0.79	2.39	-	-
<b>Carrying amount of debt at the end of the year</b>	<b>1,223.87</b>	<b>1,613.55</b>	<b>-</b>	<b>-</b>

6 Nirmal Bot Limited

Particulars	As at 31 March 2022			
	Term loans	Debentures (external)	Liability portion of compound instruments	Loans from related parties / OCD/Other
Carrying amount of debt at the beginning of the year	-	1,420.10	-	315.00
Additional borrowings during the year	-	-	-	331.12
Repayments during the year	-	(171.00)	-	(315.00)
<b>Carrying amount of debt at the end of the year</b>	<b>-</b>	<b>1,249.10</b>	<b>-</b>	<b>331.12</b>

#### 44 Revenue from contracts with customers

##### 1 Disaggregation of revenue

Revenue recognised mainly comprises of revenue from toll collections, claims with NHAI, contract revenue. Set out below is the disaggregation of the Group's revenue from contracts with customers:

Description	For the financial year ended 31 March 2022	For the financial year ended 31 March 2021	For the financial year ended 31 March 2020
<b>Revenue from operations</b>			
(a) Engineering, procurement and construction contracts and change of scope	407.82	342.81	656.67
(b) Toll income from Expressway	4,549.06	3,919.12	3,922.85
(c) Interest income on annuity receivable from NHAI	307.88	444.39	429.28
(d) Claim from NHAI	601.80	378.72	-
<b>Total revenue</b>	<b>5,866.56</b>	<b>5,085.04</b>	<b>5,008.80</b>

The table below presents disaggregated revenues from contracts with customers based on nature, amount and timing for the year ended 31 March 2022, 31 March 2021 and 31 March 2020:

S.No.	Types of Products by Nature	Types of Services by timing	For the financial year ended 31 March 2022	For the financial year ended 31 March 2021	For the financial year ended 31 March 2020
1	Service	At the point of time	5,558.68	4,640.65	4,579.52
2	Service	Over the period of time	307.88	444.39	429.28
	<b>Total Revenue</b>		<b>5,866.56</b>	<b>5,085.04</b>	<b>5,008.80</b>

##### 2 Assets and liabilities related to contracts with customers

The following table provides information about receivables, contract assets and contract liabilities from contract with customers:

Description	As at 31 March 2022	As at 31 March 2021	As at 31 March 2020
<b>Contract assets</b>			
Trade receivables	37.30	68.92	87.48
Receivables under service concession arrangements	1,944.23	2,411.73	2,780.46
<b>Total</b>	<b>1,981.53</b>	<b>2,480.65</b>	<b>2,867.94</b>
<b>Contract liability</b>			
Mobilisation advance from concession authority	-	-	2.98
<b>Total</b>	<b>-</b>	<b>-</b>	<b>2.98</b>

A receivable is a right to consideration that is unconditional upon passage of time. Revenue from the contracts are recognized upon satisfaction of Performance obligation. Trade Receivables are non-interest bearing and are generally due within 180 days except retention money held by the customer as per the terms and conditions of the contract. Basis the credit risk assessment done by the SPV Group, there is no provision for expected credit losses required to be recognized on Trade Receivables. Contract liability is the SPV Group's obligation to transfer goods or services to a customer for which the Group has received consideration from the customer in advance.

3 There is no adjustment made to the contract price of the contract and hence the revenue recognised in the statement of profit and loss is in agreement with the contracted price under the Contract.

4 For movement in service concession arrangement, refer note 7A and 7B for financial asset model. There are no significant changes in other contract assets of the group.

##### 5 Performance obligation

###### Income from toll collection

The performance obligation in service of toll collection is recorded as per rates notified by NHAI and approved by management and payment is generally due at the time of providing service.

###### Contract revenue

The performance obligation under service concession agreements (SCA) is due on completion of work as per terms of SCA.

##### 6 Significant changes in the contract liabilities balances during the year

Particulars	As at 31 March 2022	As at 31 March 2021	As at 31 March 2020
<b>Opening balance</b>	-	2.98	6.02
Addition during the year	-	-	2.98
Revenue recognised during the year	-	(2.98)	(6.02)
<b>Closing balance</b>	<b>-</b>	<b>-</b>	<b>2.98</b>

##### 7 Disclosure under Appendix - C & D to Ind AS 115 - " Service Concession Arrangements"

Name of Concessionaire	Start of Concession period under concession agreement (Appointed Date)	End of Concession period under concession agreement	Period of Concession Since the appointed date (In Years)	Construction Completion date under the concession agreement
Jodhpur Pali Expressway Private limited	16 September 2013	15 September 2038	25.00	31 October 2014
Ulunderpret Expressways Private Limited	16 October 2006	21 January 2027	20.26	23 July 2009
Godhra Expressways Private Limited	01 March 2011	28 February 2038	27.00	31 October 2013
Dewas Bhopal Corridor Private Limited	20 March 2008	02 December 2033	25.71	10 February 2009
Nirmal Bot Limited	30 October 2007	29 October 2027	20.00	22 July 2009
Shillong Expressways Private Limited	07 February 2011	06 February 2026	15.00	28 February 2013

i) The above BOT/DBFOT projects shall have following rights / obligations in accordance with the Concession Agreement entered into with the respective Government Authorities

- Right to use the Specified Assets
- Obligations to provide or rights to except provision of services
- Obligations to deliver or rights to receive at the end of concession

ii) The actual concession period may vary based on terms of the respective concession agreements.

**Highways Infrastructure Trust**  
**Summary of significant accounting policies and other explanatory information**  
**(All amounts in ₹ millions unless otherwise stated)**

45 The Special Purpose Combined Financial Statements are prepared after considering the adjustments as required pursuant to section 3.4 of SEBI Circular no. CIR/IMD/DF/114/2016 dated 20 October 2016. Below disclosure compiles with the adjustments made to the audited financial statements of the project SPVs for the financial year ended 31 March 2022, 31 March 2021 and 31 March 2020 respectively, while preparing these Special Purpose Combined Financial Statements:

Particulars	As at 31 March 2022			As at 31 March 2021			As at 31 March 2020			Note reference
	Audited financial statements	Adjustments	Special Purpose Combined Financial Statements	Audited financial statements	Adjustments	Special Purpose Combined Financial Statements	Audited financial statements	Adjustments	Special Purpose Combined Financial Statements	
<b>ASSETS</b>										
<b>Non-current assets</b>										
Property, plant and equipment	130.04	-	130.04	66.93	-	66.93	62.05	-	62.05	
Capital work-in-progress	2.39	-	2.39	9.40	-	9.40	-	-	-	
Intangible assets	20,246.54	0.03	20,246.56	21,249.03	-	21,249.03	22,159.81	-	22,159.81	Note 1
Financial assets										
Investments	269.76	(269.76)	-	299.20	(299.20)	-	216.74	(216.74)	-	Note 2
Trade receivables	-	-	-	26.57	(26.57)	-	26.57	(26.57)	-	Note 6
Loans	-	-	-	4.72	(4.72)	-	4.95	(4.95)	-	Note 3
Other financial assets	1,927.78	(544.90)	1,382.88	2,344.60	(718.22)	1,626.38	2,297.94	(436.62)	1,861.32	Note 3
Deferred tax assets (net)	156.81	(156.81)	-	40.41	(40.41)	-	14.91	(14.91)	-	Note 4
Non-current tax assets (net)	13.50	75.90	89.40	14.30	59.99	74.29	29.03	48.49	77.52	Note 5
Other non-current assets	0.29	(0.29)	-	0.09	0.36	0.45	12.23	(11.78)	0.45	Note 7
<b>Total non-current assets</b>	<b>22,747.11</b>	<b>(895.83)</b>	<b>21,851.27</b>	<b>24,055.25</b>	<b>(1,028.77)</b>	<b>23,026.48</b>	<b>24,824.23</b>	<b>(663.08)</b>	<b>24,161.15</b>	
<b>Current assets</b>										
Financial assets										
Investments	1,705.93	446.46	2,152.39	1,653.01	503.36	2,156.37	1,876.36	588.75	2,465.11	Note 2
Trade receivables	46.42	(9.12)	37.30	38.90	30.02	68.92	77.32	10.16	87.48	Note 6
Cash and cash equivalents	604.02	(238.20)	365.82	322.58	(242.77)	79.81	496.69	(321.79)	174.91	Note 8
Bank balances other than cash and cash equivalents above	1,498.24	474.38	1,972.62	1,026.14	596.07	1,622.21	671.36	187.77	859.13	Note 9
Others financial assets	819.80	121.81	941.61	804.36	145.44	949.80	737.44	202.24	939.68	Note 3
Current tax assets	61.81	(61.81)	-	45.92	(45.92)	-	37.28	(37.28)	-	Note 5
Other current assets	72.88	(0.32)	72.56	106.35	15.79	122.14	108.90	0.94	109.84	Note 7
<b>Total current assets</b>	<b>4,809.10</b>	<b>733.19</b>	<b>5,542.30</b>	<b>3,997.26</b>	<b>1,001.99</b>	<b>4,999.25</b>	<b>4,005.36</b>	<b>630.79</b>	<b>4,636.15</b>	
<b>Total assets</b>	<b>27,556.21</b>	<b>(162.63)</b>	<b>27,393.57</b>	<b>28,052.51</b>	<b>(26.78)</b>	<b>28,025.73</b>	<b>28,829.59</b>	<b>(32.29)</b>	<b>28,797.30</b>	
<b>EQUITY AND LIABILITIES</b>										
<b>EQUITY</b>										
Equity share capital	3,200.95	-	3,200.95	3,200.95	-	3,200.95	3,200.95	-	3,200.95	
Other equity	(2,910.91)	98.82	(2,812.09)	(2,389.93)	(77.20)	(2,467.13)	(1,387.50)	(232.25)	(1,619.74)	Note 10
<b>Total equity</b>	<b>290.04</b>	<b>98.82</b>	<b>388.86</b>	<b>811.02</b>	<b>(77.20)</b>	<b>733.82</b>	<b>1,813.45</b>	<b>(232.24)</b>	<b>1,581.21</b>	
<b>LIABILITIES</b>										
<b>Non-current liabilities</b>										
Financial liabilities										
Borrowings	21,260.81	-	21,260.80	18,482.53	3,769.62	22,252.15	18,898.52	3,565.57	22,464.09	Note 11
Other financial liabilities	1,277.17	(0.24)	1,276.93	1,272.39	(6.84)	1,265.55	1,243.31	(0.25)	1,243.06	Note 12
Provisions	380.28	(55.73)	324.55	286.29	285.67	571.96	613.40	(25.95)	587.46	Note 14
Deferred tax liabilities (net)	1,054.60	(205.25)	849.36	260.19	74.38	334.57	237.14	252.98	490.12	Note 4
<b>Total non-current liabilities</b>	<b>23,972.86</b>	<b>(261.23)</b>	<b>23,711.64</b>	<b>20,301.40</b>	<b>4,122.83</b>	<b>24,424.23</b>	<b>20,992.37</b>	<b>3,792.36</b>	<b>24,784.73</b>	
<b>Current liabilities</b>										
Financial liabilities										
Borrowings	2,007.63	-	2,007.63	3,769.63	(2,027.42)	1,742.21	3,565.57	(1,904.01)	1,661.56	Note 11
Trade payables	90.16	230.65	320.80	68.21	143.11	211.32	142.54	70.74	213.28	Note 15
Other financial liabilities	854.83	(205.46)	649.37	2,138.62	(1,835.43)	303.19	1,979.02	(1,718.52)	260.50	Note 12
Other current liabilities	31.16	-	31.16	15.82	-	15.82	59.25	(28.30)	30.95	Note 13
Provisions	305.24	(25.42)	279.82	932.74	(352.66)	580.08	276.42	(13.79)	262.63	Note 14
Current tax liabilities (net)	4.29	-	4.29	15.07	(0.01)	15.06	0.97	1.48	2.45	Note 16
<b>Total current liabilities</b>	<b>3,293.31</b>	<b>(0.22)</b>	<b>3,293.07</b>	<b>6,940.09</b>	<b>(4,072.41)</b>	<b>2,867.68</b>	<b>6,023.77</b>	<b>(3,592.41)</b>	<b>2,431.37</b>	
<b>Total liabilities</b>	<b>27,266.17</b>	<b>(261.45)</b>	<b>27,004.71</b>	<b>27,238.49</b>	<b>50.42</b>	<b>27,291.91</b>	<b>27,016.14</b>	<b>199.95</b>	<b>27,216.10</b>	
<b>Total equity and liabilities</b>	<b>27,556.21</b>	<b>(162.62)</b>	<b>27,393.57</b>	<b>28,052.51</b>	<b>(26.78)</b>	<b>28,025.73</b>	<b>28,829.59</b>	<b>(32.29)</b>	<b>28,797.30</b>	

Highways Infrastructure Trust  
Summary of significant accounting policies and other explanatory information  
(All amounts in ₹ millions unless otherwise stated)

Particulars	For the financial year ended 31 March 2022			For the financial year ended 31 March 2021			For the financial year ended 31 March 2020			Note reference
	Audited financial statements	Adjustments	Special Purpose Combined Financial Statements	Audited financial statements	Adjustments	Special Purpose Combined Financial Statements	Audited financial statements	Adjustments	Special Purpose Combined Financial Statements	
<b>Income</b>										
Revenue from operations	5,809.00	57.56	5,866.56	4,960.79	124.25	5,085.04	4,957.88	50.92	5,008.80	Note 17
Other income	387.98	(76.89)	311.09	355.79	(114.70)	241.09	262.72	(31.29)	231.43	Note 18
<b>Total income</b>	<b>6,196.98</b>	<b>(19.32)</b>	<b>6,177.65</b>	<b>5,316.58</b>	<b>9.55</b>	<b>5,326.13</b>	<b>5,220.60</b>	<b>19.63</b>	<b>5,240.23</b>	
<b>Expenses</b>										
Sub-contracting expenses	199.19	1,238.41	1,437.60	539.34	837.95	1,377.29	191.58	1,196.44	1,388.02	Note 19
Employee benefits expense	128.35	-	128.35	117.56	-	117.56	116.19	-	116.19	-
Finance costs	2,778.34	(2.79)	2,775.55	2,740.38	0.12	2,740.51	2,764.96	9.81	2,774.77	Note 20
Depreciation and amortisation expense	1,017.43	0.01	1,017.44	919.82	(0.01)	919.81	1,038.67	-	1,038.67	Note 21
Other expenses	1,726.21	(1,267.06)	459.15	1,219.64	(825.95)	393.69	1,567.88	(1,218.38)	349.50	Note 22
<b>Total expenses</b>	<b>5,849.52</b>	<b>(31.42)</b>	<b>5,818.09</b>	<b>5,536.74</b>	<b>12.11</b>	<b>5,548.86</b>	<b>5,679.28</b>	<b>(12.13)</b>	<b>5,667.15</b>	
<b>Profit / (loss) before tax</b>	<b>347.46</b>	<b>12.09</b>	<b>359.56</b>	<b>(220.16)</b>	<b>(2.57)</b>	<b>(222.73)</b>	<b>(458.68)</b>	<b>31.76</b>	<b>(426.92)</b>	
<b>Tax expense</b>										
Current tax	186.28	3.69	189.97	127.00	-	127.00	92.55	(1.45)	91.10	Note 10
Deferred tax	682.40	(167.61)	514.79	2.04	(157.58)	(155.54)	(15.41)	13.00	(2.41)	Note 10
<b>Total tax expense</b>	<b>868.68</b>	<b>(163.92)</b>	<b>704.76</b>	<b>129.04</b>	<b>(157.58)</b>	<b>(28.54)</b>	<b>77.14</b>	<b>11.55</b>	<b>88.68</b>	
<b>Net (loss) / profit for the year</b>	<b>(521.22)</b>	<b>176.01</b>	<b>(345.20)</b>	<b>(349.20)</b>	<b>155.02</b>	<b>(194.19)</b>	<b>(535.82)</b>	<b>20.22</b>	<b>(515.61)</b>	
<b>Other comprehensive income</b>										
Items that will not be reclassified to profit or loss										
Re-measurement gains / (losses) on defined benefit obligations	0.23	-	0.24	0.57	-	0.57	(1.25)	-	(1.25)	
Income tax relating to these items	-	-	-	-	-	-	-	-	-	
<b>Total other comprehensive income / (loss) for the year</b>	<b>0.23</b>	<b>-</b>	<b>0.24</b>	<b>0.57</b>	<b>-</b>	<b>0.57</b>	<b>(1.25)</b>	<b>-</b>	<b>(1.25)</b>	
<b>Total comprehensive (loss) / income for the year</b>	<b>(520.98)</b>	<b>176.01</b>	<b>(344.96)</b>	<b>(348.63)</b>	<b>155.02</b>	<b>(193.62)</b>	<b>(537.06)</b>	<b>20.22</b>	<b>(516.86)</b>	

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## Highways Infrastructure Trust

### Summary of significant accounting policies and other explanatory information

(All amounts in ₹ millions unless otherwise stated)

#### **Note 1 - Intangible Assets**

Adjustments on account of incorporating the effect of revised projected revenue in line with the traffic studies conducted by the SPV Group, consequently leading to an adjustment in amortisation on intangible assets.

#### **Note 2 - Investments (Non-Current and Current)**

Adjustment is on account of following items:

- a) reclassification of investment from 'non-current investment' to 'current-investment' based on nature and intention of maturity by SPV Group in accordance with suggestive framework.; and
- b) reclassification of investments from 'cash and cash equivalents' to 'current investments' based on nature and intention of maturity by SPV Group in accordance with suggestive framework.

#### **Note 3 - Loan and other financial Assets (Non-Current and Current)**

Adjustments on account of :-

- a) restatement to incorporate the appropriate accounting treatment relating to the service concession arrangement with NHAI in accordance with Ind AS 115-'Revenue from contract with customers', post incorporating the impact of estimates been considered in line with technical studies conducted by the management;
- b) reclassification of current and non-current portion of annuity receivables under service concession arrangement from 'other non-current financial assets' to 'other current financial asset' and vice-versa;
- c) reclassification of fixed deposits from 'other non-current financial asset' to 'bank balances other than cash and cash equivalents' in accordance with the maturity date;
- d) reclassifications of change of scope receivables from 'other current financial assets' to 'current trade receivables' being operating in nature;
- e) reclassification of capital advance from 'other non-current financial assets' to 'other non-current assets' in accordance with suggestive framework;
- f) reclassifications of contract asset from 'other current financial asset' to 'other current assets' in accordance with suggestive framework;
- g) reclassification of retention money receivable from NHAI which are in the normal course of business from 'other non-current financial assets' to 'trade receivables' in accordance with suggestive framework; and
- f) reclassification of security deposits from 'loans' to 'other current financial assets' in accordance with suggestive framework.

#### **Note 4 Deferred tax assets and liabilities**

Adjustments to recognise corresponding deferred tax / tax credit (minimum alternative tax) in accordance with Ind AS 12- 'Income Taxes' and reclassification from 'deferred tax assets' to 'deferred tax liability' after incorporating impacts of the adjustments (explained in this note), wherever applicable.

#### **Note 5 - Tax Assets (Non-Current and Current)**

Adjustments on account of the following items:

- a) reclassification of advance income taxes (net) from 'current tax assets (net)' and 'other current assets' to 'non-current tax assets (net)' in accordance with best suggestive framework; and
- b) reclassifications between 'current tax assets (net)', 'non-current tax assets (net)' and 'current tax liabilities' to incorporate the income tax impacts on the adjustments in accordance with suggestive framework.

#### **Note 6 - Trade Receivables (Non-Current and Current)**

Adjustments on account of the following items:

- a) reclassifications of receivables from 'non-current trade receivables' to 'current trade receivables' based on the normal operating cycle of the company in accordance with suggestive framework.;
- b) reclassifications of change of scope receivables from 'other current financial assets' to 'current trade receivables' being operating in nature, in accordance with suggestive framework.;
- c) reclassifications of other receivables not in the nature of trade receivables to 'other current financial assets' in accordance with suggestive framework; and
- d) reclassification of retention money receivable from NHAI which are in the normal course of business from 'other non-current financial assets' to 'trade receivables' in accordance with suggestive framework..

#### **Note 7 - Current Asset (Non-Current and Current)**

Adjustments on account of following:

- a) reclassifications of contract asset from 'other current financial asset' to 'other current assets' based on the nature of the receivables, in accordance with suggestive framework.;
- b) reclassification of capital advance from 'other non-current financial assets' to 'other non-current assets, in accordance with suggestive framework. ;
- c) adjustment with respect to netting off current and non-current portion of fair value of gratuity from 'other current and non-current assets' to 'current and non-current provision for gratuity, in line with suggestive framework; and
- d) reclassification of retention money receivable from NHAI which are in the normal course of business from 'other non-current assets' to 'trade receivables' in line with suggestive framework.

## Highways Infrastructure Trust

### Summary of significant accounting policies and other explanatory information

(All amounts in ₹ millions unless otherwise stated)

#### **Note 8 - Cash and Cash Equivalents**

Adjustment is on account of reclassification of investments from 'cash and cash equivalents' to 'current investments' based on nature and intention of maturity by SPV Group.

#### **Note 9 - Bank balances other than cash and cash equivalents**

Adjustments on account of reclassifications of fixed deposits coming in 'cash and cash equivalents', 'bank balances other than cash and cash equivalents' and 'other non-current financial assets' (along with interest accrued) in accordance with their maturity terms.

#### **Note 10 - Other Equity and consequent tax impact on adjustments**

Adjustments in Other equity and Combined Statement of Profit and Loss has been made consequent to the adjustments (explained in this note) along with corresponding impacts to 'tax expense', wherever applicable.

#### **Note 11 - Borrowings (Non-Current and Current)**

Adjustments on account of following:

- reclassification of optionally convertible debentures (OCDs) from 'current borrowings' to 'non-current borrowings' based on the nature of the instrument and expected outflow in the next year from the each reporting years; and
- reclassification of current maturities of long term debt from 'other current financial liability' to 'current-borrowings' in accordance with suggestive framework.

#### **Note 12- Other-current and non-current financial liabilities.**

Adjustments on account of the following items:

- Reclassification of interest accrued not due from "non current financial liability" to "current financial liability" in line with suggestive framework;
- reclassification of payables on account of goods purchased and/or services received in the normal course of the business and outstanding expenses to 'trade payables' in line with with suggestive framework ; and
- reclassification of provision for unspent CSR expense from "non current provision" to "other current financial liability" in accordance with suggestive framework.

#### **Note - 13 Other current liabilities**

Adjustments on account reclassifications / netting of advances from concession authorities from 'other current liabilities' to 'trade receivables'.

#### **Note -14 Provisions (Non-Current and Current)**

Adjustments on account of the following items:

- Adjustment in major maintenance obligation to incorporate the effect of revised projected revenue and major maintenance expenditure in line with the traffic and technical studies respectively, conducted by the SPV Group and reclassification of major maintenance obligation into current and non current provision basis expected outflow in the next year from each reporting years;
- Adjustment in major maintenance obligation to incorporate the impact of subsequent adjustable event as per the relevant accounting principles revised in line with updated technical studies done by the technical experts;
- Adjustment for reclassification of provision for employee benefits between current portion and non current portion of employee benefit provision, based on the actuarial certificates;
- reclassification of outstanding expenses from 'current provision' to 'trade payables' in accordance with suggestive framework ; and
- reclassification of provision for unspent CSR expense from "non current provision" to "other current financial liability" in accordance with suggestive framework.

#### **Note - 15 Trade Payables**

Adjustments on account of reclassification of payables on account of goods purchased and/or services received in the normal course of business to 'trade payables' earlier part of 'other current financial liabilities, in accordance with suggestive framework.

#### **Note - 16 Current Tax Liability**

Adjustments been made to recognise corresponding income tax / minimum alternative tax payable impacts (along with applicable interest) on the adjustments (explained in this note), wherever applicable and reclassifications between 'current tax assets (net)', 'non-current tax assets (net)' and 'current tax liabilities' post all income tax impacts on the adjustments (explained in this note), in accordance with suggestive framework.

#### **Note - 17 Revenue from operations**

Adjustments on account of the following items:

- restatement to incorporate the impacts relating to change in estimates in line with the technical studies conducted by the management for annuity road assets under service concession arrangement with NHAI in accordance with Ind AS 115-'Revenue from contract with customers';
- reclassification of modification gain on annuity to 'revenue from operations' which was earlier part of 'other income';
- reclassifications of claim from NHAI to 'revenue from operations' which was earlier part of 'other income'; and
- reclassification of demonetisation claim from "other income" to "revenue from operations".

#### **Note - 18 Other Income**

Adjustments on account of the following items:

- reclassification of 'loss on fair valuation of investment' from 'other income' to 'other expenses' which was earlier netted from other income;
- reclassification of modification gain on annuity to 'revenue from operations' which was earlier part of 'other income';
- reclassifications of claim from NHAI to 'revenue from operations' which was earlier part of 'other income'; and
- reclassification of demonetisation claim from "other income" to "revenue from operations".

## Highways Infrastructure Trust

### Summary of significant accounting policies and other explanatory information

(All amounts in ₹ millions unless otherwise stated)

#### **Note - 19 Operating Expenses**

Adjustments on account of the following items:

- a) Reclassification of claim expenses relating to change of scope payable under pass through arrangement from 'other expenses' to 'operating expenses' ;
- b) Reclassification of Toll operation and maintenance expense, Major maintenance provision and Change of scope and utility shifting expenses from 'other expenses' to 'operating expenses'; and
- c) Adjustment in major maintenance expense to incorporate the effect of revised projected revenue and major maintenance expenditure in line with the traffic and technical studies respectively, conducted by the SPV Group.

#### **Note - 20 Finance Cost**

Adjustments on account of the following items:

- a) reclassification of interest on income tax from 'current tax expense' to 'finance cost';
- b) Adjustment in unwinding of discount on major maintenance provision to incorporate the effect of revised projected revenue and major maintenance expenditure in line with the traffic and technical studies respectively, conducted by the SPV Group; and
- c) restatement in loss on modification of liability to incorporate the impacts relating to change in estimates in line with the technical studies conducted by the management for annuity road assets under service concession arrangement with NHAI in accordance with Ind AS 115-'Revenue from contract with customers.

#### **Note - 21 Depreciation and Amortisation Expense**

Adjustments to incorporate the effect of revised projected revenue in line with the traffic studies conducted by the SPV Group, consequently leading to an adjustment in amortisation on intangible assets.

#### **Note - 22 Other Expenses**

Adjustments on account of the following items:

- a) reclassification of claim expenses relating to change of scope payable under pass through arrangement from 'other expenses' to 'operating expenses';
- b) reclassification of Toll operation and maintenance expense, major maintenance provision and Change of scope and utility shifting expenses from 'other expenses' to 'operating expenses'; and
- c) reclassification of 'loss on fair valuation of investment' from 'other income' to 'other expenses' which was earlier netted from other income.

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## Highways Infrastructure Trust

### Summary of significant accounting policies and other explanatory information

(All amounts in ₹ millions unless otherwise stated)

46. The outbreak of Covid-19 pandemic is causing significant disturbance and slowdown of economic activities globally. The nationwide lockdown ordered by the Government of India has resulted in significant reduction in economic activities and also the business operations of the SPV Group. Slowdown in traffic was witnessed from mid of March 2020 owing to outbreak of COVID-19 in India. Subsequently, vide letter no. H-25016/01/2018-Toll dated 25 March 2020 issued by Ministry of Road Transport and Highways (MoRTH) toll collections were suspended from 26 March 2020 to 19 April 2020. The traffic on the project roads increased gradually post lockdown, however, it was further impacted up to certain extents from April 2021 to June 2021 due to second wave of Covid-19 and subsequently again increased gradually. In accordance with the provisions of concession agreements with NHAI and notifications issued by MoRTH, management is claiming the extension in the concession period towards loss of revenue for the impacted period and for which management is evaluating and under process of getting the claims. . In case of one of the Project SPV (DPCPL) under MPRDC, State of Madhya Pradesh, extension of concession period for 40 days have been received for the first wave and has been accepted by that SPV.

The management has considered the possible effects that may result from COVID-19 pandemic on the recoverability/carrying value of the assets. Based on the current indicators of future economic conditions, the management expects to recover the carrying amount of the assets, however the management will continue to closely monitor any material changes to future economic conditions. Given the uncertainties, the final impact on SPV Group's assets in future may differ from that estimated as at the date of approval of these special purpose combined financial statements.

47. All values are rounded to the nearest millions, unless otherwise indicated. Certain amount that are required to disclosed and do not appear due to rounding off are expressed as 0.00.

#### For Walker Chandiok & Co LLP

Chartered Accountants

Firm's Registration No.: 001076N/N500013

#### Manish Agrawal

Partner

Membership No.: 507000

Place: New Delhi

Date: 08 July 2022

#### For and on behalf of the Board of Directors of Virescent Infrastructure Investment Manager Private Limited (acting as Investment Manager to Highways Infrastructure Trust)

Sanjay Grewal

Director

DIN: 01971866

Place: New Delhi

Date: 08 July 2022

Hardik Bhadrak Shah

Director

DIN: 06648474

Place: Mumbai

Date: 08 July 2022

**PROJECTIONS OF REVENUE FROM OPERATIONS AND CASH FLOW FROM OPERATING  
ACTIVITIES**

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## Report of auditor on Examination of Prospective Financial Information

To

The Board of Directors of Virescent Infrastructure Investment Manager Private Limited (‘the Investment Manager’) in its capacity as Investment Manager of Highways Infrastructure Trust

Dear Sirs,

1. We have examined the accompanying Statement of Projections of ‘Revenue from Operations’ and ‘Cash Flow from Operating Activities’ (‘Prospective Financial Information’) and the basis and notes to these projections (‘together referred to as ‘Projections’) along with significant assumptions underlying the Projections and other explanatory information (‘Projection Assumptions’) of Highways Infrastructure Trust (hereinafter referred to as ‘Trust’) and the following subsidiaries of Galaxy Investments II Pte Ltd (herein referred to as ‘Sponsors’), namely:

- a) Ulundurpet Expressways Private Limited
- b) Nirmal BOT Limited
- c) Godhra Expressways Private Limited
- d) Jodhpur Pali Expressway Private Limited
- e) Shillong Expressway Private Limited
- f) Dewas Bhopal Corridor Private Limited

together referred to as ‘Project SPVs’ or ‘Project SPV Group’ and individually referred to as ‘Project SPV’ or ‘SPV’ which are proposed to be transferred from Galaxy Investments II Pte Ltd (herein referred to as ‘Sponsors’) and other shareholders of Project SPVs to the Trust pursuant to the proposed private placement of Units of the Trust (‘Private Placement’), for the years ending 31 March 2023, 31 March 2024, 31 March 2025. We have carried out such examination in accordance with Standard on Assurance Engagement 3400, ‘The Examination of Prospective Financial Information’, issued by the Institute of Chartered Accountants of India. The preparation and presentation of the projections including the underlying assumptions as set out in note 2 and note 3 to the Prospective Financial Information is the responsibility of Investment Manager and has been approved by the Board of Directors of the Investment Manager. Our responsibility is to examine the evidence supporting the Project Assumptions (excluding the hypothetical assumptions) and other information in the Projection. Our responsibility does not include verification of Projections. Therefore, we do not vouch for the accuracy of the same.

2. These Projections have been prepared for the purpose of inclusion in the updated preliminary placement memorandum, placement memorandum and final placement memorandum (‘placement documents’) in connection with the proposed Private Placement in accordance with the requirements of Securities and Exchange Board of India (Infrastructure Investment Trusts) Regulations, 2014 (as amended) along with any circulars, guidelines and notifications issued thereunder (the ‘InvIT Regulations’). These projections have been prepared by the Board of Directors of the Investment Manager using a set of assumptions that include hypothetical assumptions about future events and management’s actions that are not necessarily expected to occur. Consequently, users are cautioned that this projection

# Walker Chandiok & Co LLP

## Report of auditor on examination of prospective financial information (Cont'd)

may not be appropriate for purposes other than that described above.

2. We have carried our examination of the prospective financial information on test basis. Based on our examination of the evidence supporting the assumptions, nothing has come to our attention which causes us to believe that the Projection Assumptions do not provide a reasonable basis for the Projections.
3. Further, in our opinion, the Projections are properly prepared on the basis of the assumptions as set out in note 2 and note 3 to the Projections and on a consistent basis with the accounting policies used for the preparation of the historical special purpose combined financial statements included in the placement documents. Even if the events anticipated under the hypothetical assumptions described above occur, actual results are still likely to be different from the Projections since other anticipated events frequently do not occur as expected and the variation may be material. The actual results may therefore differ materially from those forecasted and projected. For the reasons set out above, we do not express any opinion as to the possibility of achievement of the Projections.
4. This report is addressed to and is provided to the Investment Manager solely for the inclusion in the placement documents in connection with the proposed offering of the Trust and may not be suitable for any other purpose. Our report should not be used, referred to or distributed for any other purpose or to any other party without our prior written consent. Accordingly, we do not accept or assume any liability or any duty of care for any other purpose or to any other person to whom this report is shown or into whose hands it may come without our prior consent in writing.

For **Walker Chandiok & Co LLP**

Chartered Accountants

Firm's Registration No.: 001076N/N500013

**Manish Agrawal**

Partner

Membership No.: 507000

**UDIN:** 22507000AMNEDZ5437

**Place:** New Delhi

**Date:** 08 July 2022

**Projections of revenue from operations and cash flow from operations of Trust Group**  
(All amounts in ₹ millions unless otherwise stated)

	01 April 2022 to 31 March 2023	01 April 2023 to 31 March 2024	01 April 2024 to 31 March 2025
<b>Projected revenue from operations:</b>			
Income arising out of toll collection	5,653.11	6,269.34	6,895.22
Revenue from operations and maintenance of road	302.90	232.86	212.06
Revenue from periodic maintenance of road	-	559.52	177.45
Interest income on annuity receivable from National Highway Authority of India ('NHAI')	198.04	129.65	111.79
Loss on modification of annuity	(180.88)	-	-
	<b>5,973.17</b>	<b>7,191.37</b>	<b>7,396.52</b>
<b>Projected cash flow from operations :</b>			
Cash inflow from revenue from operations (A)	6,626.51	7,242.74	7,868.62
<b>Less:</b>			
Actual outflow for operations and maintenance of road	837.10	881.38	932.46
Actual outflow for periodic maintenance of road	480.72	941.20	499.84
Management expenses	502.09	346.58	246.10
InvIT expenses	21.94	23.14	24.42
Corporate Social Responsibility ('CSR') expense paid	15.16	19.95	28.05
Premium paid to concession authorities	137.44	144.31	151.52
<b>Total expenses (B)</b>	<b>1,994.45</b>	<b>2,356.56</b>	<b>1,882.39</b>
<b>Cash generated from operations (A-B)</b>	<b>4,632.06</b>	<b>4,886.17</b>	<b>5,986.23</b>
Less : Direct taxes paid (net of refunds)	(138.21)	(296.98)	(373.35)
<b>Net cash flow from operating activities</b>	<b>4,493.85</b>	<b>4,589.19</b>	<b>5,612.88</b>

**For and on behalf of Board of Directors of**  
**Virescent Infrastructure Investment Manager Private Limited**  
(as Investment Manager of Highways Infrastructure Trust)

**Hardik Bhadrak Shah**  
Director  
DIN: 06648474

**Sanjay Grewal**  
Director  
DIN: 01971866

**Place:** Mumbai  
**Date:** 08 July 2022

**Place:** New Delhi  
**Date:** 08 July 2022

Projections of revenue from operations and cash flow from operations for the Project SPV  
 Ulundurpet Expressways Private Limited  
 (All amounts in ₹ millions unless otherwise stated)

	01 April 2022 to 31 March 2023	01 April 2023 to 31 March 2024	01 April 2024 to 31 March 2025
<b>Projected revenue from operations:</b>			
Income arising out of toll collection	1,677.70	1,820.30	1,931.10
	<b>1,677.70</b>	<b>1,820.30</b>	<b>1,931.10</b>
<b>Projected cash flow from operations :</b>			
Cash inflow from revenue from operations (A)	1,677.70	1,820.30	1,931.10
<b>Less:</b>			
Actual outflow for operations and maintenance of road	184.60	194.69	205.33
Actual outflow for periodic maintenance of road	-	424.26	330.89
Management expenses	79.75	44.81	31.56
Corporate Social Responsibility ('CSR') expense paid	-	1.90	6.19
<b>Total expenses (B)</b>	<b>264.35</b>	<b>665.66</b>	<b>573.97</b>
<b>Cash generated from operations (A-B)</b>	<b>1,413.35</b>	<b>1,154.64</b>	<b>1,357.13</b>
Less : Direct taxes paid (net of refunds)	-	(45.72)	(85.28)
<b>Net cash flows from operating activities</b>	<b>1,413.35</b>	<b>1,108.92</b>	<b>1,271.85</b>

For and on behalf of Board of Directors of  
 Virescent Infrastructure Investment Manager Private Limited  
 (as Investment Manager of Highways Infrastructure Trust)

<b>Hardik Bhadrak Shah</b> Director DIN: 06648474  Place: Mumbai Date: 08 July 2022	<b>Sanjay Grewal</b> Director DIN: 01971866  Place: New Delhi Date: 08 July 2022
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Projections of revenue from operations and cash flow from operations for the Project SPV  
Nirmal BOT Limited  
(All amounts in ₹ millions unless otherwise stated)

	01 April 2022 to 31 March 2023	01 April 2023 to 31 March 2024	01 April 2024 to 31 March 2025
<b>Projected revenue from operations:</b>			
Revenue from operations and maintenance of road	148.84	112.41	102.09
Revenue from periodic maintenance of road	-	172.28	177.45
Interest income on annuity receivable from National Highway Authority of India ('NHAI')	133.52	104.85	95.80
Loss on modification of annuity	(92.68)	-	-
	<b>189.68</b>	<b>389.54</b>	<b>375.34</b>
<b>Projected cash flow from operations :</b>			
Cash inflow from revenue from operations (A)	476.00	476.00	476.00
<b>Less:</b>			
Actual outflow for operations and maintenance of road	64.47	64.82	68.32
Actual outflow for periodic maintenance of road	-	164.03	168.95
Management expenses	79.75	44.81	31.56
Corporate Social Responsibility ('CSR') expense paid	1.88	0.53	-
<b>Total expenses (B)</b>	<b>146.10</b>	<b>274.19</b>	<b>268.83</b>
<b>Cash generated from operations (A-B)</b>	<b>329.90</b>	<b>201.81</b>	<b>207.17</b>
Less : Direct taxes paid (net of refunds)	-	-	-
<b>Net cash flows from operating activities</b>	<b>329.90</b>	<b>201.81</b>	<b>207.17</b>

For and on behalf of Board of Directors of  
Virescent Infrastructure Investment Manager Private Limited  
(as Investment Manager of Highways Infrastructure Trust)

**Hardik Bhadrik Shah**  
Director  
DIN: 06648474

**Sanjay Grewal**  
Director  
DIN: 01971866

**Place:** Mumbai  
**Date:** 08 July 2022

**Place:** New Delhi  
**Date:** 08 July 2022

Projections of revenue from operations and cash flow from operations for the Project SPV  
Shillong Expressway Private Limited  
(All amounts in ₹ millions unless otherwise stated)

	01 April 2022 to 31 March 2023	01 April 2023 to 31 March 2024	01 April 2024 to 31 March 2025
<b>Projected revenue from operations:</b>			
Revenue from operations and maintenance of road	154.06	120.45	109.98
Revenue from periodic maintenance of road	-	387.24	-
Interest income on annuity receivable from National Highway Authority of India ('NHAI')	64.52	24.80	15.99
Loss on modification of annuity	(88.20)	-	-
	<b>130.38</b>	<b>532.49</b>	<b>125.97</b>
<b>Projected cash flow from operations :</b>			
Cash inflow from revenue from operations (A)	497.40	497.40	497.40
<b>Less:</b>			
Actual outflow for operations and maintenance of road	65.35	68.89	72.61
Actual outflow for periodic maintenance of road	-	352.92	-
Management expenses	79.75	44.81	31.56
Corporate Social Responsibility ('CSR') expense paid	1.96	1.31	0.73
<b>Total expenses (B)</b>	<b>147.06</b>	<b>467.93</b>	<b>104.90</b>
<b>Cash generated from operations (A-B)</b>	<b>350.34</b>	<b>29.47</b>	<b>392.50</b>
Less : Direct taxes paid (net of refunds)	(0.02)	(13.69)	(5.37)
<b>Net cash flows from operating activities</b>	<b>350.32</b>	<b>15.78</b>	<b>387.13</b>

For and on behalf of Board of Directors of  
Virescent Infrastructure Investment Manager Private Limited  
(as Investment Manager of Highways Infrastructure Trust)

**Hardik Bhadrik Shah**  
Director  
DIN: 06648474

**Sanjay Grewal**  
Director  
DIN: 01971866

**Place:** Mumbai  
**Date:** 08 July 2022

**Place:** New Delhi  
**Date:** 08 July 2022

Projections of revenue from operations and cash flow from operations for the Project SPV

Jodhpur- Pali Expressway Private Limited

(All amounts in ₹ millions unless otherwise stated)

	01 April 2022 to 31 March 2023	01 April 2023 to 31 March 2024	01 April 2024 to 31 March 2025
<b>Projected revenue from operations:</b>			
Income arising out of toll collection	726.38	803.77	887.92
	<b>726.38</b>	<b>803.77</b>	<b>887.92</b>
<b>Projected cash flow from operations :</b>			
Cash inflow from revenue from operations (A)	726.38	803.77	887.92
<b>Less:</b>			
Actual outflow for operations and maintenance of road	149.17	157.31	165.90
Actual outflow for periodic maintenance of road	297.82	-	-
Management expenses	79.75	44.81	31.56
Premium paid to concession authorities	15.97	16.77	17.60
<b>Total expenses (B)</b>	<b>542.71</b>	<b>218.89</b>	<b>215.06</b>
<b>Cash generated from operations (A-B)</b>	<b>183.67</b>	<b>584.88</b>	<b>672.86</b>
Less : Direct taxes paid (net of refunds)	-	-	-
<b>Net cash flows from operating activities</b>	<b>183.67</b>	<b>584.88</b>	<b>672.86</b>

For and on behalf of Board of Directors of  
Virescent Infrastructure Investment Manager Private Limited  
(as Investment Manager of Highways Infrastructure Trust)

Hardik Bhadrik Shah  
Director  
DIN: 06648474

Sanjay Grewal  
Director  
DIN: 01971866

Place: Mumbai  
Date: 08 July 2022

Place: New Delhi  
Date: 08 July 2022

Projections of revenue from operations and cash flow from operations for the Project SPV  
 Godhra Expressways Private Limited  
 (All amounts in ₹ millions unless otherwise stated)

	01 April 2022 to 31 March 2023	01 April 2023 to 31 March 2024	01 April 2024 to 31 March 2025
<b>Projected revenue from operations:</b>			
Income arising out of toll collection	1,433.69	1,603.77	1,794.29
	<b>1,433.69</b>	<b>1,603.77</b>	<b>1,794.29</b>
<b>Projected cash flow from operations :</b>			
Cash inflow from revenue from operations (A)	1,433.69	1,603.77	1,794.29
<b>Less:</b>			
Actual outflow for operations and maintenance of road	140.75	148.43	156.53
Actual outflow for periodic maintenance of road	17.40	-	-
Management expenses	79.75	44.81	31.56
Premium paid to concession authorities	121.47	127.54	133.92
<b>Total expenses (B)</b>	<b>359.37</b>	<b>320.78</b>	<b>322.01</b>
<b>Cash generated from operations (A-B)</b>	<b>1,074.32</b>	<b>1,282.99</b>	<b>1,472.28</b>
Less : Direct taxes paid (net of refunds)	-	-	-
<b>Net cash flows from operating activities</b>	<b>1,074.32</b>	<b>1,282.99</b>	<b>1,472.28</b>

**For and on behalf of Board of Directors of  
 Virescent Infrastructure Investment Manager Private Limited**  
 (as Investment Manager of Highways Infrastructure Trust)

**Hardik Bhadrik Shah**  
 Director  
 DIN: 06648474

**Sanjay Grewal**  
 Director  
 DIN: 01971866

**Place:** Mumbai  
**Date:** 08 July 2022

**Place:** New Delhi  
**Date:** 08 July 2022

Projections of revenue from operations and cash flow from operations for the Project SPV  
Dewas Bhopal Corridor Private Limited  
(All amounts in ₹ millions unless otherwise stated)

	01 April 2022 to 31 March 2023	01 April 2023 to 31 March 2024	01 April 2024 to 31 March 2025
<b>Projected revenue from operations:</b>			
Income arising out of toll collection	1,815.33	2,041.51	2,281.90
	<b>1,815.33</b>	<b>2,041.51</b>	<b>2,281.90</b>
<b>Projected cash flow from operations :</b>			
Cash inflow from revenue from operations (A)	1,815.33	2,041.51	2,281.90
<b>Less:</b>			
Actual outflow for operations and maintenance of road	232.75	247.24	263.77
Actual outflow for periodic maintenance of road	165.50	-	-
Management expenses	79.75	44.81	31.56
Corporate Social Responsibility (CSR) expense paid	11.33	16.22	21.13
<b>Total expenses (B)</b>	<b>489.33</b>	<b>308.27</b>	<b>316.46</b>
<b>Cash generated from operations (A-B)</b>	<b>1,326.00</b>	<b>1,733.24</b>	<b>1,965.44</b>
Less : Direct taxes paid (net of refunds)	(138.19)	(237.56)	(282.70)
<b>Net cash flows from operating activities</b>	<b>1,187.81</b>	<b>1,495.68</b>	<b>1,682.74</b>

For and on behalf of Board of Directors of  
Virescent Infrastructure Investment Manager Private Limited  
(as Investment Manager of Highways Infrastructure Trust)

<b>Hardik Bhadrik Shah</b> Director DIN: 06648474	<b>Sanjay Grewal</b> Director DIN: 01971866
---	---

<b>Place:</b> Mumbai <b>Date:</b> 08 July 2022	<b>Place:</b> New Delhi <b>Date:</b> 08 July 2022
---	--

## MATERIAL CONTRACTS AND DOCUMENTS FOR INSPECTION

The following contracts, which are or may be deemed material have been entered or are to be entered into in due course. These contracts and also the documents for inspection referred to hereunder, may be inspected by the Eligible Investors at the office of the Highways Trust at Mumbai, from 10:00 A.M. to 5:00 P.M., from the date of this Final Placement Memorandum until the Bid/Issue Closing Date, on Working Days.

### A. Material Contracts

1. The Trust Deed, between the Sponsor, Investment Manager (acting as the settlor) and the Trustee, dated December 3, 2021;
2. The Investment Management Agreement, amongst the Trustee and the Investment Manager, dated December 6, 2021;
3. The Project Management Agreement, amongst the Trustee, Investment Manager, Project Manager and the Project SPVs dated August 8, 2022;
4. The securities purchase agreement dated August 8, 2022, executed between the Highways Trust (acting through the Trustee), the Investment Manager, the Sponsor, and the Project SPVs, in relation to the transfer of the equity shares of the Project SPVs.
5. The Placement Agreement entered into between the Highways Trust (acting through the Trustee), the Investment Manager, the Sponsor, the Project Manager and the Lead Manager, dated March 23, 2022;
6. The Cash Escrow Agreement dated August, 8, 2022 entered into between the Highways Trust (acting through the Trustee), the Investment Manager, the Sponsor, the Lead Manager and the Escrow Collection Bank,;
7. Concession Agreement executed between Madhya Pradesh Road Development Corporation Limited and Dewas Bhopal Corridor Pvt. Ltd. dated June 30, 2007, together with any amendments or supplements thereto;
8. Concession Agreement executed between NHAI and BSCPL Godhra Tollways Limited dated February 25, 2010, together with any amendments or supplements thereto;
9. Concession Agreement executed between Government of Rajasthan, Public Works Department (on behalf of Road Transport & Highways Government of India) and Jodhpur Pali Expressway Limited dated February 28, 2013, together with any amendments or supplements thereto;
10. Concession Agreement executed between NHAI and Nirmal Bot Limited dated May 4, 2007, together with any amendments or supplements thereto;
11. Concession Agreement executed between NHAI and Shillong Expressway Private Limited dated July 14, 2010, together with any amendments or supplements thereto;
12. Concession Agreement executed between NHAI and GMR Ulundurpet Expressways Private Limited dated April 19, 2006, together with any amendments or supplements thereto;
13. Certified copy of the Memorandum and Articles of Association of the Investment Manager as amended from time to time; and
14. The business support services agreement entered into between the Project SPVs, Project Manager and HC1; and
15. The agreement entered into between the Investment Manager and HC1 in relation to reimbursement of costs.

### B. Material Documents

1. SEBI registration certificate for the Highways Trust bearing number IN/InvIT/21-22/0019 dated December 23, 2021 as an infrastructure investment trust;
2. Board resolutions of the Investment Manager dated March 22, 2022 and July 23, 2022, authorising this Issue;

3. The resolutions of the Board dated March 22, 2022 and InvIT Committee dated March 24, 2022 approving the Draft Placement Memorandum;
4. The resolution of the Board dated August 8, 2022 approving the Placement Memorandum
5. The resolution of the Board dated August 22, 2022 approving this Final Placement Memorandum.
6. Consents received from (i) the Auditor; (ii) Valuer; (iii) Technical Consultant; (iv) Traffic Study Consultant; (v) Lead Manager to the Issue; (vi) Legal adviser to the Issue, as to Indian law; (vii) Registrar; (viii) Compliance Officer; (ix) Trustee; (x) Sponsor; and (xi) Investment Manager;
7. Summary financial statements of the Sponsor for the period from June 11, 2021 (date of incorporation of the Sponsor) to December 31, 2021;
8. Summary financial statements of the Investment Manager for the period from August 22, 2020 (date of incorporation of the Investment Manager) till December 31, 2021;
9. Special Purpose Combined Financial Statements along with the audit reports, dated July 8, 2022;
10. Projections of Revenue from Operations and Cash Flow from Operating Activities and the report thereon;
11. Statement of tax benefits dated August 8, 2022;
12. Corporate governance policies of the Investment Manager;
13. In-principle listing approval dated April 27, 2022 issued by NSE along with an extension letter dated July 15, 2022;
14. Tripartite Agreement dated March 7, 2022 among the Investment Manager (on behalf of the Highways Trust), NSDL and the Registrar; and
15. Tripartite Agreement dated February 25, 2022 among the Investment Manager (on behalf of the Highways Trust), CDSL and the Registrar.

Any of the contracts or documents mentioned in this Final Placement Memorandum may be amended or modified at any time if so required in the interest of the Highways Trust or if required by the other parties, without reference to the Unitholders, subject to compliance with applicable law.

## **DECLARATION**

The Investment Manager hereby declares and certifies that all relevant provisions of the InvIT Regulations, SEBI ACT and rules, regulations and guidelines issued by the GoI or SEBI (as the case may be) have been complied with and no statement made in this Final Placement Memorandum is contrary to the provisions of the InvIT Regulations, the SCRA, the SEBI Act, or rules, regulations, and guidelines issued thereunder (as the case may be). The Investment Manager further certifies that all the statements and disclosures in this Final Placement Memorandum are material, true, correct, and are adequate in order to enable the investors to make an informed decision.

### **SIGNED BY THE DIRECTOR OF THE INVESTMENT MANAGER**

Mr. Hardik Bhadrik Shah  
*Director*

**Date:** August 22, 2022

**Place:** Mumbai

## **DECLARATION**

The Investment Manager hereby declares and certifies that all relevant provisions of the InvIT Regulations, SEBI ACT and rules, regulations and guidelines issued by the GoI or SEBI (as the case may be) have been complied with and no statement made in this Final Placement Memorandum is contrary to the provisions of the InvIT Regulations, the SCRA, the SEBI Act, or rules, regulations, and guidelines issued thereunder (as the case may be). The Investment Manager further certifies that all the statements and disclosures in this Final Placement Memorandum are material, true, correct, not misleading and are adequate in order to enable the investors to make an informed decision.

### **SIGNED BY THE DIRECTOR OF THE INVESTMENT MANAGER**

Mr. Sanjay Grewal  
*Whole-time Director*

**Date:** August 22, 2022

**Place:** New Delhi

## **DECLARATION**

The Investment Manager hereby declares and certifies that all relevant provisions of the InvIT Regulations, SEBI Act and rules, regulations and guidelines issued by the GoI or SEBI (as the case may be) have been complied with and no statement made in this Final Placement Memorandum is contrary to the provisions of the InvIT Regulations, the SCRA, the SEBI Act, or rules, regulations, and guidelines issued thereunder (as the case may be). The Investment Manager further certifies that all the statements and disclosures in this Final Placement Memorandum are material, true, correct, not misleading and are adequate in order to enable the investors to make an informed decision.

### **SIGNED BY THE DIRECTOR OF THE INVESTMENT MANAGER**

Mr. Akshay Jaitly  
*Independent Director*

**Date:** August 22, 2022

**Place:** Paris

## **DECLARATION**

The Investment Manager hereby declares and certifies that all relevant provisions of the InvIT Regulations, SEBI Act and rules, regulations and guidelines issued by the GoI or SEBI (as the case may be) have been complied with and no statement made in this Final Placement Memorandum is contrary to the provisions of the InvIT Regulations, the SCRA, the SEBI Act, or rules, regulations, and guidelines issued thereunder (as the case may be). The Investment Manager further certifies that all the statements and disclosures in this Final Placement Memorandum are material, true, correct, not misleading and are adequate in order to enable the investors to make an informed decision.

### **SIGNED BY THE DIRECTOR OF THE INVESTMENT MANAGER**

Mr. Panja Pradeep Kumar  
*Independent Director*

**Date:** August 22, 2022

**Place:** Bangalore

## **DECLARATION**

The Investment Manager hereby declares and certifies that all relevant provisions of the InvIT Regulations, SEBI Act and rules, regulations and guidelines issued by the GoI or SEBI (as the case may be) have been complied with and no statement made in this Final Placement Memorandum is contrary to the provisions of the InvIT Regulations, the SCRA, the SEBI Act, or rules, regulations, and guidelines issued thereunder (as the case may be). The Investment Manager further certifies that all the statements and disclosures in this Final Placement Memorandum are material, true, correct, not misleading and are adequate in order to enable the investors to make an informed decision.

### **SIGNED BY THE DIRECTOR OF THE INVESTMENT MANAGER**

Ms. Daisy Devassy Chittilapilly  
*Independent Director*

**Date:** August 22, 2022

**Place:** Bangalore

## **DECLARATION**

The Investment Manager hereby declares and certifies that all relevant provisions of the InvIT Regulations, SEBI Act and rules, regulations and guidelines issued by the GoI or SEBI (as the case may be) have been complied with and no statement made in this Final Placement Memorandum is contrary to the provisions of the InvIT Regulations, the SCRA, the SEBI Act, or rules, regulations, and guidelines issued thereunder (as the case may be). The Investment Manager further certifies that all the statements and disclosures in this Final Placement Memorandum are material, true, correct, not misleading and are adequate in order to enable the investors to make an informed decision.

### **SIGNED BY THE DIRECTOR OF THE INVESTMENT MANAGER**

Mr. Aditya Narayan  
*Director*

**Date:** August 22, 2022

**Place:** Gurgaon

## **DECLARATION**

The Trustee (on behalf of the Highways Trust) hereby declares and certifies that all relevant provisions of the InvIT Regulations, SEBI Act and rules, regulations and guidelines issued by the GoI or SEBI (as the case may be) have been complied with and no statement made in this Final Placement Memorandum is contrary to the provisions of the InvIT Regulations, the SCRA, the SEBI Act, or rules, regulations, and guidelines issued thereunder (as the case may be). The Trustee (on behalf of the Highways Trust) further certifies that all the statements and disclosures in this Final Placement Memorandum are material, true, correct, not misleading and are adequate in order to enable the investors to make an informed decision.

**SIGNED BY THE TRUSTEE (ON BEHALF OF THE HIGHWAYS TRUST)**

For **AXIS TRUSTEE SERVICES LIMITED**

**Date:** August 22, 2022

**Place:** Mumbai

## **DECLARATION**

Galaxy Investments II Pte. Ltd. hereby declares and certifies that all relevant provisions of the InvIT Regulations, SEBI Act and rules, regulations and guidelines issued by the GoI or SEBI (as the case may be) have been complied with and no statement made in this Final Placement Memorandum is contrary to the provisions of the InvIT Regulations, the SCRA, the SEBI Act, or rules, regulations, and guidelines issued thereunder (as the case may be). We further certify that all the statements and disclosures in this Final Placement Memorandum are material, true, correct, not misleading and are adequate in order to enable the investors to make an informed decision.

**SIGNED BY THE DIRECTOR OF GALAXY INVESTMENTS II PTE. LTD.**

Madhura Narawane  
*Director*

**Date:** August 22, 2022

**Place:** Singapore

## **DECLARATION**

Galaxy Investments II Pte. Ltd. hereby declares and certifies that all relevant provisions of the InvIT Regulations, SEBI Act and rules, regulations and guidelines issued by the GoI or SEBI (as the case may be) have been complied with and no statement made in this Final Placement Memorandum is contrary to the provisions of the InvIT Regulations, the SCRA, the SEBI Act, or rules, regulations, and guidelines issued thereunder (as the case may be). We further certify that all the statements and disclosures in this Final Placement Memorandum are material, true, correct, not misleading and are adequate in order to enable the investors to make an informed decision.

**SIGNED BY THE DIRECTOR OF GALAXY INVESTMENTS II PTE. LTD.**

Tang Jin Rong  
*Director*

**Date:** August 22, 2022

**Place:** Singapore

**ANNEXURE I - VALUATION REPORT**

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**Prepared for:  
Highways Infrastructure Trust (“the Trust”)**

**Virescent Infrastructure Investment Manager Private Limited  
 (“the Investment Manager”)**

## **Valuation as per SEBI (Infrastructure Investment Trusts) Regulations, 2014 as amended**

**Fair Enterprise Valuation**

**Valuation Date: 31<sup>st</sup> March 2022**

**Mr. S Sundararaman,  
Registered Valuer,  
IBBI Registration No - IBBI/RV/06/2018/10238**

# S. SUNDARARAMAN

Registered Valuer

Registration No - IBBI/RV/06/2018/10238

RV/SSR/R/2023/06

Date: 30<sup>th</sup> June 2022

## Highways Infrastructure Trust

(acting through Axis Trustee Services Limited [in its capacity as "the Trustee" of the Trust])

2<sup>nd</sup> Floor, Piramal Tower,  
Peninsula Corporate Park,  
Lower Parel, Mumbai – 400 013.

## Virescent Infrastructure Investment Manager Private Limited

(acting as the Investment Manager to Highways Infrastructure Trust)

10<sup>th</sup> Floor, Parinee Crescenzo, C- 30,  
G Block, Bandra Kurla Complex,  
Bandra East, Mumbai – 400 051.

### Sub: Financial Valuation as per SEBI (Infrastructure Investment Trusts) Regulations, 2014, as amended ("the SEBI InvIT Regulations")

Dear Sir(s)/ Madam(s),

I, Mr. S. Sundararaman ("**Registered Valuer**" or "**RV**" or "**I**" or "**My**" or "**Me**") bearing IBBI registration number IBBI/RV/06/2018/10238, have been appointed vide letter dated 10<sup>th</sup> June 2022 as an independent valuer, as defined as per Regulation 2(zzf) of the SEBI InvIT Regulations, by **Virescent Infrastructure Investment Manager Private Limited** ("**VIIMPL**" or "**the Investment Manager**") acting as the investment manager for **Highways Infrastructure Trust** ("**the Trust**" or "**Highways InvIT**"), an infrastructure investment trust, registered with the **Securities Exchange Board of India** ("**SEBI**") with effect from 23<sup>rd</sup> December 2021, bearing registration number IN/InvIT/21-22/0019 and **Axis Trustee Services Limited** ("**the Trustee**") acting on behalf of the for the purpose of the financial valuation of the special purpose vehicles (defined below and hereinafter together referred as "**the SPVs**") of Galaxy Investments II Pte. Limited ("**the Sponsor**" or "**Galaxy**") as per the requirements of the Securities and Exchange Board of India (Infrastructure Investment Trusts) Regulations, 2014, as amended ("**SEBI InvIT Regulations**"). The SPVs to be valued are proposed to be transferred to the Trust set up under the SEBI InvIT Regulations, where VIIMPL is acting as the Investment Manager and Galaxy is the Sponsor as per the extant provisions of the SEBI InvIT Regulations.

I am enclosing the Report providing opinion on the fair enterprise value of the SPVs as defined hereinafter on a going concern basis as at 31<sup>st</sup> March 2022 ("**Valuation Date**").

Enterprise Value ("**EV**") is described as the total value of the equity in a business plus the value of its debt and debt related liabilities, minus any cash or cash equivalents to meet those liabilities. The attached Report details the valuation methodologies used, calculations performed and the conclusion reached with respect to this valuation.

I was further requested by the Investment Manager to provide the adjusted enterprise value of the SPVs as at 31<sup>st</sup> March 2022, where the adjusted enterprise value ("**Adjusted EV**") is derived as EV as defined above plus cash or cash equivalents of the SPVs as at 31<sup>st</sup> March 2022.

I have relied on explanations and information provided by the Investment Manager. Although, I have reviewed such data for consistency, those are not independently investigated or otherwise verified. My team and I have no present or planned future interest in the Trust, the SPVs or the Investment Manager except to the extent of this appointment as an independent valuer and the fee for this Valuation Report ("**Report**") which is not contingent upon the values reported herein. The valuation analysis should not be construed as investment advice, specifically, I do not express any opinion on the suitability or otherwise of entering into any financial or other transaction with the Trust.



Mr. S. Sundararaman, Registered Valuer

Registered Valuer Registration No - IBBI/RV/06/2018/10238

G Block, 5th Floor, Mena Kampala Arcade, New #18 & 20, Thiagaraya Road, T.Nagar, Chennai – 600 017, India

Telephone No.: +91 44 2815 4192

# S. SUNDARARAMAN

Registered Valuer

Registration No - IBBI/RV/06/2018/10238

This Report has been prepared solely for the purpose of inclusion as part of the Placement Memorandum ("PM") and the Final Placement Memorandum ("FPM) and such other documents as may be required in accordance with the independent valuation required as per the SEBI InvIT Regulations.

The SPVs are expected to be acquired by the Trust and are to be valued as per Regulation 21 read with Chapter V of the SEBI InvIT Regulations.

Following Special Purpose Vehicles are proposed to be transferred to the Trust:

Sr. No.	Name of the SPV	Term	Group
<b>NHAI Annuity Model Assets ("NHAI Annuity SPVs")</b>			
1	Nirmal BOT Limited	NBL	Annuity SPVs
2	Shillong Expressway Private Limited	SEPL	
<b>Toll Model Assets ("Toll SPVs")</b>			
3	Dewas Bhopal Corridor Private Limited	DBCPL	Toll SPVs
4	Godhra Expressways Private Limited	GEPL	
5	Jodhpur Pali Expressway Private Limited	JPEPL	
6	Ulundurpet Expressways Private Limited	UEPL	

(Hereinafter all the 6 companies mentioned above are together referred to as "the SPVs")

The analysis must be considered as a whole. Selecting portions of any analysis or the factors that are considered in this Report, without considering all factors and analysis together could create a misleading view of the process underlying the valuation conclusions. The preparation of a valuation is a complex process and is not necessarily susceptible to partial analysis or summary description. Any attempt to do so could lead to undue emphasis on any particular factor or analysis.

The information provided to me by the Investment Manager in relation to the SPVs included but not limited to historical financial statements, forecasts/projections, other statements and assumptions about future matters like forward-looking financial information prepared by the Investment Manager. The forecasts and projections as supplied to me are based upon assumptions about events and circumstances which are yet to occur.

By nature, valuation is based on estimates, however, considering the outbreak of COVID-19 Pandemic and the consequent economic slowdown, the risks and uncertainties relating to the events occurring in the future, the actual figures in future may differ from these estimates and may have an impact on the valuation of the SPVs.

Further, considering the current crisis in relation to COVID-19 in India and across the globe, I have been informed by the Investment Manager, that the forecasts / projections provided for the valuation exercises are prepared after reasonably evaluating and incorporating the impact of outbreak of COVID-19 pandemic as per prevalent conditions as on date.

I have not tested individual assumptions or attempted to substantiate the veracity or integrity of such assumptions in relation to the forward-looking financial information, however, I have made sufficient enquiry to satisfy myself that such information has been prepared on a reasonable basis.

Notwithstanding anything above, I cannot provide any assurance that the forward looking financial information will be representative of the results which will actually be achieved during the cash flow forecast period.

The valuation provided by RV and the valuation conclusion are included herein and the Report complies with the SEBI InvIT Regulations and guidelines, circular or notification issued by the Securities and Exchange Board of India ("SEBI") thereunder.



S. Sundararaman, Registered Valuer

Registered Valuer Registration No - IBBI/RV/06/2018/10238

5B, "A" Block, 5th Floor, Mena Kampala Arcade, New #18 & 20, Thiagaraya Road, T.Nagar, Chennai – 600 017, India

Telephone No.: +91 44 2815 4192

# S. SUNDARARAMAN

Registered Valuer

Registration No - IBBI/RV/06/2018/10238

Please note that all comments in the Report must be read in conjunction with the caveats to the Report, which are contained in Section 11 of this Report. This letter, the Report and the summary of valuation included herein can be provided to Trust's advisors and may be made available for the inspection to the public and with the SEBI, the stock exchanges and any other regulatory and supervisory authority, as may be required.

RV draws your attention to the limitation of liability clauses in Section 11 of this Report.

This letter should be read in conjunction with the attached Report.

Yours faithfully,



**S. Sundararaman**

Registered Valuer

IBBI Registration No.: IBBI/RV/06/2018/10238

Asset Class: Securities or Financial Assets

Place: Chennai

UDIN: 22028423ALZYEO5839

Mr. S Sundararaman, Registered Valuer

Registered Valuer Registration No - IBBI/RV/06/2018/10238

5B, "A" Block, 5th Floor, Mena Kampala Arcade, New #18 & 20, Thiagaraya Road, T.Nagar, Chennai – 600 017, India

Telephone No.: +91 44 2815 4192

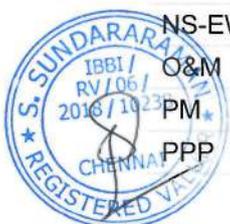
Contents

Section	Particulars	Page No.
1	Executive Summary	8
2	Procedures adopted for current valuation exercise	14
3	Overview of the InvIT and the SPVs	15
4	Proposed Transaction	29
5	Overview of the Industry	30
6	Valuation Methodology and Approach	37
7	Valuation of the SPVs	41
8	Valuation Conclusion	46
9	Additional procedures for compliance with InvIT Regulations	49
10	Sources of Information	52
11	Exclusions and Limitations	53
<b>Appendices</b>		
12	Appendix 1 : Valuation of SPVs as on 31 <sup>st</sup> March 2022	57
13	Appendix 2 : Weighted Average Cost of Capital of the SPVs	64
14	Appendix 3: Summary of Approvals and Licenses	66
15	Appendix 4: Summary of Ongoing Litigations	71



Definition, abbreviation & glossary of terms

Abbreviations	Meaning
BOT	Build, Operate and Transfer
Capex	Capital Expenditure
CCIL	Clearing Corporation of India Limited
CCM	Comparable Companies Multiples
COD	Commercial Operation Date
Cr	Crores
CTM	Comparable Transactions Multiples
DBFOT	Design, Build, Finance, Operate and Transfer
DCF	Discounted Cash Flow
DBCPL	Dewas Bhopal Corridor Private Limited
EBITDA	Earnings Before Interest, Taxes, Depreciation and Amortization
ERP	Equity Risk Premium
ETC	Electronic Toll Collection
EV	Enterprise Value
FCFF	Free Cash Flow to the Firm
FDI	Foreign Direct Investment
FPM	Final Placement Memorandum
FY	Financial Year Ended 31 <sup>st</sup> March
GEPL	Godhra Expressways Private Limited
GQ	Golden Quadrilateral
HAM	Hybrid Annuity Model
Ind AS	Indian Accounting Standards
INR	Indian Rupees
Investment Manager/VIIMPL	Virescent Infrastructure Investment Manager Private Limited
IVS	ICAI Valuation Standards 2018
JPEPL	Jodhpur Pali Expressway Private Limited
Kms	Kilometres
MoRTH	Ministry of Road Transport and Highways
MMR	Major Maintenance and Repairs
MPRDC	Madhya Pradesh Road Development Corporation Limited
Mn	Million
NAV	Net Asset Value Method
NBL	Nirmal BOT Limited
NCA	Net Current Assets Excluding Cash and Bank Balances
NH	National Highway
NHAI	National Highways Authority of India
NHDP	National Highways Development Project
NS-EW	North- South and East-West Corridors
O&M	Operation & Maintenance
PM	Placement Memorandum
PPP	Public Private Partnership



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RFID	Radio Frequency Identification
RV	Registered Valuer
SEBI	Securities and Exchange Board of India
SEBI InvIT Regulations	SEBI (Infrastructure Investment Trusts) Regulations, 2014, as amended
SEPL	Shillong Expressway Private Limited
SH	State Highway
Sponsor/ Galaxy	Galaxy Investments II Pte. Limited
SPV	Special Purpose Vehicle
the Trustee	Axis Trustee Services Limited
UEPL	Ulundurpet Expressways Private Limited



1. Executive Summary

1.1. Background

- 1.1.1. Galaxy Investments II Pte. Limited ("**the Sponsor**" or "**Galaxy**") has floated an infrastructure investment trust under the SEBI InvIT Regulations called "**Highways Infrastructure Trust**" ("**Highways InvIT**" or "**the Trust**"). Galaxy was incorporated on 11<sup>th</sup> June 2021 in Singapore. Galaxy is involved in investment activities primarily with an objective of earning long term capital appreciation. Galaxy seeks to invest in companies incorporated in India that operate in the "infrastructure" sector.
- 1.1.2. Galaxy is a 100% subsidiary of Galaxy Investments Pte. Ltd., which is invested in by funds, vehicles and/or entities managed and/or advised by Kohlberg Kravis Roberts & Co. LP and/ or its affiliates (collectively "**KKR**").
- 1.1.3. Founded in 1976, KKR is a leading global investment firm that offers alternative asset management and capital markets and insurance solutions with approximately US\$479 billion of assets under management as of 31<sup>st</sup> March 2022.
- 1.1.4. Axis Trustee Services Limited ("**the Trustee**") has been appointed as the Trustee of the Highways InvIT. Virescent Infrastructure Investment Manager Private Limited ("**VIIMPL**" or "**the Investment Manager**") has been appointed as the Investment Manager to the Trust by the Trustee and will be responsible to carry out the duties of such person as mentioned under the SEBI InvIT Regulations.
- 1.1.5. Shareholding of the Investment Manager as on the Valuation Date is as under :

Sr. No.	Particulars	No. of shares	%
1	Terra Asia Holdings II Pte. Ltd.	11,009,999	86.4%
2	Terra Asia Holdings I Pte. Ltd.*	1	-
3	PIP7 Peacock SARL	17,37,753	13.6%
	<b>Total</b>	<b>12,747,753</b>	<b>100.0%</b>

Source: Investment Manager

\* as a nominee of Terra Asia Holdings II Pte. Ltd.

- 1.1.6. I understand that Highways InvIT, acting through the Trustee, shall acquire the equity held by the Sponsor or/and other shareholders in its 6 SPVs mentioned below, following which units will be issued to the Sponsor by the Trust, which are to be listed on one or more Indian stock exchanges consequent to the proposed private placement of the Trust ("**the Proposed Transaction**").
- 1.1.7. In this regard, the Investment Manager intends to undertake an independent valuation of the SPVs (as defined in para 1.1.6) as per the extant provisions of the SEBI InvIT Regulations issued by Securities and Exchange Board of India ("**SEBI**").
- 1.1.8. **Financial Assets to be Valued**

The financial assets under consideration are valued at Enterprise Value and Adjusted Enterprise Value of the following:

Sr. No.	Name of the SPV
	<b>NHAI Annuity Model Assets ("NHAI Annuity SPVs")</b>
1	Nirmal BOT Limited ("NBL")
2	Shillong Expressway Private Limited ("SEPL")
	<b>Toll Model Assets ("Toll SPVs")</b>
3	Dewas Bhopal Corridor Private Limited ("DBCPL")
4	Godhra Expressways Private Limited ("GEPL")
5	Jodhpur Pali Expressway Private Limited ("JPEPL")
6	Ulundurpet Expressways Private Limited ("UEPL")

Together referred to as "**the SPVs**")



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- 1.1.9. In this regard, the Investment Manager has appointed me, S. Sundararaman (“**Registered Valuer**” or “**RV**” or “**I**” or “**My**” or “**Me**”) bearing IBBI registration number IBBI/RV/06/2018/10238 to undertake fair valuation of the SPVs at the enterprise level as per the extant provisions of the SEBI InvIT Regulations issued by SEBI. Enterprise Value (“**EV**”) is described as the total value of the equity in a business plus the value of its debt and debt related liabilities, minus any cash or cash equivalents to meet those liabilities.
- 1.1.10. Further, on the request of the Investment Manager, I have calculated Adjusted Enterprise Value of the SPVs which is derived as the EV as defined above plus cash or cash equivalents of the SPVs as at the Valuation Date.
- 1.1.11. I declare that:
- i. I am competent to undertake the financial valuation in terms of the SEBI InvIT Regulations;
  - ii. I am not an associate of the sponsor(s) or investment manager or trustee and I have not less than five years of experience in valuation of infrastructure assets;
  - iii. I am independent and have prepared the Report on a fair and unbiased basis;
  - iv. I have valued the SPVs based on the valuation standards as specified / applicable as per SEBI InvIT Regulations.
- 1.1.12. This Report covers all the disclosures required as per the SEBI InvIT Regulations and the Valuation of the SPVs is impartial, true and fair and in compliance with the SEBI InvIT Regulations.



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## 1.2. Scope of Valuation

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### 1.2.1. Valuation Base

Valuation Base means the indication of the type of value being used in an engagement. In the present case, I have determined the fair value of the SPVs at the enterprise level. Fair Value Bases defined as under:

#### **Fair Value**

Fair value is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction between market participants at the valuation date. It is the price that would be received to sell an asset or paid to transfer a liability in an orderly transaction in the principal (or most advantageous) market at the measurement date under current market conditions (i.e. an exit price) regardless of whether that price is directly observable or estimated using another valuation technique. Fair value or Market value is usually synonymous to each other except in certain circumstances where characteristics of an asset translate into a special asset value for the party(ies) involved.

### 1.2.2. Valuation Date

Valuation Date is the specific date at which the value of the assets to be valued gets estimated or measured. Valuation is time specific and can change with the passage of time due to changes in the condition of the asset to be valued. Accordingly, valuation of an asset as at a particular date can be different from other date(s).

The Valuation Date considered for the fair enterprise valuation of the SPVs is 31<sup>st</sup> March 2022 ("**Valuation Date**"). The attached Report is drawn up by reference to accounting and financial information as on 31<sup>st</sup> March 2022. The RV is not aware of any other events having occurred since 31<sup>st</sup> March 2022 till date of this Report which he deems to be significant for his valuation analysis.

### 1.2.3. Premise of Value

Premise of Value refers to the conditions and circumstances how an asset is deployed. In the present case, RV has determined the fair enterprise value of the SPVs on a Going Concern Value defined as under:

#### **Going Concern Value**

Going Concern value is the value of a business enterprise that is expected to continue to operate in the future. The intangible elements of going concern value result from factors such as having a trained work force, an operational plant, necessary licenses, systems, and procedures in place etc.



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1.3. Summary of Valuation

I have assessed the fair enterprise value of each of the SPVs on a stand-alone basis by using the Discounted Cash Flow (“DCF”) method under the income approach. Following table summarizes my explanation on the usage or non usage of different valuation methods:

Valuation Approach	Valuation Methodology	Used	Explanation
Cost Approach	Net Asset Value	No	NAV does not capture the future earning potential of the business. Hence NAV method is considered only for background reference.
Income Approach	Discounted Cash Flow	Yes	<p><b>For Annuity SPVs:</b> The revenue of NHAI Annuity SPVs is mainly derived from the annuity fees that are typically pre-determined with NHAI (as specified in the respective concession agreement) and cannot be modified to reflect prevailing circumstances like inflation &amp; interest rates.</p> <p><b>For Toll SPVs:</b> The Toll SPVs derive almost all of their revenue from their toll-road operations. The Toll SPVs are substantially dependent on the accuracy of the traffic volume forecasts for their respective projects.</p> <p>Accordingly, since all the SPVs are generating income based on pre-determined agreements / mechanism and since the Investment Manager has provided me the financial projections for the balance tenor of the concessions agreements, DCF Method under the income approach has been considered as the appropriate method for the present valuation exercise.</p>
Market Approach	Market Price	No	The equity shares of the SPVs are not listed on any recognized stock exchange in India. Hence, I was unable to apply the market price method.
	Comparable Companies	No	In the absence of any exactly comparable listed companies with characteristics and parameters similar to that of the SPVs, I am unable to consider this method for the current valuation.
	Comparable Transactions	No	In the absence of adequate details about the Comparable Transactions, I was unable to apply the CTM method.

Under the DCF Method, the Free Cash Flow to Firm (“FCFF”) has been used for the purpose of valuation of each of the SPVs. In order to arrive at the fair EV of the individual SPVs under the DCF Method, I have relied on audited financial statements as at 31<sup>st</sup> March 2022 prepared in accordance with the Indian Accounting Standards (Ind AS) and the financial projections of the respective SPVs prepared by the Investment Manager as at the Valuation Date based on their best judgement.

The discount rate considered for the respective SPVs for the purpose of this valuation exercise is based on the Weighted Average Cost of Capital (“WACC”) for each of the SPVs. As all the SPVs under considerations have executed projects under the BOT /DBFOT model, the operating rights of the underlying assets shall be transferred back to the appointing authority after the expiry of the concession period. At the end of the agreed concession period, the operating rights in relation to the roads, the obligation to maintain the road and the right to collect tolls from the vehicles using the road revert to the government entity that granted the concession by the SPVs. Accordingly,



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terminal period value i.e. value on account of cash flows to be generated after the expiry of concession period has not been considered.

Based on the methodology and assumptions discussed further, RV has arrived at the fair enterprise value of the SPVs as on the Valuation Date:

Sr. No.	SPVs	Approximate Projection Period (Balance Project Period#)	WACC	Fair Value of EV* (INR Mn)	Fair Value of Adjusted EV** (INR Mn)
1	NBL	~5 years 6 months	8.5%	1,362	1,929
2	SEPL	~3 years 10 month	7.8%	567	1,504
3	DBCPL	~11 years 8 months	10.5%	14,760	15,707
4	GEPL	~21 years 3 months	10.4%	21,281	22,184
5	JPEPL	~21 years 5 months	10.5%	8,628	8,847
6	UEPL	~4 years 11 months	10.1%	5,423	6,559
<b>Total</b>				<b>52,022</b>	<b>56,729</b>

# including likely extension(s) as detailed in this report

\* Enterprise Value ("EV") is described as the total value of the equity in a business plus the value of its debt and debt related liabilities, minus any cash or cash equivalents to meet those liabilities.

\*\* Further, on the request of the Investment Manager, I have calculated Adjusted Enterprise Value of the SPVs which is derived as the EV as defined above plus cash or cash equivalents of the SPVs as at the Valuation Date.

(Refer Appendix 1 & 2 for the detailed workings)

Further to above, considering that present valuation exercise is based on the future financial performance and based on opinions on the future credit risk, cost of debt assumptions, etc., which represent reasonable expectations at a particular point of time, but such information, estimates or opinions are not offered as predictions or as assurances that a particular level of income or profit will be achieved, a particular event will occur or that a particular level of income or profit will be achieved, a particular event will occur or that a particular price will be offered or accepted. Actual results achieved during the period covered by the prospective financial analysis will vary from these estimates and variations may be material. Accordingly, a quantitative sensitivity analysis is considered on the following unobservable inputs:

1. WACC by increasing / decreasing it by 0.5%
2. WACC by increasing / decreasing it by 1.0%
3. Revenue of Toll SPVs by increasing / decreasing it by 10%
4. Operation and Maintenance Expenses by increasing / decreasing it by 20%

### 1. Fair Enterprise Valuation Range based on WACC parameter (0.5%)

Sr. No.	SPVs	INR Mn					
		WACC + 0.5%	EV	Base WACC	EV	WACC - 0.5%	EV
1	NBL	9.0%	1,343	8.5%	1,362	8.0%	1,381
2	SEPL	8.3%	564	7.8%	567	7.3%	571
3	DBCPL	11.0%	14,364	10.5%	14,760	10.0%	15,172
4	GEPL	10.9%	20,283	10.4%	21,281	9.9%	22,350
5	JPEPL	11.0%	8,207	10.5%	8,628	10.0%	9,079
6	UEPL	10.6%	5,363	10.1%	5,423	9.6%	5,485
<b>Total of all SPVs</b>			<b>50,123</b>		<b>52,022</b>		<b>54,038</b>



2. Fair Enterprise Valuation Range based on WACC parameter (1.0%)

Sr. No.	SPVs	WACC + 1.0%	EV	Base WACC	EV	WACC - 1.0%	INR Mn
							EV
1	NBL	9.5%	1,325	8.5%	1,362	7.5%	1,401
2	SEPL	8.8%	560	7.8%	567	6.8%	574
3	DBCPL	11.5%	13,983	10.5%	14,760	9.5%	15,602
4	GEPL	11.4%	19,349	10.4%	21,281	9.4%	23,494
5	JPEPL	11.5%	7,814	10.5%	8,628	9.5%	9,562
6	UEPL	11.1%	5,303	10.1%	5,423	9.1%	5,549
Total of all SPVs			48,335		52,022		56,182

3. Fair Enterprise Valuation Range based on Revenue parameter of Toll SPVs (10%)

Sr. No.	SPVs	EV at Revenue - 10%	EV at Base Revenue	INR Mn
				EV at Revenue + 10%
1	NBL	NA	NA	NA
2	SEPL	NA	NA	NA
3	DBCPL	12,990	14,760	16,523
4	GEPL	18,807	21,281	23,756
5	JPEPL	7,441	8,628	9,812
6	UEPL	4,805	5,423	6,042
Total of all SPVs		44,043	50,092	56,132

4. Fair Enterprise Valuation Range based on Operation and Maintenance Expenses parameter (20%)

Sr. No.	SPVs	EV at Expenses + 20%	EV at Base Expenses	INR Mn
				EV at Expenses - 20%
1	NBL	1,275	1,362	1,449
2	SEPL	493	567	637
3	DBCPL	14,092	14,760	15,417
4	GEPL	20,803	21,281	21,760
5	JPEPL	7,998	8,628	9,252
6	UEPL	5,193	5,423	5,654
Total of all SPVs		49,855	52,022	54,168

The above represents reasonable range of fair enterprise valuation of the SPVs.



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**2. Procedures adopted for current valuation exercise**

- 2.1. I have performed the valuation analysis, to the extent applicable, in accordance with ICAI Valuation Standards 2018 ("IVS") issued by the Institute of Chartered Accountants of India.
- 2.2. In connection with this analysis, I have adopted the following procedures to carry out the valuation analysis:
- 2.2.1. Requested and received financial and qualitative information relating to the SPVs;
  - 2.2.2. Obtained and analyzed data available in public domain, as considered relevant by me;
  - 2.2.3. Discussions with the Investment Manager on:
    - Understanding of the business of the SPVs – business and fundamental factors that affect its earning-generating capacity including strengths, weaknesses, opportunities and threats analysis and historical and expected financial performance;
  - 2.2.4. Undertook industry analysis:
    - Research publicly available market data including economic factors and industry trends that may impact the valuation;
    - Analysis of key trends and valuation multiples of comparable companies/comparable transactions, if any, using proprietary databases subscribed by me;
  - 2.2.5. Analysis of other publicly available information;
  - 2.2.6. Selection of valuation approach and valuation methodology/(ies), in accordance with IVS, as considered appropriate and relevant by me;
  - 2.2.7. Conducted physical site visit of the road stretch of the SPVs;
  - 2.2.8. Determination of fair value of the EV of the SPVs on a going concern basis till the end of the concession period as at the Valuation Date and determination of fair value of the Adjusted EV of the SPVs on a going concern basis till the end of the concession period as at the Valuation Date on request of the Investment Manager.



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### 3. Overview of Sponsor, InvIT and SPVs

#### 3.1. Sponsor / Galaxy Investments II Pte. Limited (“Galaxy”)

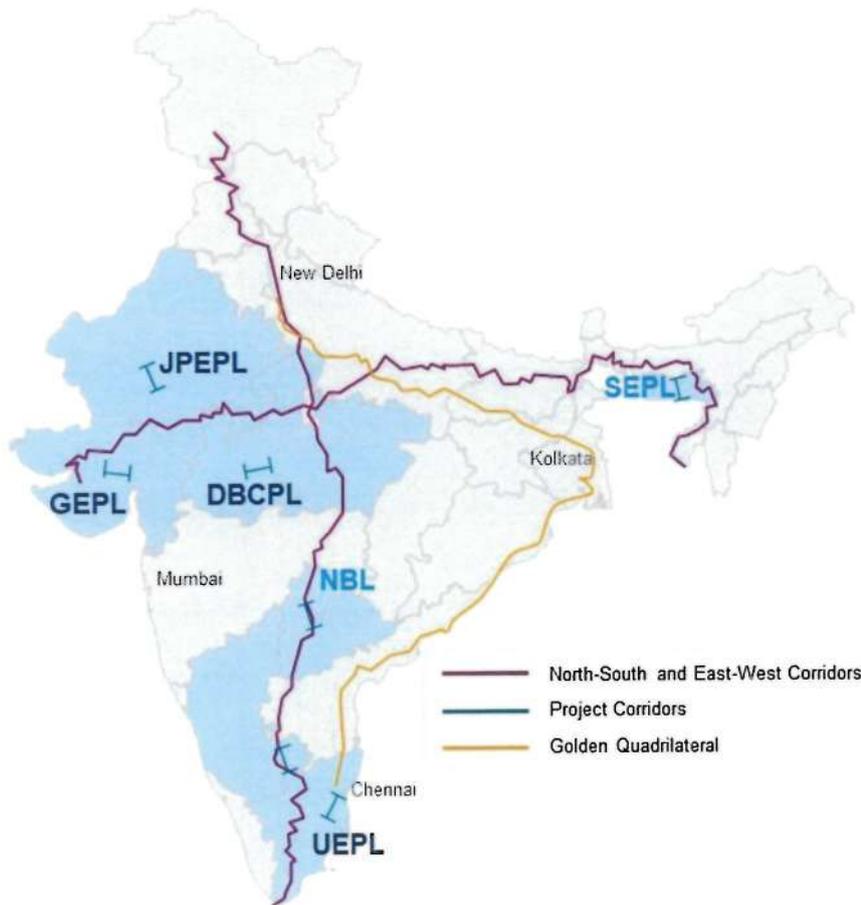
3.1.1. Galaxy Investments II Pte. Limited is the Sponsor of the Highways Trust. The Sponsor was incorporated on 11<sup>th</sup> June 2021 in Singapore. Galaxy is involved in investment activities primarily with an objective of earning long term capital appreciation. Galaxy seeks to invest in companies incorporated in India that operate in the “infrastructure” sector.

3.1.2. Galaxy is a 100% subsidiary of Galaxy Investments Pte. Ltd., which is invested in by funds, vehicles and/or entities managed and/or advised by Kohlberg Kravis Roberts & Co. LP and/ or its affiliates (collectively “KKR”).

3.1.3. Founded in 1976, KKR is a leading global investment firm that offers alternative asset management and capital markets and insurance solutions with approximately US\$479 billion of assets under management as of 31<sup>st</sup> March 2022.

3.1.4. I understand that the proposed Highways InvIT, acting through the Trustee, shall acquire the equity held by the Sponsor in the SPVs following which units will be issued to the Sponsor by the Trust, which are to be listed on one or more Indian stock exchanges consequent to the proposed private placement of the Trust.

3.2. Following is a map of India showing the area covered by the proposed SPVs of the Trust:



Source: Investment Manager

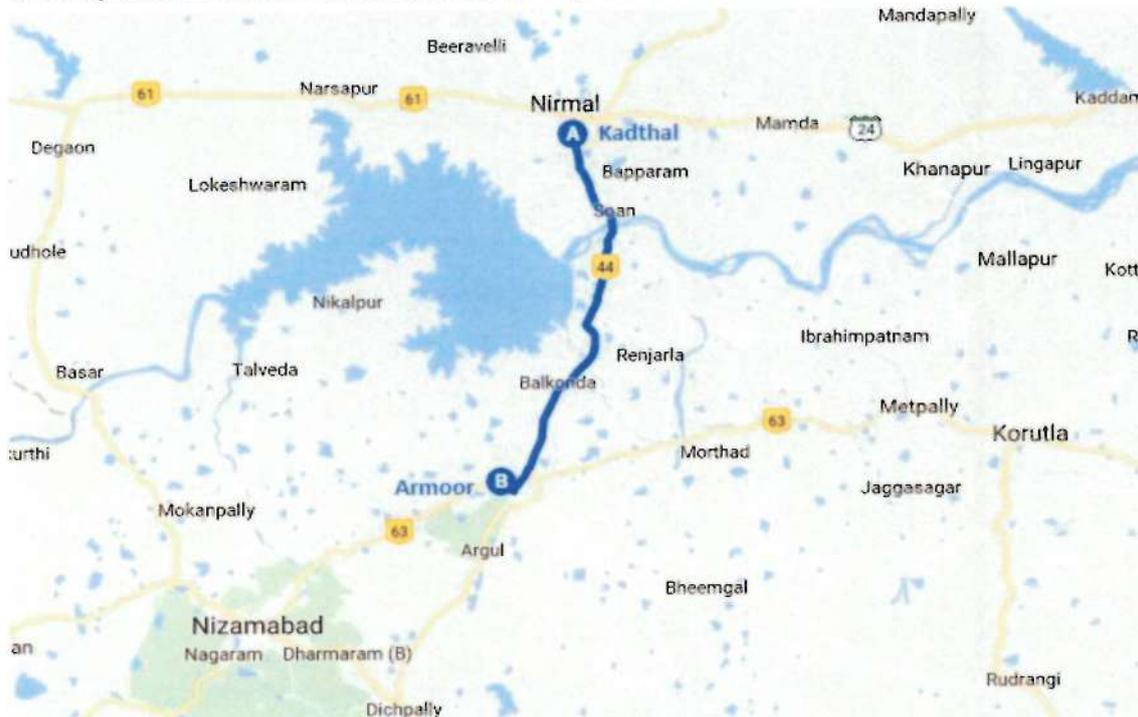


**Background of the SPVs**

**3.4. Nirmal BOT Limited (“NBL”)**

3.4.1. The Project Road is a Section of NH-7 which starts from Kadthal in Adilabad District (New Ch. 282+617) and ends at Armur in Nizamabad District (New Ch. 313+507). The Project Road crosses the Godavari river at the major bridge Ch. 289+834 (36x20.9m) and has a length of 30.89 km. This Project for up-gradation of the existing road to four lane carriageway with paved shoulders was awarded by the National Highways Authority of India to M/s. Nirmal BOT Limited for a Concession Period of 20 years on BOT (Annuity) basis.

The map below illustrates the location of the Project and the corridor it covers:



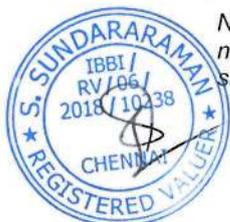
Source: Investment Manager

3.4.2. Summary of project details of NBL are as follows:

Parameters	Details
Total Length	123.56 Lane Kms
Nos. of Lanes	4
NH / SH	NH 7
State Covered	Telangana
Area (Start and End)	Kadthal-Armur
Project Cost	INR 3,150 Mn
PPP Model	BOT
Project Type	Annuity
Concession Granted by	NHA
COD Date	22 July 2009
Nos. of Annuities	36 (Semi-annual)
Total Annuity Amount	INR 8,568 Mn
Concession Period (CP)	20 years from Appointed Date

Source: Investment Manager

Note: The State/ National Highway numbers and chainages mentioned in this Report are old Highway numbers and chainages as per the concession agreements. The actual SH/ NH numbers and chainage at site may differ based on subsequent changes.



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3.4.3. The corridor forms a part of existing road from Km 278 to 308 (Approx. 30.9 Kms) between Kadtal and Armur of NH-7.

Sr. No.	Salient Features	Units
1	Total Length of Main Carriageway 4 Lane with Rigid Pavement	0
2	Total length of Service Roads	14.48 Kms
3	No of Toll Plazas	1
4	No of Bus Bays with Bus Shelters	30
5	Number of Truck Lay Bays	5
6	No of Rest Areas	0
7	No of Major Junctions	3
8	No of Minor Junctions	8
9	No of Vehicular underpasses	4
10	No of Pedestrian underpasses	12
11	No of Major Bridges	2
12	No of Minor Bridges	6
13	No of Hume Pipe Culverts	55
14	No of Box / Slab Culverts	28

Source: Investment Manager

3.4.4. The shareholding of NBL as on Valuation Date is as follows:

Sr. No.	Particulars	No. of Shares	%
1	Galaxy Investments II Pte Ltd*	3,15,00,000	100.00%
	<b>Total</b>		<b>100.00%</b>

\*Includes Shares held by nominees of Galaxy

Source: Investment Manager

I have been represented by the Investment Manager that there is no change in shareholding pattern from the Valuation Date till the date of this Report.

3.4.5. My team had conducted physical site visit of the road stretch of NBL on 7<sup>th</sup> March 2022. Refer below for the pictures of the road stretch:





**3.5. Shillong Expressway Private Limited (“SEPL”)**

3.5.1. SEPL has constructed a 2 lane Shillong Bypass Connecting NH-40 and NH-44 from KM 61.80 on NH-40 near Barapani to KM 34.85 on NH-44 on the Shillong bypass section of NH-40 and NH-44 in the state of Meghalaya on Design, Build, Finance, Operate and Transfer (“DBFOT Annuity”) Basis. The entire project road passes through rural & Forest area with very thin inhabitations. Bhoilymbong, the only town in the area which is bypassed.

The project corridor generally runs in rolling/hilly terrain for most of length except in few locations where it is slightly plain. The land use along the project road is mostly forest. It passes through small village settlements like Umroi, Nongtrah, Diengpasoh, Thangshalai, Mawryngkneng etc.

The map below illustrates the location of the Project and the corridor it covers:



Source: Investment Manager

3.5.2. Summary of project details of SEPL are as follows:

Parameters	Details
Total Length	97.53 Lane Kms
Nos. of Lanes	2
NH / SH	NH-40/44
State Covered	Meghalaya
Area (Start and End)	Umiam to Mawryngkneng
Project Cost	INR 2,480 Mn



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PPP Model	DBFOT
Project Type	Annuity
Concession Granted by	NHAI
COD Date	28 February 2013
Nos. of Annuities	24 (semi-annual)
Total Annuity Amount	INR 5,969 Mn
Concession Period (CP)	15 years from Appointed Date

Source: Investment Manager

3.5.3. The corridor forms a part of existing road from KM 61.80 of NH-40 and 34.85 of NH-44.

Sr. No.	Salient Features	Units
1	Total Length of Main Carriageway 2 Lane with Rigid Pavement	0
2	Total Length of Main Carriageway 2 Lane with Flexible Pavement	48.77 Kms
3	Total length of Service Roads	NA
4	No of Toll Plazas	1
5	No of Bus Bays with Bus Shelters	13
6	Number of Truck Lay Bays	0
7	No of Rest Areas	0
8	No of Major Junctions	2
9	No of Minor Junctions	64
10	No of Vehicular underpasses	1
11	No of Pedestrian underpasses	0
12	No of Major Bridges	3
13	No of Minor Bridges	8
14	No of Hume Pipe Culverts	218
15	No of Box / Slab Culverts	22

Source: Investment Manager

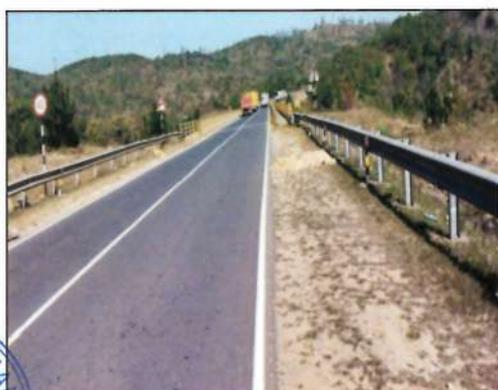
3.5.4. The shareholding of SEPL as on Valuation Date is as follows:

Sr. No.	Particulars	No. of Shares	%
1	Galaxy Investments II Pte Ltd*	5,00,000	100.00%
	<b>Total</b>	<b>5,00,000</b>	<b>100.00%</b>

\*Includes Shares held by nominees of Galaxy

Source: Investment Manager

3.5.5. My team had conducted physical site visit of the road stretch of SEPL on 7<sup>th</sup> March 2022. Refer below for the pictures of the road stretch:

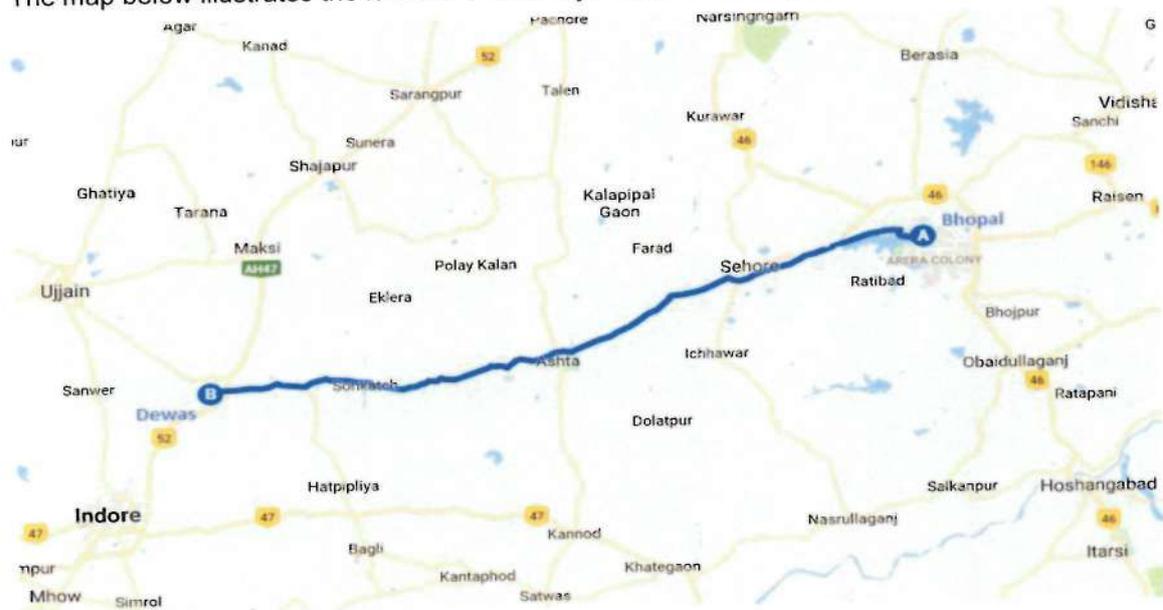




**3.6. Dewas Bhopal Corridor Private Limited (“DBCPL”)**

3.6.1. The MPRDC and DBCPL entered into the concession agreement dated June 30, 2007 (the “Concession Agreement”). DBCPL was awarded a project on BOT basis under the Concession Agreement for reconstruction, strengthening, widening and rehabilitation of the Bhopal-Dewas section including (including all bypasses) from KM 6.8 to KM 151.6 on SH-18 to 4-lane section in the State of Madhya Pradesh.

The map below illustrates the location of the Project and the corridor it covers:



Source: Investment Manager

3.6.2. Summary of project details of DBCPL are as follows:

Parameters	Details
Total Length	563.2 Lane Kms
Nos. of Lanes	4
NH / SH	SH-18
State Covered	Madhya Pradesh
Area (Start and End)	Bhopal to Dewas
Project Cost	INR 6,020 Mn
PPP Model	BOT
Project Type	Toll
Concession Granted by	MPRDC
COD Date	10 February 2009



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Original Concession Period (CP)	25 years from Appointed Date
Extension (If any)	258 days
Likely End of CP (including extension)	2 December 2033

Source: Investment Manager

3.6.3. The corridor forms a part of existing road from KM 6.8 to KM 151.6 (Approx. 140.8 Kms) from Bhopal to Dewas in SH-18

Sr. No.	Salient Features	Units
1	Total Length of Main Carriageway 4 Lane with Rigid Pavement	0
2	Total Length of Main Carriageway 4 Lane with Flexible Pavement	140.79 Kms
3	Total length of Service Roads	9.09 Kms
4	No of Toll Plazas	3
5	No of Bus Bays with Bus Shelters	3
6	Number of Truck Lay Bays	1
7	No of Rest Areas	0
8	No of Major Junctions	19
9	No of Minor Junctions	70
10	No of Vehicular underpasses	1
11	No of Pedestrian underpasses	1
12	No of Major Bridges	4
13	No of Minor Bridges	17
14	No of Hume Pipe Culverts	109
15	No of Box / Slab Culverts	53

Source: Investment Manager

3.6.4. The shareholding of DBCPL as on Valuation Date is as follows:

Sr. No.	Particulars	No. of Shares	%
1	Galaxy Investments II Pte Ltd*	1,00,000	100.00%
	<b>Total</b>	<b>1,00,000</b>	<b>100.00%</b>

\*Includes Shares held by nominees of Galaxy

Source: Investment Manager

3.6.5. Projections provided by the Investment Manager consider an extension of ~258 days from original concession end date, owing to:

- ~23 days were extended by MPRDC on account of demonetisation vide order no.02/MPRDC/BOT/D-B/2017/4947 dated 19<sup>th</sup> June 2017.
- 195 days were extended by MPRDC on account of change in scope vide order no. 11617/Maint/Bhopal-Dewas/MPRDC/2018 dated 25<sup>th</sup> October 2013.
- 40 days were extended by MPRDC on account of force majeure event due to COVID-19.

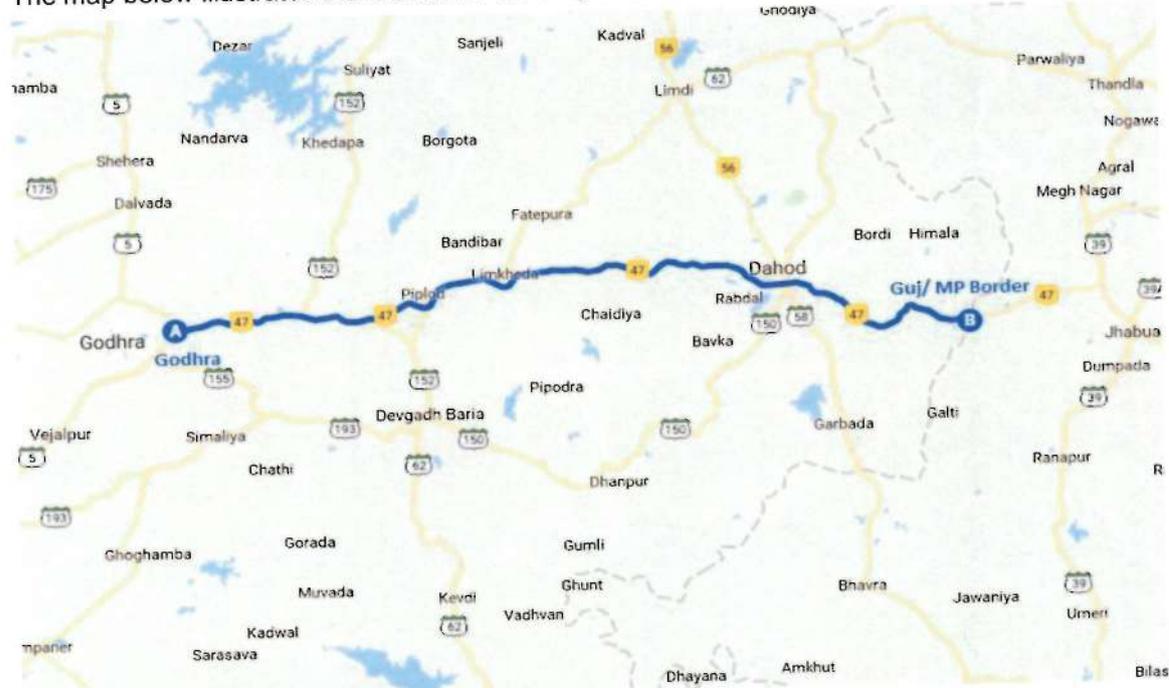
3.6.6. My team had conducted physical site visit of the road stretch of DBCPL on 4<sup>th</sup> March 2022. Refer below for the pictures of the road stretch:





**3.7. Godhra Expressways Private Limited (“GEPL”)**

3.7.1. The NHAI and GEPL entered into the concession agreement dated February 25, 2010 (the “GEPL Concession Agreement”). GEPL operates, on a four-lane highway from Godhra to Gujarat/ Madhya Pradesh Border Section of NH-59 (now NH-47) from KM 129.30 to KM 215.90, in the State of Gujarat, under NHDP Phase III on Design, Build, Finance, Operate and Transfer (“DBFOT”) basis. The map below illustrates the location of the Project and the corridor it covers:



Source: Investment Manager

3.7.2. Summary of project details of GEPL are as follow

Parameters	Details
Total Length	348.41 Lane Kms
Nos. of Lanes	4
NH / SH	NH-59
State Covered	Gujarat
Area (Start and End)	Godhra to Gujarat/ MP Border
Project Cost	INR 7,956 Mn
PPP Model	BOT
Project Type	Toll
Concession Granted by	NHAI
COD Date	31 October 2013
Original Concession Period (CP)	27 years from Appointed Date
Extension (If any)	1,973 days



Likely End of CP (including extension) 25 July 2043

Source: Investment Manager

- 3.7.3. The corridor forms a part of existing road from KM 129.3 to 215.9 (Approx. 87.10 Kms) from Godhra to Gujarat-Madhya Pradesh border in NH-59

Sr. No.	Salient Features	Units
1	Total Length of Main Carriageway 4 Lane with Rigid Pavement	83.1 Kms
2	Total Length of Main Carriageway 4 Lane with Flexible Pavement	4 kms
3	Total length of Service Roads	19.76 Kms
4	No of Toll Plazas	1
5	No of Bus Bays with Bus Shelters	24
6	Number of Truck Lay Bays	6
7	No of Rest Areas	0
8	No of Major Junctions	4
9	No of Minor Junctions	81
10	No of Vehicular underpasses	4
11	No of Pedestrian underpasses	13
12	No of Major Bridges	6
13	No of Minor Bridges	16
14	No of Hume Pipe Culverts	98
15	No of Box / Slab Culverts	32

Source: Investment Manager

- 3.7.4. The shareholding of GEPL as on Valuation Date is as follows:

Sr. No.	Particulars	No. of Shares	%
1	Galaxy Investments II Pte Ltd*	2,33,80,840	100.00%
	<b>Total</b>	<b>2,33,80,840</b>	<b>100.00%</b>

\*Includes Shares held by nominees of Galaxy

Source: Investment Manager

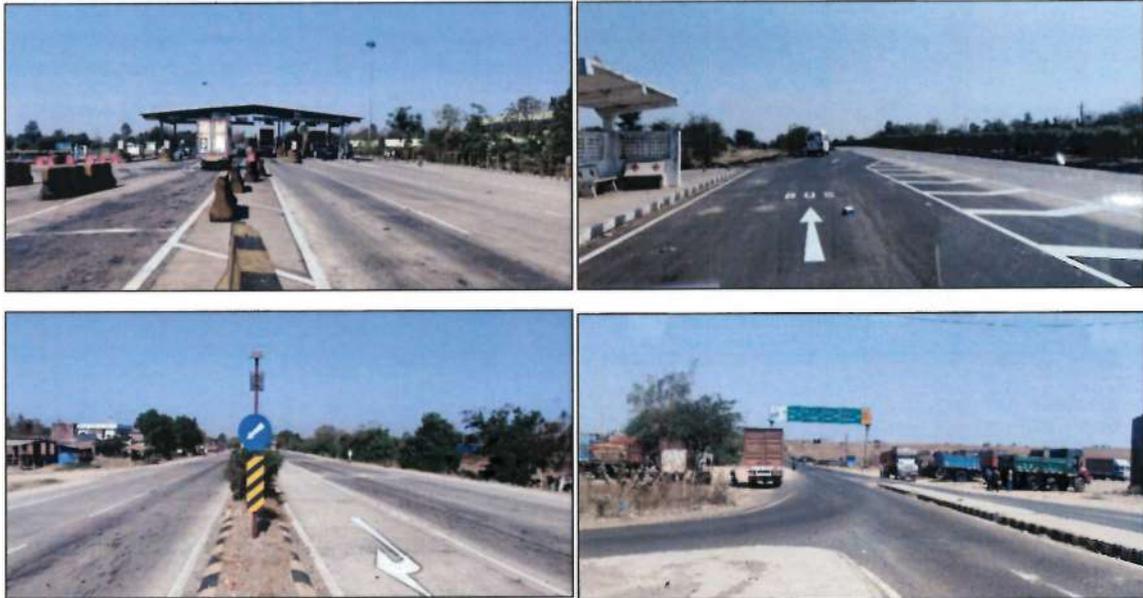
- 3.7.5. Projections provided by the Investment Manager consider an extension of 1,973 days from original concession end date, owing to the target traffic clause as per Concession Agreement, the same has been approved by IE.

- 3.7.6. Modification in the Concession Period due to target traffic clause as per Concession Agreement

Particulars	Unit	Details
Target date as per CA	Date	1 <sup>st</sup> October 2019
Target traffic as per CA	PCUs	26,839
Actual Average Traffic	PCUs	18,811
Comparison of average traffic at test date with target	%	-30%
Original concession period	years	27.0
Increase in concession period (Max. upto 20%)	%	20%
Change in concession period	days	1,973
Revised concession period	years	32.4
Appointed date	Date	1 <sup>st</sup> March 2011
Original concession end date	Date	28 <sup>th</sup> February 2038
Revised concession end date	Date	25 <sup>th</sup> July 2043



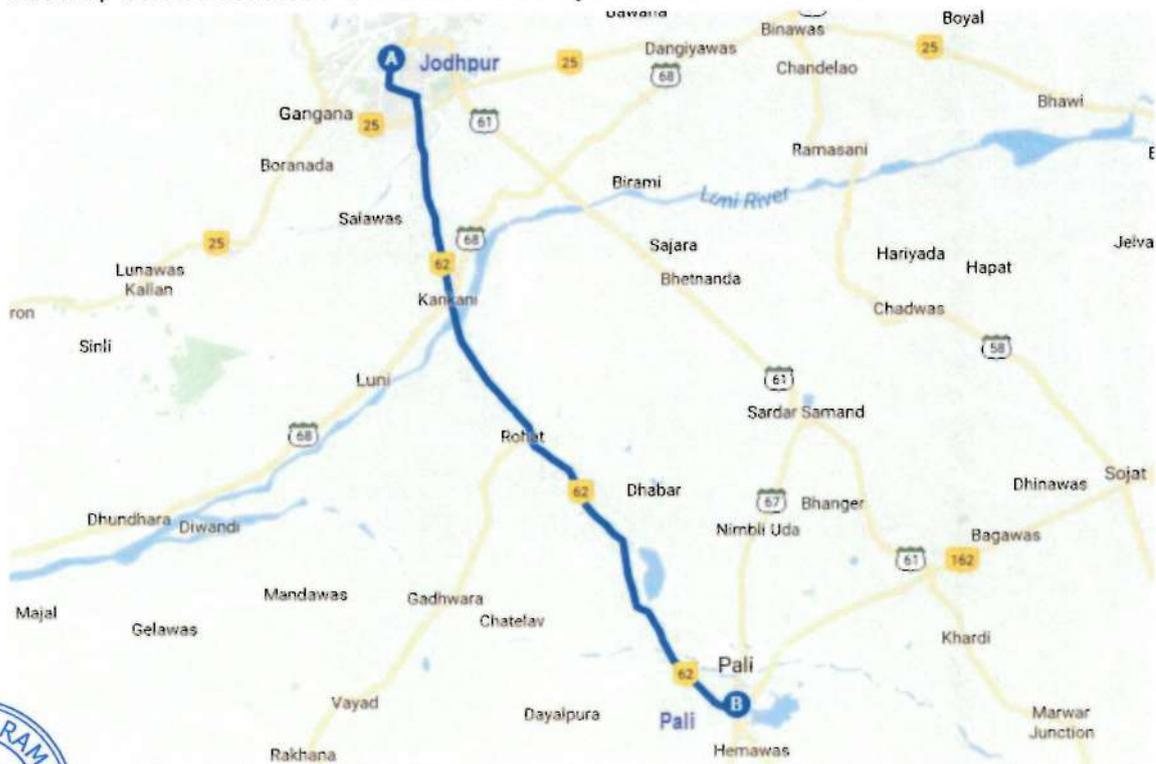
3.7.7. My team had conducted physical site visit of the road stretch of GEPL on 5<sup>th</sup> March 2022. Refer below for the pictures of the road stretch:



### 3.8. Jodhpur Pali Expressway Private Limited (“JPEPL”)

3.8.1. The PWD(R) and JPEPL entered into the concession agreement dated February 28, 2013 (the “Concession Agreement”). JPEPL was engaged, on a design, build, finance, operate and transfer basis, under the Concession Agreement for the development and operation of Jodhpur-Pali section of NH 65 from KM 308.00 to KM 366.00 and including bypass to Pali starting from KM 366.00 of National Highway 65, connecting National Highway 14 at KM 114 in State of Rajasthan.

The map below illustrates the location of the Project and the corridor it covers:



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3.8.2. Summary of project details of JPEPL are as follows:

Parameters	Details
Total Length	286.14 Lane Kms
Nos. of Lanes	4
NH / SH	NH-65
State Covered	Rajasthan
Area (Start and End)	Jodhpur to Pali
Project Cost	INR 4,140 Mn
PPP Model	DBFOT
Project Type	Toll
Concession Granted by	Public Works Department, Government of Rajasthan
COD Date	31 October 2014
Original Concession Period (CP)	25 years from Appointed Date
Extension (If any)	1,825 days
Likely End of CP (including extension)	15 September 2043

Source: Investment Manager

3.8.3. The corridor forms a part of existing road from KM 308 to 366 & includes bypass to Pali starting from KM 366 of NH-65, connecting NH-14 at KM 114 in the state of Rajasthan.

Sr. No.	Salient Features	Units
1	Total Length of Main Carriageway 4 Lane with Rigid Pavement	0
2	Total Length of Main Carriageway 4 Lane with Flexible Pavement	71.54 Kms
3	Total length of Service Roads	11.57 Kms
4	No of Toll Plazas	2
5	No of Bus Bays with Bus Shelters	12
6	Number of Truck Lay Bays	1
7	No of Rest Areas	0
8	No of Major Junctions	12
9	No of Minor Junctions	33
10	No of Vehicular underpasses	1
11	No of Pedestrian underpasses	2
12	No of Major Bridges	6
13	No of Minor Bridges	6
14	No of Hume Pipe Culverts	50
15	No of Box / Slab Culverts	14

Source: Investment Manager

3.8.4. The shareholding of JPEPL as on Valuation Date is as follows:

Sr. No.	Particulars	No. of Shares	%
1	Galaxy Investments II Pte Ltd*	61,640	100.00%
	<b>Total</b>	<b>61,640</b>	<b>100.00%</b>

\*Includes Shares held by nominees of Galaxy

Source: Investment Manager

3.8.5. Projections provided by the Investment Manager consider an extension of 1,825 days from original concession end date, owing to the target traffic clause as per Concession Agreement; the traffic count is due in FY29, FY30 and FY31.



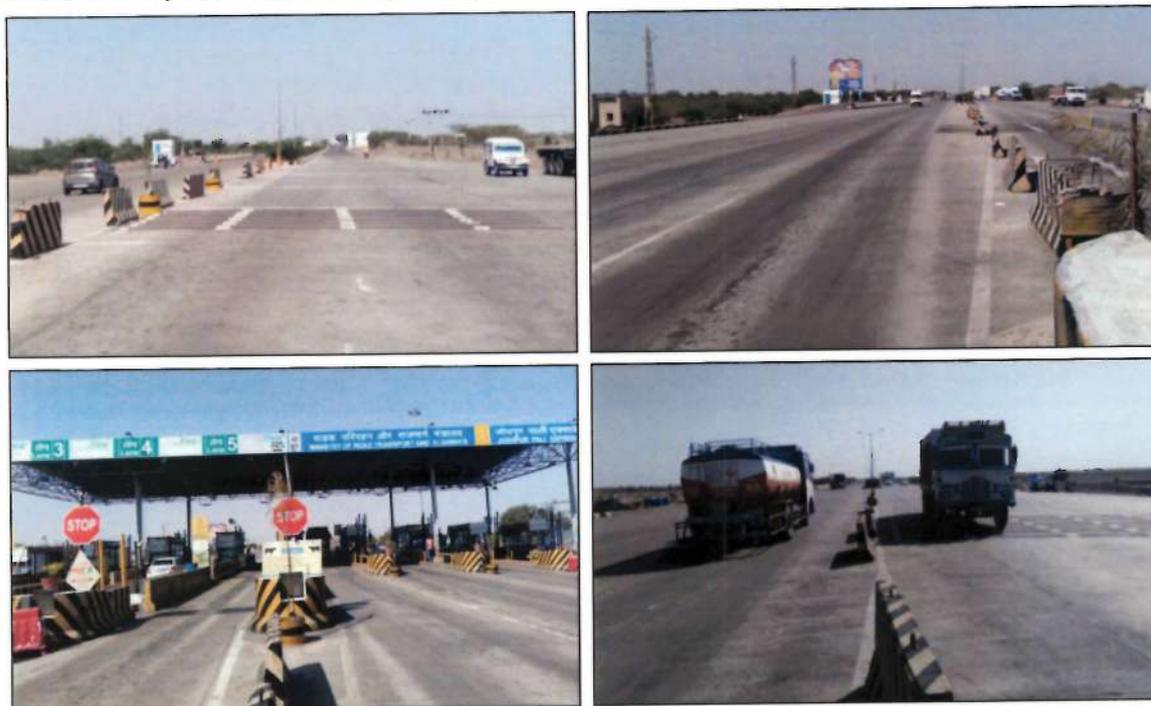
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**3.8.6. Modification in the Concession Period due to target traffic clause as per Concession Agreement**

As per the Clause 29 of the concession agreement between NHAI and JPEPL provided to us by the Investment Manager, if the actual traffic falls short or exceeds target traffic on a defined date, the concession period shall be revised subject to calculation specified therein. The target date and target traffic as provided in the concession agreement along with the projected traffic as on the target date are given below:

Particulars	Unit	Details
Target date as per CA	Date	1 <sup>st</sup> January 2030
Target traffic as per CA	PCUs	35,938
Estimated Average Traffic on Target Date	PCUs	27,612
Comparison of average traffic at test date with target	%	-23%
Original concession period	years	25.0
Increase in concession period (Max. upto 20%)	%	20%
Change in concession period	days	1,825
Revised concession period	years	30.0
Appointed date	Date	16 <sup>th</sup> September 2013
Original concession end date	Date	15 <sup>th</sup> September 2038
Revised concession end date	Date	15 <sup>th</sup> September 2043

3.8.7. My team had conducted physical site visit of the road stretch of JPEPL on 24<sup>th</sup> January 2022. Refer below for the pictures of the road stretch:



**3.9. Ulundurpet Expressways Private Limited (“UEPL”)**

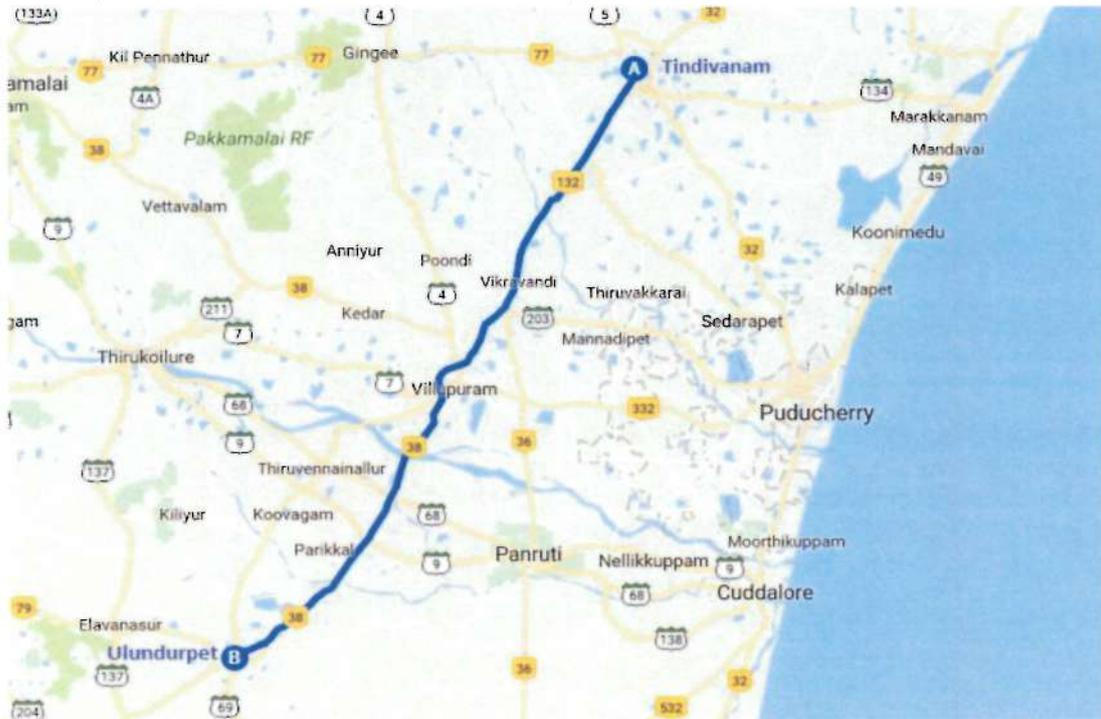
3.9.1. The project road Tindivanam-Ulundurpet, is part of 472 km long National Highway No.45 (NH-45) or Great Southern Trunk Road (GST Road) which starts from Kathipara junction in Guindy area (Chennai City) and extends up to Theni (headquarters of Theni District).



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It acts as one of the primary life-line corridor in the state of Tamil Nadu connecting the State Capital (Chennai city) with various industrial towns and tourist places in the southern, eastern and western parts of Tamil Nadu. The important towns which en-route the NH45 are Tambaram, Tindivanam, Viluppuram, Perambalur, Tiruchirapalli, Dindigul and Theni.

The map below illustrates the location of the Project and the corridor it covers:



Source: Investment Manager

3.9.2. Summary of project details of UEPL are as follows:

Parameters	Details
Total Length	291.6 Lane Kms
Nos. of Lanes	4
NH / SH	NH-45
State Covered	Tamil Nadu
Area (Start and End)	Tindivanam to Ulundurpet
Project Cost	INR 10,151 Mn
PPP Model	BOT
Project Type	Toll
Concession Granted by	NHAI
COD Date	23 July 2009
Original Concession Period (CP)	20 years from Appointed Date
Extension (If any)	136 days
Likely End of CP (including extension)	28 February 2027

Source: Investment Manager

3.9.3. The corridor forms a part of existing road from Tindivanam (km 121.00) and ends at just north of Sengurchi (km 193.90) in NH-45.

Sr. No.	Salient Features	Units
1	Total Length of Main Carriageway 4 Lane with Rigid Pavement	0
2	Total Length of Main Carriageway 4 Lane with Flexible Pavement	72.9 Kms



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3	Total length of Service Roads	36.4 Kms
4	No of Toll Plazas	1
5	No of Bus Bays with Bus Shelters	34
6	Number of Truck Lay Bays	3
7	No of Rest Areas	0
8	No of Major Junctions	4
9	No of Minor Junctions	97
10	No of Vehicular underpasses	3
11	No of Pedestrian underpasses	6
12	No of Major Bridges	6
13	No of Minor Bridges	14
14	No of Hume Pipe Culverts	56
15	No of Box / Slab Culverts	66

Source: Investment Manager

3.9.4. The shareholding of UEPL as on Valuation Date is as follows:

Sr. No.	Particulars	No. of Shares	%
1	Galaxy Investments II Pte Ltd*	26,45,52,365	100%
	<b>Total</b>	<b>26,45,52,365</b>	<b>100.00%</b>

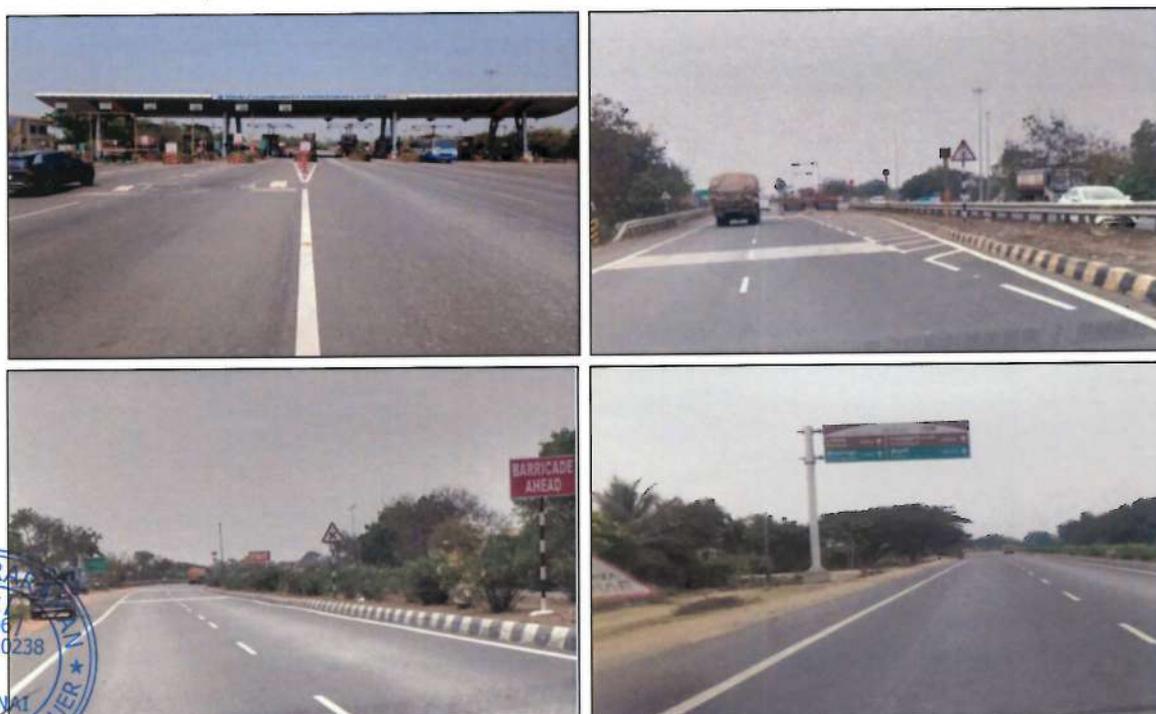
\*Includes Shares held by nominees of Galaxy

Source: Investment Manager

3.9.5. Projections provided by the Investment Manager consider an extension of 136 days from original concession end date, owing to:

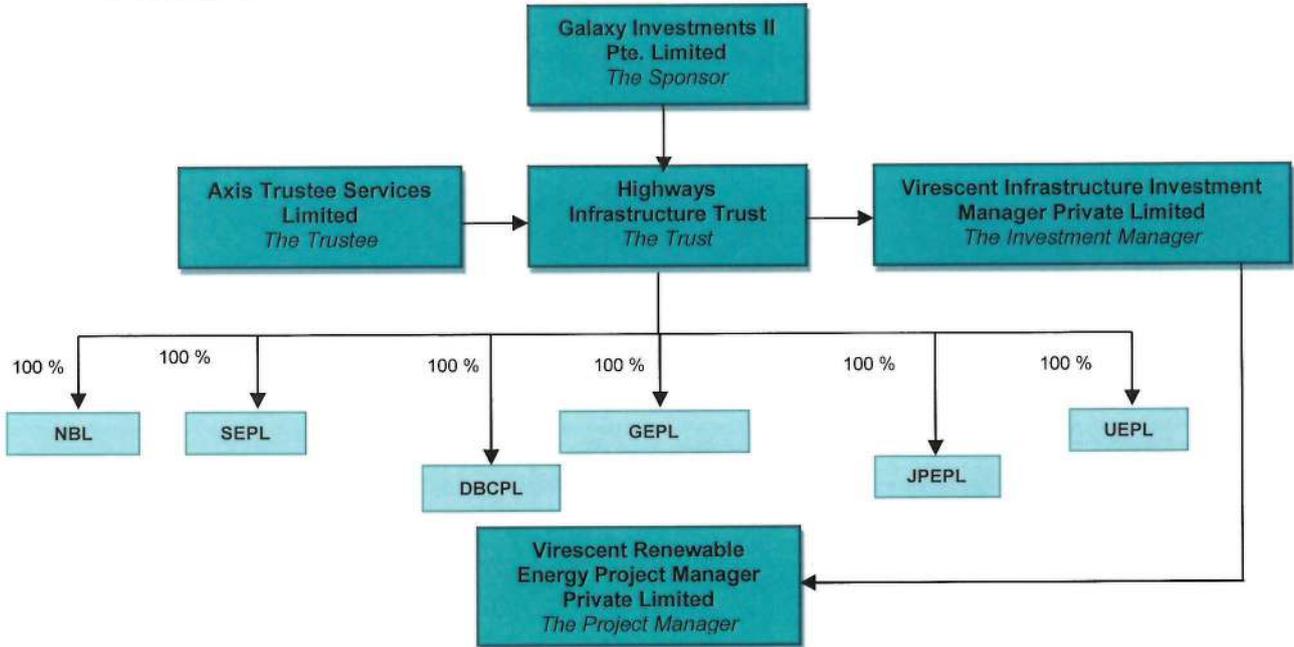
- 98 days were extended by NHA1 on account of delay in toll notification vide order no. NHA1/11015//71/RO Chennai/2009/3811 dated 27<sup>th</sup> September 2013.
- 23 days were extended on account of demonetisation.
- 15 days on account of flood.

3.9.6. My team had conducted physical site visit of the road stretch of UEPL on 7<sup>th</sup> March 2022. Refer below for the pictures of the road stretch:



4. Proposed Transaction

4.1. Following is the proposed Highways InvIT Structure after the completion of the Proposed Transaction:



Source: Investment Manager

4.2. Proposed Acquisition of stake in the SPVs by the Trust:

Sr. No.	SPV	As on Report Date	Post Proposed Transaction
		Sponsor Holding	Equity Stake proposed to be acquired by Trust prior to listing
1	NBL	100.0%	100.0%
2	SEPL	100.0%	100.0%
3	DBCPL	100.0%	100.0%
4	GEPL	100.0%	100.0%
5	JPEPL	100.0%	100.0%
6	UEPL	100.0%	100.0%

Source: Investment Manager

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## 5. Overview of the Industry

### 5.1 Introduction

### 5.2 Introduction

5.2.1 The road infrastructure is an important determinant of economic growth in India and it plays a significant role in the economy's overall development process.

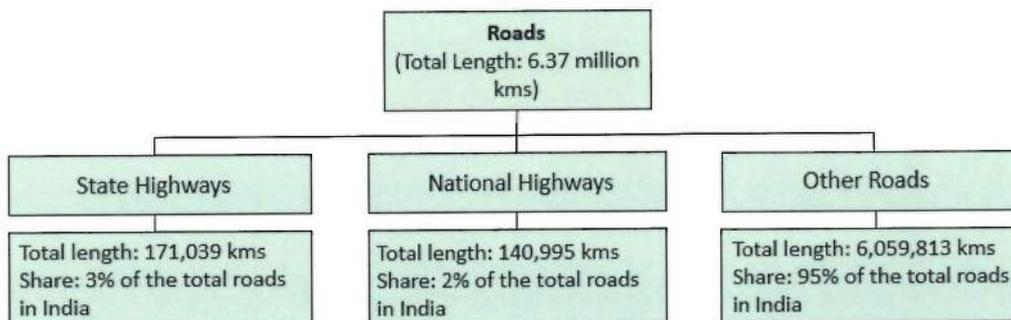
5.2.2 Creation and operation of quality road infrastructure continue to be major requirements for enabling overall growth and development of India in a sustained manner.

5.2.3 Bridging of existing infrastructure gaps and creating additional facilities to cater to the increasing population are equally important. Apart from providing connectivity in terms of enabling movement of passengers and freight, roads act as force multipliers in the economy.

5.2.4 Further, roads play a significant role in times of natural calamities, wars and other such events in terms of timely evacuation of the impacted population, carriage of relief material and other associated movements. Government takes cognisance of this requirement and road infrastructure remains to be a focus area.

### 5.3 Road Network in India

5.3.1 India has the second largest road network in the world, spanning over 6.37 million kms. Over 64.5% of all goods in the country are transported through roads, while 90% of the total passenger traffic uses road network to commute.



Source: IBEF Roads Report, March 2022

5.3.2 Out of this around 1.41 lakh km are National Highways ("NHs"). Significantly, NHs constitute around 2 per cent of the total road network in the country but carry about 40% of the road traffic. The density of India's highway network at 1.89 km of roads per square kilometer of land – is similar to that of the France (1.98) and much greater than China's (0.49) or USA's (0.68).

### 5.4 Government Agencies for Road Development

5.4.1 The Ministry of Road Transport & Highway ("MoRTH") is responsible for development of Road Transport and Highways in general and construction & maintenance of National Highways.

5.4.2 The National Highways Authority of India ("NHAI") is an autonomous agency of the Government of India, set up in 1988 and is responsible for implementation of National Highways Development Project ("NHDP").

5.4.3 The NHDP in the context of NHs is nearing completion- in seven phases. Later, the other highway development programmes like Special Accelerated Road Development Programme for Development of Road Network in North Eastern States (SARDP- NE) and National Highways Interconnectivity Improvement Project (NHIIP) were also taken up by MoRTH. Further, Bharatmala Pariyojana is ongoing. For majority of the projects under NHDP and Bharatmala Pariyojana, NHAI

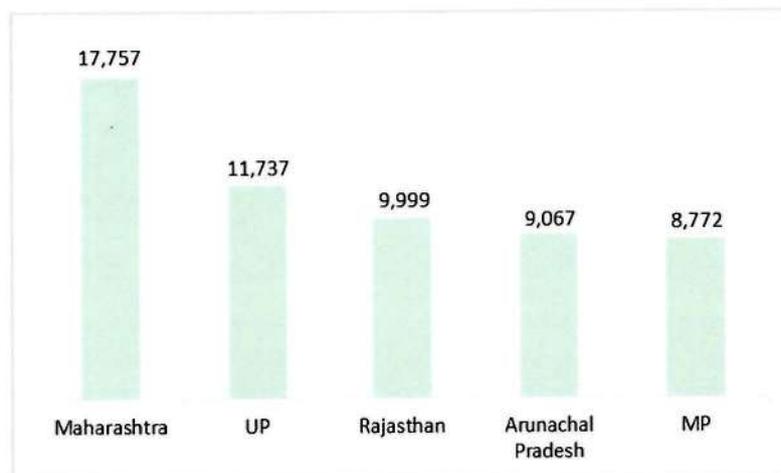


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is the implementation agency. Other NH related programmes/works are being implemented through agencies like National Highways Infrastructure Development Corporation Limited (NHIDCL), State Public Works Departments (PWDs), State Road Development Corporations and the Border Road Organization.

- 5.4.4 Roads in the jurisdiction of state governments are under different categories like State Highways (“SHs”) and Major District Roads. They are being developed/ upgraded through State PWDs and State Road Development Corporations. Pradhan Mantri Gramm Sadak Yojana is being implemented for rural roads through the Ministry of Rural Affairs with active participation by state governments. Further, roads within urban areas are maintained/ developed mostly with PWDs and Urban Local Bodies.
- 5.4.5 State Governments have a significant role to play in developing the SHs, Major District Roads, Other District Roads to ensure the last mile connectivity. States have varying levels of maturity in terms of road infrastructure development due to issues such as inadequate identification and prioritization of projects, funding shortfall, limited institutional capacity to implement projects, etc.

**Top 5 states by length of NHs in India (in Km)**



## 5.5 Trend of Road and Highways Construction

- 5.5.1 The length of National Highways awarded has almost doubled in the years FY15 to FY18 compared to FY11 to FY14. Length of NHs constructed has increased by 70% during the same period. This pace is expected to gain further ground, with the ambitious targets set by the ministry and the implementation of the Bharatmala Pariyojana as MORTH is planning to construct around 65,000 km of national highways at a cost of Rs 5.35 trillion (US\$ 74.15 billion) by 2022.
- 5.5.2 India has become the fastest highway developer in the world with 27 kms of highways built each day in 2017-18 and plans to construct 18,000 kilometres of national highways in 2022-23 at a pace of 50 km per day.
- 5.5.3 Under the Union Budget 2022-23, the Government of India has allocated Rs. 199,107 crore (US\$ 26.04 billion) to the Ministry of Road Transport and Highways.
- 5.5.4 The GST on construction equipment has been reduced to 18% from 28%, which is expected to give a boost to infrastructure development in the country.

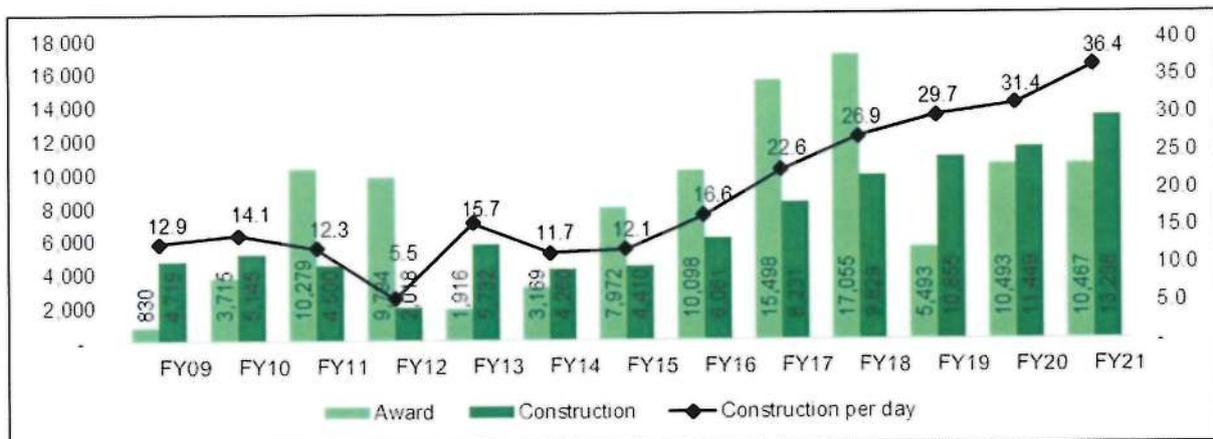
- 5.5.5 The NHDP is a program to upgrade, rehabilitate and widen major highways in India to a higher standard. The project was started in 1998 to be implemented in 7 phases.



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- 5.5.6 With the launch of Bharatmala project, 10,000 km of highway construction left under NHDP was merged with Phase I of the Bharatmala project.
- 5.5.7 The Indian government launched Gati Shakti-National Master Plan, which has consolidated a list of 81 high impact projects, out of which road infrastructure projects were the top priority. The major highway projects include the Delhi-Mumbai expressway (1,350 kilometres), Amritsar-Jamnagar expressway (1,257 kilometres) and Saharanpur-Dehradun expressway (210 kilometres).
- 5.5.8 The main aim of this program is a faster approval process by digitizing the process through a dedicated Gati shakti portal.
- 5.5.9 In December 2021, the government set a highway monetization target of Rs. 2 trillion (US\$ 26.20 billion) for the next 3 years.
- 5.5.10 The Ministry of Road Transport and Highways awarded road projects with a total length of 10,467 kms in FY21.
- 5.5.11 In FY 22, 5,835 kms of highways have been constructed until October 2021, while 13,298 kms of highway were constructed in FY21 across India.
- 5.5.12 The development of market for roads and highways is projected to exhibit a CAGR of 36.16% during 2016-2025, on account of growing government initiatives to improve transportation infrastructure in the country.

**Details of national highways awarded (by NHAI) and constructed in India (KMs):**



**5.6 Implementation of important projects and expressways:**

**5.6.1 Bharatmala Pariyojna**

Bharatmala Pariyojana is a new umbrella program for the highways sector that focuses on optimizing efficiency of freight and passenger movement across the country by bridging critical infrastructure gaps through effective interventions like development of Economic Corridors, Inter Corridors and Feeder Routes, National Corridor Efficiency Improvement, Border and International connectivity roads, Coastal and Port connectivity roads and Green-field expressway.

The Bharatmala Pariyojana envisages development of about 26,000 km length of Economic Corridors, which along with Golden Quadrilateral (GQ) and North-South and East-West (NS-EW) Corridors are expected to carry majority of the Freight Traffic on roads.

A total length of 34,800 km in road projects have been proposed to be constructed with an estimated outlay of Rs 5.35 trillion (US\$ 74.15 billion) under Bharatmala Pariyojana Phase-I over a five year period (2017-18 to 2021-22).



Components under Bharatmala Pariyojana Phase-I are as given below:

Component	Length (Km)	Cost (INR Crore)
Economic corridors development	9,000	1,20,000
Inter-corridor & feeder roads	6,000	80,000
National Corridors Efficiency	5,000	1,00,000
Border & International connectivity	2,000	25,000
Coastal & port connectivity roads	2,000	20,000
Expressways	800	40,000
<b>Sub Total</b>	<b>24,800</b>	<b>3,85,000</b>
Other works - under NHDP	10,000	1,50,000
<b>Total</b>	<b>34,800</b>	<b>5,35,000</b>

Source: Ministry of Road Transport and Highways, Government of India

More than 20,000 km length of roads has already been awarded under the Bharatmala Pariyojana project of which ~7,375 kms have been constructed till December 2021.

#### 5.6.2 Char Dham Vikas Mahamarg Pariyojna:

This project envisages development of easy access to the four dhams in India – Gangotri, Yamunotri, Kedarnath and Badrinath. Development of this route of 889 km route is expected at an estimated cost of INR 12,000 Crores.

#### 5.6.3 Eastern peripheral and western peripheral expressway

These two projects will connect NH-1 and NH-2 from western and eastern side of Delhi.

#### 5.6.4 Setu Bharatam:

This project aims to replace crossings on NHs with Road Over Bridges and Road Under Bridges. It is projected to construct 174 such structures.

#### 5.6.5 To further augment road infrastructure, more economic corridors are also being planned by Government of India as revealed in Budget 2021-22.

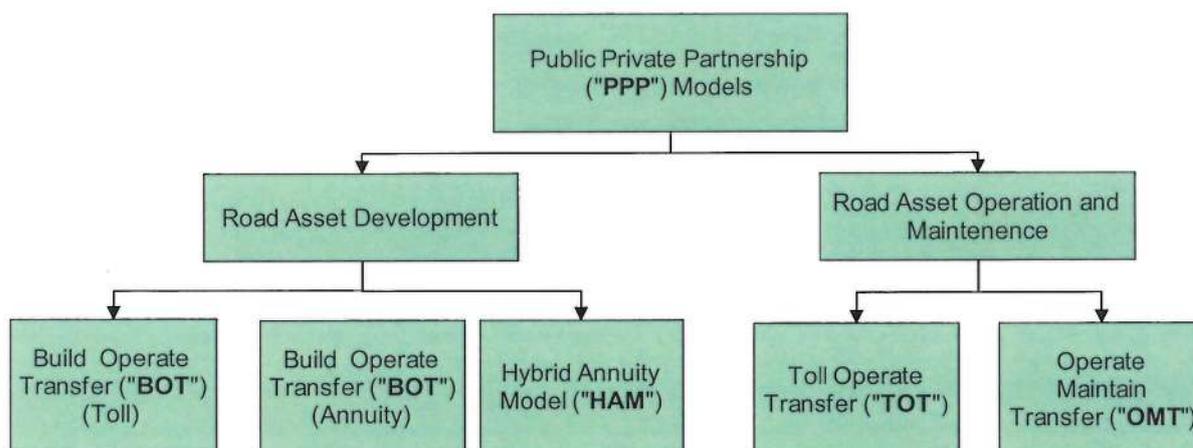
- 3,500 km of National Highway works in the state of Tamil Nadu at an investment of INR 1.03 lakh Crores. These include Madurai-Kollam corridor, Chittoor-Thatchur corridor. Construction will start next year.
- 1,100 km of National Highway works in the State of Kerala at an investment of INR 65,000 Crores including 600 km section of Mumbai Kanyakumari corridor in Kerala.
- 675 km of highway works in the state of West Bengal at a cost of INR 25,000 Crores including upgradation of existing road-Kolkata –Siliguri.
- National Highway works of around INR 19,000 Crores are currently in progress in the State of Assam. Further works of more than INR 34,000 Crores covering more than 1300 kms of National Highways will be undertaken in the State in the coming three years.

### 5.7 **Public Private Partnership (“PPP”) Models of road development and maintenance in India**

- #### 5.7.1
- India has a well-developed framework for Public-Private-Partnerships (PPP) in the highway sector. PPP has been a major contributor to the success story of the roads and highway sector in India. With the emergence of private players over the last decade, the road construction market has become fragmented and competitive. Players bidding for projects also vary in terms of size.



5.7.2 PPP modes have been used in India for both development and operation & maintenance of road assets.



### 5.7.3 Road Asset Development Models

- **BOT Toll**
  - In a BOT toll project, the concessionaire is responsible for designing, building, financing, operating, maintaining, tolling and transferring the project to the relevant authority at the end of the concession period. The concession period is project specific but is usually for 20-25 years. In BOT Toll model, the concessionaire earns revenue primarily in the form of toll revenue which in turns depends on the traffic on the road stretch. Toll rates are regulated by the government through rules.
- **BOT Annuity**
  - Similar to a BOT Toll projects, in BOT Annuity project, the concessionaire is responsible for designing, building, financing, operating, maintaining, tolling and transferring the project to the relevant authority at the end of the concession period. However, in these projects, the right to collect toll on road stretch lies with the government. The concessionaire earns revenue in the form of pre-determined semi-annual annuity payments.
- **HAM**
  - Similar to a BOT projects, in HAM project, the concessionaire is responsible for designing, building, financing, operating, maintaining, tolling and transferring the project to the relevant authority at the end of the concession period. However, in these projects, the right to collect toll on road stretch lies with the government. The construction period for HAM projects is project specific and a fixed operation period of 15 years.

## 5.8 Government Investment in the Sector

5.8.1 Under Union Budget 2022-23, the Government of India has allocated Rs. 199,107 crore (US\$ 26.04 billion) to the Ministry of Road Transport and Highways.

5.8.2 During 2019-23, NHAI is expected to generate Rs. 1 trillion (US\$ 14.30 billion) annually from toll and other sources.

5.8.3 NHAI is planning to raise Rs. 40,000 crore (US\$ 5.72 billion) to monetize its highway assets through Infrastructure Investment Trust (InvIT). Five operational roads with an estimated enterprise value of INR 5,000 crores have been transferred to the NHAI InvIT.



## 5.9 Growth Drivers

### 5.9.1 Robust Demand :

Growing domestic trade flows have led to rise in commercial vehicles and freight movement; supported by rise in production of commercial vehicles to 752,022 in FY20 which commands stronger road network in India. Higher individual discretionary spending has led to increased spending on two and four wheelers. Domestic sales of passenger vehicles, three-wheelers and two-wheelers, reached 254,287, 24,091, and 1,128,293 units, respectively, in January 2022. Road's traffic share of the total traffic in India has grown from 13.8% to 65% in freight traffic and from 32% to 90% in passenger traffic over 1951–2019.

### 5.9.2 Increasing Investment :

Huge investment have been made in the sector with total investment increasing more than three times from Rs. 51,914 crore (US\$ 7.43 billion) in 2014-15 to Rs. 158,839 crore (US\$ 22.73 billion) in 2018- 19. Between FY16 and FY21, budget outlay for road transport and highways increased at a robust CAGR of 13.10%. In 2019-20, Rs. 36,691 crore (US\$ 5.24 billion) was allocated to NHAI.

### 5.9.3 Policy Support :

100% FDI is allowed under automatic route subject to applicable laws and regulations, standardized process for bidding and tolling. Under Union Budget 2020-21, the Government of India has allocated Rs. 19,500 crore (US\$ 2.79 billion) for Pradhan Mantri Gram Sadak Yojana (PMGSY) which is a scheme for development of rural roads in India. Government of India has set up India Infrastructure Finance Company (IIFCL) to provide long-term funding for infrastructure projects.

## 5.10 Challenges & Issues in the Sector

### 5.10.1 Land Acquisition Delays & Cost :

- Land acquisition cost has increased more than 30% since 2017, primarily due to enhanced compensation payment requirements as per 'The Right to Fair Compensation and Transparency in Land Acquisition, Rehabilitation and Resettlement Act, 2013'.
- Delay in pre-construction activities (such as land acquisition, relocation) affects project timelines. Land acquisition for road projects involves various stages. Each stage involves a number of stakeholders and regulatory bodies. Thus processes consume considerable time.

### 5.10.2 Regulatory Approvals & Disputes :

- Road development process requires a number of approvals such as environmental clearance, forest clearance, railways clearance, etc. Each of these activities takes considerable time and non-adherence to timelines result in cost overruns due to delays.
- Claims arising out of disputes between the concessionaire/ contractor and the government authorities are also a significant cost which can lead to large liabilities.

### 5.10.3 Operational Issues :

- Uncertainty of toll revenue collection and variation of collected toll revenue compared to projected levels as Actual traffic is much less than the anticipated traffic.
- Often unforeseen weather conditions require unplanned O&M, over and above the routine and periodic maintenance activities. This results in enhanced O&M expenses. The increase in O&M costs is also affecting the project returns.



**5.11 Recent Initiatives by Government**

**5.11.1 Bhoomi Rashi – Land Acquisition Portal**

The ministry has corroborated with the National Informatics Centre, to create Bhoomirashi, a web portal which digitises the cumbersome land acquisition process, and also helps in processing notifications relating to land acquisition online. Processing time, which was earlier two to three months has come down to one to two weeks now.

**5.11.2 FASTag – Electronic Toll Collection**

Electronic Toll Collection (ETC) system, has been implemented on pan India basis in order to remove bottlenecks and ensure seamless movement of traffic and collection of user fee as per the notified rates, using passive Radio Frequency Identification (RFID) technology. 24 banks (including Public and Private sector banks) have been engaged as issuer banks in order to issue FASTag to road users. As of Jan-2022, collectively banks have issued 4.59 Crs FASTags.

**5.11.3 Revival of languishing projects**

Projects which were languishing for a number of years have been attempted to be revived, with the help of a number of policy measures taken by the government. Some of the policy measures like Premium deferment in stressed projects, extension of concession period for languishing projects to the extent of delay not attributable to concessionaires, One Time Capital Support for physical completion of languishing projects that have achieved at least 50 per cent physical progress, through one time fund infusion by NHAI, subject to adequate due diligence on a case to case basis.

*Sources: IBEF Roads Report, March 2022; KPMG Report - Roads and Highway Sector; website of Ministry of Road Transport and Highways, Government of India.*



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## 6. Valuation Methodology and Approach

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- 6.1. The present valuation exercise is being undertaken in order to derive the fair EV of the SPVs.
- 6.2. The valuation exercise involves selecting a method suitable for the purpose of valuation, by exercise of judgment by the valuers, based on the facts and circumstances as applicable to the business of the company to be valued.
- 6.3. There are three generally accepted approaches to valuation:
- (a) "Cost" approach
  - (b) "Market" approach
  - (c) "Income" approach

### 6.4. Cost Approach

The cost approach values the underlying assets of the business to determine the business value. This valuation method carries more weight with respect to holding companies than operating companies. Also, cost value approaches are more relevant to the extent that a significant portion of the assets are of a nature that could be liquidated readily if so desired.

#### Net Asset Value ("NAV") Method

The NAV Method under Cost Approach considers the assets and liabilities, including intangible assets and contingent liabilities. The Net Assets, after reducing the dues to the preference shareholders, if any, represent the value of a company.

The NAV Method is appropriate in a case where the main strength of the business is its asset backing rather than its capacity or potential to earn profits. This valuation approach is also used in cases where the firm is to be liquidated, i.e. it does not meet the "Going Concern" criteria.

As an indicator of the total value of the entity, the NAV method has the disadvantage of only considering the status of the business at one point in time.

Additionally, NAV does not properly take into account the earning capacity of the business or any intangible assets that have no historical cost. In many aspects, NAV represents the minimum benchmark value of an operating business.

### 6.5. Market Approach

Under the Market approach, the valuation is based on the market value of the company in case of listed companies, and comparable companies' trading or transaction multiples for unlisted companies. The Market approach generally reflects the investors' perception about the true worth of the company.

#### Comparable Companies Multiples ("CCM") Method

The value is determined on the basis of multiples derived from valuations of comparable companies, as manifest in the stock market valuations of listed companies. This valuation is based on the principle that market valuations, taking place between informed buyers and informed sellers, incorporate all factors relevant to valuation. Relevant multiples need to be chosen carefully and adjusted for differences between the circumstances.

#### Comparable Transactions Multiples ("CTM") Method

Under the CTM Method, the value is determined on the basis of multiples derived from valuations of similar transactions in the industry. Relevant multiples need to be chosen carefully and adjusted for differences between the circumstances. Few of such multiples are EV/Earnings before Interest, Taxes, Depreciation & Amortization ("**EBITDA**") multiple and EV/Revenue multiple.

#### Market Price Method

Under this method, the market price of an equity share of the company as quoted on a recognized stock exchange is normally considered as the fair value of the equity shares of that company where such quotations are arising from the shares being regularly and freely traded. The market value generally reflects the investors' perception about the true worth of the company.



6.6. **Income Approach**

The income approach is widely used for valuation under "Going Concern" basis. It focuses on the income generated by the company in the past as well as its future earning capability. The Discounted Cash Flow Method under the income approach seeks to arrive at a valuation based on the strength of future cash flows.

**DCF Method**

Under DCF Method value of a company can be assessed using the FCFF or Free Cash Flow to Equity Method ("FCFE"). Under the DCF method, the business is valued by discounting its free cash flows for the explicit forecast period and the perpetuity value thereafter. The free cash flows represent the cash available for distribution to both, the owners and creditors of the business. The free cash flows in the explicit period and those in perpetuity are discounted by the WACC. The WACC, based on an optimal vis-à-vis actual capital structure, is an appropriate rate of discount to calculate the present value of future cash flows as it considers equity-debt risk by incorporating debt-equity ratio of the firm.

The perpetuity (terminal) value is calculated based on the business' potential for further growth beyond the explicit forecast period. The "Constant Growth Model" is applied, which implies an expected constant level of growth for perpetuity in the cash flows over the last year of the forecast period.

The discounting factor (rate of discounting the future cash flows) reflects not only the time value of money, but also the risk associated with the business' future operations. The EV (aggregate of the present value of explicit period and terminal period cash flows) so derived, is further reduced by the value of debt, if any, (net of cash and cash equivalents) to arrive at value to the owners of the business.

**Conclusion on Valuation Approach**

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- 6.7. It is pertinent to note that the valuation of any company or its assets is inherently imprecise and is subject to certain uncertainties and contingencies, all of which are difficult to predict and are beyond my control. In performing my analysis, I have made numerous assumptions with respect to industry performance and general business and economic conditions, many of which are beyond the control of the SPVs. In addition, this valuation will fluctuate with changes in prevailing market conditions, and prospects, financial and otherwise, of the SPVs, and other factors which generally influence the valuation of companies and their assets.
- 6.8. The goal in selection of valuation approaches and methods for any business is to find out the most appropriate method under particular circumstances on the basis of available information. No one method is suitable in every possible situation. Before selecting the appropriate valuation approach and method, I have considered various factors, inter-alia, the basis and premise of current valuation exercise, purpose of valuation exercise, respective strengths and weaknesses of the possible valuation approach and methods, availability of adequate inputs or information and its reliability and valuation approach and methods considered by the market participants.



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**Cost Approach**

The existing book value of EV of the SPVs comprising of the value of its Net fixed assets, Net intangible assets and working capital based on the audited financial statements as at 31<sup>st</sup> March 2022 prepared as per Indian Accounting Standards (Ind AS) are as under :

In INR Mn	Book EV 31 <sup>st</sup> Mar 2022	Adjusted EV 31 <sup>st</sup> Mar 2022
NBL	1,398	1,964
SEPL	564	1,500
DBCPL	4,048	4,995
GEPL	7,889	8,792
JPEPL	3,682	3,902
UEPL	4,404	5,540
<b>Total of all SPVs</b>	<b>21,985</b>	<b>26,693</b>

In the present case, the SPVs operate and maintain the project facilities in accordance with the terms and conditions under the relevant concession agreement(s). During the concession period, the SPVs operate and maintain the road asset and earn revenues either through:

- (a) annuity payments that are pre-determine; or
- (b) charges, fees or tolls generated from the Toll SPVs.

The amount of annuity payments are pre-determined and the charges, fees or tolls that they may collect are notified by the relevant government authority, which are usually revised annually as specified in the relevant concessions and toll notifications. In such scenario, the true worth of the business is reflected in its future earning capacity rather than the cost of the project. Accordingly, I have not considered the cost approach for the current valuation exercise.

**Market Approach**

The present valuation exercise is to undertake fair EV of the SPVs engaged in the road infrastructure projects for a predetermined tenure. Further, the tariff revenue and expenses are very specific to the SPVs depending on the nature of their geographical location, stage of project, terms of profitability. In the absence of any exactly comparable listed companies with characteristics and parameters similar to that of the SPVs, I have not considered CCM method in the present case. In the absence of adequate details about the Comparable Transactions, I was unable to apply the CTM method. Currently, the equity shares of the SPVs are not listed on any recognized stock exchange of India. Hence, I was unable to apply market price method.

**Income Approach**

Each of the SPVs operates under a BOT or DBFOT based concession agreement with the relevant regulatory authorities. Government authorities in India typically award highway infrastructure development projects under BOT concessions, which are characterized by three distinct phases:

1. Build: upon successfully securing a project concession through a competitive bid, a concessionaire secures financing for, and completes construction, of a road;
2. Operate: during the agreed concession period, the concessionaire operates, manages and maintains the road at its own expense and earns revenues by collecting tolls from vehicles using the road or annuity payments from the Concessioneing Authority; and
3. Transfer: at the end of the agreed concession period, the ownership of the road (rights over the road under the concession), the obligation to maintain the road and the right to collect tolls from the vehicles using the road revert to the government entity that granted the concession.

A DBFOT project involves, in addition to the activities required under a BOT project, the provision of engineering and design for such project.



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Currently, each of the SPVs are completed and are revenue generating. The revenue of the Toll SPVs is based on tenure, annuity payments, traffic volumes, operations, macro economic factors like GDP growth, WPI, and other factors that are unique to each of the Toll SPVs. The revenue of the Annuity SPVs is mainly derived from the annuity payments (annuity fees). The annuity payments are typically pre-determined with the relevant government authority and cannot be modified to reflect prevailing circumstances. The Toll SPVs derive almost all of their revenue from their toll-road operations (toll collections) over the operation period. Traffic plying through the toll roads is primarily dependent on sustained economic development in the regions that they operate in and government policies relating to infrastructure development. The Toll SPVs are substantially dependent on the accuracy of their respective traffic volume forecasts. The rights in relation to the underlying assets of all the SPVs shall be transferred after the expiry of the Concession Period. Accordingly, since all the SPVs are generating income based on pre-determined agreements / mechanism and since the Investment Manager has provided me with the financial projections of the SPVs for the balance tenor of the concession agreements, DCF Method under the income approach has been considered as the appropriate method for the present valuation exercise.



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7. Valuation of the SPVs

7.1. I have estimated the fair EV and Adjusted Enterprise Value of the SPVs using the DCF Method. While carrying out this engagement, I have relied extensively on the information made available to me by the Investment Manager. I have considered projected financial statement of the SPVs as provided by the Investment Manager.

**Valuation**

7.2. The key assumptions of the projections provided to us by the Investment Manager are:

**Key Assumptions:**

7.2.1. Revenue cash flows for NHAI Annuity Model SPVs (NHAI Annuity SPVs)

Under this model, concessionaire is responsible for designing, building, financing, operating, maintaining and transferring the project to the authority at the end of the concession period. Under this model, post completion of the road project, the right and responsibility of tolling is with the government. Accordingly, only one mode of revenue is earned by these SPVs that is explained below:

**Annuity Payments:** The concessionaire earns revenue primarily in the form of pre - determined biannual annuity payments which are made by NHAI to the concessionaire based on the respective concession agreements.

7.2.2. Revenue cash flows for the Toll SPVs:

Under this mode, the Toll SPVs are responsible for designing, building, financing, operating, maintaining and transferring the project to the authority at the end of the concession period. The right and responsibility for tolling is with the Toll SPVs. The concessionaire earns revenue primarily in the form of toll revenue.

**Toll Revenue:** As per the concession agreements for the respective Toll SPVs, the Concessionaire is allowed to levy, demand, collect and appropriate the fees (called as toll fees) from vehicles and persons liable to payment of fees for using their road stretch or any part thereof and refuse entry of any vehicle to the road asset if the due fee is not paid. Toll revenues depend on toll receipts, which in turn depend on traffic volumes and toll fees on the toll roads.

**Concession Period**

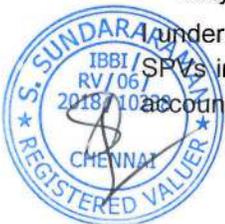
The Concession Period refers to the period where the Concessionaire has the responsibility to construct the road asset and post-construction is granted with the exclusive rights, license and authority to demand, collect and appropriate fee, operate, manage and maintain the project highway subject to the terms and conditions mention in their respective concession agreement. The cash flow projections are prepared by the Investment Manager for the balance concession period remaining from the Valuation Date as summarized below:

SPV	Concession Period End Date		Extension Period	
	Original	Revised	For Traffic Variance	For Other Reasons
DBCPL	19-Mar-33	02-Dec-33	Nil	258
GEPL	28-Feb-38	25-Jul-43	1,973*	Nil
JPEPL	16-Sep-38	15-Sep-43	1,825**	Nil
UEPL	16-Oct-26	28-Feb-27	Nil	136

\*subject to NHAI approval

\*\*subject to Public Works Department, Government of Rajasthan approval

Understand, as per the extant provisions of the Concession Agreements for the respective Toll SPVs in relation to the traffic variation, the concession period could be modified to take into the account shortfall or excess in actual average traffic vis-à-vis the target traffic ranging beyond 2.5%



and such concession extension or truncation shall be subject to a cap of 20% extension for shortfall and 10% for truncation for excess.

Accordingly, the Investment Manager has considered an extension period based on its calculation which is subject to the approval from the NHAI Authorities in case of GEPL and JPEPL. I have relied on the information provided by the Investment Manager.

**Extension for Other Reasons:** NHAI and other authorities vide their various orders have extended the concession period of the BOT Toll Projects for reasons including natural calamities, lockdowns on account of COVID-19, etc.

I have considered the projection period for the current valuation exercise based on the balance concession period as represented by the Investment Manager, wherein expected COVID-19 related extensions are not considered for the Toll SPVs (except DBCPL), as final approval from authorities has not been received. However, for DBCPL, MPRDC has already approved 40 days extension and thus, has been considered accordingly.

#### **Traffic Volumes**

Traffic volumes are directly or indirectly affected by a number of factors, many of which are outside of the control of the Toll SPVs, including: toll fees; fuel prices in India; the frequency of traveler use; the quality, convenience and travel efficiency of alternative routes outside the Toll SPV's network of toll roads; the convenience and extent of a toll road's connections with other parts of the local, state and national highway networks; the availability and cost of alternative means of transportation, including rail networks and air transport; the level of commercial, industrial and residential development in areas served by the Toll SPVs' projects; adverse weather conditions; and seasonal holidays.

#### **Toll Rates**

During the concession period, the Toll SPVs operate and maintain the road asset and earn revenues through charges, fees or tolls generated from the asset. The amount of charges, fees or tolls that they may collect are notified by the relevant government authorities, which are usually revised annually as specified in the relevant concessions and toll notifications.

The toll rates for the projected period have been derived in the manner stipulated in the individual concession agreements of the Toll SPVs.

In the present case, the Investment Manager has appointed M/s Ramboll India Private Limited an independent third-party research agency to forecast the traffic volumes and toll revenues for the Toll SPVs. As confirmed by the Investment Manager, the traffic volumes and toll revenues for Toll SPVs have been estimated by the traffic consultant after considering overall structure and condition of the projects including analysis of demand and supply and strategic geographical locations of the individual road projects. This was one of the most important input in projecting the toll revenues.

#### **7.2.3. Operating and Maintenance Expenses:**

Since all the SPVs are operational on the Valuation Date, following are the major costs incurred by the SPV:

##### **Operation and Maintenance Costs (Routine) ("O&M Costs")**

These are routine costs incurred every year. These costs are related to the normal wear and tear of the road and hence involve repairing the patches damaged mainly due to heavy traffic movement. O&M Costs also includes staff salaries, consumables, security expenses, electricity, etc. The primary purpose of these expenses is to maintain the road as per the specifications mentioned in the respective concession agreement. SPV is generally responsible for carrying out operation and maintenance activities at its toll road during its concession period. Within the scope of such operation and maintenance obligations, the SPV may be required to undertake routine maintenance of project roads, maintain and comply with safety standards to ensure smooth and safe traffic movement, deploy adequate human resources for incident management, maintain



proper medical and sanitary arrangements for personnel deployed at the site, prevent any unauthorized entry to and exit from the project as may be required.

#### **Major Maintenance and Repairs Costs (“MMR Costs”)**

##### **Estimating the MMR Costs**

Period maintenance expenses will be incurred on periodic basis say every 5 years or more. These are the costs incurred to bring the road assets back to its earlier condition or keep the road assets in its present condition. These expenses are primarily related to the construction or re-laying of the top layer of the road. Accordingly such costs includes considerable amounts of materials and labour.

Investment Manager has relied on the Engineering/ Technical Due Diligence report provided by the external professional agencies (M/s Resotech Consultancy Services Pvt. Ltd. for NBL and DBCPL and M/s Samarth Infraengg Technocrats Private Limited for other SPVs) for estimating major maintenance expenses and O&M Costs for the projected period.

##### **Provisions for MMR Costs and Cash Flow Adjustments**

As per the financial requirements, provision is required for appropriate major maintenance expense over a period until the actual expenditure is incurred. These are non-cash expenses. Hence, for my DCF analysis, such provisions are added back in their respective years and the actual expenditure expected to be incurred during the particular interval (of 5 years or more) is deducted in those respective years in order to arrive at net cash flows.

The Investment Manager has provided me the estimated Major Maintenance Expenses.

- 7.2.4. **Depreciation and Amortization:** The toll collection rights or the financial rights (intangible assets) of the SPVs are being amortized over the period of concession using the revenue based amortization method prescribed under Schedule II to the Companies Act, 2013.
- 7.2.5. **Revenue Share/ Premium payment:** The revenues collected from the toll would be shared with NHAI (in case of GEPL) and Public Works Department, Government of Rajasthan (in case of JPEPL) in the form of a concession fee. The percentage of revenue that the SPV has to share with their respective appointing authority is defined in the Concession Agreement. This is applicable in case of GEPL and JPEPL only. Such Premium payment is reduced from the revenue of the respective SPV to arrive at FCFF for calculation of Enterprise Value.
- 7.2.6. **Capital Expenditure (“Capex”):** As represented by the Investment Manager, the maintenance Capex has already been factored in the Operations & Maintenance expenditure and Major maintenance expenditure for the projected period, except for SEPL and JPEPL. Capital Expenditure of INR 27 Mn for SEPL and INR 27 Mn for JPEPL is estimated to be incurred in FY 2023.
- 7.2.7. **Taxes and Tax Incentive:** There have been changes in tax regime pursuant to introduction of Taxation Laws (Amendment) Ordinance 2019 made on 20<sup>th</sup> September 2019 which was enacted to make certain amendments in the Income Tax Act, 1961 and the Finance (No. 2) Act, 2019. As per the discussions with the Investment Manager, the old provisions of Income Tax Act have been considered for the projected period of all SPVs for the current valuation exercise, which inter alia provide benefits of additional depreciation, section 115JB and section 80-IA. New provision of Income Tax Act (with base corporate tax rate of 22%) have been considered for all SPVs (except for NBL, SEPL & UEPL) after utilization/ lapse of such 80-IA/ MAT benefits for the current valuation exercise.
- 7.2.8. **Working Capital:**

The Investment Manager has provided projected Working Capital information for all the SPVs. We have relied on the same.

##### **Impact of Ongoing Material Litigation on Valuation**

As on 31<sup>st</sup> March 2022, there are ongoing litigations as shown in Appendix 4. Further, Investment Manager has informed us that majority of the cases are low to medium risk and accordingly no



material outflow is expected against the litigations, hence no impact has been factored on the valuation of the SPVs.

**7.4. Calculation of Weighted Average Cost of Capital for the SPVs**

**7.4.1. Cost of Equity:**

Cost of Equity (CoE) is a discounting factor to calculate the returns expected by the equity holders depending on the perceived level of risk associated with the business and the industry in which the business operates.

For this purpose, I have used the Capital Asset Pricing Model (CAPM), which is a commonly used model to determine the appropriate cost of equity for the SPVs.

$$K(e) = R_f + [ERP * Beta] + CSR_P$$

Wherein:

K(e) = cost of equity

R<sub>f</sub> = risk free rate

ERP = Equity Risk Premium

Beta = a measure of the sensitivity of assets to returns of the overall market

CSR<sub>P</sub> = Company Specific Risk Premium (In general, an additional company-specific risk premium will be added to the cost of equity calculated pursuant to CAPM).

For valuation exercise, I have arrived at adjusted cost of equity of the SPVs based on the above calculation (Refer Appendix 2).

**7.4.2. Risk Free Rate:**

I have applied a risk free rate of return of 7.1% on the basis of the zero coupon yield curve as on 31<sup>st</sup> March 2022 for government securities having a maturity period of 10 years, as quoted on the website of Clearing Corporation of India Limited.

**7.4.3. Equity Risk Premium (“ERP”):**

Equity Risk Premium is a measure of premium that investors require for investing in equity markets rather than bond or debt markets. The equity risk premium is estimated based on consideration of historical realised returns on equity investments over a risk-free rate as represented by 10 year government bonds. Based on the aforementioned, a 7% equity risk premium for India is considered appropriate.

**7.4.4. Beta:**

Beta is a measure of the sensitivity of a company’s stock price to the movements of the overall market index. In the present case, I find it appropriate to consider the beta of companies in similar business/ industry to that of the SPVs for an appropriate period.

For the valuation of the NHAI Annuity SPVs, I find it appropriate to consider the beta of MEP Infrastructure Developers Ltd. and Sadbhav Engineering Ltd for an appropriate period. The beta so arrived, is further adjusted based on the factors of mentioned SPVs like completion of projects, revenue certainty, past collection trend, lack of execution uncertainty, etc. to arrive at the adjusted unlevered beta appropriate to the SPV.

I have further unlevered the beta of such companies based on market debt-equity of the respective company using the following formula:

$$\text{Unlevered Beta} = \text{Levered Beta} / [1 + (\text{Debt} / \text{Equity}) * (1-T)]$$

Further I have re-levered it based on debt-equity at 70:30 based on the industry Debt: Equity ratio of annuity based road DBFOT/BOT projects using the following formula:

$$\text{Re-levered Beta} = \text{Unlevered Beta} * [1 + (\text{Debt} / \text{Equity}) * (1-T)]$$

Accordingly, as per above, I have arrived at re-levered betas of Annuity SPVs. (Refer Appendix 2)

For the valuation of the Toll SPVs, I find it appropriate to consider the beta of Ashoka Buildcon Limited and IRB Infrastructure Developers Limited for an appropriate period. The beta so arrived, is further adjusted based on the factors of mentioned SPVs like completion of projects, revenue



certainty, past collection trend, lack of execution uncertainty etc. to arrive at the adjusted unlevered beta appropriate to the SPV.

I have further unlevered the beta of such companies based on market debt-equity of the respective company using the following formula:

$$\text{Unlevered Beta} = \text{Levered Beta} / [1 + (\text{Debt} / \text{Equity}) * (1-T)]$$

Further I have re-levered it based on debt-equity at 50:50 based on the industry Debt: Equity ratio of a road toll based BOT/DBFOT projects using the following formula:

$$\text{Re-levered Beta} = \text{Unlevered Beta} * [1 + (\text{Debt} / \text{Equity}) * (1-T)]$$

Accordingly, as per above, I have arrived at re-levered betas of the Toll SPVs. (Refer Appendix 2)

**7.4.5. Company Specific Risk Premium (“CSRP”):**

Discount Rate is the return expected by a market participant from a particular investment and shall reflect not only the time value of money but also the risk inherent in the asset being valued as well as the risk inherent in achieving the future cash flows. In the present case, considering the counterparty risk for certain SPVs, considering the length of the explicit period for the Toll SPVs, and basis my discussion with Investment Manager, I found it appropriate to consider the following CSRPs:

Sr. No.	SPVs	CSRP
1	NBL	0%
2	SEPL	0%
3	DBCPL	2%
4	GEPL	2%
5	JPEPL	2%
6	UEPL	1%

**7.4.6. Cost of Debt:**

The calculation of Cost of Debt post-tax can be defined as follows:

$$K(d) = K(d) \text{ pre-tax} * (1 - T)$$

Wherein:

K(d) = Cost of debt

T = tax rate as applicable

For valuation exercise, pre-tax cost of debt has been considered on the basis of details and representation provided by the Investment Manager.

**7.4.7. Weighted Average Cost of Capital (WACC):**

The discount rate, or the WACC, is the weighted average of the expected return on equity and the cost of debt. The weight of each factor is determined based on the company’s optimal capital structure.

Formula for calculation of WACC:

$$\text{WACC} = [K(d) * \text{Debt} / (\text{Debt} + \text{Equity})] + [K(e) * (1 - \text{Debt} / (\text{Debt} + \text{Equity}))]$$

Accordingly, as per above, I have arrived the WACC for the explicit period of the SPVs.

(Refer Appendix 2 for detailed workings).

7.5. At the end of the agreed concession period, the rights in relation to the underlying assets, its operations, the obligation to maintain the road and the right to collect tolls from the vehicles using the road revert to the government authority that granted the concession. Hence, SPVs are not expected to generate cash flow after the expiry of their respective concession agreements.

Accordingly, I found it appropriate not to consider terminal period value, which represents the present value at the end of explicit forecast period of all subsequent cash flows to the end of the life of the asset or into perpetuity if the asset has an indefinite life, in this valuation exercise.



**8. Valuation Conclusion**

- 8.1. The current valuation has been carried out based on the discussed valuation methodology explained herein earlier. Further, various qualitative factors, the business dynamics and growth potential of the business, having regard to information base, management perceptions, key underlying assumptions and limitations were given due consideration.
- 8.2. I have been represented by the Investment Manager that there is no potential devolvement on account of the contingent liability as of valuation date; hence no impact has been factored in to arrive at fair EV of the SPVs.
- 8.3. Based on the above analysis, the fair EV and Adjusted Enterprise Value as on the Valuation Date of the SPVs is as mentioned below:

Sr. No.	SPVs	End of Projected Period	Approximate Balance Period	INR Mn	
				Enterprise Value	Adjusted Enterprise Value
1	NBL	29-Oct-27	~5 years 6 months	1,362	1,929
2	SEPL	6-Feb-26	~3 years 10 month	567	1,504
3	DBCPL	1-Dec-33	~11 years 8 months	14,760	15,707
4	GEPL	23-Jul-43	~21 years 3 months	21,281	22,184
5	JPEPL	15-Sep-43	~21 years 5 months	8,628	8,847
6	UEPL	28-Feb-27	~4 years 11 months	5,423	6,559
<b>Total of all SPVs</b>				<b>52,022</b>	<b>56,729</b>

(Refer Appendix 1 for detailed workings)

- 8.4. EV is described as the total value of the equity in a business plus the value of its debt and debt related liabilities, minus any cash or cash equivalents to meet those liabilities.
- 8.5. Adjusted Enterprise Value is derived as EV as defined above plus cash or cash equivalents of the SPVs as at 31<sup>st</sup> March 2022.
- 8.6. The fair EV of the SPVs is estimated using DCF method. The valuation requires Investment Manager to make certain assumptions about the model inputs including forecast cash flows, discount rate, and credit risk.
- 8.7. Valuation is based on estimates of future financial performance or opinions, which represent reasonable expectations at a particular point of time, but such information, estimates or opinions are not offered as predictions or as assurances that a particular level of income or profit will be achieved, a particular event will occur or that a particular price will be offered or accepted. Actual results achieved during the period covered by the prospective financial analysis will vary from these estimates and the variations may be material.
- 8.8. Accordingly, I have conducted sensitivity analysis on certain model inputs, the results of which are as indicated below:
  - 1. WACC by increasing / decreasing it by 0.5%
  - 2. WACC by increasing / decreasing it by 1.0%
  - 3. Revenue of Toll SPVs by increasing / decreasing it by 10%
  - 4. Operation and Maintenance Expenses by increasing / decreasing it by 20%



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1. Fair Enterprise Valuation Range based on WACC parameter (0.5%)

Sr. No.	SPVs	INR Mn					
		WACC + 0.5%	EV	Base WACC	EV	WACC - 0.5%	EV
1	NBL	9.0%	1,343	8.5%	1,362	8.0%	1,381
2	SEPL	8.3%	564	7.8%	567	7.3%	571
3	DBCPL	11.0%	14,364	10.5%	14,760	10.0%	15,172
4	GEPL	10.9%	20,283	10.4%	21,281	9.9%	22,350
5	JPEPL	11.0%	8,207	10.5%	8,628	10.0%	9,079
6	UEPL	10.6%	5,363	10.1%	5,423	9.6%	5,485
Total of all SPVs			50,123		52,022		54,038

2. Fair Enterprise Valuation Range based on WACC parameter (1.0%)

Sr. No.	SPVs	INR Mn					
		WACC + 1.0%	EV	Base WACC	EV	WACC - 1.0%	EV
1	NBL	9.5%	1,325	8.5%	1,362	7.5%	1,401
2	SEPL	8.8%	560	7.8%	567	6.8%	574
3	DBCPL	11.5%	13,983	10.5%	14,760	9.5%	15,602
4	GEPL	11.4%	19,349	10.4%	21,281	9.4%	23,494
5	JPEPL	11.5%	7,814	10.5%	8,628	9.5%	9,562
6	UEPL	11.1%	5,303	10.1%	5,423	9.1%	5,549
Total of all SPVs			48,335		52,022		56,182

3. Fair Enterprise Valuation Range based on Revenue parameter of Toll SPVs (10%)

Sr. No.	SPVs	INR Mn		
		EV at Revenue - 10%	EV at Base Revenue	EV at Revenue + 10%
1	NBL	NA	NA	NA
2	SEPL	NA	NA	NA
3	DBCPL	12,990	14,760	16,523
4	GEPL	18,807	21,281	23,756
5	JPEPL	7,441	8,628	9,812
6	UEPL	4,805	5,423	6,042
Total of all SPVs		44,043	50,092	56,132



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4. Fair Enterprise Valuation Range based on Operation and Maintenance Expenses parameter (20%)

Sr. No.	SPVs	INR Mn		
		EV at Expenses + 20%	EV at Base Expenses	EV at Expenses - 20%
1	NBL	1,275	1,362	1,449
2	SEPL	493	567	637
3	DBCPL	14,092	14,760	15,417
4	GEPL	20,803	21,281	21,760
5	JPEPL	7,998	8,628	9,252
6	UEPL	5,193	5,423	5,654
Total of all SPVs		49,855	52,022	54,168

The above represents reasonable range of fair enterprise valuation of the SPVs.



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9. **Additional Procedures to be complied with in accordance with InvIT regulations**

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**Scope of Work**

9.1 The Schedule V of the SEBI InvIT Regulations prescribes the minimum set of mandatory disclosures to be made in the valuation report. In this reference, the minimum disclosures in valuation report may include following information as well, so as to provide the investors with the adequate information about the valuation and other aspects of the underlying assets of the InvIT.

The additional set of disclosures, as prescribed under Schedule V of InvIT Regulations, to be made in the valuation report of the SPVs are as follows:

- List of one-time sanctions/approvals which are obtained or pending;
- List of up to date/overdue periodic clearances;
- Statement of assets;
- Estimates of already carried as well as proposed major repairs and improvements along with estimated time of completion;
- Revenue pendencies including local authority taxes associated with InvIT asset and compounding charges, if any;
- On-going material litigations including tax disputes in relation to the assets, if any;
- Vulnerability to natural or induced hazards that may not have been covered in town planning/ building control.

**Limitations**

9.2 This Report is based on the information provided by the representatives of the Investment Manager. The exercise has been restricted and kept limited to and based entirely on the documents, records, files, registers and information provided to me. I have not verified the information independently with any other external source.

9.3 I have assumed the genuineness of all signatures, the authenticity of all documents submitted to me as original, and the conformity of the copies or extracts submitted to me with that of the original documents.

9.4 I have assumed that the documents submitted to me by the representatives of Investment Manager in connection with any particular issue are the only documents related to such issue.

9.5 I have reviewed the documents and records from the limited perspective of examining issues noted in the scope of work and I do not express any opinion as to the legal or technical implications of the same.

**Analysis of Additional Set of Disclosures for the SPVs**

A. List of one-time sanctions/approvals which are obtained or pending:

The list of sanctions/ approvals obtained by the SPVs till the date of this Report is provided in Appendix 3.1 to Appendix 3.6. As informed by the Investment Manager, there are no applications for government sanctions/ licenses by the SPVs for which approval is pending as on 31<sup>st</sup> March 2022, except for:

1. No-objection certificate from the Tamil Nadu Pollution Control Board by UEPL.
2. SWB stamping certificate is applied for renewal before Govt. of Gujarat Legal Metrology Dept. by GEPL. (Certificate issued on 15<sup>th</sup> June 2022)



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B. List of up to date/ overdue periodic clearances:

The Investment Manager has confirmed that the SPVs are not required to take any periodic clearances and hence there are no up to date/ overdue periodic clearances as on 31<sup>st</sup> March 2022.

C. Statement of assets included:

The details of assets of the SPVs as at 31<sup>st</sup> March 2022 are as mentioned below:

Sr. No.	SPVs	Net Fixed Assets	Net Intangible Asset	INR Mn	
				Non-Current Assets	Current Assets
1	NBL	10	-	1,438	540
2	SEPL	4	-	811	700
3	DBCPL	34	3,625	434	1,420
4	GEPL	20	8,007	270	675
5	JPEPL	35	3,907	1	267
6	UEPL	30	4,708	13	1,173
<b>Total of all SPVs</b>		<b>132</b>	<b>20,247</b>	<b>2,968</b>	<b>4,775</b>

\* Non-Current Assets for Annuity SPVs includes Non Current Financial Assets in the form of Annuity Receivable from respective counterparties.

D. Estimates of already carried as well as proposed major repairs and improvements along with estimated time of completion:

I have been informed that maintenance is regularly carried out by SPVs in order to maintain the working condition of the assets.

**Historical major repairs**

SPVs	INR Mn				
	FY 18	FY 19	FY 20	FY 21	FY 22
NBL	-	6	284	-	-
SEPL	6	-	10	23	-
DBCPL	123	-	217	180	504
GEPL	-	-	-	7	233
JPEPL	-	-	-	-	185
UEPL	-	287	333	-	-

Source: Investment Manager



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Forecasted major repairs

SPVs	INR Mn										
	FY 23	FY 24	FY 25	FY 26	FY 27	FY 28	FY 29	FY 30	FY 31	FY 32	FY 33
NBL	-	164	169	-	-	17	-	-	-	-	-
SEPL	-	352	-	16	-	-	-	-	-	-	-
DBCPL	166	-	-	-	399	439	-	-	-	-	646
GEPL	17	-	-	-	-	-	221	186	-	-	-
JPEPL	298	-	-	-	-	-	614	771	-	-	-
UEPL	-	424	331	-	21	-	-	-	-	-	-

SPVs	INR Mn										
	FY 34	FY 35	FY 36	FY 37	FY 38	FY 39	FY 40	FY 41	FY 42	FY 43	FY 44
NBL	-	-	-	-	-	-	-	-	-	-	-
SEPL	-	-	-	-	-	-	-	-	-	-	-
DBCPL	318	-	-	-	-	-	-	-	-	-	-
GEPL	-	-	272	163	-	-	-	-	-	371	162
JPEPL	-	-	374	375	-	-	-	-	892	42	-
UEPL	-	-	-	-	-	-	-	-	-	-	-

Source: Investment Manager

E. Revenue pendencies including local authority taxes associated with InvIT asset and compounding charges, if any:

Investment Manager has informed me that there are no material dues including local authority taxes (such as Municipal Tax, Property Tax, etc.) pending to be payable to the government authorities with respect to the SPVs (InvIT assets).

F. On-going material litigations including tax disputes in relation to the assets, if any:

As informed by the Investment Manager, the status of arbitration matters and status of tax assessments are updated in Appendix 4.

Investment Manager has informed us that majority of the cases are having low to medium risk and accordingly no material outflow is expected against the litigations.

Hence, I have relied on the Investment Manager with respect to the current status of the abovementioned cases.

G. Vulnerability to natural or induced hazards that may not have been covered in town planning/ building control:

Investment Manager has confirmed to me that there are no such natural or induced hazards which have not been considered in town planning/ building control.



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## 10. Sources of Information

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For the purpose of undertaking this valuation exercise, I have relied on the following sources of information provided by the Investment Manager :

- 10.1. Audited Financial Statements of the SPVs for Financial Year ("FY") ended 31<sup>st</sup> March 2018, 31<sup>st</sup> March 2019, 31<sup>st</sup> March 2020, 31<sup>st</sup> March 2021 and 31<sup>st</sup> March 2022;
- 10.2. Projected financial information for the remaining project life for each of the SPVs;
- 10.3. Details of projected Major Maintenance & Repairs (MMR) Expenditure and Capital Expenditure (Capex);
- 10.4. Traffic Study Projection Report dated 28<sup>th</sup> February 2022 prepared by M/s Ramboll India Private Limited for the Toll SPVs;
- 10.5. Technical/ Engineering Due Diligence Report dated February 2022 and addendum thereto (dated June 2022 for NBL), prepared by M/s Resotech Consultancy Services Private Limited for NBL and DBCPL for projected MMR and O&M Costs;
- 10.6. Technical/ Engineering Due Diligence Report dated February 2022 and addendums thereto (dated June 2022 for SEPL & UEPL), prepared by M/s Samarth Infraengg Technocrats Private Limited for SEPL, GEPL, JPEPL and UEPL for projected MMR and O&M Costs;
- 10.7. Details of brought forward losses and MAT credit (as per Income Tax Act) of the SPVs as at 31<sup>st</sup> March 2022;
- 10.8. Details of Written Down Value (WDV) (as per Income Tax Act) of assets as at 31<sup>st</sup> March 2022;
- 10.9. Concession Agreement of each of the SPVs with the respective authority;
- 10.10. List of licenses / approvals, details of tax litigations, civil proceeding and arbitrations of the SPVs;
- 10.11. Shareholding pattern as on 31<sup>st</sup> March 2022 of the SPVs and other entities mentioned in this Report;
- 10.12. Management Representation Letter by the Investment Manager dated 29<sup>th</sup> June 2022;
- 10.13. Relevant data and information about the SPVs provided to us by the Investment Manager either in written or oral form or in the form of soft copy;
- 10.14. Information provided by leading database sources, market research reports and other published data.

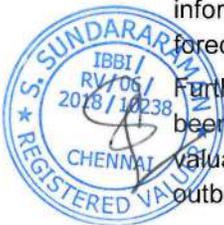
The information provided to me by the Investment Manager in relation to the SPVs included but not limited to historical financial statements, forecasts/projections, other statements and assumptions about future matters like forward-looking financial information prepared by the Investment Manager. The forecasts and projections as supplied to me are based upon assumptions about events and circumstances which are yet to occur.

By nature, valuation is based on estimates, however, considering the outbreak of COVID-19 Pandemic and the consequent economic slowdown, the risks and uncertainties relating to the events occurring in the future, the actual figures in future may differ from these estimates and may have a significant impact on the valuation of the SPVs.

I have not tested individual assumptions or attempted to substantiate the veracity or integrity of such assumptions in relation to the forward-looking financial information, however, I have made sufficient enquiries to satisfy myself that such information has been prepared on a reasonable basis.

Notwithstanding anything above, I cannot provide any assurance that the forward looking financial information will be representative of the results which will actually be achieved during the cash flow forecast period.

Further, considering the current crisis in relation to COVID-19 in India and across the globe, I have been informed by the Investment Manager, that the forecasts / projections provided for the valuation exercises are prepared after reasonably evaluating and incorporating the impact of outbreak of COVID-19 pandemic as per prevalent conditions as on date.



## 11. Exclusions and Limitations

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- 11.1. My Report is subject to the limitations detailed hereinafter. This Report is to be read in totality, and not in parts, in conjunction with the relevant documents referred to herein.
- 11.2. Valuation analysis and results are specific to the purpose of valuation and is not intended to represent value at any time other than the valuation date of 31<sup>st</sup> March 2022 ("Valuation Date") mentioned in the Report and as per agreed terms of my engagement. It may not be valid for any other purpose or as at any other date. Also, it may not be valid if done on behalf of any other entity.
- 11.3. This Report, its contents and the results are specific to (i) the purpose of valuation agreed as per the terms of my engagements; (ii) the Valuation Date and (iii) are based on the financial information of the SPVs till 31<sup>st</sup> March 2022. The Investment Manager has represented that the business activities of the SPVs have been carried out in normal and ordinary course between 31<sup>st</sup> March 2022 and the Report Date and that no material changes have occurred in the operations and financial position between 31<sup>st</sup> March 2022 and the Report date.
- 11.4. I have been informed by the Investment Manager that they have evaluated the impact of the ongoing Covid-19 pandemic outbreak (if any) on the operations of the SPVs and the projections provided to me are after considering the same.
- 11.5. The scope of my assignment did not involve me performing audit tests for the purpose of expressing an opinion on the fairness or accuracy of any financial or analytical information that was provided and used by me during the course of my work. The assignment did not involve me to conduct the financial or technical feasibility study. I have not done any independent technical valuation or appraisal or due diligence of the assets or liabilities of the SPVs or any of other entity mentioned in this Report and have considered them at the value as disclosed by the SPVs in their regulatory filings or in submissions, oral or written, made to me.
- 11.6. In addition, I do not take any responsibility for any changes in the information used by me to arrive at my conclusion as set out here in which may occur subsequent to the date of my Report or by virtue of fact that the details provided to me are incorrect or inaccurate.
- 11.7. I have assumed and relied upon the truth, accuracy and completeness of the information, data and financial terms provided to me or used by me; I have assumed that the same are not misleading and do not assume or accept any liability or responsibility for any independent verification of such information or any independent technical valuation or appraisal of any of the assets, operations or liabilities of the SPVs or any other entity mentioned in the Report. Nothing has come to my knowledge to indicate that the material provided to me was misstated or incorrect or would not afford reasonable grounds upon which to base my Report.
- 11.8. This Report is intended for the sole use in connection with the purpose as set out above. It can however be relied upon and disclosed in connection with any statutory and regulatory filing in connection with the provision of SEBI InvIT Regulations. However, I will not accept any responsibility to any other party to whom this Report may be shown or who may acquire a copy of the Report, without my written consent.
- 11.9. It is clarified that this Report is not a fairness opinion under any of the stock exchange/ listing regulations. In case of any third party having access to this Report, please note this Report is not a substitute for the third party's own due diligence/ appraisal/ enquiries/ independent advice that the third party should undertake for his purpose.
- 11.10. Further, this Report is necessarily based on financial, economic, monetary, market and other conditions as in effect on, and the information made available to me or used by me up to, the date hereof. Subsequent developments in the aforementioned conditions may affect this Report and the



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assumptions made in preparing this Report and I shall not be obliged to update, revise or reaffirm this Report if information provided to me changes.

- 11.11. This Report is based on the information received from the sources as mentioned in Section 9 of this Report and discussions with the Investment Manager. I have assumed that no information has been withheld that could have influenced the purpose of my Report.
- 11.12. Valuation is not a precise science and the conclusions arrived at in many cases may be subjective and dependent on the exercise of individual judgment. There is, therefore, no indisputable single value. I have arrived at an indicative EV based on my analysis. While I have provided an assessment of the value based on an analysis of information available to me and within the scope of my engagement, others may place a different value on this business.
- 11.13. Any discrepancies in any table / appendix between the total and the sums of the amounts listed are due to rounding-off.
- 11.14. Valuation is based on estimates of future financial performance or opinions, which represent reasonable expectations at a particular point of time, but such information, estimates or opinions are not offered as predictions or as assurances that a particular level of income or profit will be achieved, a particular event will occur or that a particular price will be offered or accepted. Actual results achieved during the period covered by the prospective financial analysis will vary from these estimates and the variations may be material.
- 11.15. I do not carry out any validation procedures or due diligence with respect to the information provided/extracted or carry out any verification of the assets or comment on the achievability and reasonableness of the assumptions underlying the financial forecasts, save for satisfying ourselves to the extent possible that they are consistent with other information provided to me in the course of this engagement.
- 11.16. My conclusion assumes that the assets and liabilities of the SPVs, reflected in their respective latest balance sheets remain intact as of the Report date.
- 11.17. Whilst all reasonable care has been taken to ensure that the factual statements in the Report are accurate, neither myself, nor any of my associates, officers or employees shall in any way be liable or responsible either directly or indirectly for the contents stated herein. Accordingly, I make no representation or warranty, express or implied, in respect of the completeness, authenticity or accuracy of such factual statements. I expressly disclaim any and all liabilities, which may arise based upon the information used in this Report. I am not liable to any third party in relation to the issue of this Report.
- 11.18. The scope of my work has been limited both in terms of the areas of the business & operations which I have reviewed and the extent to which I have reviewed them. There may be matters, other than those noted in this Report, which might be relevant in the context of the transaction and which a wider scope might uncover.
- 11.19. For the present valuation exercise, I have also relied on information available in public domain; however the accuracy and timelines of the same has not been independently verified by me.
- 11.20. In the particular circumstances of this case, my liability (in contract or under any statute or otherwise) for any economic loss or damage arising out of or in connection with this engagement, however the loss or damage caused, shall be limited to the amount of fees actually received by me from the Investment Manager, as laid out in the engagement letter for such valuation work.
- 11.21. In rendering this Report, I have not provided any legal, regulatory, tax, accounting or actuarial advice and accordingly I do not assume any responsibility or liability in respect thereof.



- 11.22. This Report does not address the relative merits of investing in InvIT as compared with any other alternative business transaction, or other alternatives, or whether or not such alternatives could be achieved or are available.
- 11.23. I am not an advisor with respect to legal, tax and regulatory matters for the proposed transaction. No investigation of the SPVs' claim to title of assets has been made for the purpose of this Report and the SPVs' claim to such rights have been assumed to be valid. No consideration has been given to liens or encumbrances against the assets, beyond the loans disclosed in the accounts. Therefore, no responsibility is assumed for matters of a legal nature.
- 11.24. I have no present or planned future interest in the Trustee, Investment Manager or the SPVs and the fee for this Report is not contingent upon the values reported herein. My valuation analysis should not be construed as investment advice; specifically, I do not express any opinion on the suitability or otherwise of entering into any financial or other transaction with the Investment Manager or SPVs.
- 11.25. I have submitted the draft valuation report to the Trust and Investment Manager for confirmation of accuracy of the factual data used in my analysis and to prevent any error or inaccuracy in this Report.

**11.26. Limitation of Liabilities**

- i. It is agreed that, having regard to the RV's interest in limiting the personal liability and exposure to litigation of its personnel, the Sponsor, the Investment Manager and the Trust will not bring any claim in respect of any damage against any of RV personally.
- ii. In no circumstances RV shall be responsible for any consequential, special, direct, indirect, punitive or incidental loss, damages or expenses (including loss of profits, data, business, opportunity cost, goodwill or indemnification) in connection with the performance of the services whether such damages are based on breach of contract, tort, strict liability, breach of warranty, negligence, or otherwise, even if the Investment Manager had contemplated and communicated to RV the likelihood of such damages. Any decision to act upon the deliverables (including this Report) is to be made by the Investment Manager and no communication by RV should be treated as an invitation or inducement to engage the Investment Manager to act upon the deliverable(s).
- iii. It is clarified that the Investment Manager will be solely responsible for any delays, additional costs, or other liabilities caused by or associated with any deficiencies in their responsibilities, misrepresentations, incorrect and incomplete information including information provided to determine the assumptions.
- iv. RV will not be liable if any loss arises due to the provision of false, misleading or incomplete information or documentation by the Investment Manager.

**11.27. Limitation on account of COVID-19 and Uncertainty in Valuation**

- v. It is important to highlight that the COVID-19 pandemic has created uncertainty in valuation. The mitigation in the spread of COVID-19 and commencement of vaccination process has led to relaxation of restrictions and consequent opening up of the economy. Accordingly, the impact assessment of COVID-19 is a continuing process given the uncertainties associated with its nature and durations.
- vi. I have been informed by the Investment Manager, that the forecasts / projections provided for the valuation exercises are prepared after reasonably evaluating and incorporating the impact of outbreak of COVID-19 pandemic as per prevalent conditions as on date. The estimates and judgement made by the Investment Manager, could vary on future developments, including, among other things, any new information concerning the impact created by the COVID-19 pandemic on the economy and consequent effect on the



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business and on the customer's ability to make the payment. The Investment Manager continues to monitor any material changes to future economic conditions, which will be given effect, where relevant, in the respective future period.

- vii. Accordingly, I would recommend a degree of caution to the values arrived under current circumstances. Further, this Report is necessarily based on financial, economic, monetary, market and other conditions as in effect on, and the information made available to me or used by me up to, the date hereof. Subsequent developments in the aforementioned conditions may affect this Report and the assumptions made in preparing this Report and I shall not be obliged to update, revise or reaffirm this Report if information provided to me changes.

Yours faithfully,



**S. Sundararaman**

Registered Valuer

IBBI Registration No.: IBBI/RV/06/2018/10238

Asset Class: Securities or Financial Assets

Place: Chennai

UDIN: 22028423ALZYEO5839

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Appendix 1 – Valuation of SPVs as on 31<sup>st</sup> March 2022

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Abbreviations	Meaning
EBITDA	Operating Earnings Before Interest, Taxes, Depreciation and Amortization
MMR	Major Maintenance and Repair Expenses
Capex	Capital Expenditure
Wcap	Incremental Working Capital
FCFF	Free Cash Flow to the Firm
CAF	Cash Accrual Factor
DF	Discounting Factor
PVFCFF	Present value of Free Cash Flow to the Firm



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Appendix 1.1 – Valuation of NBL as on 31<sup>st</sup> March 2022 under the DCF Method

Year	WACC 8.5%											INR Mn		
	Revenue	EBITDA	Financial income	O&M and MMR Income	Annuitiy Receipt from NHA1	Non-Cash Expense	Cash EBITDA	MMR	Capex	Wcap	Tax	FCFF	CAF	DF
	A	B	C	D	E	F=A+B+C+D+E	G	H	I	J	K=F-G-H-I-J	L	M=K*L	
FY23	190	44	(134)	(149)	476	93	330	-	18	7	305	0.50	0.96	293
FY24	403	293	(105)	(298)	476	-	366	164	-	22	180	1.50	0.88	159
FY25	385	285	(96)	(289)	476	-	376	169	-	20	187	2.50	0.81	152
FY26	203	94	(79)	(124)	476	-	367	-	-	15	352	3.50	0.75	264
FY27	179	65	(46)	(133)	476	-	362	-	-	11	351	4.50	0.69	243
FY28*	114	44	(12)	(101)	476	-	406	17	-	4	384	5.29	0.65	249
<b>Total of PVFCFF</b>														<b>1,360</b>
(+ ) Present Value of Working Capital Release														
<b>Enterprise Value</b>														
(+ ) Closing cash or cash equivalents as at the Valuation Date														
<b>Adjusted Enterprise Value</b>														
*Upto 29 October 2027														
<b>1,362</b>														
<b>567</b>														
<b>1,929</b>														



Appendix 1.2 – Valuation of SEPL as on 31<sup>st</sup> March 2022 under the DCF Method

WACC	7.8%														INR Mn
Year	Revenue	EBITDA	Financial income	O&M and MMR Income	Annuitiy Receipt from NHAI	Non-Cash Expense	Cash EBITDA	MMR	Capex	Wcap	Tax	FCFF	CAF	DF	PVFCFF
	A	B	C	D	E	F=A+B+C+D+E	G	H	I	J	K=F-G-H-I-J	L	M=K*L		
FY23	130	(17)	(65)	(154)	497	88	350	-	27	13	-	311	0.50	0.96	299
FY24	547	433	(25)	(522)	497	-	383	352	-	-	13	18	1.50	0.89	16
FY25	136	31	(16)	(120)	497	-	393	-	-	-	5	388	2.50	0.83	322
FY26*	117	23	10	(127)	-	-	(94)	16	-	-	1	(111)	3.43	0.77	(86)
<b>Total of PVFCFF</b>															<b>551</b>
(+ ) Present Value of Working Capital Release															
<b>Enterprise Value</b>															<b>567</b>
(+ ) Closing cash or cash equivalents as at the Valuation Date															
<b>Adjusted Enterprise Value</b>															<b>936</b>
*Upto 6 February 2026															
															<b>1,504</b>



Appendix 1.3 – Valuation of DBCPL as on 31<sup>st</sup> March 2022 under the DCF Method

Year	WACC 10.5%										INR Mn	
	Book Revenue	EBITDA	MMR Provision	MMR Expense	Capex	Wcap	Tax	FCFF	CAF	DF	PVFCFF	I=G*H
	A	B	C	D	E	F	G=A-B-C-D-E-F	H				
FY23	1,815	(166)	166	-	137	204	985	0.95	0.50	0.95	937	
FY24	2,041	(100)	-	-	8	272	1,455	0.86	1.50	0.86	1,251	
FY25	2,282	(100)	-	-	8	308	1,649	0.78	2.50	0.78	1,284	
FY26	2,562	(100)	-	-	9	347	1,858	0.70	3.50	0.70	1,308	
FY27	2,868	(100)	399	-	10	320	1,753	0.64	4.50	0.64	1,116	
FY28	3,218	(439)	439	-	10	363	1,988	0.58	5.50	0.58	1,145	
FY29	3,583	(129)	-	-	11	492	2,625	0.52	6.50	0.52	1,368	
FY30	4,008	(129)	-	-	12	553	2,954	0.47	7.50	0.47	1,392	
FY31	4,474	(129)	-	-	13	621	3,314	0.43	8.50	0.43	1,413	
FY32	5,010	(129)	-	-	14	698	3,724	0.39	9.50	0.39	1,436	
FY33	5,563	(129)	646	-	15	689	3,598	0.35	10.50	0.35	1,255	
FY34*	4,179	(318)	318	-	-	760	2,412	0.32	11.34	0.32	774	
<b>Enterprise Value</b>											<b>14,680</b>	
(+) Present Value of Working Capital Release											80	
<b>Enterprise Value</b>											<b>14,760</b>	
(+) Closing cash or cash equivalents as at the Valuation Date											947	
<b>Adjusted Enterprise Value</b>											<b>15,707</b>	

\*Upto 2 December 2033



Appendix 1.4 – Valuation of GEPL as on 31<sup>st</sup> March 2022 under the DCF Method

Year	Book Revenue	WACC 10.4%										INR Mn
		EBITDA	MMR Provision	MMR Expense	MMR	Premium Payment to NHAI	Capex	Wcap	Tax	FCFF	CAF	
	A	B	C	D	E	F	G	H=A-B-C-D-E-F-G	I	J=H*I		
FY23	1,434	(17)	17	121	-	118	169	787	0.50	0.95	749	
FY24	1,604	(23)	-	128	-	-	203	1,080	1.50	0.86	931	
FY25	1,794	(25)	-	134	-	-	234	1,239	2.50	0.78	966	
FY26	2,006	(28)	-	141	-	-	265	1,403	3.50	0.71	991	
FY27	2,243	(31)	-	148	-	-	300	1,585	4.50	0.64	1,014	
FY28	2,506	(34)	-	155	-	-	338	1,787	5.50	0.58	1,035	
FY29	2,789	(37)	221	163	-	-	341	1,821	6.50	0.52	955	
FY30	3,110	(186)	186	171	-	-	394	2,097	7.50	0.47	995	
FY31	3,453	(28)	-	179	-	-	477	2,514	8.50	0.43	1,081	
FY32	3,835	(31)	-	188	-	-	533	2,807	9.50	0.39	1,093	
FY33	4,243	(34)	-	198	-	-	593	3,122	10.50	0.35	1,100	
FY34	4,696	(38)	-	208	-	-	660	3,473	11.50	0.32	1,108	
FY35	5,201	(41)	-	218	-	-	735	3,868	12.50	0.29	1,117	
FY36	5,727	(45)	272	229	-	-	766	4,053	13.50	0.26	1,060	
FY37	6,273	(163)	163	241	-	-	867	4,569	14.50	0.24	1,082	
FY38	6,854	(39)	-	253	-	-	1,545	4,595	15.50	0.21	985	
FY39	7,478	(43)	-	265	-	-	1,691	5,029	16.50	0.19	976	
FY40	8,181	(47)	-	278	-	-	1,856	5,520	17.50	0.18	971	
FY41	8,883	(51)	-	292	-	-	2,020	6,008	18.50	0.16	956	
FY42	9,659	(56)	-	307	-	-	2,203	6,550	19.50	0.14	944	
FY43	10,478	(62)	371	322	-	-	2,302	6,846	20.50	0.13	893	
FY44*	3,613	(162)	162	113	-	-	757	2,251	21.16	0.12	275	
<b>Total of PVFCFF</b>											<b>21,279</b>	
(+) Present Value of Working Capital Release											3	
<b>Enterprise Value</b>											<b>21,281</b>	
(+) Closing cash or cash equivalents as at the Valuation Date											903	
<b>Adjusted Enterprise Value</b>											<b>22,184</b>	

SUNDARAJAN & SUNDARAJAN  
 Chartered Accountants  
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 2018/10238  
 25 July 2023



Appendix 1.5 – Valuation of JPEPL as on 31<sup>st</sup> March 2022 under the DCF Method

Year	Book Revenue	WACC 10.5%										INR Mn
		A	B	C	D	E	F	G	H=A-B-C-D-E-F-G	I	J=H*I	
	EBITDA	MMR Provision	MMR Expense	Premium Payable	Capex	Wcap	Tax	FCFF	CAF	DF	PVFCFF	
FY23	726	(298)	298	16	27	89	19	49	0.50	0.95	46	
FY24	804	(65)	-	17	-	-	88	497	1.50	0.86	428	
FY25	888	(71)	-	18	-	-	102	571	2.50	0.78	445	
FY26	986	(78)	-	18	-	-	116	643	3.50	0.71	454	
FY27	1,084	(85)	-	19	-	-	129	716	4.50	0.64	458	
FY28	1,203	(93)	-	20	-	-	146	805	5.50	0.58	466	
FY29	1,332	(102)	614	21	-	-	57	397	6.50	0.52	208	
FY30	1,471	(771)	771	22	-	-	49	372	7.50	0.47	177	
FY31	1,631	(40)	-	24	-	-	207	1,130	8.50	0.43	485	
FY32	1,802	(43)	-	25	-	-	231	1,261	9.50	0.39	490	
FY33	1,987	(47)	-	26	-	-	257	1,402	10.50	0.35	493	
FY34	2,186	(52)	-	27	-	-	285	1,547	11.50	0.32	493	
FY35	2,397	(57)	-	29	-	-	314	1,706	12.50	0.29	491	
FY36	2,636	(62)	374	30	-	-	282	1,577	13.50	0.26	411	
FY37	2,882	(375)	375	32	-	-	317	1,761	14.50	0.24	416	
FY38	3,136	(124)	-	33	-	-	418	2,262	15.50	0.21	483	
FY39	3,418	(136)	-	35	-	-	654	2,280	16.50	0.19	441	
FY40	3,706	(149)	-	37	-	-	769	2,425	17.50	0.18	425	
FY41	4,022	(163)	-	38	-	-	841	2,637	18.50	0.16	418	
FY42	4,362	(178)	892	40	-	-	694	2,200	19.50	0.14	316	
FY43	4,717	(42)	42	42	-	-	988	3,076	20.50	0.13	400	
FY44*	2,340	-	-	30	-	-	486	1,509	21.23	0.12	182	
<b>Total of PVFCFF</b>											<b>8,625</b>	
(+) Present Value of Working Capital Release											2	
<b>Enterprise Value</b>											<b>8,628</b>	
(+) Closing cash or cash equivalents as at the Valuation Date											219	
<b>Adjusted Enterprise Value</b>											<b>8,847</b>	

Upto 15 September 2043



Appendix 1.6 – Valuation of UEPL as on 31<sup>st</sup> March 2022 under the DCF Method

Year	WACC 10.1%										INR Mn
	Book Revenue	EBITDA	MMR Provision	MMR Expense	Capex	Wcap	Tax	FCFF	CAF	DF	
	A	B	C	D	E	F	G=A-B-C-D-E-F	H	I=G*H		
FY23	1,678	1,307	(106)	-	40	83	1,291	0.50	1,230		
FY24	1,820	1,536	(42)	-	0	110	1,044	1.50	904		
FY25	1,931	1,357	(331)	-	-	69	1,288	2.50	1,013		
FY26	2,066	1,800	(10)	-	-	135	1,675	3.50	1,197		
FY27*	2,028	1,790	(10)	-	-	137	1,643	4.46	1,071		
<b>Total of PVFCFF</b>											<b>5,415</b>
(+ ) Present Value of Working Capital Release											8
<b>Enterprise Value</b>											<b>5,423</b>
(+ ) Closing cash or cash equivalents as at the Valuation Date											1,136
<b>Adjusted Enterprise Value</b>											<b>6,559</b>

\*Upto 28 Feb 2027



Appendix 2.1 – Weighted Average Cost of Capital of the NHAI Annuity SPVs as on 31<sup>st</sup> March 2022

Particulars	NBL	SEPL	Remarks
Risk free return (Rf)	7.1%	7.1%	Risk Free Rate has been considered based on zero coupon yield curve as at 31 <sup>st</sup> March 2022 of Government Securities having maturity period of 10 years, as quoted on CCIL's website
Market Risk Premium (ERP)	7.0%	7.0%	Based on historical realized returns on equity investments over a risk free rate represented by 10 years government bonds, a 7% equity risk premium is considered appropriate for India
Beta (Relevered)	0.46	0.48	Beta has been considered based on the beta of companies operating in the similar kind of business in India
<b>Cost of Equity (Ke)</b>	<b>10.3%</b>	<b>10.4%</b>	<b>Base Ke = Rf + (β x ERP)</b>
Company Specific Risk Premium (CSRP)	0.0%	0.0%	Based on SPV specific risk(s)
<b>Revised Cost of Equity (Ke)</b>	<b>10.3%</b>	<b>10.4%</b>	<b>Adjusted Ke = Rf + (β x ERP) + CSRP</b>
Pre-tax Cost of Debt (Kd)	9.4%	7.6%	As per the Existing Cost of Debt of the SPVs, as represented by the Investment Manager
Tax rate of SPV	17.0%	12.5%	Tax Rate Applicable to SPVs is considered
<b>Post-tax Cost of Debt (Kd)</b>	<b>7.8%</b>	<b>6.6%</b>	<b>Effective cost of debt. Kd = Pre tax Kd * (1-Effective Tax Rate)</b>
Debt/(Debt+Equity)	70.0%	70.0%	Debt : Equity ratio computed as [D/(D+E)]
<b>WACC</b>	<b>8.5%</b>	<b>7.8%</b>	<b>WACC = [Ke * (1 - t) * D/(D+E)]</b>



Appendix 2.2 – Weighted Average Cost of Capital of the Toll SPVs as on 31<sup>st</sup> March 2022

Particulars	DBCPL	GEPL	JPEPL	UEPL	Remarks
Risk free return (Rf)	7.1%	7.1%	7.1%	7.1%	Risk Free Rate has been considered based on zero coupon yield curve as at 31 <sup>st</sup> March 2022 of Government Securities having maturity period of 10 years, as quoted on CCIL's website
Market Risk Premium (ERP)	7.0%	7.0%	7.0%	7.0%	Based on historical realized returns on equity investments over a risk free rate represented by 10 years government bonds, a 7% equity risk premium is considered appropriate for India
Beta (Relevered)	0.70	0.69	0.70	0.70	Beta has been considered based on the beta of companies operating in the similar kind of business in India
<b>Cost of Equity (Ke)</b>	<b>12.0%</b>	<b>12.0%</b>	<b>12.0%</b>	<b>12.0%</b>	<b>Base Ke = Rf + (β x ERP)</b>
Company Specific Risk Premium (CSRp)	2.0%	2.0%	2.0%	1.0%	Based on SPV specific risk(s)
<b>Revised Cost of Equity (Ke)</b>	<b>14.0%</b>	<b>14.0%</b>	<b>14.0%</b>	<b>13.0%</b>	<b>Adjusted Ke = Rf + (β x ERP) + CSRp</b>
Pre-tax Cost of Debt (Kd)	8.7%	8.7%	8.7%	8.7%	As represented by the Investment Manager
Tax rate of SPV	18.1%	19.9%	19.5%	17.5%	Tax Rate Applicable to SPVs is considered
<b>Post-tax Cost of Debt (Kd)</b>	<b>7.1%</b>	<b>6.9%</b>	<b>7.0%</b>	<b>7.1%</b>	<b>Effective cost of debt. Kd = Pre tax Kd * (1-Effective Tax Rate)</b>
Debt/(Debt+Equity)	50.0%	50.0%	50.0%	50.0%	Debt : Equity ratio computed as [D/(D+E)]
<b>WACC</b>	<b>10.5%</b>	<b>10.4%</b>	<b>10.5%</b>	<b>10.1%</b>	<b>WACC = [Ke * (1 - t) * D/(D+E)] + [Kd * (1-t) * D/(D+E)]</b>



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**Appendix 3.1 – NBL: Summary of approval and licences**

Sr. No.	Description of the permits	Issuing Authority	Validity/ Current status
1	Environmental Clearance No. 5-22/2007-IA-III (MH/AP to Arumur, Andhra Pradesh) dated June 11, 2007	Ministry of Environment & Forest (IA-III Division), NHA	
2	Approval of Installation of DG set dated 08.09.2009	Government of Andhra Pradesh, Electrical Inspectorate	Lifetime
3	<b>Bore well permit</b>		
i	Lr No:107/T/2019	Govt of Telengana Ground Water Dept.	Lifetime
ii	Lr No:107/T/2019	Govt of Telengana Ground Water Dept.	Lifetime
iii	316/T4/Drinking/2019-20	Govt of Telengana Ground Water Dept.	Lifetime
4	Provisional completion certificate dated July 22, 2009	Aarvee Associates	
5	Completion certificate dated October 8, 2018	MSV International Inc.	
6	Registration certificate of establishment dated December 1, 2020	Labour Department, Government of Telangana	December 31, 2021

Source: Investment Manager

**Appendix 3.2 – SEPL: Summary of approval and licences**

Sr. No.	Description of the permits	Issuing Authority	Validity/ Current status
1	Labour License No. GH.46 (120)/2010-L dated 10.08.2010	GOI Office of the Deputy Chief Labour Commissioner(Central)	09.08.2022
2	Provisional approval for installation of a DG set dated 30.07.2021	Government of Meghalaya, Inspectorate of Electricity	29.07.2022
3	Provisional completion certificate dated July 12, 2013	URS Scott Wilson India Pm. Ltd	
4	Completion certificate dated March 30, 2017	Feedback Infra Private Limited	

Source: Investment Manager



## Appendix 3.3 – DBCPL: Summary of approval and licences

Sr. No.	Description of the permits	Issuing Authority	Validity/ Current status
1	Environmental Clearance No. 5-43/2006-IA-III (Sehore bypass to Dewas bypass, Madhya Pradesh)	Ministry of Environment & Forest (IA-III Division), NHAI	
3	Labour License No. 45056 dated 15.12.2021 (For Amlhala Toll Plaza)	Govt of MP Office of Licensing officer SEHORE	31.12.2022
4	Labour License No. 45061 dated 21.12.2021 (For Fanda Toll Plaza)	Govt of MP Office of Licensing officer SEHORE	31.12.2022
5	Labour License No. 42972 dated 03.12.2020 (For Bhourasa Toll Plaza)	Govt of MP Office of Licensing officer SEHORE	31.12.2022
<b>6</b>	<b>Air (Prevention &amp; Control of Pollution) Act, 1981</b>		
i	Fanda Toll Plaza CTE-68241	Government of Madhya Pradesh	24.06.2024
ii	Amlaha Toll Plaza CTE-68239	Government of Madhya Pradesh	24.06.2024
<b>7</b>	<b>Applications for Issue of NOC to Abstract Ground Water (NOCAP)</b>		
i	21-4/915/MP/INF/2020	Government of India (Ministry of Jal Shakti)	17.02.2020
ii	21-4/911/MP/INF/2020	Government of India (Ministry of Jal Shakti)	13.02.2020
iii	21-4/914/MP/INF/2020	Government of India (Ministry of Jal Shakti)	17.02.2020
8	Provisional completion certificate dated February 10, 2009	MPRDC	
9	Completion certificate dated August 7, 2009	MPRDC	
10	Provisional completion certificate dated September 17, 2009	MPRDC	
11	Completion certificate dated February 3, 2010	MPRDC	
12	Provisional completion certificate dated April 30, 2009	MPRDC	

Source: Investment Manager



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Appendix 3.4 – GEPL: Summary of approval and licences

Sr. No.	Description of the permits	Issuing Authority	Validity
1	Environmental Clearance No. 5-27/2008-IA.III (Ahemdabad, Gujarat to Madhya Pradesh/Gujarat border.	Ministry of Environment & Forest (IA Division), NHAI	
2	Labour License No. ALC/ADI/46(56)/2017 dated 28.02.2017	Office Asst Labour Commissioner(C) Ahmedabad	27.02.2023
3	DG installation certificate No/E/I/Nad/Certi/2716/2018	Office of the Electrical Inspector	Lifetime
4	<b>Groundwater extraction NOC</b>		
i	GWA/NOC/INF/ORIG/2020/9605	Central Ground Water Board West Central Region	24.12.2024
ii	CGWA/NOC/INF/ORIG/2020/9551	Central Ground Water Board West Central Region	21.12.2025
iii	CGWA/NOC/INF/ORIG/2021/10553	Central Ground Water Board West Central Region	28.01.2025
iv	CGWA/NOC/INF/ORIG/2021/9755	Central Ground Water Board West Central Region	02.01.2025
5	Provisional certificates dated (i) October 31, 2013 and (ii) September 25, 2015	Intercontinental Consultants and Technocrats Pvt. Ltd.	
6	Completion certificate dated June 29, 2016	MSV International Inc.	

Source: Investment Manager



Appendix 3.5 – JPEPL: Summary of approval and licences

Sr. No.	Description of the permits	Issuing Authority	Validity/ Current status
1	Sanction of CRS for Launching Scheme of composite girder in Railway Portion in connection with the work of widening of existing Road over Bridge at Railway km 689/8-9 on Luni-Marwar junction section of Jhodpur division. CRS Ref no. JU/05/2015-16 dated 22.04.2015	Dy Chief Engineer/Const. North-Western Rly, Jhodpur	
2	Labour License No. AJ(L)412/2014/-ALC dated 25.11.2014	Licensing officer and Asst Labour Commissioner(C) Ajmer	24.11.2022
3	Certificate for registration of DG set (2 Set of 415kv Ref no: JPEPL/OTH/2021-22/004 dated 29.06.2021)	Government of Raj. Electrical Inspector, Jhodpur	
4	BOCW BOCW/ ALCAjmer/ 2019/R-24	Assistant Labour commissioner	Lifetime
5	WIM & SWB stamping 018632, 018633, 018634 & 018690, 018691, 018692	Weights and Measures Department	28.12.2021 & 29.12.2021
6	For Energization of DG Installation EIJDR/PP/2021-22/310	Electrical Inspectorate , Rajasthan	Lifetime
7	Registration certificate dated December 20, 2019		

Source: Investment Manager



Appendix 3.6 –UEPL: Summary of approval and licences

Sr. No.	Description of the permits	Issuing Authority	Validity/ Current status
1	Environmental Clearance No. 18-18/2004-IA-III (Tindivandam to Trichy bypass, Tamilnadu)	Ministry of Environment & Forest (IA Division), NHA	
2	Certificate for registration of captive generating unit ( Reg ID: CUD 59/2016-17/HT dated 22.09.2020	Government of Tamil Nadu, Electrical Inspector, Cuddalore	
3	Fire Service License ( K.Dis.No : 6655/A2/2021 dated 27.09.2021)	Tamil Nadu Fire and Rescue Service Department	26.09.2022
4	Certificate of registration dated December 10, 2019	Ministry of Labour and Employment	31.12.2027
5	Consent to establish for Air dated October 30, 2018	Tamil Nadu Pollution Control Board	31.03.2023
6	Consent to establish for Water dated October 30, 2018	Tamil Nadu Pollution Control Board	31.03.2023
7	Certificate of verification (WIM Stamping)	Legal Metrology Officer	30.12.2022
8	<b><u>NOC for Ground water</u></b>		
i	201/2020	Chief Engineer, (SG & SWRDC) PWD, Tharamani, Chennai-114 (State Ground & Surface Water Resources Data Centre)	23.07.2023
ii	202/2020	Chief Engineer, (SG & SWRDC) PWD, Tharamani, Chennai-114 (State Ground & Surface Water Resources Data Centre)	23.07.2023
iii	203/2020	Chief Engineer, (SG & SWRDC) PWD, Tharamani, Chennai-114 (State Ground & Surface Water Resources Data Centre)	23.07.2023
iv	204/2020	Chief Engineer, (SG & SWRDC) PWD, Tharamani, Chennai-114 (State Ground & Surface Water Resources Data Centre)	23.07.2023
v	205/2020	Chief Engineer, (SG & SWRDC) PWD, Tharamani, Chennai-114 (State Ground & Surface Water Resources Data Centre)	23.07.2023
9	Provisional completion certificate dated July 22, 2009	Intercontinental Consultants and Technocrats Pvt. Ltd.	
10	Completion certificate dated August 4, 2016	CDM Smith India Private Limited	

Source: Investment Manager



Appendix 4.1 – NBL: Summary of Ongoing Litigations

Sr. No	Matter	No. of Suits	Pending Before	Particulars	Amount Involved (INR Million)
1	Civil Suit	1	High Court of Judicature, Andhra Pradesh	<p><b>Background of the case:</b> NBL has filed a writ petition before the High Court of Judicature, Andhra Pradesh at Hyderabad ("Court"), against The District Registrar and the Inspector General of Stamps and Registration in relation to payment of certain stamp duty on the NBL Concession Agreement. The District Registrar had called upon the Petitioner to pay an alleged deficit stamp duty amount of approximately ₹ 135.80 million in relation to the NBL Concession Agreement. The Petitioner prayed that the demand for such stamp duty be set aside by the Court as the same is not required to be paid on concession agreements. The Respondents have filed their response to the Petition. Simultaneously, the Petitioner has also filed an interim application praying for a stay in respect of all further proceedings in relation to recovery of the alleged deficit stamp duty and other amounts until the disposal of the Petition. Subsequently, the Court by way of its order dated June 9, 2011 granted a stay in respect of all further proceedings and in relation to recovery of a token amount of ₹ 0.5 million from the Petitioner. The matter is currently pending.</p> <p><b>Current Status:</b> The matter is currently pending.</p>	135.8
2	Taxation Proceedings	1	Service Tax Demand	<p><b>Background of the case:</b> Based on ITR filed and service tax return filed, Tax Authorities observed that the Company declared turnover of Rs. 47,60,00,000 in ITR for FY 2015-16, however turnover declared in Service tax return was 'Zero'. The Company availed Mega Exemption Notification (No. 25/2012-ST dated 20th June, 2012, however, Tax Authorities have not extended the said notification benefit, and issued demand order is for following demands :-</p> <ol style="list-style-type: none"> <li>1. Service tax demand of Rs 6,90,20,000/- including cess on taxable services and applicable interest</li> <li>2. Penalty @100% of service tax liability for non payment of service tax liability</li> <li>3. Penalty of Rs. 10,000 for non-payment of taxes electronically</li> <li>4. Penalty of 10,000 for non-disclosure of exempt income in ST-3 returns for the period</li> </ol> <p><b>Current Status:</b> The Company is in the process of filing an appeal against the Order</p>	138.1

Source: Investment Manager



Appendix 4.2 – SEPL: Summary of Ongoing Litigations

Sr. No	Matter	No. of Suits	Pending Before	Particulars	Amount Involved (INR Million)
1	Civil Suit	1	Delhi High Court	<p><b>Background of the case:</b> SEPL raised certain claims before the Arbitral Tribunal ("Tribunal"), against NHAI in relation to certain delays and defaults on part of NHAI, which resulted in breach of various provisions of the SEPL Concession Agreement. Such defaults by NHAI included, amongst others, (i) change in scope, (ii) faulty and factually incorrect drawings, and (iii) additional requirement of land ("Defaults"). Due to such Defaults, SEPL was not able to complete the relevant project highway as per the proposed timeline and in relation to which SEL also put forth eight claims before the Tribunal. The Tribunal by way of its award dated June 27, 2018, awarded a claim of ₹ 274.20 million in favour of SEL along with advancing the annuity dates as prayed by SEPL ("Award"). Subsequently, SEPL filed an execution petition dated October 26, 2018 ("Execution Petition") before the High Court of Delhi ("Court") for seeking the execution of the decree and direction to NHAI to pay the amount as sought by the Award. Thereafter, NHAI filed an application before the Court for setting aside the Award, which was dismissed by the Court by its order dated November 2, 2018 ("Court Order").</p> <p>Thereafter, NHAI filed an appeal dated January 7, 2019 ("NHAJ Appeal") challenging the Court Order before the Commercial Appellate Divisional bench of the Court ("Appellate Bench"). <b>The Appellate Bench by way of an interim order dated January 22, 2019 directed NHAI to deposit the amount towards additional bonus annuity i.e. ₹ 106.30 million with an additional interest amount of ₹ 37.20 million with the Court within a period of four weeks. Further the Court upheld the rest of the Award. The direction was complied with by NHAI.</b></p> <p><b>Current Status:</b> The matter is currently pending in respect to the Execution Petition and the NHAJ Appeal.</p>	143.5
2	Taxation Proceedings	1	CIT(Appeal)	<p><b>Background of the case:</b> Refund as per ITR filed was Rs. 122,90,600 against which Company received refund of Rs.20,58,450/- on July 5, 2020</p> <p>Demand for Financial Year 2016-17 of Rs. 158,779/- adjusted against refund for Financial Year 2017-18.</p> <p>Scrutiny assessment proceeding have been completed by the AO after disallowance as per the 143(1)(a) adjustment proposed by CPC</p> <ul style="list-style-type: none"> <li>- for finance charges on preference shares</li> <li>- cash payment u/s40A(3)</li> <li>- double addition of transition amount in MAT computation</li> <li>- tax calculated @ 30% instead of 25% under normal provisions of the Act.</li> </ul> <p>The Company has filed as appeal with CIT (Appeal) for all above disallowances on March 16, 2021 vide acknowledgement number 292147381160321</p> <p><b>Current Status:</b> The matter is currently pending.</p>	10.1

Source: Investment Manager



Appendix 4.3 – DBCPL: Summary of Ongoing Litigations

Sr. No	Matter	No. of Suits	Pending Before	Particulars	Amount Involved (INR Million)
1	Civil	1	MP High Court	<b>Background of the case:</b> DBCPL has filed writ petition (no. 10812 of 2011) in MP High Court against imposition of labor cess amounting INR 4.68 Cr. under Building and other construction workers Welfare Cess Act, 1996. <b>Current Status:</b> The matter is currently pending.	46.8
2	Civil	1	Supreme Court	<b>Background of the case:</b> DBCPL has filed special leave petition (civil) (no. 14693 of 2010 - converted into Civil Appeal No. 8987 of 2013) in Supreme Court against final order passed by MP High Court on 11 Feb. 2010 in regards to applicability of 2% stamp duty (on TPC) on execution of Concession Agreement. <b>Current Status:</b> The matter is currently pending.	89
3	Civil	0	MP Arbitral Tribunal	<b>Background of the case:</b> Claim under Change in Law provisions of the Concession Agreement for actual toll revenue loss due to suspension of toll collection by MPRDC from 09 Nov. 2016 to 02 Dec. 2016 due to demonetization of specified bank notes by Govt. of India. <b>Current Status:</b> The matter has been disposed of by AT.	60.9
4	Civil Suit	1	Labour Court Bhopal	<b>Background of the case:</b> Mukesh Chandravanshi and Manohar Singh Rajput ("Complainants"), erstwhile employees of DBCPL have filed two separate complaints before the Labour Court, Bhopal, in relation to wrongful termination of their employment by DBCPL. DBCPL claimed that the termination of Complainants was due to (i) the Complainants stopping toll collection at DBCPL's toll plazas and allowing vehicles to cross without payment of toll on December 30, 2015, and (ii) misbehaviour of Complainants with other senior employees of DBCPL. <b>Current Status:</b> The matter is currently pending.	Not quantifiable
5	Criminal Suit	1	L.D. Judicial Magistrate, First Class, Sonkutch (Dist. Dewas)	<b>Background of the case:</b> DBCPL has filed a criminal complaint before the court of L.D. Judicial Magistrate, First Class, Sonkutch (Dist. Dewas) against its erstwhile accountant, Sameer Kumar Jha under section 408 and 420 of the Indian Penal Code, 1860, read with section 200 of the Code of Criminal Procedure, 1973, in relation to unauthorised absence from service and misappropriation of an amount of approximately ₹0.09 million. <b>Current status:</b> The matter is currently pending.	0.1
6	Taxation Proceedings	1	CIT (Appeal)	<b>Background of the case:</b> 1. Major Maintenance Expenses of INR 359.4 mn claimed as deduction was treated as capital expenditure and disallowed; it was all owed to be amortized over a period of 25 years, i.e. INR 14.38 mn was allowed for FY17. Hence, net disallowance of INR 345 mn. 2. Disallowance under section 14A of the ITA (Expenses incurred to earned exempt income) of INR 0.82 mn. 3. Demand of Rs. 10,30,84,559 as per Demand Order dated December 23, 2019. <b>Current status:</b> The matter is currently pending.	345.8

Source: Investment Manager



**Appendix 4.4 – GEPL: Summary of Ongoing Litigations**

Sr. No	Matter	No. of Suits	Pending Before	Particulars	Amount Involved (INR Million)
1	Taxation Proceedings	2	CIT(Appeal)	<p><b>Background of the case:</b> 1. Completed Assessment under section 143(3) ; the AO added INR 666.11 Mn being excess depreciation claim at the rate of 25% on intangible asset over amortization of the same over the life of the project. Subsequently, an appeal has been filed with CIT(A)</p> <p>2. Completed Assessment under section 143(3) ; the AO added INR 417.55 Mn being excess depreciation claim at the rate of 25% on intangible asset over amortization of the same over the life of the project. Subsequently, an appeal has been filed with CIT(A)</p> <p><b>Current Status:</b> The matter is currently pending.</p>	1,083.66

**Appendix 4.5 – JPEPL: Summary of Ongoing Litigations**

**No Material Ongoing Litigations**



Appendix 4.6 – UEPL: Summary of Ongoing Litigations

Sr. No	Matter	No. of Suits	Pending Before	Particulars	Amount Involved (INR Million)
1	Civil Suit	1	High Court of Judicature at Madras	<p><b>Background of the case:</b> 1. UEPL ("Petitioner") has filed a writ petition before the High Court of Judicature at Madras ("High Court"), against The Secretary (Transport), Government of Tamil Nadu ("Respondent") in relation to certain pending toll fees from the Respondent. UEPL alleged that the Respondent was involved in plying buses enrolled under the monthly passes issued by the Petitioner more frequently than permitted and also plying different buses other than those enrolled with the monthly passes. The amount involved in this matter is approximately ₹ 128 million, along with an interest amount of 18% p.a. for the period between July 2009 until December 2011, which allegedly remains unpaid in relation to three depots of the Petitioner. <b>The Respondent claims to have remitted a sum of ₹62.20 million towards the payment of the pending toll fee,</b> however, the High Court has, vide order dated November 18, 2021, directed the Respondent to file the statement of accounts with regard to such payment. The Respondent is yet to file the same.</p> <p><b>Current Status:</b> The matter is currently pending.</p>	128.0
2	Civil Suit	0	Arbitral Tribunal	<p><b>Background of the case:</b> 1. Claim under Concession Agreement provisions for Material Default by NHAI for actual toll revenue loss due to suspension of toll collection by NHAI from 03 December 2015 to 18 December 2015 due to flood situation in State of Tamil Nadu.</p> <p>2. Claim under Change in Law provisions of the CA for actual toll revenue loss due to suspension of toll collection by NHAI from 09 November 2016 to 02 December 2016 due to demonetization of specified bank notes by Govt. of India.</p> <p><b>Current Status:</b> <b>The matter has been settled.</b></p> <p><b>Background of the case:</b> The following items have been disallowed:</p> <p>(a) Rs. 17,869,492 under Section 14A of the IT Act                      (b) Mark to market gain on mutual fund of Rs. 709,554                      (c) Interest expense of Rs. 172,20,000 under Section 36(1)(iii) of the IT Act</p> <p><b>Current Status:</b> The matter is currently pending</p>	123.9
3	Taxation Proceedings	1	CIT (Appeal)	<p>(a) Rs. 17,869,492 under Section 14A of the IT Act                      (b) Mark to market gain on mutual fund of Rs. 709,554                      (c) Interest expense of Rs. 172,20,000 under Section 36(1)(iii) of the IT Act</p> <p><b>Current Status:</b> The matter is currently pending</p>	35.8

Source: Investment Manager

<< End of Report >>



**ANNEXURE II - TECHNICAL REPORT**

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**RESOTECH****CONSULTANCY SERVICES PVT. LTD.**

CIN - U74140MP2008PTC020576

**RESOTECH CONSULTANCY SERVICES PVT. LTD.**58, Shri Mangal Nagar, Near Elite Anmol Multi, Bicholi Hapsi Road,  
Indore 452 018 (M.P.) Telefax : 0731-4006024. e-mail : contact@resotechindia.com  
Website: www.resotechindia.com GSTIN:23AADCR9601G1ZL

RCSPL/VIIMPL/TDD/D-B/21-22/438

Date: 28.02.2022

**To,**  
**M/s Virescent Infrastructure Investment Manager Private Limited**  
**10th Floor, Parinee Crescenzo**  
**C-30, 'G' Block, Bandra Kurla Complex**  
**Bandra (East), Mumbai 400 051**  
**Maharashtra, India**  
**Tel: +91 99716 22660**

Sub:-Consultancy Services for Technical Due Diligence for Dewas – Bhopal Road section of SH-18 in the State of Madhya Pradesh.

Ref.: Work order No. HC1/Tech/2021-22/016 dated 18.01.2022

Dear Sir,

This is with reference to work order cited above vide which we have been awarded the work mentioned in subject above. The Final Report pertaining to Technical Due Diligence is enclosed herewith for your needful.

Thanking you,

Yours truly,

**For RESOTECH CONSULTANCY SERVICES PVT. LTD.**



**RAJNISH MISHRA**  
**DIRECTOR**

# DEWAS BHOPAL CORRIDOR PVT. LTD.

4-LANE BHOPAL TO DEWAS ROAD SECTION OF SH-18  
IN THE STATE OF MADHYA PRADESH



## TECHNICAL DUE DILIGENCE REPORT

For Virescent Infrastructure Investment Manager Private Limited  
(For the purpose of Highways Infrastructure Trust)

FEBRUARY 2022

### Resotech Consultancy Services Pvt. Ltd.

58, Shri Mangal Nagar, Near Elite Anmol Society, Bicholi Hapsi Road,  
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## **EXECUTIVE SUMMARY**

## EXECUTIVE SUMMARY

### **E 01: THE PROJECT ROAD**

The Project Road is a Section of MP SH-18 which starts from Km 6/8 (from Lalghati Square at Bhopal) to Km 151/6 at junction with NH-3 in Dewas town. The Project Road bypasses the major towns of Sehore, Ashta, Mehatwada and Sonkatchh and has a length of **140.79km**. This Project for strengthening, up-gradation and 4 laning of Bhopal Dewas Section was awarded to *M/s Dewas Bhopal Corridor Pvt Ltd* for a Concession Period of 25 years on BOT basis. The Concessionaire had appointed *M/s MSK Projects (India) Ltd & M/s Chetak Enterprises Pvt Ltd* as their EPC Contractors for execution of work under EPC mode. The Concession Agreement was signed on 30<sup>th</sup> June 2007 and the Project construction commenced on 20<sup>th</sup> March 2008 and Commercial Operation was started in three different dates for three different sections (Section 1 on 10.02.2009, Section 2 on 17.09.2009 and Section 3 on 30.04.2010). On 22<sup>nd</sup> December 2015, *M/s India Infrastructure Fund 2 (IIF-2)* acquired control of 74% stakes of *M/s Dewas Bhopal Corridor Pvt Lt* and balance 26% was acquired on 14<sup>th</sup> December 2018. Further, on 17<sup>th</sup> December 2021, *Galaxy Investments II Pte. Ltd* has acquired control of 100% stakes of *M/s Dewas Bhopal Corridor Pvt. Ltd.* from *M/s IIF-2*.

### **E02: BROAD SCOPE OF TECHNICAL DUE DILIGENCE**

*M/s Resotech Consultancy Services Pvt Ltd* has been engaged as Technical/Engineering Due Diligence Advisor for Highways Infrastructure Trust purpose. The broad scope of Technical Due Diligence is as under:

- i) Review of all Project Documents
- ii) Assessment of road assets in conformance with specifications, standards and codes stipulated in Concession Agreement and O&M manual, etc
- iii) Evaluation of overall condition of the pavement, structures and other road assets by visual observation and analysis of the available investigation reports
- iv) Assessment of maintenance needs of the Project Road and development of a detailed O&M and Major Maintenance Cost.

### **E 03: SALIENT DETAILS OF THE PROJECT ROAD**

**Table E.01: Salient Details of the Project Road**

S. No	Parameter	Description
1	Roadway	4 laned divided Carriageway with raised median/depressed median – 7.0m carriageway plus 2.5m hard shoulder on outer side and 1.0m earthen shoulder on median side in case of depressed medians
2	ROW	Varying from 30m to 60m
3	Pavement Type	Flexible, Rigid (in Toll Plaza area)
4	Bypasses	Sehore (16.35km), Sonda (1.37km), Ashta (4.3km), Dodi (0.9km), Mehatwada (1.6km), Semli (0.6km), Sonkatchh (3.5km), Arniya (0.8km)
5	Service Road/Slip Road (4/5/5.5m)	Total length of 9.090 km
6	Toll Plaza	Fanda (Km 25+000), Amlaha (Km 61+550), Bhourasa (Km 134+600) (4+4 Lanes)

S. No	Parameter	Description
7	Major Junctions	19
8	Minor Junctions	70
9	Bus Bays	3 / 35
10	Truck Laybys	01 (92+000)
11	VUP	01 (94+330 at Dodi)
12	PUP	01 (67+250 at Kothri)
13	Major Bridges	04 (53+300, 77+850, 121+120, 128+510)
14	Minor Bridges	17
15	Culverts	162 (109 HPC, 53 SC)

#### E04: MAJOR FINDINGS AND CONCLUSIONS

- i) The Project Road has been constructed in accordance with the requirements of the Concession Agreement with MPRDC and it conforms to the requirements of the Technical Specifications. There are no pending items of works from the Scope of Work as per the Concession Agreement
- ii) From review of the records of the Maintenance works it is seen that the Concessionaire has been carrying out its O&M liabilities in accordance with the requirements of the Concession Agreement.
- iii) The Conditions of various assets of the Project Road are in good condition. The Major Maintenance work on the road is presently been carried out and the pavement condition is good. All the structures are in good condition. The road signs, markings, furniture items and other project facilities are also seen to be maintained in good condition.
- iv) On review of the asset condition and the requirements of the Concession Agreement there does not appear to be any requirement of any Major Maintenance on the Project Road apart from the routine Operations and Maintenance and Periodic Renewal of the wearing course of the carriageway required as per Concession Agreement.
- v) O & M Cost Projection

**Table E.02: Operation & Maintenance Cost Projections**

S.No	Year	Periodic Maintenance Costs (in Cr.)	Routine Operations and Maintenance Cost (in Cr.)
1	2022-23		17.87
2	2023-24		17.87
3	2024-25		17.87
4	2025-26		17.87
5	2026-27	35.41	17.53
6	2027-28	37.88	17.53
7	2028-29		17.87
8	2029-30		17.87

<b>S.No</b>	<b>Year</b>	<b>Periodic Maintenance Costs (in Cr.)</b>	<b>Routine Operations and Maintenance Cost (in Cr.)</b>
9	2030-31		17.87
10	2031-32		17.87
11	2032-33	48.06	17.53
12	2033-34	22.97	11.68
		<b>144.31</b>	<b>225.08</b>

Note: Rates of MPPWD 2017 SOR have been adopted and the costs are based on 2022-23 base rates.

--- x ---

# **MAIN REPORT**

**Strengthening, Up-gradation and 4 Laning of Bhopal Dewas Section  
(Km 6/8 to Km 151/6) of SH-18 in the State Madhya Pradesh on  
Build, Operate and Transfer (BOT) Basis**

**TECHNICAL DUE DILIGENCE REPORT**

**TABLE OF CONTENTS**

<b>E.</b>	<b>EXECUTIVE SUMMARY</b>	<b>E2</b>
E01	PROJECT ROAD	E2
E 02	BROAD SCOPE OF TECHNICAL DUE DILIGENCE	E2
E 03	SALIENT DETAILS OF PROJECT ROAD	E2
E 04	MAJOR FINDINGS AND CONCLUSIONS	E3
<b>1.0</b>	<b>INTRODUCTION</b>	<b>01</b>
1.1	BACKGROUND	01
1.2	PROJECT ROAD LOCATION	01
1.3	SALIENT FEATURES OF PROJECT	02
1.4	SCOPE OF WORK FOR THE STUDY	03
1.4.1	GENERAL	03
1.4.2	ASSESSMENT OF ASSET CONDITION	04
1.4.3	INVESTIGATIONS TO BE CARRIED OUT	05
1.4.4	O&M ASSESSMENT	05
<b>2.0</b>	<b>REVIEW OF DOCUMENTS</b>	<b>06</b>
2.1	REVIEW OF CONCESSION AGREEMENT	06
2.1.1	SPECIFIC COMMENTS ON ARTICLES OF CONCESSION AGREEMENT	06
2.1.2	CONCLUSIONS ON OBSERVATIONS ON CONCESSION AGREEMENT	20
2.2	REVIEW OF EPC AGREEMENT	20
2.2.1	SPECIFIC COMMENTS ON ARTICLES OF EPC AGREEMENT	21
2.2.2	CONCLUSIONS ON OBSERVATIONS ON EPC AGREEMENT	22
2.3	REVIEW OF O&M MANUAL	22
2.3.1	ROUTINE MAINTENANCE	23
2.3.2	PERIODIC MAINTENANCE	23
2.3.3	MAINTENANCE STANDARD	25
2.3.4	REPORTING REQUIREMENTS OF MAINTENANCE ACTIVITIES	27
2.3.5	CONCLUSIONS ON OBSERVATIONS ON O&M MANUAL	28
2.4	REVIEW OF SAFETY AUDIT REPORT (O&M STAGE)	28
2.5	REVIEW OF CHANGE OF SCOPE ORDERS	29
2.5.1	WORK ITEMS UNDER CHANGE OF SCOPE	29
2.5.2	CHANGE OF CONCESSION PERIOD	30
2.5.2.1	ISSUES RELATED TO MATHEMATICAL COMPUTATION	30

2.5.2.2	EXTENSION IN CONCESSION PERIOD	31
2.6	REVIEW OF CLEARANCES	32
<b>3.0</b>	<b>EXISTING INVENTORY &amp; CONDITION SURVEY</b>	<b>33</b>
3.1	PROJECT DETAILS	33
3.1.1	LENGTH OF PROJECT	33
3.2	COMMENCEMENT AND COMPLETION OF WORK	34
3.2.1	WORK ITEMS UNDER CHANGE OF SCOPE	34
3.3	OVERVIEW OF ROAD ASSETS AND APPURTENANCES	35
3.3.1	HIGHWAY INVENTORY	35
3.3.2	MAJOR JUNCTIONS	44
3.3.3	MINOR JUNCTIONS	50
3.3.4	SERVICE ROADS	51
3.3.5	MEDIAN OPENINGS	53
3.3.6	BUS BAYS/SHELTERS	61
3.3.7	LONGITUDINAL ROADSIDE RCC PUCCADRAIN	64
3.3.8	SIGN BOARDS	66
3.3.9	OVERHEAD GANTRY	71
3.3.10	METAL BEAM CRASH BARRIERS	72
3.3.11	HIGH MASTS	75
3.3.12	KM STONES	76
3.4	OBSERVATIONS PERTAINING TO STRUCTURES	78
3.4.1	MAJOR BRIDGES	78
3.4.2	MINOR BRIDGES	83
3.4.3	UNDERPASSES	94
3.4.4	SLAB CULVERTS	96
3.4.5	HUME PIPE CULVERTS	100
3.5	SUMMARY OF INVENTORY	105
3.6	TOLL PLAZA WORKING STATUS	107
3.6.1	TOLL MANAGEMENT SYSTEM	110
3.6.2	AVAILABLE MODES OF TOLL COLLECTION	110
3.6.3	BOOTH OPERATIONAL STEPS IN SEMI-AUTOMATIC LANE (TMS)	110
3.6.4	BOOTH OPERATIONAL STEPS IN HYBRID LANE (ETMS)	110
3.6.5	REVIEW ON FANDA, AMLAHA AND BHOORASA TOLL PLAZA	111
3.6.5.1	CONDITION OF THE EQUIPMENTS IN FANDA AND AMLAHA TOLL PLAZA	111
3.6.5.2	CONDITION OF THE EQUIPMENTS IN BHOORASA TOLL PLAZA	111
3.6.6	EDI CONNECTIVITY	112
3.6.7	COMMENTS AND OBSERVATIONS	112
<b>4.0</b>	<b>REVIEW OF AS-BUILT DRAWINGS</b>	<b>117</b>
4.1	REVIEW OF DESIGNS AND AS-BUILT DRAWINGS	117
4.1.1	AS-BUILT DRAWINGS OF HIGHWAYS	117
4.1.2	AS-BUILT DRAWINGS OF STRUCTURES	121
4.2	REVIEW OF PAVEMENT DESIGN REQUIREMENTS	123

4.2.1	FLEXIBLE PAVEMENT REQUIREMENTS - MCW & SERVICE ROADS	123
4.2.2	FLEXIBLE PAVEMENT REQUIREMENTS - EXISTING CARRIAGEWAY	123
4.2.3	RIGID PAVEMENT REQUIREMENTS	123
4.2.4	PAVEMENT DESIGN FOR MAIN CARRIAGEWAY	124
4.2.5	PAVEMENT CRUST FOR MAIN CARRIAGEWAY	124
4.2.6	RIGID PAVEMENT DESIGN FOR TOLL PLAZA AREAS	126
4.2.7	CONCLUSIONS ON REVIEW OF PAVEMENT DESIGN	126
4.3	REVIEW OF STRUCTURE DESIGN REQUIREMENTS	126
4.3.1	GENERAL DESIGN REQUIREMENTS	126
4.3.2	SPECIAL DESIGN REQUIREMENTS	127
4.4	REVIEW OF STRUCTURE DRAWINGS	127
4.4.1	MAJOR AND MINOR BRIDGES	127
4.4.2	REVIEW OF AS-BUILT DRAWINGS OF MAJOR STRUCTURES	128
4.4.3	SLAB CULVERTS	128
4.4.4	REVIEW OF AS-BUILT DRAWINGS OF SLAB CULVERTS	128
4.4.5	HYDROLOGICAL ADEQUACY OF STRUCTURES	129
4.5	CONCLUSIONS ON REVIEW OF DRAWINGS	129
<b>5.0</b>	<b>OPERATION &amp; MAINTENANCE</b>	<b>130</b>
5.1	OPERATIONS - REQUIREMENTS OF CONCESSION AGREEMENT	130
5.2	PERIODIC MAINTENANCE STRATEGY	130
5.3	DETAILS OF LATEST BBD TESTS	131
5.4	LATEST ROUGHNESS MEASUREMENT STUDIES	134
5.5	ASSESSMENT OF TRAFFIC GROWTH RATES	137
5.5.1	COMPARISON OF ACTUAL TRAFFIC VERSUS TRAFFIC CONSIDERED FOR DESIGN	137
5.6	PRESENT STATUS OF O&M	138
5.6.1	CONCESSIONAIRE OBLIGATION STATUS	138
5.6.2	CONTRACT FOR ROUTE OPERATION & ROUTINE MAINTENANCE	139
5.6.3	CONTRACT FOR REPAIR WORK OF STRUCTURES	140
5.6.4	PRESENT WORK OF PERIODIC MAINTENANCE	140
5.7	HIGHWAY ENCROACHMENT DETAILS	140
5.8	IDENTIFIED BLACK SPOTS	142
5.9	CONCLUSIONS ON STATUS OF O&M	143
<b>6.0</b>	<b>COSTS</b>	<b>144</b>
6.1	OPERATION & MAINTENANCE COSTS AND FUTURE STRATEGY	144
6.1.1	BROAD STRATEGY	144
6.2	ASSESSMENT OF O&M COSTS	144
6.2.1	PERIODIC MAINTENANCE COSTS	145
6.2.2	ROUTINE OPERATION & MAINTENANCE COSTS	149
6.2.2.1	ROUTINE & PREVENTIVE MAINTENANCE	149
6.2.2.2	OPERATIONAL EXPENSES	151
6.3	CONCLUSIONS ON O&M REQUIREMENTS	152

## **Tables**

Table 1.1	Salient Details of Project	02
Table 2.1	Comments on Concession Agreement	06
Table 2.2	Comments on Schedule-M of Concession Agreement	16
Table 2.3	Comments on EPC Agreement	21
Table 2.4	Routine Maintenance of Project Facilities	23
Table 2.5	Periodic Maintenance of Project Facilities	24
Table 2.6	Intervention Levels - Operation Period, Schedule-M	27
Table 2.7	Frequency of Inspection for Road Maintenance Activities	27
Table 2.8	COS work items	29
Table 3.1	Major Details of Project Road	33
Table 3.2	COS work items	34
Table 3.3	Details of Highway Inventory	41
Table 3.4	Details of Major Junctions	47
Table 3.5	Details of Minor Junctions	51
Table 3.6	Details of Service/Slip Roads	52
Table 3.7	Details of Median Openings	54
Table 3.8	Details of Bus Bays/Shelters	62
Table 3.9	Details of Longitudinal Roadside Pucca Drain	65
Table 3.10A	Number of Sign Boards in Km 10 to Km 80	68
Table 3.10B	Number of Sign Boards in Km 80 to Km 150	69
Table 3.11	Details of Cantilever Gantries	71
Table 3.12	Details of Metal Beam Crash Barriers	73
Table 3.13	Details of High Masts	76
Table 3.14	Details of Km/Hm Stones	77
Table 3.15	Details of Major Bridges	78
Table 3.16	Details of Minor Bridges	83
Table 3.17	Details of Underpasses	94
Table 3.18	Summary of Slab Culverts	98
Table 3.19	Summary of Hume Pipe Culverts	101
Table 3.20	Summary of Project Road assessed by RCSP	105
Table 3.21	Details of Toll Plazas	112
Table 3.22A	Details of Equipments at Fanda Toll Plaza	114
Table 3.22B	Details of Equipments at Amlaha Toll Plaza	114
Table 3.22C	Details of Equipments at Bhourasa Toll Plaza	115
Table 4.1	List of reviewed As-Built drawings	117
Table 4.2	Review of As-Built drawings for Highways	118
Table 4.3	Review of As-Built details for Structures	121
Table 4.4	Summary of Flexible Pavement Design	124
Table 4.5	Summary of Rigid Pavement Crust Composition	126
Table 5.1	Summary of latest BBD Tests conducted in October 2020	131
Table 5.2	Latest Roughness Measurement Values	135

Table 5.3	MSA Calculation for Pavement	137
Table 5.4	Summary of MSA scenarios	138
Table 5.5	List of encroachment locations	140
Table 5.6	Identified Black Spots	142
Table 6.1	Base O&M and Periodic Maintenance Cost at FY 2022 level which is used for future years with escalation	144
Table 6.2	Operation & Maintenance Cost Projections	145
Table 6.3A	Costs of Periodic Renewal	146
Table 6.3B	Costs of Periodic Renewal	146
Table 6.3C	Costs of Periodic Renewal	147
Table 6.4A	Yearly Routine Maintenance and Cleaning Costs	149
Table 6.4B	Yearly Routine Maintenance and Cleaning Costs	150
Table 6.5	Costs for Operational Expenses	151

## **Figures**

Fig 1.1	Project Road Map	01
Fig 3.1	Start of the Project	36
Fig 3.2	Road Stretch between Ch. 10-15	36
Fig 3.3	Road Stretch between Ch. 15-20	36
Fig 3.4	Road Stretch between Ch. 20-25	36
Fig 3.5	Road Stretch between Ch. 25-30	36
Fig 3.6	Road Stretch between Ch. 30-35	36
Fig 3.7	Road Stretch between Ch. 35-40	37
Fig 3.8	Road Stretch between Ch. 40-45	37
Fig 3.9	Road Stretch between Ch. 45-50	37
Fig 3.10	Road Stretch between Ch. 50-55	37
Fig 3.11	Road Stretch between Ch. 55-60	37
Fig 3.12	Road Stretch between Ch. 60-65	37
Fig 3.13	Road Stretch between Ch. 65-70	38
Fig 3.14	Road Stretch between Ch. 70-75	38
Fig 3.15	Road Stretch between Ch. 75-80	38
Fig 3.16	Road Stretch between Ch. 80-85	38
Fig 3.17	Road Stretch between Ch. 85-90	38
Fig 3.18	Road Stretch between Ch. 90-95	38
Fig 3.19	Road Stretch between Ch. 95-100	39
Fig 3.20	Road Stretch between Ch.100-105	39
Fig 3.21	Road Stretch between Ch.105-110	39
Fig 3.22	Road Stretch between Ch.110-115	39
Fig 3.23	Road Stretch between Ch.115-120	39
Fig 3.24	Road Stretch between Ch.120-125	39
Fig 3.25	Road Stretch between Ch.125-130	40
Fig 3.26	Road Stretch between Ch.130-135	40

Fig 3.27	Road Stretch between Ch.135-140	40
Fig 3.28	Road Stretch between Ch.140-145	40
Fig 3.29	Road Stretch between Ch.145-150	40
Fig 3.30	End point of Project Road	40
Fig 3.31	Major Junction 17+400 RHS Bhopal bypass	44
Fig 3.32	Major Junction 25+450 RHS Sehore Bypass start	44
Fig 3.33	Major Junction 28+450 LHS Lasudia Parihar	44
Fig 3.34	Major Junction 34+150 LHS to Sehore	44
Fig 3.35	Major Junction 36+050 LHS to Sehore	44
Fig 3.36	Major Junction 39+700 LHS Sehore Ichhawar	44
Fig 3.37	Major Junction 41+800 LHS Sehore bypass end	45
Fig 3.38	Major Junction 53+080 RHS Sonda bypass	45
Fig 3.39	Major Junction 77+210 LHS Ashta bypass start	45
Fig 3.40	Major Junction 80+175 Ashta Shujalpur road	45
Fig 3.41	Major Junction 81+510 Ashta bypass end	45
Fig 3.42	Major Junction 93+300 Highway Treat Dodi	45
Fig 3.43	Major Junction 94+600 Dodi Arniyaganj	46
Fig 3.44	Major Junction 102+100 Jawar Gwala Gwali	46
Fig 3.45	Major Junction 104+400 Mehatwada Bypass start	46
Fig 3.46	Major Junction 119+050 Sonkatchh bypass start	46
Fig 3.47	Major Junction 120+300 To Sonkatchh town	46
Fig 3.48	Major Junction 120+550 Sonkatchh bypass end	46
Fig 3.49	Major Junction 148+600 Dewas bypass crossing	47
Fig 3.50	Major Junction 150+790 Junction with NH-3	47
Fig 3.51	Minor Junction 19+310 LHS	50
Fig 3.52	Minor Junction 36+050 LHS	50
Fig 3.53	Minor Junction 44+900 RHS	50
Fig 3.54	Minor Junction 64+200 LHS	50
Fig 3.55	Minor Junction 118+350 LHS	50
Fig 3.56	Minor Junction 136+200 LHS	50
Fig 3.57	Service road at Ch. 66+700 LHS	51
Fig 3.58	Service road at Ch. 57+300 RHS	51
Fig 3.59	Service road at Ch. 66+500 RHS	51
Fig 3.60	Service road at Ch. 149+500 LHS	52
Fig 3.61	Service road at Ch. 149+500 RHS	52
Fig 3.62	Service road at Ch.150+000 RHS	52
Fig 3.63	Median Opening in Ch.15-20	53
Fig 3.64	Un-authorized Median Opening in Ch.15-20	53
Fig 3.65	Depressed Median in Ch. 15-20	53
Fig 3.66	Median Opening in Ch.45-50	53
Fig 3.67	Median Opening in Ch.70-75	53
Fig 3.68	Median Opening in Ch. 80-85	53
Fig 3.69	Bus Shelter at Ch 28+450	61
Fig 3.70	Bus Shelter at Ch 39+700	61

Fig 3.71	Bus Shelter at Ch 88+500	61
Fig 3.72	Bus Shelter at Ch 94+900	62
Fig 3.73	Bus Shelter at Ch 106+100	62
Fig 3.74	Bus Shelter at Ch 150+790	62
Fig 3.75	Condition of Drain at Ch 57+500	64
Fig 3.76	Condition of Drain at Ch 134+500	64
Fig 3.77	Condition of Drain at Ch 149+500	64
Fig 3.78	Sign Board in Ch.10-15	66
Fig 3.79	Sign Board in Ch. 25-30	66
Fig 3.80	Sign Board in Ch. 30-35	66
Fig 3.81	Sign Board at Ch 46+050	66
Fig 3.82	Sign Board at Ch 61+200	66
Fig 3.83	Sign Board at Ch 65+300	66
Fig 3.84	Sign Board at Ch 74+400	67
Fig 3.85	Sign Board at Ch 98+750	67
Fig 3.86	Sign Board at Ch 119+000	67
Fig 3.87	Sign Board at Ch 124+500	67
Fig 3.88	Sign Board at Ch 128+600	67
Fig 3.89	Sign Board at Ch 140+000	67
Fig 3.90	Overhead Signboard Ch. 17+400	71
Fig 3.91	Overhead Signboard Ch. 39+700	71
Fig 3.92	Overhead Signboard Ch. 149+200	71
Fig 3.93	MBCB at Ch. 34+600	72
Fig 3.94	MBCB at Ch. 38+300	72
Fig 3.95	MBCB at Ch. 41+650	72
Fig 3.96	MBCB at Ch. 88+850	72
Fig 3.97	MBCB at Ch. 105+100	72
Fig 3.98	MBCB at Ch. 117+960	72
Fig 3.99	High mast at Ch. 25+400	75
Fig 3.100	High mast at Ch. 61+550	75
Fig 3.101	High mast at Ch. 148+600	75
Fig 3.102	Km. Stone at 13+000	76
Fig 3.103	Km. Stone at 32+000	76
Fig 3.104	Km. Stone at 39+000	76
Fig 3.105	Km. Stone at 43+000	77
Fig 3.106	Km. Stone at 119+000	77
Fig 3.107	Km. Stone at 148+000	77
Fig 3.108A	MjB at Ch. 53+300 – Expansion joint, Deck view, MBCB	79
Fig 3.108B	MjB at Ch. 53+300 – View of deck slab, View of underside of superstructure	79
Fig 3.109A	MjB at Ch. 77+850 – Condition of deck, Crash Barrier	80
Fig 3.109B	MjB at Ch. 77+850 – Drainage spout, View of underside of superstructure	80
Fig 3.110A	MjB at Ch. 121+120 –View of deck and underside of bridge	81
Fig 3.110B	MjB at Ch. 121+120 – Expansion joint, View of underside of superstructure	81
Fig 3.111A	MjB at Ch. 128+510 –View of deck and underside of bridge	82

Fig 3.111B	MjB at Ch. 128+510 – Vegetation on abutments, condition of substructure	82
Fig 3.112	MnB Ch. 34+680 –View of deck slab, underside of bridge	86
Fig 3.113	MnB Ch. 38+350 –Condition of expansion joints, view of deck slab	86
Fig 3.114	MnB Ch. 38+850 –View of deck slab, drainage spout and hazard marker	87
Fig 3.115	MnB Ch. 45+250 - Damaged quadrant pitching & toe wall, view of deck slab	87
Fig 3.116	MnB Ch. 60+970 –View of underside of bridge, condition of expansion joints	88
Fig 3.117	MnB Ch. 63+550 – View of deck slab, View of underside of slab	88
Fig 3.118	MnB Ch. 67+420 –View of deck slab, underside of box	89
Fig 3.119	MnB Ch. 71+450 –View of deck slab, view of underside of superstructure	89
Fig 3.120	MnB Ch. 94+230 –View of footpath and deck slab, view of underside of bridge	90
Fig 3.121	MnB Ch. 105+190 –View of deck slab, view of underside of bridge	90
Fig 3.122	MnB Ch. 107+900 –View of deck slab and underside of bridge, expansion joints	91
Fig 3.123	MnB Ch. 117+960 – Condition of approaches & expansion joints	91
Fig 3.124	MnB Ch. 122+860 – View of deck slab, condition of expansion joint	92
Fig 3.125	MnB Ch. 126+570 – View of deck slab & approaches, underside of bridge	92
Fig 3.126	MnB Ch. 127+010 – View of deck slab & approaches, underside of bridge	93
Fig 3.127	MnB Ch. 140+205 – View of deck slab, minor vegetation in quadrants	93
Fig 3.128	MnB Ch. 143+410 – View of deck slab and underside of bridge	94
Fig 3.129	VUP at 94+330– General cleaning in quadrants, view of underside & deck slab	95
Fig 3.130	PUP at 67+250 –View of underside, minor damages in crash barrier	95
Fig 3.131	SC at 10+050	96
Fig 3.132	SC at 13+370	96
Fig 3.133	SC at 15+850	96
Fig 3.134	SC at 16+830	96
Fig 3.135	SC at 21+580	96
Fig 3.136	SC at 39+820	96
Fig 3.137	SC at 49+750	97
Fig 3.138	SC at 51+500	97
Fig 3.139	SC at 62+160	97
Fig 3.140	SC at 100+600	97
Fig 3.141	SC at 102+870	97
Fig 3.142	SC at 114+900	97
Fig 3.143	SC at 115+650	98
Fig 3.144	SC at 125+400	98
Fig 3.145	SC at 142+050	98
Fig 3.146	HPC at 14+100	100
Fig 3.147	HPC at 22+350	100
Fig 3.148	HPC at 32+010	100
Fig 3.149	HPC at 32+700	100
Fig 3.150	HPC at 48+150	100
Fig 3.151	HPC at 66+105	100
Fig 3.152	HPC at 64+470	101
Fig 3.153	HPC at 113+800	101
Fig 3.154	HPC at 121+730	101

Fig 3.155	HPC at 123+840	101
Fig 3.156	HPC at 141+510	101
Fig 3.157A	Toll Plaza at Fanda (Km 25+000)	107
Fig 3.157B	Toll Plaza at Fanda (Km 25+000)	107
Fig 3.158A	Toll Plaza at Amlaha (Km 61+550)	108
Fig 3.158B	Toll Plaza at Amlaha (Km 61+550)	108
Fig 3.159A	Toll Plaza at Bhourasa (Km 134+600)	109
Fig 3.159B	Toll Plaza at Bhourasa (Km 134+600)	109
Fig 5.1	Ambulance at Toll Plazas	139

### LIST OF ABBREVIATIONS USED

Abbreviations	Meaning
ATMS	Automatic Toll Management System
AVCC	Automatic Vehicle Count Classifier
BBD	Benkelman Beam Deflection
BC	Bituminous Concrete
BOQ	Bill of Quantities
BOT	Build Operate and Transfer
B/T	Bituminous
B/s	Both Sides
CA	Concession Agreement
CB	Crash Barrier
CBR	California Bearing Ratio
CC	Cement Concrete
c/c	Centre to Centre
CD	Cross Drainage
Ch	Chainage
COD	Commercial Operation Date
COM	Communication Port
COS	Change of Scope
C/s	Cross-section
Cr.	Crores
cum	Cubic Meter
DBM	Dense Bituminous Macadam
DC	Design Chainage
Dept.	Department
Dia	diameter
DL	Dead Load

Abbreviations	Meaning
DLC	Dry Lean Concrete
DLP	Defect Liability Period
D/s	Downstream
Dwg	Drawing
ECW	Existing Carriageway
Emb	Embankment
EPC	Engineering Procurement Construction
Etc.	Etcetera
ETC	Electronic Toll Collection
Fe415, Fe500	Grade of Steel
Fig.	Figure
FME	Force Majeure Event
FWD	Falling Weight Deflectometer
GOI	Government of India
GOMP	Government of Madhya Pradesh
gms	Grams
GSB	Granular Sub Base
HD	High Definition
HDD	Hard Disk Drive
Hm	Hectometer
HPC	Hume Pipe Culvert
HYSD	High Yield Stress Deformed
IC / IE	Independent Consultant / Engineer
IRC	Indian Road Congress
Jn.	Junction
Kg	Kilogram
Km	Kilometer
Km/h	Kilometer per hour
kVA	Kilo Volt Ampere
LCV	Light Commercial Vehicle
LHS	Left Hand Side
LL	Live Load
LMV	Light Motor Vehicle
LOA	Letter of Award
Ltd	Limited
m	Meter
M15, M30, M35	Grades of Concrete
MAV	Multi Axle Vehicle

Abbreviations	Meaning
Max	Maximum
MBCB	Metal Beam Crash Barrier
MCW	Main Carriageway
MDR	Major District Road
Min	Minimum
MoRTH	Ministry of Road Transport & Highways
MP	Mega Pixel
MPRDC	Madhya Pradesh Road Development Corp.
M/s	Messer's
MSA, msa	Million Standard Axles
mm	Millimeter
MjB	Major Bridge
MnB	Minor Bridge
MoEF	Ministry of Environment and Forests
NA	Not Applicable
NBC	National Building Code
NH	National Highway
NJ CB	New Jersey Crash Barrier
NOC	No Objection Certificate
Nos, No.	Numbers
O&M	Operation & Maintenance
PCC	Plain Cement Concrete
PCOD	Provisional Commercial Operation Date
PQC	Pavement Quality Concrete
PR	Project Road
PUP, u/p	Pedestrian Underpass
PWD	Public Works Department
Pvt. Ltd.	Private Limited
Res.	Residence
RCC	Reinforced Cement Concrete
R/f	Reinforcement
RFID	Radio Frequency Identification
RHS	Right Hand Side
ROW	Right of Way
Rs.	Rupees
SBC	Safe Bearing Capacity
SC	Slab Culvert
Sch.	Schedule

<b>Abbreviations</b>	<b>Meaning</b>
SG	Subgrade
SH	State Highway
SIDL	Super Imposed Dead Load
SMPS	Switch Mode Power Supply
SP	Special Publication
SPV	Special Purpose Vehicle
Sqm.	Square Meter
SR	Service Road
TCS	Typical Cross Section
TFT	Thin Film Transistor Monitor
T/m <sup>2</sup>	Tonne per square meter
TMS	Toll Management System
UPS	Uninterrupted Power Supply
U/s	Upstream
VDF	Vehicle Damage Factor
VUP	Vehicular Underpass
WIM	Weigh in Motion
WMM	Wet Mix Macadam
WPI	Wholesale Price Index
&	and

## CHAPTER 1.0: INTRODUCTION

### 1.1 BACKGROUND

Madhya Pradesh Road Development Corporation Ltd (MPRDC) has got developed the Bhopal to Dewas Section (Km 6/8 to Km 151/6) of SH-18 in the State of Madhya Pradesh into a 4-lane dual carriageway facility. This Project *“Reconstruction, Strengthening, Widening & Rehabilitation of Bhopal-Dewas Section including existing bypasses of Bhopal and Dewas from Km 6/8 (from Lalghati Square at Bhopal) to Km 151/6 (Dewas Bypass Junction) on SH-18 to 4-lane Section in the State of Madhya Pradesh on Build, Operate and Transfer (BOT) Basis”* was awarded to M/s Dewas Bhopal Corridor Pvt Ltd for a Concession Period of 25 years. The Concession Agreement was signed on 30<sup>th</sup> June 2007. The Project Commencement Date was recorded as 20<sup>th</sup> March 2008 and Provisional Completion Certificate was issued in three different dates for three different sections (Section 1 on 10.02.2009, Section 2 on 17.09.2009 and Section 3 on 30.04.2010). The Project is presently under Operation & Maintenance Stage.

### 1.2 PROJECT ROAD LOCATION

As per the Concession Agreement, the start and end points of Project Road were Km 6/8 (Lalghati Square) and Km 151/6 (Dewas Bypass Junction). However, the start and end points were subsequently revised by a COS Order to Ch 10+000 and junction with NH-3 in Dewas Town (Ch 150+790). Thus Project Road is the Section of MP State Highway -18 starting at Km 10/10 (Ch 10+000) after Bairagarh town near Bhopal (N23°16'11", E77°19'42") and ends at the junction with NH-3 in Dewas town (Ch 150+790) (N22°58'05", E73°03'50") of SH-18. The Length of Project Road is **140.790km**. For Report purpose we have used chainage as per Concession Agreement i.e., Km 6/8 to Km 151/6.

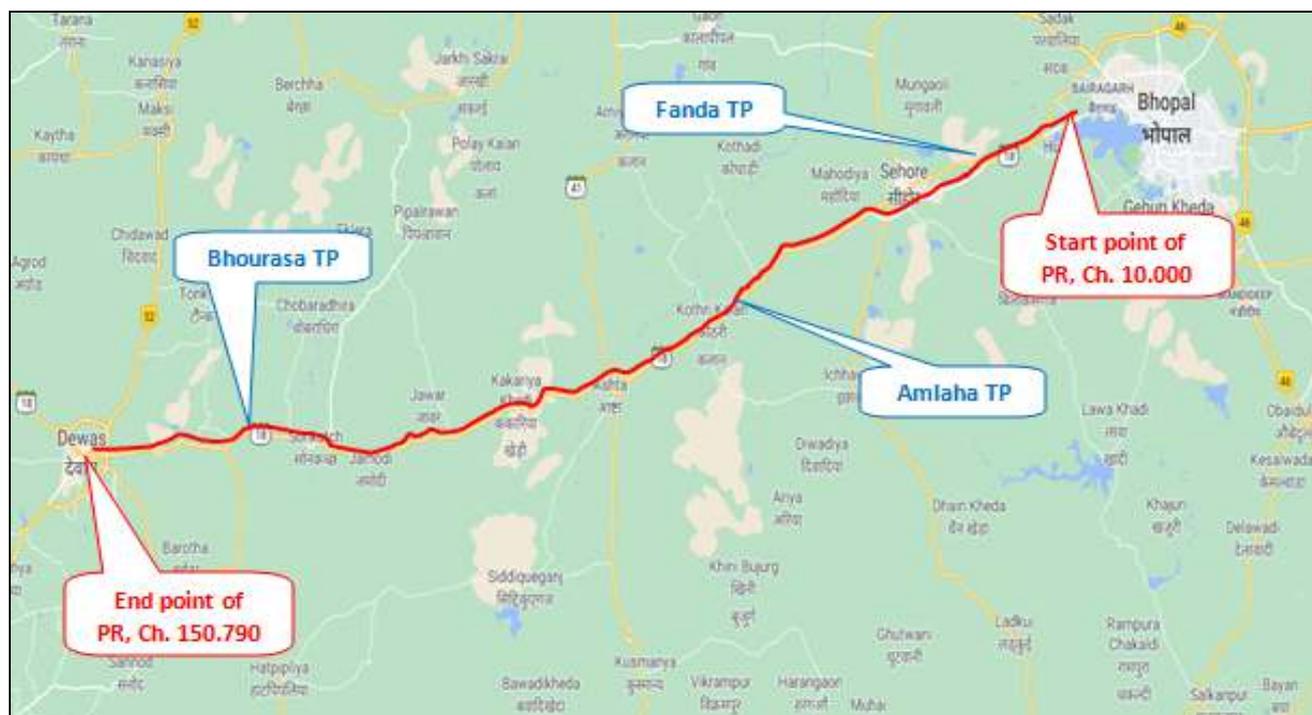


Fig 1.1: Project Road Map

### 1.3 SALIENT FEATURES OF PROJECT

The Salient Features of the Project are brought out in **Table 1.1** below.

**Table 1.1: Salient Details of Project**

S. No	Parameter	Description		
<b>A.</b>	<b>Basic Details</b>			
1	Project Name	Strengthening, up-gradation and Four Laning of Bhopal - Dewas Section of SH-18 in the State of Madhya Pradesh on BOT Basis		
2	State	Madhya Pradesh		
3	SH	SH-18		
4	Section 1	Ch 10.000 to Ch 41.600	Bairagarh to end of Sehore Bypass	31.60 Km
	Section 2	Ch 41.600 to Ch 81.600	End of Sehore Bypass to end of Ashta Bypass	40.00 Km
	Section 3	Ch 81.600 to Ch 150.790	End of Ashta Bypass to junction with NH-3 in Dewas	69.19 Km
5	Total Length of the Project	140.79 km		
<b>B.</b>	<b>Contract Details</b>			
1	Authority	Madhya Pradesh Road Development Corporation (MPRDC)		
2	Concessionaire	Dewas Bhopal Corridor Pvt Ltd (DBCPL)		
3	Independent Consultant (during Construction)	M/s SAI Consulting Engineers Pvt Ltd		
4	Independent Consultant (Current)	Yongma Engg. Co Ltd in association with V-PRA Infra Pvt Ltd		
5	Date of Award (LOA)	16 <sup>th</sup> March, 2007		
6	Date of signing of Concession Agreement	30 <sup>th</sup> June, 2007		
7	Commencement Date	20 <sup>th</sup> March, 2008		
8	Concession Period	25 years from Commencement Date (including 2.5 years construction period)		
9	Scheduled COD	20 <sup>th</sup> September, 2010		
10	Provisional Completion Date	Section 1	Section 2	Section 3
		10 <sup>th</sup> February 2009	17 <sup>th</sup> September 2009	30 <sup>th</sup> April 2010
11	Final Completion Date	Section 1	Section 2	Section 3
		27 <sup>th</sup> June 2009	15 <sup>th</sup> December 2009	12 <sup>th</sup> August 2010
12	End of Concession Period (Original)	19 <sup>th</sup> March, 2033		
13	Extended Concession End Date	01 <sup>st</sup> December, 2033		

S. No	Parameter	Description
C.	Project Details	
1	Roadway	4 laned divided Carriageway with raised median / depressed median -7.0m carriageway plus 2.5m hard shoulder on outer side and 1.0m earthen shoulder on median side in case of depressed medians
2	ROW	Varying from 30m to 60m
3	Pavement Type	Flexible, Rigid (in Toll Plaza area)
4	Bypasses/Realignments	Sehore (16.35km), Sonda (1.37km), Ashta (4.3km), Dodi (0.9km), Mehatwada (1.6km), Semli (0.6km), Sonkatchh (3.5km), Arniya (0.8km)
5	Built-up areas	Total Length of 21.190 km
6	Service Road (4/5/5.5m)	Total length of 9.090 km
7	Toll Plaza	Fanda (Km 25+000), Amlaha (Km 61+550), Bhourasa (Km 134+600) (4+4 Lanes)
8	Major Junctions	19
9	Minor Junctions	70
10	Bus Bays / Bus Shelters	3 / 35
11	Truck Lay-byes	01 (92+000)
12	Rest Areas	Nil
13	VUP	01 (94+330 at Dodi)
14	PUP	01 (67+250 at Kothri)
15	Major Bridges	04 (53+300, 77+850, 121+120, 128+510)
16	Minor Bridges	17
17	Culverts	162 (109 HPC, 53 SC)

\*As per the Concession Agreement, the Project Road is a Section of MP State Highway-18. But the Highway has been re-numbered to SH-28 vide a Gazette Notification dated 15<sup>th</sup> Sept 2017. We have kept SH-18 in the report as per Concession Agreement

## 1.4 SCOPE OF WORK FOR THE STUDY

The Scope of Work for the Technical Due Diligence is mentioned as under:

### 1.4.1 General

- Review of all documents related to Project including but not limited to Concession Agreement, Provisional Completion Certificates, Punch list items, Completion Certificate, clearances, Monthly IE Reports, important correspondence if any.
- Review of Change of Scope/other Claims submitted and to be submitted to Authority/IC, comment on the veracity of the same and approval status.

- c. Highlight any non-compliance of the terms of the Concession Agreement or O&M Manual and IC Inspection Reports, etc.
- d. Review of any pending issues related to utility shifting, maintenance, etc. in accordance with the Concession Agreement.
- e. Comment on issues including any balance work that may have a potential impact on the maintenance costs going forward and which may warrant a one-time expense in future.
- f. In general review the Toll Plaza systems (incl. TMS, HTMS, AVCC, weigh bridge, sensors, ETC, etc.) and the hardware installed therein and comment on the adequacy and level of maintenance of the same to meet the requirements under Concession Agreement.
- g. Review of as-built drawings and Design Reports (including stage construction, if any).
- h. Determine the appropriate level and frequency of Routine and Major Maintenance activities required to keep the road assets in good condition and to meet the performance and O&M standards, specifications and requirements.
- i. Review the Major Maintenance work undertaken if any, and prepare projections for future Major Maintenance expenses (incl. any hand-back requirements), so as to ensure compliance with the terms of Concession Agreement.
- j. Review of condition of SPV assets including all equipment and vehicles, etc.
- k. Report on balance acquisition of land if any and possibility of acquisition.
- l. Report on current encroachments on the Project stretch and future expected problems due to the same.
- m. Review of O&M Contracts

#### **1.4.2 Assessment of Asset Condition**

- a. Assessment of road assets in conformance with specifications, standards and codes stipulated in Concession Agreement and O&M Manual, etc.
- b. A detailed inventory survey of road assets including main carriageway, structures, service roads, lightings, drains, slope protection works, retaining walls, bus bays, bus shelters, truck lay byes, O&M center, road furniture including signages, MBCB, guard rails, etc., other safety measures, toll collection infrastructure, buildings, plantation, vehicles and other objects.
- c. Assessment of condition of the structures including but not limited to visual inspections of bearings, expansion joints, superstructure, substructures, foundations, associated components, pre-stress anchorages (if any), review of geotechnical assumptions, perform geotechnical due diligence, review as-built design and assess design assumptions and provide a detailed report thereon.
- d. Assessment of condition of the road pavement including but not limited to visual inspections of the pavement, review as-built design and assess design assumptions and provide a detailed report thereon.

- e. Assessment of physical dimensions/condition of the infrastructure to determine useful lives of the materials and equipment requiring rehabilitation and/or replacement.
- f. Recommendations for any major repair/rehabilitation and strengthening based on the condition survey and Design Reports.
- g. To provide a detail photographic report of the infrastructure assets and its condition to withstand till end of Concession Period. Suggestion and cost evaluation for any additional repair/rectification/modification required.

#### **1.4.3 Investigations to be carried out**

- a. Assessing maintenance needs and its valuation according to the level of deterioration.
- b. Evaluation of overall condition of flexible pavement including PQC/BT at Toll Plaza, BC, DBM, Base/Sub base and sub grade and drainage condition survey.
- c. Carry out visual condition survey for rigid (Toll Plaza) and flexible pavement
- d. Review the BBD test report provided by the Concessionaire to ascertain the adequacy of the pavement structure for expected traffic loads, pavement life evaluation.
- e. Review the Roughness test report provided by the Concessionaire
- f. Carry out drainage survey to asses any potential future problems which will cause by moisture and runoff.
- g. Assessment of variation/COS orders on the Project, if any, and evaluate their impact on expenditure, time to completion, future O&M obligations and tolling revenue.
- h. Comment on the pavement crust composition (Design vs. Actual) for PQC/BT at Toll Plaza, BC, DBM, overlay and non-bituminous layer, etc.

#### **1.4.4 O&M Assessment**

- a. Develop a detailed O&M cost forecast for each year of the Concession Period and a detailed Major Maintenance Cost forecast along with estimation of costs towards handover requirements.

## CHAPTER 2.0: REVIEW OF DOCUMENTS

### 2.1 REVIEW OF CONCESSION AGREEMENT

*Madhya Pradesh Road Development Corporation (MPRDC)* has entered into a Concession Agreement on 30<sup>th</sup> June 2007 with *Dewas Bhopal Corridor Private Limited*, a Special Purpose Vehicle (SPV) formed for implementing this project, a company incorporated under Indian Companies Act, 1956 for “*Reconstruction, Strengthening, Widening & Rehabilitation of Bhopal-Dewas Section including existing bypasses of Bhopal and Dewas from Km 6/8 (from Lalghati square at Bhopal) to Km 151/6 (Dewas Bypass Junction) on SH-18 to 4-lane Section in the State of Madhya Pradesh on Build, Operate and Transfer (BOT) Basis*”.

Our observations on the major relevant provisions of the Concession Agreement are brought out in the sub paras below.

#### 2.1.1 SPECIFIC COMMENTS ON ARTICLES OF CONCESSION AGREEMENT

The Project has been completed and is presently under the Operation & Maintenance Period. We have reviewed the major provisions of the Concession Agreement and our specific comments on the same are indicated below clause-wise.

**Table 2.1: Comments on Concession Agreement**

Review of Concession Agreement			
Article & Clause No.	Subject	Information in Brief	Remarks
Chapter II, Clause 2.1.3	Scope of Project	Operation and Maintenance of the Project Highway in accordance with the provisions of this Agreement (Schedule-M)	Since all the phases of work have been completed and COD has been issued, the work is presently in O&M stage.
Chapter III, Clause 3.1, Chapter I, Point 20	Grant of Concession, Concession Period	MPRDC hereby grants to the Concessionaire the Concession set forth therein including the exclusive right, licence and authority during the subsistence of this Agreement to construct, operate and maintain the Project Highway for the Concession Period as defined in definition 20 of this Agreement and the Concessionaire hereby accepts the Concession and agrees to implement the Project in accordance with the Terms and Conditions set forth herein. Concession Period as defined under S. No. 20,	The Commencement Date is 20 <sup>th</sup> March 2008; thereby the Concession Period shall end on 19 <sup>th</sup> March 2033. The Concession Period is extended upto 01 <sup>st</sup> December 2033 on account of works under COS Orders and Force Majeure Events.

Review of Concession Agreement			
Article & Clause No.	Subject	Information in Brief	Remarks
		Chapter 1 of the Concession Agreement, is "The period beginning from Commencement Date and ending at the end of 25 years or any valid extension granted thereof by MPRDC or the Termination Date, whichever is earlier."	
Chapter III, Clause 3.2.3	Liability during Tolling Period	The Concession hereby granted shall entitle the Concessionaire to, upon completion of Project Highway and during the toll period to manage, operate & maintain the Project Highway and so as to allow the use of road appropriately for toll collection and to regulate the use such that no traffic/persons use the highway in a manner detrimental to the road condition.	Concessionaire's liability is operation and maintenance of the road and also to regulate the traffic/persons for proper use of road.
Chapter VI, Clause 6.1	Fees	The Concessionaire shall be entitled during the toll period to levy, collect and appropriate the Fees from the users of the Project Highway pursuant to and in accordance with the Fee Notification set forth in Schedule-C of this Agreement.	Collection of user fees is covered under this clause.
Chapter VI, Clause 6.2	Revision of Fees	The Concessionaire acknowledges that the Fee Notification, inter alia, provides for revision in the Fees by increase in the fees of, @ 7% per year based on the fees charged in the previous accounting year, as per the Fee Notifications, and hereby confirms that save and except as provided in the Fee Notification, the Concessionaire is not entitled to and shall not seek any relief whatsoever from MPRDC, GOI or GOMP on account of increase or otherwise in WPI or on any other account except in accordance with the express provisions of this Agreement.	Revision of fee at fixed rate of 7% per year irrespective of increase of WPI has been specified.
Chapter VI, Clauses 6.3, 6.3.1, 6.3.2	Fees from Local Personal and Commercial Traffic	6.3 The Concessionaire shall collect fees from local personal traffic and local commercial traffic after reducing the fees by the following rates: 6.3.1 For Local Personal Traffic: 75% of the applicable fees for the specific category of vehicle. 6.3.2 For Local Commercial Traffic: 50% of the applicable fees for the specific category of vehicle.	Local Personal and Commercial Traffic means traffic travelling a distance of 10km on either or both sides of Toll Plaza. Discount is available in the issue of monthly pass to such traffic.

Review of Concession Agreement			
Article & Clause No.	Subject	Information in Brief	Remarks
			<b>Note:</b> In most other projects, a monthly local pass at a fixed fee is issued to Local Personal vehicle residing within a radius of 10km from Toll Plaza.
Chapter VI, Clause 6.10.3	Project Monitoring Fee	The Concessionaire shall pay to MPRDC till end of Concession Period or the termination of this Agreement, an amount equivalent to 1% of annual toll collected as a Project Monitoring Fee for the first 10 years from commencement date and thereafter the amount will increase to 2% from start of 11 <sup>th</sup> year to end of 15 <sup>th</sup> year and to 3% from the 16 <sup>th</sup> year till the end of Concession Period.	As informed by the Concessionaire, this Project Monitoring Fees is being regularly paid to MPRDC.
Chapter VI, Clause 6.11.1	Additional Check posts	Notwithstanding anything to the contrary contained in this Agreement, if any by-pass/road is built which results in loss of toll fees and leakage of revenue the Concessionaire may be allowed to shift the toll plazas and construct new check posts to minimise such leakage of revenue.	Till the present date, there is no such additional check-post under construction or under operation. There is also no proposal for construction of any additional toll way at this stage.
Chapter XIII, Clause 13.2	Toll Date	Toll date of the Project shall be the date on which MPRDC has issued the Completion Certificate or the Provisional Certificate as the case may be for any or all sections of the Project Highway under this Agreement and the Concessionaire shall not levy or collect any fee until it has received such Completion Certificate or Provisional Certificate.	The Project Road has been divided into three homogeneous sections and accordingly Provisional Completion Certificates and Completion Certificates were issued as under: (a) 1 <sup>st</sup> section: (31.6km) PCOD on 10.03.09, COD on 27.06.09 (b) 2 <sup>nd</sup> section: (40.0km) PCOD on 17.09.09, COD on 15.12.09

Review of Concession Agreement			
Article & Clause No.	Subject	Information in Brief	Remarks
			(c) 3 <sup>rd</sup> section: (69.19km) PCOD on 30.04.10, COD on 12.08.10. <b>Note:</b> The Project completion is achieved before the SCOD (20.09.10)
Chapter XV, Clause 15.1	Change of Scope	MPRDC may, require provision of such additional works and services on or about the Project Highway which are beyond the Scope of Project (Schedule-I) as contemplated by this Agreement (Change of Scope), to be carried out by the Concessionaire at his own cost during the Concession Period and that there shall be no change in Concession Period or any compensation payable if such changes do not require expenditure exceeding Rs. 2.14 Crores (0.5% of the Project Cost) (Rs. 2.14 Crores) and do not adversely affect the Toll Date.	This implies that if the expenditure exceeds the amount of Rs. 2.14 Crores due to COS work items, then accordingly there shall be a change in Concession Period.
Chapter XV, Clause 15.5	Ceiling of COS expenditure	Change of Scope after the Project completion shall be limited to 20% of the Total Project Cost (based on the Schedule of Rates given in the Detailed Project Report).	The Total Project Cost is Rs. 426.64 Cr excluding IDC and escalation, so the upper ceiling of expenditure on account of COS is Rs. 85.33 Cr. <b>Note:</b> The COS Order from MPRDC till date amounts to Rs. 28.85 Cr
Chapter XV, Clause 15.9	Computation of extension / reduction in Concession Period	The calculation for computing the extension or reduction in Concession Period on account of increase / decrease in scope of work beyond Rs. 2.14 Crores will be done on the basis of following formula: Mathematically the steps would be as follows: 1. A = Average daily toll in the first 6 months 2. $B = A \times (1 + \text{annual traffic growth}) \times (1.07)^{\text{toll period in year}}$ 3. $C = B / (1 + \text{discount rate})^{\text{year between expenses and end of toll period}}$	The mathematical formula for estimating the increase / decrease of the Concession Period on account of COS is clearly mentioned. <b>Note:</b> However, this mathematical formula has been unilaterally changed by MPRDC

Review of Concession Agreement			
Article & Clause No.	Subject	Information in Brief	Remarks
		<p>4. D = Cost of change of scope / C</p> <p>D is the number of days to be added to the toll period, rounded to the nearest whole day.</p> <p>It is proposed that traffic growth will be estimated at actual traffic growth or 4% per annum whichever is higher. For computation of traffic growth, the average annual traffic growth for a period of at least 2 years or actual whichever is higher will be taken.</p>	<p>later. The same has been accepted vide Supplementary Agreement dated 26.11.2021 by the Concessionaire.</p>
Chapter XVI, Clauses 16.1 to 16.10	Operation and Maintenance liability	<p>16.1 The Concessionaire shall operate and maintain the Project Highway by itself, or through O&amp;M Contractors and if required modify, repair or otherwise make improvements to the Project Highway to comply with Specifications and Standards, and other requirements set forth in this Agreement, Good Industry Practice, applicable Laws and Applicable Permits and manufacturer's guidelines and instructions with respect to toll systems.</p>	<p>It is the liability of the Concessionaire to operate &amp; maintain the Project Highway and even to make improvements to comply with Specifications and Standards and Good Industry Practice.</p>
Chapter XVI, Clause 16.2	Maintenance Manual	<p>The Concessionaire shall in consultation with the Independent Consultant prepare not later than 180 days before the Scheduled Project Completion Date, the repair and maintenance manual which shall be based on the O&amp;M specification laid down in Schedule-M annexed hereto this Agreement for regular and periodic maintenance and shall ensure and procure that at all times, during the Toll Period, the Project Highway is maintained in a manner that it complies with the specifications and standards and the minimum maintenance requirements as provided in this agreement and schedules thereof and as approved by MPRDC.</p>	<p>The O&amp;M Manual has been prepared and submitted on 28.06.2011.</p>

Review of Concession Agreement			
Article & Clause No.	Subject	Information in Brief	Remarks
Chapter XVI, Clause 16.3, 16.3.1 to 16.3.6	Maintenance Programme	Not later than forty five (45) days before the beginning of each Accounting Year, the Concessionaire, shall in consultation with the Independent Consultant prepare and provide to MPRDC, its proposed programme of preventive and other scheduled maintenance of the Project Highway subject to the minimum maintenance requirements set forth in Maintenance Manual as approved by MPRDC necessary to maintain the Project Highway at all times in conformity with the Specifications and Standards (the "Maintenance Programme").	The items to be included in Maintenance Programme including safety standards are specified.
Chapter XVI, Clause 16.4	Additional items under Maintenance	Maintenance shall include replacement of equipment/consumables, horticulture maintenance and upkeep of all Project Assets in good order and working condition. Maintenance shall not include the extension of any existing pavements, bridge, structures and other civil works unless part of the Project.	Concessionaire's maintenance liability does not include extension of any existing pavements, bridge, structures and other civil works that are not part of the Project.
Chapter XVI, Clause 16.7	Maintenance of Approach roads	The Concessionaire shall be responsible for the maintenance of the approach roads to and underpasses and overpasses up to 50 meters from the Project Highway in accordance with Good Industry Practice.	Concessionaire is bound by Agreement to maintain these.
Chapter XVI, Clause 16.12	Maintenance Fund	The Concessionaire shall for due and faithful performance of its Obligations during the Toll Period and to cover the cost of repairs and maintenance of the Project Highway shall maintain a "Maintenance Fund" in a separate designated account (in the form of Fixed Deposit with the Bank) in the bank with the lien of MPRDC recorded with the Bank and to be operated by MPRDC.	As informed by the Concessionaire, a separate Maintenance Fund is being maintained.
Chapter XVII, Clause 17.2	O&M Inspection Report	The IC shall review the Maintenance Report and inspect the Project Highway at least once a fortnight during the Toll Period and make out an Inspection Report of such inspection (the "O&M Inspection Report"). IC shall send a copy of its	MPRDC has recently appointed Independent Consultant for the O&M stage and the IC is monitoring the O&M

Review of Concession Agreement			
Article & Clause No.	Subject	Information in Brief	Remarks
		O&M Inspection Report to MPRDC. The Concessionaire shall within 30 days of the receipt of the O&M Inspection Report from MPRDC remedy the defects and deficiencies, if any, set forth in such O&M Inspection Report and submit its report in respect thereof to MPRDC within the said 30 days period. Where the remedying of such defects or deficiencies is likely to take more than 30 days in accordance with Good Industry Practice, the Concessionaire shall undertake the works in accordance with such practice and submit progress reports of such works every fortnight.	works done by the Concessionaire.
Chapter XVIII, Clause 18.1	Safety, vehicle breakdown and Accident	The Concessionaire shall comply with the provisions of this agreement, applicable laws and applicable permits and conform to Good Industry Practice for securing the safety of the users. In particular, the Concessionaire shall develop, implement and administer a surveillance and safety programme for providing a safe environment on or about the Project Highway, and shall comply with the safety requirements set forth in Schedule - L ( the "Safety Requirement")	Concessionaire is bound by Agreement to comply with the Safety requirements.
Chapter XIX, Clause 19.5	Cost of supervising Authority	During the Toll Period, the cost of supervising Authority to be borne by the Concessionaire shall be equal to Rs. 15,000.00 per Crore of the Total Project Cost per year (duly increased every three years by increase in WPI). The said cost for a block of three years shall be payable by the Concessionaire in 6 equal instalments (first instalment to be paid on toll date and balance 5 instalments every 6 months thereafter)	This Clause has been modified as per Pre-bid replies. It shall be 0.15% of Total Project Cost.
Chapter XXIII, Clause 23.1	Revenue Shortfall Loan	If the Realisable Fees in any Accounting Year during the Concession Period shall fall below the subsistence revenue level, MPRDC agrees to allow the Concessionaire to avail accommodation for such shortfall, by way of a loan ("Revenue Shortfall Loan") from any Bank. Any balance of Maintenance Fund of the Concessionaire or any sums received or likely to be received by the	MPRDC is bound by the Agreement to allow Concessionaire to avail this facility if the Realisable Fees in any Accounting Year falls below the Subsistence Revenue Level.

Review of Concession Agreement			
Article & Clause No.	Subject	Information in Brief	Remarks
		Concessionaire through insurance claims (except insurance payments for physical loss used to carry out requisite repairs) or payments by MPRDC under Clause 28 shall first be deducted and only the balance amount remaining shall be availed as the Revenue Shortfall Loan.	<b>Note:</b> The Concessionaire has not opted for Revenue Shortfall Loan.
Chapter XXIII, Clause 23.6	Compensation for loss of revenue	If any sum remains due or outstanding from the Concessionaire under this Clause 23 at any time during a period of one year preceding the Termination Date, MPRDC shall allow the increase in the Concession Period only in the event of such loans being taken to cover the shortfall in Subsistence Revenue Level, proportionately and to the extent approved by MPRDC, to allow the Concessionaire to be compensated for the loss of Revenue and to be able to repay such Revenue Shortfall Loan. In any case, such extended period shall not exceed 3 years. The extension of Concession Period upto 3 years may be considered with prior approval of MPRDC.	Concession Period/Toll Period can be extended.
Chapter XXVI, Clause 26.2	Insurance during Toll Period	Insurance during the Toll Period: Not later than 4 months prior to the anticipated Completion of the Project Highway, the Concessionaire shall obtain and maintain at no cost to MPRDC during the Toll Period in respect of the Project Highway and its operations such insurance as may be required under any of the Financing Documents, Applicable Laws and such insurance as the Concessionaire may insure such risks and such costs as is considered necessary by MPRDC in accordance with Good Industry Practice. Provided, however, the amount and risks covered as well as the level of insurance to be maintained after satisfaction of Lenders dues in full, shall be determined on the same principles as applicable for determining the level of Insurance prior to such date. This level shall be agreed with MPRDC with 90 days of date of this Agreement. The Concessionaire shall also include insurance of all	The Concessionaire has to keep all assets of the Project Highway insured at all times during the entire Concession Period. <b>Note:</b> The Concessionaire has obtained the required insurance.

<b>Review of Concession Agreement</b>			
<b>Article &amp; Clause No.</b>	<b>Subject</b>	<b>Information in Brief</b>	<b>Remarks</b>
		insurable FME as defined in Clause 28.	
Chapter XXVII, Clause 28.5.3	Force Majeure Event	Where a Force Majeure Event occurs after Toll Date, the Concessionaire shall continue to make all reasonable efforts to collect Fees, but if he is unable to collect Fees during the subsistence of such Force Majeure Event, the Concession Period shall be extended by the period for which collection of fees remains suspended on account thereof.	There were 02 Force Majeure Events (FME), demonetization and Covid-19. Concession Period is already extended by MPRDC on account of both these FME by 62.5 days. (22.5 days for Demonetization - Order dated 19.06.17 & 40 days for Covid-19 - Order dated 22.09.20)
Chapter XXX, Clause 30.1.1& 30.1.6	Defects Liability (Initial Inspection & Second Inspection)	Not less than 12 months or more than 15 months prior to the expiry of the Concession Period, the Concessionaire and the IC shall conduct a joint inspection (the "Initial Inspection") of the Project Highway and all Project Facilities. Not less than 9 months nor more than 12 months prior to the expiry of the Concession Period, the Concessionaire and the IC shall conduct a joint inspection (the "Second Inspection") of all elements of the Project Highway and Project Facilities (whether or not the Renewal Works have been carried out).	Preventive maintenance may be required to be carried out to avoid major expenditure on this account.
Chapter XXX, Clause 30.2.4	Vesting Certificate	Upon the Concessionaire conforming to all Divestment Requirements and handing over actual or constructive possession of the Project Highway to MPRDC or a person nominated by MPRDC in this regard, MPRDC shall issue a Certificate substantially in the form set forth in Schedule-T (The Vesting Certificate) within 3 months of Concessionaire conforming to all divestment requirement and handing over actual or constructive possession of the Project Highway to MPRDC.	The divestment of all rights, title and lien in the Project Highway shall be deemed to be complete on the date of issue of Vesting Certificate.
Schedule-I, Clause 12.1	Location of Toll Plaza	Homogeneous sections and location of toll plaza For the purpose of tolling the project has been divided into three homogeneous sections as	Although there was some change in the start and end point

Review of Concession Agreement			
Article & Clause No.	Subject	Information in Brief	Remarks
		<p>under:</p> <p>I Lalghati Square to end of Sehore bypass - 35.80Km Location of Toll Plaza: Start of Sehore bypass</p> <p>II End offshore by pass - End of Ashta bypass - 40.00 Km Location of toll plaza in between Km60-65</p> <p>III End of Ashta Bypass to Start of Dewas bypass- 66.80 Km Location of toll plaza in between km 136-140</p>	<p>through a COS Order, the locations of Toll Plazas remained as per Schedule as under:</p> <p>Fanda (Design Ch.25+000), Amlaha (Design Ch. 61+550), Bhourasa (Design Ch. 134+600)</p>
Schedule-L, Clause 5.2	Highway Safety Management Unit	The Concessionaire shall establish a Highway Safety Management Unit (the "HSMU") to be functional on and after the toll date, and designate one of its officers to be in charge of the HSMU. Such officer shall have specialist knowledge and training in road safety and traffic engineering by having attended a course conducted by a reputed organisation on the subject.	<p>Concessionaire is bound by Agreement to fulfil this.</p> <p><b>Note:</b> As informed by Concessionaire, two Patrolling teams are engaged round the clock providing safety on highway and one Corridor Manager is in-charge of the same.</p>
Schedule-L, Clause 5.3& 5.4	Accident record and reporting	<p>The Concessionaire has to collect copy of every FIR recorded by the Police with respect to any accident occurring and also collect data in the form prescribed by IRC/MoRTH for all cases of accidents not recorded by the Police but where a vehicle rolled over or had to be towed away. The aforesaid data shall be submitted to MPRDC at the conclusion of every quarter and to the IC.</p> <p>5.4 The Concessionaire shall submit to MPRDC before the 31<sup>st</sup> May of each year, an annual report (in two copies) containing a detailed listing and analysis of all accidents of the proceeding accounting year and the measures taken by the Concessionaire pursuant to the provisions of paragraph 5.1 of this Schedule L for averting or minimizing such accident in future.</p>	<p>Concessionaire is bound by Agreement to maintain an Accident Reporting System which shall comprise of detailed information of accidents and measures taken for minimizing such accidents in future. MPRDC has developed an Accident Response System and Traffic Management Centre website wherein Concessionaires have to upload real-time data related to Accidents &amp; incidents/congestions.</p>

Review of Concession Agreement			
Article & Clause No.	Subject	Information in Brief	Remarks
Schedule-L, Clause 5.5	Safety Audit	Once in every Accounting Year, a Safety Audit shall be carried out by the IC to be nominated by MPRDC. It shall review and analyse the annual report and accident data of the proceeding years, and undertake an inspection of the Project Highway. The IC shall submit a Safety Report recommending specific improvement if any, required to be made to the road bridge, culverts, marking signs, road furniture and Project Facilities including cattle crossing, and pedestrian crossing.	IC has been appointed by MPRDC during the O&M Stage recently. However, no Safety Audit Report of the IC is available till date. Only a Safety Audit Report got conducted by the Concessionaire in the year 2019 was made available to us for review.

Since the Project has been completed and is presently under the Operation Period, we have separately reviewed the provisions of Schedule-M of the Concession Agreement which pertains to the Operation and Maintenance requirements and our observations on some of the important clauses therein have been brought out in **Table 2.2** below.

**Table 2.2: Comments on Schedule-M of Concession Agreement**

O&M Requirements - Schedule-M of Concession Agreement		
Clause	Description of Clause	Remark
Clause 1 (c)	The Concession Agreement stipulates that the Project Road shall be constructed, operated and maintained during the Concession Period by Concessionaire and thereafter transferred to MPRDC. This Schedule elaborates the O&M requirements of the Concession and is to be read together with the Concession Agreement for this purpose. For clarification of doubt, the period during which the Concessionaire shall comply with O&M requirements covers the entire Concession Period including the Construction Period. Particularly, during the Construction Period, the Concessionaire is required to Operate and Maintain the existing road as provided in the Concession Agreement and this Schedule.	This clause specifies that the Operation and Maintenance is to be carried out during entire Concession Period including the Construction Period.
Clause 3.1 (c)	Six weeks prior to the anniversary of Commercial Operation Date of Project (COD) each year. The Concessionaire shall submit an annual O&M plan for the next year of operations.	This clause specifies annual submission of O&M plan. The Concessionaire is submitting these to MPRDC.

**O&M Requirements - Schedule-M of Concession Agreement**

Clause	Description of Clause	Remark
Clause 3.1 (e)	The Manual shall include without limitation the following aspects; Organization structure with responsibilities of key personnel, Traffic Management Plan including the Corridor Control Plan, Safety Management Programme including the Emergency Response Protocol, Inspection Procedure, Maintenance Intervention Levels, Asset Management Project Deliverables and Tolerance Criteria, Environment Management Plan, Maintenance Programme, Management Information System, Report Formats	The details to be included in O&M Manual have been specified.
Clause 3.3.5	<b>Routine Maintenance</b> In order to ensure smooth and uninterrupted flow of traffic during normal operating condition for all 24 hours of a day, Routine Maintenance of the Project Facilities shall include all elements of the Project Road.	Routine maintenance has to be carried out as per relevant MORTH/IRC Standards and Specifications, as per Appendix J-1 and J-2 of Schedule-J of Concession Agreement.
Clause 3.3.6	<b>Preventive Maintenance:</b> (i) The Concessionaire shall regularly carry out the necessary Preventive Maintenance activities for the Project Facilities to ensure adherence to the Design Requirements and specifications throughout the Concession Period. (ii) Preventive Maintenance shall include the activities related to each element and the system as whole of the Project Highway to ensure that during the Concession Period and at its end, the Project Highway is in sound, durable and functional condition.	Preventive Maintenance has to be carried out to ensure adherence to Standards and Specifications throughout the Concession Period to ensure that at the end of the Concession Period, the Project Highway is in sound, durable and functional condition.
Clause 3.3.7	<b>Periodic Maintenance</b> This activity shall be carried out as required and at least once in six years from COD and in the last year of Concession Period. Road marking as specified and other road side features shall be restored to meet the relevant standards to the satisfaction of the IC.	This clause specifies the frequency of Periodic Maintenance.
Clause 3.3.9	<b>Minimum Maintenance Requirement</b> 3.9.1 Major Breaches in the Roadway Major breaches in the roadway of any type endanger safety of traffic and cause obstruction in movement of vehicles. These breaches shall be repaired urgently.	Time period for attending to major breaches and minor cuts etc. has been specified.

O&M Requirements - Schedule-M of Concession Agreement		
Clause	Description of Clause	Remark
	Steps as mentioned in O&M Manual shall be followed by the Concessionaire for repairing the breaches; 3.9.2 Minor cuts, ruts or blockage Minor cuts, ruts and damages on Project Road which do not completely obstruct the traffic but endanger the safety of traffic, shall be attended to on an urgent basis.	
Clause 3.4.2.1	During Operations Period, all the road works and pavements contained in the Project Facilities (including those in the ancillary facilities) shall be maintained in traffic worthy condition as per the Intervention Levels 1 (Desirable)& 2 (Acceptable).	The Intervention Levels for performance parameters like Roughness Index, potholes, cracking, rut depth, deflection, etc., have been defined.
Clause 3.4.2.2 & 3.4.2.3	3.4.2.2 The Road Roughness Value shall be measured at least twice in a year before the monsoon and soon after the monsoon preferably in the months of April and October of every year. The Concessionaire shall ensure that at no point during the Operation Period the roughness in the road surface shall fall below than the prescribed acceptable roughness values given in Table M-2. 3.4.2.3 The structural condition of the flexible pavement of the Project Highway shall be assessed every year by taking Benkelman Beam Deflection and working out characteristic deflections of homogeneous sections of the Project Highway.	Frequency (as per Table M-2 of Schedule-M) for carrying out measurement of and the performance criteria for Roughness Value and BBD test has been specified.
Clause 3.4.2.5	<b>Pavement Riding Quality</b> The riding quality of the pavement shall be ensured by satisfying the minimum requirements given herein under: (i) Surface roughness of the Project Highway on newly laid surface shall not exceed 2000 mm/km as measured by Vehicle Mounted Bump Integrator (ROMDAS System) (ii) Surface roughness shall not exceed 3000 mm/km and 1000 mm in any 200 m length during the service life of the pavement at any time. A renewal coat of 25mm of bituminous concrete shall be laid after initial construction whenever the roughness value reaches 3000mm/km to bring it to less than 2000mm/km.	Whenever surface roughness exceeds 3000mm/km and 1000 mm in any 200 m length a renewal coat of 25 mm of Bituminous Concrete has to be applied.

<b>O&amp;M Requirements - Schedule-M of Concession Agreement</b>		
<b>Clause</b>	<b>Description of Clause</b>	<b>Remark</b>
Clause 3.4.2.5	<p><b>Structural condition of the Pavement</b></p> <p>(i) The structural condition of the flexible pavement of the Project Highway shall be assessed every year by taking Benkelman Beam Deflections and working out characteristic deflections of homogenous sections of the Project Highway as per IRC 81-1997. Wherever the characteristic deflection exceeds 0.8mm, a bituminous overlay shall be provided appropriately designed according to IRC 81-1997 or its latest version of amendments to it. The characteristic deflection at the end of Concession Period shall not exceed 0.5mm.</p> <p>(ii) In case of cement concrete pavement, joints shall be thoroughly inspected every year and the loss of sealing compounds made good.</p>	If the characteristic deflection exceeds 0.8 mm a suitably designed bituminous overlay has to be provided.
Clause 3.4.2.6	If the shoulders are deformed or scoured and are lower than 25mm from the adjacent carriageway, these shall be corrected.	This Clause specifies the limit for shoulder drop from the Main Carriageway edge.
Clause 4.0	<p>Corridor Control Plans:</p> <p>a) Regular 24 hours patrol/surveillance of the ROW in respect of the Project /Project Facilities shall be required to monitor report and take actions against activities, such as enforcement, unauthorised construction of road or entrance connection, structures, interference with drainage system etc. within 150 m of the highway corridor.</p> <p>b) Surveillance shall also include traffic operation and management of accidents/other incidents.</p>	The Corridor Plan shall be developed in consultation with local administrative authorities and shall form part of the O&M Manual.
Clause 5.0	<p><b>Inspections &amp; Frequency</b></p> <p>5.1 Visual Inspection :</p> <p>Visual Inspections are broad general inspections carried out frequently by highway/bridge maintenance engineers having adequate knowledge of road structures. The purpose of visual inspection is to report the obstacles to traffic and fairly obvious deficiencies, which could lead to accidents or maintenance problems.</p> <p>5.2 Close Inspection:</p> <p>Close Inspections may be visual and or by standard instrumental aids for assessment of defects/deficiencies of Project Highway with careful</p>	This clause requires a system to be developed for visual inspections, close inspections and thorough inspections, desired frequencies of inspection for various elements of the Highway. Based on Inspection, preventive maintenance should be carried out. Concessionaire is doing all these inspections and submitting to the Authority

**O&M Requirements - Schedule-M of Concession Agreement**

Clause	Description of Clause	Remark
	<p>observations of specific elements. The close inspection is more intensive and would require detailed examination of element of the project highway against a checklist.</p> <p>5.3 Thorough Inspection: A Thorough Inspection is comprehensive and detailed for assessment of defects/deficiencies of the project highway by visual inspection or with and of standard equipment and non destructive testing where necessary. The thorough inspection should be undertaken during the critical weather condition which is generally rainy season in India. The inspection carried out during the said period offer to the client critical evaluation of the performance of the structure.</p> <p>5.4 Frequency of Inspection: The type of inspection and related frequency of various items of Project Highway and its facilities have been indicated. The frequency of inspection can be suitably revised in consultation with the IC if the situation so warrants.</p>	<p>along with Monthly Progress Report (MPR).</p>

**2.1.2 CONCLUSIONS ON OBSERVATIONS ON CONCESSION AGREEMENT**

The Concession Agreement is comprehensive and covers all the issues concerned with the Construction and Operation of the Project. It is seen that the provisions in the Agreement are spelt out clearly without ambiguities.

**2.2 REVIEW OF EPC AGREEMENT**

The Project SPV Company (*M/s Dewas Bhopal Corridor Pvt Ltd*) entered into EPC Agreement with two Contractors (*M/s MSK Projects (India) Ltd & M/s Chetak Enterprises Pvt Ltd*) on 2<sup>nd</sup> April 2008 & 6<sup>th</sup> December 2008 respectively, for the construction of the facilities and maintenance of all assets. The EPC Agreements with both the Contractors has been done for a fixed price lump sum contract of **Rs. 248.61 Cr** each.

Broadly, the EPC Agreement has to be formulated in such a way that the overall requirements and obligations of the SPV as spelt out in the Concession Agreement are taken care of. This Agreement is generally in line with the Concession Agreement and binds the EPC Contractor to the obligations of the SPV under the Concession Agreement.

## 2.2.1 SPECIFIC COMMENTS ON ARTICLES OF EPC AGREEMENT

We have studied both the EPC Agreements bearing in mind that the Project has been completed and is presently under O&M Stage. The concerned clauses and our comments are listed in the **Table 2.3** below.

**Table 2.3: Comments on EPC Agreement**

Clause No.	Brief Description of Clause	Remarks
Clause 4.1 Contractor's General Obligations	The Contractor shall design, execute and complete the Works in accordance with the Contract, and shall remedy the any defects in the Works. The Contractor shall be responsible for the adequacy, stability and safety of all site operations, of all methods of construction and of all the Works.	The overall responsibility for construction activities is on the Contractor.
Clause 4.7 Contractor's Documents	The Contractor shall make available to the Employer, all the Contractor's Documents as may be necessary for review, verification, inspection, carrying out tests, as the case may be. The works shall not be treated complete until the Employer has received all the Contractor's Documents.	The Clause specifies that Work shall not be considered to be completed for the purposes of taking-over until the Employer has received these documents.
Clause 9.1 (b) Works Completion	The Contractor acknowledges that the Punch List items are to be completed within 120 calendar days of the date of issue of Provisional Certificate. Upon completion of all Punch List items and all further Tests on Completion to the satisfaction of IE, the IE shall issue the Completion Certificate to the Employer.	The issuance of Completion Certificate by the IE shall occur only upon completion of all punch list items appended with Provisional Completion Certificate.
Clause 9.3 Defects Liability	The Defects Notification Period for the Works is 12 months. The Contractor has to complete any work which is outstanding or required to remedy defects or damage on or before the expiry date of the Defects Notification Period. If a defect appears or damage occurs, the Employer shall notify the Contractor accordingly.	The Defect Notification Period is over. There is presently no obligation of pending of defective works on the Contractor.
Clause 9.9 (a) & (d) Performance Certificate	Performance of the Contractor's obligations shall not be considered to have been completed until the Employer has issued the Performance Certificate to the Contractor, stating the date on which the Contractor completed his obligations under the Agreement. Only this Performance Certificate shall be deemed to constitute acceptance of Works.	Since the Project construction has been completed long back, it is expected that the said Performance Certificate has been issued to the Contractor.

## **2.2.2 CONCLUSIONS ON OBSERVATIONS ON EPC AGREEMENT**

- a) The Agreement with each of the two Contractors has been done for a fixed price lump sum contract of **Rs. 248.61 Cr.** This being a lump sum contract; there was no price variation/escalation in the Contract Price. The scope of works in the Agreements for both the Contractors was defined as the full stretch of the Project Road. The stretch-wise detail of the works to be carried out by the two EPC contractors was not made available to us.
- b) The provisions of both the EPC Agreements are broadly consistent with the provisions of the Concession Agreement. The obligations of both the Contractors under the EPC Agreement are limited to design, execute and complete the works and remedy any defects therein in conformity with the provisions of the Contract. The Project has been completed and is presently under O&M Stage, thereby indicating clearly that the Contractors have successfully completed their obligations under this Contract.

## **2.3 REVIEW OF O&M MANUAL**

The O&M Manual describes guidelines for implementing the O&M requirements successfully by prescribing the procedures and systems for activities involved in the Concession Period. This objective of this Manual is to ensure the safety of personnel deployed on and users of the Project Facilities and to keep the Project activities from undue deterioration and wear. The Manual is a guide for performance of statutory duties and functions of any party in relation to the Project. Certain forms and procedures have been annexed therein, which facilitate proper supervision and also enable the maintenance works to progress in an orderly and efficient manner.

The broad scope of works as per the Manual is as under:

- a) Operations
  - i) Toll Systems - Functioning of Toll System, Charging and collecting fees from road users. Provision of appropriate equipment for computerized toll collection.
  - ii) Traffic - Permitting smooth and uninterrupted flow of traffic during normal operating conditions.
  - iii) Incident Management System - Road patrols and surveillance, wireless facility, road safety works.
  - iv) Functioning of rescue and medical aid service - Ambulance, Fire Brigade, Tow away trucks and cranes.
  - v) Functioning of Project Facilities - Administrative, operation and Maintenance Camp, Pickup bus stop, Parking Lay byes, Potable water supply system with supply of drinking water at Truck Lay byes, Public toilets, and Solid waste disposal systems.
- b) Maintenance
  - i) Road Maintenance - This includes routine, periodic and preventive maintenance. Routine would include maintenance of shoulders and slopes, side drains, CD works, carriageway, crust and horticulture maintenance in median and ROW.

- ii) Road Property Maintenance - Identification of encroachments and ribbon development. Land Acquisition as desired by MPRDC, enforcement of regulations, Liaison with relevant authorities for above and maintenance of road furniture and road signs.
- iii) Engineering Improvements - Junction improvement, providing fencing along road boundary, providing Crash Barriers, Provision of Truck Lay byes and management of access.

### 2.3.1 ROUTINE MAINTENANCE

As per the Manual immediately after COD, the highway will be subject to Routine Maintenance by the Concessionaire. This Routine Maintenance shall be carried out as and when necessary and as advised by the Authority after joint inspection with Concessionaire. The Routine Maintenance of the Project Facilities includes the following items as described in **Table 2.4** below.

**Table 2.4: Routine Maintenance of Project Facilities**

S.No.	Description of work item
1	Prompt repair of Toll Plazas, Concrete joints, Drains, Lane marking, Signages, Patching, Raised berms, Repairing of signs, Road marking, repair of pavement cracks by sealing, Barricading, Railing, etc.
2	Replacement of equipments / consumables, Horticultural maintenance, repairs to pavements, elevated highways, overpasses, bridges, structures
3	Preventing any unauthorized entry to and exit from including any encroachments on the ROW / Project site.
4	Keeping the site in a clean, tidy and orderly, condition free of litter and debris
5	Taking all reasonable measures for safety of all workmen, material, supplies and equipment brought to Project site. Explosives, if any, shall be stored, transported and disposed off in accordance with applicable laws.
6	Maintenance of road furniture viz., Km & hectometre stones, ROW pillar
7	All traffic signs and marking shall always be kept clear, visible and in correct alignment and position.

### 2.3.2 PERIODIC MAINTENANCE

The Periodic Maintenance of the Project Facilities includes the following items as described in Table 2.5 below.

**Table 2.5: Periodic Maintenance of Project Facilities**

S.No.	Description of work item
<b>A</b>	<b>Carriageway</b>
1	This activity shall be carried out as required and at least one in six years (from COD) and in the last year of Concession Period. Road marking and other road side features shall be restored to meet the relevant standard.
2	Profile corrective course of overlay with the periodic renewal of the wearing course of BC minimum 25mm thickness of the road pavement. The same shall be undertaken on all roads and pavements in Project Facilities including truck lay byes, bus bays and wayside amenities - Service Area.
3	The periodic renewal shall result in improvement of the riding quality, meeting road roughness values as specified at the time of COD.
4	Separator islands shall be restored to design cross section.
5	Road markings as specified and other roadside features wherever required shall be restored to meet the relevant standard specified.
<b>B</b>	<b>Crash Barriers &amp; Pedestrian Guard Rails</b>
6	Crash Barriers should require minimum maintenance except in case of damage due to impact.
7	Concrete posts and Steel Beam Crash barriers will require repairs or replacement from low to medium impact damage caused by vehicles. Periodic painting of Crash Barriers, Posts, and Steel Beam Crash Barriers is required.
<b>C</b>	<b>Major Breaches in the Roadway</b>
8	Major breaches in the roadway of any type that endanger safety of traffic and cause obstruction in movement of vehicles. These breaches shall be repaired urgently. The Concessionaire shall ensure speedy restoration of traffic which shall be made within 24 hours of the incidence.
<b>D</b>	<b>Minor cuts, ruts or blockage</b>
9	Minor cuts, ruts and damages on Project Road which do not completely obstruct the traffic but endanger the safety of traffic, shall be attended to on an urgent basis. For this purpose, any cut which is in width more than 1m shall be repaired within 24 hours.
<b>E</b>	<b>Periodic Maintenance of Pavement</b>
10	Surface roughness of the Project Highway on completion of construction shall not exceed 2000mm/km as measured by the 5 <sup>th</sup> wheel Bump Integrator.
11	Surface roughness shall not exceed 3000mm/km and 1000mm in any 200m length during the service life of the pavement at any time. A renewal coat of 25mm BC shall be laid after initial construction whenever the roughness value reaches 3000mm/km to bring it to less than 2000mm/km.

S.No.	Description of work item
F	<b>Maintenance of Buildings</b>
12	This shall include cleaning, repair and maintenance of various parts of building, service and facilities in a wholesome and hygienic condition at all times. Shall include replacement of irreparable items of work, cleaning and disinfecting of the water supply system, inspection and maintenance of drainage/sanitation systems, illumination and electrical installation, landscaping, painting and shall be as per relevant clauses of NBC. Maintenance of pavement of parking lot with road marking shall be carried out.
13	Maintenance of all furniture, furnishing items and equipments shall mean periodic servicing, checking and replacement, repairs, replenishment of the consumables and other incidentals.
14	Laboratory shall be maintained and operated efficiently to carry out requisite tests till end of Concession Period.

### 2.3.3 MAINTENANCE STANDARD

During Operation Period, all the road-works and pavements contained in the Project Facilities shall be maintained in traffic worthy condition as per the Intervention Level 1 (Desirable) & 2 (Acceptable) as provided in the Table M-2 of Schedule-M of Concession Agreement.

- a) **Pavement Distress** - Maintenance procedure for correcting distress in bituminous pavement shall include patching, crack sealing, surface treatment and pot hole filling have been described.
- b) **Pavement Riding Quality** - The Road Roughness value shall be measured at least twice in a year by a properly calibrated Bump Integrator device before and soon after the monsoon every year. The Concessionaire is required to ensure that at no point during the Operations Period, the Roughness in the road surface shall fall below the acceptable Roughness Values given in Schedule-M.
- c) **Structural condition of the flexible pavement**- This shall be assessed every year by taking Benkelman Beam Deflections and working out characteristic deflections of homogeneous sections of the Project Highway as per IRC: 81-1997.

Whenever the characteristic deflection exceeds 0.8mm, a bituminous overlay shall be provided appropriately designed according to IRC: 81-1997 or its latest versions or amendments to it. The characteristic deflection at the end of Concession Period shall not exceed 0.5mm. In case of CC pavements, joints shall be thoroughly inspected every year and the loss of sealing compounds made good.

- d) **Shoulders** - If the shoulders are deformed or scoured and are lower than 25mm from the adjacent carriageway, these shall be corrected by excavation, filling, dressing and compacting with a material matching the existing material. It shall be ensured that no earth is borrowed from road side land.

- e) **Bridges and other structures** – The Concessionaire shall maintain and carry out required repairs of the various elements of the structures in accordance with IRC SP: 35-1990.
- f) **Roadside Drains** – This shall cover pipe drainage systems, slot drains, porous drains, gullies, catch pits, open grills, side drains and median drainage, etc. If these side drains and / or other drainage structures have been silted such that it is causing obstruction in flow of water, the same shall be cleared regularly in order to keep drains free from obstruction all the times.
- g) **Cross Drainage works** – When the bed of a culvert gets silted up and causes obstruction in flow of water, the de-silting operation shall be done regularly. The scouring of piers & abutments of bridges and culverts shall be observed carefully particularly before and after rainy season and suitable remedial measures as deemed fit shall be taken.
- h) **Landscaping** – Trees shall be maintained as per guidelines in IRC SP: 21-1979. This shall include cutting or clearance to safeguard visibility at road bends, accesses and signs. Turfing shall be mown as to achieve a visual pattern in harmony with adjacent areas.
- i) **Lighting and Signages** – The lighting wherever provided shall be maintained by Concessionaire in condition nearly similar to original condition. The faults to be repaired instantly, missing and damaged items to be replaced instantly. Proper servicing of stand-by power generation units shall be carried out regularly.

Line marking with thermo-plastic paint shall be carried out soon after any overlay / renewal coat is provided and in situation when adequate reflectivity is lost under poor weather conditions, adequate wet reflectivity should be ensured.

- j) **Control Centre, Buildings and other Facilities** – Maintenance of Emergency Telephone Systems including equipment and its periodic servicing, checking, replacement of components shall be done to keep the system in working condition. All the vehicles shall be maintained in smooth running condition at all times. On account of breakdown of any vehicle, a substitute vehicle shall be provided immediately. At the end of Concession Period, the Control Centre together with all equipments in working order shall be handed over to MPRDC.
- k) **Corridor Control Plan** – Regular 24 hours patrol / surveillance of the ROW in respect of the Project / Facilities shall be required to monitor, report and take action against activities such as encroachments, unauthorized construction of road or entrance connection, structures, interference with drainage systems, etc within 150m of the Highway Corridor. The surveillance shall include traffic operation and management of accidents / other incidents.

During Operations Period, all the road works and pavements contained in the Project facilities (including those in the ancillary facilities) shall be maintained in traffic-worthy conditions as per the Intervention Levels 1 & 2 as presented in **Table 2.6** below, through the various maintenance activities.

**Table 2.6: Intervention Levels - Operation Period, Schedule-M**

S. No.	Service factor	Level 1 (Desirable)	Level 2 (Acceptable)
1.	Roughness by Vehicle Mounted Bump Integrator	2000mm/km (Allowable tolerance +5%)	3000mm/km
2.	Potholes/km (max)		
	a) Less than 75mm deep	Nil	2 nos of size < 5sqm
	b) More than 75mm deep	Nil	Nil
3.	Percent Cracking	Nil	No unsealed cracks > 6mm wide on 95% Project Highway
4.	Rut Depth not exceeding 10mm	Length not more than 5% of Project Highway	Upto 10% of length of Project Highway
5.	User Information	All road signs, Km post & road marking in good condition in 3 language formula	All road signs, Km post & road marking in good condition in 3 language formula
6.	Percentage Defective Bridge area & bump at approach	Nil	Nil
7.	Camber - Mainline	(+/-) or 0.05% variation from the camber as per design requirements	(+/-) or 0.15% variation from the camber as per design requirements
8.	Drainage (including shoulders)	No visible water pool within the Project Highway	No visible water pool within the Project Highway
9.	Characteristic Deflection as per IRC:81-1997	Upto 0.5mm	Upto 0.8mm
10.	Pavement Marking	Full reflectivity in wet conditions	Adequate wet reflectivity

### 2.3.4 REPORTING REQUIREMENTS OF MAINTENANCE ACTIVITIES

The Reporting requirements and frequency for inspection of Road Maintenance Activities is presented as **Table 2.7** below.

**Table 2.7: Frequency of Inspection for Road Maintenance Activities**

FREQUENCY OF INSPECTION FOR ROAD MAINTENANCE ACTIVITIES -DEWAS BHOPAL						
S.No.	Object	Item	Daily	Monthly	Quarterly	Before & after rainy season
1	Riding surface	Pavement	0	#	*	
		Expansion joints	0	#	*	
2	Median	Kerb	0	#	*	
3	Side slopes	Shape	0	#	*	
		Turfing	0		*	
		Pitching & Masonry	0		*	
		Retaining Wall	#		*	
4	Drainage	Side drain	&	#		
		Gullies & Catch pits	&	#		
5	Bridges	Superstructure	#	*		
		Substructure	#	*		
		Head, wing walls & aprons	#	*		
		Painting		*		
		Hand rail	#	*		
6	Culverts			*		
7	Safety Barrier		&	#	*	
8	Traffic operation facilities	Signs	*	*		
		Marking	&	#	#	*
		Delineator	&	#	#	*
		Lighting	&	#	*	
9	Other facilities	Vegetation/landscaping/Toll Plaza/Wayside amenities	&	#	*	
10	Traffic conditions		&	*	#	
11	Encroachments		&	*		

S. No.	Symbol	Legend	S. No.	Symbol	Legend
1.	0	Visual Inspection	3.	*	Thorough Inspection
2.	#	Close Inspection	4.	&	Visual Inspection during rainy season only

### 2.3.5 CONCLUSIONS ON OBSERVATIONS ON O&M MANUAL

The O&M Manual is comprehensively covering all the aspects of maintenance requirements for the Project Road.

## 2.4 REVIEW OF SAFETY AUDIT REPORT (O&M STAGE)

Safety requirements as per Concession Agreement have been given in Clause 4 of Schedule-L for requirement of safety during Construction Period. Safety measures to be observed for highway safety during Operation and Maintenance are provided in Clause 5 of Schedule-L of Concession Agreement.

The provision of safety measures as per Schedule-L have been audited by the Safety Auditor (*M/s GK Consulting Engineers, Hyderabad*) appointed by the Concessionaire and their Report dated September 2019 has been reviewed by us.

The Audit Team had come up with certain recommendations for long term measures to be adopted for overall improvement in the Project infrastructure. These recommendations like providing partial access control, new underpasses/foot over bridges and provision of paved shoulders were not part of the Scope of Work under the Concession Agreement. The Concessionaire has submitted the Safety Audit Report to MPRDC for necessary action.

The other recommendations like installing of sign boards, hazard markers and lighting at bus stop locations are being taken up by the Concessionaire.

## 2.5 REVIEW OF CHANGE OF SCOPE ORDERS

### 2.5.1 WORK ITEMS UNDER CHANGE OF SCOPE

Some work items were approved under Change of Scope. The Change of Scope Orders issued by MPRDC for the Project has been summarized in **Table 2.8** below. Financial implication of COS had been finalized by MPRDC as Rs. 29.05 Cr. and Rs. 1.93 Cr. (for ETC lanes) i.e., total Rs. 30.98 Cr. including Rs. 2.14 Cr. (0.5% of TPC).

As per Clause 15.1 of the Concession Agreement, the COS amount beyond Rs. 2.14 Cr is to be considered for computation of additional days in the Concession Period. Hence, amount of COS of Rs. 28.85 Cr. has been considered by MPRDC for computation of additional days.

**Table 2.8: COS work items**

S. No.	Description of COS work	Date of Work Order for COS	Net COS considered (Rs.)
1.	Reduction of 4.2km length from Lalghati Chouraha to Km 10/10 & Addition of 2.70km length from Dewas bypass end to NH-3 junction in Dewas town	20.07.2008	7,46,81,207
2.	Pipe culvert on road from Dewas bypass NH-3 junction at Km 153/6	01.06.2009	12,93,108
3.	Service Road provided in urban area of Amlaha and Kotri village (TCS 3 & 4)	06.02.2009	5,91,40,067
4.	Additional Pipe culverts, Box culvert in homo section 1	19.05.2009	39,86,371
5.	Reconstruction of 0.6m span cut stone slab culverts to 1000mm dia pipe culverts at Ch. 24+045 & Ch 24+245	18.12.2008	2,92,785
6.	Provision of PUP size 4.0m x 3.0m at Ch. 41+480 in village Kotri	20.04.2009	47,37,825

S. No.	Description of COS work	Date of Work Order for COS	Net COS considered (Rs.)
7.	Development of Junction at Highway Treat Restaurant Dodi (Intersections / Junctions at Ch. 68+500 & 67+900) homogeneous section 2	20.05.2009	99,92,734
8.	4 Intersections / Junctions in homo section 2	16.07.2009	1,63,02,428
9.	Underpass at Ch. 68+840 at village Dodi	24.12.2009	93,78,534
10.	Construction of 3 culverts	10.03.2010	40,97,983
11.	Development Junctions at 12 <sup>th</sup> km (RHS)	27.03.2010	30,37,079
12.	Increase in width of shoulders 2.5m instead of 1.0m in road length with open median - homo section 1 & 2	30.03.2010	6,71,92,344
13.	Provision of T-Junction at 94+800	09.04.2010	40,01,885
14.	Junction improvement - Four legged Junction at Ch. 123+100 and T-Junction at Ch. 125+290	15.04.2010	11,20,875
15.	Development of Truck Lay bye at Km 92 (RHS) Dodi Ghat	23.06.2010	98,92,237
16.	Electronic Toll Collection Lanes*	07.01.2016	1,93,29,000
	<b>Total Amount</b>		<b>28,84,76,460</b>

\*A COS proposal seeking post-facto approval for conversion of all Toll Lanes to hybrid ETC has been submitted by the Concessionaire to MPRDC which is presently under review.

All the works specified in the table have been completed on field by the Concessionaire.

## 2.5.2 CHANGE OF CONCESSION PERIOD

### 2.5.2.1 ISSUES RELATED TO MATHEMATICAL COMPUTATION

As per Clause 15.9 of the Concession Agreement, the calculation for computing the extension or reduction in Concession Period on account of increase or decrease in scope of work beyond Rs. 2.14 Cr will be done on basis of following mathematical formula.

1. A = Average daily toll in the first 6 months
2. B =  $A \times (1 + \text{annual traffic growth}) \times (1.07)^{\text{Toll period in year}}$
3. C =  $B / (1 + \text{discount rate})^{\text{Year between expenses and end of toll period}}$
4. D = Cost of change of scope / C

Where, D = No. of days to be added to the toll period, rounded to nearest whole day

It is also mentioned in the Clause 15.9 that traffic growth will be estimated at actual traffic growth or 4% per annum whichever is higher. (For computation of traffic growth, the average annual traffic growth for a period of at least 2 years or actual whichever is higher will be taken).

MPRDC vide their Order dated 12.06.2017, has considered the amount of Rs. 28.84 Cr for computing additional days in the Concession Period. MPRDC has also modified the

mathematical formula by citing a typographical error in the specified Clause. The modified formula is as under:

1. A = Average daily toll in the first 6 months
2. B = {A x (1+annual traffic growth) x (1.07)}<sup>Toll period in year</sup>
3. C = B/(1+discount rate)<sup>Year between expenses and end of toll period</sup>
4. D = Cost of change of scope / C

MPRDC has also mentioned that since the toll period is quite long and future traffic growth cannot be estimated accurately at present, also since the annual average traffic growth rate may fluctuate more than 4%, therefore calculation of additional tolling days shall be done 6 months prior to expiry of Concession Period.

The Concessionaire has accepted the modification vide Supplementary Agreement dated 26.11.2021.

### 2.5.2.2 EXTENSION IN CONCESSION PERIOD

The Concession Period for the Project is for a period of 25 years from the Commencement Date. The Commencement Date for the Project has been notified as 20.03.2008, therefore the end of Concession Period (or transfer date) for the Project is 19.03.2033. However an ambiguity has now been created in respect of the commencement data by MPRDC Order No. 02/MPRDC/ BOT/B-D/2020 dated 22.09.2020 wherein Commencement Date of the Project is mentioned as 27.11.2007 and the transfer date is mentioned as 26.11.2032. However there have been two Force Majeure Events and execution of some work items under COS (as brought out in **Table 2.7** above), which required Extension of the Concession Period. The details of the orders issued by MPRDC in this regard are as under:

- a) On account of Force Majeure Event of demonetization of currency notes, an extension of **22.5 days** have been granted to the Concessionaire vide Order No. 02/MPRDC/BOT/D-B/2017/4946 dated 19.06.2017 and the revised transfer date became 11<sup>th</sup> April 2033.
- b) On account of work items under COS (as brought out in **Table 2.8** above), the Concession Period was further extended by **195 days** by MPRDC vide Order No. 11617/Maint/Bhopal-Dewas/MPRDC/2018 dated 25.10.2018. While working out this period of 195 days MPRDC has made use of formula modified by them but not acceptable to the Concessionaire.
- c) Owing to Covid-19 another Force Majeure Event, the toll collection was suspended for a total of 40 days. MPRDC vide Order No. 02/MPRDC/ BOT/B-D/2020 dated 22.09.2020 has granted an extension of **40 days** in the Concession Period, revising the transfer date to 21<sup>st</sup> May 2033.

It is pertinent to note here that this MPRDC Order does not take into account the extension of 195 days approved vide MPRDC Letter dated 25.10.2018. However, in the supplementary Concession Agreement dated 26.11.2021 it has been stated that 195 days extension is already provided.

## **2.6 REVIEW OF CLEARANCES**

The Concessionaire had to obtain necessary permits and clearances from all the concerned Authorities as mentioned in Schedule-A of the Concession Agreement. The Concessionaire had obtained the necessary clearances. Some of the important clearances obtained by the Concessionaire are mentioned below.

- a) Environmental Clearance - Accorded by MoEF: Order No, 5-43/2006-IA-III dated 31.01.07.
- b) Tree cutting Permission - Accorded by FO, Sehore Dist. Order No. 76 dated 07.09.2009.
- c) Tree cutting Permission - Accorded by FO, Dewas Dist. Order No. 1031/2009 dated 30.01.09.
- d) Tree cutting Permission - Accorded by Commissioner, Dewas Municipal Corporation Order No. 175/10 dated 29.01.10.

## CHAPTER 3.0: EXISTING INVENTORY & CONDITION SURVEY

### 3.1 PROJECT DETAILS

The Project Road is the Section of SH-18 starting just beyond the built-up area of Bairagarh town near Bhopal (Design Chainage 10+000) and ends at the junction with NH-3 in Dewas town (Design Chainage 150+790). The Length of Project Road is **140.790km**. The notable built-up areas which the Project Road bypasses are Sehore, Sonda, Ashta, Dodi, Mehatwada, Semli, Sonkatchh and Arniya.

The road traverses through mainly plain terrain. The road alignment has mostly easy gradients. The major details of the Project are presented in **Table 3.1** below.

**Table 3.1: Major Details of Project Road**

S. No	Parameter	Description	
1.	Main Carriageway Details	4 laned divided Carriageway with raised median and depressed median – 7.0m carriageway plus 2.5m hard shoulder on outer side and 1.0m earthen shoulder on depressed median side	
2.	ROW	Varying between 30m - 60m	
3.	Service Road (4m /5m /5.5m wide)	4m/5m/5.5m wide	
	Total both side Length = 9.090km	57+270 to 58+350 (LHS) - 5m	57+270 to 58+350 (RHS) - 5m
		66+280 to 67+500 (LHS) - 5m/4m	66+280 to 67+500 (RHS) - 5m/4m
		148+700 to 150+790 (LHS) - 5.5m	148+700 to 150+790 (RHS) - 5.5m

#### 3.1.1 LENGTH OF PROJECT

- i) As per the Schedule-E of the Concession Agreement, the Project Road starts at Km stone 6/8 (Lalghati square at Bhopal) of SH-18 and ends at the existing Km stone 151/6 (Dewas bypass junction). The total length of the Project Road along SH-18 is 140.790 km (Design Length). This length of 140.790 km consisted of following three sections as per existing kilometre stones.

Section 1 - 19.6km : Bhopal -Sehore existing 4 lane section (Km 6/8 to Km 26/4)

Section 2 - 16.1km : Existing Sehore bypass 2 lane section (Ch 0.0 to Ch 16+100)

Section 3 - 106.9km : Existing 2 lane road from end of Sehore bypass to Dewas bypass junction (Ch 16+100 to Ch 123+000) including bypass of Ashta, Mehatwada & Sonkatchh and re-aligned stretches.

- ii) During construction, there was a COS Order by MPRDC wherein the start point was changed to Km stone 10/10 at Bairagarh town, thereby a reduction of 4.2km length. Similarly the end point was changed to Junction of NH-3 at Dewas town, thereby an addition of 2.7km length. This resulted in a net decrease of 1.5km length.

- iii) The tolling length of the Project Road is **140.79km** which has been verified on ground by us during carrying out highway inventory. The Completion Certificates issued by MPRDC for the three homogeneous sections also add up to 140.79km.

### 3.2 COMMENCEMENT AND COMPLETION OF WORK

The work at site was commenced by the Concessionaire from 20<sup>th</sup> March 2008. As per Project Completion Schedule given in Chapter XIII of Concession Agreement, completion period of 30 months from Commencement Date has been mentioned. Thus the Scheduled Completion Date was 20<sup>th</sup> September 2010. The *Provisional Completion Certificates* as per the Concession Agreement for the Project was issued by MPRDC for three stretches on three dates (Section 1 on 10.02.09, Section 2 on 17.09.09, Section 3 on 30.04.10) along with Punch List items covering the balance items of incomplete works. These balance items of incomplete works were completed by the Concessionaire and subsequently, MPRDC issued the *Completion Certificates* (Section 1 on 27.07.09, Section 2 on 15.12.09, Section 3 on 12.08.10) in accordance with Clause 15 of the Concession Agreement.

#### 3.2.1 WORK ITEMS UNDER CHANGE OF SCOPE

During the construction, some work items were approved under Change of Scope. The brief description of Change of Scope work items and their date of Work Order have been summarized in **Table 3.2** below.

**Table 3.2: COS work items**

S. No.	Description of COS work	Date of Work Order for COS
1.	Reduction of 4.2km length from Lalghati Chouraha to Km 10/10 & Addition of 2.70km length from Dewas bypass end to NH-3 junction in Dewas town.	20.07.2008
2.	Pipe culvert on road from Dewas bypass NH-3 junction at Km 153/6	01.06.2009
3.	Service Road provided in urban area of Amlaha and Kotri village (TCS 3 & 4)	06.02.2009
4.	Additional Pipe culverts, Box culvert in homogeneous section 1	19.05.2009
5.	Reconstruction of 0.6m span cut stone slab culverts to 1000mm dia pipe culverts at Ch. 24+045 & Ch 24+245	18.12.2008
6.	Provision of PUP size 4.0m x 3.0m at Ch. 41+480 in village Kotri	20.04.2009
7.	Development of junction at Highway Treat Restaurant Dodi (Intersections/Junctions at Ch. 68+500 & 67+900) homo. section 2	20.05.2009
8.	Four intersections/junctions in homo section 2	16.07.2009
9.	Underpass at Ch. 68+840 at village Dodi	24.12.2009
10.	Construction of 3 culverts	10.03.2010
11.	Development junctions at 12 <sup>th</sup> km (RHS)	27.03.2010
12.	Increase in width of shoulders 2.5m instead of 1.0m in road length with open median – homogeneous section 1 & 2	30.03.2010
13.	Provision of T-Junction at 94+800	09.04.2010
14.	Junction improvement – Four legged Junction at Ch. 123+100 and T-Junction at Ch. 125+290	15.04.2010
15.	Development of Truck Lay bye at Km 92 (RHS) Dodi Ghat	23.06.2010

### **3.3 OVERVIEW OF ROAD ASSETS AND APPURTENANCES**

Detailed inspection of the site was carried out by our team of Engineers in January 2022 for assessment of status and condition of various Road Assets and Appurtenances. Inventories of various road assets and structures were prepared.

Status of various road furniture items, painting, road markings, safety fixtures, way-side amenities, horticulture and landscaping with respect to the provisions of Concession Agreement and their condition were checked. Assessment of condition of various assets was made on the basis of visual inspections. The inventory details pertaining to the highway inventory have been summarized in the following paras.

#### **3.3.1 HIGHWAY INVENTORY**

The Roadway Inventory for the Project Road was studied and noted for every 100m intervals. Summary of this inventory pertaining to the Carriageway widths, shoulders, Embankment height, Median, etc. were noted and this information has been presented in **Table 3.3** below. The condition of the road is found to be generally good and the renewal work was also seen to be ongoing. Representative photographs of the road in each 5km stretch are presented in **Figures** below.



Fig 3.1: Start of the Project



Fig 3.2: Road Stretch between Ch.10-15



Fig 3.3: Road Stretch between Ch.15-20



Fig 3.4: Road Stretch between Ch.20-25



Fig 3.5: Road Stretch between Ch.25-30



Fig 3.6: Road Stretch between Ch.30-35



Fig 3.7: Road Stretch between Ch. 35-40



Fig 3.8: Road Stretch between Ch. 40-45



Fig 3.9: Road Stretch between Ch. 45-50



Fig 3.10: Road Stretch between Ch 50-55



Fig 3.11: Road Stretch between Ch. 55-60



Fig 3.12: Road Stretch between Ch. 60-65



Fig 3.13: Road Stretch between Ch. 65-70



Fig 3.14: Road Stretch between Ch. 70-75



Fig 3.15: Road Stretch between Ch. 75-80



Fig 3.16: Road Stretch between Ch. 80-85



Fig 3.17: Road Stretch between Ch. 85-90



Fig 3.18: Road Stretch between Ch. 90-95



Fig 3.19: Road Stretch between Ch. 95-100



Fig 3.20: Road Stretch between Ch. 100-105



Fig 3.21: Road Stretch between Ch. 105-110



Fig 3.22: Road Stretch between Ch. 110-115



Fig 3.23: Road Stretch between Ch. 115-120



Fig 3.24: Road Stretch between Ch. 120-125



Fig 3.25: Road Stretch between Ch. 125-130



Fig 3.26: Road Stretch between Ch. 130-135



Fig 3.27: Road Stretch between Ch. 135-140



Fig 3.28: Road Stretch between Ch. 140-145



Fig 3.29: Road Stretch between Ch. 145-150



Fig 3.30: End point of Project Road

Table 3.3: Details of Highway Inventory

S.No.	Chainage (Km)		LHS					Median		RHS				
	From	To	Land Use	Embankment Height (m)	LHS Earthen Shoulder (m)	MCW Width (m)	RHS Earthen Shoulder (m)	Depressed/Raised/NJ Barrier	Width (m)	LHS Earthen Shoulder (m)	MCW Width (m)	RHS Earthen Shoulder (m)	Embankment Height (m)	Land Use
1	10000	15800	Barren, Agri, Built up, House	0.00-5.0	1.5	7-9	0.0	Raised	1.25	0.0	7-9	0.0	0.00-5.0	Barren, Agri, Built up, House
2	15800	18100	Agri, Comm	0.5-1.0	2.0	7-9	1.5	Depressed	13.50	1.5-2.0	7.0	2.0	0.00-0.5	Agri, Comm
3	18100	20000	Agri, Comm, Built up	0-0.3	1-2	7.0	0.0	Raised	1.50	0.0	7.0	2.0	0.0	Agri, Comm, Built up
4	20000	25000	Agri, Comm, Barren	0-0.2	1-1.5	7-22	1-1.5	Depressed	10-29	2.0	7-22	2.0	0-1.5	Agri, Comm, Barren
5	25000	25100	Toll Admin	0.0	0.0	20.0	0.0	Raised	1.8	0.0	21.0	0.0	0.0	Toll Admin
6	25100	36600	Agri, Comm, Barren	0-3.0	1-2	7.2-14	0.0	Raised	1.8-4.4	0.0	7.2-19	0-2	0-4.5	Agri, Comm, Barren
7	36600	37000	Short Length - Only 600m length seen between Km 36 & Km 37							Short Length - Only 600m length seen between Km 36 & Km 37				
8	37000	42200	Agri, Barren, Comm	0-4.5	1-2	7-10.7	0.0	Raised	1.3-4.5	0.0	7-13.4	2.0	1-4.5	Agri, Barren, Comm
9	42200	53200	Agri, Barren, Comm	0-2.7	2-3.0	7.0	0-3	Depressed	12.6-14.5	0-2	7.0	1.6-3.2	0-2.8	Agri, Barren, Comm
10	53200	54600	Agri, Built up	0.6-8.5	1.5-2.8	7.0	0-2.0	Raised	4.3-10.4	0-2.3	7.0	1.5-2.6	1.2-8.5	Agri, Built up
11	54600	56700	Agri	0.2-2.0	2.0-2.5	7.0	0-2.5	Depressed	11.5-12.8	0-2.5	7.0	1.4-2.5	0.5-1.5	Agri
12	56700	57200	Agri	0.4-0.5	2.5	7.0	0.0	Raised	1.6-5.9	0.0	7.0	2.5	0.8-1.5	Agri
13	57200	58300	Built up	S.R	0.0	7.0	0.0	NJ C.B	0.6	0.0	7.0	0.0	S.R	Built up
14	58300	60100	Agri	0-0.5	2.5-2.6	7.0	0-2.7	Raised	1.2-8.3	0-2.5	7.0	2.5	0.1-0.6	Agri, Comm
15	60100	61400	Agri, Built up	0.3-2.5	2.5	7.0	0-2.5	Depressed	8.5-14.9	0-2.5	7.0	2.5	0.5-2.5	Agri
16	61400	61800	Toll Admin,	0.5-1.2	0-2.5	7-20	0-2.5	Raised	0.5-3.4	0-2.5	7-20.0	0-2.5	0.5-1.2	Toll Admin,

S.No.	Chainage (Km)		LHS					Median		RHS				
	From	To	Land Use	Embankment Height (m)	LHS Earthen Shoulder (m)	MCW Width (m)	RHS Earthen Shoulder (m)	Depressed/Raised/NJ Barrier	Width (m)	LHS Earthen Shoulder (m)	MCW Width (m)	RHS Earthen Shoulder (m)	Embankment Height (m)	Land Use
			Agri											Agri
17	61800	65300	Agri, Comm	0.2-2.0	2.5-2.6	7-7.2	2.5-2.6	Depressed	6.2-13	0-2.5	7-7.2	2.4-2.5	0.3-2.0	Agri, Comm
18	65300	66400	Agri, Built up, Comm	0-0.2	0-2.5	7.1-7.3	0.0	Raised	1.7-3.5	0.0	7.1-7.3	0-2.5	0-0.2	Agri, Built up, Comm
19	66400	67600	Agri, Built up	S.R	0.0	7.1-7.3	0.0	NJ C.B	0.6	0.0	7.1-7.4	0-2.5	S.R	Agri, Built up
20	67600	69700	Agri, Comm	0.2-1.7	2.4-2.7	7.0-7.4	0-2.6	Raised	1.6-4.9	0-2.6	7.0-7.4	1.3-2.7	0.5-1.8	Agri, Comm, Built up
21	69700	77100	Agri, Comm, Built-up	0-1.5	1.2-2.8	7-7.3	0-2.6	Depressed	9-13.5	0-2.7	7-10.3	2.4-2.8	0.2-7.0	Agri, Comm, Built up
22	77100	82200	Agri, Built up, Barren	0-4.1	2.0-3.2	7.1-10.0	0-4.0	Raised	0.4-8	0-3.2	7-11	2.1-3.0	0-4.5	Agri, Built up
23	82200	85200	Agri, Built up	1-1.5	2.5-3.0	7.0-7.3	2.5-4	Depressed	5.0-12.5	2.5-2.8	7-7.3	2.5-3	0.8-1.5	Agri, Built up
24	85200	86300	Agri, Barren	1-1.5	3.0	7-7.3	0-2.5	Raised	2.3-3.8	3.0-3.5	7.0-7.3	0-2.5	1.0	Agri
25	86300	89500	Agri, Barren	0.3-5.0	2-4.5	7.0	2.5	Depressed	6-13	2.0-4.0	7.0	2.0-3.0	0.4-2.0	Agri, Barren
26	89500	95000	Agri, Barren, Built up	0.3-4.0	1-4.0	7.0	0.0	Raised	4.2-7.5	0.0	7-10.5	2-4.0	0.5-4	Agri, Barren, Built up
27	95000	104000	Agri, Built up	0.2-1.5	2.0-3.5	7.0	2.0-4.5	Depressed	6-12.0	1.5-3.5	7.0	2.0-3.5	0.2-2.5	Agri, Built up
28	104000	106000	Agri, Built up	0.5-1	2.0-2.8	7.0	0.0	Raised	4.0-7	0.0	7.0	2.0-3	0.5-1.0	Agri, Built up
29	106000	106500	Agri	1.2-2.0	2.5-3	7.0	0.0	Depressed	6.0-12	3.0	7.0	2.5	1-3.0	Agri
30	106500	108500	Agri	0.5-2.0	1.0-3.0	7.0	0.0	Raised	3.5-6.0	0.0	7.0	0.5-3.0	1-3	Agri
31	108500	118900	Agri, Barren, Built up	0-3.3	1-3.3	7.0	2-3.5	Depressed	6.3-13.5	0.5-3.5	7.0	2.0-3.5	0-3.0	Agri, Barren, Built up
32	118900	122800	Agri, Built up	0-3.3	2.5-3.3	7.0	0.0	Raised	0.75-4.6	0.0	7-7.5	2.5-2.5	0-2.0	Agri, Built up
33	122800	128900	Agri, Built up	0-2.0	2.5	7.0	2-3.0	Depressed	10-14.0	2.5-3.0	7.0-7.5	2.5-3	0-2.0	Agri, Built up

S.No.	Chainage (Km)		LHS					Median		RHS				
	From	To	Land Use	Embankment Height (m)	LHS Earthen Shoulder (m)	MCW Width (m)	RHS Earthen Shoulder (m)	Depressed/Raised/ NJ Barrier	Width (m)	LHS Earthen Shoulder (m)	MCW Width (m)	RHS Earthen Shoulder (m)	Embankment Height (m)	Land Use
34	128900	130100	Agri	0-0.2	2.5-2.8	7.0	0.0	Raised	4-5.5	0.0	7.0	2.5	0.0-0.5	Agri
35	130100	134600	Agri	0.00-1.0	2.0-3.0	7-10.5	2.0-3	Depressed	12-14.5	2.5	7-10.5	2.5	0.0-0.8	Agri
36	134600	134900	Toll	0.0	Toll	10.5-20.0	Toll	-	-	Toll	10.5-20.0	Toll	0.0	Toll Admin
37	134900	148200	Agri + Built up	0-2.0	0-3.5	7.0	0-3.5	Depressed	9-12	2.5-3.5	7.0	0.5-3.5	0-3.0	Agri + Built up
38	148200	148800	Agri + Built-up	0.0	3.0	7.0	0.0	Raised	0.5-4	0.0	7.0	3.5	0.0	Agri + Built up
39	148800	150790	Built up	S.R.	0-3	7-8.0	0.0	NJ C.B	0.6	0.0	7-8.0	3.5	S.R	Built up

### 3.3.2 MAJOR JUNCTIONS

During our site inventory, we have found 19 numbers of Major Junctions which are same as the numbers of Major Junctions with respect to the inventory details of the Concessionaire. As per Schedule-E of the Concession Agreement however, only 10 numbers of Major Junctions are mentioned. The details of Major Junctions are presented in **Table 3.4** below. Representative photographs of some of the Major Junctions are presented in **Figures** below.



Fig 3.31: 17+400 RHS - Bhopal bypass



Fig 3.32: 25+450 RHS Sehore Bypass start



Fig 3.33: 28+450 LHS Lasudia Parihar



Fig 3.34: 34+150 LHS to Sehore



Fig 3.35: 36+050 LHS to Sehore



Fig 3.36: 39+700 LHS Sehore Ichhawar



Fig 3.37: 41+800 LHS Sehore bypass end



Fig 3.38: 53+080 RHS Sonda bypass



Fig 3.39: 77+210 LHS Ashta bypass start



Fig 3.40: 80+175 Ashta Shujalpur road



Fig 3.41: 81+510 Ashta bypass end



Fig 3.42: 93+300 Highway Treat Dodi



Fig 3.43: 94+600 Dodi Arniyaganj



Fig 3.44: 102+100 Jawar Gwala Gwali



Fig 3.45: 104+400 Mehatwada Bypass start



Fig 3.46: 119+050 Sonkatchh bypass start



Fig 3.47: 120+300 To Sonkatchh town



Fig 3.48: 120+550 Sonkatchh bypass end



Fig 3.49: 148+600 Dewas bypass crossing



Fig 3.50: 150+790 Junction with NH-3

Table 3.4: Details of Major Junctions

S. No	Chainage	Type (T / X / Y)	Side Road LHS		Side Road RHS		No. of Islands		Auxiliary Lane / Deceleration Lane / Acceleration Lane				Type of Lighting	Associated Signage	Associated Marking
			Pavement Type	Width (m)	Pavement Type	Width (m)	LHS	RHS	LHS		RHS		High Mast/Single Double Arm		
									L (m)	W (m)	L (m)	W (m)			
1	17+400 - Bhopal Bypass Starts	Y	-	-	BT (4-Lane Divided)	16	-	1	-	-	-	-	-	Yes	No
2	25+450 - Sehore Bypass Starts	T	-	-	BT (Poor cond near rotary)	13	-	2	-	-	-	-	1 HM	Yes	No

S. No	Chainage	Type (T / X / Y)	Side Road LHS		Side Road RHS		No. of Islands		Auxiliary Lane / Deceleration Lane / Acceleration Lane				Type of Lighting	Associated Signage	Associated Marking
			Pavement Type	Width (m)	Pavement Type	Width (m)	LHS	RHS	LHS		RHS		High Mast/Single Double Arm		
									L (m)	W (m)	L (m)	W (m)			
3	28+450 - Lasudia Parihar	+	BT	9.5	CC	5	-	-	-	-	-	-	-	Yes	No
4	34+150- To Sehore	+	BT	8.5	CC (4Lane Divided)	16	-	-	-	-	-	-	-	Yes	No
5	36+050 - To Sehore	+	BT	7.5	BT	7.5	-	-	-	-	-	-	-	No	No
6	39+700 - Sehore, Ichhawar	+	BT	4.5	BT	8.5	-	-	-	-	-	-	-	Yes	Faded
7	41+800 - Sehore Bypass Ends	Y	-	-	CC (4Lane Divided)	16	-	2	-	-	-	-	1 HM	Yes	Faded
8	53+080 Sonda Bypass Start	Y	BT	6	-	-	2	-	25	3.5	-	-	-	Yes	No
9	77+210 Ashta Bypass Start	Y	BT	10.8	-	-	2	-	110	4.5	-	-	1 HM	Yes	Faded
10	80+175 Ashta, Shujalpur	+	BT	7	BT	5.5	2	2	32	3	33	3	1 HM	Yes	No
11	81+510 Ashta Bypass End	Y	BT	7.9	-	-	2	-	100	3.5	-	-	-	Yes	Faded
12	93+300 - Highway Treat Dodi	Y	BT	5.5	-	-	-	-	28	8.5	-	-	-	Yes	No
13	94+600 Dodi, Arniya Ganj	+	CC	7	BT	6	-	-	-	-	-	-	-	Yes	No
14	102+100 -Jawar,	+	BT	4.5	CC	7	-	-	-	-	-	-	-	Yes	No

S. No	Chainage	Type (T / X / Y)	Side Road LHS		Side Road RHS		No. of Islands		Auxiliary Lane / Deceleration Lane / Acceleration Lane				Type of Lighting	Associated Signage	Associated Marking
			Pavement Type	Width (m)	Pavement Type	Width (m)	LHS	RHS	LHS		RHS		High Mast/Single Double Arm		
									L (m)	W (m)	L (m)	W (m)			
	Gwala Gwali														
15	104+400 Mehatwada bypass Starts	Y	BT	7	-	-	3	-	100	6.5	-	-	-	Yes	Faded
16	119+050 Sonkatchh Bypass Start	Y	BT	10	-	-	3	-	135	10	-	-	1 HM	Yes	Faded
17	120+300 To Sonkatchh	Y	BT	7.5	-	-	2	-	44	7.4	-	-	-	Yes	Faded
18	122+550 - Sonkatchh Bypass End	Y	BT	7	-	-	3	-	135	3.75	-	-	-	Yes	Faded
19	148+600 - Indore Ujjain (Grade Sepe.)	+	BT	7	BT	7	-	1	23	8.5	-	-	1 HM	Yes	Y

### 3.3.3 MINOR JUNCTIONS

During our site inventory, we have found 70 numbers of Minor Junctions as against 31 numbers of Minor Junctions with respect to the inventory details of the Concessionaire. Therefore, we have found 39 additional numbers of Junctions. Schedule-E of the Concession Agreement mentions 35 numbers of Minor Junctions. On a number of Junctions, markings are not provided and on some of the Junctions, sign boards are also missing. Summary of Minor Junctions is presented in **Table 3.5** below. Representative photographs of some of the Minor Junctions are presented in **Figures** below.



Fig 3.51: 19+310 LHS



Fig 3.52: 36+050 LHS



Fig 3.53: 44+900 RHS



Fig 3.54: 64+200 LHS



Fig 3.55: 118+350 LHS



Fig 3.56: 136+200 LHS

**Table 3.5: Details of Minor Junctions**

S.No.	Project Road Section	No. of Minor Junctions	T-Type	Y-Type	+ Type	Remarks
1	Km 10+000 to Km 45+000	16 nos.	13	0	3	7nos. found additional at site
2	Km 45+000 to Km 80+000	24 nos.	18	2	4	14nos. found additional at site
3	Km 80+000 to Km 115+000	08 nos.	5	2	1	3nos. found additional at site
4	Km 115+000 to Km 150+790	22 nos.	20	0	2	15nos. found additional at site

### 3.3.4 SERVICE ROADS

Service Road/Slip Road are provided at four locations with total length of 9.09km. Representative photographs of some of the stretches of Service Roads are presented in **Figures** below.



**Fig 3.57: Service road at Ch. 66+700 LHS**



**Fig 3.58: Service road at Ch. 57+300 RHS**



**Fig 3.59: Service road at Ch. 66+500 RHS**



Fig 3.60: Service road at Ch. 149+500 LHS

Fig 3.61: Service road at Ch. 149+500 RHS

Fig 3.62: Service road at Ch.150+000 RHS

Summary of Service /Slip Roads is presented in Table 3.6 below.

Table 3.6: Details of Service/Slip Roads

S. No.	Village Name	Chainage (Km)		Side LHS/RHS	Length (m)	Width (m)	Drain cum Footpath	Separator/PGR/RCC CB	Condition of S.R.
		From	To				LHS/RHS	LHS/RHS	
1	Amlaha	57.270	58.350	Both Sides	1080	5	Cover Drain B/s	PGR B/s	Good
2	Kothri	66.280	67.200	Both Sides	920	5	Cover Drain B/s	PGR B/s	Good
		67.200	67.500	Both Sides	300	4	Cover Drain B/s	-	Improvement required
3	Ashta	76.990	77.300	LHS	310	5	Cover Drain LHS	-	Good
4	Dewas	148.700	150.790	Both Sides	2090	5.5	Cover Drain B/s	PGR B/s	Improvement required
		<b>Total Length B/s (m)</b>			<b>9090</b>				

### 3.3.5 MEDIAN OPENINGS

Summary of Median Openings is presented in **Table 3.7** below. Besides the provisioned Median Openings, a number of Unauthorized Median Openings are also seen to have been created. Representative photographs of some of the Median Openings are presented in **Figures** below:



Fig 3.63: Median Opening in Ch.15-20



Fig 3.64: Un-auth. Median Opening in Ch.15-20



Fig 3.65: Depressed Median in Ch. 15-20



Fig 3.66: Median Opening in Ch. 45-50



Fig 3.67: Median Opening in Ch. 70-75



Fig 3.68: Median Opening in Ch. 80-85

Table 3.7: Details of Median Openings

S.No.	Chainage Stretch (Km)		Median Openings		Type	Sign Board	Paved / Unpaved	Remarks
	Between		Length (m)	Width (m)	Depressed/ Raised/NJ CB			
1	10.200	10.300	15	1.6	Raised	Yes	Paved	-
2	10.300	10.400	18.5	1.8	Raised	Yes	Paved	-
3	10.700	10.800	20	1.7	Raised	Yes	Paved	-
4	11.100	11.200	30	1.6	Raised	Yes	Paved	-
5	11.400	11.500	5	1.6	Raised	Yes	Paved	-
6	11.500	11.600	10	1.6	Raised	Yes	Paved	-
7	11.700	11.800	10	1.6	Raised	Yes	Paved	-
8	11.900	12.000	17.5	1.7	Raised	Yes	Paved	-
9	13.100	13.200	13.5	1.5	Raised	Yes	Paved	Solar Blinkers Provided
10	15.000	15.100	13	1.6	Raised	Yes	Paved	-
11	15.400	15.500	11.2	1.6	Raised	Yes	Paved	-
12	15.500	15.600	17.5	1.7	Raised	Yes	Paved	-
13	17.400	17.500	70	17.5	Depressed	Yes	Paved	-
14	17.800	17.900	9	7.0	Depressed	-	Unpaved	Unauthorized
15	19.200	19.300	11.2	1.6	Raised	Yes	Paved	-
16	19.300	19.400	20.5	1.6	Raised	Yes	Paved	-
17	19.400	19.500	9	1.6	Raised	Yes	Paved	-
18	19.500	19.600	20	1.6	Raised	Yes	Paved	-
19	19.700	19.800	15	1.5	Raised	Yes	Paved	-
20	20.200	20.300	10	18	Depressed	-	Unpaved	Unauthorized
21	22.000	22.100	14.3	3	Depressed	-	Unpaved	Unauthorized

S.No.	Chainage Stretch (Km)		Median Openings		Type	Sign Board	Paved / Unpaved	Remarks
	Between		Length (m)	Width (m)	Depressed/ Raised/NJ CB			
22	22.800	22.900	14.5	4	Depressed	-	Unpaved	Unauthorized
23	23.300	23.400	23.5	17	Depressed	Yes	Paved	-
24	24.000	24.100	28	15.5	Depressed	Yes	Paved	-
25	24.900	25.000	18.5	4	Depressed	Yes	Unpaved	Unauthorized
26	28.400	28.500	30	5	Raised	Yes	Paved	Storage Lane Provided, L=60m, W=3m, Solar Blinkers Provided
27	30.800	30.900	5.7	4.4	Raised	-	Unpaved	Unauthorized
28	34.000	34.100	30	5	Raised	Yes	Paved	Storage Lane Provided, L=60m, W=3m, Solar Blinkers Provided
29	36.000	36.100	30	5	Raised	Yes	Paved	Storage Lane Provided, L=60m, W=3m, Solar Blinkers Provided
30	37.400	37.500	8	5	Raised	Yes	Paved	-
31	37.900	38.000	20.6	5	Raised	Yes	Paved	-
32	39.700	39.800	41	5	Raised	Yes	Paved	Storage Lane Provided, L=60m, W=3m, Solar Blinkers Provided
33	41.200	41.300	4	3	Raised	-	Unpaved	Unauthorized
34	41.800	41.900	25	2.7	Raised	Yes	Paved	Solar Blinkers Provided
35	42.900	43.000	13	3	Depressed	-	Unpaved	Unauthorized
36	43.000	43.100	13	3	Depressed	-	Unpaved	Unauthorized
37	44.900	45.000	14.5	3.5	Depressed	-	Unpaved	Unauthorized
38	45.700	45.800	19	18.2	Depressed	Yes	Paved	-
39	48.100	48.200	15.1	4.2	Depressed	-	Paved	-
40	49.000	49.100	17.8	13.5	Depressed	-	Paved	-
41	50.600	50.700	17.8	13.5	Depressed	Yes	Paved	-

S.No.	Chainage Stretch (Km)		Median Openings		Type	Sign Board	Paved / Unpaved	Remarks
	Between		Length (m)	Width (m)	Depressed/ Raised/NJ CB			
42	53.100	53.200	4.8	2.1	Raised	Yes	Paved	-
43	54.000	54.100	2.2	4.4	Raised	-	Unpaved	Unauthorized
44	54.500	54.600	17	15	Raised	Yes	Paved	-
45	55.200	55.300	17.5	12.2	Depressed	-	Paved	-
46	56.600	56.700	4	5	Depressed	-	Unpaved	Unauthorized
47	57.200	57.300	24.5	1	NJ CB	Yes	Paved	-
48	57.800	57.900	22.5	0.5	NJ CB	-	Paved	-
49	58.000	58.100	23	0.5	NJ CB	-	Paved	-
50	58.300	58.400	23.8	1.2	NJ CB	-	Paved	-
51	59.900	60.000	21.7	13.8	Raised	Yes	Paved	-
52	62.100	62.200	17.5	8	Depressed	Yes	Paved	-
53	62.900	63.000	3	17.8	Depressed	-	Unpaved	Unauthorized
54	64.200	64.300	17.5	17.5	Depressed	Yes	Paved	-
55	65.200	65.300	11.5	11	Depressed	Yes	Paved	-
56	65.600	65.700	22.9	1.7	Raised	-	Paved	-
57	65.800	65.900	17.2	1.8	Raised	Yes	Paved	-
58	66.300	66.400	23	0.7	Raised	-	Paved	-
59	66.400	66.500	15	0.7	NJ CB	-	Paved	-
60	67.100	67.200	21	0.7	NJ CB	-	Paved	-
61	67.400	67.500	20	0.7	NJ CB	-	Paved	-
62	69.800	69.900	22	14.8	Depressed	-	Paved	-
63	70.900	71.000	18.8	17.5	Depressed	Yes	Paved	-
64	71.700	71.800	5	18	Depressed	-	Unpaved	Unauthorized

S.No.	Chainage Stretch (Km)		Median Openings		Type	Sign Board	Paved / Unpaved	Remarks
	Between		Length (m)	Width (m)	Depressed/ Raised/NJ CB			
65	72.500	72.600	17.5	16	Depressed	-	Paved	-
66	74.400	74.500	19.8	15	Depressed	-	Paved	-
67	75.200	75.300	20.5	17.5	Depressed	-	Paved	-
68	76.800	76.900	22	17.3	Depressed	Yes	Unpaved	Unauthorized
69	76.900	77.000	22	17.3	Depressed	-	Unpaved	Unauthorized
70	77.300	77.400	7.3	0.5	Raised	Yes	Paved	Storage Lane Provided, L=100m, W=3.5m
71	78.600	78.700	20.3	3.8	Raised	Yes	Paved	-
72	80.200	80.300	42.2	4.5	Raised	-	Paved	Storage Lane Provided, L=50m, W=3.5m
73	85.100	85.200	50	5	Depressed	Yes	Unpaved	Unauthorized
74	86.200	86.300	9	6.5	Raised	Yes	Paved	-
75	86.400	86.500	10	8.4	Depressed	-	Paved	-
76	86.800	86.900	17.4	13.3	Depressed	Yes	Unpaved	Unauthorized
77	92.400	92.500	11	5	Raised	Yes	Paved	-
78	95.500	95.600	17.5	17.6	Depressed	Yes	Unpaved	Unauthorized
79	95.700	95.800	5	17.5	Depressed	-	Unpaved	Unauthorized
80	96.400	96.500	12	5	Depressed	-	Paved	-
81	98.000	98.100	5	12	Depressed	-	Unpaved	Unauthorized
82	98.100	98.200	8.5	17.5	Depressed	Yes	Paved	-
83	99.500	99.600	4	12	Depressed	Yes	Unpaved	Unauthorized
84	99.600	99.700	4	12.5	Depressed	-	Unpaved	Unauthorized
85	100.100	100.200	3.5	13.5	Depressed	-	Unpaved	Unauthorized

S.No.	Chainage Stretch (Km)		Median Openings		Type	Sign Board	Paved / Unpaved	Remarks
	Between		Length (m)	Width (m)	Depressed/ Raised/NJ CB			
86	100.300	100.400	18.5	17.5	Depressed	-	Paved	-
87	101.000	101.100	3.5	13.5	Depressed	-	Unpaved	Unauthorized
88	101.300	101.400	3	11	Depressed	-	Unpaved	Unauthorized
89	101.900	102.000	3	11	Depressed	Yes	Unpaved	Unauthorized
90	102.600	102.700	4	10.5	Depressed	-	Unpaved	Unauthorized
91	102.700	102.800	14.1	5	Depressed	-	Paved	-
92	102.800	102.900	3	12	Depressed	-	Unpaved	Unauthorized
93	103.100	103.200	3.5	12	Depressed	-	Unpaved	Unauthorized
94	103.200	103.300	15	7	Depressed	-	Paved	-
95	104.300	104.400	17	8	Raised	Yes	Paved	-
96	104.800	104.900	5	4	Raised	-	Unpaved	Unauthorized
97	105.300	105.400	10	4.5	Raised	-	Unpaved	Unauthorized
98	105.900	106.000	4	12	Raised	Yes	Unpaved	Unauthorized
99	108.700	108.800	3	10	Depressed	Yes	Unpaved	Unauthorized
100	112.700	112.800	10	17	Depressed	-	Paved	-
101	115.100	115.200	25	13.5	Depressed	Yes	Paved	-
102	116.000	116.100	21	13.5	Depressed	-	Unpaved	Unauthorized
103	116.400	116.500	11.5	13.5	Depressed	-	Unpaved	Unauthorized
104	116.500	116.600	23	13.5	Depressed	-	Unpaved	Unauthorized
105	118.300	118.400	25	10.5	Depressed	-	Unpaved	Unauthorized
106	118.700	118.800	8	6.3	Depressed	Yes	Unpaved	Unauthorized
107	118.800	118.900	17	4.6	Depressed	Yes	Unpaved	Unauthorized
108	118.900	119.000	17	4.6	Raised	Yes	Unpaved	Unauthorized

S.No.	Chainage Stretch (Km)		Median Openings		Type	Sign Board	Paved / Unpaved	Remarks
	Between		Length (m)	Width (m)	Depressed/ Raised/NJ CB			
109	119.000	119.100	6	4.6	Raised	Yes	Unpaved	Unauthorized
110	119.100	119.200	6	4.6	Raised	Yes	Unpaved	Unauthorized, Storage Lane Provided, L=80m, W= 3.5m
111	120.800	120.900	5	4.5	Raised		Unpaved	Unauthorized
112	122.500	122.600	35	2	Raised	Yes	Unpaved	Unauthorized
113	122.600	122.700	35	2	Raised	Yes	Unpaved	Unauthorized, Storage Lane Provided, L=100m, W= 3.5m
114	123.600	123.700	10	14	Depressed	-	Unpaved	Unauthorized
115	125.300	125.400	21	14	Depressed	-	Unpaved	Unauthorized
116	125.800	125.900	20	14	Depressed	Yes	Unpaved	Unauthorized
117	126.600	126.700	26	14	Depressed	Yes	Paved	-
118	127.700	127.800	27.2	14	Depressed	Yes	Unpaved	Unauthorized
119	129.000	129.100	23	5.5	Raised	Yes	Unpaved	Unauthorized
120	129.700	129.800	80	4.5	Raised	-	Unpaved	Unauthorized
121	129.800	129.900	40	4.5	Raised	Yes	Unpaved	Unauthorized
122	131.000	131.100	13	12	Depressed	-	Unpaved	Unauthorized
123	132.300	132.400	28	12	Depressed	Yes	Unpaved	Unauthorized
124	133.200	133.300	40	12	Depressed	Yes	Unpaved	Unauthorized
125	133.400	133.500	5	12	Depressed	Yes	Unpaved	Unauthorized
126	135.200	135.300	25	14	Depressed	Yes	Unpaved	Unauthorized
127	136.900	137.000	38	14	Depressed	Yes	Unpaved	Unauthorized
128	137.300	137.400	7	14	Depressed	-	Unpaved	Unauthorized
129	140.000	140.100	15	9	Depressed	Yes	Unpaved	Unauthorized

S.No.	Chainage Stretch (Km)		Median Openings		Type	Sign Board	Paved / Unpaved	Remarks
	Between		Length (m)	Width (m)	Depressed/ Raised/NJ CB			
130	140.400	140.500	4	10	Depressed	-	Unpaved	Unauthorized
131	140.800	140.900	5.5	11	Depressed	-	Unpaved	Unauthorized
132	141.400	141.500	7.5	11	Depressed	-	Unpaved	Unauthorized
133	141.800	141.900	5	11	Depressed	-	Unpaved	Unauthorized
134	142.100	142.200	7.5	11	Depressed	-	Unpaved	Unauthorized
135	142.300	142.400	4	10	Depressed	-	Unpaved	Unauthorized
136	143.000	143.100	6	10	Depressed	-	Unpaved	Unauthorized
137	143.800	143.900	8	11	Depressed	Yes	Unpaved	Unauthorized
138	144.100	144.200	14	11	Depressed	-	Unpaved	Unauthorized
139	145.500	145.600	6	11	Depressed	-	Unpaved	Unauthorized
140	146.900	147.000	17	10	Depressed	Yes	Unpaved	Unauthorized
141	148.200	148.300	7	10	Raised	-	Unpaved	Unauthorized
142	148.800	148.900	20	0.6	Raised	-	Paved	-
143	149.400	149.500	10	0.6	NJ CB	-	Paved	-
144	149.500	149.600	10	0.6	NJ CB	-	Paved	-
145	149.600	149.700	10	0.6	NJ CB	-	Paved	-
146	149.800	149.900	10	0.6	NJ CB	-	Paved	-
147	150.500	150.600	15	0.6	NJ CB	-	Paved	-

### 3.3.6 BUS BAYS / SHELTERS

During our site inventory, we have found 35 numbers of Bus Shelters as against 18 numbers of Bus Shelters with respect to the inventory details of the Concessionaire. Some of the shelters may have been constructed by local villagers.

The shelters seen at the site are of different variety. Some of them are of RCC structure, some of them have steel roof. The additional shelters appear to have been constructed recently and are also of a different design than those constructed by the Concessionaire initially. Also, it may be noted that proper bus bays are at only three locations. Summary of the Bus shelters is presented in **Table 3.8** below. Representative photographs of some of the Bus Shelters are presented in **Figures** below:



Fig 3.69: Bus Shelter at Ch 28+450



Fig 3.70: Bus Shelter at Ch 39+700



Fig 3.71: Bus Shelter at Ch 45+700



Fig 3.72: Bus Shelter at Ch 94+900



Fig 3.73: Bus Shelter at Ch 106+100

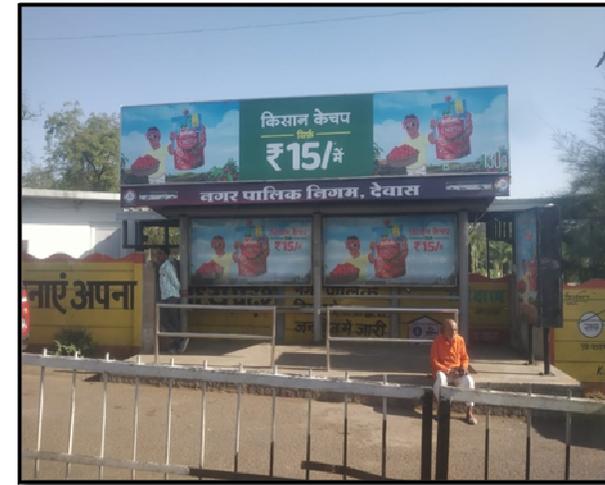


Fig 3.74: Bus Shelter at Ch 150+790

Table 3.8: Details of Bus Bays/Shelters

S.No.	Chainage (Km)	Side	Passenger Shelter Type		Passenger Shelter Condition		Entry / Exit (Taper Y/N)	Remark
			RCC	Steel	RCC	Steel		
1	26.300	LHS	-	Yes	-	Good	-	
2	28.450	LHS	-	Yes	-	Good	-	
3	39.700	LHS	-	Yes	-	Good	-	
4	44.800	RHS	-	Yes	-	Good	-	
5	45.700	LHS	-	Yes	-	Good	Yes	Bus Bay Provided, L=180m, W=3.5m
6	45.750	RHS	-	Yes	-	Good	-	

S.No.	Chainage (Km)	Side	Passenger Shelter Type		Passenger Shelter Condition		Entry / Exit (Taper Y/N)	Remark
			RCC	Steel	RCC	Steel		
7	45.900	RHS	-	Yes	-	Good	-	
8	49.150	LHS	-	Yes	-	Good	-	
9		RHS	-	Yes	-	Good	-	
10	50.660	RHS	-	Yes	-	Improvement Req'd.	-	
11	53.040	RHS	Yes	-	Improvement Req'd.	-	-	
12	53.050	LHS	Yes	-	Improvement Req'd.	-	-	
13	55.220	RHS		Yes	-	Good	-	
14	63.370	LHS	Yes	-	Improvement Req'd.	-	-	
15	65.625	LHS	-	Yes	-	Good	-	
16	71.010	LHS	-	Yes	-	Improvement Req'd.	Yes	Bus Bay Provided, L=150m, W=3.0m
17	71.053	RHS	-	Yes	-	Improvement Req'd.	Yes	Bus Bay Provided, L=180m, W=3.5m
18	76.930	LHS	-	Yes	-	Improvement Req'd.	-	
19	77.010	RHS	-	Yes	-	Improvement Req'd.	-	
20	88.500	LHS	-	Yes	-	Good	-	
21	93.400	LHS	-	Yes	-	Good	-	
22	94.900	LHS	Yes	-	Improvement Req'd.	-	-	
23	95.900	RHS	Yes	-	Good	-	-	
24	99.700	LHS	Yes	-	Good	-	-	
25	100.200	RHS	Yes	-	Good	-	-	
26	106.100	LHS	-	Yes	-	Good	-	
27	110.000	RHS	-	Yes	-	Good	-	

S.No.	Chainage (Km)	Side	Passenger Shelter Type		Passenger Shelter Condition		Entry / Exit (Taper Y/N)	Remark
			RCC	Steel	RCC	Steel		
28	112.700	LHS	-	Yes	-	Good	-	
29		RHS	Yes	-	Good	-	-	
30	115.100	LHS	-	Yes	-	Good	-	
31		RHS	-	Yes	-	Good	-	
32	124.300	LHS	-	Yes	-	Improvement Reqd.	-	
33	136.900	RHS	-	Yes	-	Improvement Reqd.	-	
34	140.250	RHS	-	Yes	-	Improvement Reqd.	-	
35	150.790	RHS	-	Yes	-	Good	Yes	

### 3.3.7 LONGITUDINAL ROADSIDE RCCPUCCA DRAIN

Representative photographs of some of the roadside drain sections are presented in **Figures** below:



Fig 3.75: Condition of Drain at Ch 57+500



Fig 3.76: Condition of Drain at Ch 134+500



Fig 3.77: Condition of Drain at Ch 149+500

Summary of Longitudinal Roadside RCC Drain is presented in **Table 3.9** below.

**Table 3.9: Details of Longitudinal Roadside Pucca Drain**

S.No.	Chainage (Km)		Length (m)	LHS /RHS / Median	Type	Cover / Open	Condition
	From	To					
1	15.500	15.800	300	Both Sides	CC	Cover	Cleaning required
2	18.900	19.500	600	Both Sides	CC	Cover	Cleaning required
3	57.250	58.350	1100	Both Sides	CC	Cover	Working
4	61.450	61.600	150	Both Sides	CC	Cover	Working
5	66.000	67.200	1200	Both Sides	CC	Cover	Working
6	134.300	134.900	600	Both Sides	CC	Cover	Working
7	148.900	150.710	1810	Both Sides	CC	Cover	Working
	<b>Total Length (m)</b>		<b>11520</b>				

### 3.3.8 SIGN BOARDS

Representative photographs of some of the sign boards are presented in **Figures** below:



Fig 3.78: Sign Board in Ch. 10-15



Fig 3.79: Sign Board in Ch. 25-30



Fig 3.80: Sign Board in Ch. 30-35



Fig 3.81: Sign Board at Ch. 46+050



Fig 3.82: Sign Board at Ch. 61+200



Fig 3.83: Sign Board at Ch. 65+300



Fig 3.84: Sign Board at Ch. 74+400



Fig 3.85: Sign Board at Ch. 98+750



Fig 3.86: Sign Board at Ch. 119+000



Fig 3.87: Sign Board at Ch. 124+500



Fig 3.88: Sign Board at Ch. 128+600



Fig 3.89: Sign Board at Ch. 140+000

The numbers of various types of Mandatory, Cautionary & Informatory Sign boards installed at site are summarized in **Table 3.10A** & **Table 3.10B** below.

**Table 3.10A: Summary of Sign Boards Km 10 to Km 80**

Sign Boards / Chainage (Km)	Total	10 to 15	15 to 20	20 to 25	25 to 30	30 to 35	35 to 40	40 to 45	45 to 50	50 to 55	55 to 60	60 to 65	65 to 70	70 to 75	75 to 80
Junction Ahead/Direction Informatory	125	17	9	9	6	8	10	8	4	11	5	7	7	10	14
Chevron	143	5	3	6	26	15	20	16	3	15	1	5	9	2	17
Go slow	33	2	2	2	2	1	4	2	1	6	1		5	2	3
State Highway	47	5	4	5	2	2	3	4	2	3	5	5		4	3
T/Y/+ -Junction	25	4	3		1	1	6	2	2	3		1			2
STOP	5			1	1					2				1	
Accident Prone area	39	2	1	2	4	2	5	3	2	3	4		3	3	5
OHM	69	20	15				5	1	5	11	3	4	1	1	3
Delineators	22	20													2
Gap in Median	27	10	5			2	3			2	2		3		
Solar Blinker	11	2			3	2	2	2							
Left/ Right Hand Curve	49	2	1	3	8	4	2	3	7	4	2	3	2		8
School Ahead	7	1	4	1					1						
Helpline No.	11	3	1	1			4		1						1
Stray Animal	4	1	2							1					
Overhead Gantry	3	1	1					1							
Cantilever Gantry	5		1				3	1							
Petrol Pump Sign Board	6		1	2	1					1		1			
Hotel Sign Board	6			3	1		2								
Toll Ahead Sign Board	6			2	1							3			

Sign Boards / Chainage (Km)	Total	10 to 15	15 to 20	20 to 25	25 to 30	30 to 35	35 to 40	40 to 45	45 to 50	50 to 55	55 to 60	60 to 65	65 to 70	70 to 75	75 to 80
Speed Breaker/Rumble Strip	2	1		1											
Toll rates/Exempt Veh.	11			3	3							5			
Rotary Sign Board	3				3										
Police Check Post	7		1				1		3		1				1
Pedestrian Crossing	9									1	4		2	1	1
Hospital	2								1				1		
Speed limit	1												1		

Table 3.10B: Summary of Sign Boards Km 80 to Km 150

Sign Boards / Chainage (Km)	Total	80 to 85	85 to 90	90 to 95	95 to 100	100 to 105	105 to 110	110 to 115	115 to 120	120 to 125	125 to 130	130 to 135	135 to 140	140 to 145	145 to 150
Junction Ahead/Direction Informatory	124	5	6	8	9	9	6	8	12	10	9	10	8	7	17
Chevron	254	18	40	40	6	4	52	18	13	22	14	5		21	1
Go slow	32	3	1	4	3	5		1	4	2		3	3		3
State Highway	48	1	5	2	5	4	3	5	7	5	2	3	2	1	3
T/Y/+ -Junction	21	4	1		2				5	1		2	2	2	2
U-Turn	1	1													
STOP	1	1													
Accident Prone area	42	1	1	5	4	5	2	3	3	4	1	4	4	2	3
OHM	28								1		7	5	4	8	3
Gap in Median	20	2	1	6	1	2	2			4					2
Solar Blinker	3									3					
Left/ Right Hand Curve	89	4	8	20	2	2	17	8	5	7	2		3	10	1

Sign Boards / Chainage (Km)	Total	80 to 85	85 to 90	90 to 95	95 to 100	100 to 105	105 to 110	110 to 115	115 to 120	120 to 125	125 to 130	130 to 135	135 to 140	140 to 145	145 to 150
School Ahead	7								2					3	2
Stray Animal	10	1		2	1	4	1	1							
Overhead Gantry	1														1
Cantilever Gantry	6										1			1	4
Petrol Pump Sign Board	21					5			2	4		1	4	1	4
Hotel Sign Board	16							1	2		2	1	1	5	4
Toll Ahead Sign Board	3											2	1		
Speed Breaker/Rumble Strip	2														2
Toll rates/Exempt Veh.	5											5			
Rotary Sign Board	2														2
Police Check Post	7			2				1		1	1	1	1		
Pedestrian Crossing	1														1
Hospital	2								2						
Bollard	1		1												
Speed limit	5						1	1	1	1		1			
Busbay/Shelter	10		3	1				2	2				2		

### 3.3.9 OVERHEAD GANTRY

Representative photographs of some of the cantilever gantries are presented in **Figures** below:



Fig 3.90: Overhead Signboard Ch. 17+400



Fig 3.91: Overhead Signboard Ch. 39+700

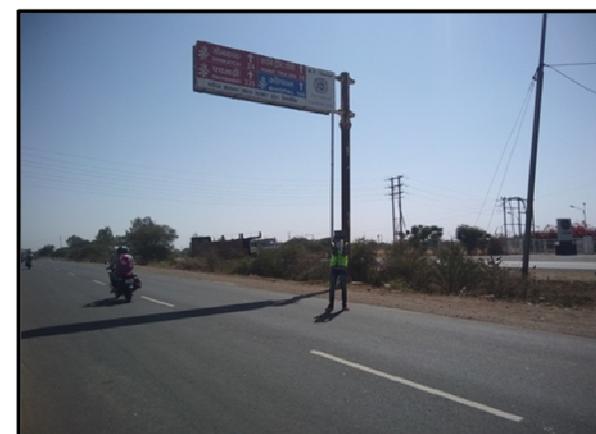


Fig 3.92: Overhead Signboard Ch. 149+200

Details of Cantilever gantries on the Project Road are presented in **Table 3.11** below.

**Table 3.11: Details of Cantilever Gantries**

S.No.	Chainage (Km)	CANTILEVER		S. No.	Chainage (Km)	CANTILEVER	
		LHS/RHS	Condition			LHS/RHS	Condition
1	17+400	RHS	Ok	6	140+200	LHS	Good
2	36+000	LHS	Ok	7	145+400	RHS	Fair
3	39+600	LHS	Ok	8	149+200	LHS	Good
4	39+700	RHS	Ok	9	149+900	LHS	Fair
5	127+700	LHS	Ok	10	150+500	LHS	Good

### 3.3.10 METAL BEAM CRASH BARRIERS

Representative photographs of some of the locations where MBCB has been provided are presented in **Figures** below:



Fig 3.93: MBCB at Ch. 34+600



Fig 3.94: MBCB at Ch. 38+300



Fig 3.95: MBCB at Ch. 41+650



Fig 3.96: MBCB at Ch. 88+850



Fig 3.97: MBCB at Ch. 105+100



Fig 3.98: MBCB at Ch. 117+960

Details of Metal Beam Crash Barriers (8619m length) at various locations are presented in **Table 3.12** below.

**Table 3.12: Details of Metal Beam Crash Barriers**

S.No.	Chainage (Km)		Total Length (m)	Side of MCW	End Treatment	Condition (Length of damage)	S.No.	Chainage (Km)		Total Length (m)	Side of MCW	End Treatment	Condition (Length of damage)
	From	To						From	To				
1	32+900	33+000	50	LHS	Yes	Good	48	89+300	89+400	100	LHS	Yes	Good
2	33+000	33+100	50	LHS	Yes	Good	49	89+400	89+500	100	LHS	Yes	Good
3	33+700	33+800	30	LHS	Yes	Good	50	89+900	90+000	100	LHS	Yes	Good
4	34+400	34+500	60	LHS	Yes	Good	51	90+000	90+100	70	LHS	Yes	Good
5	34+600	34+700	60	LHS	Yes	Good	52	91+300	91+400	100	LHS	Yes	Good
6	34+600	34+700	70	RHS	Yes	Good	53	91+300	91+400	100	RHS	Yes	Good
7	38+300	38+400	70	LHS	Damaged	10m damaged	54	91+400	91+500	100	LHS	Yes	Good
8	38+300	38+400	70	RHS	Yes	Good	55	91+400	91+500	100	RHS	Yes	Good
9	38+800	38+900	60	LHS	Yes	Good	56	91+500	91+600	100	LHS	Yes	Good
10	38+800	38+900	60	RHS	Yes	Good	57	91+500	91+600	100	RHS	Yes	Good
11	39+500	39+600	50	LHS	Yes	Good	58	91+600	91+700	100	LHS	Yes	Good
12	41+600	41+750	150	LHS	Damaged	10m damaged	59	91+600	91+700	100	RHS	Yes	Good
13	41+550	41+750	200	RHS	Yes	20m damaged	60	92+900	93+000	100	LHS	Yes	Good
14	44+300	44+400	50	RHS	Yes	20m damaged	61	92+900	93+000	100	RHS	Yes	Good
15	45+100	45+200	50	RHS	Yes	Good	62	93+000	93+100	100	LHS	Yes	Good
16	45+200	45+300	190	LHS	Yes	30m damaged	63	93+000	93+100	100	RHS	Yes	Good
17	45+200	45+300	190	RHS	Yes	30m damaged	64	93+100	93+200	100	LHS	Yes	Good
18	45+300	45+400	90	LHS	Yes	Good	65	93+100	93+200	100	RHS	Yes	Good
19	45+300	45+400	90	RHS	Yes	Good	66	93+200	93+300	100	LHS	Yes	Good
20	53+300	53+400	100	LHS	Yes	100m damaged	67	93+200	93+300	100	RHS	Yes	Good
21	53+300	53+400	100	RHS	Yes	Good	68	93+700	93+800	100	RHS	Yes	Good

S.No.	Chainage (Km)		Total Length (m)	Side of MCW	End Treatment	Condition (Length of damage)	S.No.	Chainage (Km)		Total Length (m)	Side of MCW	End Treatment	Condition (Length of damage)
	From	To						From	To				
22	53+400	53+500	100	LHS	Yes	Good	69	94+100	94+200	100	LHS	Yes	Good
23	53+400	53+500	100	RHS	Yes	Good	70	94+100	94+200	100	RHS	Yes	Good
24	53+500	53+600	100	LHS	Yes	30m damaged	71	94+200	94+300	100	LHS	Yes	Good
25	53+500	53+600	100	RHS	Yes	Good	72	94+200	94+300	100	RHS	Yes	Good
26	53+600	53+700	100	LHS	Yes	Good	73	94+300	94+400	100	LHS	Yes	Good
27	53+600	53+700	100	RHS	Yes	Good	74	94+300	94+400	100	RHS	Yes	Good
28	60+800	60+900	100	LHS	Yes	Good	75	94+400	94+500	100	LHS	Yes	Good
29	60+800	60+900	100	RHS	Yes	Good	76	94+400	94+500	100	RHS	Yes	Good
30	60+900	61+000	100	LHS	Yes	Good	77	105+000	105+100	100	LHS	Yes	Good
31	60+900	61+000	100	RHS	Yes	Good	78	105+000	105+100	100	RHS	Yes	Good
32	61+000	61+100	100	LHS	Yes	Good	79	105+100	105+200	100	LHS	Yes	Good
33	61+000	61+100	100	RHS	Yes	Good	80	105+100	105+200	100	RHS	Yes	Good
34	63+500	63+600	124	LHS	Yes	Good	81	107+800	107+900	50	LHS	Yes	Good
35	63+500	63+600	124	RHS	Yes	Good	82	107+800	107+900	50	RHS	Yes	Good
36	63+600	63+700	48	LHS	Yes	Good	83	117+900	118+000	60	LHS	Yes	Good
37	63+600	63+700	88	RHS	Yes	Good	84	117+900	118+000	60	RHS	Yes	Good
38	67+400	67+500	15	RHS	Yes	Good	85	118+000	118+100	70	LHS	Yes	Good
39	71+300	71+400	80	LHS	Yes	Good	86	125+900	126+000	60	RHS	Yes	Good
40	71+300	71+400	80	RHS	Yes	Good	87	126+000	126+100	70	RHS	Yes	Good
41	71+400	71+500	180	LHS	Yes	Good	88	126+600	126+700	80	RHS	Yes	Good
42	71+400	71+500	180	RHS	Yes	Good	89	126+900	127+000	60	LHS	Yes	Good
43	88+800	88+900	100	LHS	Yes	Good	90	127+000	127+100	60	RHS	Yes	Good
44	88+900	89+000	100	LHS	Yes	Good	91	127+100	127+200	60	LHS	Yes	Good

S.No.	Chainage (Km)		Total Length (m)	Side of MCW	End Treatment	Condition (Length of damage)	S.No.	Chainage (Km)		Total Length (m)	Side of MCW	End Treatment	Condition (Length of damage)
	From	To						From	To				
45	89+000	89+100	100	LHS	Yes	Good	92	128+500	128+600	80	RHS	Yes	30m damaged
46	89+100	89+200	100	LHS	Yes	Good	93	143+400	143+500	60	LHS	Yes	Good
47	89+200	89+300	100	LHS	Yes	Good	94	143+600	143+700	70	RHS	Yes	Good

### 3.3.11 HIGH MASTS

Representative photographs of some of the locations where high masts have been provided are presented in **Figures** below.



Fig 3.99: High mast at Ch. 25+400

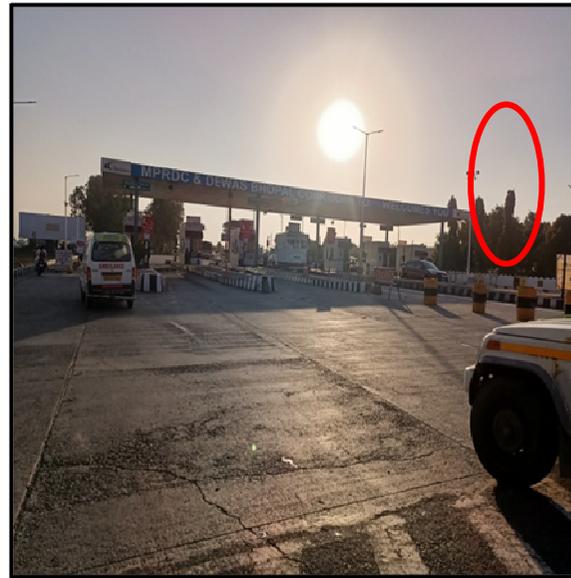


Fig 3.100: High mast at Ch. 61+550



Fig 3.101: High mast at Ch. 148+600

Details of High Masts at various locations are presented in **Table 3.13** below.

**Table 3.13: Details of High Masts**

S.No	Chainage (Km)	Side	Village / Location	Height (m)	Lamps	Condition
1	25+400	LHS	Sehore Bypass Starts	15	4	Ok
2	41+800	RHS	Sehore Bypass Ends	15	4	Ok
3	61+550	RHS	Amlaha Toll Plaza	15	3	Ok
4	80+175	RHS	Shujalpur, Ashta	15	4	Ok
5	134+600	RHS	Bhourasa Toll Plaza	15	3	Ok
6	148+600	LHS	Indore Ujjain Flyover	15	6	Ok

### 3.3.12 KM STONES

Representative photographs of some of the Kilometre stones are presented in **Figures** below. It may be noted that the number of State Highway on the kilometre stones have been painted as SH-18.



**Fig 3.102: Km. Stone at 13+000**



**Fig 3.103: Km. Stone at 32+000**



**Fig 3.104: Km. Stone at 39+000**



Fig 3.105: Km. Stone at 43+000



Fig 3.106: Km. Stone at 119+000



Fig 3.107: Km. Stone at 148+000

Summary of numbers of Kilometre and Hectometre stones on the Project Road is presented in Table 3.14 below.

Table 3.14: Details of Km / Hm Stones

S.No.	Chainage (Km)		No. of Kilometer Stone	No. of Hectometer Stone	S. No.	Chainage (Km)		No. of Kilometer Stone	No. of Hectometer Stone
	From	To				From	To		
1	10.000	20.000	18	69	9	90.000	100.000	20	65
2	20.000	30.000	17	61	10	100.000	110.000	19	64
3	30.000	40.000	18	62	11	110.000	120.000	20	54
4	40.000	50.000	20	72	12	120.000	130.000	20	69
5	50.000	60.000	13	59	13	130.000	140.000	19	70
6	60.000	70.000	18	56	14	140.000	150.000	13	45
7	70.000	80.000	20	65	15	150.000	150.790	-	0
8	80.000	90.000	20	74	-	-	-	-	-

### 3.4 OBSERVATIONS PERTAINING TO STRUCTURES

#### 3.4.1 MAJOR BRIDGES

There are 4 numbers of Major Bridges on the Project Road. The condition survey of all these bridges on both the sides was conducted by us by visual inspection. The broad details of these Major Bridges have been outlined in **Table 3.15** below and some representative photographs presented in the **Figures** below.

**Table 3.15: Details of Major Bridges**

S. No	Location	Site Ch.	Str. No.	Type of Str.	Span Arrangement	Overall Length (m)	Carriageway Width (m) Each side	Overall width (m) Each side	Type of Super Structure	Type of Sub Structure	Railing/ Crash Barrier
1	Ajnar River	53+300	54/1	MjB	4x21.6 m (LHS)	86.4 m	11.0m	12.0 m	RCC Slab with Girder	RCC Wall Type Abutments & RCC Piers with Circular Shaft	RCC Crash Barrier
					4x21.6 m (RHS)	86.4 m	11.0m	12.0 m			
2	Parvati River	77+850	78/1	MjB	5x21.6 m (LHS)	108 m	11.0m	12.0 m	RCC Slab with Girder	RCC Wall Type Abutments & RCC Piers with Circular Shaft	RCC Crash Barrier
					5x21.6 m (RHS)	109 m	11.0m	12.0 m			
3	Kalisindh River	121+120	122/1	MjB	5x21.6 m (LHS)	108 m	11.0m	12.0 m	RCC Slab with Girder	RCC Wall Type Abutments & RCC Piers with Circular Shaft	RCC Crash Barrier
					5x21.6 m (RHS)	109 m	11.0m	12.0 m			
4	Lodri River	128+510	129/1	MjB	4x13.5 m (LHS)	54 m	7.4m	8.4 m	RCC Slab with Girder	Stone Masonry Wall Type Abutments & Piers	RCC Crash Barrier
					6x12.6 m (RHS)	75.6 m	11.0m	12.0 m		RCC Wall Type Abutments & RCC Piers with Circular Shaft	



Fig 3.108A: MjB at Ch. 53+300 -Expansion joint, Deck view, MBCB



Fig 3.108B: MjB at Ch. 53+300-View of deck slab, View of underside of superstructure of bridge



Fig 3.109A: MjB at Ch. 77+850 -Condition of deck, crash barrier



Fig 3.109B: MjB at Ch. 77+850 -Drainage spout, View of underside of superstructure of bridge



Fig 3.110A: MjB at Ch 121+120-View of deck and underside of bridge



Fig 3.110B: MjB at Ch 121+120-Expansion joints & drainage spout, underside of superstructure of bridge



Fig 3.111A: MjB at Ch 128+510 - View of deck and underside of bridge



Fig 3.111B: MjB at Ch 128+510-Vegetation on abutments, minor repairs of substructure underway

### 3.4.2 MINOR BRIDGES

There are 17 numbers of Minor Bridges on the Project Road. The condition survey of all these bridges on both the sides was conducted by us by visual inspection. The broad details of these Minor Bridges have been outlined in **Table 3.16** below and some representative photographs presented in the **Figures** below.

**Table 3.16: Details of Minor Bridges**

S. No.	Chainage	Str. No.	Span Arrangement	Overall Length (m)	Carriageway Width (m) Each side	Overall width (m) Each side	Type of Super Structure	Type of Substructure	Railing/ Crash Barrier
1	34+680	35/2	3x14.6 m (LHS)	43.8 m	11.0m	12.0 m	RCC Deck Slab with Girder	RCC Wall Type Abutments &RCC Piers with Circular Shaft	RCC Railings
			3x14.6 m (RHS)	43.8 m	11.0m	12.0 m			RCC Crash Barriers
2	38+350	39/1	1x21.0 m (LHS)	21.0 m	11.0m	12.0 m	RCC Deck Slab with Girder	PCC Wall Type Abutments	RCC Railings
			1x21.0 m (RHS)	21.0 m	11.0m	12.0 m			RCC Crash Barriers
3	38+850	39/2	2x14.7 m (LHS)	29.4 m	11.0m	12.0 m	RCC Deck Slab with Girder	PCC Wall Type Abutments & RCC Piers with Circular Shaft	RCC Railings
			2x14.7 m (RHS)	29.4 m	11.0m	12.0 m			RCC Crash Barriers
4	45+250	46/1	1x9.5 m (LHS)	9.5 m	11.0m	12.0 m	RCC Solid Slab	PCC Wall Type Abutments	RCC Crash Barriers
			1x9.5 m (RHS)	9.5 m	11.0m	12.0 m			
5	60+970	61/1	1x12.6 m (LHS)	12.6 m	11.0m	12.0 m	RCC Deck Slab with Girder	PCC Wall Type Abutments	RCC Crash Barriers
			1x12.6 m (RHS)	12.6 m	11.0m	12.0 m			

S. No.	Chainage	Str. No.	Span Arrangement	Overall Length (m)	Carriageway Width (m) Each side	Overall width (m) Each side	Type of Super Structure	Type of Substructure	Railing / Crash Barrier
6	63+550	64/1	1x12.6 m (LHS)	12.6 m	7.4m	8.4 m	RCC Solid Slab	Stone Masonry Wall Type Abutments	RCC Crash Barriers
			2x7.0 m (RHS)	14.0 m	11.0m	12.0 m		PCC Wall Type Abutments and Piers	
7	67+420	68/2	2x9.0 m	18.0 m	10.2m both sides	25.2m	RCC Solid Slab	Stone Masonry Wall Type Abutments and Pier widened with PCC	RCC Crash Barriers
8	71+450	72/1	3x12.5 m (LHS)	37.5 m	7.4m	8.4 m	RCC Solid Slab	PCC Wall Type Abutments and Piers	RCC Crash Barriers
			3x12.5 m (RHS)	37.5 m	11.0m	12.0 m	RCC Deck Slab with RCC Girder	RCC Wall Type Abutments & RCC Piers with Circular Shaft	
9	94+230	95/1	5x10.42 m (LHS)	52.1 m	9.7m	12.3 m	RCC Solid Slab	PCC Wall Type Abutments and Piers	RCC Crash Barriers
			5x10.42 m (RHS)	52.1 m	9.7m	12.3 m			
10	105+190	106/1	3x10.42 m (LHS)	31.26 m	11.0m	12.0 m	RCC Solid Slab	PCC Wall Type Abutments and Piers	RCC Crash Barriers
			3x10.42 m (RHS)	31.26 m	11.0m	12.0 m			
11	107+900	108/3	3x10.42 m (LHS)	31.26 m	11.0m	12.0 m	RCC Solid Slab	PCC Wall Type Abutments and Piers	RCC Crash Barriers
			3x10.42 m (RHS)	31.26 m	11.0m	12.0 m			
12	117+960	118/2	1x11.35 m (LHS)	11.35 m	11.0m	12.0 m	RCC Deck	PCC Wall Type	RCC Crash

S. No.	Chainage	Str. No.	Span Arrangement	Overall Length (m)	Carriageway Width (m) Each side	Overall width (m) Each side	Type of Super Structure	Type of Substructure	Railing / Crash Barrier
			1x11.35 m (RHS)	11.35 m	11.0m	12.0 m	Slab with Girder	Abutments	Barriers
13	122+860	123/1	1x12.6 m (LHS)	12.6 m	11.0m	12.0 m	RCC Deck Slab with Girder	PCC Wall Type Abutments	RCC Crash Barriers
			1x12.6 m (RHS)	12.6 m	11.0m	12.0 m			
14	126+570	127/2	1x10.6 m (LHS)	10.6 m	11.0m	12.0 m	RCC Solid Slab	PCC Wall Type Abutments	RCC Crash Barriers
			1x10.6 m (RHS)	10.6 m	11.0m	12.0 m			
15	127+010	128/1	2x4.5 m (LHS)	9.0 m	11.0m	12.0 m	Box Type	Box Type	RCC Crash Barriers
			2x4.5 m (RHS)	9.0 m	11.0m	12.0 m			
16	140+205	141/1	2x6.0 m (LHS)	12.0 m	11.0m	12.0 m	RCC Solid Slab	PCC Wall Type Abutments and Piers	RCC Crash Barriers
			2x6.0 m (RHS)	12.0 m	11.0m	12.0 m			
17	143+410	144/1	2x10.8 m (LHS)	21.6 m	11.0m	12.0 m	RCC Solid Slab	PCC Wall Type Abutments and Piers	RCC Crash Barriers
			2x10.8 m (RHS)	21.6 m	11.0m	12.0 m			



Fig 3.112: MnB Ch. 34+680-View of deck slab, underside of bridge



Fig 3.113: MnB Ch.38+350-Condition of expansion joints, View of deck slab and underside of bridge



Fig 3.114: MnB Ch.38+850–View of deck slab, drainage spout cleaning required, hazard marker



Fig 3.115: MnB Ch.45+250–Status of quadrant pitching & toe wall, erosion of embankment, view of deck slab



Fig 3.116: MnB Ch.60+970-View of underside of bridge, condition of expansion joints



Fig 3.117: MnB Ch.63+550 - View of deck slab, minor damages in crash barrier, view of underside of slab



Fig 3.118: MnB at 67+420-View of deck slab, minor damages in crash barrier, underside of box



Fig 3.119: MnB at 71+450-View of deck slab, view of underside of superstructure of bridge



Fig 3.120: MnB at 94+230-View of footpath and deck slab, view of underside of bridge



Fig 3.121: MnB at 105+190-View of deck slab, Minor repairs required on expansion joints, view of underside of bridge



Fig 3.122: MnB at 107+900-View of deck slab and underside of bridge, expansion joints buried



Fig 3.123: MnB at 117+960 - Condition of approaches, expansion joints buried, view of underside of bridge



Fig 3.124: MnB at 122+860–View of deck slab, condition of expansion joint, view of underside of bridge



Fig 3.125: MnB at 126+570–View of deck slab & approaches, view of underside of bridge



Fig 3.126: MnB at 127+010 – View of deck slab & approaches, view of underside of bridge



Fig 3.127: MnB at 140+205 – View of deck slab, minor vegetation in quadrants, view of underside of bridge



Fig 3.128: MnB at 143+410 - View of deck slab & underside of bridge

### 3.4.3 UNDERPASSES

There are 2 numbers of Underpasses on the Project Road. The condition survey of both these underpasses was conducted by us by visual inspection. The broad details of these Underpasses have been outlined in **Table 3.17** below and some representative photographs presented in the **Figures** below.

Table 3.17: Details of Underpasses

S. No.	Chainage	Type of Str.	Span Arrangement	Overall width of Structure	Type of Super Str.	Railing/ Crash Barrier
1	94+330 (95/2)	VUP at Dodi	1x7.0mx4.5m	29.5m	Box Type	RCC Crash Barriers
2	67+250 (68/1)	PUP at Kotri	1x4.0mx3.5m	18 m	Box Type	RCC Crash Barriers at both sides and at the Median



Fig 3.129: VUP at 94+330 – General cleaning required in Quadrants, view of underside & deck slab of VUP



Fig 3.130: PUP at 67+250–View of underside of PUP, minor damages in crash barrier

### 3.4.4 SLAB CULVERTS

There are 53 numbers of Slab Culverts on the Project Road, the summarized information of which is presented in **Table 3.18** and some representative photographs presented in the **Figures** below.



Fig 3.131: SC at 10+050



Fig 3.132: SC at 13+370



Fig 3.133: SC at 15+850



Fig 3.134: SC at 16+830



Fig 3.135: SC at 21+580



Fig 3.136: SC at 39+820



Fig 3.137: SC at 49+750



Fig 3.138: SC at 51+500



Fig 3.139: SC at 62+160



Fig 3.140: SC at 100+600



Fig 3.141: SC at 102+870



Fig 3.142: SC at 114+900



Fig 3.143: SC at 115+650



Fig 3.144: SC at 125+400



Fig 3.145: SC at 142+050

Table 3.18: Summary of Slab Culverts

S. No.	Ch.	Type of Str.	Span Arrangement	S. No.	Ch.	Type of Str.	Span Arrangement
1	10+050	SC	1x5m	28	84+700	SC	1x4m
2	12+050	SC	1x8m	29	97+410	SC	1x3m
3	13+370	SC	1x5m	30	100+600	SC	1x3m
4	15+300	SC	1x4m	31	101+370	SC	1x5m
5	15+850	SC	3x3.4m	32	102+870	SC	1x6m
6	16+830	SC	3x3.2m (LHS), 3x2.5m (RHS)	33	111+140	SC	1x5m
7	17+135	SC	2x3.2m	34	112+240	SC	1x5m
8	18+560	SC	1x8.2m	35	112+960	SC	1x5m

S. No.	Ch.	Type of Str.	Span Arrangement	S. No.	Ch.	Type of Str.	Span Arrangement
9	20+600	SC	2x2.4m (LHS), 2x3.2m (RHS)	36	114+440	SC	1x5m
10	21+580	SC	2x2.4m (LHS), 2x2m (RHS)	37	114+900	SC	1x6m
11	22+670	SC	3x2.3m	38	115+650	SC	1x6m
12	24+650	SC	3x3m	39	116+040	SC	1x4m
13	33+100	SC	1x3m	40	119+030	SC	1x5m
14	36+250	SC	1x3m	41	125+400	SC	1x5m
15	39+820	SC	1x3m	42	125+995	SC	1x5m
16	42+000	SC	1x5m	43	130+800	SC	1x3m
17	42+550	SC	2x2.0m (LHS), 1x4m (RHS)	44	133+770	SC	1x4m
18	46+820	SC	1x3m	45	134+430	SC	1x3m
19	49+750	SC	1x5m	46	135+050	SC	1x3m
20	51+500	SC	1x5m	47	136+800	SC	1x4m
21	52+080	SC	1x6m	48	139+400	SC	1x6m
22	52+600	SC	1x6m	49	141+760	SC	1x4m
23	57+940	SC	1x3m	50	142+050	SC	1x4m
24	58+430	SC	1x3m	51	142+640	SC	1x6m
25	62+160	SC	1x5m (LHS), 1x4m (RHS)	52	143+940	SC	1x4m
26	75+525	SC	1x5m	53	144+370	SC	1x4m
27	76+850	SC	1x4m	---	---	---	---

### 3.4.5 HUME PIPE CULVERTS

There are 109 numbers of Hume Pipe Culverts on the Project Road, the summarized information of which is presented in **Table 3.19** and some representative photographs presented in the **Figures** below.



Fig 3.146: HPC at 14+100



Fig 3.147: HPC at 22+350



Fig 3.148: HPC at 32+010



Fig 3.149: HPC at 32+700



Fig 3.150: HPC at 48+150



Fig 3.151: HPC at 66+105



Fig 3.152: HPC at 84+470



Fig 3.153: HPC at 113+800



Fig 3.154: HPC at 121+730



Fig 3.155: HPC at 123+840



Fig 3.156: HPC at 141+510

**Table 3.19: Summary of Hume Pipe Culverts**

S. No.	Ch.	Type of Str.	Span Arrangement	S. No.	Ch.	Type of Str.	Span Arrangement
1	11+350	HPC	5x1.2m	56	79+510	HPC	3x1.2m
2	14+100	HPC	1x0.9m	57	79+620	HPC	3x1.2m
3	14+550	HPC	4x0.9m	58	80+975	HPC	3x1.2m
4	16+180	HPC	3x0.9m	59	81+205	HPC	3x1.2m
5	20+300	HPC	5x0.9m	60	81+620	HPC	3x1.2m
6	22+350	HPC	4x0.9m	61	82+100	HPC	2x1.0m
7	24+045	HPC	1x1.0m	62	84+200	HPC	1x1.0m
8	24+245	HPC	1x1.0m	63	84+470	HPC	2x1.0m
9	25+450	HPC	1x1.0m	64	86+800	HPC	1x1.0m
10	26+220	HPC	2x1.0m	65	87+900	HPC	2x1.0m
11	26+440	HPC	2x1.0m	66	89+040	HPC	1x1.0m
12	26+850	HPC	2x1.0m	67	89+300	HPC	1x1.0m
13	27+450	HPC	2x1.0m	68	91+270	HPC	2x1.0m
14	27+870	HPC	1x1.0m	69	96+440	HPC	2x1.0m
15	28+720	HPC	3x1.0m	70	97+850	HPC	1x1.0m
16	28+930	HPC	1x1.0m	71	98+610	HPC	1x1.0m
17	29+230	HPC	2x1.0m	72	99+320	HPC	3x1.2m
18	29+680	HPC	2x1.0m	73	100+100	HPC	1x1.0m

S. No.	Ch.	Type of Str.	Span Arrangement	S. No.	Ch.	Type of Str.	Span Arrangement
19	30+200	HPC	1x1.0m	74	100+270	HPC	2x1.2m
20	31+020	HPC	2x1.0m	75	103+260	HPC	1x1.0m
21	32+010	HPC	3x1.0m	76	104+075	HPC	1x1.0m
22	32+250	HPC	1x1.0m	77	105+895	HPC	1x1.0m
23	32+700	HPC	2x1.0m	78	107+010	HPC	2x1.0m
24	33+330	HPC	2x1.0m	79	107+640	HPC	1x1.0m
25	33+450	HPC	2x1.0m	80	108+540	HPC	2x1.0m
26	34+100	HPC	1x1.0m	81	108+540	HPC	2x1.0m
27	35+130	HPC	2x1.0m	82	109+710	HPC	2x1.0m
28	36+050	HPC	1x1.0m	83	113+400	HPC	1x1.0m
29	37+150	HPC	1x1.0m	84	113+800	HPC	3x1.2m
30	39+630	HPC	1x1.0m	85	113+950	HPC	3x1.2m
31	41+350	HPC	3x1.0m	86	116+550	HPC	1x1.0m
32	41+700	HPC	1x1.0m	87	117+420	HPC	1x1.0m
33	43+150	HPC	4x1.2m	88	119+190	HPC	2x1.0m
34	43+650	HPC	1x1.0m	89	119+600	HPC	1x1.0m
35	48+150	HPC	2x1.2m	90	119+830	HPC	2x1.0m
36	53+400	HPC	6x1.0m	91	120+540	HPC	2x1.2m
37	53+900	HPC	2x1.2m	92	121+730	HPC	1x1.2m
38	54+620	HPC	1x1.2m	93	123+500	HPC	2x1.0m

S. No.	Ch.	Type of Str.	Span Arrangement	S. No.	Ch.	Type of Str.	Span Arrangement
39	55+805	HPC	3x1.0m	94	123+840	HPC	1x1.2m
40	56+610	HPC	3x1.0m	95	124+730	HPC	2x1.2m
41	64+630	HPC	3x1.0m	96	125+050	HPC	3x1.2m
42	65+210	HPC	3x1.0m	97	126+100	HPC	1x1.2m
43	66+105	HPC	3x1.0m	98	129+080	HPC	2x1.2m
44	68+080	HPC	1x1.0m	99	129+220	HPC	3x1.2m
45	68+510	HPC	2x1.0m	100	133+150	HPC	1x1.0m
46	68+800	HPC	1x1.0m	101	138+300	HPC	1x1.0m
47	70+150	HPC	1x1.0m	102	138+870	HPC	4x1.2m
48	73+155	HPC	2x1.0m	103	141+510	HPC	2x1.2m
49	74+180	HPC	3x1.0m	104	144+820	HPC	1x1.2m
50	74+590	HPC	1x1.0m	105	145+650	HPC	3x1.2m
51	74+830	HPC	2x1.0m	106	146+070	HPC	2x1.2m
52	75+200	HPC	2x1.0m	107	146+660	HPC	1x1.2m
53	76+020	HPC	1x1.0m	108	147+100	HPC	2x1.2m
54	78+280	HPC	1x1.2m	109	147+620	HPC	4x1.2m
55	78+950	HPC	3x1.2m	---	---	---	---

It is found that the structures are mostly in good condition with requirements pertaining mainly to routine maintenance/minor repairs. The issues identified during the condition assessment are summarized as under.

- a) Quadrant pitching is seen to be covered with vegetation. At some locations, minor repairs are required at quadrant pitching and toe wall.
- b) Some expansion joints have been covered with the wearing coat and are required to be cleaned.
- c) Minor repairs are required at some locations on Railing /RCC Crash Barrier/Parapets.
- d) Repairs are required in the bed protection work at some locations.
- e) Cleaning/clearing of the waterway is required.

As informed by the Concessionaire, the routine cleaning of the structures and waterway is carried out before and after monsoon. The observations pertaining to cleaning of the waterway/quadrant pitching, etc will be taken up by the Concessionaire before monsoon and other minor repairs are being taken up by the Concessionaire under Routine Maintenance. Moreover, it is noted that the Concessionaire had awarded a Contract for all such rectification & repair works other than the routine maintenance works for major structures to *M/s Sunrise Engineering*, Ghaziabad. The same has been completed.

### 3.5 SUMMARY OF INVENTORY

The summary of the Project Road inventory assessed by RCSPL is presented in **Table 3.20** below.

**Table 3.20: Summary of Project Road inventory assessed by RCSPL**

S. No	Description	Unit	Assessed by RCSPL
1	Service Roads	km	9.09
2	Major Junctions	Nos.	19
3	Minor Junctions	Nos.	70
4	Hume Pipe Culverts	Nos.	109
5	Slab Culverts	Nos.	53
6	Major Bridges	Nos.	4

<b>S. No</b>	<b>Description</b>	<b>Unit</b>	<b>Assessed by RCSPL</b>
7	Minor Bridges	Nos.	17
8	Underpasses - VUP	Nos.	1
9	Underpasses - PUP	Nos.	1
10	Service Roads Drains (RCC Drain)	m	10620
11	Overhead Gantry	Nos.	4
12	High mast lighting	Nos.	6
13	W-beam Steel Crash Barriers	m	8619
14	Bus Shelters	Nos.	35
15	Truck Lay Bys	Nos.	1
16	By Pass details	Km	29.420

### 3.6 TOLL PLAZA WORKING STATUS

There are three Toll Plazas, at Km 25+000 (Village Fanda), at Km 61+550 (Village Amlaha) and at Km 134+600 (Bhourasa) on the Project Road. Open system of Toll collection has been provided at the Plazas. There are total of 8 (eight) lanes having a Semi-automated System with the necessary equipment for registering vehicle classification, ticket issuing, data processing and power supply.



Fig 3.157A: Toll Plaza at Fanda (Km 25+000)



Fig 3.157B: Toll Plaza at Fanda (Km 25+000)



Fig 3.158A: Toll Plaza at Amlaha (Km 61+550)



Fig 3.158B: Toll Plaza at Amlaha (Km 61+550)



Fig 3.159A: Toll Plaza at Bhourasa (Km 134+600)

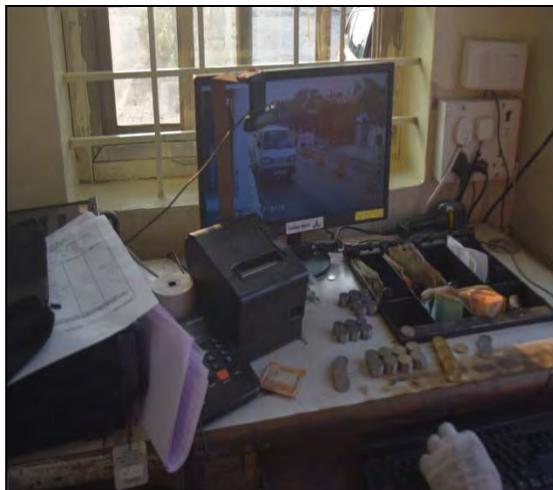


Fig 3.159B: Toll Plaza at Bhourasa (Km 134+600)

### **3.6.1 Toll Management System**

The Concessionaire has installed a semi-automatic and hybrid system for toll collection, such that manual collection and Electronic (Fastag) collection can be done on the same lane.

### **3.6.2 Available modes of toll collection**

In semi-automatic lanes, Toll can be collected via cash, smart card (monthly pass), Paytm. Hybrid lanes are facilitated with Fastag for payments.

### **3.6.3 Booth Operational steps in Semi-Automatic Lane (TMS)**

- (i) Operator after login activates the lane and its equipment like Boom barriers, OHLS (Over Head Lane Status), and AVC, etc.
- (ii) The vehicle stops near the booth window and provides either cash, smart card, or scans the QR code for payment through the wallet.
- (iii) In the case of cash the required fee is deducted by the operator and desired change amount is returned.
- (iv) A transaction receipt is provided as proof of fee payment.
- (v) During the transaction process the LPR camera records the License plate details.
- (vi) The boom barrier opens-up and the vehicle then moves towards the Loop sensor.
- (vii) Once the vehicle crosses over the sensor section the boom barrier closes automatically and vehicle classification is done simultaneously.
- (viii) The incident camera captures the details of the vehicle while it exits the sensor loop.

### **3.6.4 Booth Operational steps in Hybrid Lane (ETMS)**

- (i) The RFID trans-receiver reads the Fastag data and deducts the desired amount directly from the bank account linked with Fastag and the user receives the transaction message for the same.
- (ii) In case of any violation or un-readable Fastag, a handheld Fastag reader is used to complete the transaction.
- (iii) Other steps are the same as mentioned in the above section (i) & (ii)

### **3.6.5 Review on Fanda, Amlaha and Bhourasa Toll Plaza**

The primary focus of the exercise was to check the various equipments installed in Toll Plaza and their functioning. Details pertaining to lane level equipments for all the three plazas are furnished in the Volume-II of this Report.

#### **3.6.5.1 Condition of the Equipments in Fanda and Amlaha Toll Plaza**

All 8 lanes are hybrid with ETMS i.e. equipped with RFID trans-receivers. Toll lane controllers are facilitated with the latest desired industrial-grade equipments. All desired cameras including the plaza surveillance camera were working satisfactorily.

AVC, Loop sensors are working satisfactorily in all lanes. All lanes are equipped with desired cameras like LPR, Incident Capturing and Booth Camera, etc., and are working satisfactorily.

Plaza surveillance camera is installed at desired distance and height and found working satisfactorily. All live recordings can be observed in the control room.

Both the toll plazas have dedicated workstation and room for Server, MIS, and validators. Computers being used in all the workstations are configured as per requirement and provided with Licensed Softwares. The servers of both the toll plaza are secured with the firewall security system.

Concessionaire has already given a proposal to MPRDC for up-gradation of the Toll Management System at Fanda and Amlaha Toll Plaza under COS. However, the up-gradation of Fanda and Amlaha Toll Plaza has been completed by the Concessionaire on its own cost as the COS is not approved by MPRDC.

#### **3.6.5.2 Condition of the Equipments in Bhourasa Toll Plaza**

All 8 lanes are hybrid with ETMS i.e. equipped with RFID trans-receivers. Toll lane controllers are facilitated with the latest desired industrial-grade equipments. All desired cameras including the plaza surveillance camera were working satisfactorily. Some of the Overhead Lane status lights need up-gradation. All other equipments like boom barrier, pole traffic light are working satisfactorily.

### 3.6.6 EDI Connectivity

In all three Toll Plazas a database access has been provided to the Authority where they can view their desired data with simple database login credentials.

Tunnels have not been provided in any of the 3 Toll Plazas.

### 3.6.7 Comments and Observations

Up-gradation of Toll collection system is in progress at site. Now all 24 lanes are ETC enabled. AVCC will be there in all 24 lanes. The summarized details in respect of Toll Plazas are presented in **Table 3.21** below.

**Table 3.21: Details of Toll Plazas**

S. No.	Description		Toll Plaza-1, (Fanda)	Toll Plaza-2, (Amlaha)	Toll Plaza-3, (Bhourasa)	Remarks
1	Location (Design Chainage)		25+000	61+550	134+600	
2	Total Length (m)		100m	300m	300m	
3	Type (Staggered / Straight)		Straight	Straight	Straight	
4	Straight Dimension	Length (m)	100	300	300	
		Width (m)	50	50	50	
5	Toll Lane Width - Left	Lane-1	3.5	3.5	3.5	
		Lane-2	3.5	3.5	3.5	
		Lane-3	3.5	3.5	3.5	
		Lane-4	5.5	5.5	5.5	For large veh.
6	Toll Lane Width - Right	Lane-1	3.5	3.5	3.5	
		Lane-2	3.5	3.5	3.5	
		Lane-3	3.5	3.5	3.5	
		Lane-4	5.5	5.5	5.5	For large veh.

S. No.	Description	Toll Plaza-1, (Fanda)	Toll Plaza-2, (Amlaha)	Toll Plaza-3, (Bhourasa)	Remarks	
7	Toll Island	Width of Island	1.9	1.9	1.9	
		Width of Centre Island	1.9	1.9	1.9	
		Condition	Okay	Okay	Okay	
8	Pavement	Type	CC	CC	CC	
		Condition	LHS Panel damaged	Panels damaged on B/s	LHS Panel damaged	
9	Toll Booths	Numbers	7	7	7	
		Condition	Okay	Okay	Okay	
10	Condition of Sign Boards at the Plaza		Okay	Okay	Okay	
11	Lifting Barriers	Numbers	4+4	4+4	4+4	
		Condition	Okay	Okay	Okay	
12	Signal Posts	Numbers	4+4	4+4	4+4	
		Condition	Okay	Okay	Okay	
13	WIM	Numbers	Not Prov.	Not Prov.	Not Prov.	
		Condition	-	-	-	
14	Whether ATMS Installed and Condition		No	No	No	
15	Condition of Lined Drain		-	Fair	-	
16	Lighting Facilities		Yes	Yes	Yes	
17	Any Other Remarks		Nil	Nil	Nil	

The details pertaining to Toll Plaza equipments, WIM, TMS installed on the site are presented in Table 3.22A, B & C below.

**Table 3.22A: Details of Equipments at Fanda Toll Plaza**

Plaza Level Equipment: Fanda Toll Plaza			
S. No	Item / Equipment Description	Working / Non-working / Qty	Remark
1	Plaza Server in hot standby configuration	1	4GB, 32GB, 2012, R2 HP, Xenon Licensed
2	Network Printer	Yes / 3	
3	Static Weigh Bridge	No	
4	Broadband Internet connection with minimum 2Mbps	Yes / 2	Broadband + FTTH
5	Working of Software - Plaza Level	Yes	
6	42" /55" LED Display for CCTV monitoring	Yes	
7	Network Video Recorder (NVR) for CCTV	Yes	
8	CCTV Camera for Plaza Building surveillance	Yes	
9	Work station for POS	Yes	2500, D2, Win7
10	Work station for Auditor	Yes	4500, i3, W10
11	Work station for MIS	Yes	4500, i3, W10
12	Intercom in Control Room	Yes	
13	Hand-held RFID readers	Yes / 2	
14	Outdoor Wi-Fi access point	Yes	
15	Plaza surveillances PTZ Camera	Yes	Above section of booth not clear, lighting issue
16	Internet router for connection to the CCH	Yes	
17	Plaza UPS	Yes	15KV/45 minute Backup
18	24 Port Network switches	Yes	
19	Any additional / special arrangement for Fastag Link		No
20	Any MPRDC Guidelines pertaining to Fastag		No
21	High mast lights		No
22	Length of cable from booths to plaza via any other way		70m
23	Equipments and staff insurance		Yes

**Table 3.22B: Details of Equipments at Amlaha Toll Plaza**

<b>Plaza Level Equipment: Amlaha Toll Plaza</b>			
<b>S. No</b>	<b>Item / Equipment Description</b>	<b>Working / Non-working / Qty</b>	<b>Remark</b>
1	Plaza Server in hot standby configuration	1	3GB, 1TB, 2012, R2 HP, Xenon Licensed
2	Network Printer	Yes / 3	
3	Static Weigh Bridge	No	
4	Broadband Internet connection with minimum 2Mbps	Yes / 2	Broadband + FTTH
5	Working of Software - Plaza Level	Yes	
6	42" /55" LED Display for CCTV monitoring	Yes	
7	Network Video Recorder (NVR) for CCTV	Yes	
8	CCTV Camera for Plaza Building surveillance	Yes	
9	Work station for POS	Yes	4GB, 500GB, core i3, Win10
10	Work station for Auditor	Yes	4500, i3, W10
11	Work station for MIS	Yes	4500, i3, W10
12	Intercom in Control Room	Yes	
13	Hand-held RFID readers	Yes /2	
14	Outdoor Wi-Fi access point	Yes	
15	Plaza surveillance PTZ Camera	Yes	
16	Internet router for connection to the CCH	Yes	
17	Plaza UPS	Yes	15KV/45 minute Backup
18	24 Port Network switches	Yes	
19	Any additional / special arrangement for Fastag Link		No
20	Any MPRDC Guidelines pertaining to Fastag		No
21	High mast lights		Yes
22	Length of cable from booths to plaza via any other way		70m
23	Equipments and staff insurance		Yes

**Table 3.22C: Details of Equipments at Bhourasa Toll Plaza**

<b>Plaza Level Equipment: Bhourasa Toll Plaza</b>			
<b>S. No</b>	<b>Item / Equipment Description</b>	<b>Working / Non-working / Qty</b>	<b>Remark</b>
1	Plaza Server in hot standby configuration	1	3GB, 1TB, 2012, R2 HP, Xenon Licensed
2	Network Printer	Yes/3	
3	Static Weigh Bridge	No	

Plaza Level Equipment: Bhourasa Toll Plaza			
S. No	Item / Equipment Description	Working / Non-working / Qty	Remark
4	Broadband Internet connection with minimum 2Mbps	Yes/2	Broadband + FTTH
5	Working of Software - Plaza Level	Yes	
6	42" /55" LED Display for CCTV monitoring	Yes	
7	Network Video Recorder (NVR) for CCTV	Yes	
8	CCTV Camera for Plaza Building surveillance	Yes	
9	Work station for POS	Yes	4GB, 500GB, core i3, Win10
10	Work station for Auditor	Yes	4500, i3, W10
11	Work station for MIS	Yes	4500, i3, W10
12	Intercom in Control Room	Yes	
13	Hand-held RFID readers	Yes/2	
14	Outdoor Wi-Fi access point	Yes	
15	Plaza surveillances PTZ Camera	Yes	
16	Internet router for connection to the CCH	Yes	
17	Plaza UPS	Yes	15KV/45 minute Backup
18	24 Port Network switches	Yes	
19	Any additional / special arrangement for Fastag Link		No
20	Any MPRDC Guidelines pertaining to Fastag		No
21	High mast lights		Yes
22	Length of cable from booths to plaza via any other way		70m
23	Equipments and staff insurance		Yes

## CHAPTER 4.0: REVIEW OF AS-BUILT DRAWINGS

### 4.1 REVIEW OF DESIGNS AND AS-BUILT DRAWINGS

Following as-built drawings for highways and structures prepared and furnished by the Concessionaire (as per **Table 4.1** below) were studied by us and our observations for the same have been presented in the subsequent paragraphs below. The remaining drawings could not be provided as the same were not available with the Concessionaire.

**Table 4.1: List of reviewed as-built drawings**

S. No.	Highways	S. No.	Structures	
A.	P&P of section: Bairagarh (10+000) to Start of Sehore Bypass (25+400)	A.	Drawings of Homogeneous Section 3 (D. Ch 81+600 to D. Ch 150+790)	
B.	P&P of section: Start of Sehore Bypass (25+400) to crossing of Dewas Bypass (148+500)	i)	Major Bridges	2 Nos.
	---	ii)	Minor Bridges	9 Nos.
	---	iii)	Slab Culverts	26 Nos.

#### 4.1.1 AS-BUILT DRAWINGS OF HIGHWAYS

We have received the Plan & Profile as-built drawings from Ch 10+000 (Bairagarh) to Ch 25+400 (Start of Sehore Bypass) and from Km Ch 25+400 (Start of Sehore Bypass) to Ch 148+500 (crossing of Dewas bypass). A comparison on the development provisions mentioned in the Technical Schedules of Concession Agreement and as provided in the as-built drawings have been presented in **Table 4.2** below.

**Table 4.2: Review of As-Built drawings for Highways**

S. No.	Name of Item	As per Agreement Schedule			As per as-built Drawing			Deficiency	Remarks	
1	Project Length	142.60km			140.790km but as-built P&P drawing reviewed for 138.50km (P&P drawing of stretch from Dewas bypass to Junction with NH-3 not reviewed)				Length got revised as per COS Order	
2	Design Speed	IRC: 73-1980			IRC: 73-1980			Nil		
	i) Plain Ter.	100/80			100/80					
3	Hori. Curves	360/230			6 nos. curves are having radius below desirable limits (less than 360m): 13+960 (355m), 48+000 (290m), 57+260 (290m), 78+810 (350m), 118+590 (230m) & 123+000 (250m)			Nil	All curves improved as per plain terrain	
	i) Plain Ter.									
4	Max. Grade of Vert. Curves	Ruling 3.3% for Plain & Rolling			Under Limits			Nil		
5	Sharp horizontal curve improvement	S. No	Chainage	Location	S. No.	Chainage	Location	Radius	Nil	All curves radii have been improved as per IRC-73.
		1	40.3	Existing Bypass	1	40+300	Sharp curve improved by introducing horizontal curve having radius as mentioned in the column to the right	355m		
		2	42.6	Existing Bypass Rafiqgunj	2	42+600		400m		
		3	54.3	Near Sonda Village	3	54+300		400m		
		4	68.1	Near Kotri Village	4	68+100		400m		
		5	78.1	Ashta Bypass	5	78+100		500m		
		6	86.3	Near Hotel Midway	6	86+300		400m		
		7	86.8	Near Hotel Midway-Pagriyachor Village- Hill	7	86+800		400m		
		8	88.7	Hill	8	88+700		400m		
		9	89.7	Rupeta Village	9	89+700		350m		
10	90	Rupeta Village	10	90+000	350m					

S. No.	Name of Item	As per Agreement Schedule			As per as-built Drawing				Deficiency	Remarks
		11	91.8	Fudra Village	11	91.8		400m		
		12	92.1	Fudra Village	12	92.1		400m		
		13	92.8	Fudra Village	13	92.8		400m		
		14	93.5	Up to Dodi Village	14	93.5		350m		
		15	94.9	Up to Dodi Village	15	94.9		400m		
		16	95.5	Up to Dodi Village	16	95.5		400m		
6	Design of pavement (Design MSA and crust details)	Flexible pavement design as per IRC-37 or AASHTO			Flexible pavement design as per IRC-37. Overlay over existing carriageway.					The Pavement Design Report & the TCS drawings were not available for review. This crust composition is seen as per unsigned documents available.
		Rigid pavement as per IRC or AASHTO			Rigid pavement as per IRC 58-2002					
		90 MSA for flexible pavement			90 MSA for flexible pavement (CBR 10%)					
		10 MSA for Service road			10 MSA for Service road (CBR 10%)					
		The composition and thickness of various layers of pavement shall not be less than those required as per IRC 37.			<b>MCW</b>		<b>Service Road</b>			
					BC = 40mm		BC = 40mm			
					DBM = 140mm		DBM = 85mm			
					WMM = 250mm		WMM = 250mm			
					GSB = 200mm		GSB = 200mm			
SG = 500mm					SG = 500mm					
			Total = 1130mm		Total = 1075mm					
7	Major Junctions	<b>S. No</b>	<b>Ch.</b>	<b>Location of the Junction</b>	<b>S. No.</b>	<b>Ch.</b>	<b>Location of the Junction</b>	It is seen from the P&P that most of the Major Junctions do not	As-built drawings of junctions not available. We have reviewed the P&P drawings of	
		1	18/6	Bakaniya Bypass	1	17+400	Bakaniya/Bhopal Bypass			
		2	26/4	Start of Sehore Bypass	2	25+450	Start of Sehore Bypass			
		3	43/2	End of Sehore Bypass	3	41+800	End of Sehore Bypass			
		4	78/8	Start of Ashta Bypass	4	77+210	Start of Ashta Bypass			
		5	84/4	End of Ashta Bypass	5	81+510	End of Ashta Bypass			

S. No.	Name of Item	As per Agreement Schedule			As per as-built Drawing			Deficiency	Remarks
		S. No.	Chainage	Description	S.No	Design Chainage	Description		
		6	106/8	Start of Mehatwada Bypass	6	104+400	Start of Mehatwada Bypass	have provision of acc/dec lanes & channelizing islands.	the Main Carriageway.
		7	108/6	End of Mehatwada Bypass	7	106+000	End of Mehatwada Bypass		
		8	122/4	Start of Sonkatchh Bypass	8	119+050	Start of Sonkatchh Bypass		
		9	124/8	End of Sonkatchh Bypass	9	122+550	End of Sonkatchh Bypass		
		10	150/8	Dewas Bypass NH-3 + SH	10	148+600	Start of Dewas Bypass		
8	Minor Junctions	All Minor intersections given in Annexure-E-3 (35nos) shall be improved			39 Nos. Minor junctions as per as-built drawing.				
9	Truck Lay-bye	One Truck lay-bye is proposed in the Project Road. (Given at Ch. 92+000 on RHS).			No Truck lay-bye is shown in the as-built drawing. However, one non-standard Truck lay-bye is seen at site at Ch 92+000 on RHS.			Non-standard	
10	Bus Bays	18 nos. Bus bays are proposed on the Project Road.			No Bus bays have been shown in the as-built drawing. However, 35 bus shelters including 3 bus-bays are seen at site.			No island seen in bus-bays	
11	Toll Plaza	S. No	Chainage		S.No	Design Chainage		The tapering portion is not as per Manual	
		1	Between Lalghati Sq to End of Sehore Bypass (Location of TP: Start of Sehore Bypass)		1	25+000 Fanda village (450m before the start of Sehore Bypass)			
		2	End of Sehore Bypass to End of Ashta Bypass (Location of TP: in Between Km. 60-65)		2	61+550 (Amlaha village)			
		3	End of Ashta Bypass to Start of Dewas Bypass (Location of TP: in between Km. 136 to 140)		3	134+600 (Bhourasa village)			

#### 4.1.2 AS-BUILT DRAWINGS OF STRUCTURES

As-built drawings of structures in homogeneous section 3 (Ch 81+600 to Ch 150+790) were made available to us for review. Our observations on the development provisions mentioned in the Technical Schedules of Concession Agreement with respect to as-built drawings/site inventory have been presented in **Table 4.3** below.

**Table 4.3: Review of As-Built details for Structures**

S. No.	Type of Str.	Proposal as per Agreement Schedule							As per Site Inventory					
		S. No	Old Str No.	Type of Bridge	Prop. Span	Prop. Length	Proposal	Remarks	S. No	Design Ch.	Type of Bridge	Span	Prov. Length	Remarks
1	Major Bridge	4 Nos.							4 Nos.					
		1	55/4	RCC T-Girder	5x16.6	83	New	Ajnar River	1	53+300	RCC T-Girder	4x21.6	86	Ajnar River
		2	79/4	RCC T-Girder	5x21.6	108	New	Parvati River	2	77+850	RCC T-Girder	5x21.6	108	Parvati River
		3	124/2	RCC T-Girder	5x21.6	108	New	Kalisindh River	3	121+120	RCC T-Girder	5x21.6	108	Kalisindh River
		4	131/8	RCC T-Girder	6x21.6	75.6	New on one side	Lodri River	4	128+510	RCC T-Girder	6x12.6	75.6	Lodri River
2	Minor Bridge	16 Nos.							17 Nos.					
		1	37/2	Girder	3x14.5	43.5	New		1	34+680	Girder	3x14.6	43.8	It is noted that there is lot of variation in
		2	40/2	Girder	1x21.5	21.5	New		2	38+350	Girder	1x21.0	21	
		3	40/10	Girder	1x15	15	New		3	38+850	Girder	2x14.7	29.4	
		4	46/10	Slab	1x9	9	Recon		4	45+250	Slab	1x9.5	9.5	
		5	62/8	Slab	1x9	9	Recon		5	60+970	Slab	1x12.6	12.6	

S. No.	Type of Str.	Proposal as per Agreement Schedule							As per Site Inventory					
		S. No	Old Str No.	Type of Bridge	Prop. Span	Prop. Length	Proposal	Remarks	S. No	Design Ch.	Type of Bridge	Span	Prov. Length	Remarks
		6	65/4	Girder	1x12.6	12.6	Recon		6	63+550	Slab	1x12.6 (LHS), 2x7.0 (RHS)	12.6, 14.0	the chainages, span length and span arrangement of the as-built structures as compared to the provision in the Schedule.
		7	69/2	Slab	2x9	18	Recon		7	67+420	Slab	2x9.0	18	
		8	73/2	Girder	3x12.6	37.8	Recon		8	71+450	Slab	3x12.5	37.5	
		9	97/6	Girder	3x16.6	49.8	Recon		9	94+230	Slab	5x10.42	52.1	
		10	108/6	Girder	3x12.6	37.8	Recon		10	105+190	Slab	3x10.42	31.26	
		11	111/2	Girder	3x12.6	37.8	Recon		11	107+900	Slab	3x10.42	31.26	
		12	121/2	Girder	1x12.6	12.6	Recon		12	117+960	Girder	1x11.35	11.35	
		13	126/2	Girder	1x12.6	12.6	Recon		13	122+860	Girder	1x12.6	12.6	
		14	129/8	Slab	1x9	9	Recon		14	126+570	Slab	1x10.6	10.6	
		15	130/2	Slab	1x9	9	Recon		15	127+010	Box	2x4.5	9	
		16	131/8	Girder	4x12.6	50.4	Recon		16	140+205	Slab	2x6.0	12	
								17	143+410	Slab	2x10.8	21.6		
3	Underpasses	Nil							2 Nos.					
									1	94+230	VUP	1x7x4.5	7	Under COS
								2	67+250	PUP	1x4x3.5	4		
4	Culverts	1	79 Nos.	Slab					1	53 Nos.	Slab			
		2	86 Nos.	HPC					2	109 Nos.	HPC			

## 4.2 REVIEW OF PAVEMENT DESIGN REQUIREMENTS

As per Clause 5.1 of Schedule-J of the Concession Agreement, the Pavement Design was to be based on the following two parameters:

- a) Traffic Forecast : As per Detailed Project Report or any higher value as assessed by the Concessionaire (minimum 90MSA for MCW and 25MSA for Service Roads) – As per revised specification, Design Traffic for Service Road is to be kept as 10MSA instead of 25MSA.
- b) Design Life : **20 years** for Flexible Pavement, **30 years** for Rigid Pavement

It is noted that the Design Life specified is 20 years whereas the Design Period is 25 years. However, the Concession Agreement also provides minimum Design MSA of 90 MSA. Looking to the traffic on the Project Road, the Pavement Design of 90 MSA will be adequate even for 25 years.

### 4.2.1 FLEXIBLE PAVEMENT REQUIREMENTS - MCW & SERVICE ROADS

The Flexible Pavement for Main Carriageway and Service Roads has been provisioned to be designed as per IRC method or the AASHTO method. The composition and thickness of various layers of pavement shall not be less than those required as per IRC: 37 for minimum design traffic of 90MSA for MCW and 25MSA for Service Roads.(As per revised specification, design traffic for Service Road is to be kept as 10MSA instead of 25MSA).The Concessionaire should however satisfy himself in this regard and should consider higher traffic (than minimum specified 90MSA) for design purposes in case required, as per projected traffic considering 20 years design life. In the Appendix J-2 of Schedule J of the Concession Agreement, the geometric parameters and standards have been specified.

### 4.2.2 FLEXIBLE PAVEMENT REQUIREMENTS - EXISTING CARRIAGEWAY

Strengthening of existing Flexible Pavement was provisioned to be done with a bituminous overlay designed in accordance with IRC: 81 or procedures specified by the Asphalt Institute, USA or any other international method. However the Clause 5.1 (c) (ii) specifies minimum requirements of profile: camber of 2.5% minimum for the cross profile and vertical curves as per geometric design with minimum 30m straight length between two curves for the longitudinal profile.

### 4.2.3 RIGID PAVEMENT REQUIREMENTS

Rigid Pavement was provisioned to be done in accordance with IRC, AASHTO or any other international code/specification considering 30 years Design Life. However, the table in Appendix J-1 of Schedule-J of the Concession Agreement specifies the IRC codes to be followed in the design of road works.

#### 4.2.4 PAVEMENT DESIGN FOR MAIN CARRIAGEWAY

The Pavement Design Report and the TCS drawings were not available for review. We have however; been able to procure some unsigned documents of the TCS. Based on the documents available, it was observed that the Flexible Pavement for Main Carriageway and Service Roads seems to have been designed as per IRC: 37-2001. The composition and thickness of various layers of pavement appears to have been provided as per charts given in the code. On the new carriageway, the pavement crust was for a traffic of 90MSA and the provided crust composition was 40mm BC, 140mm DBM, 250mm WMM, 200mm GSB over 500mm Subgrade having 10% CBR.

#### 4.2.5 PAVEMENT CRUST FOR MAIN CARRIAGEWAY

The Pavement Design Report prepared by the Concessionaire and submitted to the IE was not available with us for review. The entire road was to be designed as flexible pavement except for Toll Plaza area where it was to be designed as rigid pavement.

The Concession Agreement specifies that the Flexible Pavement has to be designed in accordance with IRC 37 for minimum design traffic of 90MSA for Main Carriageway and 10MSA for Service Roads. The road is to be designed for a design life of 20 years. With a Subgrade having 10% CBR, the pavement design as per IRC: 37-2001 gives a total pavement crust thickness of 630mm (50mm BC, 130mm DBM, 250mm WMM, 200mm GSB) for a design traffic of 100MSA. The total bituminous layer is 180mm. We have been able to obtain some unsigned TCS drawings of the Project Road (The approved/as-built TCS drawings are not available with the Concessionaire). The pavement crust adopted as per these TCS is summarized in the **Table 4.4** below. The provided crust thickness is 630mm (with total bituminous layer being 180mm) and so the adopted crust composition in accordance with the codal provisions.

**Table 4.4: Summary of Flexible Pavement Design**

Typical Cross Section Bhopal-Dewas							
Sr. No.	TCS Type	Description	LHS		RHS		Service Road Crust
			Proposal	Crust Composition	Proposal	Crust Composition	
1	TCS-1	Sehore Bypass (Strengthening the existing Carriageway and provided additional Carriageway)	Strengthening of existing Carriageway	BC - 40 mm DBM- 50 to 100 mm (Camber/Profile correction from BM)	Addition of New Carriageway	BC - 40 mm DBM - 150 mm WMM - 250 mm GSB - 200 mm SG - 500 mm	

Typical Cross Section Bhopal-Dewas							
Sr. No.	TCS Type	Description	LHS		RHS		Service Road Crust
			Proposal	Crust Composition	Proposal	Crust Composition	
2	TCS-2	Raising Existing Road and Providing Additional Carriageway in Rural Area	New Carriageway	BC - 40 mm DBM - 140 mm WMM - 250 mm GSB - 200 mm SG - 500 mm	New Carriage way	BC - 40 mm DBM - 140 mm WMM - 250 mm GSB - 200 mm SG - 500 mm	
3	TCS-3	TCS for Bypasses (Ashta, Mehatwada, Sonkatchh, Sonda, Dodi)&Realignment Sections	New Carriageway	BC - 40 mm DBM - 140 mm WMM - 250 mm GSB - 200 mm SG - 500 mm	New Carriage way	BC - 40 mm DBM - 140 mm WMM - 250 mm GSB - 200 mm SG - 500 mm	
4	TCS-4	Concentric Widening with Rigid Pavement in Urban Area	Widening	PQC - 320 mm DLC - 150 mm GSB - 200 mm SG - 500 mm	Widenin g	PQC - 320 mm DLC - 150 mm GSB - 200 mm SG - 500 mm	BC - 40 mm DBM - 85 mm WMM - 250 mm GSB - 200 mm SG - 500 mm
5	TCS-5	Strengthening the Existing Carriageway and Providing Additional Carriageway	Strengthe ning of existing Carriageway	BC - 40 mm DBM- 100 mm	Addition al New Carriage way	BC - 40 mm DBM - 140 mm WMM - 250 mm GSB - 200 mm SG - 500 mm	
6	TCS-6	Concentric Widening - Rural Areas	Widening	BC - 40 mm DBM - 140 mm WMM - 250 mm GSB - 200 mm SG - 500 mm	Widenin g	BC - 40 mm DBM - 140 mm WMM - 250 mm GSB - 200 mm SG - 500 mm	
7	TCS-7	Strengthening of Existing Road from Km. 6/800 to Km. 26/400 (Lalghati to Sehore Bypass Start)	Strengthe ning of existing Carriageway	BC - 40 mm DBM - 50 to 80 mm (Camber/Profil e Correction with BM)	Strengthe ning of existing Carriage way	BC - 40 mm DBM - 50 to 80 mm (Camber/Profi le Correction with BM)	

Typical Cross Section Bhopal-Dewas							
Sr. No.	TCS Type	Description	LHS		RHS		Service Road Crust
			Proposal	Crust Composition	Proposal	Crust Composition	
8	TCS-8	Concentric Widening with Flexible Pavement in Dewas Town Portion from Km. 151/300 to 154/000 (2.7 km)	Widening	BC - 40 mm DBM - 140 mm WMM - 250 mm GSB - 200 mm SG - 500 mm	Widening	BC - 40 mm DBM - 140 mm WMM - 250 mm GSB - 200 mm SG - 500 mm	BC - 40 mm DBM - 85 mm WMM - 250 mm GSB - 200 mm SG - 500 mm

#### 4.2.6 RIGID PAVEMENT DESIGN FOR TOLL PLAZA AREAS

The Rigid Pavement for MCW seems to have been designed with thickness of PQC as 320mm over DLC layer of thickness 150mm and GSB of 200mm thickness. The CC road has been designed for 30 years. The crust composition is in line with the codal requirements. The summary of pavement design has been shown below in **Table 4.5**.

**Table 4.5: Summary of Rigid Pavement Crust Composition**

CBR	10	%
Granular Sub Base (GSB)	200	mm
Dry Lean Concrete layer	150	mm
Polythene Layer between PQC and DLC	125	micron
Thickness of Pavement Quality Concrete	320	mm

#### 4.2.7 CONCLUSIONS ON REVIEW OF PAVEMENT DESIGN

The Pavement Design of the Flexible and Rigid Pavements seems to have been done in accordance with the relevant codes and also satisfying the provisions laid down in the Concession Agreement.

### 4.3 REVIEW OF STRUCTURE DESIGN REQUIREMENTS

#### 4.3.1 GENERAL DESIGN REQUIREMENTS

As per Schedule-J of the Concession Agreement, the design standards and loading to be considered for culverts, bridges, underpasses and retaining walls shall be those laid down in the relevant IRC codes. Any existing bridge found to be structurally unsafe and / or deficient to carry the IRC design load shall be replaced or rehabilitated. The table in Appendix J-1 of Schedule-J of the Concession Agreement specifies the IRC codes to be followed in the design of structures.

**Note by RCSPL:** The Detailed Design Calculations of the Project Road were not available with us for review, so we have no information related to the design basis for the existing structures required to be retained/widened. In the absence of this information, it is not possible to ascertain the design life of such structures. However, the Clause 7.1 of Schedule-J of Concession Agreement has specified that any existing bridge found to be structurally unsafe and/or deficient to carry the IRC design load (based on Non-Destructive Testing including full scale load testing) shall be replaced or rehabilitated. The Concessionaire with the consultation of IE during construction therefore can be deemed to have made an appropriate assessment related to the structural condition of the structures. The assessment of the condition of structures is also the responsibility of the Concessionaire during the O&M period also.

#### **4.3.2 SPECIAL DESIGN REQUIREMENTS**

- a) As per the Schedule-J of the Concession Agreement, NP4 pipes are to be used for all pipe culverts that are required to be reconstructed. In case of existing culverts which are in sound condition functioning satisfactorily, be extended using NP4 class pipes of existing diameter. For all pipe culverts having pipe diameter less than 900mm, these shall be replaced by pipes of 1000mm diameter (NP4) under both the carriageways. Also, the minimum diameter of pipes for new/reconstruction pipe culverts shall be of 1200mm.
- b) Where a new structure is constructed alongside an existing structure or culvert, the profiles of the new and existing structures and their approaches shall be same. Also, suitable protection of the embankment between the structures in the median portion shall be provided either by extending the abutment wall or by a median wall.
- c) Bridge superstructure may be of RCC, PCS or steel-concrete composite construction. The substructure and foundations may also be concrete, steel or steel-concrete composite construction.
- d) Bearings of all bridges shall be easily accessible for inspection and maintenance.
- e) Existing expansion joints should be working at all times and shall be timely replaced without causing additional stresses for the structure.

#### **4.4 REVIEW OF STRUCTURE DRAWINGS**

##### **4.4.1 MAJOR AND MINOR BRIDGES**

There are 4 Major Bridges and 17 Minor Bridges which have been reconstructed for the new carriageway portion as per the Concession Agreement. The codes which have been followed for the design are IRC: 78-2000, IRC: 6-2000 and IRC: 21-2000. Following Design Features have been considered.

The abutments for the Major Bridges have been designed as box type. Piers have been designed as circular columns. The Foundations are open type and the superstructure is T-Type Girder with RCC slabs. Following design parameters have been considered.

- a) Material : M30 Concrete for Piers, Abutments, Pier & Abutment Caps, Superstructure, M35 for Bearing Pedestal, M40 for Crash Barrier, PCC M15 for Return Walls.
- b) Cover R/f : 75mm on earthen face & foundation, 40mm on front face of stem
- c) Loading : DL, Earth pressure, SIDL, Impact Load, Vehicular Load (One lane of Class 70R plus one lane of IRC Class A OR three lanes of IRC Class A loads)
- d) SBC considered : Varying from 70T/m<sup>2</sup> to 90T/m<sup>2</sup>
- e) Bearings : Elastomeric bearings
- f) Expansion joints : Strip seal type

The abutments and piers for the Minor Bridges have been designed as PCC Type. The Foundations are open type and the superstructure is RCC slabs. Following design parameters have been considered.

- a) Material : PCC M15 for Piers, Abutments, M30 for Pier & Abutment Caps, Superstructure, M35 for Bearing Pedestal, M40 for Crash Barrier, PCC M15 for Return Walls.
- b) Cover R/f : 75mm on earthen face & foundation, 40mm on front face of stem
- c) Loading : DL, Earth pressure, SIDL, Impact Load, Vehicular Load (One lane of Class 70R plus one lane of IRC Class A OR three lanes of IRC Class A loads)
- d) SBC considered : Varying from 30/m<sup>2</sup> to 90T/m<sup>2</sup>
- e) Bearings : Tar paper
- f) Expansion joints : Strip seal type

#### 4.4.2 REVIEW OF AS-BUILT DRAWINGS OF MAJOR STRUCTURES

The as-built drawings of some of the major structures have been studied and the constructed structures appear to be in order.

#### 4.4.3 SLAB CULVERTS

There are 53 Slab Culverts constructed at site. The codes which have been followed for the design are IRC: 78-2000, IRC: 6-2000 and IRC: 21-2000. Following Design Features have been considered.

- a) Material : PCC M15 for Abutments & wing walls, M30 for Abutment caps and Superstructure, M40 for Crash Barrier
- b) Reinforcement : Skin reinforcement provided
- c) Loading : DL, Earth Pressure, Vertical load due to backfill soil, LL Surcharge

#### 4.4.4 REVIEW OF AS-BUILT DRAWINGS OF SLAB CULVERTS

The as-built drawings of some of the Slab Culverts have been studied and the constructed culverts appear to be in order.

#### 4.4.5 HYDROLOGICAL ADEQUACY OF STRUCTURES

The Hydrology calculations of the structures were not available with us for review. Also, there is no data pertaining to hydrological calculations (Discharge, Catchment, Scour Depth, etc.) in the as-built drawings of the Major Structures (Major and Minor Bridges) made available to us. However from our assessment of condition of structures during the site inventory, we are of the view that almost all structures are high level and the design of these structures must have been done by fulfilling the requirements of hydrology.

#### 4.5 CONCLUSIONS ON REVIEW OF DRAWINGS

As per the Concession Agreement, the structures have been designed for loading as per IRC: 6-2000. In the present day however, IRC: 6-2017 is used for the designs. Special Vehicle (SV) loading has been included in the latest code. The Concessionaire needs to take this into account while allowing over-dimensional/overweight vehicles to pass through the Project Road.

*Apart from the above, on the basis of the review of available as-built drawings for the Project, it is confirmed that the Project has been developed in accordance with the provisions of the Schedules of Concession Agreement.*

## **CHAPTER 5.0: OPERATION & MAINTENANCE**

### **5.1 OPERATIONS – REQUIREMENTS OF CONCESSION AGREEMENT**

The Scope of Works for O&M stage has been mentioned in the Schedule-M of the Concession Agreement and also the O&M Manual as described earlier. The O&M Manual is a guideline to assist the Concessionaire. Certain forms and procedures are annexed as part of the Manual for facilitating proper supervision and implementation of various O&M activities. The Concessionaire is expected to cover the following two aspects during the entire Operations Period.

#### **a) Operations part**

This includes permitting smooth and uninterrupted flow of traffic during normal operating conditions, functioning of Toll system including charging and collecting the fees from road user, functioning of patrolling system, functioning of rescue and medical aid services, functioning of the Project Facilities, public toilets and other sanitary facilities and solid waste disposal system.

#### **b) Maintenance part**

This includes maintaining the Project Road in traffic worthy conditions and the Project's Ancillary Facilities in usable condition satisfying the performance criteria as provided in the Concession Agreement throughout the Concession Period through regular maintenance and preventive maintenance of the various items and elements of the Project Highway.

### **5.2 PERIODIC MAINTENANCE STRATEGY**

As per the Concession Agreement, Periodic Maintenance for the carriageway with 25mm BC shall be carried out as required and at least once in *six years* from COD and in the last year of Concession Period. Road marking as specified and other roadside features shall also be restored to meet the relevant standards. This Periodic Maintenance shall also include profile corrective course of overlays with the periodic renewal of the wearing course of the road pavement and the wayside amenities.

The periodic renewal shall result in improvement of the riding quality, road roughness value to be restored to meet the relevant standards.

As per the above provisions of the Concession Agreement since the COD has been achieved in the year 2010 and the (proposed extended) Concession Period ends in December 2033, the Periodic Maintenance activity needs to be carried out in the years 2016 and in 2033-34. The Concessionaire is however, required to carry out Preventive Maintenance as when required. The Concessionaire has carried out the first Major Maintenance in the year 2016-17. The Concessionaire has thereafter done Renewal works under Preventive/Major Maintenance, in the year 2019-20 and 2020-21 in a stretch of 81km (29% of total 281.6km of 2-lane length) and 62km (22% of total 281.6km 2-lane length) respectively. The Concessionaire has also done Renewal works under Preventive/Major Maintenance in the present year 2021-22 in a stretch

of 85km (29% of total 281.6km of 2-lane length)till Jan 2022, and has planned to complete Renewal works for full Project Road length by June 2022.

### 5.3 DETAILS OF LATEST BBD TESTS

The Benkelman Beam Deflection studies have been carried out by the Concessionaire in November 2021 (in the period of 10.11.2021to 26.11.2021). A summary of the same has been presented in **Table 5.1** below.

**Table 5.1: Summary of latest BBD Tests conducted in November 2021**

Sr. No.	D. Chainage		Side	Characteristic Deflection (mm)	Side	Characteristic Deflection (mm)
	From	To				
1	10	11	LHS	0.583	RHS	0.583
2	11	12	LHS	0.548	RHS	0.546
3	12	13	LHS	0.532	RHS	0.559
4	13	14	LHS	0.542	RHS	0.589
5	14	15	LHS	0.504	RHS	0.505
6	15	16	LHS	0.573	RHS	0.572
7	16	17	LHS	0.530	RHS	0.540
8	17	18	LHS	0.601	RHS	0.518
9	18	19	LHS	0.586	RHS	0.556
10	19	20	LHS	0.576	RHS	0.552
11	20	21	LHS	0.555	RHS	0.732
12	21	22	LHS	0.577	RHS	0.565
13	22	23	LHS	0.719	RHS	0.558
14	23	24	LHS	0.573	RHS	0.507
15	24	25	LHS	0.534	RHS	0.509
16	25	26	LHS	0.550	RHS	0.626
17	26	27	LHS	0.512	RHS	0.601
18	27	28	LHS	0.569	RHS	0.566
19	28	29	LHS	0.567	RHS	0.524
20	29	30	LHS	0.527	RHS	0.515
21	30	31	LHS	0.589	RHS	0.562
22	31	32	LHS	0.590	RHS	0.564
23	32	33	LHS	0.610	RHS	0.573
24	33	34	LHS	0.569	RHS	0.571
25	34	35	LHS	0.572	RHS	0.533
26	35	36	LHS	0.586	RHS	0.539
27	36	37	LHS	0.552	RHS	0.555
28	37	38	LHS	0.515	RHS	0.509
29	38	39	LHS	0.573	RHS	0.611
30	39	40	LHS	0.531	RHS	0.746
31	40	41	LHS	0.516	RHS	0.509

Sr. No.	D. Chainage		Side	Characteristic Deflection (mm)	Side	Characteristic Deflection (mm)
	From	To				
32	41	42	LHS	0.500	RHS	0.508
33	42	43	LHS	0.525	RHS	0.576
34	43	44	LHS	0.506	RHS	0.725
35	44	45	LHS	0.575	RHS	0.603
36	45	46	LHS	0.546	RHS	0.518
37	46	47	LHS	0.538	RHS	0.563
38	47	48	LHS	0.543	RHS	0.602
39	48	49	LHS	0.564	RHS	0.615
40	49	50	LHS	0.580	RHS	0.545
41	50	51	LHS	0.541	RHS	0.547
42	51	52	LHS	0.551	RHS	0.560
43	52	53	LHS	0.539	RHS	0.552
44	53	54	LHS	0.530	RHS	0.587
45	54	55	LHS	0.569	RHS	0.723
46	55	56	LHS	0.587	RHS	0.503
47	56	57	LHS	0.565	RHS	0.532
48	57	58	LHS	0.578	RHS	0.569
49	58	59	LHS	0.527	RHS	0.531
50	59	60	LHS	0.562	RHS	0.527
51	60	61	LHS	0.569	RHS	0.544
52	61	62	LHS	0.620	RHS	0.526
53	62	63	LHS	0.553	RHS	0.541
54	63	64	LHS	0.539	RHS	0.540
55	64	65	LHS	0.529	RHS	0.536
56	65	66	LHS	0.510	RHS	0.522
57	66	67	LHS	0.547	RHS	0.562
58	67	68	LHS	0.525	RHS	0.574
59	68	69	LHS	0.574	RHS	0.588
60	69	70	LHS	0.534	RHS	0.566
61	70	71	LHS	0.557	RHS	0.557
62	71	72	LHS	0.562	RHS	0.569
63	72	73	LHS	0.569	RHS	0.531
64	73	74	LHS	0.556	RHS	0.561
65	74	75	LHS	0.578	RHS	0.541
66	75	76	LHS	0.556	RHS	0.551
67	76	77	LHS	0.537	RHS	0.511
68	77	78	LHS	0.539	RHS	0.509
69	78	79	LHS	0.574	RHS	0.536
70	79	80	LHS	0.512	RHS	0.547
71	80	81	LHS	0.541	RHS	0.515

Sr. No.	D. Chainage		Side	Characteristic Deflection (mm)	Side	Characteristic Deflection (mm)
	From	To				
72	81	82	LHS	0.559	RHS	0.537
73	82	83	LHS	0.563	RHS	0.544
74	83	84	LHS	0.533	RHS	0.551
75	84	85	LHS	0.535	RHS	0.528
76	85	86	LHS	0.540	RHS	0.550
77	86	87	LHS	0.528	RHS	0.531
78	87	88	LHS	0.550	RHS	0.539
79	88	89	LHS	0.556	RHS	0.552
80	89	90	LHS	0.546	RHS	0.543
81	90	91	LHS	0.545	RHS	0.548
82	91	92	LHS	0.551	RHS	0.553
83	92	93	LHS	0.537	RHS	0.554
84	93	94	LHS	0.559	RHS	0.583
85	94	95	LHS	0.527	RHS	0.536
86	95	96	LHS	0.553	RHS	0.560
87	96	97	LHS	0.546	RHS	0.509
88	97	98	LHS	0.566	RHS	0.548
89	98	99	LHS	0.556	RHS	0.520
90	99	100	LHS	0.563	RHS	0.510
91	100	101	LHS	0.528	RHS	0.505
92	101	102	LHS	0.585	RHS	0.565
93	102	103	LHS	0.546	RHS	0.577
94	103	104	LHS	0.558	RHS	0.566
95	104	105	LHS	0.534	RHS	0.550
96	105	106	LHS	0.710	RHS	0.551
97	106	107	LHS	0.512	RHS	0.505
98	107	108	LHS	0.543	RHS	0.567
99	108	109	LHS	0.586	RHS	0.588
100	109	110	LHS	0.575	RHS	0.746
101	110	111	LHS	0.560	RHS	0.553
102	111	112	LHS	0.569	RHS	0.564
103	112	113	LHS	0.564	RHS	0.559
104	113	114	LHS	0.531	RHS	0.591
105	114	115	LHS	0.501	RHS	0.552
106	115	116	LHS	0.550	RHS	0.581
107	116	117	LHS	0.531	RHS	0.594
108	117	118	LHS	0.582	RHS	0.534
109	118	119	LHS	0.588	RHS	0.583
110	119	120	LHS	0.582	RHS	0.539
111	120	121	LHS	0.543	RHS	0.542

Sr. No.	D. Chainage		Side	Characteristic Deflection (mm)	Side	Characteristic Deflection (mm)
	From	To				
112	121	122	LHS	0.549	RHS	0.520
113	122	123	LHS	0.575	RHS	0.567
114	123	124	LHS	0.558	RHS	0.517
115	124	125	LHS	0.562	RHS	0.556
116	125	126	LHS	0.586	RHS	0.550
117	126	127	LHS	0.533	RHS	0.596
118	127	128	LHS	0.556	RHS	0.585
119	128	129	LHS	0.549	RHS	0.559
120	129	130	LHS	0.553	RHS	0.536
121	130	131	LHS	0.558	RHS	0.570
122	131	132	LHS	0.529	RHS	0.585
123	132	133	LHS	0.519	RHS	0.559
124	133	134	LHS	0.558	RHS	0.542
125	134	135	LHS	0.528	RHS	0.580
126	135	136	LHS	0.561	RHS	0.533
127	136	137	LHS	0.557	RHS	0.577
128	137	138	LHS	0.531	RHS	0.508
129	138	139	LHS	0.524	RHS	0.534
130	139	140	LHS	0.560	RHS	0.559
131	140	141	LHS	0.568	RHS	0.593
132	141	142	LHS	0.508	RHS	0.554
133	142	143	LHS	0.507	RHS	0.545
134	143	144	LHS	0.565	RHS	0.543
135	144	145	LHS	0.534	RHS	0.601
136	145	146	LHS	0.539	RHS	0.560
137	146	147	LHS	0.537	RHS	0.579
138	147	148	LHS	0.559	RHS	0.508
139	148	149	LHS	0.604	RHS	0.574
140	149	150	LHS	0.555	RHS	0.592
141	150	150.790	LHS	0.540	RHS	0.531
Average Deflection (mm)				<b>0.554</b>		<b>0.558</b>

As per Schedule-M of the Concession Agreement, wherever the characteristic deflection exceeds 0.8mm, a bituminous overlay shall be provided appropriately designed according to IRC 81-1997. From the above Table, it can be seen that the deflection values are within the acceptable limit. Thus there is no requirement of any overlay as per the BBD test results.

#### 5.4 LATEST ROUGHNESS MEASUREMENT STUDIES

Roughness Measurement by using 5<sup>th</sup> Wheel Bump Integrator is being done by the Concessionaire on regular intervals as mentioned in the O&M Manual. The O&M Manual

specifies that Concessionaire has to ensure that at no point during the Operations Period, the roughness in the road surface shall fall below the prescribed acceptable Roughness Values given in Table M-2 of the Concession Agreement. The Acceptable values and Desirable values of Roughness are 3000mm/km and 2000mm/km (allowable tolerance is +/- 5%) respectively. Also, the surface roughness shall not exceed 1000mm in any 200m length during the service life of the pavement at any time.

The latest Roughness Measurement Report made available to us is for studies done in the month of November 2021 (10.11.2021 to 11.11.2021). The Calibrated Roughness values mm/km for both the carriageways have been represented in **Table 5.2** below.

**Table 5.2: Latest Roughness Measurement Values**

S.N o	Chainage		Calculated UI/Km		S. No	Chainage		Calculated UI/Km	
	From	To	LHS	RHS		From	To	LHS	RHS
1	10	11	1864	1859	72	81	82	1874	1843
2	11	12	1854	1869	73	82	83	1823	1797
3	12	13	1895	1864	74	83	84	1859	1848
4	13	14	1874	1848	75	84	85	1879	1859
5	14	15	1838	1817	76	85	86	1879	1828
6	15	16	1879	1854	77	86	87	1817	1812
7	16	17	1854	1833	78	87	88	1885	1874
8	17	18	1838	1848	79	88	89	1817	1843
9	18	19	1854	1890	80	89	90	1843	1802
10	19	20	1864	1854	81	90	91	1848	1854
11	20	21	1838	1869	82	91	92	1838	1812
12	21	22	1890	1874	83	92	93	1823	1781
13	22	23	1843	1812	84	93	94	1869	1828
14	23	24	1879	1895	85	94	95	1838	1823
15	24	25	1890	1874	86	95	96	1885	1838
16	25	26	1833	1869	87	96	97	1843	1781
17	26	27	1833	1869	88	97	98	1828	1874
18	27	28	1869	1833	89	98	99	1848	1843
19	28	29	1869	1854	90	99	100	1854	1792
20	29	30	1848	1838	91	100	101	1885	1802
21	30	31	1854	1843	92	101	102	1833	1879
22	31	32	1854	1874	93	102	103	1848	1873
23	32	33	1817	1807	94	103	104	1895	1859
24	33	34	1848	1854	95	104	105	1859	1864
25	34	35	1859	1854	96	105	106	1854	1828
26	35	36	1817	1838	97	106	107	1843	1833
27	36	37	1874	1854	98	107	108	1854	1807
28	37	38	1864	1864	99	108	109	1812	1812
29	38	39	1879	1843	100	109	110	1817	1797

S.N o	Chainage		Calculated UI/Km		S. No	Chainage		Calculated UI/Km	
	From	To	LHS	RHS		From	To	LHS	RHS
30	39	40	1843	1854	101	110	111	1864	1864
31	40	41	1864	1864	102	111	112	1812	1802
32	41	42	1843	1859	103	112	113	1895	1812
33	42	43	1885	1838	104	113	114	1833	1817
34	43	44	1859	1854	105	114	115	1833	1843
35	44	45	1859	1848	106	115	116	1848	1817
36	45	46	1854	1843	107	116	117	1833	1807
37	46	47	1854	1838	108	117	118	1859	1833
38	47	48	1874	1833	109	118	119	1838	1838
39	48	49	1874	1854	110	119	120	1828	1823
40	49	50	1817	1854	111	120	121	1848	1823
41	50	51	1890	1812	112	121	122	1843	1848
42	51	52	1833	1874	113	122	123	1864	1833
43	52	53	1843	1900	114	123	124	1859	1859
44	53	54	1869	1864	115	124	125	1843	1833
45	54	55	1869	1859	116	125	126	1874	1879
46	55	56	1869	1854	117	126	127	1838	1843
47	56	57	1823	1854	118	127	128	1848	1797
48	57	58	1833	1812	119	128	129	1864	1843
49	58	59	1859	1869	120	129	130	1838	1854
50	59	60	1869	1802	121	130	131	1833	1843
51	60	61	1854	1874	122	131	132	1879	1833
52	61	62	1905	1885	123	132	133	1854	1817
53	62	63	1859	1864	124	133	134	1869	1854
54	63	64	1874	1838	125	134	135	1854	1916
55	64	65	1854	1859	126	135	136	1838	1864
56	65	66	1843	1828	127	136	137	1859	1854
57	66	67	1828	1817	128	137	138	1859	1874
58	67	68	1848	1900	129	138	139	1838	1854
59	68	69	1869	1843	130	139	140	1838	1874
60	69	70	1864	1854	131	140	141	1838	1869
61	70	71	1859	1823	132	141	142	1817	1848
62	71	72	1838	1854	133	142	143	1885	1885
63	72	73	1869	1807	134	143	144	1854	1848
64	73	74	1854	1833	135	144	145	1838	1859
65	74	75	1869	1838	136	145	146	1812	1854
66	75	76	1864	1807	137	146	147	1833	1802
67	76	77	1848	1812	138	147	148	1843	1848
68	77	78	1838	1859	139	148	149	1838	1848
69	78	79	1854	1817	140	149	150	1848	1812

S.N o	Chainage		Calculated UI/Km		S. No	Chainage		Calculated UI/Km	
	From	To	LHS	RHS		From	To	LHS	RHS
70	79	80	1838	1823	141	150	150.79	1824	1830
71	80	81	1843	1807		<b>Maximum Value</b>		<b>1905</b>	<b>1916</b>
72	81	82	1874	1843		<b>Average Value</b>		<b>1853</b>	<b>1843</b>

As seen from above, the maximum Roughness Values on LHS and RHS carriageway are seen to be 1905mm/km and 1916mm/km respectively which are within the Acceptable Range. The pavement surface on an average is seen to have a Roughness Value of 1853mm/km and 1843mm/km on LHS and RHS respectively which also are within the Acceptable Range. Thus as per the Roughness measurement studies also, no requirement of overlay is suggested.

## 5.5 ASSESSMENT OF TRAFFIC GROWTH RATES

The data pertaining to vehicle passing from start of tolling (2010-11) upto end of December 2021 was furnished to us by the Concessionaire for all the three Toll Plazas. These vehicle passing figures were compiled by us to assess the historical average Growth Rate of different vehicle categories. The traffic passing data of the three plazas was averaged for the assessment of the Growth Rate.

### 5.5.1 COMPARISON OF ACTUAL TRAFFIC VERSUS TRAFFIC CONSIDERED FOR DESIGN

The pavement has been designed for 20 years Design Life for a Design Traffic of 90MSA. Since the data for actual traffic movement on the road since COD is available with the Concessionaire and the same has been provided to us, we have carried out an analysis for working out the Design Life consumed till date. For this analysis, normally expected VDF values have been considered. The results are brought out in the **Table 5.3** below.

**Table 5.3: MSA Calculation for Pavement**

Year	C.P. Year	LCV/ Minibus	Bus	Trucks	MAVs	Total Veh.	No. of Standard Axles	Design Standard Axles	Cum. no. of Std. Axles pass ed	Cum. MSA passed
VDF		1.50	1.00	4.50	4.50					
2010-11 (Start of Traffic)	2.5	770	292	941	1153	3156	3967550	1487831	1487831	1.49
2011-12	3.5	745	296	945	1223	3209	4076868	1528825	3016657	3.02
2012-13	4.5	675	298	858	1109	2940	3709130	1390924	4407580	4.41
2013-14	5.5	728	302	868	1119	3017	3772458	1414672	5822252	5.82
2014-15	6.5	738	340	817	1005	2900	3520790	1320296	7142548	7.14
2015-16	7.5	939	452	913	1243	3547	4220313	1582617	8725165	8.73
2016-17	8.5	1022	486	885	1209	3602	4176330	1566124	10291289	10.29

Year	C.P. Year	LCV/Minibus	Bus	Trucks	MAVs	Total Veh.	No. of Standard Axles	Design Standard Axles	Cumu. no. of Std. Axles passed	Cumu. MSA passed
VDF		1.50	1.00	4.50	4.50					
2017-18	9.5	1086	503	934	1313	3836	4468878	1675829	11967118	11.97
2018-19	10.5	1209	535	924	1374	4042	4631668	1736875	13703993	13.70
2019-20	11.5	1312	567	854	1204	3937	4305540	1614578	15318571	15.32
2020-21	12.5	1702	395	938	1487	4522	5059083	1897156	17215727	17.22
2021-22	13.5	1813	427	947	1502	4688	5171017	1939131	19154858	19.15

For estimation of MSA from year 2021-22 and upto the end of Concession Period (2033-34), we have analysed the cumulative likely MSA in two scenarios by applying a uniform 3% & 5% traffic growth rate on all the vehicle categories from the year 2022-23 till end of Concession Period (2033-34). This analysis has been summarized in **Table 5.4** below.

**Table 5.4: Summary of MSA scenarios**

Scenarios	Traffic from COD to 2021-22		Traffic from 2022-23 upto end of C.P (2033-34)	
	Adopted Growth Rate	Cumulative likely MSA	Adopted Growth Rate	Cumulative likely MSA
Scenario 1	Actual traffic	17.22	3% uniform	46.56
Scenario 2	Actual traffic	17.22	5% uniform	52.50

From the above Table, following inferences can be drawn.

- It is seen that the cumulative MSA of traffic passing since the COD (2010-11) upto the year 2021-22 is only about 17MSA as against the Design Traffic of 90MSA. Even though almost 50% of the Concession Period has been completed, so far only about 19% of the Design MSA has been consumed.
- Even if a standard 5% traffic growth rate is applied uniformly for all vehicles from 2022-23 to end of Concession Period, it is seen that the cumulative traffic at the end of Concession Period is 46MSA only.
- Considering the data of the actual traffic captured from COD till now, the Residual Life of the Pavement is still about 73MSA and so it can be said that there is no requirement of any structural overlay during the balance Concession Period.

## 5.6 PRESENT STATUS OF O&M

### 5.6.1 CONCESSIONAIRE OBLIGATION STATUS

As per the information shared by the Concessionaire, there are adequate numbers of Technical and Non-Technical personnel presently mobilized at site.

- a) The Technical manpower include Project Manager, Senior and Mid-management level Managers, Civil Engineers, Executives for Maintenance, Toll Operation, IT, Accounts, HR & Administration.
- b) The User Services presently mobilized at site include
  - i) Three fully furnished Ambulances and necessary staff including drivers, compounder and helpers.
  - ii) Recovery Vans are available on call.
  - iii) Fire fighting vehicle is available on call.
  - iv) Heavy duty tow-away vehicle / crane is available on call.
- c) The Route Patrol Vehicles (2 nos. Mahindra Scorpio & 3 nos. Hero HF Deluxe motorbikes) are also mobilized and are functional.
- d) Tolling System is functional at the Toll Plazas
- e) Insurances are in place.



Fig 5.1: Ambulance at Toll Plazas

## 5.6.2 CONTRACT FOR ROUTE OPERATION & ROUTINE MAINTENANCE

The Concessionaire has executed a contract with *M/s Feedback Highways OMT Pvt Ltd* for the Toll Collection (including Security and Housekeeping), Route Operations & Incident Management and Routine Maintenance. The Scope of Work under this contract is mentioned in brief below.

- a) Toll operations including security
  - i) Providing manpower for tolling, housekeeping (accounts executive, HR & admin)
  - ii) Managing all incidents on Toll Plaza, VIP lanes
  - iii) Providing and deploying entire tolling security
- b) Route Operations & Incident Management
  - i) Managing all incidents on the Highway and ensuring smooth traffic flow
  - ii) Prevention of all unauthorized works, entries/accesses
  - iii) Removal of all new encroachments
  - iv) Registering of all incidents, filing FIRs if any thefts/burglary on Project Road
- c) Routine Maintenance
  - i) Maintenance of all fixed assets and project assets (Incidence Management Vehicles, JCB Machine, Bucket lift crane/sky life vehicle, Water tanker, DG Sets, ACs)

- ii) Leasing of vehicles for maintenance (Tractor trolley, Water tanker, Maintenance vehicle, Motor bikes, Mechanical broomer) including diesel & petrol.
- iii) Horticulture of median & avenue plantation - weeding and manure including provision of water for horticulture and housekeeping supplies from existing borewell.

### 5.6.3 CONTRACT FOR REPAIR WORK OF STRUCTURES

The Concessionaire had appointed *M/s Sunrise Engineering* for conducting specialized repair work of 21 major structures (each side) of the Project Road. This contract was on BOQ basis the item-wise quantities of which have been got assessed by the Concessionaire in the year 2018. The works specified therein were to be completed in a time period of 3 months with a DLP of 12 months from date of completion of work. These works broadly included repair of expansion joints, cleaning of bearings, repairs on concrete surfaces using epoxy mortar grouting at pre-identified locations including making any necessary temporary diversions (without any bituminous treatment) and all other incidental works.

During our field studies, we observed that the works have been completed by the agency.

### 5.6.4 PRESENT WORK OF PERIODIC MAINTENANCE

The Concessionaire is presently doing the overlay work. As informed by the Concessionaire, in the F.Y 19-20, overlay work in different stretches aggregating to a length of 25.080km and 50.170km on LHS and RHS respectively, was jointly identified with MPRDC and the work was duly completed. Similarly in the F.Y 20-21, the overlay work in different stretches aggregating to a length of 41.612km and 20.396km on LHS and RHS respectively had been completed. The Concessionaire has also done Renewal works under Preventive/Major Maintenance in the present year 2021-22 in a stretch of 85km (29% of total 281.6km of 2-lane length) till Jan 2022. The Concessionaire intends to complete the present cycle of Renewal works on full length of the Project Road by June 2022.

## 5.7 HIGHWAY ENCROACHMENT DETAILS

There is encroachment seen in the Service Roads at Amlaha and Kotri built-up stretches. These encroachments are in the form of parked vehicles, cattle tied with the pedestrian guard rail on the Service Road. Some permanent encroachments like road-side dhabas, Petrol Pumps, etc are also seen but with the support and intervention of Local Administration, some of these have been removed by the Concessionaire. The latest list of locations of encroachments reported removed by the Concessionaire in the MPR of Dec-21 is presented in the **Table 5.5** below.

**Table 5.5: List of encroachments removed**

Encroachment removal Details as on Dec-2021				
S.No.	Side	Km	Encroachment	Type
1	Median	44+450	Unauthorized Median Opening	Removed with JCB

Encroachment removal Details as on Dec-2021				
S.No.	Side	Km	Encroachment	Type
2	Median	45+900	Unauthorized Median Opening	Removed with JCB
3	Median	46+500	Unauthorized Median Opening	Removed with JCB
4	Median	47+400	Unauthorized Median Opening	Removed with JCB
5	Median	52+150	Unauthorized Median Opening	Removed with JCB
6	Median	52+700	Unauthorized Median Opening	Removed with JCB
7	Median	10+100	Political Advt. Flex	Removed
8	LHS	17+750	Advt. posters	Removed
9	LHS	15+800	Property Seller Flex	Removed
10	RHS	132+800	Wire fencing by farmer	Removed
11	LHS	97+200	OFC cable laying at shoulder	Removed
12	RHS	139+200	Shiv Shakti boat club board	Removed
13	RHS	17+400	Property Seller Flex	Removed
14	RHS	16+250	Property Seller Flex	Removed
15	Median	118+900	Advt. board	Removed
16	RHS	110+650	Forest Deptt fencing work	Removed
17	LHS	87+000	Unauthorized tea shop	Removed
18	LHS	87+900	Restaurant Advt. Board	Removed
19	LHS	87+200	Dhaba board	Removed
20	LHS	98+800	Restaurant Advt. Board	Removed
21	Median	116+800	Dhaba flags in median	Removed
22	Median	118+400	Rudra palace board in Median	Removed
23	LHS	57+900	Shoppers material on SR road	Removed
24	Median	44+050	Farmhouse board in median	Removed
25	RHS	25+400	Temp. Fruit Seller	Removed
26	LHS	25+300	Temp. Fruit Seller	Removed
27	RHS	120+650	HDD work at road shoulder	Stopped
28	LHS	25+300	Temp. Fruit Seller	Removed
29	RHS	133+800	Temp. shop on shoulder	Removed
30	Median	115+200	Temple work in Median	Stopped
31	LHS	55+450	Verma Tea stall Advt. board	Removed
32	RHS	41+950	Tea shop on shoulder	Removed
33	LHS	118+600	HDD work at road shoulder	Stopped
34	RHS	117+400	HDD work at road shoulder	Stopped

From the above table, it is seen that majority of the encroachments are in the form of earthen access to the roadside eateries. It is informed by the Concessionaire that the Concessionaire has issued notices and also taken up with the local administration for the removal of such encroachments. Such exercises are carried out by the Concessionaire from time to time.

## 5.8 IDENTIFIED BLACK SPOTS

MPRDC vide their Letter No. 19230 dated 02.08.2019, had communicated to the Concessionaire regarding 29 number of black spots of the years 2016, 2017 & 2018 for the Project Road. MPRDC had sought the pre-improvement and post-improvement photographs for the 29 locations from the Concessionaire. As per the list attached in the Annexure of the said letter, long term improvement measures were required only at one location and the required short term rectification measures (in the form of erection of sign boards and road markings) were completed on 19 locations by the Concessionaire. The updated status in respect of these black spots is to be provided by the Concessionaire.

In the Safety Audit Report dated September 2019 of *M/s G.K Consulting Engineers, Hyderabad*, appointed by the Concessionaire to carry out Safety Audit during O&M stage, 14 accident black spots on the Project Road have been identified on the basis of accident data from May 2016 to Dec 2018. These identified black spots have been presented in **Table 5.6** below.

**Table 5.6: Identified Black Spots**

Accident Black spot Data from May 2016 to December 2018			
Sr. No.	Chainage	Location Details	No. of Accidents
1	133.200	Starting of Curve	20
2	128.800	Bridge on Curve	9
3	140.200	Culvert in Curve Location	8
4	132.400	Straight Road	7
5	137.000	Straight Road	7
6	137.100	Straight Road	7
7	138.800	Straight Road	7
8	137.000	Straight Road	6
9	132.200	Straight Road	5
10	134.000	500m from Toll Plaza	5
11	135.400	300m away from Junction	5
12	137.500	On Curve	5
13	137.800	End of Curve	5
14	28.400	Straight Road	5

It was seen that there were 14 locations identified as accident-prone. From these 14 locations, 11 locations were seen to be between Ch 130+000 to Ch 140+000. Most of these stretches are straight road sections. The Safety Audit Report had suggested rectification remedial measures for these black spots in the form of providing traffic calming measures, providing warning signs, roadway indicators, hazard markers, crash barriers, etc.

Upon review of the MPRs of Oct-21, Nov-21 & Dec-21 of the Concessionaire, it was seen that 31% of the reported accidents took place in the same stretch of Ch 130+000 to Ch 140+000.

Over-speeding was the main reason of accidents. Due to over-speeding, the vehicles were seen skidding and having rear-ended collisions.

It is noted that the recommendations made by the Safety Consultant for the rectification measures has been partially completed by the Concessionaire and the balance work is in progress except the work which requires COS approval from MPRDC.

## **5.9 CONCLUSIONS ON STATUS OF O&M**

- i) From the results of BBD Studies as well as Roughness Measurement studies, it is seen that the performance of the pavement is within acceptable limits. Though the pavement shows signs of distresses like Ravelling and cracking in some small areas, Patchwork is seen at a number of locations. It is expected however, that the Concessionaire shall rectify such damaged areas during the overlay work which is being done presently.
- ii) It is seen than MBCB/guardrail, cat eyes, etc are damaged at some places. Repair works of such items need to be taken up urgently since these are essential from Road Safety considerations.
- iii) For the structures, regular inspections and timely maintenance activity need to be enhanced.
- iv) The Routine Maintenance especially the clearing of ROW and Waterway, etc. needs to be improved.
- v) The operation of the Toll Plazas, Route Patrol Vehicles and Ambulance is found to be acceptable.

## **CHAPTER 6.0: COSTS**

### **6.1 OPERATION & MAINTENANCE COSTS AND FUTURE STRATEGY**

#### **6.1.1 BROAD STRATEGY**

As per Concession Agreement and also mentioned in the O&M Manual approved for the Project, one overlay or renewal with BC is to be carried out at least one in six years and in the last year of Concession Period. Along with functional overlay some rectification of the wearing coat of the structures may be required.

Under Preventive Maintenance, the Concessionaire is already rectifying the existing damages/defects seen during the condition survey. The first Major Maintenance has been carried out in the year 2016-17. Another renewal is being carried out, some portion of which has been completed in the present year 2021-22. As per the Concessionaire, this present cycle of Renewal works is planned to be completed by June 2022.

The Concessionaire has also got done the repair and maintenance works of all the major structures and the culverts.

### **6.2 ASSESSMENT OF O&M COSTS**

The assessment of the O&M costs has been done by considering works pertaining to functional overlay and repair to the minor damages to the road furniture. Rates of MPPWD 2017 SOR have been adopted. A summary of the O&M Cost for the year 2022-23 is furnished in the **Table 6.1** below. The break-up of these costs are presented in sub-paras later.

**Table 6.1: Base O&M and Periodic Maintenance Cost at FY 2023 level which is used for future years with escalation**

S.No	Details	Amount(Rs in Cr.)
1	Periodic Maintenance Costs (for entire length)	76.63
2	Routine Maintenance & Operations Costs	
i)	Operational Expense	14.46
ii)	Routine Maintenance Expense	3.41

Renewal works are being carried out, some portion of which has been completed in the present year 2021-22. As per the Concessionaire, this present cycle of Renewal works is planned to be completed by June 2022.

The future requirements in terms of renewals are envisaged by us as under

2026-27: Renewal to be carried out in 140km 2-lane length.

2027-28: Renewal to be carried out in 140km 2-lane length.

2032-33: Renewal to be carried out in 190km 2-lane length.

2033-34: Renewal to be carried out in 90km 2-lane length.

For the projection of O&M Costs, the strategy presented above is used and the rates of MPPWD SOR 2017 have been escalated by 3.63% per annum. (WPI Growth Rate from 2010 to 2020 is 3.63% on an average). The year on year costs so worked out are brought out in the **Table 6.2** below.

**Table 6.2: Operation& Maintenance Cost Projections at 2022-23 base rate**

S.No	Year	Periodic Maintenance Costs (in Cr.)	Routine Operations and Maintenance Cost (in Cr.)
1	2022-23		17.87
2	2023-24		17.87
3	2024-25		17.87
4	2025-26		17.87
5	2026-27	35.41	17.53
6	2027-28	37.88	17.53
7	2028-29		17.87
8	2029-30		17.87
9	2030-31		17.87
10	2031-32		17.87
11	2032-33	48.06	17.53
12	2033-34	22.97	11.68
		<b>144.31</b>	<b>225.08</b>

### 6.2.1 PERIODIC MAINTENANCE COSTS

Cost for Periodical Renewal has been worked out as per MPPWD 2017 SOR rates and an escalation of 3.63% has been applied over these rates to arrive for rates for the base year (2022-23). The costs worked out are inclusive of GST. The costs have been summarized in the **Table 6.3A to 6.3C** below.

**Table 6.3A: Costs of Periodic Renewal**

Main Carriageway Paved area – Rigid	35,000	Sqm
Main Carriageway Paved area - Flexible	19,94,942	Sqm
Service/ Slip Road - Flexible	46,940	Sqm
Structure Deck Carriageway Area	20,580	Sqm
Major/ Minor Junctions Area - Flexible	80,619	Sqm

**Table 6.3B: Costs of Periodic Renewal**

S. No.	Items	Unit	Quantity for overlay in 2026-27	Quantity for overlay in 2027-28	Quantity for overlay in 2032-33	Quantity for overlay in 2033-34
			140 km <sup>2</sup> lane	140 km <sup>2</sup> lane	190 km <sup>2</sup> lane	90 km <sup>2</sup> lane
1	Functional overlay with 25 mm BC for MCW Junction + Busbay + truck laybye	Cum	25945	25945	35210	16679
2	Functional overlay with 25 mm BC for Service Road + Junctions	Cum	587	587	796	377
3	Tack Coat on BT Layer	Sqm	1061251	1061251	1440269	682232
4	Cats EYE (Studs)	Nos	3750	3750	5089	2411
5	Replacement of W.C on structures 53mm	Sqm	10290	10290	13965	6615
6	Lane Marking	Sqm	9333	9333	12667	6000
7	Median & other Crash Barrier (RE Wall) Painting	Rm	969	969	1315	623
8	New Jersey Crash Barrier painting	Rm	2145	2145	2911	1379
9	Replacement of missing / damaged sign boards	no.	216	216	293	139
10	Construction of rumble strip on side roads	no.	53	53	72	34
11	I-Kerb Painting	Rm	53200	53200	72200	34200

S. No.	Items	Unit	Quantity for overlay in 2026-27	Quantity for overlay in 2027-28	Quantity for overlay in 2032-33	Quantity for overlay in 2033-34
12	Expansion joint (50mm wide strip seal joints)	Rm	405	405	550	260
13	Making good the earthen shoulders	Cum	55787	55787	75711	35863
14	Raising of Kerb	Rm				
15	Retexturing and Grinding (as per Cl 6.3.4.1 of IRC-58-2015) 100%	Sqm		35000		35,000
16	Replacement of PQC Slab ( 1% ) every 5 <sup>th</sup> Year	Cum		105		105
17	Joint sealant replacement every 5 <sup>th</sup> Year ( 5% )	m		1278		1,278
18	Up-gradation of TMS	Lane		24		

Table 6.3C: Costs of Periodic Renewal

S. No.	Items	Unit	Qty for complete length renewal	Rates as per MPPWD SOR 2017	Amount for entire length	Amount for overlay in 2026-27	Amount for overlay in 2027-28	Amount for overlay in 2032-33	Amount for overlay in 2033-34
						140 km 2 lane	140 km 2 lane	190 km 2 lane	90 km 2 lane
1	Functional overlay with 25mm BC for MCW Junction + Busbay + truck laybye	Cum	51889	7655	39,72,10,494	198605247	198605247	269535692	127674802
2	Functional overlay with 25 mm BC for Service Road + Junctions	Cum	1174	7655	89,83,143	4491571	4491571	6095704	2887439
3	Tack Coat on BT Layer	Sqm	2122501	12	2,54,70,012	12735006	12735006	17283223	8186790
4	Cats EYE (Studs)	Nos	7500	545	40,87,500	2043750	2043750	2773661	1313839
5	Replacement of W.C on structures 53mm	Sqm	20580	849	1,74,72,513	8736257	8736257	11856348	5616165

S. No.	Items	Unit	Qty for complete length renewal	Rates as per MPPWD SOR 2017	Amount for entire length	Amount for overlay in 2026-27	Amount for overlay in 2027-28	Amount for overlay in 2032-33	Amount for overlay in 2033-34
6	Lane Marking	Sqm	18667	516	96,32,000	4816000	4816000	6536000	3096000
7	Median & other Crash Barrier (RE Wall) Painting	Rm	1938	58	1,12,425	56212	56212	76288	36137
8	New Jersey Crash Barrier painting	Rm	4290	96	4,11,840	205920	205920	279463	132377
9	Replacement of missing / damaged sign boards	no.	432	4200	18,14,400	907200	907200	1231200	583200
10	Construction of rumble strip on side roads	no.	106	6842	7,25,231	362615	362615	492121	233110
11	I - Kerb Painting	Rm	106400	17	17,61,984	880992	880992	1195632	566352
12	Expansion joint (50mm wide strip seal joints)	Rm	810	10431	84,49,110	4224555	4224555	5733325	2715785
13	Making good the earthen shoulders	Cum	1,11,574	150	1,67,36,160	8368080	8368080	11356680	5379480
14	Raising of Kerb	Rm	1,14,180	211	2,40,91,980				
15	Retexturing and Grinding (as per Cl 6.3.4.1 of IRC-58-2015) 100%	Sqm	35,000	25	8,75,000		875000		875000
16	Replacement of PQC Slab (1%) every 5 <sup>th</sup> Year	Cum	105.000	5,153	5,41,065		541065		541065
17	Joint sealant replacement every 5 <sup>th</sup> Year (5%)	m	1,277.778	27	34,500		34500		34500
18	Up-gradation of TMS	Lane			19200000		19200000		
<b>Total (in Cr.) at 2022-23 rates including up-gradation of TMS</b>					<b>68.32</b>	31.62	33.72	42.91	20.51
<b>Total (in Cr.) including GST charges</b>					<b>76.63</b>	35.41	37.88	48.06	22.97

## 6.2.2 ROUTINE OPERATION & MAINTENANCE COSTS

These costs comprise of two categories - The Routine & Preventive Maintenance and Operational Expenses. Our assessments regarding both of these are presented in the paras below.

### 6.2.2.1 ROUTINE & PREVENTIVE MAINTENANCE

The Routine Maintenance and cleaning have been considered to include broadly three categories.

- A) Routine and Preventive Maintenance
- B) Cleaning of road and other assets, removal of vegetation, cleaning of drains, etc.
- C) Electrical Maintenance

For the purpose of assessing of Routine and Preventive Maintenance, we have assigned weightages on all such works of highways that might need continued attention for repair. Our assessments of these costs are presented in the **Table 6.4A** and **Table 6.4B** below.

**Table 6.4A: Yearly Routine maintenance and Cleaning Costs**

S. No	Activity	Highway Component	Unit	Total Qty	Weightage Assigned	Projected Qty for 12 Months	Rates	Total amount (Rs.)
1	Replacement of Sign Boards (Routine)		Sqm	1872	5%	94	6641	6,21,598
2	Replacement of Cat Eyes		Nos	7500	5%	375	545	2,04,375
3	Repair of MBCB/Guard Rail		Rm	8619	3%	259	3406	8,80,689
4A	Pot Hole Filling (Flexi Pvmt) - MCW		Sqm	1994942	0.05%	997	124	1,23,686
4B	Pot Hole Filling (Flexi Pvmt) - Service Rd		Sqm	46940	0.10%	47	124	5,821
4C	Rigid Pavement Repair		Km			0.70	12000	8,400
4D	Flexi Pavement Repair		Km			140.00	15000	21,00,000
5	Painting on Fixtures	Sign Boards	Nos	1872		1,872	20	37,440
		5th Km	Nos	56	5%	3	238	666
		Km	Nos	226	5%	11	80	904
		HM Stone	Nos	1126	5%	56	21	1,182
		Conc. CB	Rm	1938	5%	97	58	5,621
		NJB	Rm	4290	5%	215	96	20,592
		Railing	Rm	7780	5%	389	32.42	12,611
		Road Mark.	Sqm	52951	20%	10590.25	516	54,64,571
	Kerb stone	Rm	106400	5%	5,320	16.56	88,099	
6A	Replacement of Km Stone		Nos	226	1%	2	1681	3,799
6B	Replacement of Hm Stone		Nos	1126	2%	23	495	11,147
6C	Replacement of 5th Km Stone		Nos	56	0%	-	2791	-

S. No	Activity	Highway Component	Unit	Total Qty	Weightage Assigned	Projected Qty for 12 Months	Rates	Total amount (Rs.)
7	Replacement of Dead Plant	Median	Nos	31968	10%	3,197	570	18,22,176
8	Repair to the Conc. Structure		LS/No /Mth		20%	23	50000	27,60,000
9	Repair of Earthen shoulder		Cum	111574	10%	5,579	150	8,36,808
<b>Total (in Cr.) at 2017 MPPWD SOR rates</b>								<b>1.50</b>
<b>Total (in Cr.) at 2022-23 rates considering 3.63% escalation</b>								<b>1.859</b>
<b>Total per km cost (in Rs.)</b>								<b>1,32,047</b>

**Table 6.4B: Yearly Routine Maintenance and Cleaning Costs**

S. No.	Description	Unit	Quantity	Rates	Total amount
<b>1</b>	<b>Routine and Preventive Maintenance</b>				
i	Repairs of distresses on flexible pavement on approaches and slip road, service road flushing by fine aggregates during monsoon, re-surfacing hungry areas by MSS	Km	140.79	132047 *	18590843
ii	Repair of joint seals, concrete spall and edge breaking, Sealing of minor cracks with epoxy in concrete pavement				
iii	Removal and readjustment of footpath tiles to remove rut and ravel, replacement of damaged tiles				
iv	Repair of median, kerbs, footpath, Sign Boards, Road Markings, etc				
v	Epoxy grouting in cracks in concrete in structure and epoxy coating/painting on damaged concrete portions, cement plaster and/or repair with cement mortar				
vi	Replacement of seals of expansion joints				
vii	Replacement of damaged/stolen sign boards, fixtures such as cats eyes, delineators				
viii	Replacement of damaged electric poles/consumables/high mast lamps/street light				
ix	Landscaping: Grass cutting & pruning of shrubs & trees, watering, applying manure & pesticide				
<b>2</b>	<b>Cleaning of road and other assets, removal of vegetation, cleaning of drains, etc.</b>				
i	Cleaning of Main Carriageway	Km	140.79	64720	9111960
ii	Cleaning of Project Facilities				
iii	Cleaning of Service Road, Junctions, Median Openings, etc				
iv	Cleaning of structures				
v	Cleaning of ROW				
vi	Lined Drain Maintenance				
vii	RCC Drain Maintenance				

S. No.	Description	Unit	Quantity	Rates	Total amount
viii	Transverse Drain Maintenance				
ix	Maintenance of the Toll Plaza				
x	Median plantation maintenance				
<b>3</b>	<b>Potable Drinking Water Maintenance</b>			LS	
	<b>Total (in Rs.)</b>				27702803
	Add 10 % for unforeseen and contingencies				2770280
	<b>Grand Total (in Rs.)</b>				30473083
	<b>Amount (in Cr.) at 2022-23 Rates</b>				<b>3.05</b>
	<b>Total (in Cr.) including GST charges</b>				<b>3.41</b>

\* For the year of Major Maintenance, the Routine Maintenance Cost considered is reduced from Rs. 132047/km to Rs. 112359/km.

#### 6.2.2.2 OPERATIONAL EXPENSES

These generally include the staff salaries, consumables, security expenses, electricity, Incidence Management charges, etc. These costs have been assessed by us in accordance with other projects of similar nature and standard industry practice. These costs are brought out in Table 6.5 below.

**Table 6.5: Costs for Operational Expenses**

S. No	Description	Per Month	Yearly at 2022-23 rates
1	Staff salaries and Other expenses (Feedback Highways OMT expenses as per Contract) + Security expenses	41,59,529	6,18,43,882
2	SPV Staff	24,00,000	2,88,00,000
3	Consumables (like diesel for DG operations, HSD for vehicles, stationary, printers, cartridge, etc)	4,00,000	48,00,000
4	Electricity charges	1,20,000	14,40,000
5	AMC charges for TMS	6,00,000	72,00,000
6	Incidence Management expenses (Ambulance, Crane and Patrolling vehicle) - Only vehicle & fuel	4,22,370	50,68,440
7	Professional Consultancy charges		80,00,000
8	House-keeping and other misc. charges	2,00,000	24,00,000
9	Administration charges		50,00,000
10	Insurance charges		2,00,00,000
		<b>Total (in Rs.)</b>	<b>14,45,52,322</b>
		<b>Total (in Cr.)</b>	<b>14.46</b>

Note: As per the Clause 6.10.3 of the Concession Agreement, the Concessionaire is required to pay a Monitoring Fees to MPRDC @ 1% of annual toll collected for the first ten years from Commencement Date and thereafter 2% from start of 11<sup>th</sup> year to end of 15<sup>th</sup> year and 3% from the 16<sup>th</sup> year till the end of Concession Period.

### **6.3 CONCLUSIONS ON O&M REQUIREMENTS**

The O&M Costs and the OpEx Projections for the Project Road has been worked out taking into consideration the requirements stipulated in the Concession Agreement. The present condition of the road, structure and other assets and the overall maintenance strategy of the Concessionaire, the costs cover all the requirements and there does not appear to be any likelihood of any unforeseen expenditure during the Concession Period.

--- x ---

Date: February 28, 2022

To

**Virescent Infrastructure Investment Manager Private Limited**

10th Floor, Parinee Crescenzo

C- 30 'G' Block

Bandra Kurla Complex

Bandra (East),

Mumbai 400051, Maharashtra, India

Dear Sir,

**Re: Submission of Final Report of Technical due diligence study for the project "Godhra Expressway Private Limited (GEPL)".**

With reference to the captioned matter, we are here with submitting the Final Report of "Technical Diligence for 4 Laning of Godhra - Gujarat/ Madhya Pradesh border Section of NH-59 from km 129.300 to km 215.900 in the State of Gujarat "

Yours faithfully,

For **Samarth Infraengg Technocrats Pvt. Ltd.**

**Authorized Signatory**

Kalva Kiran Kumar



**Technical Diligence for 4 Laning of  
Godhra-Gujarat/ Madhya Pradesh  
border Section of NH-59 from km  
129.300 to km 215.900 in the State of  
Gujarat**

**For Virescent Infrastructure Investment  
Manager Private Limited (For the purpose of  
Highways Infrastructure Trust)**

**FINAL REPORT**

**SAMARTH INFRAENGG Technocrats Private Limited**



**Feb 2022**

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## TABLE OF CONTENTS

1.1	Introduction .....	1
1.2	Project at a Glance .....	11.3
	Objective and Scope of services - for due diligence .....	4
1.3.1	General.....	5
1.3.2	Assessment of Asset Condition.....	5
1.3.3	Investigations to be carried out .....	6
1.3.4	O&M Assessment and Submission of Report.....	6
1.4	Surveys and Investigations .....	6
1.4.1	Road Inventory.....	7
1.4.2	Visual Pavement Condition Surveys .....	12
1.4.3	Roughness surveys .....	14
1.4.4	Subgrade Investigation .....	15
1.4.5	Subgrade Investigations & Laboratory Testing .....	17
1.5	Validation of Executed Works .....	18
1.5.1	Road Works .....	18
1.5.2	Bridge Works .....	53
1.6	Quality Audit .....	56
1.6.1	Embankment & Subgrade .....	56
1.6.2	Pavement Condition .....	57
1.6.3	Roughness.....	57
1.6.4	Pavement Composition .....	58
1.6.5	CD Structures .....	59
1.6.6	Drainage and Slope Protection.....	140
1.6.7	Traffic Safety and Road Furniture .....	140
1.6.8	Road User Facilities.....	141
1.7	Rehabilitation Plans and Designs .....	141
1.7.1	Pavement Rehabilitation and Strengthening.....	141
1.7.2	Structural Rehabilitation.....	141
1.8	Operation and Maintenance .....	141
1.8.1	Introduction .....	141
1.8.2	CA specifications for Major Maintenance .....	141
1.8.3	O&M schedule .....	141
1.9	COST.....	142
1.10	Conclusions .....	146

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**LIST OF TABLES**

---

Table 1: Project Corridor Chainage System .....	2
Table 2: Salient Features of Project Corridor.....	3
Table 3: Pavement Composition .....	17
Table 4: Service Road/Slip Road Locations .....	19
Table 5: Lined Covered Drain Locations .....	19
Table 6: Open Lined Drains.....	20
Table 7: Earthen Drains .....	21
Table 8: Median Chutes .....	22
Table 9: Slope Protection Details .....	25
Table 10: Side Kerb and chute Details .....	31
Table 11: Locations of Median Openings .....	36
Table 12: Details of Solar Blinkers .....	37
Table 13: Median Damaged Locations .....	38
Table 14: Single pole single faced Metal Beam Crash Barrier Locations .....	39
Table 15: Single pole double faced Metal Beam Crash Barrier Locations.....	44
Table 16: Concrete Crash Barrier Locations .....	44
Table 17: Details of Pedestrian Guard Rails.....	46
Table 18: List of Major Junctions .....	47
Table 19: List of Minor Junctions .....	47
Table 20: Locations of High mast Lighting .....	50
Table 21: Locations of Highway Lighting along Main Carriageway .....	50
Table 22: Details of Bus Shelters .....	52
Table 23: Details of CD & Other Structures .....	53
Table 24: Details of Soaked CBR valuses .....	56
Table 25: Summary of Major Structures including COS .....	59
Table 26: Summary of culverts including COS .....	59
Table 27: Abstract of Cost Estimates .....	143
Table 28: Cost Summary Without Escalation (Amount in Crores).....	144

## I. INTRODUCTION

NHAI has awarded the work of Rehabilitation and Upgrading to four lane from km 129.300 to km 215.900 existing 2 lane Highway section of NH-59 between Godhra to Gujarat/Madhya Pradesh Border in the state of Gujarat under NHDP-Phase-III on Design, Build, Finance, Operate, and Transfer (“DBFOT”) Toll basis to the Bidder M/s BSCPL Infrastructure Ltd.,

Consequent to this, M/s BSCPL Infrastructure Ltd. formed a Special Purpose Vehicle (SPV) in the name of BSCPL Godhra Toll ways Ltd., for implementation/execution of the project, registered under the companies act, 1956. The Concession Agreement was signed between NHAI and the SPV, M/s. BSCPL Godhra Toll ways Ltd., on 25.02.2010.

On 23.02.2017, India Infrastructure Fund II (IIF-II) acquired control of 80% stake of M/s Godhra Expressways Pvt. Ltd. (Formerly known as BSCPL Godhra Tollways Ltd.) and balance 20% was acquired on 27.02.2017. Further, on 17.12.2021, Galaxy Investments II Pte. Ltd. acquired control of 100% stakes of M/s Godhra Expressways Pvt. Ltd. from India Infrastructure Fund-II.

The project is presently under operation and maintenance by the Concessionaire Godhra Expressways Pvt. Ltd. (GEPL”). Samarth Infraengg Technocrats Pvt. Ltd. has been engaged as Technical/ Engineering Due Diligence Advisor for Highways Infrastructure Trust purpose.

This report highlights the findings of due diligence study undertaken by consultants on the project

## II. PROJECT AT A GLANCE

- The Project Corridor starts on the outskirts of Godhra town at Km 129.300 and traverses towards Madhya Pradesh Border and ends before the Gujarat/Madhya Pradesh Border Check post at Km 215.900. The Total Project Road length is 87.102 Km and the Project road is having four lane divided carriageway configuration.
- The project corridor has rigid pavement in the entire length, with 7.0m wide carriageway flanked by 1.5m paved shoulder plus 1.5m to 2.0m earthen shoulder on each side except at approaches to grade separators and underpasses.
- In general, the median width is 4.5m all along the project road except at median openings associated with storage lane (median width is 1.5m) and at some of the bridge locations and at underpass locations median width is varying between 4.5m to 12.5m
- The Project Road has four major junctions and these are at Bypass termini points of Piploid, Limkheda and Dahod. Further, the project road has about 81 minor junctions along its length.
- Altogether, the Project road has about Twenty-four (24) Bus shelters on Main Carriageway with Bus Bays and at remaining forty (40) locations it has only bus shelters.
- The Project Road has six Truck lay byes, two each at km 134.400, km 157.800 & km 190.500. These truck lay byes have been provided with rigid Pavement and the condition appears to be good

- The Project Road has one Toll Plaza at km 146.150. Rigid pavement exists in the toll plaza as well as in tapering portions. The condition of toll plaza appears to be good. There are three normal lanes and one extra wide lane in each direction. One more extra lane is observed for 2-wheeler & 3-wheeler on both sides
- Originally the Pavement envisaged was Flexible for main carriageway; however, the Concessionaire changed the pavement type from flexible to Rigid; however, for small portion of about 7.5 km carriageway length is having flexible pavement.
- The Project received LOA on 01.01.2010 and the agreement was signed on 25.02.2010.
- Appointed date was declared on 01.03.2011 and the Project received First Provisional Certificate on 31.10.2013 for a length of 75.0% of project and the Commercial Operation started from 31.10.2013.
- The Project received PCOD-2 on 25.09.2015 for a length of 98.12% of project, (except 1.635 Km approach of Km 171+300 ROB) and the Toll rates were revised for the PCOD-2 and the rates are effective from 30.09.2015.
- Due to delay in Land acquisition at Dahod Kasba, Change of Scope of 4 ROBs and the waiver of maintenance charge issues by the Railway had delayed the project completion. The project was completed 100% and got Final Completion Certificate on 29.06.2016.
- As per CA, the Concession Period for the project is 27 Years from appointment date, subject to extension as per Concession Agreement. Original Concession end date is 28.02.2038 However, IE & NHA PIU has recommended for extension in concession period by 5.4 years based on traffic variation. Accordingly revised end date of concession i.e. 23.07.2043 has been considered for costing purpose.

### III. SALIENT FEATURES

Sl. No.	Particulars	Length/No
1	No of Grade Separated Structures	4Nos. (2 Numbers Flyovers and 2 numbers Over passes)
2	Service Road	19.760 km (Both Sides)
3	ROBs	4Nos.
4	ROB location (chainage)	km 137+083, km 144+827, km 167+324 & km 171+300
5	No of Bypass	3 Nos.
6	Length of Bypass / Realignment	Total Bypass Length - 14.260 km
		Piploid Bypass km 152.030-km 156.450= km 4.420
		Limkheda Bypass km 160.950-km 165.600= km 4.650
		Dahod realignment km 189.430-km 194.620=km 5.190
7	No of Major Bridges	6 Nos.

Sl. No.	Particulars	Length/No
8	No of Minor Bridges	16 Nos.
9	No of Culvert	32 Nos. Box Culvert -98 Nos. Pipe Culvert
10	No of VUP	4Nos.
11	No of PUP/Cattle underpass	13 Nos.
12	No of major intersection/Junction	4 Nos.
13	No of Toll Plaza/	1 No.
14	Location of Toll Plaza chainage)	Km 146+150
15	No of Truck Lay byes	6 Nos
16	No of Bus Bays with Shelter	24 Nos Bus Bays with Shelter & 40 Nos only Shelters
17	No of Wayside Amenities & Rest Rooms	6 (Way Side Amenities) & 6 (Rest Rooms)
18	Location of Wayside Amenities (Chainage)	Km 134.400 (BHS), Km (157.800(BHS) & Km 190.500(BHS)
19	Stone Pitching	8.380 Kms
20	Grouting	0.060 Kms
21	RE Wall	6.670 Kms
22	Green Blanketing	2.840 Kms
23	Partial RE Wall with Embankment	0.570 Kms
24	Partial RE Wall with Stone Pitching	0.690 Kms
25	Partial RE wall with Green Blanketing	1.730 Kms
26	Delineators	136 Nos.
27	RCC Covered Drain	8.840 Kms
28	Lined Drain	3.470 Kms
29	Major Junctions	4 Nos.
30	Minor Junctions	81 Nos.
31	High Mast Lighting	11 Nos.
32	Double Arm Lightning's	349 Nos.
33	Single Arm Lightning's	153 Nos.
34	Median Openings	37 Nos.
35	Median Chutes	3050 Nos.
36	Median Plantation Functional	86.452 Kms

Sl. No.	Particulars	Length/No
37	Metal Beam Crash Barrier	49.560 Kms
38	Concrete Safety barrier	14.890 km
39	Pedestrian Guard Rails	4.226 Kms
40	Solar Blinkers	72 Nos.
41	Road Signs	1439 Nos.

#### IV. IMPORTANT FINDINGS AND CONCLUSION

1. The project road has good pavement condition except very little surface related distress. Predominantly few locations raveling, longitudinal and transverse cracks/ Full depth cracks are noticed at very few locations. At Km 181.800 in LHS direction, Panel repair work is going on, this is the one location where major distress observed in Rigid Pavement along the Project Road.
2. Roughness surveys along corridor indicates that entire Project length is having Roughness values less than 2200mm/Km.
3. Review of Pavement Design Report and As-built drawings indicates that the rigid pavement is design for 40 years design period and the adopted composition is 300mm PQC+150mm DLC+150mm GSB.
4. Test pit surveys indicated average PQC thickness of 297mm, average DLC thickness of 140mm and average thickness of granular layers is 165 mm over subgrade.
5. The subgrade quality of the corridor appears to be good with high CBR above 10% at most of locations.
6. Crack sealing and Epoxy patching has been seen at isolated locations indicating the routine maintenance works are taken care to avoid further cracking and raveling.
7. As of now there is no HTMS but as per Schedule 12.12.1 of IRC: SP: 84-2009 (referred in Annex-1 of D) of CA, HTMS shall be considered when PCU>40,000. Accordingly, the Concessionaire is required to provide HTMS once traffic on project road crosses 40,000 PCU.
8. As informed by the Concessionaire, the project road will reach 40,000 PCU in the year 2030/31 and accordingly the cost of HTMS is considered.
9. As per clause 12.7 of Concession Agreement, after 8<sup>th</sup> Anniversary from COD if Authority Constructs Service Road, the same shall be maintained by Concessionaire.
10. Overall, there are 21 number grade separated structures exist along the project Road. 2 numbers flyovers, 2 numbers Overpasses, 4 numbers Vehicular underpasses and 13 numbers Pedestrian Underpasses.
11. Overall, there 22 Bridges exist along the project road. Six out of Twenty-two are Major bridges and remaining sixteen are Minor bridges.

12. All structures are in good condition expect few, wherever Minor distresses observed; presently Concessionaire carrying out rectification works for the same.
13. There is one toll Plaza along the project Road and all Project Facilities such Traffic aid post, medical aid post and Vehicle rescue posts are located near this Toll Plaza.
14. There are total six lay byes exist, three on each side and 24 number of Bus Bays with shelter and another 40 locations only bus shelter exists. Condition of all these is good.
15. Schedule K of CA species that Roughness values exceeds 2500 mm/km in a length of KM, needs to be corrected within 180 days. But since the pavement type is changed from Flexible to Rigid, subsequently the threshold roughness value is increased from 2500 mm/Km to 3000mm/Km
16. For Flexible Pavement Overlay thickness of 40mm BC is considered on Main carriageway in FY2029, FY2035, FY2043 and apart from this Micro Surfacing of total flexible pavement in Main Carriageway is considered in FY 2040 apart from the regular routine maintenance which is to be done on every year.
17. 25mm BC considered on Service Road Pavement in FY2029, FY2035, FY2043 apart from the regular routine maintenance which is to be done on every year.
18. For Rigid Pavement about 1% of panel repair/replacement and 1% of epoxy patching, 25% of pavement retexturing and 2 to 3 % replacement of joints at every 7<sup>th</sup> Year apart from the regular routine maintenance which is to be done on every year.
19. All the lands required from the Forest department has been acquired and the project has been completed and there is no issue pending regarding this
20. As per IE MPR, there is no Compensation disbursement pending against land acquisition.
21. Demolishing of unauthorized the Government Structures have been completed except Post Office at Saliya (Sant road) at Ch. 141+350, and it is understood that correspondences is being done between NHAI and Superintendent of Post Office, Panchmahal for demolishing this structure and shifting of Temple at Km 129+400 is in progress

**V. COST ABSTRACT**

S. No	FY	Abstract of Cost Without escalation (in Crores)		
		Immediate Repair's Cost +Routine and Operational Cost	Periodic Maintenance Cost	Total Cost
1	2023	13.83	1.02	14.85
2	2024	13.83	-	13.83
3	2025	13.83	-	13.83
4	2026	13.83	-	13.83
5	2027	13.83	-	13.83
6	2028	13.83	-	13.83
7	2029	13.83	18.52	32.34
8	2030	13.83	15.09	28.92
9	2031	13.83	-	13.83
10	2032	13.83	-	13.83
11	2033	13.83	-	13.83
12	2034	13.83	-	13.83
13	2035	13.83	-	13.83
14	2036	13.83	18.52	32.34
15	2037	13.83	10.76	24.59
16	2038	13.83	-	13.83
17	2039	13.83	-	13.83
18	2040	13.83	-	13.83
19	2041	13.83	-	13.83
20	2042	13.83	-	13.83
21	2043	13.83	20.53	34.36
22	2044	4.44	8.71	13.15
	Total:	<b>294.77</b>	<b>93.15</b>	<b>387.92</b>

- Base Cost are arrived for FY2023
- All the material rates are February 2022 Rates
- All labour rates are taken from Central minimum wages (October'2021 cycle) and 2.5% escalation applied on the same to arrive FY2023 Rates
- All the costs are without any Escalation.
- All the Cost presented in the above table are excluding Head Office (HQ) Expenses

# DUEDILIGENCE REPORT

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## 1.1 INTRODUCTION

The Govt. of India (GOI) through Ministry of Shipping, Road Transport & Highways is contemplating to enhance the road capacity and safety for efficient transshipment of goods as well as passenger traffic on the heavily trafficked National Highway sections. GOI has entrusted National Highways Authority of India (NHAI) with the responsibility of augmenting the capacity of highway corridors. NHAI had identified one such corridor to Design, Build, Finance, Operation and Transfer of the Rehabilitation and Upgrading to four lane from km 129.300 to km 215.900 existing 2 lane Highway section of NH-59 between Godhra to Gujarat/Madhya Pradesh Border in the state of Gujarat under NHDP-Phase-III on Design, Build, Finance, Operate, and Transfer (“DBFOT”) Toll Basis.

NHAI has awarded the work of 4 laning of above stretch of highway, Design, Build, Finance, Operate, and Transfer (“DBFOT”) Toll Basis to the Bidder **M/s BSCPL Infrastructure Ltd.**,

Consequent to this, **M/s BSCPL Infrastructure Ltd.** formed a Special Purpose Vehicle (SPV) in the name of **BSCPL Godhra Tollways Ltd.**, for implementation/execution of the project, registered under the companies’ act, 1956. The Concession Agreement was signed between NHAI and the SPV, **M/s. BSCPL Godhra Tollways Ltd.**, on 25.02.2010.

The Project received First Provisional Certificate on 31.10.2013 for a length of 75.0% of project and the Commercial Operation started from 2nd day of November 2013. The Project received PCOD-2 on 25.09.2015 for a length of 98.12% of project, (except 1.635 Km approach of Km 171+300 ROB) and the Toll rates were revised for the PCOD-2 and the rates are effective from 30.09.2015. The Project Road received Final COD on 29.06.2016.

The project is presently under operation and maintenance by concessionaire **GODHRA EXPRESSWAY PRIVATE LIMITED (GEPL)**.

This report highlights the findings of due diligence study undertaken by consultants on the project

## 1.2 PROJECT AT A GLANCE

National Highway 59 connecting Ahmadabad with Indore, is one of the important Highway corridors of the Country. It serves an important link to connect Indore - Ahmedabad important cities with its rich hinterland part of Madhya Pradesh and Gujarat. NH-59 which originates from Ahmadabad and ends at Indore, en route passing through very important cities and towns line Kamba, Kathal, Balasinor Sevaliya, Timba, Godhra, Piplod, Limkheda, Dahod, Katwara, Jhabua, Rajgarh, Dhar and Lebad travelling a distance of 376 Km. through the states of Gujarat (9212 Km) and Madhya Pradesh (154 Km).

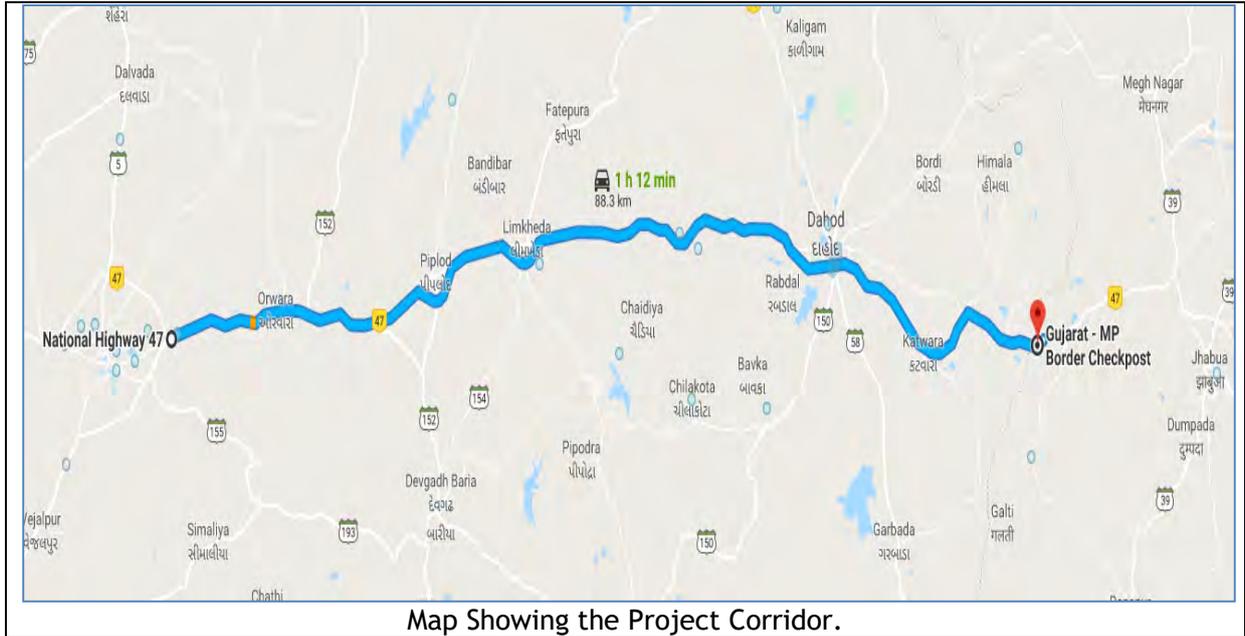


Table 1: Project Corridor Chainage System

Referencing system	Project Corridor Start Point (km)	Project Corridor End Point (km)	Length (km)
Old Chainage	129+300	215+900	86.600
Revised Chainage	127+848	214+950	87.102

The Project Corridor starts on the outskirts of Godhra town and traverses towards Madhya Pradesh Border and ends before the Gujarat/Madhya Pradesh Border Check post. Photograph showing the start and end point of the project road are presented below:



Following Table highlights the total project at a glance:

SI No.	Description	Date
1.	Date of Letter of Award (LOA)	01.01.2010
2.	Date of Signing the Concession Agreement	25.02.2010
3.	Appointment Date	01.03.2011
4.	Scheduled Project completion	26.08.2013
5	Original Concession Period	27 Years from Appointed date
6	Original Concession end date	28.02.2038
7	Extension of Concession period due to variation in Traffic	Another 5.4 Years
8	Revised Concession end date	23.07.2043
9	Date of issue of Provisional Completion Certificate for 75% of project length	31.10.2013
10	Date of issue of Provisional Completion Certificate for 98.12% of project length	25.09.2015
11	Date of Commencement of Commercial Operation	31.10.2013
12	Date of Issue of Final Completion Certificate	29.06.2016

**Table 2: Salient Features of Project Corridor**

SI. No.	Particulars	Length/No
1	No of Grade Separated Structures	4Nos. (2 Nos. Over passes)
2	Service Road	19.760 km (Both Sides)
3	ROBs	4Nos.
4	ROB location (chainage)	km 137+083, km 144+827, km 167+324 & km 171+300
5	No of Bypass	3 Nos.
6	Length of Bypass	Total Bypass Length - 14.260 km
7	No of Major Bridges	6 Nos.
8	No of Minor Bridges	16 Nos.
9	No of Culvert	32 Nos. Box Culvert -98 Nos. Pipe Culvert
10	No of VUP	4 Nos.
11	No of PUP/Cattle underpass	13 Nos.
12	No of major intersection/Junction	4 Nos.
13	No of Toll Plaza	1 No.
14	Location of Toll Plaza (chainage)	Km 146+150
15	No of Truck Lay byes	6 Nos
16	No of Bus Bays with Shelter	24 Nos Bus Bays with Shelter & 40 Nos only Shelters
17	No of Wayside Amenities & Rest Rooms	6 (Way Side Amenities) & 6 (Rest Rooms)
18	Location of Wayside Amenities (Chainage)	Km 134.400 (BHS), Km (157.800(BHS) & Km 190.500(BHS)
19	Stone Pitching	24.355 Kms
20	Grouting	0.060 Kms
21	RE Wall	6.670 Kms

Sl. No.	Particulars	Length/No
22	Green Blanketing	2.840 Kms
23	Partial RE Wall with Embankment	0.570 Kms
24	Partial RE Wall with Stone Pitching	0.690 Kms
25	Partial RE wall with Green Blanketing	1.730 Kms
26	Delineators	136 Nos.
27	RCC Covered Drain	8.840 Kms
28	Lined Drain	3.470 Kms
29	Major Junctions	4 Nos.
30	Minor Junctions	81 Nos.
31	High Mast Lighting	10 Nos.
32	Double Arm Lightning's	349 Nos.
33	Single Arm Lightning's	153 Nos.
34	Median Openings	37 Nos.
35	Median Chutes	3075 Nos.
36	Median Damages	30 Locations
37	Median Plantation Functional	86.452 Kms
38	Metal Beam Crash Barrier	54.853 Kms
39	Concrete Safety barrier	16.000 km
40	Pedestrian Guard Rails	4.226 Kms
41	Solar Blinkers	72 Nos.
42	Km Stones LHS	88 Nos.
43	Hectometer Stone LHS	348 Nos.
44	Km Stones RHS	88 Nos.
45	Hectometer Stone RHS	348 Nos.
46	Road Signs	1439 Nos.

- All the lands required from the Forest department has been acquired and the project has been completed and there is no issue pending regarding this
- As per IE MPR, there is no Compensation disbursement pending against land acquisition.
- Demolishing of unauthorized the Government Structures have been completed except Post Office at Saliya (Sant road) at Ch. 141+350, and it is understood that correspondences is being done between NHAI and Superintendent of Post Office, Panchmahal for demolishing this structure and shifting of Temple at Km 129+400 is in progress

### 1.3 OBJECTIVE AND SCOPE OF SERVICES - FOR DUE DILIGENCE

The main objective of the study is to review the current status of project corridor including details pertaining to its construction and maintenance and to provide requisite technical

information for processing the acquisition of said project by client. Objective of the study can be broadly defined with following tasks:

### 1.3.1 General

- Review of all documents related to Project including but not limited to provisional completion certificates, punch list items completion certificate, clearances, monthly IE reports, important correspondence if any.
- Review of Change of Scope/ other Claims submitted and to be submitted to Authority / IC, comment on the veracity of the same and approval status.
- Highlight any non-compliance of the terms of the CA or O&M manual and IC inspection reports etc.
- Review of any pending issues related to Utility shifting, maintenance etc. in accordance with the Concession Agreement.
- Comment on issues including any balance work that may have a potential impact on the maintenance costs going forward and which may warrant a one-time expense in future.
- In general review the toll plaza systems (incl. AVCC, weigh bridge, sensors, ETC etc.) and the hardware installed therein and comment on the adequacy and level of maintenance of the same to meet the requirements under CA.
- Review of as built drawings.
- Determine the appropriate level and frequency of routine and major maintenance activities required to keep the road assets in good condition and to meet the performance and O&M standards, specifications and requirements.
- Review the major maintenance work undertaken, and prepare projections for future major maintenance expenses (incl. any hand-back requirements), so as to ensure compliance with the terms of CA.
- Review of condition of SPV assets including all equipment and vehicles etc.
- Report on balance acquisition of land if any and possibility of acquisition.
- Report on current encroachments on the project stretch and future expected problems due to the same.

### 1.3.2 Assessment of Asset Condition

- i. Assessment of road assets in conformance with specifications, standards and codes stipulated in CA and O&M manual etc.
- ii. A detailed inventory survey of road assets including main carriageway, structures, service roads, lightings, drains, slope protection works, retaining walls, bus bays, bus shelters, truck lay byes, O&M center, road furniture including signages, MCB, guard rails etc. other safety measures, toll collection infrastructure, buildings, plantation, vehicles and other objects.
- iii. Assessment of condition of the structures including but not limited to visual inspections of bearings, expansion joints, superstructure, substructures, foundations, associated components, pre-stress anchorages (if any), review of geotechnical assumptions,

- perform geotechnical due diligence, review as-built design and assess design assumptions and provide a detailed report thereon.
- iv. Assessment of condition of the road pavement including but not limited to visual inspections of the pavement, review as-built design and assess design assumptions and provide a detailed report thereon.
  - v. Assessment of physical dimensions/ condition of the infrastructure to determine useful lives of the materials and equipment requiring rehabilitation and/or replacement.
  - vi. Recommendations for any major repair/ rehabilitation and strengthening based on the condition survey and design reports.
  - vii. To provide a detail photographic report of the infrastructure assets and its condition to withstand till end of concession period. Suggestion and cost evaluation for any additional repair / rectification / modification required.

### **1.3.3 Investigations to be carried out**

- 1.1. Assessing maintenance needs and its valuation according to the level of deterioration.
- 1.2. Evaluation of overall condition of flexible pavement including PQC/ BT at toll plaza, BC, DBM, Base/Sub base and sub grade and drainage condition survey.
- 1.3. Carry out visual condition survey for rigid (toll plaza) and flexible pavement
- 1.4. Carry out drainage survey to assess any potential future problems which will cause by moisture and runoff.
- 1.5. Assessment of variation/ COS orders on the project, if any, and evaluate their impact on expenditure, time to completion, future O&M obligations and tolling revenue.

### **1.3.4 O&M Assessment and Submission of Report**

- Develop a detailed O&M cost forecast for each year of the concession period and a detailed major maintenance cost forecast along with estimation of costs towards handover requirements.
- Provide comprehensive report by covering all scope of work mentioned herein this Engagement Letter.

## **1.4 SURVEYS AND INVESTIGATIONS**

The main objective of undertaking Surveys and Investigations is to appreciate the existing engineering features along the project corridor and to understand the present condition of the various elements of the project road and to prepare inputs required for various rehabilitation and maintenance strategies.

Following Survey and Investigations have been undertaken as a part of study with an objective to understand the present condition of the road and there by access the quality of construction and as well to prepare requisite rehabilitation/corrective designs where necessary.

- Road Inventory Surveys
- Visual Pavement Condition

- Structure Inventory and Condition Surveys

#### 1.4.1 Road Inventory

The project corridor has rigid pavement in the entire length, with 7.0m wide carriageway flanked by 1.5m paved shoulder plus 1.5m to 2.0m earthen shoulder on each side except at approaches to grade separators and underpasses.

In general, the median width is 4.5m all along the project road except at median openings associated with storage lane (median width is 1.5m) and at some of the bridge locations and at underpass locations median width is varying between 4.5m to 12.5m

The project corridor generally runs in plain to mild rolling terrain. The land use along the project road is mostly Agricultural. It passes through urban settlements like Godhra, Sant road, Piploid, Limkheda and Dahod and also through the small village settlements like Ladpur, Panchela, Jekot, Gamla etc.

In general, road embankments are in the range of 1-1.5m height. Embankments higher than 1.5m are observed mainly in the approaches of CD structures and Underpass locations. Maximum embankment height is observed near ROBs and Underpass locations.

The Project Road has four major junctions and these are at Bypass termini points of Piploid, Limkheda and Dahod. Further, the project road has about 81 minor junctions along its length. Photographs showing the Major Junctions are presented below:



Towards Piploid Town at km 152.050 (junction)



Towards Piploid town at km 156.400 (junction)



Towards Limkheda town at km165.600 (junction)



Towards Dahod town at km 189.450 (junction)

About 10 numbers of High mast lighting is observed along the project road. Four numbers are located at Toll Plaza location, two of them at over pass locations and remaining were at junction locations. Few photos showing High mast lighting are presented below:



High mast lighting on Island at overpass location at km 153.720



High mast lighting on Island at overpass location at km 193+800

Altogether, the Project road has about Twenty-four (24) Bus shelters on Main Carriageway with Bus Bays and at remaining forty (40) locations it has only bus shelters. Few photos taken at the bus shelters and bus bays are presented below:



Bus Shelter near km 131.780, LHS Service Road



Bus Bay with shelter near km 160.080, LHS Main Carriageway



Bus bay with shelter near km 166.600, RHS Main Carriage way

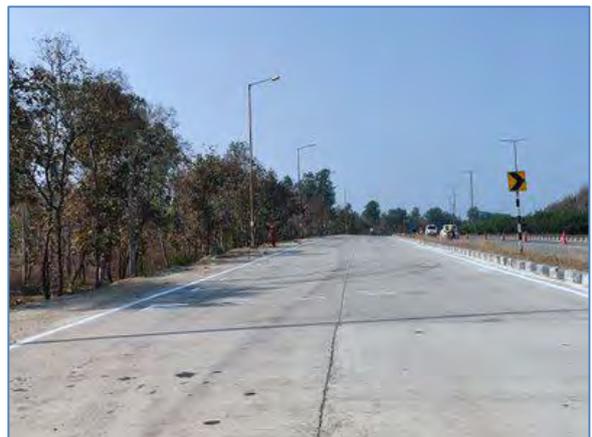


Bus shelter near km 201.400, RHS Main Carriage way

The Project Road has six Truck lay byes, two each at km 134.400, km 157.800 & km 190.500. These truck lay byes have been provided with rigid Pavement and the condition appears to be good. Few photos depicting the truck lay bye portion are presented below:



Truck Lay bye on LHS km 134.400



Truck Lay bye on RHS km 134.400



Truck Lay bye on LHS km 157.800



Toilet Block and Rest Room at Truck Lay bye on RHS km 157.800



Truck Lay bye on LHS km 190.500



Rest Room at Truck Lay bye on RHS km 190.500

Toilet blocks and rest rooms have been provided at all truck lay bye location. Separator is provided between main carriageway and Truck lay bye portion. Lighting in the form of single arm poles have been provided on the separator and outer edge of the truck lay bye. On each side, 10 single arm lights are observed and almost all are found to be in good condition.

The Project Road has one Toll Plaza at km 146.150. Rigid pavement exists in the toll plaza as well as in tapering portions. The condition of toll plaza appears to be good. There are three normal lanes and one extra wide lane in each direction. One more extra lane is observed for 2-wheeler & 3-wheeler on both sides. 4 numbers of High mast lighting has been provided at Toll plaza location and on the approach to Toll plaza, double arm lighting has been provided on median.

Few photos taken at toll plaza location are presented below:



Toll Plaza near km 146.150

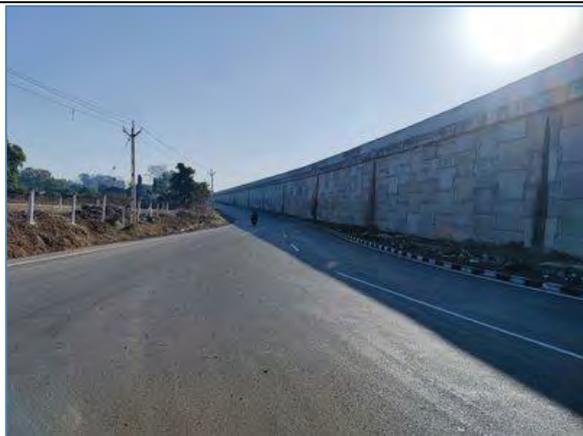


Static Weigh bridge



Admin Building

Service road/slip roads have been observed at underpass locations and at few village locations. Few photos depicting the service road pavement surface type, condition and the other associated features like covered drain, pedestrian guard railing are presented below.



Service Road @ km 128.030 to km 128.800-LHS\_7m wide



Service Road @ km 131.610 to km 132.090 LHS\_7.5m wide



Service Road @ km 143.440 to km 144.260-  
LHS\_5.5m wide



Service Road @ km 151.700 to km 152.400-LHS\_7m  
wide



Service Road @ km 153.520 to km 153.620-  
LHS\_5.5m wide



Service Road @ km 162.340 to km 163.200-  
RHS\_7m wide



Service Road @ km 173.600 to km 174.210-  
LHS\_7.5m wide



Service Road @ km 194.010 to km 194.300-  
LHS\_5.5m wide

#### 1.4.2 Visual Pavement Condition Surveys

Rigid pavement condition along the project road appears to be fair to good in most of the sections and the riding quality is good. Longitudinal and transverse cracks and full depth cracks are noticed at some isolated locations. Surface of rigid pavement appears to ravel with loss of

texture. Exposure of aggregates and loss of fines are noticed at some locations. Majority of joints appear to be intact with very few failures. Pop outs and potholes mainly seen at locations where severe ravelling is seen. The condition of Flexible pavement provided on the approaches of the underpasses appears to be good and the riding quality is satisfactory.

		
Good Condition @ km 128.350, LHS	Cracking @ km 136.550, LHS	Good Condition at Pavement surface @ km 138.800, LHS
		
Good Condition @ km 151.800, LHS	Raveling @ km 156.050, LHS	Good Condition @ km 162.900, LHS
		
Cracking at @ km 169.970, LHS	Cracking Cum Raveling @ km 178.100, LHS	Repair of Cracks done @ km 181.800, LHS
		
Level difference b/w lanes @ km 182.350, RHS	Repair of Cracks done @ km 189.600, RHS	Good Condition @ km 194.100, LHS

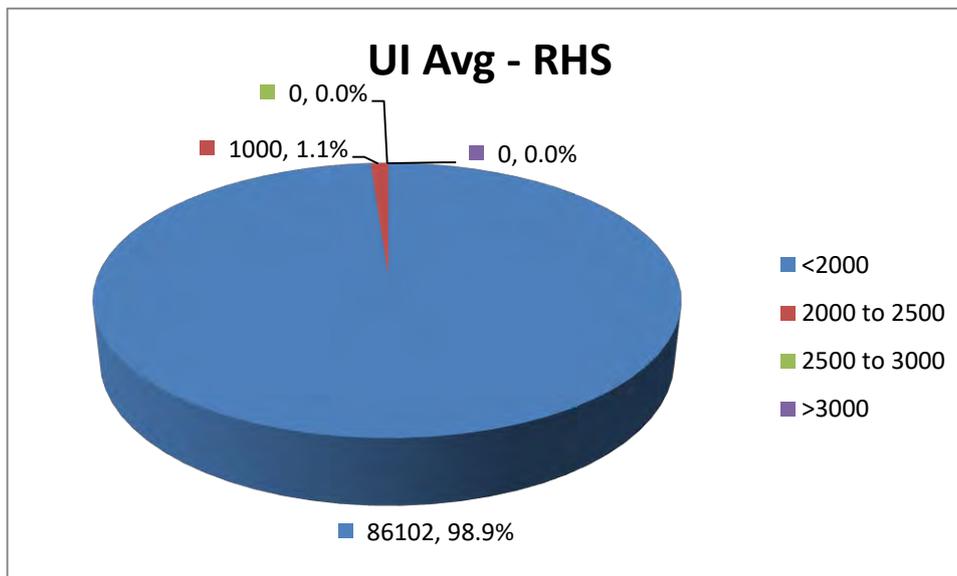
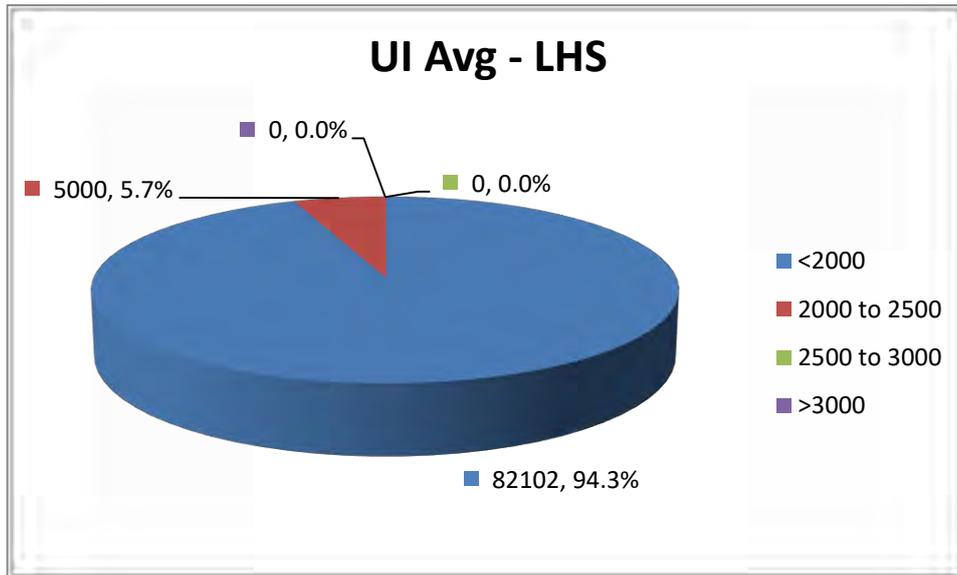


### 1.4.3 Roughness surveys

Roughness Report Received from Company indicates that the Roughness data has been collected using Vehicle mounted Roughness Measuring Device (CMBI-21) in the first week of January 2021. The Data has been analyzed in terms of International Roughness Index (IRI), separately for each lane, for both direction of travel.

As per IRCP:16-2004, Rigid pavement is surface is considered to be good when its UI value is less than 2000 mm/km and the same is considered to be average for UI values between 2000 and 3000 mm/km whilst the surface is treated as Poor for UI values greater than 3000 mm/km.

Average UI values along the corridor were grouped in to four categories, Pie chart showing the range of UI values in each carriageway of the project road have been presented below:



It can be seen from the above pie charts, that about 94.3% & 98.9% length of the Project Road has good riding quality (UI<2000 mm/km) in LHS carriageway and RHS carriageway respectively.

#### 1.4.4 Subgrade Investigation

The composition of the existing pavement crust has been noted from test pit surveys. Test pits have been undertaken at an interval of 10.0 km in each carriageway along the project road. Thus, a total of 20 pits have been dug along the corridor and the data on composition of pavement has been noted. Eighteen out of 20 pits done on Main Carriageway edge and remaining test pits done on Service Road edge. Few sample photos taken are presented below:



km 130.000 LHS (GMP-TP-1)



km 155.400 RHS (GMP-TP-6)



km 134.950 RHS (GMP-TP-2)



km 174.400 RHS (GMP-TP-10)



km 143.200 RHS (GMP-TP-4)



km 190.000 LHS (GMP-TP-13)



km 205.200 RHS (GMP-TP-16)



km 205.200 RHS (GMP-TP-16)

Results of the test pit survey showing average thickness of pavement layers are presented in the Table below.

**Table 3: Pavement Composition**

Sl. No	Test Pit Number	Existing Chainage	Direction	PQC	DLC	GSB	Total
1	GMP-TP-1	130+000	LHS	300	180	120	600
2	GMP-TP-2	134+950	RHS	290	100	200	590
3	GMP-TP-3	139+400	LHS	300	150	150	600
4	GMP-TP-4	143+200	RHS	310	150	150	610
5	GMP-TP-5	150+000	LHS	300	120	180	600
6	GMP-TP-6	155+400	RHS	280	150	150	580
7	GMP-TP-7	159+800	LHS	320	150	150	620
8	GMP-TP-8	165+150	RHS	300	150	150	600
9	GMP-TP-9	170+000	LHS	300	150	150	600
10	GMP-TP-10	174+400	RHS	270	150	150	570
11	GMP-TP-11	179+800	LHS	320	130	150	600
12	GMP-TP-12	185+400	RHS	270	140	200	610
13	GMP-TP-13	190+000	LHS	280	150	200	630
14	GMP-TP-14	194+600	RHS	320	100	130	550
15	GMP-TP-15	200+000	LHS	320	150	150	620
16	GMP-TP-16	205+200	RHS	270	100	300	670
17	GMP-TP-17	210+300	LHS	320	150	150	620
18	GMP-TP-18	214+900	RHS	270	150	170	600

Sl. No	Test Pit Number	Existing Chainage	Direction	BT	WMM	GSB	Total
19	GMP-SR-TP-19	140+800	LHS	80	180	150	410
20	GMP-SR-TP-20	173+560	RHS	70	150	150	370

Total average crust thickness of the MCW pavement is 604mm. The average thickness of PQC layer is 297 mm. Pavement is mainly composed of a PQC layer, DLC& GSB base over subgrade.

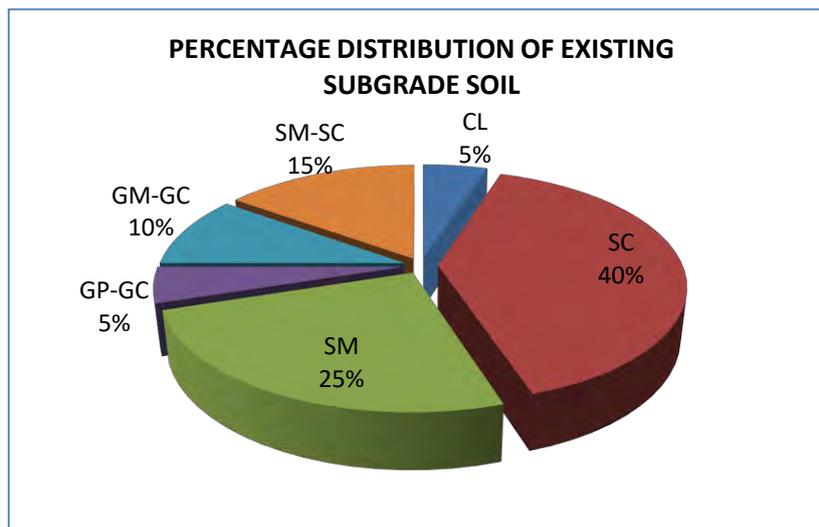
#### 1.4.5 Subgrade Investigations & Laboratory Testing

Sub-grade Investigations have been carried out to examine the subgrade soil characteristics along the project road. A total number of 20 Test pits have been carefully dug from the pavement surface up to sub-grade level. Eighteen out of 20 pits done on Main Carriageway edge and remaining two test pits done on Service Road edge. Field density tests have been conducted for subgrade samples and a small quantity of sample has also been collected in airtight containers for determining the field moisture content. Upon completion of the field density test, representative sample of sub-grade soil has been collected in bulk, in gunny bags, from each test pit for laboratory testing.

The soil samples collected have been tested for the following properties to assess the existing sub-grade soil properties.

- Sieve analysis
- Atterberg limits
- Heavy compaction
- Four (4) days soaked CBR as per IS standards at 97% of MDD as applicable for sub-grade (Heavy Compaction)
- Free swelling index

Soil classification has been done according to IS Classification of Soils (ISC) as detailed in IS 1498 - 1970. Laboratory test results indicate that all the Subgrade soil samples collected belongs to Coarse Grained Soil. Pie Chart showing the percentage distribution of soil classification of existing subgrade sample is presented below:



## 1.5 VALIDATION OF EXECUTED WORKS

The project road has been closely inspected to verify the executed works on ground vis-à-vis the scope envisaged in CA. The as-built drawings made available have been studied in detail before examining them on ground. Each and every structure has been inspected to note down its structural configuration and condition. The following works highlight the findings on executed works on ground.

### 1.5.1 Road Works

The project corridor appears to have been constructed with the cross-sectional elements matching to those given in CA TCS drawings. The carriageway width of 7.0 plus paved shoulders of 1.5m and a shyness of 0.25m has been provided over the entire length except at structures. Earthen shoulders of 1.5m on either side of carriageway have also been provided.

Service roads/Slip roads are constructed to a width as shown in TCS. Location of service roads and slip roads as constructed are as below:

**Table 4: Service Road/Slip Road Locations**

Service/Slip Road Details Both Sides									
S.No.	Chainage (Including Taper)		Chainage (Excluding taper)		Side	Pavement Type	As Per Site	Width (m)	Remarks
	From (km)	To (km)	From (km)	To (km)					
1	127.97	128.95	128.03	128.8	LHS	Flexible	0.98	7	
2	131.55	132.17	131.61	132.09	LHS	Flexible	0.62	7.5	
3	136.9	137.45	137	137.34	LHS	Flexible	0.55	7.5	
4	138.6	139.3	138.71	139.16	LHS	Flexible	0.7	7.5	
5	140.7	141.8	140.78	141.78	LHS	Flexible	1.1	7.5	
6	143.3	144.2	143.44	144.15	LHS	Flexible	0.9	5.5	
7	151.5	151.95	151.7	151.9	LHS	Flexible	0.45	7.5	
8	153.65	153.62	153.65	153.62	LHS	Flexible	0.5	5.5	Over pass location
9	153.76	153.9	153.76	153.9	LHS	Flexible	0.8	5.5	Over pass location
10	160.5	160.9	160.61	160.85	LHS	Flexible	0.4	7.2	
11	162.3	163.3	162.34	163.2	LHS	Flexible	1	7	
12	173.5	174.33	173.6	174.21	LHS	Flexible	0.83	7.5	
13	194.01	194.1	194.01	194.1	LHS	Flexible	0.5	5.5	Over pass location
14	194.15	194.3	194.15	194.3	LHS	Flexible	0.45	5.5	Over pass location
15	128.55	128.95	128.55	128.82	RHS	Flexible	0.4	7	
16	131.5	132.65	131.58	132.38	RHS	Flexible	1.15	7.5	
17	138.6	139.3	138.71	139.16	RHS	Flexible	0.7	7.5	
18	143.3	144.2	143.44	144.1	RHS	Flexible	0.9	5.5	
19	146.6	147.7	146.68	147.66	RHS	Flexible	1.1	7	
20	151.6	152.45	151.7	152.4	RHS	Flexible	0.85	7	
21	153.52	153.62	153.52	153.62	RHS	Flexible	0.8	5.5	Over pass location
22	153.76	153.9	153.76	153.9	RHS	Flexible	0.5	5.5	Over pass location
23	160.5	161.3	160.61	161.25	RHS	Flexible	0.8	7	
24	162.3	163.3	162.34	163.2	RHS	Flexible	1	7	
25	173.5	174.33	173.6	174.21	RHS	Flexible	0.83	7.5	
26	194.01	194.1	194.01	194.1	RHS	Flexible	0.45	5.5	Over pass location
27	194.15	194.3	194.15	194.3	RHS	Flexible	0.5	5.5	Over pass location
<b>As per Site Total Length of Service/Slip Road (Km)</b>							<b>19.76</b>		

Lined Covered drains exist at service road and truck lay bye locations along the project road. Cleaning of gratings is required for flow of surface water from service road to drain. The locations of Line covered drains are presented in the Table below:

**Table 5: Lined Covered Drain Locations**

S.No	Chainage		Side	Length	Condition	Remarks
	From	To				
1	131.600	132.000	LHS	0.400	Good	RCC Cum Footpath Drain on SR
2	131.600	132.400	RHS	0.800	Good	RCC Cum Footpath Drain on SR
3	134.250	134.450	LHS	0.200	Good	RCC Cum Footpath Drain on Truck lay bye (TLB)
4	134.250	134.450	RHS	0.200	Good	RCC Cum Footpath Drain on TLB
5	138.650	139.050	LHS	0.400	Good	RCC Cum Footpath Drain on SR
6	138.670	139.150	RHS	0.480	Good	RCC Cum Footpath Drain on SR
7	139.100	139.250	LHS	0.150	Good	RCC Cum Footpath Drain on SR
8	143.400	144.150	RHS	0.750	Good	RCC Cum Footpath Drain on SR
9	143.560	144.100	LHS	0.540	Good	RCC Cum Footpath Drain on SR
10	153.570		LHS	0.500	Good	RCC Cum Footpath Drain on SR
11	153.800		LHS	0.500	Good	RCC Cum Footpath Drain on SR
12	158.700	158.900	LHS	0.200	Good	RCC Cum Footpath Drain on TLB
13	158.700	158.900	RHS	0.200	Good	RCC Cum Footpath Drain on TLB
14	160.600	160.900	RHS	0.300	Good	RCC Cum Footpath Drain on SR
15	173.600	174.200	LHS	0.600	Good	RCC Cum Footpath Drain on SR
16	173.600	174.220	RHS	0.620	Good	RCC Cum Footpath Drain on SR
17	193.980		LHS	0.500	Fair to Poor	RCC Cum Footpath Drain on SR
18	193.980		RHS	0.500	Good	RCC Cum Footpath Drain on SR
19	194.080		LHS	0.500	Good	RCC Cum Footpath Drain on SR
20	194.080		RHS	0.500	Good	RCC Cum Footpath Drain on SR
<b>Total Length of RCC covered Drain(km)</b>				8.840		

Open lined drains of trapezoidal shape exist at few locations and toe drains are also presented above the partial RE wall at approach locations and are as listed in Table below:

**Table 6: Open Lined Drains**

S. No	Chainage		Side	Length	Condition	Remarks
	From	To				
1	128.150	128.350	LHS	0.2	Good	Trapezoidal open lined drain
2	136.200	136.800	RHS	0.6	Good	open lined Drain at top of RE Wall
3	136.500	136.800	LHS	0.3	Good	open lined Drain at top of RE Wall
4	144.300	144.500	LHS	0.2	Good	open lined Drain at top of RE Wall
5	144.300	144.400	RHS	0.1	Good	open lined Drain at top of RE Wall
6	144.600	145.100	LHS	0.5	Good	open lined Drain at top of RE Wall
7	144.620	145.100	RHS	0.48	Good	open lined Drain at top of RE Wall
8	160.650	160.800	RHS	0.15	Good	open lined Drain at top of RE Wall
9	160.800	161.100	RHS	0.3	Good	Trapezoidal open lined drain
10	161.200	161.300	RHS	0.1	Good	open lined Drain at top of RE Wall
11	170.780	171.000	LHS	0.22	Good	open lined Drain at top of RE Wall

S. No	Chainage		Side	Length	Condition	Remarks
	From	To				
12	170.800	171.000	RHS	0.2	Good	open lined Drain at top of RE Wall
13	171.080	171.140	LHS	0.06	Good	open lined Drain at top of RE Wall
14	171.080	171.140	RHS	0.06	Good	open lined Drain at top of RE Wall
Total Length of Open lined Drain(km)				3.470		

Unlined drains exist at the main carriage way edge and these are in good condition. Maintenance needs to be required for these unlined drains. Earthen drains are listed below:

**Table 7: Earthen Drains**

S.no	Chainage		Side	Length (m)	Remarks
	From	To			
1	128.620	131.120	RHS	2500.000	Earthen Drain
2	128.650	131.145	LHS	2495.000	Earthen Drain
3	131.120	131.532	RHS	412.000	STONE PITCHING
4	131.145	131.410	LHS	265.000	STONE PITCHING TREPIZOIDAL
5	131.410	131.865	LHS	455.000	Earthen Drain
6	131.532	131.865	RHS	333.000	Earthen Drain
7	132.295	133.050	LHS	755.000	Earthen Drain
8	132.650	133.830	RHS	1180.000	STONE PITCHING
9	133.050	133.830	LHS	780.000	STONE PITCHING TREPIZOIDAL
10	133.830	134.040	LHS	210.000	Earthen Drain
11	133.830	134.020	RHS	190.000	Earthen Drain
12	134.020	134.990	RHS	970.000	STONE PITCHING
13	134.040	134.583	LHS	543.000	STONE PITCHING TREPIZOIDAL
14	134.683	136.780	LHS	2097.000	Earthen Drain
15	134.990	136.493	RHS	1503.000	Earthen Drain
16	137.046	137.140	RHS	94.000	Earthen Drain
17	137.400	138.970	RHS	1570.000	Earthen Drain
18	137.610	138.970	LHS	1360.000	Earthen Drain
19	139.420	141.000	LHS	1580.000	Earthen Drain
20	139.420	141.000	RHS	1580.000	Earthen Drain
21	142.000	142.398	LHS	398.000	STONE PITCHING TREPIZOIDAL
22	142.140	142.400	RHS	260.000	STONE PITCHING TREPIZOIDAL
23	142.398	143.700	LHS	1302.000	Earthen Drain
24	142.400	143.700	RHS	1300.000	Earthen Drain
25	144.700	144.950	LHS	250.000	Earthen Drain
26	144.700	144.900	RHS	200.000	Earthen Drain
27	145.500	146.200	LHS	700.000	Earthen Drain
28	145.700	146.010	RHS	310.000	Earthen Drain
29	148.040	158.050	RHS	10010.000	Earthen Drain
30	148.100	153.750	LHS	5650.000	Earthen Drain
31	154.250	158.050	LHS	3800.000	Earthen Drain
32	158.160	160.650	LHS	2490.000	Earthen Drain

S.no	Chainage		Side	Length (m)	Remarks
	From	To			
33	158.160	160.900	RHS	2740.000	Earthen Drain
34	160.650	160.900	LHS	250.000	TREPIZOIDAL CEMENT DRAIN B/W SR
35	160.900	166.400	LHS	5500.000	Earthen Drain
36	161.435	166.400	RHS	4965.000	Earthen Drain
37	167.900	171.050	LHS	3150.000	Earthen Drain
38	167.900	171.000	RHS	3100.000	Earthen Drain
39	171.229	171.331	RHS	102.000	Earthen Drain
40	171.430	173.850	RHS	2420.000	Earthen Drain
41	171.460	173.850	LHS	2390.000	Earthen Drain
42	174.465	193.980	LHS	19515.000	Earthen Drain
43	174.465	193.980	RHS	19515.000	Earthen Drain
44	194.230	199.530	LHS	5300.000	Earthen Drain
45	194.230	199.530	RHS	5300.000	Earthen Drain
46	199.530	199.950	LHS	420.000	STONE PITCHING TREPIZOIDAL
47	199.530	200.850	RHS	1320.000	Earthen Drain
48	199.950	202.900	LHS	2950.000	Earthen Drain
49	200.850	215.217	RHS	14367.000	Earthen Drain
50	202.900	203.550	LHS	650.000	STONE PITCHING TREPIZOIDAL
51	203.550	215.217	LHS	11667.000	Earthen Drain
<b>Total Length</b>				<b>153163.000</b>	

On curved sections with super-elevation, Chutes provided in the median portion. The locations and no. of cuts in median are presented in table below:

**Table 8: Median Chutes**

Details of Median Chutes					
Sr. No.	From	To	Length	No. of Cuts	Remarks
1	128.000	128.600	0.600	45	
2	130.420	130.540	0.120	18	
3	131.040	131.160	0.120	13	
4	131.350	131.500	0.150	16	
5	132.050	132.560	0.510	55	
6	133.200	134.000	0.800	71	
7	134.050	134.200	0.150	13	
8	134.650	134.900	0.250	22	
9	136.030	136.600	0.570	46	
10	136.970	137.000	0.030	3	

Details of Median Chutes					
Sr. No.	From	To	Length	No. of Cuts	Remarks
11	137.000	137.680	0.680	60	
12	139.200	139.450	0.250	14	
13	140.380	140.670	0.290	21	
14	141.960	142.000	0.040	6	
15	142.000	142.500	0.500	49	
16	144.040	144.420	0.380	60	
17	145.000	145.250	0.250	22	
18	145.450	145.550	0.100	13	
19	146.500	146.800	0.300	31	
20	148.150	149.000	0.850	80	
21	149.000	149.350	0.350	31	
22	150.030	150.150	0.120	11	
23	151.940	152.000	0.060	7	
24	152.020	152.350	0.330	31	
25	153.650	154.000	0.350	44	
26	154.000	154.260	0.260	29	
27	154.400	154.630	0.230	29	
28	155.980	156.000	0.020	5	
29	156.000	156.380	0.380	34	
30	156.500	156.760	0.260	26	
31	157.350	157.560	0.210	26	
32	160.930	161.000	0.070	6	
33	161.000	161.200	0.200	10	
34	162.860	162.930	0.070	8	
35	163.070	163.250	0.180	27	
36	163.800	164.000	0.200	31	
37	164.000	164.110	0.110	12	
38	164.400	165.000	0.600	48	
39	165.000	165.600	0.600	63	
40	168.000	168.180	0.180	17	
41	168.440	168.600	0.160	16	
42	170.680	171.000	0.320	22	
43	171.200	171.350	0.150	19	
44	171.700	172.000	0.300	40	
45	172.000	172.230	0.230	19	
46	173.200	173.500	0.300	27	
47	174.100	174.300	0.200	28	

Details of Median Chutes					
Sr. No.	From	To	Length	No. of Cuts	Remarks
48	174.560	174.860	0.300	40	
49	175.050	175.400	0.350	38	
50	176.200	176.560	0.360	38	
51	176.700	177.000	0.300	36	
52	177.000	177.100	0.100	15	
53	177.900	178.000	0.100	15	
54	178.000	178.260	0.260	27	
55	178.700	178.780	0.080	10	
56	178.810	179.000	0.190	20	
57	179.000	179.200	0.200	19	
58	180.030	180.360	0.330	30	
59	180.780	181.000	0.220	22	
60	181.000	181.130	0.130	15	
61	181.610	182.000	0.390	41	
62	182.000	182.200	0.200	26	
63	182.820	183.000	0.180	19	
64	183.000	183.760	0.760	87	
65	184.500	185.000	0.500	49	
66	185.000	185.030	0.030	8	
67	185.180	185.360	0.180	24	
68	186.800	187.000	0.200	20	
69	187.000	187.250	0.250	26	
70	188.400	188.640	0.240	28	
71	188.700	188.000	-0.700	33	
72	189.000	189.030	0.030	3	
73	189.610	189.650	0.040	4	
74	189.700	189.920	0.220	23	
75	191.200	191.400	0.200	24	
76	191.200	191.400	0.200	25	
77	191.600	191.660	0.060	10	
78	194.620	194.680	0.060	6	
79	194.700	194.800	0.100	16	
80	195.820	196.000	0.180	31	
81	196.000	196.200	0.200	18	
82	196.500	196.700	0.200	26	
83	196.900	197.000	0.100	14	
84	197.000	197.230	0.230	26	

Details of Median Chutes					
Sr. No.	From	To	Length	No. of Cuts	Remarks
85	197.900	198.000	0.100	11	
86	198.300	198.400	0.100	12	
87	198.800	199.000	0.200	23	
88	199.000	199.800	0.800	64	
89	200.550	200.850	0.300	25	
90	200.900	201.000	0.100	16	
91	201.000	201.880	0.880	76	
92	202.930	203.000	0.070	11	
93	203.000	203.200	0.200	22	
94	204.400	204.700	0.300	37	
95	204.800	205.000	0.200	25	
96	205.000	205.100	0.100	8	
97	205.200	205.700	0.500	52	
98	205.930	206.000	0.070	22	
99	206.000	206.800	0.800	98	
100	207.000	207.980	0.980	96	
101	208.300	209.000	0.700	74	
102	209.130	209.360	0.230	25	
103	210.450	210.730	0.280	39	
104	211.720	212.000	0.280	35	
105	213.000	213.230	0.230	30	
106	213.600	213.900	0.300	27	
107	214.800	214.880	0.080	11	
<b>Total</b>			<b>28.150</b>	<b>3075</b>	

Stone Pitching is found in approaches of some of the Grade-Separators/ROB/Major Bridges along the Project. Side kerb and chutes are also observed in the approaches whereas the dissipation chambers are covered with garbage and soil. Slope Protection details and side kerb details are listed in the tables below.

**Table 9: Slope Protection Details**

S. no	Chainage (km)		Length	Side	Embankment	Green Blanking	Stone Pitching	RE wall	Partial RE Wall	Grouting	Condition	Remarks
	From	To										
1	128.05	128.35	0.300	LHS	Yes	Yes	No	No	No	No	Poor	
2	128.4	128.75	0.350	LHS	No	No	No	Yes	No	No	Good	
3	128.4	128.75	0.350	RHS	No	No	No	Yes	No	No	Good	
4	131.12	131.3	0.180	LHS	Yes	Yes	No	No	No	No	Good	
5	131.32	131.42	0.100	LHS	Yes	Yes	No	No	No	No	Good	

S. no	Chainage (km)		Length	Side	Embankment	Green Blanking	Stone Pitching	RE wall	Partial RE Wall	Grouting	Condition	Remarks
	From	To										
6	131.1	131.3	0.200	RHS	Yes	Yes	No	No	No	No	Good	
7	131.32	131.42	0.100	RHS	Yes	Yes	No	No	No	No	Fair to Poor	
8	136.05	136.15	0.100	LHS	Yes	Yes	No	No	No	No	Poor	
9	136.15	136.72	0.570	LHS	Yes	No	No	No	Yes	No	Good	Partial RE wall provided
10	136.8	137.25	0.450	LHS	No	No	No	Yes	No	No	Good	
11	136.2	136.8	0.600	RHS	Yes	Yes	No	No	Yes	No	Good	Partial RE wall provided
12	139.7	140.03	0.330	RHS	Yes	Yes	No	No	No	No	Fair to Poor	
13	140.25	140.4	0.150	RHS	Yes	Yes	No	No	No	No	Fair to Poor	
14	140.42	140.47	0.050	RHS	Yes	No	No	No	No	No	Good	
15	140.8	141.2	0.400	LHS	No	No	No	Yes	No	No	Good	
16	141.28	141.66	0.380	LHS	No	No	No	Yes	No	No	Good	
17	140.8	141.2	0.400	RHS	No	No	No	Yes	No	No	Good	
18	141.28	141.66	0.380	RHS	No	No	No	Yes	No	No	Good	
19	144.27	144.5	0.230	LHS	Yes	Yes	No	No	Yes	No	Good	Partial RE wall provided
20	144.66	145.1	0.440	LHS	Yes	Yes	No	No	Yes	No	Good	Partial RE wall provided
21	144.15	144.25	0.100	RHS	Yes	Yes	No	No	No	No	Good	
22	146.75	147.17	0.420	LHS	No	No	No	Yes	No	No	Good	
23	147.2	147.6	0.400	LHS	No	No	No	Yes	No	No	Good	
24	146.75	147.17	0.420	RHS	No	No	No	Yes	No	No	Good	
25	147.2	147.6	0.400	RHS	No	No	No	Yes	No	No	Good	
26	151.7	152.02	0.320	LHS	No	No	No	Yes	No	No	Good	
27	152.07	152.4	0.330	LHS	Yes	Yes	No	No	No	No	Good	
28	151.7	152.02	0.320	RHS	No	No	No	Yes	No	No	Good	
29	152.07	152.4	0.330	RHS	No	No	No	Yes	No	No	Good	
30	161.2	161.32	0.120	RHS	Yes	Yes	No	No	No	No	Fair to Poor	
31	162.47	162.91	0.440	LHS	No	No	No	Yes	No	No	Good	
32	162.93	163.1	0.170	LHS	No	No	No	Yes	No	No	Good	
33	162.47	162.91	0.440	RHS	No	No	No	Yes	No	No	Good	
34	162.93	163.15	0.220	RHS	No	No	No	Yes	No	No	Good	
35	166.97	167.02	0.050	LHS	Yes	No	No	No	No	Yes	Good	
36	167.01	167.02	0.010	RHS	No	No	No	No	No	Yes	Good	
37	170.48	170.64	0.160	LHS	Yes	No	No	No	No	No	Good	
38	170.66	170.82	0.160	LHS	Yes	Yes	No	No	No	No	Fair to Poor	
39	170.82	170.96	0.140	LHS	Yes	Yes	No	No	Yes	No	Good	Partial RE wall provided
40	170.96	171	0.040	LHS	No	No	No	Yes	No	No	Good	

S. no	Chainage (km)		Length	Side	Embankment	Green Blanking	Stone Pitching	RE wall	Partial RE Wall	Grouting	Condition	Remarks
	From	To										
41	171.08	171.4	0.320	LHS	Yes	Yes	No	No	Yes	No	Good	Partial RE wall provided
42	170.5	170.64	0.140	RHS	Yes	No	No	No	No	No	Good	
43	170.66	170.96	0.300	RHS	Yes	Yes	No	No	No	No	Good	
44	170.96	171	0.040	RHS	No	No	No	Yes	No	No	Good	
45	171.08	171.25	0.170	RHS	Yes	Yes	No	No	No	No	Good	
46	171.6	171.8	0.200	RHS	Yes	Yes	No	No	No	No	Good	
47	171.8	172	0.200	RHS	Yes	No	No	No	No	No	Good	
48	181	181.12	0.120	LHS	Yes	No	No	No	No	No	Good	
49	181.15	181.2	0.050	LHS	Yes	No	No	No	No	No	Good	
50	181.05	181.12	0.070	RHS	Yes	No	No	No	No	No	Poor	Damaged 50m @3.0m height
51	181.61	181.8	0.190	RHS	Yes	No	No	No	No	No	Good	
52	199	199.08	0.080	LHS	Yes	No	No	No	No	No	Good	
53	199.11	199.2	0.090	LHS	Yes	No	No	No	No	No	Good	
54	201.75	201.93	0.180	LHS	Yes	No	No	No	No	No	Poor	Damaged 60m @ 3.5m
55	201.95	202.15	0.200	LHS	Yes	No	No	No	No	No	Good	
56	201.75	201.93	0.180	RHS	Yes	No	No	No	No	No	Good	
57	201.95	202.15	0.200	RHS	Yes	No	No	No	No	No	Good	
<b>Total (km)</b>			<b>13.78</b>									

**Stone Pitching**

S. No	Chainage		Length	Side	Remarks
	From	To			
1	128.400	128.500	0.100	LHS	Stone Pitching
2	131.060	131.140	0.080	LHS	Stone Pitching
3	131.060	131.160	0.100	RHS	Stone Pitching
4	131.520	131.590	0.070	RHS	Stone Pitching
5	131.540	131.590	0.050	LHS	Stone Pitching
6	132.120	132.240	0.120	RHS	Stone Pitching
7	136.440	136.470	0.030	LHS	Stone Pitching
8	136.500	137.040	0.540	LHS	Stone Pitching
9	136.960	137.040	0.080	RHS	Stone Pitching
10	137.140	137.400	0.260	RHS	Stone Pitching
11	138.200	138.440	0.240	LHS	Stone Pitching
12	139.960	140.280	0.320	RHS	Stone Pitching
13	140.010	140.290	0.280	LHS	Stone Pitching
14	140.520	140.620	0.100	LHS	Stone Pitching
15	140.540	140.620	0.080	RHS	Stone Pitching
16	141.820	142.100	0.280	RHS	Stone Pitching
17	142.680	142.740	0.060	LHS	Stone Pitching

S. No	Chainage		Length	Side	Remarks
	From	To			
18	142.980	143.040	0.060	LHS	Stone Pitching
19	143.440	143.480	0.040	LHS	Stone Pitching
20	144.530	144.700	0.170	RHS	Stone Pitching
21	144.880	145.040	0.160	RHS	Stone Pitching
22	144.900	145.200	0.300	LHS	Stone Pitching
23	145.220	145.560	0.340	LHS	Stone Pitching
24	145.580	145.620	0.040	LHS	Stone Pitching
25	146.580	146.660	0.080	RHS	Stone Pitching
26	147.160	147.400	0.240	LHS	Stone Pitching
27	148.900	149.020	0.120	LHS	Stone Pitching
28	149.400	149.600	0.200	LHS	Stone Pitching
29	150.000	150.220	0.220	RHS	Stone Pitching
30	150.380	150.460	0.080	LHS	Stone Pitching
31	152.760	152.840	0.080	LHS	Stone Pitching
32	152.760	152.840	0.080	RHS	Stone Pitching
33	153.060	153.360	0.300	LHS	Stone Pitching
34	153.080	153.360	0.280	RHS	Stone Pitching
35	155.000	155.120	0.120	RHS	Stone Pitching
36	155.290	155.500	0.210	RHS	Stone Pitching
37	155.310	155.500	0.190	LHS	Stone Pitching
38	155.520	155.620	0.100	LHS	Stone Pitching
39	155.520	155.620	0.100	RHS	Stone Pitching
40	157.020	157.120	0.100	RHS	Stone Pitching
41	157.400	157.460	0.060	LHS	Stone Pitching
42	160.380	160.460	0.080	LHS	Stone Pitching
43	160.420	160.500	0.080	RHS	Stone Pitching
44	160.940	161.190	0.250	RHS	Stone Pitching
45	160.960	161.050	0.090	LHS	Stone Pitching
46	161.210	161.880	0.670	RHS	Stone Pitching
47	161.440	161.900	0.460	LHS	Stone Pitching
48	164.700	164.780	0.080	RHS	Stone Pitching
49	164.720	164.780	0.060	LHS	Stone Pitching
50	165.120	165.340	0.220	RHS	Stone Pitching
51	165.540	165.640	0.100	RHS	Stone Pitching
52	166.180	166.285	0.105	LHS	Stone Pitching
53	166.220	166.285	0.065	RHS	Stone Pitching
54	166.305	166.420	0.115	LHS	Stone Pitching
55	166.305	166.360	0.055	RHS	Stone Pitching
56	169.360	169.520	0.160	RHS	Stone Pitching

S. No	Chainage		Length	Side	Remarks
	From	To			
57	169.380	169.500	0.120	LHS	Stone Pitching
58	170.960	171.210	0.250	LHS	Stone Pitching
59	170.960	171.210	0.250	RHS	Stone Pitching
60	171.360	171.510	0.150	LHS	Stone Pitching
61	171.360	171.510	0.150	RHS	Stone Pitching
62	171.870	171.910	0.040	LHS	Stone Pitching
63	171.870	171.910	0.040	RHS	Stone Pitching
64	171.950	172.290	0.340	LHS	Stone Pitching
65	171.950	172.290	0.340	RHS	Stone Pitching
66	172.700	172.760	0.060	LHS	Stone Pitching
67	172.800	173.040	0.240	RHS	Stone Pitching
68	173.200	173.280	0.080	RHS	Stone Pitching
69	173.240	173.320	0.080	LHS	Stone Pitching
70	173.540	173.620	0.080	LHS	Stone Pitching
71	174.740	174.960	0.220	LHS	Stone Pitching
72	174.800	174.880	0.080	RHS	Stone Pitching
73	175.060	175.300	0.240	LHS	Stone Pitching
74	175.160	175.300	0.140	RHS	Stone Pitching
75	175.580	175.660	0.080	RHS	Stone Pitching
76	175.660	175.760	0.100	LHS	Stone Pitching
77	175.720	175.780	0.060	RHS	Stone Pitching
78	175.840	175.880	0.040	RHS	Stone Pitching
79	175.900	175.960	0.060	LHS	Stone Pitching
80	176.120	176.240	0.120	RHS	Stone Pitching
81	176.480	176.560	0.080	LHS	Stone Pitching
82	176.740	176.920	0.180	LHS	Stone Pitching
1	176.860	176.940	0.080	RHS	Stone Pitching
2	177.280	177.420	0.140	RHS	Stone Pitching
3	177.500	177.580	0.080	LHS	Stone Pitching
4	177.500	177.600	0.100	RHS	Stone Pitching
5	177.860	177.900	0.040	RHS	Stone Pitching
6	178.200	178.240	0.040	LHS	Stone Pitching
7	178.360	178.440	0.080	LHS	Stone Pitching
8	178.600	178.840	0.240	RHS	Stone Pitching
9	178.720	178.820	0.100	LHS	Stone Pitching
10	179.260	179.420	0.160	LHS	Stone Pitching
11	179.840	180.000	0.160	RHS	Stone Pitching
12	180.160	180.320	0.160	LHS	Stone Pitching
13	180.160	180.200	0.040	RHS	Stone Pitching

S. No	Chainage		Length	Side	Remarks
	From	To			
14	180.580	180.640	0.060	LHS	Stone Pitching
15	180.840	181.040	0.200	LHS	Stone Pitching
16	181.360	181.404	0.044	RHS	Stone Pitching
17	181.411	181.661	0.250	RHS	Stone Pitching
18	181.440	181.640	0.200	LHS	Stone Pitching
19	181.681	181.880	0.199	RHS	Stone Pitching
20	182.360	182.440	0.080	LHS	Stone Pitching
21	182.500	182.560	0.060	RHS	Stone Pitching
22	182.640	182.680	0.040	RHS	Stone Pitching
23	182.780	183.040	0.260	RHS	Stone Pitching
24	184.980	185.160	0.180	LHS	Stone Pitching
25	185.180	185.300	0.120	LHS	Stone Pitching
26	185.740	185.840	0.100	LHS	Stone Pitching
27	186.380	186.660	0.280	RHS	Stone Pitching
28	186.400	186.580	0.180	LHS	Stone Pitching
29	187.340	187.580	0.240	RHS	Stone Pitching
30	187.500	187.620	0.120	LHS	Stone Pitching
31	187.720	187.780	0.060	LHS	Stone Pitching
32	187.720	187.780	0.060	RHS	Stone Pitching
33	188.500	188.900	0.400	RHS	Stone Pitching
34	189.620	189.660	0.040	LHS	Stone Pitching
35	189.740	189.940	0.200	LHS	Stone Pitching
36	189.860	190.080	0.220	RHS	Stone Pitching
37	190.000	190.080	0.080	LHS	Stone Pitching
38	190.120	190.320	0.200	RHS	Stone Pitching
39	190.360	190.420	0.060	LHS	Stone Pitching
40	190.740	190.980	0.240	RHS	Stone Pitching
41	190.820	191.020	0.200	LHS	Stone Pitching
42	191.600	191.660	0.060	LHS	Stone Pitching
43	192.380	192.480	0.100	RHS	Stone Pitching
44	197.700	197.840	0.140	LHS	Stone Pitching
45	197.700	197.860	0.160	RHS	Stone Pitching
46	199.020	199.080	0.060	RHS	Stone Pitching
47	199.300	199.366	0.066	RHS	Stone Pitching
48	199.373	199.480	0.107	RHS	Stone Pitching
49	200.280	200.460	0.180	RHS	Stone Pitching
50	201.780	202.380	0.600	RHS	Stone Pitching
51	202.140	202.200	0.060	LHS	Stone Pitching
52	202.280	202.380	0.100	LHS	Stone Pitching

S. No	Chainage		Length	Side	Remarks
	From	To			
53	202.460	202.500	0.040	RHS	Stone Pitching
54	202.840	202.940	0.100	LHS	Stone Pitching
55	202.860	203.060	0.200	RHS	Stone Pitching
56	204.210	204.246	0.036	LHS	Stone Pitching
57	204.220	204.236	0.016	RHS	Stone Pitching
58	204.253	204.540	0.287	RHS	Stone Pitching
59	204.260	204.540	0.280	LHS	Stone Pitching
60	204.780	204.940	0.160	RHS	Stone Pitching
61	205.300	205.520	0.220	LHS	Stone Pitching
62	205.960	206.020	0.060	LHS	Stone Pitching
63	206.940	207.080	0.140	LHS	Stone Pitching
64	207.240	207.420	0.180	RHS	Stone Pitching
65	207.840	207.900	0.060	LHS	Stone Pitching
66	209.080	209.220	0.140	RHS	Stone Pitching
67	209.440	209.600	0.160	LHS	Stone Pitching
68	210.060	210.200	0.140	LHS	Stone Pitching
69	210.060	210.180	0.120	RHS	Stone Pitching
70	210.260	210.520	0.260	LHS	Stone Pitching
71	210.280	210.520	0.240	RHS	Stone Pitching
72	210.780	210.920	0.140	RHS	Stone Pitching
73	211.000	211.200	0.200	RHS	Stone Pitching
74	211.020	211.300	0.280	LHS	Stone Pitching
75	211.720	211.960	0.240	RHS	Stone Pitching
76	212.360	212.520	0.160	LHS	Stone Pitching
77	212.360	212.480	0.120	RHS	Stone Pitching
78	213.440	213.520	0.080	LHS	Stone Pitching
79	213.500	213.540	0.040	RHS	Stone Pitching
80	214.200	214.300	0.100	LHS	Stone Pitching
81	214.880	214.940	0.060	RHS	Stone Pitching
<b>Total Length</b>			<b>24.355</b>		

Table 10: Side Kerb and chute Details

S. No.	Chainage (km)		Side	Length(km)	No of Chutes	No of Chutes Damaged	Side kerb damaged	Remarks
	From	To						
1	128.1	128.6	LHS	0.5	10	-	-	
2	130.8	130.9	LHS	0.1	8			
3	131.25	131.35	LHS	0.1	4	-	-	
4	136	136.8	LHS	0.8	42	-	-	
5	137.95	138.15	LHS	0.2	17	-	-	

S. No.	Chainage (km)		Side	Length(km)	No of Chutes	No of Chutes Damaged	Side kerb damaged	Remarks
	From	To						
6	139.7	140.1	LHS	0.4	16	-	-	
7	140.2	140.35	LHS	0.15	12	-	-	
8	142.4	142.75	LHS	0.35	10	-	-	
9	144.2	145.3	LHS	1.1	45	-	-	
10	146.6	146.8	LHS	0.2	10			
11	148.6	148.7	LHS	0.1	9	1	-	
12	149.1	149.3	LHS	0.2	14	-	-	
13	150.1	150.2	LHS	0.1	6	-	-	
14	152.4	152.5	LHS	0.1	5	-	-	
15	152.7	153.1	LHS	0.4	19	3	5	
16	155	155.4	LHS	0.4	21	-	-	
17	157.4	157.5	LHS	0.1	5	-	-	
18	160.6	161	LHS	0.4	12	-	-	
19	161.95	162.5	LHS	0.55	18	-	-	
20	162.51	162.65	LHS	0.14	15	-	-	
21	164.45	164.5	LHS	0.05	10	-	-	
22	166.1	166.3	LHS	0.2	12	-	-	
23	166.6	167.01	LHS	0.41	39	-	-	
24	167.06	167.42	LHS	0.36	24	-	-	
25	168.2	168.4	LHS	0.2	3	-	-	
26	169	169.3	LHS	0.3	12	-	-	
27	171.12	171.4	LHS	0.28	23	-	-	
28	171.6	171.7	LHS	0.1	3	-	-	
29	172.46	172.6	LHS	0.14	5	-	-	
30	172.9	173.1	LHS	0.2	4	-	-	
31	174.6	175.05	LHS	0.45	32	4	5	
32	175.2	175.4	LHS	0.2	9	-	-	
33	175.6	175.7	LHS	0.1	7	-	-	
34	176.2	176.3	LHS	0.1	6	-	-	
35	176.6	176.8	LHS	0.2	13	-	-	
36	177.4	177.6	LHS	0.2	6	2	-	
37	177.8	177.9	LHS	0.1	4	-	-	
38	178.1	178.2	LHS	0.1	6	2	-	
39	178.4	178.6	LHS	0.2	6	1	-	
40	178.9	179.2	LHS	0.3	10	3	-	
41	179.9	180.05	LHS	0.15	11	2	-	
42	180.2	180.3	LHS	0.1	5	-	5	
43	180.55	180.8	LHS	0.25	9	2	-	
44	181	181.2	LHS	0.2	14	-	-	

S. No.	Chainage (km)		Side	Length(km)	No of Chutes	No of Chutes Damaged	Side kerb damaged	Remarks
	From	To						
45	181.4	181.6	LHS	0.2	7	-	-	
46	184.6	184.85	LHS	0.25	14	-	-	
47	184.85	185.05	LHS	0.2	8	-	-	
48	185.55	185.65	LHS	0.1	8	2	-	
49	186.1	186.3	LHS	0.2	13	-	-	
50	187.1	187.25	LHS	0.15	9	1	-	
51	187.4	187.6	LHS	0.2	5	-	-	
52	189.4	189.6	LHS	0.2	4	-	5	
53	189.7	189.8	LHS	0.1	23	-	-	
54	189.9	190	LHS	0.1	6	-	-	
55	190.3	190.5	LHS	0.2	9	-	-	
56	191.2	191.4	LHS	0.2	5	-	-	
57	193.1	193.3	LHS	0.2	21	2	-	
58	193.4	193.5	LHS	0.1	4	-	-	
59	197.5	197.6	LHS	0.1	10	-	-	
60	199.2	199.4	LHS	0.2	5	-	-	
61	202	202.15	LHS	0.15	8	-	-	
62	202.6	202.8	LHS	0.2	8	-	-	
63	203.95	204	LHS	0.05	3	-	-	
64	204	204.35	LHS	0.35	20	-	-	
65	204.5	204.7	LHS	0.2	12	-	-	
66	205	205.2	LHS	0.2	16	-	-	
67	206.7	206.75	LHS	0.05	5	-	-	
68	206.8	206.9	LHS	0.1	10	-	-	
69	207	207.05	LHS	0.05	3	-	-	
70	207.5	207.6	LHS	0.1	5	-	-	
71	209.16	209.2	LHS	0.04	12	-	-	
72	209.8	209.99	LHS	0.19	10	-	-	
73	210	210.3	LHS	0.3	18	-	-	
74	211	211.28	LHS	0.28	20	-	-	
75	212	212.3	LHS	0.3	12	-	-	
76	213.4	213.5	LHS	0.1	6	-	-	
77	214.3	214.5	LHS	0.2	7	-	-	
78	214.62	214.64	LHS	0.02	2	-	-	
79	130.6	130.8	RHS	0.2	6	-	-	
80	131.2	131.4	RHS	0.2	7	-	5	
81	136.5	136.7	RHS	0.2	12	-	-	
82	137	137.6	RHS	0.6	11	-	-	
83	139.8	140	RHS	0.2	20	-	-	

S. No.	Chainage (km)		Side	Length(km)	No of Chutes	No of Chutes Damaged	Side kerb damaged	Remarks
	From	To						
84	140.1	140.2	RHS	0.1	13	-	-	
85	141.6	141.8	RHS	0.2	20	-	-	
86	144.2	144.5	RHS	0.3	43	-	-	
87	144.6	145.4	RHS	0.8	22	-	-	
88	146.6	146.8	RHS	0.2	6	-	-	
89	149.7	149.9	RHS	0.2	6	-	-	
90	152.8	153.1	RHS	0.3	20	-	-	
91	154.6	154.7	RHS	0.1	9	-	-	
92	155	155.6	RHS	0.6	23	-	-	
93	156.7	156.85	RHS	0.15	12	-	-	
94	159.6	159.8	RHS	0.2	8	-	-	
95	159.95	160.1	RHS	0.15	8	-	-	
96	160.5	160.9	RHS	0.4	19	-	-	
97	160.95	161.3	RHS	0.35	43	-	-	
98	164.3	164.4	RHS	0.1	17	-	-	
99	164.9	165.05	RHS	0.15	10	3	-	
100	165.2	165.3	RHS	0.1	7	-	-	
101	165.8	166	RHS	0.2	8	-	-	
102	166.05	166.15	RHS	0.1	6	-	-	
103	166.7	166.95	RHS	0.25	21	-	-	
104	167	167.05	RHS	0.05	4	-	-	
105	169.1	169.25	RHS	0.15	9	-	-	
106	170.7	171	RHS	0.3	24	-	-	
107	171.6	171.9	RHS	0.3	28	1	5	
108	172.3	172.5	RHS	0.2	17	-	-	
109	172.9	173.1	RHS	0.2	10	-	-	
110	173.4	173.5	RHS	0.1	7	-	-	
111	174.5	174.6	RHS	0.1	5	-	-	
112	174.8	175.02	RHS	0.22	10	-	-	
113	175.25	175.3	RHS	0.05	1	-	-	
114	175.35	175.4	RHS	0.05	2	-	-	
115	175.45	175.5	RHS	0.05	3	-	-	
116	175.55	175.65	RHS	0.1	4	-	-	
117	175.7	175.9	RHS	0.2	9	-	-	
118	176.6	176.8	RHS	0.2	4	-	-	
119	177	177.2	RHS	0.2	11	-	-	
120	177.66	177.8	RHS	0.14	10	-	-	
121	178.45	178.6	RHS	0.15	16	-	-	
122	179.1	179.2	RHS	0.1	3	-	-	

S. No.	Chainage (km)		Side	Length(km)	No of Chutes	No of Chutes Damaged	Side kerb damaged	Remarks
	From	To						
123	179.6	179.85	RHS	0.25	17	-	-	
124	180.25	180.4	RHS	0.15	4	-	-	
125	181.05	181.1	RHS	0.05	4	-	-	
126	181.15	181.4	RHS	0.25	19	1	-	
127	181.45	181.7	RHS	0.25	14	-	-	
128	182.1	182.2	RHS	0.1	5	-	-	
129	182.5	182.55	RHS	0.05	4	-	-	
130	182.6	182.65	RHS	0.05	5	-	-	
131	182.65	182.75	RHS	0.1	20	-	-	
132	187.1	187.3	RHS	0.2	17	-	-	
133	187.4	187.5	RHS	0.1	5	-	-	
134	188.2	188.6	RHS	0.4	29	-	-	
135	189.4	189.45	RHS	0.05	4	-	-	
136	189.45	189.7	RHS	0.25	13	-	-	
137	190.17	190.3	RHS	0.13	11	-	-	
138	190.6	190.8	RHS	0.2	12	-	-	
139	192.2	192.4	RHS	0.2	5	-	-	
140	193.4	193.6	RHS	0.2	10	-	-	
141	197.7	197.9	RHS	0.2	12	-	-	
142	199.5	199.7	RHS	0.2	8	-	-	
143	200.1	200.2	RHS	0.1	6	-	-	
144	200.5	200.7	RHS	0.2	12	-	-	
145	201.5	201.98	RHS	0.48	36	4	-	
146	202	202.1	RHS	0.1	8	-	-	
147	202.55	202.85	RHS	0.3	14	-	5	
148	203.95	204	RHS	0.05	4	-	-	
149	204	204.4	RHS	0.4	23	-	-	
150	206.98	207	RHS	0.02	12	-	-	
151	208.7	208.8	RHS	0.1	10	-	-	
152	209.75	209.98	RHS	0.23	10	-	5	
153	210	210.3	RHS	0.3	16	-	-	
154	210.35	210.5	RHS	0.15	12	-	-	
155	210.6	210.9	RHS	0.3	14	-	-	
156	211.5	211.8	RHS	0.3	17	2	-	
157	212.1	212.25	RHS	0.15	9	-	-	
158	213.2	213.4	RHS	0.2	4	-	-	
159	214.6	214.75	RHS	0.15	5	-	-	
<b>Total No of Chutes</b>				<b>32.98</b>	<b>1883</b>	<b>36</b>	<b>40</b>	

Median width of 4.5m is generally observed along the project road. Median opening and Blinker Signal locations are presented in Tables below:

**Table 11: Locations of Median Openings**

S. No.	Chainage (km)	Width (m)	Length (m)	Reserve lane	Remarks
1	130+150	1.2	30	Yes	
2	132+800	1.2	25	Yes	
3	136+000	1.2	28	Yes	
4	137+750	1.2	30	Yes	
5	139+560	1.2	30	Yes	
6	141+500	At under pass location			
7	142+600	1.2	25	Yes	
8	147+200	At under pass location			
9	149+450	1.2	30	Yes	
10	150+850	1.2	30	Yes	
11	153+140	1.2	25	Yes	
12	154+340	1.2	30	Yes	
13	156+030	4.5	10	No	
14	156+400	4.5/1.2	30	Yes	
15	158+640	1.2	30	Yes	
16	161+840	1.2	30	Yes	
17	165+650	4.5/1.2	20	Yes	
18	168+950	1.2	25	Yes	
19	172+350	1.2	25	Yes	
20	174+650	1.2	30	Yes	
21	177+800	1.2	25	Yes	
22	180+480	1.2	30	Yes	
23	182+450	1.2	30	Yes	
24	185+630	1.2	25	Yes	
25	187+430	1.2	25	Yes	
26	188+070	1.2	20	Yes	
27	189+430	4.5/1.2	20	Yes	
28	191+100	1.2	30	Yes	
29	193+230	1.2	25	Yes	
30	194+600	1.2	25	Yes	
31	198+120	1.2	25	Yes	
32	200+200	1.2	30	Yes	
33	203+650	1.2	30	Yes	
34	205+160	1.2	30	Yes	
35	208+120	1.2	30	Yes	
36	211+620	1.2	20	Yes	
37	214+080	1.2	25	Yes	

Median openings and cross road locations with Solar Blinkers are presented below:

Table 12: Details of Solar Blinkers

S. No	Chainage (km)	Location	No. of Blinkers	Condition		Damage
				Towards MP Border	Towards Godhra	
1	130+150	Median	2	Working	Working	
2	132+800	Median	2	Working	Working	
3	136+000	Median	2	Working	Working	
4	137+750	Median	2	Working	Working	
5	138+900	LHS Shoulder	1	Working	-	
	138+900	RHS Shoulder	1	-	Working	
6	139+560	Median	2	Working	Working	
7	142+600	Median	2	Working	Working	
8	149+450	Median	2	Working	Working	
9	150+850	Median	2	Working	Working	
10	153+140	Median	2	Working	Working	
11	154+340	Median	2	Working	Working	
12	156+030	Median	2	Working	Damage	Blinker Damage & Solar Panel Missing
13	156+400	Median	2	Working	Working	
14	158+640	Median	2	Working	Working	
15	161+840	Median	2	Working	Working	
16	165+650	Median	2	Working	Working	
17	168+950	Median	2	Working	Working	
18	172+350	Median	2	Working	Working	
19	174+650	Median	2	Working	Working	
20	177+800	Median	2	Working	Working	
21	180+480	Median	2	Not Working	Working	
22	182+450	Median	2	Working	Working	
23	185+630	Median	2	Working	Working	
24	187+430	Median	2	Not Working	Not Working	
25	188+070	Median	2	Working	Working	
26	189+430	Median	2	Working	Working	
27	191+100	Median	2	Working	Working	
28	193+230	Median	2	Working	Working	
29	194+600	Median	2	Working	Not Working	
30	198+120	Median	2	Working	Working	
31	200+200	Median	2	Working	Working	
32	203+650	Median	2	Working	Working	
33	205+160	Median	2	Working	Working	
34	208+120	Median	2	Working	Working	
35	211+620	Median	2	Working	Working	

S. No	Chainage (km)	Location	No. of Blinkers	Condition		Damage
				Towards MP Border	Towards Godhra	
36	214+080	Median	2	Working	Working	
Total			72			

There are few unauthorized median cuts and damaged medians exist along the project corridor and are presented in Table below:

**Table 13: Median Damaged Locations**

Sr.No.	Location	Length (In Mtrs)	Current Status	Police Station	Remark
1	134+820	2	Open	Godhra Taluka	
2	135+500	0.5	Open	Godhra Taluka	
3	138+660	0.5	Open	Morva (Hadaf)	
4	154+ 770	0.5	Open	Devgad Bariya	
5	159+770	0.5	Open	Limbkheda	
6	169+ 380	0.5	Open	Limbkheda	
7	169+ 950	0.5	Open	Limbkheda	
8	167+350	0.5	Open	Limbkheda	
9	170+ 400	1	Open	Limbkheda	
10	170+ 550	0.9	Open	Limbkheda	
11	175+ 750	0.5	Open	Limbkheda	
12	178+380	0.5	Open	Limbkheda	
13	192+950	0.5	Open	Dahod Town	
14	193+950	0.5	Open	Dahod Town	
15	195+030	0.5	Open	Dahod Town	
16	196+700	1.5	Open	Dahod Rural	
17	197+170	2	Open	Dahod Rural	
18	198+430	5	Open	Katwara	
19	198+570	8	Open	Katwara	
20	199+000	10	Closed	Katwara	
21	199+250	10	Open	Katwara	
22	199+500	10	Open	Katwara	
23	199+550	10	Closed	Katwara	
24	200+950	8	Open	Katwara	
25	213+350	4	Open	Katwara	
26	212+900	4	Open	Katwara	
27	212+780	0.5	Open	Katwara	
28	212+300	0.5	Open	Katwara	
29	210+300	8	Open	Katwara	
30	209+500	4	Open	Katwara	
31	209+180	0.5	Open	Katwara	
32	207+500	4	Open	Katwara	

Safety barriers have been provided along the project road at high embankments where embankment height is >3m at sharp curve locations, at approaches of grade separated and cross drainage Structures. Details of safety barriers provided along the corridor include the following:

**Table 14: Single pole single faced Metal Beam Crash Barrier Locations**

Metal Beam Crash Barrier Locations					
Sr. No.	Chainage		Length	Side	Remarks
	From	To			
1	128+450	128+620	170	LHS	
2	128+330	128+620	290	LHS	
3	129+360	129+430	70	LHS	
4	131+060	131+150	90	LHS	
5	131+060	131+170	110	RHS	
6	131+520	131+740	220	RHS	
7	131+540	131+750	190	LHS	
8	131+960	132+010	50	RHS	
9	132+110	132+250	140	RHS	
10	133+610	133+760	150	RHS	
11	134+350	134+490	140	RHS	
12	134+560	134+690	130	RHS	
13	134+800	134+870	70	LHS	
14	136+370	137+030	660	RHS	
15	136+460	137+030	570	LHS	
16	137+140	137+200	48	LHS	
17	137+140	137+410	270	RHS	
18	138+200	138+450	250	LHS	
19	138+370	138+420	50	RHS	
20	139+950	140+630	680	RHS	
21	140+010	140+290	280	LHS	
22	140+030	140+290	260	LHS Median	
23	140+030	140+290	260	RHS Median	
24	140+500	140+810	310	LHS Median	
25	140+500	140+810	310	RHS Median	
26	140+520	140+640	120	LHS	
27	141+150	141+360	210	LHS	
28	141+810	142+030	220	LHS	
29	141+920	142+100	180	RHS	
30	142+670	142+740	70	LHS	
31	142+970	143+050	80	LHS	
32	144+355	145+610	1255	LHS	
33	144+359	144+692	333	RHS Median	
34	144+490	145+610	1120	RHS	
35	146+580	146+670	90	RHS	
36	147+030	147+200	170	RHS	
37	147+160	147+400	226	LHS	
38	148+170	148+220	50	LHS	
39	148+430	148+680	250	RHS	
40	148+620	148+670	50	LHS	
41	148+900	149+010	110	LHS	
42	148+910	149+040	130	RHS	
43	149+370	149+540	170	RHS	

Metal Beam Crash Barrier Locations					
Sr. No.	Chainage		Length	Side	Remarks
	From	To			
44	149+410	149+610	200	LHS	
45	149+990	150+410	420	RHS	
46	150+380	150+470	90	LHS	
47	152+070	152+140	70	LHS	
48	152+310	152+540	230	LHS	
49	152+760	152+840	80	RHS	
50	152+770	152+840	70	LHS	
51	153+060	153+370	310	LHS	
52	153+070	153+360	290	RHS	
53	153+910	154+020	110	LHS	
54	153+980	154+250	270	RHS	
55	154+100	154+250	150	LHS	
56	154+470	155+130	660	RHS	
57	155+290	155+620	330	RHS	
58	155+310	155+610	300	LHS	
59	156+990	157+090	100	LHS	
60	157+010	157+130	120	RHS	
61	157+440	157+520	80	LHS	
62	160+380	160+460	80	LHS	
63	160+420	160+470	50	RHS	
64	160+940	161+890	950	RHS	
65	160+960	161+900	940	LHS	
66	161+171	161+323	152	RHS Median	
67	162+670	162+880	210	LHS	
68	162+750	163+000	250	RHS	
69	163+675	163+750	75	RHS	
70	164+700	164+780	80	RHS	
71	164+710	164+780	70	LHS	
72	165+030	165+380	350	LHS	
73	165+120	165+340	220	RHS	
74	165+520	165+680	160	LHS	
75	165+540	165+650	110	RHS	
76	166+180	166+430	250	LHS	
77	166+220	166+360	140	RHS	
78	166+900	167+390	490	RHS	
79	166+920	167+590	670	LHS	
80	168+250	168+380	130	RHS	
81	168+310	168+640	330	LHS	
82	169+370	169+490	120	LHS	
83	169+370	169+530	160	RHS	
84	170+360	171+560	1200	LHS	
85	170+380	170+440	60	RHS	
86	170+970	171+610	640	RHS	
87	171+050	171+163	113	RHS Median	
88	171+429	171+501	72	LHS Median	

Metal Beam Crash Barrier Locations					
Sr. No.	Chainage		Length	Side	Remarks
	From	To			
89	171+800	172+040	240	LHS	
90	171+870	172+300	430	RHS	
91	172+350	172+420	70	RHS	
92	172+700	172+770	70	LHS	
93	172+790	173+050	260	RHS	
94	173+200	173+290	90	RHS	
95	173+230	173+330	100	LHS	
96	173+540	173+620	80	LHS	
97	174+441	174+628	187	RHS Median	
98	174+465	174+710	245	LHS	
99	174+740	174+970	230	LHS	
100	174+800	174+940	140	RHS	
101	175+040	175+300	260	LHS	
102	175+160	175+320	160	RHS	
103	175+440	175+660	220	RHS	
104	175+452	175+770	318	LHS	
105	175+452	175+539	87	RHS Median	
106	175+715	175+780	65	RHS	
107	175+830	175+880	50	RHS	
108	175+900	175+970	70	LHS	
109	176+110	176+250	140	RHS	
110	176+480	176+570	90	LHS	
111	176+520	176+630	110	RHS	
112	176+730	176+930	200	LHS	
113	176+860	176+950	90	RHS	
114	177+030	177+310	280	LHS	
115	177+036	177+256	220	RHS Median	
116	177+050	177+420	370	RHS	
117	177+490	177+600	110	LHS	
118	177+500	177+600	100	RHS	
119	177+850	177+910	60	RHS	
120	177+860	178+000	140	LHS	
121	178+190	178+450	260	LHS	
122	178+240	178+410	170	RHS	
123	178+240	178+411	171	LHS Median	
124	178+590	178+840	250	RHS	
125	178+710	178+830	120	LHS	
126	179+060	179+490	430	RHS	
127	179+115	179+165	50	LHS	
128	179+250	179+420	170	LHS	
129	179+840	180+010	170	RHS	
130	180+150	180+640	490	LHS	
131	180+150	180+210	60	RHS	
132	180+830	181+110	280	LHS	
133	181+270	181+640	370	LHS	

Metal Beam Crash Barrier Locations					
Sr. No.	Chainage		Length	Side	Remarks
	From	To			
134	181+320	182+050	730	RHS	
135	181+920	182+050	130	LHS	
136	181+922	182+049	127	RHS Median	
137	182+150	183+200	1050	RHS	
138	182+290	182+440	150	LHS	
139	182+293	182+375	82	LHS Median	
140	184+980	185+540	560	LHS	
141	185+030	185+500	470	RHS	
142	185+730	185+850	120	LHS	
143	186+380	186+670	290	RHS	
144	186+390	186+580	190	LHS	
145	187+280	187+630	350	LHS	
146	187+280	187+600	320	RHS	
147	187+710	187+790	80	LHS	
148	187+720	187+790	70	RHS	
149	188+490	188+900	410	RHS	
150	189+600	190+075	475	RHS	
151	189+610	189+660	50	LHS	
152	189+740	189+950	210	LHS	
153	190+000	190+090	90	LHS	
154	190+120	190+310	190	RHS	
155	190+350	190+430	80	LHS	
156	190+730	190+940	210	RHS	
157	190+820	191+030	210	LHS	
158	191+470	191+565	95	RHS	
159	191+471	191+565	94	LHS Median	
160	191+600	191+660	60	LHS	
161	191+850	192+140	290	LHS Median	
162	191+850	192+140	290	RHS Median	
163	191+865	191+970	105	RHS	
164	192+240	192+530	290	LHS Median	
165	192+240	192+530	290	RHS Median	
166	192+380	192+470	90	RHS	
167	193+300	193+520	220	LHS	
168	193+370	193+490	120	RHS	
169	193+665	193+780	115	LHS	
170	194+000	194+200	200	LHS Median	
171	194+000	194+200	200	RHS Median	
172	196+010	196+230	220	LHS	
173	197+240	197+415	175	RHS	
174	197+243	197+415	172	LHS Median	
175	197+640	197+880	240	LHS Median	
176	197+640	197+880	240	RHS Median	
177	197+690	197+850	160	LHS	
178	197+690	197+860	170	RHS	

Metal Beam Crash Barrier Locations					
Sr. No.	Chainage		Length	Side	Remarks
	From	To			
179	197+990	198+300	310	LHS Median	
180	197+990	198+300	310	RHS Median	
181	199+010	199+080	70	RHS	
182	199+108	199+179	71	RHS Median	
183	199+110	199+490	380	LHS	
184	199+300	199+480	180	RHS	
185	199+880	199+955	75	LHS	
186	199+883	199+956	73	RHS Median	
187	200+270	200+470	200	RHS	
188	201+125	201+245	120	RHS	
189	201+570	201+600	30	RHS	
190	201+710	202+390	680	RHS	
191	201+740	202+390	650	LHS	
192	201+881	202+016	135	RHS Median	
193	202+450	202+520	70	RHS	
194	202+840	202+950	110	LHS	
195	202+850	203+070	220	RHS	
196	204+210	204+550	340	LHS	
197	204+220	204+550	330	RHS	
198	204+750	204+940	190	LHS	
199	204+780	204+940	160	RHS	
200	205+300	205+520	220	LHS	
201	205+310	205+440	130	RHS	
202	205+890	206+005	115	LHS	
203	205+620	205+730	110	RHS	
204	206+835	206+980	145	RHS	
205	206+930	207+080	150	LHS	
206	206+835	206+931	96	LHS Median	
207	207+240	207+420	180	RHS	
208	207+270	207+340	70	LHS	
209	207+830	207+880	50	LHS	
210	207+950	208+115	165	RHS	
211	207+953	208+115	162	LHS Median	
212	208+590	209+200	610	LHS	
213	208+590	209+030	440	RHS Median	
214	209+030	209+260	230	LHS Median	
215	209+030	209+260	230	RHS Median	
216	209+070	209+240	170	RHS	
217	209+350	209+730	380	LHS Median	
218	209+350	209+730	380	RHS Median	
219	209+426	209+600	174	RHS	
220	209+440	209+600	160	LHS	
221	210+050	210+210	160	LHS	
222	210+050	210+165	115	RHS	
223	210+260	210+530	270	LHS	

Metal Beam Crash Barrier Locations					
Sr. No.	Chainage		Length	Side	Remarks
	From	To			
224	210+280	210+520	240	RHS	
225	210+785	210+930	145	RHS	
226	211+000	211+200	200	RHS	
227	211+020	211+300	280	LHS	
228	211+720	212+030	310	RHS	
229	212+350	212+480	130	LHS	
230	212+350	212+475	125	RHS	
231	213+390	213+550	160	RHS	
232	213+435	213+530	95	LHS	
233	214+200	214+310	110	LHS	
234	214+630	214+680	50	LHS	
235	214+870	214+950	80	RHS	
Total			52848		

Table 15: Single pole double faced Metal Beam Crash Barrier Locations

Two Side Metal Beam Crash Barrier					
Sr. No.	Chainage		Length	Side	Remarks
	From	To			
1	138+970	139+420	450	Median	
2	143+700	144+380	680	Median	
3	153+835	154+095	260	Median	
4	173+850	174+465	615	Median	
Total			2005		

Table 16: Concrete Crash Barrier Locations

Details of Concrete Crash Barrier						
Sr. No.	Chainage	Length (m)	Structure	Side	Total Length(m)	Remarks
1	128.371	375.531	VUP	2	751.062	on LHS & RHS MCW Edge
2	128.371	24.365	VUP	2	48.730	on Median LHS & RHS EDGE
3	131.321	20.385	PUP	2	40.770	on LHS & RHS MCW Edge
4	131.321	15.100	PUP	2	30.200	on Median LHS & RHS EDGE
5	137.083	106.675	ROB	4	426.700	on LHS & RHS Bridge Portion
6	137.083	378.000	ROB	1	378.000	on LHS MCW Edge Approaches
7	140.405	407.170	MJB	1	407.170	on LHS - MCW Edge
8	140.405	390.600	MJB	1	390.600	on RHS - MCW Edge
9	140.396	22.210	PUP	2	44.420	on LHS & RHS MCW Edge
10	140.396	15.100	PUP	2	30.200	on Median LHS & RHS EDGE
11	141.526	826.980	FOB	2	1653.960	on LHS & RHS MCW Edge
12	144.251	23.600	PUP	2	47.200	on LHS & RHS MCW Edge
13	144.251	15.100	PUP	2	30.200	on Median LHS & RHS EDGE

Details of Concrete Crash Barrier						
Sr. No.	Chainage	Length (m)	Structure	Side	Total Length(m)	Remarks
14	144.827	595.120	ROB	1	595.120	on LHS & RHS Bridge Portion
15	144.944	23.180	MNB	2	46.360	on LHS & RHS MCW Edge
16	144.944	14.200	MNB	2	28.400	on Median LHS & RHS EDGE
17	146.750	840.000	FOB	2	1680.000	on LHS & RHS MCW Edge
18	146.944	26.502	MNB	2	53.004	on LHS & RHS MCW Edge
19	146.944	25.030	MNB	2	50.060	on Median LHS & RHS EDGE
20	152.026	467.385	VUP	2	934.770	on LHS & RHS MCW Edge
21	152.026	18.900	VUP	2	37.800	on Median LHS & RHS EDGE
22	153.966	722.310	SH -FOB	2	1444.620	on LHS & RHS MCW Edge
23	155.241	21.040	PUP	2	42.080	on LHS & RHS MCW Edge
24	155.241	15.100	PUP	2	30.200	on Median LHS & RHS EDGE
25	157.217	38.440	MNB	2	76.880	on LHS & RHS MCW Edge
26	157.217	30.400	MNB	2	60.800	on Median LHS & RHS EDGE
27	160.930	32.410	VUP	2	64.820	on LHS & RHS MCW Edge
28	160.930	18.900	VUP	2	37.800	on Median LHS & RHS EDGE
29	161.414	20.520	PUP	2	41.040	on LHS & RHS MCW Edge
30	161.414	15.100	PUP	2	30.200	on Median LHS & RHS EDGE
31	162.914	652.290	VUP	2	1304.580	on LHS & RHS MCW Edge
32	162.914	18.900	VUP	2	37.800	on Median LHS & RHS EDGE
33	163.400	22.220	PUP	2	44.440	on LHS & RHS MCW Edge
34	163.400	15.100	PUP	2	30.200	on Median LHS & RHS EDGE
35	163.970	188.160	MJB	1	188.160	on LHS MCW Edge & on Median LHS EDGE
36	163.970	188.160	MJB	1	188.160	on RHS MCW Edge & on Median RHS EDGE
37	164.116	41.966	MNB	2	83.932	on LHS & RHS MCW Edge
38	164.116	39.920	MNB	2	79.840	on Median LHS & RHS EDGE
39	166.024	30.300	MNB	2	60.600	on LHS & RHS MCW Edge
40	166.024	14.500	MNB	2	29.000	on Median LHS & RHS EDGE
41	167.324	254.560	ROB	1	254.560	on LHS & RHS MCW Edge & on Median LHS & RHS EDGE
42	171.300	103.690	ROB	4	414.760	on LHS & RHS MCW Edge & on Median LHS & RHS EDGE
43	170.639	22.440	PUP	2	44.880	on LHS & RHS MCW Edge
44	170.639	15.100	PUP	2	30.200	on Median LHS & RHS EDGE
45	173.365	21.850	MNB	2	43.700	on LHS & RHS MCW Edge
46	173.365	16.000	MNB	2	32.000	on Median LHS & RHS EDGE
47	178.872	23.100	PUP	2	46.200	on LHS & RHS MCW Edge
48	178.872	15.100	PUP	2	30.200	on Median LHS & RHS EDGE
49	179.547	180.780	MJB	1	180.780	on LHS MCW Edge & on Median LHS EDGE
50	179.547	180.780	MJB	1	180.780	on RHS MCW Edge & on Median RHS EDGE
51	181.137	20.920	PUP	2	41.840	on LHS & RHS MCW Edge

Details of Concrete Crash Barrier						
Sr. No.	Chainage	Length (m)	Structure	Side	Total Length(m)	Remarks
52	181.137	15.100	PUP	2	30.200	on Median LHS & RHS EDGE
53	181.401	35.070	MNB	2	70.140	on LHS & RHS MCW Edge
54	181.401	28.220	MNB	2	56.440	on Median LHS & RHS EDGE
55	182.881	17.153	MNB	2	34.306	on LHS & RHS MCW Edge
56	182.881	14.500	MNB	2	29.000	on Median LHS & RHS EDGE
57	184.900	22.895	PUP	2	45.790	on LHS & RHS MCW Edge
58	184.900	15.100	PUP	2	30.200	on Median LHS & RHS EDGE
59	186.971	17.730	MNB	2	35.460	on LHS & RHS MCW Edge
60	186.971	17.730	MNB	2	35.460	on Median LHS & RHS EDGE
61	192.186	196.400	MJB	1	196.400	on LHS MCW Edge & on Median LHS EDGE
62	192.186	205.800	MJB	1	205.800	on RHS MCW Edge & on Median RHS EDGE
63	194.098	539.600	SH -FOB	2	1079.200	on LHS & RHS MCW Edge
64	195.880	52.310	MNB	2	104.620	on LHS & RHS MCW Edge
65	195.880	42.630	MNB	2	85.260	on Median LHS & RHS EDGE
66	197.933	237.870	MJB	1	237.870	on LHS MCW Edge & on Median LHS EDGE
67	197.933	248.550	MJB	1	248.550	on RHS MCW Edge & on Median RHS EDGE
68	198.818	16.205	MNB	2	32.410	on LHS & RHS MCW Edge
69	198.818	14.510	MNB	2	29.020	on Median LHS & RHS EDGE
70	199.099	20.380	PUP	2	40.760	on LHS & RHS MCW Edge
71	199.099	15.100	PUP	2	30.200	on Median LHS & RHS EDGE
72	201.985	21.010	PUP	2	42.020	on LHS & RHS MCW Edge
73	201.985	15.100	PUP	2	30.200	on Median LHS & RHS EDGE
74	203.979	20.610	PUP	2	41.220	on LHS & RHS MCW Edge
75	203.979	15.100	PUP	2	30.200	on Median LHS & RHS EDGE
76	209.298	151.000	MJB	1	151.000	on LHS MCW Edge & on Median LHS EDGE
77	209.298	150.600	MJB	1	150.600	on RHS MCW Edge & on Median RHS EDGE
78	212.471	11.800	MNB	2	23.600	on LHS & RHS MCW Edge
79	212.471	7.200	MNB	2	14.400	on Median LHS & RHS EDGE
80	213.525	24.570	MNB	2	49.140	on LHS & RHS MCW Edge
81	213.525	19.190	MNB	2	38.380	on Median LHS & RHS EDGE
Total Length					16005.704	

Pedestrian Guard Rails in a length of 4.226 Km are observed at service road and built-up area locations and are presented in Table below:

Table 17: Details of Pedestrian Guard Rails

S.no	Chainage(km)		Length(km)	Side	Condition	Damage	Remarks
	From	To					
1	131.570	132.110	0.540	LHS	Good	-	
2	138.650	139.180	0.530	LHS	Good	-	
3	153.765	153.870	0.105	LHS	Good	-	

S.no	Chainage(km)		Length(km)	Side	Condition	Damage	Remarks
	From	To					
4	153.520	153.600	0.080	LHS	Good	-	Paint Washed out
5	173.500	174.200	0.700	LHS	Good	4	
6	193.982	194.020	0.038	LHS	Good	-	
7	194.100	194.140	0.040	LHS	Good	-	
8	131.620	132.370	0.750	RHS	Good	-	
9	138.650	139.180	0.530	RHS	Good	-	
10	153.765	153.870	0.105	RHS	Good	-	
11	153.520	153.600	0.080	RHS	Good	-	
12	173.500	174.150	0.650	RHS	Good	-	
13	193.982	194.020	0.038	RHS	Good	-	
14	194.100	194.140	0.040	RHS	Good	-	
Total length(km)			4.226			4	

List of major and minor junctions developed are presented in table below:

**Table 18: List of Major Junctions**

S. No.	Existing Chainage	Design Chainage	Side	Category of Road	Type of Junction	Width of the access Road	Speed Breaker	Culvert	Sign boards	Remarks
1	152.100	152.050	LHS	Start of Piploid Bypass	Y	7.5	No	No	Give Way, Speed Breaker	At Under pass location
2	156.700	156.420	LHS	Piplod Bypass End	Y	7	No	Yes	Keep Left, Hazard, Signal Board, Give wayx2	
3	166.000	165.600	LHS	Limkheda Bypass End	Y	7	Yes	No	Keep Left, , Hazard, Signal Board, Give wayx2	
4	189.630	189.450	LHS	Entry to Dahod Town	Y	7	Yes	No	Keep Left, , Hazard, Signal Board	

**Table 19: List of Minor Junctions**

S.No.	Existing Chainage	Side	Carriageway Width (m)	Category	Sign Boards		Remarks
					Left	Right	
1	129.05	LHS	3	Village Road	Speed Breaker & Give Way		
2	129.07	RHS	3	Village Road		Give way	
3	132.359	RHS	3.5	Village Road		Give way	
4	132.937	RHS	3.5	Village Road			
5	133.429	RHS	3.5	Village Road		Give Way	
6	133.761	LHS	4	Village Road	Give Way		
7	134.642	RHS	3.5	Village Road		Give way	
8	135.361	LHS	3.5	Village Road	Give way		

S.No.	Existing Chainage	Side	Carriageway Width (m)	Category	Sign Boards		Remarks
					Left	Right	
9	137.222	LHS	3	Village Road			
10	137.222	RHS	3	Village Road			
11	137.631	RHS	3.5	Village Road			
12	138.981	RHS	5	Village Road			
13	139.033	LHS	5	Village Road	Speed Breaker		
14	140.313	LHS	5	Village Road			
15	141.531	LHS	7.5	Village Road	Keep Left, Give way		At SR
16	141.612	RHS	7.5	Village Road			At SR
17	143.541	RHS	3	Village Road			
18	143.558	LHS	5.5	Village Road			
19	146.556	RHS	5	Village Road			
20	154.756	RHS	3.5	Village Road			
21	154.784	LHS	3.5	Village Road			
22	156.531	LHS	5	Village Road			
23	159.545	LHS	6	Village Road	Speed breaker & Give way		
24	159.517	RHS	4	Village Road			
25	160.289	LHS	3.5	Village Road	Give way		
26	163.061	RHS	3.5	Village Road			
27	163.051	LHS	3.5	Village Road			
28	163.321	RHS	3.5	Village Road		Give way, Speed Breaker	
29	163.311	LHS	7	Village Road	Give Way		
30	168.704	RHS	3	Village Road			
31	169.242	LHS	3.5	Village Road	Give way		
32	169.284	RHS	3	Village Road		Give way	
33	170.44	LHS	3	Village Road			
34	172.066	RHS	3.5	Village Road		Give way	Damage
35	174.085	RHS	3	Village Road			
36	174.783	LHS	3.5	Village Road	Speed breaker & Give way		Damage
37	175.197	LHS	3.5	Village Road			
38	175.424	RHS	3	Village Road		Speed breaker & Give way	
39	178.199	RHS	6	Village Road		Speed breaker & Give way	
40	178.673	LHS	7	Village Road	Speed breaker & Give way		
41	179.391	LHS	7	Village Road	Give Way		
42	179.772	RHS	3.5	Village Road		Give Way	
43	179.782	LHS	3.5	Village Road	Give Way		

S.No.	Existing Chainage	Side	Carriageway Width (m)	Category	Sign Boards		Remarks
					Left	Right	
44	184.249	LHS	3	Village Road	Give Way & Major Road ahead		
45	188.067	LHS	7	NH-59	Hazard, Give Way		
46	189.832	RHS	4	Village Road			
47	190.194	LHS	4	Village Road	Give way		
48	190.194	RHS	3.5	Village Road			
49	190.927	LHS	6	Village Road	Give way, Speed Breaker & ADS		
50	190.927	RHS	3.5	Village Road		Give way	
51	192.939	LHS	4	Village Road	Give Way & Speed Breaker		
52	192.939	RHS	4	Village Road		Give way	
53	194.608	LHS	7	Village Road	keep left, Hazard		
54	194.874	LHS	6	Village Road			
55	196.693	LHS	3.5	Village Road	Give Way & Speed Breaker		
56	197.953	LHS	4	Village Road	Give Way & Speed Breaker		
57	198.393	LHS	3	Village Road	Give Way		
58	198.56	RHS	4	Village Road		Give Way & Speed Breaker	
59	199.237	LHS	3.5	Village Road	Give Way & Speed Breaker		
60	199.246	RHS	3.5	Village Road		Give Way & Speed Breaker	
61	199.665	LHS	3.5	Village Road	Give Way & Speed Breaker		
62	200.937	LHS	3	Village Road			
63	201.281	LHS	3	Village Road	Give way		
64	201.563	LHS	4	Village Road	Give Way & Speed Breaker		
65	203.07	RHS	5.5	Village Road		Give Way & Speed Breaker	
66	203.37	LHS	3	Village Road			
67	203.391	RHS	3	Village Road			
68	204.457	RHS	7	Village Road		Give Way & Speed Breaker	
69	204.8	RHS	2.5	Village Road		Stop & Speed breaker	
70	207.583	LHS	3	Village Road			
71	208.433	LHS	3	Village Road			
72	209.138	LHS	4	Village Road			
73	210.5	LHS	4	Village Road			
74	212.304	LHS	4	Village Road			
75	212.297	RHS	4	Village Road			

S.No.	Existing Chainage	Side	Carriageway Width (m)	Category	Sign Boards		Remarks
					Left	Right	
76	212.789	LHS	3	Village Road	Stop		
77	212.903	LHS	3	Village Road	Stop		
78	212.951	RHS	3	Village Road			
79	213.413	RHS	3	Village Road		Give way	
80	214.515	LHS	3	Village Road	Give Way & Speed Breaker		
81	214.527	RHS	3.5	Village Road		Give Way & Speed Breaker	

Road furniture in the form of Signs/Markings, Gantry signs and traffic safety blinkers, lighting, high mast lights have been provided along the project road at few locations and are presented in the Tables below:

**Table 20: Locations of High mast Lighting**

S. No.	Chainage (km)	No of Poles	Side	Location	Condition	Remarks
1	127.900	1	Median	Junction	Good	
2	141.200	1	LHS	Junction	Good	
3	146.200	4	Both sides	TOLL PLAZA	Good	
4	153.700	2	Both sides	OVER PASS	Good	
5	194.200	2	Both sides	OVER PASS	Good	

**Table 21: Locations of Highway Lighting along Main Carriageway**

S.No.	Chainage(km)		Side	No. of Light poles		Location	Remarks
	From	To		Single arm	Double arm		
1	127.848	128.15		-	7	Median	
2	131.6	131.9	Median	-	8		
3	131.61	132.11	LHS	-	11	Between MCW & SR	
4	131.61	132.11	LHS	4	-	On Service Road	
5	131.61	132.36	RHS	-	11	Between MCW & SR	1 Damaged
6	131.61	132.36	RHS	6	-	SR edge	
7	132	132.6	Median	-	18		
8	134.2	134.45	LHS	11	-	TRUCK LAY BAY	
9	134.2	134.45	RHS	11	-	TRUCK LAY BAY	
10	134.2	134.6	Median	-	16		
11	138.5	138.7	Median	-	5		
12	138.65	139.2	LHS	-	13	ON SEPARATOR	
13	138.65	139.2	RHS	-	13	ON SEPARATOR	
14	139	139.4	Median	-	5		

S.No.	Chainage(km)		Side	No. of Light poles		Location	Remarks
	From	To		Single arm	Double arm		
15	140.6	140.8	Median	-	11		
16	140.8	141.6	LHS	-	27	B/W VUP&CW	
17	140.8	141.6	RHS	24	-	B/W VUP&MCW	
18	141.8	141.4	Median	-	11		
19	142	143.7	Median	-	10		
20	145	146	at TP Median	-	15		
21	146.2	146.4	Median	-	4		
22	146.6	147.6	LHS	30		B/W VUP&MCW	
23	146.6	147.6	RHS	-	33	B/W VUP&SR	
24	147.6	147.8	Median	-	4		
25	153.3	153.4	LHS	4	-	SLIP ROAD	
26	153.3	153.4	RHS	4	-	SLIP ROAD	
27	153.6	154	Median	-	14		
28	153.765	153.87	LHS	4	-	SLIP ROAD	
29	153.765	153.87	RHS	4	-	SLIP ROAD	
30	153.765		On SH Over Pass		10	On SH OverPass	
31	157.56	158	LHS	11	-	TRUCK LAY BAY	
32	157.56	158	RHS	11	-	TRUCK LAY BAY	
33	157.8	158	Median	-	13		
34	173.5	174.15	LHS	-	17	ON SEPARATOR	
35	173.5	174.15	RHS	-	17	B/W MCW&SR	
36	173.5	174.2	Median	-	13		
37	190.3	190.7	LHS	11	-	TRUCK LAY BAY	
38	190.3	190.7	RHS	10	-	TRUCK LAY BAY	
39	190.3	190.7	Median	-	15		
40	193.4	194	Median	-	7		
41	193.8	194	LHS	2	-	On Slip Road Edge	
42	193.8	194	RHS	2	-	On Slip Road Edge	
43	194	194.2	LHS	2	-	On Slip Road Edge	
44	194	194.2	RHS	2	-	On Slip Road Edge	
45	194	194.6	Median	-	7		
46	194.1		On SH Overpass		14	On SH Overpass	
<b>Total No of Light poles</b>				<b>153</b>	<b>349</b>		<b>1</b>

The project Road has 24 number of bus bays with bus shelters and it has forty (40nos) of only bus shelters without bus bays along the project Road. The details of the bus shelter are provided below

**Table 22: Details of Bus Shelters**

S. No.	Chainage (km)	Side	As per Site	Facilities Provided		Remarks
				PGR	Single arm Lightning	
1	129.300	LHS	Bus Bay with shelter	-	-	
2	129.500	RHS	Bus Bay with shelter	-	-	
3	131.780	LHS	Bus Shelter	-	-	SERVICE ROAD
4	131.780	RHS	Bus Shelter	-	-	SERVICE ROAD
5	137.550	LHS	Bus Shelter	-	-	
6	137.550	RHS	Bus Shelter	-	-	
7	138.900	LHS	Bus Shelter	-	-	SERVICE ROAD
8	138.900	RHS	Bus Shelter	-	-	SERVICE ROAD
9	140.550	LHS	Bus Bay with shelter	-	-	
10	140.750	RHS	Bus Bay with shelter	-	-	
11	141.850	RHS	Bus Bay with shelter	-	-	
12	142.000	LHS	Bus Bay with shelter	-	-	
13	145.380	RHS	Bus Bay with shelter	-	-	
14	145.600	LHS	Bus Bay with shelter	-	-	
15	147.500	LHS	Bus Shelter	-	-	
16	147.430	RHS	Bus Shelter	-	-	SERVICE ROAD
17	151.150	LHS	Bus Bay with shelter	-	-	
18	151.300	RHS	Bus Bay with shelter	-	-	
19	156.900	LHS	Bus Bay with shelter	-	-	
20	157.080	RHS	Bus Bay with shelter	-	-	
21	158.430	LHS	Bus Shelter	-	-	
22	158.430	RHS	Bus Shelter	-	-	
23	159.680	LHS	Bus Shelter	-	-	
24	159.680	RHS	Bus Shelter	-	-	
25	160.080	LHS	Bus Bay with shelter	-	-	
26	160.230	RHS	Bus Bay with shelter	-	-	
27	166.450	LHS	Bus Bay with shelter	-	-	
28	166.600	RHS	Bus Bay with shelter	-	-	
29	169.150	LHS	Bus Shelter	-	-	
30	169.150	RHS	Bus Shelter	-	-	
31	170.300	LHS	Bus Shelter	-	-	
32	170.300	RHS	Bus Shelter	-	-	
33	172.100	LHS	Bus Shelter	-	-	
34	172.100	RHS	Bus Shelter	-	-	
35	173.130	LHS	Bus Shelter	-	-	
36	173.130	RHS	Bus Shelter	-	-	
37	175.500	LHS	Bus Shelter	-	-	
38	175.500	RHS	Bus Shelter	-	-	

S. No.	Chainage (km)	Side	As per Site	Facilities Provided		Remarks
				PGR	Single arm Lightning	
39	178.650	LHS	Bus Shelter	-	-	
40	178.650	RHS	Bus Shelter	-	-	
41	180.030	LHS	Bus Shelter	-	-	
42	180.030	RHS	Bus Shelter	-	-	
43	184.430	LHS	Bus Shelter	-	-	
44	184.430	RHS	Bus Shelter	-	-	
45	187.750	LHS	Bus Bay with shelter	-	-	
46	187.900	RHS	Bus Bay with shelter	-	-	
47	189.900	LHS	Bus Bay with shelter	-	-	
48	190.100	RHS	Bus Bay with shelter	-	-	
49	196.050	LHS	Bus Shelter	-	-	
50	196.050	RHS	Bus Shelter	-	-	
51	201.400	LHS	Bus Shelter	-	-	
52	201.400	RHS	Bus Shelter	-	-	
53	202.950	LHS	Bus Bay with shelter	-	-	
54	203.250	RHS	Bus Bay with shelter	-	-	
55	204.300	LHS	Bus Bay with shelter	-	-	
56	204.620	RHS	Bus Bay with shelter	-	-	
57	209.100	LHS	Old Bus Shelter	-	-	
58	209.100	RHS	Bus Shelter	-	-	
59	210.420	LHS	Bus Shelter	-	-	
60	210.420	RHS	Bus Shelter	-	-	
61	211.380	LHS	Bus Shelter	-	-	
62	211.380	RHS	Bus Shelter	-	-	
63	212.950	LHS	Bus Shelter	-	-	
64	212.900	RHS	Bus Shelter	-	-	

### 1.5.2 Bridge Works

List of Bridges found during the inventory surveys along the corridor are as follows:

**Table 23: Details of CD & Other Structures**

S. No.	Chainage	Type of Structures	Side	Age of Structure	Span as per Schedule	Span as per Site	Deck width as per site	Structure in Schedule	Structure on Site	Skew angle
1	128+371	VUP	BHS	New	1 x 10.5 x 6	1 x 15 x 6	20.5	YES	YES	20
2	131+321	PUP	BHS	New	1 x 7 x 3.5	1 x 7 x 3.5	20.5	YES	YES	-
3	136+216	MNB	BHS	New	1 x 12.2	2 x 6.8	34	YES	YES	-
4	137+083	ROB	LHS	New	2 x 20 + 2 x 28.791	2 x 28 + 1 x 30.5	10.25	YES	YES	30
5	137+083	ROB	RHS	New	2 x 20 + 2 x 28.791	2 x 28 + 1 x 30.5	10.25	YES	YES	30

S. No.	Chainage	Type of Structures	Side	Age of Structure	Span as per Schedule	Span as per Site	Deck width as per site	Structure in Schedule	Structure on Site	Skew angle
6	140+405	MJB	LHS	New	9 x 20.73	9 x 20.73	10.25	YES	YES	-
7	140+405	MJB	RHS	Old	9 x 20.73	9 x 20.73	8	YES	YES	-
8	140+396	PUP	BHS	New	1 x 7 x 3.5	1 x 7 x 3.5	20.5	YES	YES	-
9	141+526	Flyover	LHS	New	2 x 15	2 x 15	10.25	YES	YES	-
10	144+251	PUP	BHS	New	1 x 7 x 3.5	1 x 7 x 3.5	20.5	YES	YES	-
11	144+827	ROB	LHS	New	3 x 17.10 + 3 x 44.683	3 x 36 + 1 x 18	10.25	YES	YES	35
12	144+827	ROB	RHS	New	3 x 17.10 + 3 x 44.683	3 x 36 + 1 x 18	10.25	YES	YES	35
13	145+944	MNB	BHS	New	1 x 1.2	2 x 5.5	67.5	YES (As per Schedule PC)	YES	40
14	145+305	MNB	BHS	New	1 x 1.2	1 x 6	20.5	YES (As per Schedule PC)	YES	-
15	146+944	MNB	BHS	New	2 x 6.8	2 x 6.8	20.5	YES	YES	20
16	146+944	MNB	RHS	New	2 x 6.8	2 x 6.8	9	YES	YES	20
17	147+445	Flyover	RHS	New	2 x 15	2 x 15	10.25	YES	YES	-
18	152+026	VUP	BHS	New	-	1 x 10.5 x 6	20.5	NO	YES	-
19	153+966	Overpass	BHS	New	2 x 10 + 2 x 15	2 x 10 + 2 x 15	12.5	YES	YES	-
20	155+241	PUP	BHS	New	1 x 7 x 3.5	1 x 7 x 3.5	20.5	YES	YES	-
21	157+217	MNB	LHS	New	3 x 7.6	2 x 11	10.25	YES	YES	-
22	157+217	MNB	RHS	New	3 x 7.6	2 x 11	10.25	YES	YES	-
23	160+930	VUP	BHS	New	1 x 10.5 x 6	1 x 10.5 x 6	20.5	YES	YES	-
24	161+765	PUP	BHS	New	1 x 7 x 3.5	1 x 7 x 3.5	20.5	YES	YES	-
25	162+914	VUP	BHS	New	1 x 10.5 x 6	1 x 10.5 x 6	20.5	YES	YES	-
26	163+400	PUP	BHS	New	1 x 7 x 3.5	1 x 7 x 3.5	20.5	YES	YES	-
27	163+970	MJB	LHS	New	4 x 20.2	4 x 20.2	10.25	YES	YES	-
28	163+970	MJB	RHS	New	4 x 20.2	4 x 20.2	10.25	YES	YES	-
29	164+166	MNB	LHS	New	3 x 10	3 x 10	10.25	YES	YES	20
30	164+116	MNB	RHS	New	3 x 10	3 x 10	10.25	YES	YES	20
31	166+024	MNB	LHS	New	1 x 6.85	1 x 6.85	10.25	YES	YES	-
32	166+024	MNB	RHS	New	1 x 6.85	1 x 6.85	10.25	YES	YES	-
33	167+324	ROB	LHS	New	2 x 11.75	1 x 54	10.25	YES	YES	20
34	167+324	ROB	RHS	New	2 x 11.75	1 x 54	10.25	YES	YES	20
35	170+639	PUP	BHS	New	1 x 7 x 3.5	1 x 7 x 3.5	20.5	YES	YES	-
36	171+300	ROB	LHS	New	2 x 15 + 2 x 15.68	1 x 36 + 1 x 37 + 1 x 19	10.25	YES	YES	-
37	171+300	ROB	RHS	New	2 x 15 + 2 x 15.68	1 x 36 + 1 x 37 + 1 x 19	10.25	YES	YES	-
38	171+300	ROB	LHS	-	2 x 15 + 2 x 15.68	-	-	YES	NO	-

S. No.	Chainage	Type of Structures	Side	Age of Structure	Span as per Schedule	Span as per Site	Deck width as per site	Structure in Schedule	Structure on Site	Skew angle
39	171+300	ROB	RHS	-	2 x 15 + 2 x 15.68	-	-	YES	NO	-
40	171+660	MNB	BHS	New	3 x 7.6	3 x 7.55	39.5	YES (As per Schedule BC)	YES	-
41	173+365	MNB	LHS	New	1 x 8.4	1 x 8.4	10.25	YES	YES	-
42	173+365	MNB	RHS	New	1 x 8.4	1 x 8.4	10.25	YES	YES	-
43	178+872	PUP	BHS	New	1 x 7 x 3.5	1 x 7 x 3.5	20.5	YES	YES	-
44	179+547	MJB	LHS	New	3 x 24.81	4 x 20	10.25	YES (As per Schedule MNB)	YES	-
45	179+547	MJB	RHS	New	3 x 24.81	4 x 20	10.25	YES (As per Schedule MNB)	YES	-
46	181+137	PUP	BHS	New	1 x 7 x 3.5	1 x 7 x 3.5	20.5	YES	YES	-
47	181+401	MNB	LHS	Old	2 x 10.3	2 x 10.3	10.25	YES	YES	-
48	181+401	MNB	RHS	New	2 x 10.3	2 x 10.3	10.25	YES	YES	-
49	182+881	MNB	BHS	New	1 x 6.3	1 x 6.3	20.5	YES	YES	-
50	184+900	PUP	BHS	New	1 x 7 x 3.5	1 x 7 x 3.5	20.5	YES	YES	-
51	186+971	MNB	LHS	Old	1 x 11.82	2 x 4.3	13.25	YES	YES	-
52	186+971	MNB	RHS	New	1 x 11.82	1 x 11.82	10.25	YES	YES	-
53	192+186	MJB	LHS	New	5 x 16	5 x 16	10.25	YES	YES	-
54	192+186	MJB	RHS	Old	5 x 16	5 x 16	8.2	YES	YES	-
55	194+098	Overpass	BHS	New	2 x 10 + 2 x 15	2 x 10 + 2 x 15	12.5	YES	YES	-
56	195+880	MNB	LHS	New	5 x 7	3 x 11.7	10.25	YES	YES	-
57	195+880	MNB	RHS	New	5 x 7	3 x 11.7	10.25	YES	YES	-
58	197+933	MJB	LHS	New	10.55 + 24.7 + 25.9 + 22.4 + 11.2	10.55 + 24.7 + 25.9 + 22.4 + 11.2	10.25	YES	YES	-
59	197+933	MJB	RHS	Old	10.55 + 24.7 + 25.9 + 22.4 + 11.2	10.55 + 24.7 + 25.9 + 22.4 + 11.2	8.5	YES	YES	-
60	198+818	MNB	LHS	New	1 x 6.7	1 x 6.7	10.25	YES	YES	-
61	198+818	MNB	RHS	Old	1 x 6.7	1 x 6.7	12.4	YES	YES	-
62	199+099	PUP	BHS	New	1 x 7 x 3.5	1 x 7 x 3.5	20.5	YES	YES	-
63	201+985	PUP	BHS	New	1 x 7 x 3.5	1 x 7 x 3.5	20.5	YES	YES	-
64	203+979	PUP	BHS	New	1 x 7 x 3.5	1 x 7 x 3.5	20.5	YES	YES	-
65	208+780	VUP	BHS	-	1 x 10.5 x 6	-	-	YES	NO	-
66	209+298	MJB	LHS	Old	4 x 15.3	4 x 15.3	8	YES	YES	-
67	209+298	MJB	RHS	New	4 x 15.3	4 x 15.3	10.25	YES	YES	-
68	212+471	MNB	LHS	Old	1 x 6.1	1 x 6.1	12.1	YES	YES	-

S. No.	Chainage	Type of Structures	Side	Age of Structure	Span as per Schedule	Span as per Site	Deck width as per site	Structure in Schedule	Structure on Site	Skew angle
69	212+471	MNB	RHS	New	1 x 6.1	1 x 6.1	10.25	YES	YES	-
70	213+525	MNB	LHS	Old	2 x 5.9	2 x 5.9	10.25	YES	YES	-
71	213+525	MNB	RHS	New	1 x 11.85	2 x 5.9	10.25	YES	YES	-

## 1.6 QUALITY AUDIT

### 1.6.1 Embankment & Subgrade

The embankment soil appears to be clayey sand in nature and embankment appears to be in good condition over the entire length of project. No major settlements or depressions have been noted even at high embankment locations. There are no marshy/water logging areas along the length of project road.

The subgrade of the project road appears to be in good condition as revealed by test pit investigations. Laboratory results conducted on subgrade indicates that most of subgrade soils are of coarse-grained soils. Condition of subgrade appears to intact as no major evidence of subsidence of depressions exists along the corridor. CBR of subgrade soils for lab testing indicates a good value greater than 10% at all the locations. Results of Subgrade CBR are as follows:

**Table 24: Details of Soaked CBR values**

Lab Sample No	Site Identification		Grain Size Analysis					Atterberg Limits (%)			Soil Class	MDD (gm/cc)	OMC (%)	Soaked CBR 97% MDD	Free Swelling Index (%)
	Location (km)	Up/Dn	Percentage passing from					LL	PL	PI					
			4.75 mm IS Sieve	425 mic IS Sieve	75 mic IS Sieve	Gravel %	Sand %								
GMP-TP-1	130+000	LHS	87	41	21	13	66	-	NP	NP	SM	2.07	8.20	15.09	8.00
GMP-TP-2	134+950	RHS	84	47	15	16	69	-	NP	NP	SM	1.98	9.80	9.64	13.04
GMP-TP-3	139+400	LHS	86	76	33	14	53	25	18	7	SM-SC	2.06	8.80	15.32	25.00
GMP-TP-4	143+200	RHS	95	71	30	5	65	-	NP	NP	SM	1.98	9.80	9.64	22.73
GMP-TP-5	150+000	LHS	77	49	22	23	55	-	NP	NP	SM	2.02	9.80	15.09	20.00
GMP-TP-6	155+400	RHS	75	67	48	25	27	31	18	13	SC	1.85	12.00	9.63	20.00
GMP-TP-7	159+800	LHS	89	73	49	11	40	24	19	5	SM-SC	2.04	9.20	15.33	36.84
GMP-TP-8	165+150	RHS	87	71	48	13	39	-	NP	NP	SM	1.94	10.60	11.19	14.29
GMP-TP-9	170+000	LHS	58	41	27	42	31	31	24	7	GM-GC	2.14	11.20	18.73	16.67
GMP-TP-10	174+400	RHS	62	42	34	38	28	27	21	6	GM-GC	2.09	10.40	18.73	20.00
GMP-TP-11	179+800	LHS	16	8	6	84	10	50	30	20	GP-GC	2.13	10.20	21.46	20.00
GMP-TP-12	185+400	RHS	62	19	15	38	47	39	25	14	SC	1.88	14.20	9.44	36.00
GMP-TP-13	190+000	LHS	84	66	52	16	32	30	19	11	CL	1.95	10.40	7.54	14.29
GMP-TP-14	194+600	RHS	65	33	27	35	38	37	21	16	SC	1.82	11.60	9.63	21.43
GMP-TP-15	200+000	LHS	69	40	31	31	38	31	20	11	SC	1.97	10.40	10.51	17.39

Lab Sample No	Site Identification		Grain Size Analysis					Atterberg Limits (%)			Soil Class	MDD (gm/cc)	OMC (%)	Soaked CBR 97% MDD	Free Swelling Index (%)
	Location (km)	Up/Dn	Percentage passing from					LL	PL	PI					
			4.75 mm IS Sieve	425 mic IS Sieve	75 mic IS Sieve	Gravel %	Sand %								
GMP-TP-16	205+200	RHS	73	40	35	27	38	34	20	14	SC	1.91	12.20	10.51	15.38
GMP-TP-17	210+300	LHS	76	41	31	24	45	40	27	13	SC	2.04	6.80	15.28	12.00
GMP-TP-18	214+900	RHS	69	27	18	31	51	50	32	18	SC	1.59	23.60	NA	16.67
GMP-SR-TP-19	140+800	LHS	80	61	34	20	46	25	18	7	SM-SC	1.94	9.40	8.32	27.27
GMP-SR-TP-20	173+560	RHS	83	65	46	17	37	27	18	9	SC	2.03	9.00	15.28	30.43

All the samples meeting the required limits for the subgrade criteria as per MORT&H Specification except 1 sample having MDD less than 1.75 gm/cc;

**On the whole, it can be concluded that the existing subgrade is in good condition.**

### 1.6.2 Pavement Condition

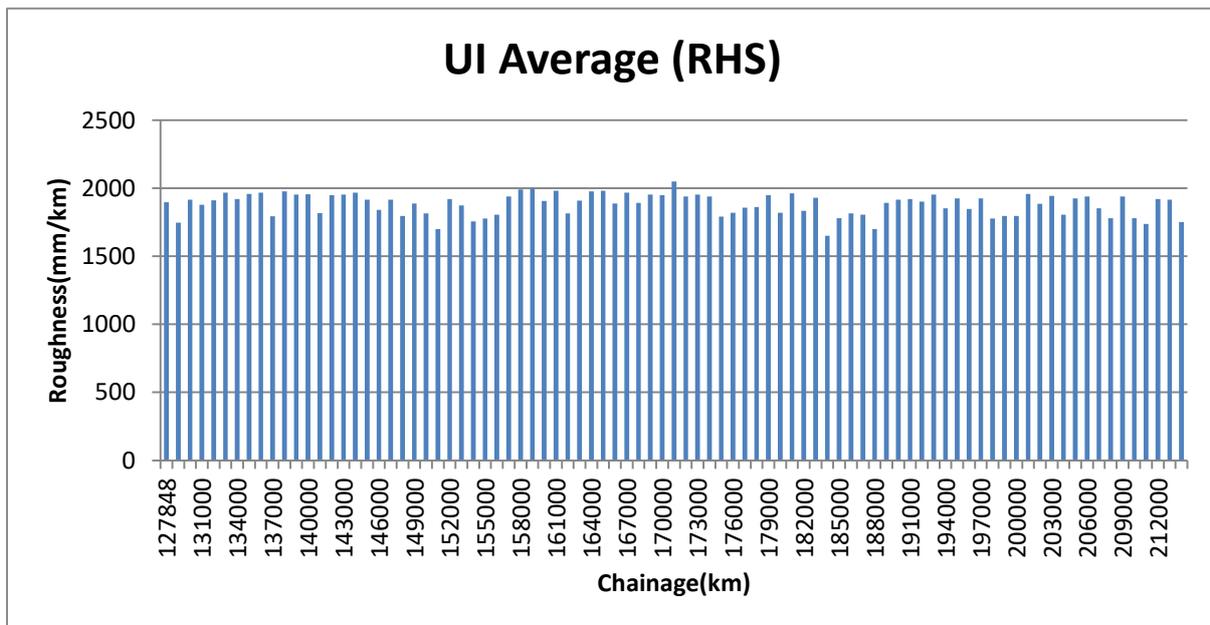
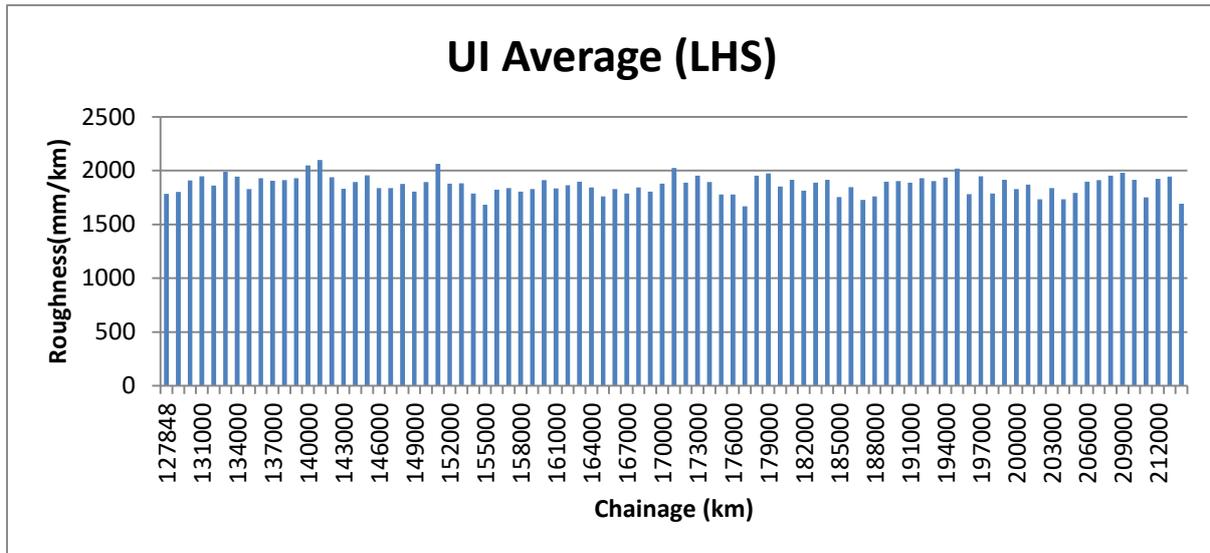
The condition of the Flexible Pavement is good as recent overly was done in the flexible pavement locations and kerb painting and road marking works were in progress.

The Condition of the Rigid Pavement is Good except at few locations, where the repair of few panels with epoxy patching over the raveled and cracked surface is done as part of major maintenance.

The Condition of the Service Road is good.

### 1.6.3 Roughness

The roughness surveys conducted along the corridor indicate good riding quality over the length of project corridor. Bar diagrams showing the Kilometer wise roughness along the project road are presented below:



Almost entire project road is having good riding quality. From the above charts, there is no Overlay requirement on Flexible Pavement (LHS & RHS carriageway) as the unevenness Index (UI) is less than 2500 mm/km. and the riding quality of Rigid pavement is good.

#### 1.6.4 Pavement Composition

Review of Pavement Design Report indicates that the Rigid Pavement has designed for 30 years period and TCS drawing shows crust composition for the main carriageway and service road is as:

Main carriageway	
PQC, mm	300
DLC, mm	150

Main carriageway	
GSB, mm	150
Total mm above Subgrade	600

However, from the test pits dug eighteen locations along the main carriageway indicates that the average PQC thickness is 297mm.

### 1.6.5 CD Structures

The CD structures along the corridor are constructed appears to be as per the standards and specifications as no design calculations/ as-built drawings for structures made available to verify the same. Presently, all structures appear new and seem to be in good condition without major distress. The Summary of Major Structures and culverts are as listed below

**Table 25: Summary of Major Structures including COS**

Item	As Per Schedule-B	As Per Site
Overpass	2	2
Flyover	2	2
Major Bridge	5	6
Minor Bridge	15	16
Pedestrian Underpass	13	13
Railway Over Bridge	5	4
Vehicular Underpass	4	4

**Table 26: Summary of culverts including COS**

Item	As Per Schedule-B	As Per Site
Slab Culvert	24	0
Box Culvert	7	32
Pipe Culvert	84	98
Pipe Not Found at Site	-	10

### Age of Structures:

S.no	Structure	LHS		RHS		BHS		Total (Nos)		Total No. of Structures
		Old	New	Old	New	Old	New	Old	New	
1	ROB	0	4	0	4	0	0	0	8	8
2	MJB	1	5	3	3	0	0	4	8	12
3	MNB	4	6	1	10	0	6	5	22	27
4	Flyover	0	1	0	1	0	0	0	2	2
5	VUP	0	0	0	0	0	4	0	4	4

6	PUP	0	0	0	0	0	13	0	13	13
7	Overpass	0	0	0	0	0	2	0	2	2
<b>Total:</b>		<b>5</b>	<b>16</b>	<b>4</b>	<b>18</b>	<b>0</b>	<b>25</b>	<b>9</b>	<b>59</b>	<b>68</b>

**Summary of Expansion joints and Bearings:**

S.no	Structure	Expansion joints		Bearings					
				Pot PTFE		Elastomeric		Metallic	
		Old	New	Old	New	Old	New	Old	New
1	ROB	0	30	0	200	0	16	0	0
2	MJB	29	41	0	0	108	266	24	0
3	MNB	0	0	0	0	0	0	0	0
4	Flyover	0	6	0	0	0	24	0	0
5	Overpass	0	10	0	0	0	56	0	0
<b>Total:</b>		<b>29</b>	<b>87</b>	<b>0</b>	<b>200</b>	<b>108</b>	<b>362</b>	<b>24</b>	<b>0</b>

**Summary of Super Structures:**

S.no	Structure	RCC Precast Panels & RCC Solid Slab	RCC Precast Panels	Steel Comp. Girder	Steel Comp. Girder & RCC Girder	Balanced Cantilever	RCC solid slab	RCC Box	RCC Girder	Total No. of Structures
1	ROB	0	0	6	2	0	0	0	0	8
2	MJB	0	7	0	0	2	1	0	2	12
3	MNB	0	10	0	0	0	7	10	0	27
4	Flyover	0	2	0	0	0	0	0	0	2
5	VUP	0	0	0	0	0	0	4	0	4
6	PUP	0	0	0	0	0	0	13	0	13
7	Overpass	2	0	0	0	0	0	0	0	2
<b>Total:</b>		<b>2</b>	<b>19</b>	<b>6</b>	<b>2</b>	<b>2</b>	<b>8</b>	<b>27</b>	<b>2</b>	<b>68</b>

**Deviations from Schedule:**

- MJB as per Schedule -B are 05 No's & as per Site are 06 No's.
- MNB as per Schedule -B are 15 No's & as per Site are 16 No's.
- Span deviations were observed in the following structure locations:

Concessionaire informed that the change in span arrangements were made as recommended by Authority/IE under COS works.

S. No.	Chainage	Type of Structures	Span as per Schedule	Span as per Site
1	137+083	ROB	2 x 20 + 2 x 28.791	2 x 28 + 1 x 30.5
2	144+827	ROB	3 x 17.10 + 3 x 44.683	3 x 36 + 1 x 18
3	167+324	ROB	2 x 11.75	1 x 54

S. No.	Chainage	Type of Structures	Span as per Schedule	Span as per Site
4	171+300	ROB	2 x 15 + 2 x 15.68	1 x 36 + 1 x 37 + 1 x 19
5	179+547	MJB	3 x 24.81	4 x 20
6	136+216	MNB	1 x 12.2	2 x 6.8
7	145+305	MNB	1 x 1.2	2 x 5.5
8	146+944	MNB	1 x 1.2	1 x 6
9	157+217	MNB	3 x 7.6	2 x 11
10	157+217	MNB	3 x 7.6	2 x 11
11	186+971	MNB	1 x 11.82	2 x 4.3
12	195+880	MNB	5 x 7	3 x 11.7
13	213+525	MNB	1 x 11.85	2 x 5.9

Structure wise conditions along the project corridor are presented below:

**BR. NO. 137+083 (ROB)**

**GENERAL DESCRIPTION**

• Name of bridge	:	Nanda Pura
• Chainage	:	Km 137+083
• Type of bridge	:	ROB
• Span Arrangement	:	2 x 28.0 + 1 x 30.5 m
• Total outer width of bridge	:	2 x 10.25 m
• Median Width	:	3.5 m
• Type of Foundation	:	Not Visible
• Type of substructure	:	RCC Circular Type
• Type of Superstructure	:	Steel Comp. Girders
• Type of Bearing	:	POT PTFE bearing.
• Type of Railing	:	RCC Crash barrier.
• Method of Inspection	:	Visual

**OBSERVATIONS**

Visual Observations on condition of the bridge are as below:

- The structure is in skew of nearly 30 degrees.
- RCC crash barrier is provided is in good condition.
- Stone pitching is provided on abutment location quadrant slopes is in good condition.

Refer the matter given at the end of the Document for Conclusions, Strategy for Renewals and Assumption for structure BOQ.





**BR. NO. 144+827 (ROB)**

**GENERAL DESCRIPTION**

• Name of bridge	:	Saliya
• Chainage	:	Km 144+827
• Type of bridge	:	ROB
• Span Arrangement	:	1 x 18 + 3 x 36 m
• Total outer width of bridge	:	2 x 10.25 m
• Median Width	:	6.2 m
• Type of Foundation	:	Not Visible
• Type of substructure	:	RCC Circular Type
• Type of Superstructure	:	Steel Comp. Girders and RCC Girders
• Type of Bearing	:	POT PTFE and Elastomeric bearing.
• Type of Railing	:	RCC Crash barrier.
• Method of Inspection	:	Visual

**OBSERVATIONS**

Visual Observations on condition of the bridge are as below:

- The bridge is in skew of nearly 35 degrees.
- Corrosion stains observed on pier cap and bottom of girders at BHS.
- RCC crash barrier is provided is in good condition.
- Fly wings provided on abutment location quadrant slopes are in good condition.

Refer the matter given at the end of the Document for Conclusions, Strategy for Renewals and Assumption for structure BOQ.





**BR. NO. 167+324 (ROB)**

**GENERAL DESCRIPTION**

• Name of bridge	:	Datiya
• Chainage	:	Km 167+324
• Type of bridge	:	ROB
• Span Arrangement	:	1 x 54.0 m
• Total outer width of bridge	:	2 x 10.25 m
• Median Width	:	2 m
• Type of Foundation	:	Not Visible
• Type of substructure	:	RCC Wall type
• Type of Superstructure	:	Steel Comp. Girders
• Type of Bearing	:	POT PTFE bearing.
• Type of Railing	:	RCC Crash Barrier
• Method of Inspection	:	Visual

**OBSERVATIONS**

Visual Observations on condition of the bridge are as below:

- The bridge is in skew of nearly 20 degrees.
- Abutments are in good condition.
- Steel Girders are in good condition.
- Stone pitching is provided on abutment location quadrant slopes is in good condition

Refer the matter given at the end of the Document for Conclusions, Strategy for Renewals and Assumption for structure BOQ.





**BR. NO. 171+300 (ROB)**

**GENERAL DESCRIPTION**

• Name of bridge	:	Mangal Mahudi
• Chainage	:	Km 171+300
• Type of bridge	:	ROB
• Span Arrangement	:	1 x 36.0 + 1 x 37.0 + 1 x 19.0 m
• Total outer width of bridge	:	2 x 10.25 m
• Median Width	:	3.5 m
• Type of Foundation	:	Not Visible
• Type of substructure	:	RCC Wall Type
• Type of Superstructure	:	Steel Comp. Girders
• Type of Bearing	:	POT PTFE bearing.
• Type of Railing	:	RCC Crash barrier.
• Method of Inspection	:	Visual

**OBSERVATIONS**

Visual Observations on condition of the bridge are as below:

- As per Schedule 2 ROB's at chainage specific ch:- 171+320 & 171+430 but As per site observations we found only one ROB at ch:- 171+320 with spans deviation.
- Abutments and piers are in good condition.
- Top slab is in good condition.
- RCC crash barrier is provided is in good condition.
- Wing wall provided on abutment location quadrant slopes is in good condition
- Sealant damaged in Expansion joint at some locations.

Refer the matter given at the end of the Document for Conclusions, Strategy for Renewals and Assumption for structure BOQ.





**BR. NO. 141+526 (Flyover)**

**GENERAL DESCRIPTION**

• Location of structure	:	Santroad Village
• Chainage	:	km 141+526 (LHS)
• Type of structure	:	Flyover
• Span Arrangement	:	2 x 15.0 m
• Total outer width of bridge	:	10.25 m
• Type of Foundation	:	Not Visible
• Type of substructure	:	RCC Wall Type
• Type of Superstructure	:	RCC Precast Panels
• Type of Bearing	:	Elastomeric
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- RE walls and side walls are in good condition.
- Damp spots observed on bottom of RCC Precast Panels.
- RCC crash barrier is provided is in good condition.

Refer the matter given at the end of the Document for Conclusions, Strategy for Renewals and Assumption for structure BOQ.





**BR. NO. 147+445 (Flyover)**

**GENERAL DESCRIPTION**

• Location of structure	:	Asayadi SH - 152 Crossing
• Chainage	:	Km 147+445 (RHS)
• Type of structure	:	Flyover
• Span Arrangement	:	2 x 15.0 m
• Total outer width of structure	:	10.25 m
• Type of Foundation	:	Not Visible
• Type of substructure	:	RCC Wall Type
• Type of Superstructure	:	RCC Precast Panels
• Type of Bearing	:	Elastomeric
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- RE walls and side walls are in good condition.
- Damp spots observed on bottom of RCC Precast Panels.
- Minor Honey combing observed on diaphragm.
- Strip seal damaged in Expansion joint at some locations.
- RCC crash barrier is provided is in good condition.

Refer the matter given at the end of the Document for Conclusions, Strategy for Renewals and Assumption for structure BOQ.





**BR. NO. 153+966 (Overpass)**

**GENERAL DESCRIPTION**

• Location of structure	:	Piploid SH - 62 Crossing
• Chainage	:	Km 153+966
• Type of structure	:	Overpass
• Span Arrangement	:	10.0 + 2 x 15.0 + 10.0 m
• Total outer width of structure	:	12.5 m
• Type of Foundation	:	Not Visible
• Type of substructure	:	RCC Wall Type
• Type of Superstructure	:	RCC Precast Panels and Solid slabs
• Type of Bearing	:	Elastomeric
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

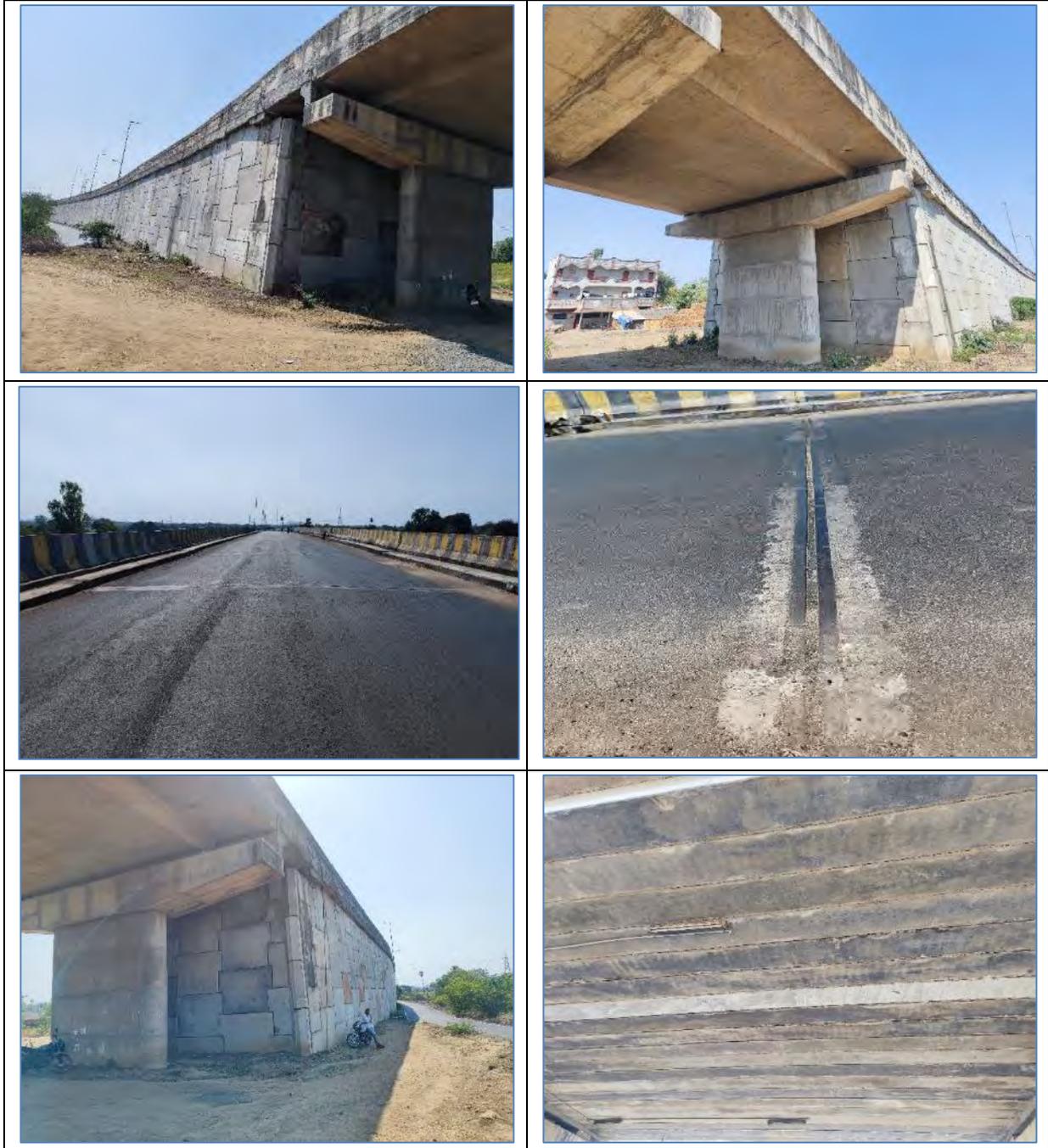
**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- RE walls are in good condition.
- Pedestal and panel damaged at some locations observed at LHS & RHS.
- Damp spots observed on bottom of RCC Precast Panels.
- Honey combing observed on dirt wall, diaphragm and pier cap.
- RCC crash barrier is provided is in good condition.

Refer the matter given at the end of the Document for Conclusions, Strategy for Renewals and Assumption for structure BOQ.





**BR. NO. 194+098 (Overpass)**

**GENERAL DESCRIPTION**

• Location of structure	:	Dahod Bypass SH - 58 Crossing
• Chainage	:	Km 194+098
• Type of structure	:	Overpass
• Span Arrangement	:	10.0 + 2 x 15.0 + 10.0 m
• Total outer width of structure	:	12.5 m
• Type of Foundation	:	Not Visible
• Type of substructure	:	RCC Wall Type
• Type of Superstructure	:	RCC Precast Panels and Solid slab
• Type of Bearing	:	Elastomeric
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- RE walls are in fair condition.
- Minor Honey combing on median pier
- RCC Solid Girders are in good condition and minor damp spots are observed in RCC Precast Panels.
- RCC crash barrier is provided is in good condition.

Refer the matter given at the end of the Document for Conclusions, Strategy for Renewals and Assumption for structure BOQ.





**BR. NO. 140+405 (MJB)**

**GENERAL DESCRIPTION**

• Location of bridge	:	Panam
• Chainage	:	Km 140+405
• Type of bridge	:	Major bridge
• Span Arrangement	:	9 x 20.73 m
• Total outer width of bridge	:	1 x 10.25 m (LHS) 1 x 8 m (RHS)
• Median	:	12.5 m
• Type of Foundation	:	Well (LCW) Open (RCW)
• Type of substructure	:	RCC Wall Type (LCW) Masonry Wall Type (RCW)
• Type of Superstructure	:	RCC Precast Panels (LCW) Balanced Cantilever (RCW)
• Type of Bearing	:	Elastomeric Rocker Roller
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

**OBSERVATIONS**

Visual Observations on condition of the bridge are as below:

**LHS Bridge (New):**

- Retaining wall and side walls are in good condition.
- Minor Damp spots observed on bottom of RCC Precast Panels.

**RHS Bridge (Old):**

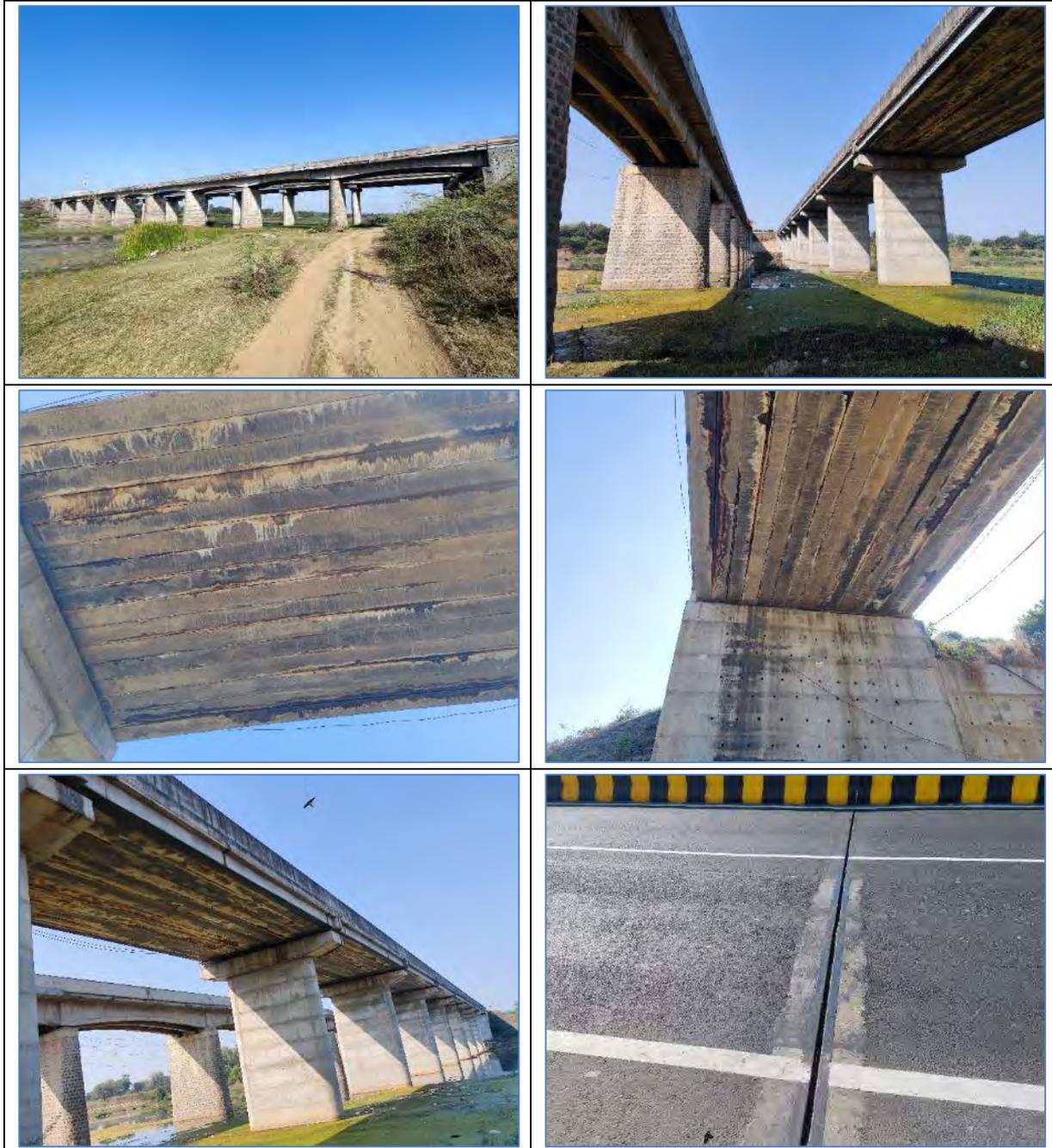
- Reinforcement steel exposed in top slab and Girders at few locations. (Repair Work is in Progress)
- Honey combing observed on diaphragm. (Repair Work is in Progress)
- Retaining wall is in good condition.
- Side walls are in fair condition.
- Sealant damaged at some locations in Expansion joint. (Repair Work is in Progress)
- Stone pitching is provided on abutment location is in good condition.

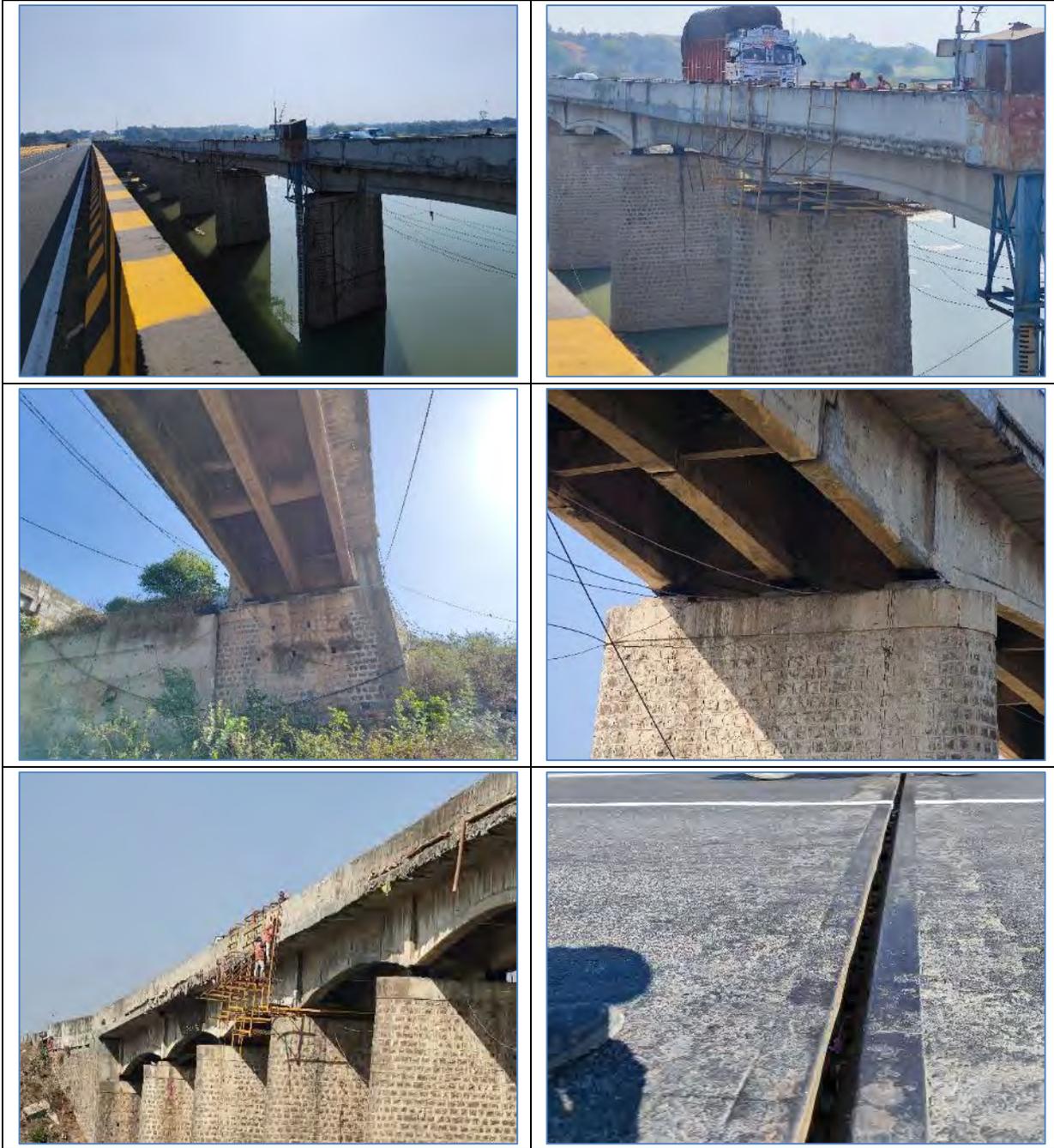
Refer the matter given at the end of the Document for Conclusions, Strategy for Renewals and Assumption for structure BOQ.

**IMPORTANT NOTE:**

MJB @ 140+331 (BALANCED CANTILEVER BRIDGE)

In the absence of seismic arresters and high degradation levels shown, the performance of the bridge during seismic event is to be ascertained by appropriate inspection and testing activity.





**BR. NO. 163+970 (MJB)**

**GENERAL DESCRIPTION**

• Name of bridge	:	Hadaf
• Chainage	:	km 163+970
• Type of bridge	:	Major bridge
• Span Arrangement	:	4 x 20.2 m
• Total outer width of bridge	:	2 x 10.25 m
• Type of Foundation	:	Not Visible
• Type of substructure	:	RCC Wall Type
• Type of Superstructure	:	RCC Precast Panels
• Type of Bearing	:	Elastomeric
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

**OBSERVATIONS**

Visual Observations on condition of the bridge are as below:

- RCC precast panels are in good condition.
- RCC crash barrier is provided is in good condition.
- Minor Honey combing observed on RCC precast panels.
- Stone pitching is provided on abutment location quadrant slopes is in good condition.
- Minor Damp spots observed on bottom of RCC Precast Panels at BHS.

Refer the matter given at the end of the Document for Conclusions, Strategy for Renewals and Assumption for structure BOQ.





**BR. NO. 179+547 (MJB)**

**GENERAL DESCRIPTION**

• Name of bridge	:	River Bridge
• Chainage	:	Km 179+547
• Type of bridge	:	Major Bridge
• Span Arrangement	:	4 x 20 m
• Total outer width of bridge	:	2 x 10.25 m
• Type of Foundation	:	Not Visible
• Type of substructure	:	RCC Wall Type
• Type of Superstructure	:	RCC Precast Panels
• Type of Bearing	:	POT PTFE
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

**OBSERVATIONS**

Visual Observations on condition of the bridge are as below:

- As per site Major Bridge, in schedule mentioned as Minor Bridge.
- This Bridge is in skew of nearly 15 degrees.
- Damp spots observed on bottom of RCC Precast Panels at BHS.
- Panels damage and Honey combing observed on bottom of RCC Precast Panels at some locations on RHS.
- Corrosion stains observed on bottom of RCC Precast Panels at RHS.
- Steel Exposed on bottom of RCC Precast Panels at RHS.
- RCC crash barrier is provided is in good condition.
- Stone pitching is provided on abutment location quadrant slopes is in good condition.
- Rubber sealant is damaged in some expansion joint location.

Refer the matter given at the end of the Document for Conclusions, Strategy for Renewals and Assumption for structure BOQ.





**BR. NO. 192+186 (MJB)**

**GENERAL DESCRIPTION**

• Name of bridge	:	Dudhimati
• Chainage	:	Km 192+186
• Type of bridge	:	Major Bridge
• Span Arrangement	:	5 x 16.0 m
• Total outer width of bridge	:	1 x 10.25 (LCW) 1x 8.2(RCW)
• Median	:	12.5 m
• Type of Foundation	:	Open
• Type of substructure	:	RCC Wall Type
• Type of Superstructure	:	RCC Precast Panels (LCW) RCC girder (RCW)
• Type of Bearing	:	Elastomeric
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

**OBSERVATIONS**

Visual Observations on condition of the bridge are as below:

**LHS bridge (New):**

- Damp spots observed on bottom of RCC Precast Panels.
- Rubber sealant is damaged in some expansion joint location.
- RCC crash barrier is in good condition except minor Reinforcement exposed.

**RHS bridge (Old):**

- Structure is in fair condition.
- Rubber sealant is damaged in some expansion joint location.

Refer the matter given at the end of the Document for Conclusions, Strategy for Renewals and Assumption for structure BOQ.





**BR. NO. 197+933 (MJB)**

**GENERAL DESCRIPTION**

• Name of bridge	:	Khan
• Chainage	:	Km 197+933
• Type of bridge	:	Major Bridge
• Span Arrangement	:	10.55 + 24.7 + 25.9 + 22.4 + 11.2 m
• Total outer width of bridge	:	1 x 10.25 m (LCW) 1 x 8.5 m (RCW)
• Type of Foundation	:	Well (LCW) Open (RCW)
• Type of substructure	:	RCC wall (LCW) Masonry (RCW)
• Type of Superstructure	:	RCC Solid slab (LCW) Balanced Cantilever (RCW)
• Type of Bearing	:	Elastomeric (LCW) Metallic bearings (RCW)
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

**OBSERVATIONS**

Visual Observations on condition of the bridge are as below:

**LHS bridge (New):**

- Honey combing observed on top slab.
- Rubber Sealant is damaged in some expansion joint locations.
- RCC crash barrier provided is in good condition.

**RHS bridge (Old):**

- Structure is in fair condition
- Rubber Sealant is damaged in some expansion joint locations.

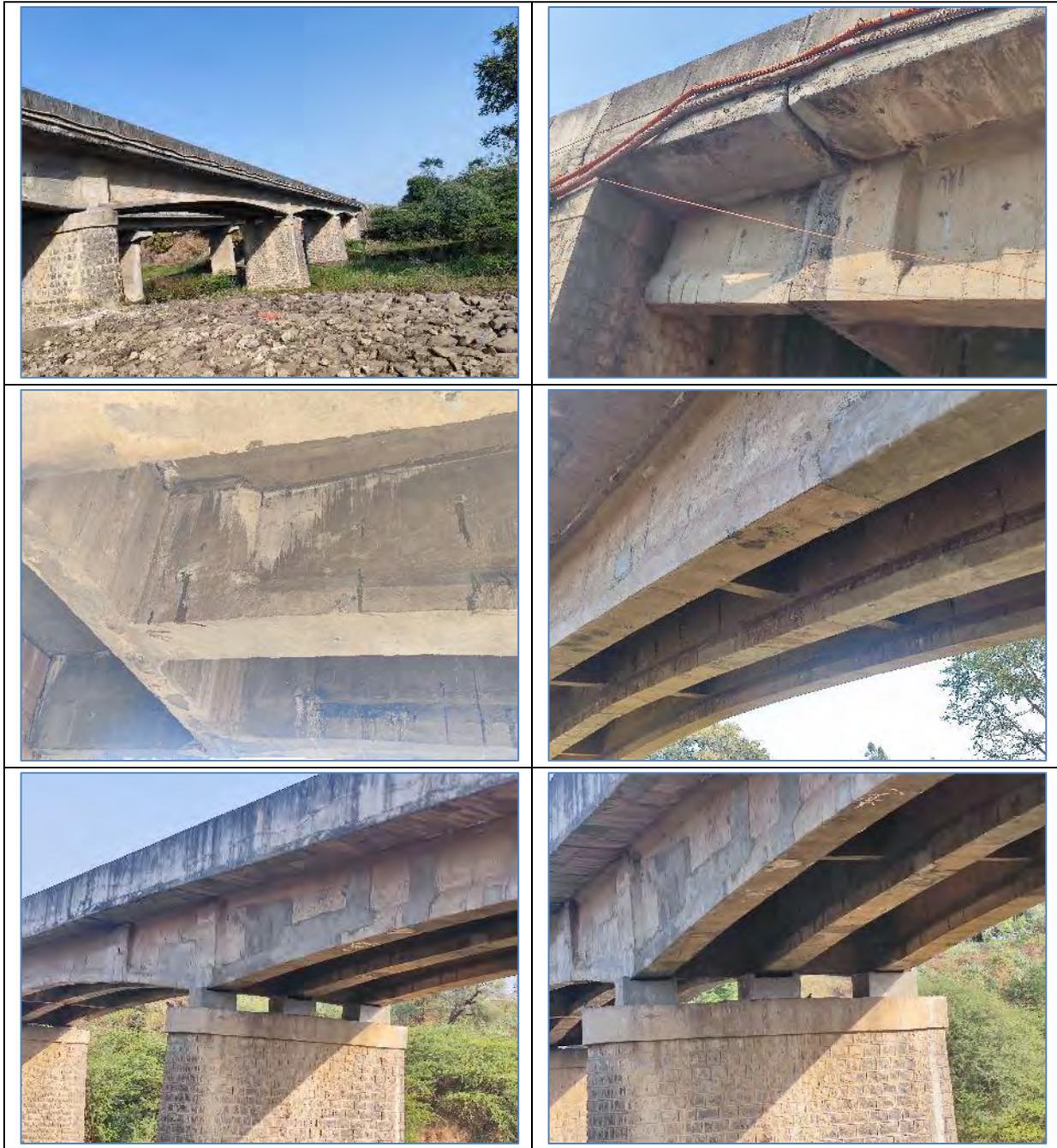
Refer the matter given at the end of the Document for Conclusions, Strategy for Renewals and Assumption for structure BOQ.

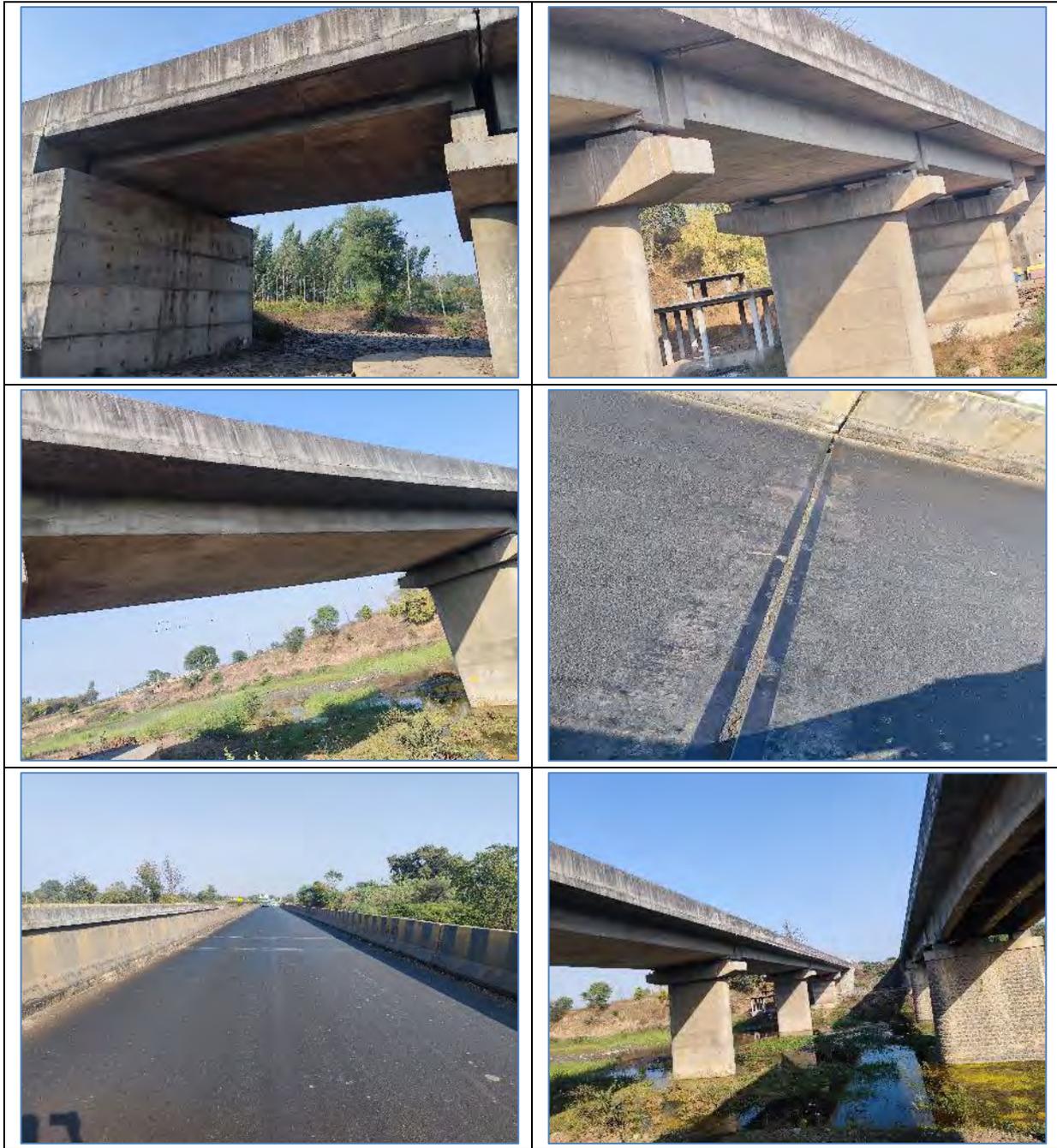
**IMPORTANT NOTE:**

MJB @ 197+956 (BALANCED CANTILEVER BRIDGE)

Review of NDT Report pertaining to Major bridge at 197+956 supplied by Concessionaire, indicates the following

- Concrete quality - Good
- Carbonation depth - 0 to 20mm
- Probability of Corrosion risk 10%





**BR. NO. 209+298 (MJB)**

**GENERAL DESCRIPTION**

• Name of bridge	:	Kali Nadi
• Chainage	:	Km 209+298
• Type of bridge	:	Major Bridge
• Span Arrangement	:	4 x 15.3 m
• Total outer width of bridge	:	1 x 8 m(LCW) 1 x 10.25 m (RCW)
• Median	:	12.5 m
• Type of Foundation	:	Open
• Type of substructure	:	RCC wall type
• Type of Superstructure	:	RCC girder (LCW) RCC Precast Panels (RCW)
• Type of Bearing	:	Elastomeric bearing (RCW)
• Type of Railing	:	RCC Crash barrier
• Method of Inspection:	:	Visual

**OBSERVATIONS**

Visual Observations on condition of the bridge are as below:

**LHS Bridge (Old):**

- Rubber Sealant is damaged in some expansion joint locations.

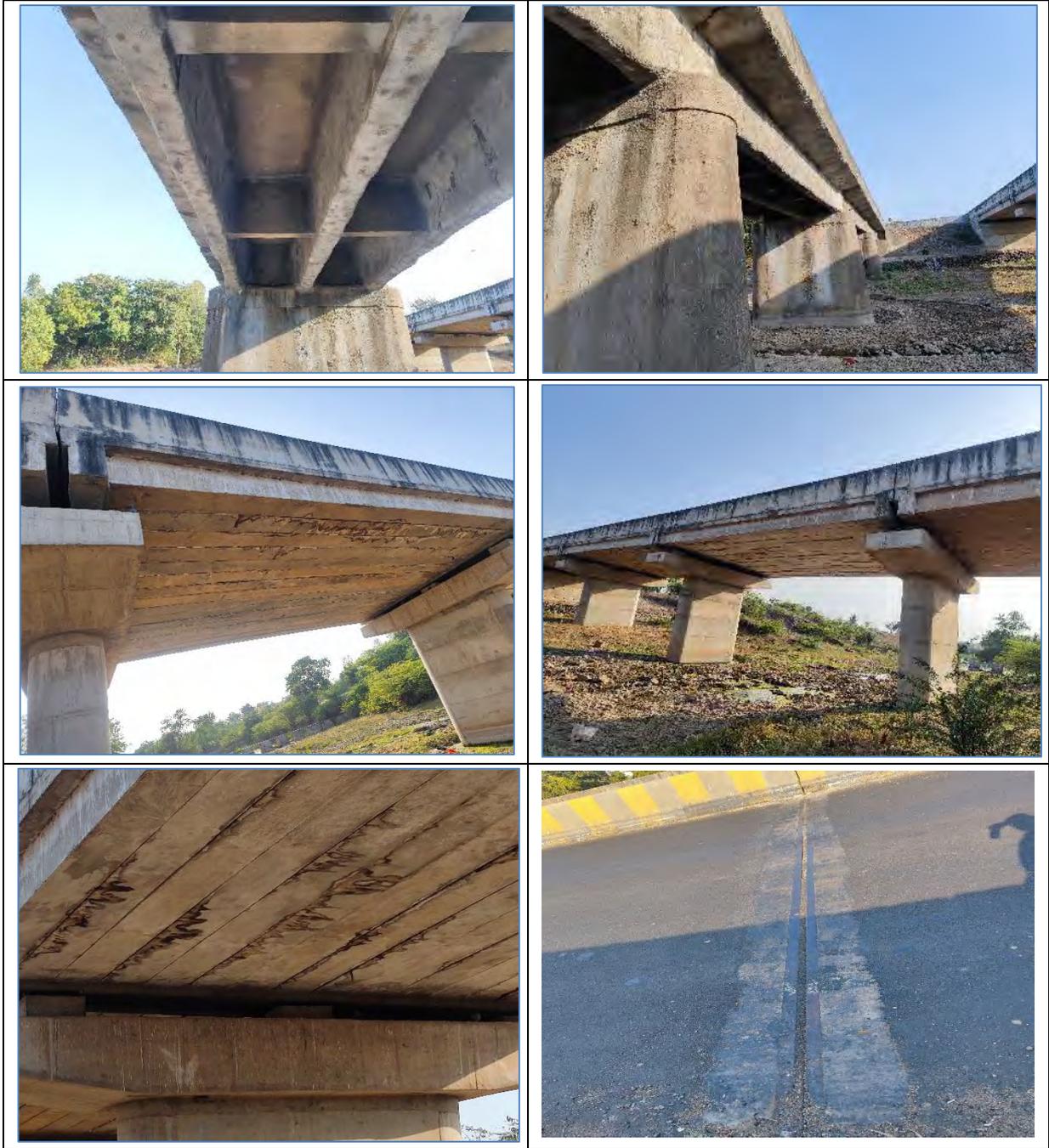
**RHS Bridge (New):**

- Rubber Sealant is damaged in some expansion joint locations.
- RCC crash barrier is provided is in good condition.
- Stone pitching is provided on abutment location quadrant slopes is in good condition.

Review of NDT Report pertaining to Major bridge at 209+361 supplied by Concessionaire, indicates the following

- Concrete quality -doubtful
- Carbonation depth - 0 to 20mm
- Probability of Corrosion risk 10%





**BR. NO. 136+216 (MNB)**

**GENERAL DESCRIPTION**

• Location of bridge	:	-
• Chainage	:	Km 136+216
• Type of bridge	:	Minor bridge
• Span Arrangement	:	2 x 6.8m
• Total outer width of bridge	:	1 x 34 m
• Median Width	:	3.5 m
• Type of Foundation	:	Raft
• Type of substructure	:	RCC Box
• Type of Superstructure	:	RCC Box
• Method of Inspection	:	Visual

**OBSERVATIONS**

Visual Observations on condition of the bridge are as below:

- Overall condition is good but Hairline cracks observed on side walls.
- Leaching observed in construction joint at median location.
- Minor Corrosion stains observed on top slab.
- Stone pitching is provided on abutment location quadrant slopes is in good condition.



**BR. NO. 144+944 (MNB)**

**GENERAL DESCRIPTION**

• Name of bridge	:	-
• Chainage	:	km 144+944
• Type of bridge	:	Minor bridge
• Span Arrangement	:	2 x 5.5 m
• Total outer width of bridge	:	1 x 67.5 m
• Median Width	:	3.5 m
• Type of Foundation	:	Raft
• Type of substructure	:	RCC Box
• Type of Superstructure	:	RCC Box
• Method of Inspection	:	Visual

**OBSERVATIONS**

Visual Observations on condition of the bridge are as below:

- As per site Minor Bridge, in schedule it is mentioned as Pipe Culvert.
- This Bridge is in skew of nearly 40 degrees.



**BR. NO. 145+305 (MNB)**

**GENERAL DESCRIPTION**

• Name of bridge	:	-
• Chainage	:	km 145+305
• Type of bridge	:	Minor bridge
• Span Arrangement	:	1 x 6 m
• Total outer width of bridge	:	2 x 10.25 m
• Median Width	:	3.5 m
• Type of Foundation	:	Raft
• Type of substructure	:	RCC Box
• Type of Superstructure	:	RCC Box
• Type of Bearing	:	NA
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

**OBSERVATIONS**

Visual Observations on condition of the bridge are as below:

- As per site Minor Bridge, in schedule it is mentioned as Pipe Culvert.
- Side walls are in good condition.
- Top slab and RCC crash barrier is in good condition.
- Stone pitching is provided on abutment location quadrant slopes is in good condition.



**BR. NO. 146+944 (MNB)**

**GENERAL DESCRIPTION**

• Location of bridge	:	-
• Chainage	:	km 146+944
• Type of bridge	:	Minor bridge
• Span Arrangement	:	2 x 6.8 m
• Total outer width of bridge (RSR)	:	1 x 10.25 (LCW) + 1 x 10.25 (RCW)+ 1 x 9
• Median Width	:	3.5 m
• Type of Foundation	:	Raft
• Type of substructure	:	RCC Box
• Type of Superstructure	:	RCC Box
• Type of Bearing	:	NA
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

**OBSERVATIONS**

Visual Observations on condition of the bridge are as below:

- The bridge is in skew of nearly 20 degrees.
- Minor Honey combing observed on side walls.
- Top slab is in good condition.
- RCC crash barrier is provided is in good condition.
- Stone pitching is provided on abutment location quadrant slopes is in good condition.



**BR. NO. 157+217 (MNB)**

**GENERAL DESCRIPTION**

• Name of bridge	:	-
• Chainage	:	Km 157+217
• Type of bridge	:	Minor Bridge
• Span Arrangement	:	2 x 11.0 m
• Total outer width of bridge	:	2 x 10.25 m
• Median Width	:	3.5 m
• Type of Foundation	:	Open
• Type of substructure	:	RCC Wall Type
• Type of Superstructure	:	RCC Precast Panels
• Type of Bearing	:	NA
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

**OBSERVATIONS**

Visual Observations on condition of the bridge are as below:

- Minor damages observed on bottom of RCC precast panels and abutment cap.
- Honey combing observed on pier cap.
- Minor Corrosion stains observed on pier cap.
- RCC crash barrier is provided is in good condition.
- Stone pitching is provided on abutment location quadrant slopes is in good condition.





**BR. NO. 164+116 (MNB)**

**GENERAL DESCRIPTION**

• Name of bridge	:	-
• Chainage	:	Km 164+116
• Type of bridge	:	Minor Bridge
• Span Arrangement	:	3 x 10 m
• Total outer width of bridge	:	2 x 10.25 m
• Median Width	:	3.5 m
• Type of Foundation	:	Open
• Type of substructure	:	RCC wall
• Type of Superstructure	:	RCC Solid Slab
• Type of Bearing	:	NA
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

**OBSERVATIONS**

Visual Observations on condition of the bridge are as below:

- The bridge is in skew of nearly 20 degrees.
- Minor Spalling observed on pier cap.
- RCC Solid slab is in good condition.
- RCC crash barrier is provided is in good condition.
- Stone pitching is provided on abutment location quadrant slopes is in good condition.



**BR. NO. 166+024 (MNB)**

**GENERAL DESCRIPTION**

• Name of bridge	:	-
• Chainage	:	Km 166+024
• Type of bridge	:	Minor Bridge
• Span Arrangement	:	1x 6.85 m
• Total outer width of bridge	:	2 x 10.25 m
• Median Width	:	3.5 m
• Type of Foundation	:	Open
• Type of substructure	:	RCC Wall Type
• Type of Superstructure	:	RCC Precast Panels
• Type of Bearing	:	NA
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

**OBSERVATIONS**

Visual Observations on condition of the bridge are as below:

- Minor Honey Combing observed on side walls.
- RCC precast panels is in good condition.
- Damp spots observed on bottom of RCC Precast Panels.
- RCC crash barrier is provided is in good condition.
- Stone pitching is provided on abutment location quadrant slopes is in good condition.



**BR. NO. 171+660 (MNB)**

**GENERAL DESCRIPTION**

• Name of bridge	:	-
• Chainage	:	Km 171+660
• Type of bridge	:	Minor Bridge
• Span Arrangement	:	3 x 7.55 m
• Total outer width of bridge	:	1 x 39.5 m
• Median width	:	3.5
• Type of Foundation	:	Raft
• Type of substructure	:	RCC Box
• Type of Superstructure	:	RCC Box
• Type of Bearing	:	NA
• Type of Railing	:	Crash barrier
• Method of Inspection	:	Visual

**OBSERVATIONS**

Visual Observations on condition of the bridge are as below:

- Minor Honey combing observed on top slab.
- Metallic crash barrier provided is in good condition.
- Stone pitching is provided on abutment location quadrant slopes is in good condition.



**BR. NO. 173+365 (MNB)**

**GENERAL DESCRIPTION**

• Name of bridge	:	-
• Chainage	:	Km 173+365
• Type of bridge	:	Minor Bridge
• Span Arrangement	:	1 x 8.4 m
• Total outer width of bridge	:	2 x 10.25 m
• Median width	:	3.5
• Type of Foundation	:	Open
• Type of substructure	:	RCC Wall Type
• Type of Superstructure	:	RCC Precast Panels
• Type of Bearing	:	NA
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

**OBSERVATIONS**

Visual Observations on condition of the bridge are as below:

- Side walls are in good condition.
- Minor Spalling observed on abutment cap at LHS A1.
- Damp spots observed on bottom of RCC Precast Panels.
- RCC crash barrier is provided is in good condition.



**BR. NO. 181+401 (MNB)**

**GENERAL DESCRIPTION**

• Name of bridge	:	-
• Chainage	:	Km 181+401
• Type of bridge	:	Minor Bridge
• Span Arrangement	:	2 x 10.3 m
• Total outer width of bridge	:	2 x 10.25 m
• Median width	:	3.5
• Type of Foundation	:	Open
• Type of substructure	:	RCC Wall Type
• Type of Superstructure	:	RCC Solid slab (LHS) RCC Precast Panels (RHS)
• Type of Bearing	:	NA
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

**OBSERVATIONS**

Visual Observations on condition of the bridge are as below:

**LHS Bridge (Old):**

- Old bridge of span 2 x 10.3 m is widened by 3 m on LHS and new two-lane bridge of span 2 x 10.3 m is constructed beside the old bridge.
- Leaching observed on top slab at construction joint.
- Minor Honey combing observed on top slab and side wall.
- Stone pitching is provided on abutment location quadrant slopes is in good condition.

**RHS Bridge (New):**

- RCC Precast Panels are in good condition.
- RCC crash barrier is provided is in good condition.
- Stone pitching is provided on abutment location quadrant slopes is in good condition.





**BR. NO. 182+881 (MNB)**

**GENERAL DESCRIPTION**

• Name of bridge	:	-
• Chainage	:	Km 182+881
• Type of bridge	:	Minor Bridge
• Span Arrangement	:	1 x 6.3 m
• Total outer width of bridge	:	2 x 10.25 m
• Median width	:	3.5 m
• Type of Foundation	:	Raft
• Type of substructure	:	RCC Box
• Type of Superstructure	:	RCC Box
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

**OBSERVATIONS**

Visual Observations on condition of the bridge are as below:

- Structure is in good condition
- Stone pitching is provided on abutment location quadrant slopes is in good condition.



**BR. NO. 186+971 (MNB)**

**GENERAL DESCRIPTION**

• Name of bridge	:	-
• Chainage	:	Km 186+971
• Type of bridge	:	Minor Bridge
• Span Arrangement	:	2 x 4.3 (LHS) 1 x 11.82 (RHS)
• Total outer width of bridge	:	1 x 13.25 m (LHS) 1 x 10.25 m (RHS)
• Median width	:	3.5
• Type of Foundation	:	Open
• Type of substructure	:	Brick Wall Type (LHS) RCC Wall Type (RHS)
• Type of Superstructure	:	RCC Solid slab (LHS) RCC Precast Panels (RHS)
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

**OBSERVATIONS**

Visual Observations on condition of the bridge are as below:

**LHS Bridge (Old):**

- Old bridge of span 6 x 1.4 m is widened with a span 2 x 3.0 m by 4.1 m on LCW and new two-lane Bridge of span 1 x 11.82 m is constructed beside the old bridge.
- RCC crash barrier is provided is in good condition.
- Stone pitching is provided on abutment location quadrant slopes is in good condition.

**RHS Bridge (New):**

- Structure is in fair condition.





**BR. NO. 195+880 (MNB)**

**GENERAL DESCRIPTION**

• Name of bridge	:	-
• Chainage	:	Km 195+880
• Type of bridge	:	Minor Bridge
• Span Arrangement	:	3 x 11.7 m
• Total outer width of bridge	:	2 x 10.25 m
• Median width	:	3.5
• Type of Foundation	:	Open
• Type of substructure	:	RCC wall type
• Type of Superstructure	:	RCC Precast Panels
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

**OBSERVATIONS**

Visual Observations on condition of the bridge are as below:

- PSC Girders Solid slab are in good condition.
- Damp spots observed on bottom of RCC Precast Panels.
- RCC crash barrier is provided is in good condition.



**BR. NO. 198+818 (MNB)**

**GENERAL DESCRIPTION**

- Name of bridge : -
- Chainage : Km 198+818
- Type of bridge : Minor Bridge
- Span Arrangement : 1 x 6.7 m
- Total outer width of bridge : 1 x 10.25 (LHS)  
1 x 12.4 (RHS)
- Median : 3.5 m
- Type of Foundation : Raft (LHS)  
Open (RHS)
- Type of substructure : RCC wall Type
- Type of Superstructure : RCC Box (LHS)  
RCC Solid slab (RHS)
- Type of Railing : RCC Crash barrier
- Method of Inspection : Visual

**OBSERVATIONS**

Visual Observations on condition of the bridge are as below:

- Old bridge of span 1 x 6.7 m is widened by 2.6 m on RHS and new two-lane bridge of span 1 x 6.7 m is constructed beside the old bridge.
- Side walls are in good condition.
- Small portion of Median wall damaged.
- Top slab is in good condition.
- RCC crash barrier is provided is in good condition.
- Stone pitching is provided on abutment location quadrant slopes in good condition.
- Crash barrier damaged and Reinforcement exposed.



**BR. NO. 212+471 (MNB)**

**GENERAL DESCRIPTION**

• Name of bridge	:	-
• Chainage	:	km 212+471
• Type of bridge	:	Minor Bridge
• Span Arrangement	:	1 x 6.1 m
• Total outer width of bridge	:	1 x 12.1 m (LHS) 1 x 10.25 m (RHS)
• Median	:	3.5 m
• Type of Foundation	:	Open (LHS) Raft (RHS)
• Type of substructure	:	Stone masonry (LHS) RCC Box (RHS)
• Type of Superstructure	:	RCC Solid slab (LHS) RCC Box (RHS)
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

**OBSERVATIONS**

Visual Observations on condition of the bridge are as below:

**LHS Bridge (Old):**

- R & R of existing bridge of span 1 x 6.1 m and New 2 Lane bridge beside old bridge of span 1 x 6.1 m.
- RCC crash barrier is provided is in good condition.

**RHS Bridge (New):**

- Top slab is in good condition.
- RCC crash barrier is provided is in good condition.
- Stone pitching is provided on abutment location quadrant slopes are in good condition.



**BR. NO. 213+525 (MNB)**

**GENERAL DESCRIPTION**

• Name of bridge	:	-
• Chainage	:	Km 213+525
• Type of bridge	:	Minor Bridge
• Span Arrangement	:	2 x 5.9 m
• Total outer width of bridge	:	2 x 10.25 m
• Median	:	3.5 m
• Type of Foundation	:	Open (LHS) Raft (RHS)
• Type of substructure	:	RCC Wall Type (LHS) RCC Box Type (RHS)
• Type of Superstructure	:	RCC Solid slab (LHS) RCC Box Type (RHS)
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

**OBSERVATIONS**

Visual Observations on condition of the bridge are as below:

- Side walls are in good condition.
- Solid slab is in good condition.
- RCC crash barrier is provided is in good condition.



**BR. NO. 128+317 (VUP)**

**GENERAL DESCRIPTION**

• Location of structure	:	Existing NH-59 Entry and Exit Godhra
• Chainage	:	Km 128+317
• Type of structure	:	VUP
• Span Arrangement	:	1 x 15 x 6 m
• Total outer width of bridge	:	2 x 10.25 m
• Median Width	:	3.5 m
• Type of Foundation	:	Raft
• Type of Substructure	:	RCC Box Type
• Type of Superstructure	:	RCC Box Type
• Type of Bearing	:	NA
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- The span is observed as 1 x 15.0 m in skew.
- The structure is in skew of nearly 20 degrees.
- RE walls are in good condition.
- RCC crash barrier is provided is in good condition.



**BR. NO. 152+026 (VUP)**

**GENERAL DESCRIPTION**

• Location of structure	:	-
• Chainage	:	Km 152+026
• Type of structure	:	VUP
• Span Arrangement	:	1 x 10.5 x 6.0 m
• Total outer width of structure	:	2 x 10.25 m
• Median Width	:	3.5 m
• Type of Foundation	:	Raft
• Type of Substructure	:	RCC Box Type
• Type of Superstructure	:	RCC Box Type
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- Side walls are in good condition.
- The structure is box type with raft foundation and is in good condition.
- RE walls are in good condition.
- RCC crash barrier is provided is in good condition.
- Stone pitching is provided on abutment location quadrant slopes in good condition.



**BR. NO. 160+930 (VUP)**

**GENERAL DESCRIPTION**

• Location of structure	:	Existing NH-59 Entry and Exit Limkheda
• Chainage	:	Km 160+930
• Type of structure	:	VUP
• Span Arrangement	:	1 x 10.5 x 6 m
• Total outer width of structure	:	2 x 10.25 m
• Median Width	:	3.5 m
• Type of Foundation	:	Raft
• Type of substructure	:	RCC Box Type
• Type of Superstructure	:	RCC Box Type
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- The structure is box type with raft foundation and is in good condition.
- Side walls are in good condition.
- RE walls are in fair condition.
- RCC crash barrier is provided is in good condition.
- Stone pitching is provided on abutment location quadrant slopes in good condition.



**BR. NO. 162+914 (VUP)**

**GENERAL DESCRIPTION**

• Location of structure	:	SH - 154
• Chainage	:	Km 162+914
• Type of structure	:	VUP
• Span Arrangement	:	1 x 10.5 x 6.0 m
• Total outer width of structure	:	2 x 10.25 m
• Median Width	:	3.5 m
• Type of Foundation	:	Raft
• Type of substructure	:	RCC Box Type
• Type of Superstructure	:	RCC Box Type
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- Side walls are in fair condition.
- The structure is box type with raft foundation.
- RE walls are in good condition.
- RCC crash barrier is provided is in good condition.
- Stone pitching is provided on abutment location quadrant slopes in good condition.



**BR. NO. 131+321 (PUP)**

**GENERAL DESCRIPTION**

• Location of structure	:	-
• Chainage	:	Km 131+321
• Type of structure	:	PUP
• Span Arrangement	:	1.0 x 7.0 x 3.5 m
• Total outer width of structure	:	2 x 10.25 m
• Median Width	:	3.5 m
• Type of Foundation	:	Raft
• Type of substructure	:	RCC Box Type
• Type of Superstructure	:	RCC Box Type
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- Side walls are in good condition.
- Top slab is in good condition.
- RCC crash barrier is provided is in good condition.
- Stone pitching is provided on abutment location quadrant slopes is good.



**BR. NO. 140+396 (PUP)**

**GENERAL DESCRIPTION**

• Location of structure	:	Panchela Village
• Chainage	:	Km 140+396
• Type of structure	:	PUP
• Span Arrangement	:	1.0 x 7.0 x 3.5 m
• Total outer width of structure	:	2 x 10.25 m
• Median Width	:	12.5 m
• Type of Foundation	:	Raft
• Type of substructure	:	RCC
• Type of Superstructure	:	RCC box
• Type of Bearing	:	NA
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- Side walls are in good condition.
- RCC crash barrier is provided is in good condition.
- Stone pitching is provided on abutment location quadrant slopes is in good condition



**BR. NO. 144+251 (PUP)**

**GENERAL DESCRIPTION**

• Location of structure	:	Panchela village
• Chainage	:	km 144+251
• Type of structure	:	PUP
• Span Arrangement	:	1.0 x 7.0 x 3.5 m
• Total outer width of structure	:	2 x 10.25 m
• Median Width	:	3.5 m
• Type of Foundation	:	Raft
• Type of substructure	:	RCC Box Type
• Type of Superstructure	:	RCC Box Type
• Type of Bearing	:	NA
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- Side walls are in good condition.
- RCC crash barrier is provided is in good condition.
- Stone pitching is provided on abutment location quadrant slopes is in good condition



**BR. NO. 155+241 (PUP)**

**GENERAL DESCRIPTION**

• Location of structure	:	Local road at Piploid
• Chainage	:	Km 155+241
• Type of structure	:	PUP
• Span Arrangement	:	1.0 x 7.0 x 3.5 m
• Total outer width of structure	:	2 x 10.25 m
• Median Width	:	3.5 m
• Type of Foundation	:	Raft
• Type of substructure	:	RCC Box Type
• Type of Superstructure	:	RCC Box Type
• Type of Bearing	:	NA
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- Side walls are in good condition.
- RCC crash barrier is provided is in fair condition.
- Stone pitching is provided on abutment location quadrant slopes in fair condition.



**BR. NO. 161+414 (PUP)**

**GENERAL DESCRIPTION**

• Location of structure	:	Local road at Limkheda
• Chainage	:	Km 161+414
• Type of structure	:	PUP
• Span Arrangement	:	1.0 x 7.0 x 3.5 m
• Total outer width of structure	:	2 x 10.25 m
• Median Width	:	3.5 m
• Type of Foundation	:	Raft
• Type of substructure	:	RCC Box Type
• Type of Superstructure	:	RCC Box Type
• Type of Railing	:	Crash barrier
• Method of Inspection	:	Visual

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- Side walls are in good condition.
- RCC crash barrier is provided is in good condition.
- Stone pitching partially damaged.



**BR. NO. 163+400 (PUP)**

**GENERAL DESCRIPTION**

• Location of structure	:	
• Chainage	:	Km 163+400
• Type of structure	:	PUP
• Span Arrangement	:	1.0 x 7.0 x 3.5 m
• Total outer width of structure	:	2 x 10.25 m
• Median Width	:	3.5 m
• Type of Foundation	:	Raft
• Type of substructure	:	RCC Box Type
• Type of Superstructure	:	RCC Box Type
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- Side walls are in good condition.
- Honey combing observed and steel exposed on side wall.
- RCC crash barrier is provided is in good condition.
- Stone pitching partially damaged.



**BR. NO. 170+639 (PUP)**

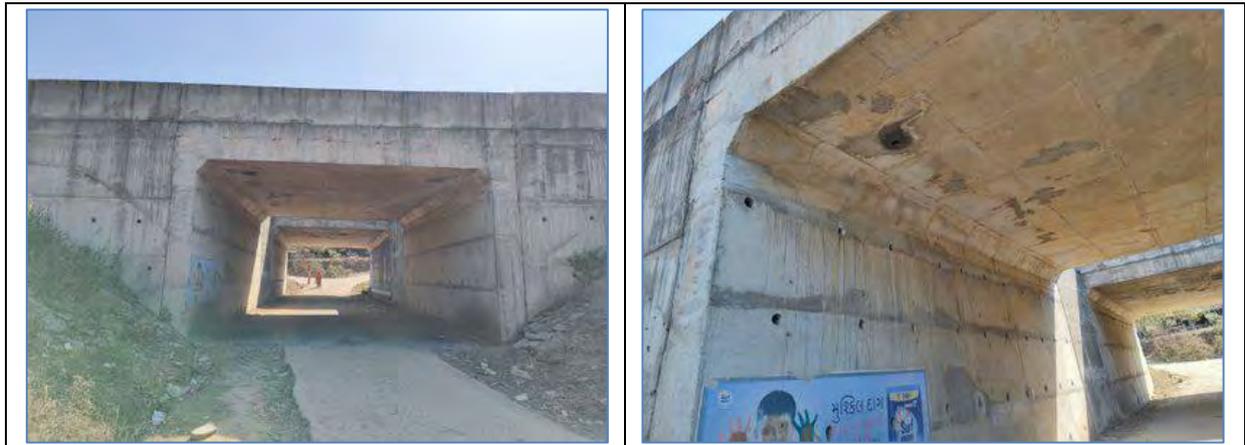
**GENERAL DESCRIPTION**

• Location of structure	:	Mangle Mahudi Village
• Chainage	:	km 170+639
• Type of structure	:	PUP
• Span Arrangement	:	1.0 x 7.0 x 3.5 m
• Total outer width of structure	:	2 x 10.25
• Median Width	:	3.5 m
• Type of Foundation	:	Raft
• Type of substructure	:	RCC Box Type
• Type of Superstructure	:	RCC Box Type
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- Side walls are in good condition.
- RCC crash barrier is provided is in good condition.
- Stone pitching is partially damaged.



**BR. NO. 178+872 (PUP)**

**GENERAL DESCRIPTION**

• Location of structure	:	Access to Major and Temple
• Chainage	:	Km 178+872
• Type of structure	:	PUP
• Span Arrangement	:	1.0 x 7.0 x 3.5 m
• Total outer width of structure	:	2 x 10.25 m
• Median Width	:	3.5 m
• Type of Foundation	:	Raft
• Type of substructure	:	RCC Box Type
• Type of Superstructure	:	RCC Box Type
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- Side walls are in good condition.
- RCC crash barrier is provided is in good condition.
- Stone pitching is provided on abutment location quadrant slopes is mostly good



**BR. NO. 181+137(PUP)**

**GENERAL DESCRIPTION**

• Location of structure	:	-
• Chainage	:	Km 181+137
• Type of structure	:	PUP
• Span Arrangement	:	1.0 x 7.0 x 3.5 m
• Total outer width of structure	:	2 x 10.25 m
• Median Width	:	3.5 m
• Type of Foundation	:	Raft
• Type of substructure	:	RCC Box Type
• Type of Superstructure	:	RCC Box Type
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- RCC crash barrier is provided is in good condition.
- Stone pitching partially damaged.



**BR. NO. 184+900 (PUP)**

**GENERAL DESCRIPTION**

• Location of structure	:	-
• Chainage	:	Km 184+900
• Type of structure	:	PUP
• Span Arrangement	:	1.0 x 7.0 x 3.5 m
• Total outer width of structure	:	2 x 10.25 m
• Median Width	:	3.5 m
• Type of Foundation	:	Raft
• Type of substructure	:	RCC Box Type
• Type of Superstructure	:	RCC Box Type
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- RCC crash barrier is provided is in good condition.
- Stone pitching is provided on abutment location quadrant slopes is good.



**BR. NO. 199+099 (PUP)**

**GENERAL DESCRIPTION**

• Location of structure	:	-
• Chainage	:	Km 199+099
• Type of structure	:	PUP
• Span Arrangement	:	1.0 x 7.0 x 3.5 m
• Total outer width of structure	:	2 x 10.25 m
• Median Width	:	3.5 m
• Type of Foundation	:	Raft
• Type of substructure	:	RCC Box Type
• Type of Superstructure	:	RCC Box Type
• Type of Bearing	:	NA
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- Side walls are in good condition.
- RCC crash barrier is provided is in good condition.
- Stone pitching provided on abutment location quadrant slope is fair.



**BR. NO. 201+985 (PUP)**

**GENERAL DESCRIPTION**

• Location of structure	:	-
• Chainage	:	Km 201+985
• Type of structure	:	PUP
• Span Arrangement	:	1.0 x 7.0 x 3.5 m
• Total outer width of structure	:	2 x 10.25 m
• Median Width	:	3.5 m
• Type of Foundation	:	Raft
• Type of substructure	:	RCC Box Type
• Type of Superstructure	:	RCC Box Type
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- Side walls are in good condition.
- RCC crash barrier is provided is in good condition.
- Stone pitching partially damaged.



**BR. NO. 203+979 (PUP)**

**GENERAL DESCRIPTION**

• Location of structure	:	-
• Chainage	:	Km 203+979
• Type of structure	:	PUP
• Span Arrangement	:	1.0 x 7.0 x 3.5 m
• Total outer width of structure	:	2 x 10.25 m
• Median Width	:	3.5 m
• Type of Foundation	:	Raft
• Type of substructure	:	RCC Box Type
• Type of Superstructure	:	RCC Box Type
• Type of Bearing	:	NA
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- Side walls are in good condition.
- RCC crash barrier is provided is in good condition.
- Minor damage on Stone pitching.



Photos of some culverts at site



Km 130+820



Km 152+541



Km 161+381



Km 174+267



Km 129+111



Km 142+800



Km 156+471



Km 179+553

**Details of Culverts**

S. No	Type as per CA	Type as per site	Proposed chainage	Proposed chainage as per site	Proposed Span arrangement (No. x Length) (m)	Span as per site (No. x Length) (m)	Existing deck width as per site	Skew angle	Vertical Clearance (m)	Slab Thickness (m)	Remarks
1	-	PIPE CULVERT	-	129+111	-	1 x 1.2	32.5	-	-	-	Partially buried with mud.
2	PIPE	PIPE CULVERT	129+965	129+777	1 x 1.2	1 x 1.2	32.5	-	-	-	Stone pitching partially damaged.
3	RCC Slab	BOX CULVERT	131+009	130+820	1 x 7	1 x 3 x 2.5	32.5	-	2.5	0.3	Structure is in good condition.
4	PIPE	PIPE CULVERT	131+624	131+437	2 x 0.9	2 x 0.9	29.5	-	-	-	Structure is in good condition.
5	PIPE	PIPE CULVERT	132+128	131+938	1 x 1.2	1 x 1.2	46	-	-	-	Structure is in good condition.
6	PIPE	PIPE CULVERT	132+381	132+191	1 x 0.9	2 x 0.9	29.5	-	-	-	Partially buried with debris.
7	PIPE	PIPE CULVERT	133+940	133+747	2 x 1.2	2 x 1.2	26.5	-	-	-	Partially buried with mud.
8	PIPE	PIPE CULVERT	135+196	134+994	1 x 1.2	1 x 1.2	26.5	-	-	-	Partially buried with mud.
9	PIPE	PIPE CULVERT	135+808	135+605	1 x 1.2	1 x 1.2	27.5	-	-	-	Structure is in good condition.
10	-	PIPE CULVERT	-	137+076	-	1 x 1.2	32.25	-	-	-	Partially buried with mud.
11	PIPE	PIPE CULVERT	138+320	138+126	2 x 0.9	2 x 1.2	32.5	-	-	-	Structure is in good condition.
12	PIPE	PIPE CULVERT	141+277	141+079	1 x 0.9	1 x 1.2	37.5	-	-	-	Stone masonry head wall damaged at RHS. Partially buried with mud.
13	RCC Slab	BOX CULVERT	141+922	141+724	1 x 1.2	1 x 3 x 3	39.5	-	3	0.3	Structure is in good condition.
14	PIPE	PIPE CULVERT	143+002	142+800	1 x 0.9	1 x 0.9	39.5	-	-	-	Structure is in good condition.
15	PIPE	PIPE CULVERT	143+750	143+176	1 x 1.2	1 x 1.2	39.5	-	-	-	Stone pitching partially damaged.
16	PIPE	PIPE CULVERT	144+150	143+791	1 x 1.2	1 x 1.2	29.5	-	-	-	Stone pitching partially damaged. Partially buried with debris.
17	PIPE	-	145+260	144+944	1 x 1.2	-	-	-	-	-	AS PER SITE MNB
18	PIPE	-	145+540	145+305	1 x 1.2	-	-	-	-	-	AS PER SITE MNB

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19	PIPE	PIPE CULVERT	146+095	145+913	2 x 1	2 x 1.2	31	-	-	-	Stone pitching partially damaged.
20	RCC Slab	BOX CULVERT	146+547	146+382	1 x 5	1 x 3 x 2.5	34.5	-	2.5	0.3	Structure is in good condition.
21	PIPE	PIPE CULVERT	147+543	147+359	1 x 1.2	1 x 1.2	36	-	-	-	Stone pitching partially damaged.
22	PIPE	PIPE CULVERT	148+108	147+922	1 x 1.2	1 x 1.2	31	-	-	-	Stone pitching partially damaged. RHS buried.
23	PIPE	PIPE CULVERT	148+821	148+681	1 x 1.2	1 x 1.2	33.5	-	-	-	Partially covered with bushes. Partially buried with debris.
24	PIPE	PIPE CULVERT	149+815	149+630	1 x 0.9	1 x 0.9	31	-	-	-	Stone pitching partially damaged.
25	PIPE	PIPE CULVERT	150+011	149+825	1 x 1	1 x 0.9	36	-	-	-	Stone pitching partially damaged.
26	PIPE	PIPE CULVERT	150+210	150+020	1 x 0.9	1 x 1.2	37.3	-	-	-	Structure is in good condition.
27	RCC Slab	BOX CULVERT	150+398	150+209	1 x 2.5	1 x 3 x 2.5	27.5	-	2.5	0.35	Structure is in good condition.
28	PIPE	PIPE CULVERT	150+918	150+734	2 x 1.2	2 x 1.2	39	-	-	-	Stone pitching partially damaged.
29	PIPE	PIPE CULVERT	151+752	151+571	2 x 1.2	2 x 1.2	30.5	-	-	-	Stone pitching partially damaged.
30	RCC BOX	BOX CULVERT	152+730	152+541	1 x 3 x 3	1 x 3 x 3	34	-	3	0.3	Stone pitching partially damaged at LHS.
31	RCC BOX	BOX CULVERT	153+115	152+941	1 x 3 x 3	1 x 3 x 3	37	-	3	0.3	Stone pitching partially damaged at RHS.
32	-	BOX CULVERT	-	153+061	-	1 x 3 x 3	37.2	-	3	0.35	Partially buried with mud.
33	-	PIPE CULVERT	-	153+491	-	2 x 1.2	37	-	-	-	Partially buried with mud.
34	-	-	-	153+791	-	-	-	-	-	-	NOT FOUND AT SITE

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35	-	PIPE CULVERT	-	154+431	-	1 x 1.2	29.2	-	-	-	Partially buried with mud.
36	PIPE	PIPE CULVERT	155+900	155+640	1 x 1.2	1 x 1.2	31	-	-	-	Partially covered with bushes.
37	PIPE	PIPE CULVERT	156+780	156+471	1 x 1.2	1 x 1.2	26.5	-	-	-	LHS Pipe not found. Stone pitching partially damaged at RHS.
38	PIPE	PIPE CULVERT	158+782	158+595	1 x 1.2	1 x 1.2	34.3	-	-	-	Partially buried with mud.
39	RCC Slab	BOX CULVERT	159+300	159+112	2 x 5	1 x 5 x 3	30.3	-	3	0.5	Spalling observed on side walls.
40	RCC Slab	BOX CULVERT	160+342	160+155	2 x 3	1 x 3 x 2.5	30.5	-	2.5	0.25	Stone pitching partially damaged.
41	RCC BOX	BOX CULVERT	161+550	161+381	1 x 3 x 3	1 x 3 x 3	38.5	-	3	0.35	Stone pitching partially damaged.
42	-	PIPE CULVERT	-	161+584	-	3 x 1.2	38.2	-	-	-	Partially buried with mud.
43	RCC BOX	BOX CULVERT	162+410	162+225	1 x 3 x 2	1 x 3 x 2	32.5	-	2	0.35	Stone pitching partially damaged.
44	RCC BOX	BOX CULVERT	162+610	162+492	1 x 3 x 3	1 x 3 x 3	58.4	-	3	0.35	Stone pitching partially damaged.
45	-	PIPE CULVERT	-	163+257	-	2 x 1.2	33	-	-	-	Partially buried with mud.
46	RCC BOX	BOX CULVERT	164+680	164+472	1 x 3 x 2	1 x 3 x 3	32.5	-	3	0.35	Partially buried with bushes.
47	PIPE	PIPE CULVERT	165+120	164+942	3 x 1.2	3 x 1.2	44.5	-	-	-	Partially covered with bushes at LHS.
48	PIPE	PIPE CULVERT	165+470	165+312	3 x 1.2	3 x 1.2	40.5	-	-	-	Stone pitching partially damaged.
49	-	PIPE CULVERT	-	165+639	-	3 x 1.2	42	-	-	-	Partially buried with mud.
50	RCC Slab	BOX CULVERT	166+902	166+713	2 x 5	1 x 3 x 2.5	34.5	-	2.5	0.3	Stone pitching partially damaged.
51	PIPE	PIPE CULVERT	167+450	167+260	1 x 0.9	1 x 1.2	38.5	-	-	-	Stone pitching partially damaged.
52	RCC	BOX CULVERT	168+267	168+079	2 x 3.5	1 x 3 x 2.5	40.5	-	2.5	0.35	Structure is in good condition.

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	Slab										
53	RCC Slab	BOX CULVERT	169+325	169+135	1 x 3	1 x 2 x 2	32.5	-	2	0.25	LHS partially covered with bushes.
54	RCC Slab	BOX CULVERT	169+742	169+557	2 x 2.5	1 x 3 x 2.5	34.5	-	2.5	0.35	Structure is in good condition.
55	PIPE	-	171+878	171+308	2 x 1.2	-	-	-	-	-	NOT FOUND AT SITE
56	RCC BOX	-	171+740	171+664	3 x 7.6	-	-	-	-	-	AS PER SITE MNB
57	RCC Slab	BOX CULVERT	173+825	173+561	1 x 1	1 x 2 x 2	42	-	2	0.3	Stone pitching partially damaged.
58	RCC Slab	BOX CULVERT	174+053	173+791	1 x 1	1 x 2 x 2	44.9	-	2	0.3	Structure is in good condition.
59	RCC Slab	BOX CULVERT	174+353	174+144	1 x 1	1 x 2 x 2	44.9	-	2	0.35	Stone pitching partially damaged.
60	RCC Slab	BOX CULVERT	174+530	174+267	1 x 1.5	1 x 3 x 3	44.5	-	3	0.3	Structure is in good condition.
61	RCC Slab	BOX CULVERT	174+670	174+407	1 x 1	1 x 2 x 2	32.5	-	2	0.35	Cracks observed on top slab.
62	RCC Slab	BOX CULVERT	174+774	174+511	1 x 2.5	1 x 3 x 3	38.5	-	3	0.3	Stone pitching partially damaged.
63	PIPE	PIPE CULVERT	175+134	174+869	1 x 1.2	1 x 1.20	36.5	-	-	-	Stone pitching partially damaged.
64	PIPE	PIPE CULVERT	177+087	176+803	1 x 1.2	1 x 1.20	36.5	-	-	-	Partially buried with bushes.
65	RCC Slab	BOX CULVERT	177+534	177+264	1 x 2	1 x 2 x 2	32.5	-	2	0.35	Stone pitching partially damaged.
66	PIPE	PIPE CULVERT	178+427	178+158	1 x 1.2	1 x 1.20	33.5	-	-	-	Partially covered with bushes. Stone pitching partially damaged.
67	PIPE	PIPE CULVERT	178+774	178+506	1 x 1.2	1 x 1.20	39.5	-	-	-	partially covered with bushes. Stone pitching partially damaged.

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68	-	BOX CULVERT	-	179+143	-	1 x 4 x 4	37.9	-	4	-	Partially buried with mud.
69	PIPE	PIPE CULVERT	179+819	179+553	1 x 0.9	1 x 1.20	32.5	-	-	-	Stone pitching partially damaged.
70	PIPE	PIPE CULVERT	180+130	179+863	1 x 1	1 x 1.20	38.5	-	-	-	Stone pitching partially damaged.
71	PIPE	PIPE CULVERT	180+664	180+398	1 x 1.2	1 x 1.20	32.5	-	-	-	Stone pitching partially damaged.
72	PIPE	PIPE CULVERT	180+898	180+631	1 x 1.2	1 x 1.20	32.5	-	-	-	Stone pitching partially damaged at RHS.
73	RCC Slab	BOX CULVERT	181+057	180+790	1 x 1.5	1 x 3 x 3	32.5	-	3	0.35	Stone pitching partially damaged.
74	-	PIPE CULVERT	-	181+212	-	2 x 1.2	32.75	-	-	-	Partially buried with mud.
75	PIPE	PIPE CULVERT	182+392	182+122	1 x 1	1 x 1.20	38.5	-	-	-	Partially covered with bushes. Stone pitching partially damaged at RHS.
76	PIPE	PIPE CULVERT	182+576	182+306	1 x 1	1 x 0.9	32.5	-	-	-	Stone pitching partially damaged.
77	PIPE	PIPE CULVERT	182+800	182+531	1 x 1.2	1 x 0.9	32.5	-	-	-	Partially covered with bushes. Stone pitching partially damaged at RHS.
78	PIPE	PIPE CULVERT	183+001	182+731	1 x 0.9	1 x 0.9	35.5	-	-	-	Stone pitching partially damaged.
79	RCC Slab	BOX CULVERT	188+477	188+201	1 x 1.2	1 x 3 x 3	29.5	-	3	0.35	Structure is in good condition.
80	RCC Slab	BOX CULVERT	188+577	188+301	1 x 1.5	1 x 2 x 2	29.5	-	2	0.3	Stone pitching partially damaged at LHS.
81	RCC Slab	BOX CULVERT	188+870	188+592	1 x 1.5	1 x 2 x 2	31.5	-	2	0.3	Damaged observed at top slab
82	-	PIPE CULVERT	-	189+874	-	1 x 1.2	31.5	-	-	-	Partially buried with mud.
83	PIPE	PIPE CULVERT	190+496	190+214	1 x 0.9	1 x 0.90	38.5	-	-	-	Partially covered with bushes at LHS. Pipe buried at RHS

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84	PIPE	PIPE CULVERT	190+520	190+238	1 x 0.9	1 x 0.90	39.5	YES	-	-	Partially buried with debris.
85	PIPE	-	190+879	190+595	1 x 0.9	-		-	-	-	NOT FOUND AT SITE
86	PIPE	-	190+976	190+692	1 x 0.9	-		-	-	-	NOT FOUND AT SITE
87	PIPE	PIPE CULVERT	191+351	191+066	1 x 1	2 x 0.9	34	-	-	-	Stone pitching partially damaged.
88	-	PIPE CULVERT	-	191+367	-	1 x 1.2	32.5	-	-	-	Partially buried with mud.
89	PIPE	PIPE CULVERT	191+866	191+582	1 x 1	1 x 0.90	41	YES	-	-	Stone pitching partially damaged.
90	-	PIPE CULVERT	-	192+066	-	1 x 1.2	39.5	-	-	-	Partially buried with mud.
91	-	PIPE CULVERT	-	192+093	-	1 x 1.2	39.5	-	-	-	Partially buried with mud.
92	PIPE	PIPE CULVERT	192+481	192+199	1 x 1.2	1 x 1.2	28.5	-	-	-	Structure is in good condition.
93	PIPE	SYPHON	192+605	192+324	1 x 0.9	1 x 0.9	27.5	-	-	-	Structure is in good condition.
94	PIPE	SYPHON	192+735	192+454	1 x 0.9	1 x 0.9	32.5	-	-	-	Structure is in good condition.
95	PIPE	PIPE CULVERT	192+870	192+589	1 x 0.9	1 x 0.9	36.5	-	-	-	Pipe buried at LHS. Partially buried with debris.
96	PIPE	SYPHON	193+032	192+750	1 x 1.2	1 x 0.6	29.5	-	-	-	Structure is in good condition.
97	PIPE	PIPE CULVERT	193+214	192+934	1 x 0.9	1 x 0.9	36.5	-	-	-	Structure is in good condition.
98	PIPE	PIPE CULVERT	193+230	192+950	1 x 1.2	1 x 1.2	30	-	-	-	Stone pitching partially damaged.
99	PIPE	PIPE CULVERT	193+284	193+004	1 x 0.9	1 x 1.2	29.5	YES	-	-	Structure is in good condition.
100	PIPE	PIPE CULVERT	193+420	193+139	1 x 0.9	1 x 0.9	38	-	-	-	Structure is in good condition.
101	-	PIPE CULVERT	-	193+281	-	1 x 1.2	37.5	-	-	-	Partially buried with mud.
102	PIPE	PIPE CULVERT	193+661	193+382	1 x 0.9	1 x 1.2	37.5	-	-	-	Structure is in good condition.
103	PIPE	-	193+825	193+544	2 x 0.9	-	-	-	-	-	
104	PIPE	-	193+892	193+611	2 x 0.9	-	-	-	-	-	

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105	PIPE	-	194+125	193+845	2 x 0.9	-	-	-	-	-	
106	PIPE	-	194+637	194+357	1 x 1.2	-	-	-	-	-	
107	PIPE	PIPE CULVERT	194+844	194+562	1 x 0.9	1 x 0.9	31.5	YES	-	-	Structure is in good condition.
108	-	-	-	194+637	-	-	-	-	-	-	
109	-	-	-	194+969	-	-	-	-	-	-	
110	PIPE	PIPE CULVERT	196+961	196+673	1 x 0.9	1 x 0.9	32.5	-	-	-	Stone pitching partially damaged.
111	PIPE	PIPE CULVERT	197+591	197+301	2 x 1.2	2 x 1.2	36.5	-	-	-	Stone pitching partially damaged at LHS.
112	PIPE	PIPE CULVERT	198+143	197+852	1 x 0.9	1 x 0.9	32.5	YES	-	-	Stone pitching partially damaged.
113	PIPE	PIPE CULVERT	198+298	198+009	1 x 1.2	1 x 0.9	29.5	-	-	-	Structure is in good condition.
114	-	SYPHON	-	198+142	-	1 x 0.6	29.5	-	-	-	Partially buried with mud.
115	PIPE	PIPE CULVERT	199+444	199+148	1 x 0.9	1 x 1.2	46.5	-	-	-	Structure is in good condition.
116	-	SYPHON	-	199+536	-	1 x 0.6	29	-	-	-	Partially buried with mud.
117	PIPE	PIPE CULVERT	200+331	200+038	1 x 0.9	1 x 0.9	31.5	-	-	-	Structure is in good condition.
118	-	SYPHON	-	200+161	-	1 x 0.6	29.5	-	-	-	Partially buried with mud.
119	RCC Slab	BOX CULVERT	201+131	200+838	1 x 2.65	1 x 3 x 2.5	29.5	YES	2.5	0.3	Canal crossing
120	PIPE	PIPE CULVERT	201+287	200+993	3 x 0.9	3 x 0.9	29	-	-	-	Structure is in good condition.
121	RCC Slab	BOX CULVERT	201+878	201+583	3 x 1	1 x 3 x 2.5	34.5	-	2.5	0.3	Structure is in good condition.
122	PIPE	PIPE CULVERT	203+130	202+829	1 x 0.9	1 x 0.9	28.5	-	-	-	Stone pitching partially damaged.
123	-	PIPE CULVERT	-	204+183	-	2 x 1.2	38.5	-	-	-	Partially buried with mud.
124	PIPE	PIPE CULVERT	204+860	204+557	1 x 0.9	1 x 0.9	38.5	-	-	-	Stone pitching partially damaged.

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125	PIPE	PIPE CULVERT	205+430	205+124	1 x 0.9	1 x 1.2	38.5	-	-	-	Structure is in good condition.
126	PIPE	PIPE CULVERT	206+063	205+755	1 x 0.9	1 x 0.9	32.5	-	-	-	Stone pitching partially damaged.
127	PIPE	PIPE CULVERT	206+656	206+346	1 x 0.9	1 x 1.2	36.5	-	-	-	Partially buried with mud at RHS.
128	PIPE	PIPE CULVERT	207+584	207+270	1 x 1.2	1 x 1.2	28.5	YES	-	-	Partially buried with mud at RHS.
129	PIPE	PIPE CULVERT	207+937	207+622	1 x 0.9	1 x 0.9	28.5	-	-	-	Stone pitching partially damaged.
130	PIPE	PIPE CULVERT	208+758	208+071	1 x 0.9	1 x 1.2	33.5	-	-	-	Structure is in good condition.
131	-	PIPE CULVERT	-	209+916	-	1 x 1.2	32.5	-	-	-	Partially buried with mud.
132	PIPE	PIPE CULVERT	210+830	210+503	1 x 0.9	1 x 1.2	32.5	-	-	-	Partially covered with bushes at LHS. Stone pitching partially damaged.
133	PIPE	PIPE CULVERT	211+234	210+903	2 x 0.9	2 x 1.2	38.5	-	-	-	Stone pitching partially damaged.
134	PIPE	PIPE CULVERT	211+625	211+293	1 x 0.9	1 x 1.2	30.5	-	-	-	Partially covered with bushes.
135	-	PIPE CULVERT	-	211+592	-	1 x 1.2	30.5	-	-	-	Partially buried with mud.
136	PIPE	PIPE CULVERT	212+556	212+223	1 x 0.9	1 x 1.2	36.5	-	-	-	Partially covered with bushes.
137	RCC Slab	BOX CULVERT	213+487	213+153	1 x 5	1 x 5 x 4	35.5	-	4	0.5	Structure is in good condition.
138	PIPE	PIPE CULVERT	214+978	214+644	1 x 1.2	1 x 1.2	34.5	-	-	-	Stone pitching partially damaged.
139	PIPE	PIPE CULVERT	215+145	214+810	1 x 0.9	1 x 0.9	32.5	-	-	-	Stone pitching partially damaged.

The common matter pertaining to the bridges is given below indicating Conclusions, Strategy for Renewals, and Assumptions for structure Repair BOQ:

**Conclusions:**

- It is well known that it would be costly and ineffective to repair corrosion damaged structure. Since the structure remained unprotected against environmental impact some deterioration to place and rate of which is required to slow down by standard techniques and material. This has to be planned during the concession period depending upon the regular inspections for corrosion induced cracks.

**Strategy for Renewals**

**Expansion joints:**

- Visual inspection is carried out to check for seal breakages, Armor angle, Weld failures, cracks between deck & Expansion joints concrete and Joints filled with debris. Such joints replaced immediately.
- Joint buried with debris shall be inspected for any distress, if any distress is shown it shall be replaced immediately.
- During visual inspection it is seen that some Expansion joints are bad whereas some are not showing any defects.
- Due to this it is considered provedent to change the Expansion joints which are visibly damaged in initial stage.
- In the absence of records pertaining to Expansion joint replacements it is highly difficult to predict the date of replacement needed for compliance to IRC codal requirements. Balance joints which are not replaced initially will be replaced as on when defects are shown in the joints. This aspect is considered in BOQ.

**Bearings:**

- In order to identify the bearings requiring immediate replacement, the following strategy is adopted.
- Girder Bridges showing diagonal cracks at support, distress in the Pedestals and any form of distress in support location is regarded as a candidate for replacement. By visual inspection there are only a handful of such situations.
- Wherever pedestals are damaged either by cracking or spalling Poison's confinement is proposed by Jacketing/MS plate bonding such procedure is very effective and common.
- All Metallic Bearings need to be taken up for servicing.

**Wearing Coat:**

Since there is a very weak component of the bridge structure which is subjected to severe deterioration due to Loading, Environment etc. It is necessary to replace the Wearing coat at 15years frequency. As of now we have considered sealing of cracks by Fog Seal which is other does not show any distress than cracking by viz. Pot holes, abrading etc. based on this aspect BOQ is formed.

**ASSUMPTION FOR STRUCTURE BOQ****Immediate Cost**

1. For Bridges requiring durability makeup measures “PMM, Epoxy putty” considered. This is one-time repair in till end of CA years, if executed with proper QC/QA adherence.
2. Wearing course having minor pot holes repair has been envisaged with bitumen and for having cracks in wearing course he cracks are envisaged with Fog seal emulsion with fine chips.
3. Protective works for box culverts/Box type minor Bridges are either missing/damaged for majority of structures. This cost has been taken in immediate cost.
4. Immediate repairs for structural defects.
5. Cleaning of Bearings, Expansion Joints, Drainage spouts, vegetation and others.
6. Repair of Damaged portions.
7. Structural tests if required.

**Routine Cost**

1. Wearing coat comprising of 30 mm thick BC.
2. Cleaning and adding rubber sealant near expansion joints.
3. Modular Expansion joints.
4. Replacement of Damaged Concrete Railing all complete as per Technical specifications and as directed by the Engineer
5. Provision of an RCC crash barrier (0.35sqm cross sectional area) constructed with M-40 grade concrete including reinforcement
6. Cleaning of rocker & roller bearing using high pressure water jet, free from rust scales, re-setting & greasing the bearings using graphite grease including cost of materials, labour etc., complete.
7. POT PTF Bearings greasing and maintaining (sand plastering).
8. Elastomeric Bearings and maintaining.
9. Cutting of groove of 15 mm x 15 mm along crack and sealing the same with epoxy putty including cost of material, labour etc.
10. Carrying out 50 to 60 mm thick shortsheeting using a mix proportion of 1:2:2 (cement: sand:6 mm down aggregate) added with Polypropylene fibers at a dosage rate of 125 gms/bag of cement including cost of labour, material, scaffolding, equipment etc. complete.
11. Repair of Floor Aprons, pitching and other protection works

12. Cleaning of Drainage Spouts
13. M-25 Concrete
14. Providing and filling joint sealing compound as per drawings of pourable grade, (Bitumastic sealant in the gap b/w Abutment & Approach slab. As per Technical specifications
15. Providing and laying Filter material underneath pitching in slopes.
16. Providing and laying Pitching on slopes laid over prepared filter media including boulder apron laid dry in front of toe of embankments.
17. Tests UPV, RHT and Load test for span 15m and above as per Schedule I.
18. Vegetation cleaning before and after monsoon.
19. Repair of damaged structure portion due accidents and any others.
20. Level of Service if applicable.

#### **Periodic Cost**

1. Replacement of Bearings with super structure lifting.
2. Replacement of Expansion joints.
3. Replacement of Wearing course.
4. Level of Service if applicable.
5. Structural tests if applicable.

#### **1.6.6 Drainage and Slope Protection**

Lined Covered drains observed only at service road Locations along the corridor. Open unlined drains at few locations are not functioning properly and require some attention.

Median chutes at curve locations are in good condition except for few locations where they need cleaning. No major distress is observed on the carriageway on downstream side at median drain locations. It may be prudent to consider a longitudinal drain in median to avoid water from one carriageway to flow on the other. It is necessary to see the possibility of draining of median drain to nearest culvert/outfall. This will help preventing distress on carriageway in the long run.

Slope protection in the form of Stone pitching, Green Blanketing, RE walls have been provided along the corridor. Most of the locations the slope protection is good condition.

#### **1.6.7 Traffic Safety and Road Furniture**

Metal beam crash barriers provided along the project road appear to be intact over entire length except for few locations where it got damaged.

Pedestrian guard rails installed at service road locations and appear to be in good condition.

Traffic blinkers are provided at median opening locations along the corridor and few of them are not working. Street lighting and high mast lighting provided, are all functioning well.

### 1.6.8 Road User Facilities

The bus stops and bus bay, Truck lay bye provided along the corridor appear to be good condition.

## 1.7 REHABILITATION PLANS AND DESIGNS

### 1.7.1 Pavement Rehabilitation and Strengthening

Overlay work on Flexible pavement of main carriageway and Service Roads is Completed. Crack sealing and patching works on raveled surfaces, most importantly, repair of severely damaged concrete panel work is in progress.

By looking at the present nature and severity of distress type immediate as well as periodic Pavement Rehabilitation is suggested. Details are presented in BOQ sheet.

### 1.7.2 Structural Rehabilitation

Out of 6 Structures, minor surface defect repair work of 5 nos Structure (Ch. 209.028 LHS, 212.471 LHS, 191.915 RHS, 186.917 LHS, 197.669 LHS) has been completed and 1 no structure (140.135 RHS - Panam Bridge) is in progress.

## 1.8 OPERATION AND MAINTENANCE

### 1.8.1 Introduction

Initially the threshold value of Roughness to be maintained during the operation period was 2500mm/Km as per Schedule K but since the pavement type is changed from Flexible to Rigid, subsequently the threshold roughness value is increased from 2500 mm/Km to 3000mm/Km.

In the Present Case only small portion of length is Flexible and remaining all other length is rigid pavement, HDM Model was not used. The Major Maintenance Cost of Rigid Pavement is estimated by assuming appropriate maintenance criteria.

### 1.8.2 CA specifications for Major Maintenance

- Schedule K of CA species that Roughness values exceeds 2500 mm/km in a length of KM, needs to be corrected within 180 days. But since the pavement type is changed from Flexible to Rigid, subsequently the threshold roughness value is increased from 2500 mm/Km to 3000mm/Km in approved O&M Manual
- Roughness in each lane for full length shall be measured bi-annually using

### 1.8.3 O&M schedule

- For Flexible Pavement Overlay thickness of 40mm BC is considered on Main carriageway in FY2029, FY2036, FY2043 and apart from this Micro Surfacing of total flexible

pavement in Main Carriageway is considered in FY 2040 apart from the regular routine maintenance which is to be done on every year.

- 25mm BC considered on Service Road Pavement in FY2029, FY2035, FY2043 apart from the regular routine maintenance which is to be done on every year.
- For Rigid Pavement about 1% of panel repair/replacement and 1% of epoxy patching, 25% of pavement retexturing and 2 to 3 % replacement of joints at every 7<sup>th</sup> Year apart from the regular routine maintenance which is to be done on every year.
- Kerb painting and Pavement Marking for entire Project Length (Flexible and Rigid Pavement Portion) is Considered at the time of overlay on Flexible pavement.

## 1.9 COST

Cost Component for various items and activities have been worked out by considering the Best Industry practice and most appropriate methods. The gist of the cost components considered are presented below

- Immediate Repair's Cost
- Routine Maintenance Cost
  - Routine Maintenance of Road
  - Repair and Replacement of various road items
  - Tolling system and HTMS maintenance AMC cost
  - Incident management
  - Routine Maintenance for Structures
  - Electricity bill of lighting areas near cities, I/C and other areas & Fuel expenditure
- Periodic Maintenance Cost
  - Functional +Structural overlay MCW of Flexible Pavement
  - Major Maintenance of Rigid Pavement
  - Major Maintenance of structures (replacement of bearing and expansion joints etc.)
  - Replacement of Toll Hardware and software & HTMS at later date
- Toll Plaza Operation cost and Highway Patrolling and maintenance supervision staff cost
- Maintenance of utilities and public amenities
- Operation and management costs of rest areas and lay byes
- Safety audit and other inspection costs @Rs15 Lacs per annum
- Insurance
- I.C for O&M period
- Administrative Cost
- Additional cost Required for capacity augmentation
- Grand Total Cost

Table 27: Abstract of Cost Estimates

S. No	FY	Abstract of Cost Without escalation (in Crores)		
		Immediate Repair's Cost +Routine and Operational Cost	Periodic Maintenance Cost	Total Cost
1	2023	13.83	1.02	14.85
2	2024	13.83	-	13.83
3	2025	13.83	-	13.83
4	2026	13.83	-	13.83
5	2027	13.83	-	13.83
6	2028	13.83	-	13.83
7	2029	13.83	18.52	32.34
8	2030	13.83	15.09	28.92
9	2031	13.83	-	13.83
10	2032	13.83	-	13.83
11	2033	13.83	-	13.83
12	2034	13.83	-	13.83
13	2035	13.83	-	13.83
14	2036	13.83	18.52	32.34
15	2037	13.83	10.76	24.59
16	2038	13.83	-	13.83
17	2039	13.83	-	13.83
18	2040	13.83	-	13.83
19	2041	13.83	-	13.83
20	2042	13.83	-	13.83
21	2043	13.83	20.53	34.36
22	2044	4.44	8.71	13.15
	Total:	<b>294.77</b>	<b>93.15</b>	<b>387.92</b>

- Base Cost are arrived for FY2023
- All the material rates are February 2022 Rates
- All labour rates are taken from Central minimum wages (October'2021 cycle) and 2.5% escalation applied on the same to arrive FY2023 Rates
- All the costs are without any Escalation.
- All the Cost presented in the above table are excluding Head Office (HQ) Expenses
- End of Concession is taken as 23.07.2043 (Revised Date)

**Table 28: Cost Summary Without Escalation (Amount in Crores)**

FY	Routine Maintenance						Periodic Maintenance				Toll Plaza Operat ion cost	SPV Cost	Surv ey Cost s	Insuran ce & Audit charge s	IE Fee	Admi nistr ative Cost	Total Recurri ng cost
	Routi ne Maint enanc e	R&R of Road items	Toll and HTMS AMC cost	Incide nt manag ement	R&R of Struct ures	Electri city bill of lightin g	Function al +Struct ural overlay MCW+ S/R	Major Mainte nance of Rigid Pavem ent	Replac ement of Toll Hardwa re and softwar e & HTMS at later date	Struct ure specif ied repair s							
2023	2.01	2.64	0.47	1.52	0.29	0.92	0.00	-	1.02	-	1.91	1.70	0.13	1.52	0.62	0.10	<b>14.85</b>
2024	2.01	2.64	0.47	1.52	0.29	0.92	0.00	-		-	1.91	1.70	0.13	1.52	0.62	0.10	<b>13.83</b>
2025	2.01	2.64	0.47	1.52	0.29	0.92	0.00	-		-	1.91	1.70	0.13	1.52	0.62	0.10	<b>13.83</b>
2026	2.01	2.64	0.47	1.52	0.29	0.92	0.00	-		-	1.91	1.70	0.13	1.52	0.62	0.10	<b>13.83</b>
2027	2.01	2.64	0.47	1.52	0.29	0.92	0.00	-		-	1.91	1.70	0.13	1.52	0.62	0.10	<b>13.83</b>
2028	2.01	2.64	0.47	1.52	0.29	0.92	0.00	-		-	1.91	1.70	0.13	1.52	0.62	0.10	<b>13.83</b>
2029	2.01	2.64	0.47	1.52	0.29	0.92	18.52	-		-	1.91	1.70	0.13	1.52	0.62	0.10	<b>32.34</b>
2030	2.01	2.64	0.47	1.52	0.29	0.92	0.00	7.24	4.92	2.93	1.91	1.70	0.13	1.52	0.62	0.10	<b>28.92</b>
2031	2.01	2.64	0.47	1.52	0.29	0.92	0.00	-		-	1.91	1.70	0.13	1.52	0.62	0.10	<b>13.83</b>
2032	2.01	2.64	0.47	1.52	0.29	0.92	0.00	-		-	1.91	1.70	0.13	1.52	0.62	0.10	<b>13.83</b>
2033	2.01	2.64	0.47	1.52	0.29	0.92	0.00	-		-	1.91	1.70	0.13	1.52	0.62	0.10	<b>13.83</b>
2034	2.01	2.64	0.47	1.52	0.29	0.92	0.00	-		-	1.91	1.70	0.13	1.52	0.62	0.10	<b>13.83</b>
2035	2.01	2.64	0.47	1.52	0.29	0.92	0.00	-		-	1.91	1.70	0.13	1.52	0.62	0.10	<b>13.83</b>
2036	2.01	2.64	0.47	1.52	0.29	0.92	18.52	-		-	1.91	1.70	0.13	1.52	0.62	0.10	<b>32.34</b>
2037	2.01	2.64	0.47	1.52	0.29	0.92	0.00	7.24	2.25	1.27	1.91	1.70	0.13	1.52	0.62	0.10	<b>24.59</b>
2038	2.01	2.64	0.47	1.52	0.29	0.92	0.00	-		-	1.91	1.70	0.13	1.52	0.62	0.10	<b>13.83</b>

FY	Routine Maintenance						Periodic Maintenance				Toll Plaza Operation cost	SPV Cost	Survey Costs	Insurance & Audit charges	IE Fee	Administrative Cost	Total Recurring cost
	Routine Maintenance	R&R of Road items	Toll and HTMS AMC cost	Incident management	R&R of Structures	Electricity bill of lighting	Functional +Structural overlay MCW+S/R	Major Maintenance of Rigid Pavement	Replacement of Toll Hardware and software & HTMS at later date	Structure specified repairs							
2039	2.01	2.64	0.47	1.52	0.29	0.92	0.00	-	-	-	1.91	1.70	0.13	1.52	0.62	0.10	<b>13.83</b>
2040	2.01	2.64	0.47	1.52	0.29	0.92	0.00	-	-	-	1.91	1.70	0.13	1.52	0.62	0.10	<b>13.83</b>
2041	2.01	2.64	0.47	1.52	0.29	0.92	0.00	-	-	-	1.91	1.70	0.13	1.52	0.62	0.10	<b>13.83</b>
2042	2.01	2.64	0.47	1.52	0.29	0.92	0.00	-	-	-	1.91	1.70	0.13	1.52	0.62	0.10	<b>13.83</b>
2043	2.01	2.64	0.47	1.52	0.29	0.92	20.53	-	-	-	1.91	1.70	0.13	1.52	0.62	0.10	<b>34.36</b>
2044	0.62	0.82	0.15	0.47	0.09	0.28	0.00	7.24	-	1.46	0.59	0.53	0.13	0.47	0.19	0.10	<b>13.15</b>
<b>Total:</b>	<b>42.86</b>	<b>56.15</b>	<b>10.06</b>	<b>32.37</b>	<b>6.15</b>	<b>19.54</b>	<b>57.57</b>	<b>21.73</b>	<b>8.19</b>	<b>5.67</b>	<b>40.65</b>	<b>36.18</b>	<b>2.86</b>	<b>32.48</b>	<b>13.28</b>	<b>2.20</b>	<b>387.92</b>

Note:

1. Base Cost are arrived for FY2023
2. All the material rates are February 2022 Rates
3. All labour rates are taken from Central minimum wages (October'2021 cycle) and 2.5% escalation applied on the same to arrive FY2023 Rates
4. All the costs are without any Escalation.
5. All the Cost presented in the above table are excluding Head Office (HQ) Expenses

## 1.10 CONCLUSIONS

Foregoing discussions on various elements of project highway concludes the following:

1. The Project Corridor starts on the outskirts of Godhra town at Km 129.300 and traverses towards Madhya Pradesh Border and ends before the Gujarat/Madhya Pradesh Border Check post at Km 215.900. The Total Project Road length is 87.102 Km and the Project road is having four lane divided carriageway configuration.
2. The project corridor has rigid pavement in the entire length, with 7.0m wide carriageway flanked by 1.5m paved shoulder plus 1.5m to 2.0m earthen shoulder on each side except at approaches to grade separators and underpasses.
3. In general, the median width is 4.5m all along the project road except at median openings associated with storage lane (median width is 1.5m) and at some of the bridge locations and at underpass locations median width is varying between 4.5m to 12.5m
4. The Project Road has four major junctions and these are at Bypass termini points of Piploid, Limkheda and Dahod. Further, the project road has about 81 minor junctions along its length.
5. Altogether, the Project road has about Twenty-four (24) Bus shelters on Main Carriageway with Bus Bays and at remaining forty (40) locations it has only bus shelters.
6. The Project Road has six Truck lay byes, two each at km 134.400, km 157.800 & km 190.500. These truck lay byes have been provided with rigid Pavement and the condition appears to be good
7. The Project Road has one Toll Plaza at km 146.150. Rigid pavement exists in the toll plaza as well as in tapering portions. The condition of toll plaza appears to be good. There are three normal lanes and one extra wide lane in each direction. One more extra lane is observed for 2-wheeler & 3-wheeler on both sides
8. Originally the Pavement envisaged was Flexible for main carriageway; however, the Concessionaire changed the pavement type from flexible to Rigid; however, for small portion of about 7.5 km carriageway length is having flexible pavement.
9. The Project received LOA on 01.01.2010 and the agreement was signed on 25.02.2010.
10. Appointed date was declared on 01.03.2011 and the Project received First Provisional Certificate on 31.10.2013 for a length of 75.0% of project and the Commercial Operation started from 31.10.2013.
11. The Project received PCOD-2 on 25.09.2015 for a length of 98.12% of project, (except 1.635 Km approach of Km 171+300 ROB) and the Toll rates were revised for the PCOD-2 and the rates are effective from 30.09.2015.
12. Due to delay in Land acquisition at Dahod Kasba, Change of Scope of 4 ROBs and the waiver of maintenance charge issues by the Railway had delayed the project completion. The project was completed 100% and got Final Completion Certificate on 29.06.2016.

13. As per CA, the Concession Period for the project is 27 Years from appointment date, subject to extension as per Concession Agreement. Original Concession end date is 28.02.2038 However, IE has recommended for extension in concession period by 5.4 years based on traffic variation. Accordingly revised end date of concession i.e. 23.07.2043 has been considered for costing purpose.
14. The project road has good pavement condition except very little surface related distress. Predominantly few locations raveling, longitudinal and transverse cracks/ Full depth cracks are noticed at very few locations. At Km 181.800 in LHS direction, Panel repair work is going on, this is the one location where major distress observed in Rigid Pavement along the Project Road.
15. Roughness surveys along corridor indicates that entire Project length is having Roughness values less than 2200mm/Km.
16. Review of Pavement Design Report and As-built drawings indicates that the rigid pavement is design for 40 years design period and the adopted composition is 300mm PQC+150mm DLC+150mm GSB.
17. Test pit surveys indicated average PQC thickness of 297mm, average DLC thickness of 140mm and average thickness of granular layers is 165 mm over subgrade.
18. The subgrade quality of the corridor appears to be good with high CBR above 10% at most of locations.
19. Crack sealing and Epoxy patching has been seen at isolated locations indicating the routine maintenance works are taken care to avoid further cracking and raveling.
20. As of now there is no HTMS but as per Schedule 12.12.1 of IRC: SP: 84-2009 (referred in Annex-1 of D) of CA, HTMS shall be considered when PCU>40,000. Accordingly, the Concessionaire is required to provide HTMS once traffic on project road crosses 40,000 PCU.
21. As informed by the Concessionaire, the project road will reach 40,000 PCU in the year 2030/31 and accordingly the cost of HTMS is considered.
22. As per clause 12.7 of Concession Agreement, after 8<sup>th</sup> Anniversary from COD if Authority Constructs Service Road, the same shall be maintained by Concessionaire.
23. Overall, there are 21 number grade separated structures exist along the project Road. 2 numbers flyovers, 2 numbers Overpasses, 4 numbers Vehicular underpasses and 13 numbers Pedestrian Underpasses.
24. Overall, there are 22 Bridges exist along the project road. Six out of Twenty-two are Major bridges and remaining sixteen are Minor bridges.
25. All structures are in good condition expect few, wherever Minor distresses observed; presently Concessionaire carrying out rectification works for the same.
26. There is one toll Plaza along the project Road and all Project Facilities such Traffic aid post, medical aid post and Vehicle rescue posts are located near this Toll Plaza.
27. There are total six lay byes exist, three on each side and 24 number of Bus Bays with shelter and another 40 locations only bus shelter exists. Condition of all these is good.

28. Schedule K of CA species that Roughness values exceeds 2500 mm/km in a length of KM, needs to be corrected within 180 days. But since the pavement type is changed from Flexible to Rigid, subsequently the threshold roughness value is increased from 2500 mm/Km to 3000mm/Km
29. For Flexible Pavement Overlay thickness of 40mm BC is considered on Main carriageway in FY2029, FY2035, FY2043 and apart from this Micro Surfacing of total flexible pavement in Main Carriageway is considered in FY 2040 apart from the regular routine maintenance which is to be done on every year.
30. 25mm BC considered on Service Road Pavement in FY2029, FY2035, FY2043 apart from the regular routine maintenance which is to be done on every year.
31. For Rigid Pavement about 1% of panel repair/replacement and 1% of epoxy patching, 25% of pavement retexturing and 2 to 3 % replacement of joints at every 7<sup>th</sup> Year apart from the regular routine maintenance which is to be done on every year.
32. All the lands required from the Forest department has been acquired and the project has been completed and there is no issue pending regarding this
33. As per IE MPR, there is no Compensation disbursement pending against land acquisition.
34. Demolishing of unauthorized the Government Structures have been completed except Post Office at Saliya (Sant road) at Ch. 141+350, and it is understood that correspondences is being done between NHAI and Superintendent of Post Office, Panchmahal for demolishing this structure and shifting of Temple at Km 129+400 is in progress.

Date: February 28, 2022

To

**Virescent Infrastructure Investment Manager Private Limited**

10th Floor, Parinee Crescenzo

C- 30 'G' Block

Bandra Kurla Complex

Bandra (East),

Mumbai 400051, Maharashtra, India

Dear Sir,

**Re: Submission of Final Report of Technical due diligence study for the project "Jodhpur Pali Expressways Pvt. Ltd".**

With reference to the captioned matter, we are here with submitting the Final Report of "Technical Due Diligence for 4 Laning of Jodhpur to Pali Section of NH 65 from Km 308 to Km 366 & includes bypass to Pali starting from Km 366 of NH-65, connecting NH-14 at Km 114 in the State of Rajasthan".

Yours faithfully,

For **Samarth Infraengg Technocrats Pvt. Ltd.**

**Authorized Signatory**

Kalva Kiran Kumar



**Technical Due Diligence for 4 Laning of Jodhpur to Pali Section of NH 65 from Km 308 to Km 366 & includes bypass to Pali starting from Km 366 of NH-65, connecting NH-14 at Km 114 in the State of Rajasthan**

**For Virescent Infrastructure  
Investment Manager Private Limited  
(For the purpose of  
Highways Infrastructure Trust)**

# **Final Report**

**SAMARTH INFRAENGG Technocrats Private Limited**



**FEBRUARY 2022**

## TABLE OF CONTENTS

1.1	INTRODUCTION.....	1
1.2	PROJECT AT A GLANCE .....	1
1.3	OBJECTIVE AND SCOPE OF SERVICES - FOR DUE DILIGENCE.....	4
1.3.1	General .....	4
1.3.2	Assessment of Asset Condition.....	5
1.3.3	Investigations to be carried out .....	5
1.3.4	O&M Assessment and Submission of Report .....	6
1.4	SURVEYS AND INVESTIGATIONS .....	6
1.4.1	Road Inventory .....	6
1.4.2	Visual Pavement Condition Surveys.....	9
1.4.3	Falling Weight Deflectometer (FWD) Surveys .....	10
1.4.4	Roughness surveys .....	12
1.4.5	Pavement Composition Surveys (Test PITS) .....	13
1.4.6	Subgrade Investigations & Laboratory Testing .....	17
1.4.7	Axle Load Surveys.....	18
1.5	VALIDATION OF EXECUTED WORKS.....	19
1.5.1	Road Works .....	19
1.5.2	Bridge Works.....	33
1.6	QUALITY AUDIT.....	34
1.6.1	Embankment & Subgrade.....	34
1.6.2	Roughness .....	35
1.6.3	FWD Analysis and Assessment of Overlay Requirement.....	36
1.6.4	Pavement Composition.....	38
1.6.5	CD Structures .....	38
1.6.6	Drainage and Slope Protection .....	82
1.6.7	Traffic Safety and Road Furniture .....	82
1.6.8	Road User Facilities .....	82
1.7	REHABILITATION PLANS AND DESIGNS .....	82
1.7.1	Design Traffic Loading .....	82
1.7.2	Pavement Rehabilitation and Strengthening .....	83
1.7.3	Structural Rehabilitation .....	86
1.8	OPERATION AND MAINTENANCE .....	86
1.8.1	Introduction.....	86
1.8.2	CA specifications for Major Maintenance .....	86
1.8.3	Inputs for O&M .....	86
1.8.4	Schedule.....	86
1.8.5	Options for O&M schedule .....	88
1.8.6	O&M Schedule .....	89
1.9	COST .....	89
1.10	Change of Scope Details as on Dec-2020.....	94
1.11	Status of Supplementary Agreements Works as on Dec-2020.....	95
1.12	CONCLUSIONS .....	96

## LIST OF TABLES

Table 1: Project Corridor Chainage System .....	2
Table 2: Salient Features of Project Corridor.....	3
Table 3: Summary of Homogenous Section – LHS & RHS .....	11
Table 4: Pavement Composition .....	17
Table 5: Pavement Composition at Toll Plaza locations .....	17
Table 6: Details of Standard Axles Used .....	18
Table 7: VDF Values Estimated at the Toll Plaza Location (Near km 338+400).....	19
Table 8: VDF Values Estimated at the Toll Plaza Location (Near km 365+400).....	19
Table 9: Service Road/Slip Road Locations .....	19
Table 10: Lined Covered Drain Locations.....	20
Table 11: Earthen Drains .....	21
Table 12: Median Chutes .....	21
Table 13: Slope Protection Details.....	22
Table 14: Side Kerb and chute Details .....	24
Table 15: Locations of Median Openings .....	24
Table 16: Details of Solar Blinkers .....	26
Table 17: Median Damaged Locations .....	27
Table 18: Metal Beam Crash Barrier Locations .....	27
Table 19: Concrete Crash Barrier Locations.....	29
Table 20: Concrete Railing Locations .....	30
Table 21: Details of Pedestrian Guard Rails.....	31
Table 22: List of Major Junctions .....	31
Table 23: List of Minor Junctions .....	31
Table 24: Locations of High mast Lighting.....	32
Table 25: Locations of Highway Lighting along Main Carriageway .....	33
Table 26: Locations of Highway Lighting along Service Roads.....	33
Table 27: Details of CD & Other Structures .....	33
Table 28: Details of Soaked CBR valuses .....	34
Table 29: Summary of Design Moduli of different layers – LHS .....	37
Table 30: Summary of Design Moduli of different layers – RHS .....	37
Table 31: Estimated Design Traffic loading near (km338+350) .....	82
Table 32: Estimated Design Traffic loading near (km365+400) .....	82
Table 33: Remaining life of the existing pavement on Both Carriageways .....	84
Table 34: Adopted Overlay Schedule .....	89
Table 35: Abstract of Cost Estimates without escalation.....	90
Table 36: Summary of Cost Estimates without Escalation .....	92

## I. INTRODUCTION

The Govt. of India (GOI) through Ministry of Shipping, Road Transport & Highways is contemplating to enhance the road capacity and safety for efficient transshipment of goods as well as passenger traffic on the heavily trafficked National Highway sections. MoRT&H had identified one such corridor to Design, Construction, Development, Finance, Operation and Maintenance of the Rehabilitation and Upgrading to **Four Lane of NH 65 from Km 308 to Km 366 & includes bypass to Pali starting from Km 366 of NH-65, connecting NH-14 at Km 114 (Length 71.535 km) existing 2 lane Highway section of NH-65 between Jodhpur to Pali in the state of Rajasthan** south-east Corridor Under (Public private Partnership) on Design, Build, Finance, Operate and Transfer (DBFOT).

The Government of Rajasthan acting through the Chief Engineer, **Public Work Department (PWD)**, Government of Rajasthan has awarded the work of 4 laning of above stretch of highway, on Design, Build, Finance, Operate and Transfer (DBFOT) Toll Basis to the Consortium Company lead by **M/s. G.R.INFRA Project Ltd.**, under Package No: F.7 (269)/pt-IV/BOT/PPP-NH/D-480dt.

Consequent to this, **M/S G.R.INFRA Project Ltd.**, formed a Special Purpose Vehicle (SPV) in the name of **Jodhpur- Pali Expressway Ltd.**, for implementation/execution of the project, registered under the companies act, 1956. The Concession Agreement was signed between PWD and the SPV, **M/s. Jodhpur Pali Expressways Pvt. Ltd.** (formerly known as **Jodhpur Pali Expressways Ltd.**).

On 31.03.2017, **India Infrastructure Fund II (IIF-II)** acquired control of 90.43% stake of **M/s Jodhpur Pali Expressway Pvt. Ltd.** and balance 9.57% was acquired on 28.03.2018. Further, on 17.12.2021, **Galaxy Investments II Pte. Ltd.** acquired control of 100% stakes of **M/s JODHPUR PALI EXPRESSWAY PRIVATE LIMITED** from India Infrastructure Fund-II.

The project is presently under operation and maintenance by concessionaire **JODHPUR PALI EXPRESSWAY PRIVATE LIMITED (JPEPL)**. **Samarth Infraengg Technocrats Pvt. Ltd.** has been engaged as Technical/ Engineering Due Diligence Advisor for Highways Infrastructure Trust purpose.

This report highlights the findings of due diligence study undertaken by consultants on the project

## II. PROJECT AT A GLANCE

National Highway 65 connects Ambala in Haryana and Pali in Rajasthan. This 690 km road starts from the junction of Grand Trunk Road and National Highway 22 at Ambala. It then traverses south-west for 240 km before entering Rajasthan at Jhumpa; Kaithal, Narwana, Barwala and Hissar are some major towns that lie along the National Highway 62 on the Haryana side. In Rajasthan, the road passes through Rajgarh, Jhunjhunu, Nagaur and Jodhpur before terminating at Pali, 30 km south-east of Rohat.

From Km 308.000 to Km 315.400 the urban area the carriageway width is 7m flanked by paved Shoulder varies from 1.5 to 3m with shyness of 0.25m. From Km 316.500 to Km 323.600 the carriageway width is 7m flanked by paved Shoulder With 1.5 Width and with shyness of 0.25m Plus 1.5m Earthen Shoulder. From Km 324.500 to Km 379.535 the carriageway width is 7m and with shyness of 0.25m Plus 1.5m Earthen Shoulder Except Structure locations and built-up Area.

- The agreement was signed on 28.02.2013 and the Appointed date was taken on 16.09.2013.
- Scheduled Project Completion date was 20.03.2015 considering the construction period of the Project Highway as 550 days (as stipulated in CA). The Scheduled Project Completion date has been further extended up to October 2015.
- Concession period for this project is 25 Years i.e., the original end date of Concession is 15.09.2038. However, as informed by the Concessionaire, the Concessionaire expects 5 years extension in concession period on account of traffic variation as per Article 29 of CA. Based on latest traffic surveys end date of Concession will be 15.09.2043
- First Provisional Completion Certificate for the length of 60.015 Km out of 71.535 Km has been issued on 31.10.2014
- Second Provisional Completion Certificate for the length of 71.093 Km (60.015 Km of First PCC plus additional 10.078 Km after First PCC) out of 71.535 (as per CA length) has been issued on 10.10.2015
- Supplementary Agreement was made on 08.03.2018 indicates that the Concessionaire shall complete the balance works as and when the Land is made available to him by Authority. Most of the works have been completed except small works which are highlighted in Section 1.11 of this Report

### III. SALIENT FEATURES

Sl. No.	Particulars	Length/No
1	No of Grade Separated Structures	2 Nos.
2	Service Roads	11.565
3	ROB (Numbers) and location (chainage)	1 Number at Km 367.473 Km
4	No of Bypass	1 Nos
5	Length of Bypass	Total Bypass Length - 12.352 km
6		1. Pali Bypass km 367.200 - km 379.535 = km 12.333
7	No of Major Bridges	6 Nos
8	No of Minor Bridges	6 Nos.
9	No of Culvert	6 Nos. Box, 8 No. Slab Culverts, 50 Nos. Pipe Culvert
10	No of VUP	1 Nos.
11	No of PUP/Cattle underpass	2 Nos.
12	No of major intersection/Junction	12 Nos.
13	No of Toll Plaza and Locations	2 Nos. (Km 338+350 and Km 365+400)
14	No of Truck Lay bye	1 Nos.
15	No of Bus Bays with Shelter	12 Nos. Bus Bays with Shelter
16	Stone Pitching	5.93 km's _Both Sides
17	RCC Wall	0.0450 km's_ Both Sides
18	RE Wall	6.010 km's Both Sides
19	Delineators	1051 No's
20	RCC Covered Drain	23.25 Km's
21	Lined Drain	0.710 Km's
22	Median drain	8.947m Km's
23	Major and Minor Junctions	12 No's Major and 33 No's Minor junctions
24	High Mast Lighting	5 No's
25	Double Arm Lightning	205 No's excluding the lighting provided by Jodhpur Urban Area (JDA) from 308+460 to 315+400.
26	Single Arm Lightning's	26
27	Median Openings	42 No's
28	Median Plantation_ Functional	71.103 Km's
29	Metal Beam Crash Barrier	11.394 Km's
30	Concrete Safety barrier	12.244 Km's
31	Pedestrian Guard Rails	3 Km's
32	Concrete Railing	0.930 Km's
33	Solar Blinkers	77 No's
34	Guard Posts	521 No's
35	Road Signs	752 No's

#### IV. IMPORTANT FINDINGS AND CONCLUSION

Foregoing discussions on various elements of project highway leads to following Conclusions

1. COS works for 2 VUPs has been awarded. VUP work at Mandia was completed and opened to Traffic in the month of August 2019. Kakani VUP construction work stopped w.e.f. 18th November 2020 due to local villager's agitation. In this regard Concessionaire already represented PWD to resolve the matter at the earliest. But, till date local issue not been resolved by PWD.
2. From Km 308.000 to Km 315.400 the urban area the carriageway width is 7m flanked by paved Shoulder varies from 1.5 to 3m with shyness of 0.25m. From Km 316.500 to Km 323.600 the carriageway width is 7m flanked by paved shoulder with 1.5 width and with shyness of 0.25m plus 1.5m earthen shoulder. From Km 324.500 to Km 379.535 the carriageway width is 7m and with shyness of 0.25m Plus 1.5m earthen shoulder except structure locations and built-up area.
3. The project road in general has good pavement condition except for few surface related distress. The cracking appears to top-down cracking rather than bottom-up cracking.
4. There are no undulations or depressions are observed along the corridor indicating good Subgrade quality.
5. Roughness surveys along corridor indicate at an average roughness is far less than 2500 mm/km and does not require immediate overlay from roughness consideration as the limiting value is 2500mm/Km as per CA.
6. Test pit surveys indicated average crust of 575 mm consisting of 147 mm blacktop and 428mm of granular layers over subgrade.
7. The subgrade quality in the corridor appears to be good with CBR above 8% at all locations.
8. Vehicle damage factors arrived from axle load surveys indicate that VDF for 2-Axle Truck is more in LHS Carriageway than RHS Carriageway but the VDF for 3 Axle trucks and Multi Axle Trucks is more in RHS Carriageway than in LHS Carriageway
9. The Remaining life of the existing pavement is more than the 10 years design MSA, hence no immediate Overlay is required from Structural Consideration; however, it is felt prudent to consider 30mm overlay in the year FY22/F23 as preventive overlay and accordingly the Concessionaire has commenced the work at site.
10. Though Minor distresses were observed; all structures along the project road are having good condition. Some of the distresses observed are of routine in nature and rectification work for the same is in progress.
11. Distresses or deficiencies noticed along the project Road (Pavement/highway/Drainage/Structures) are considered for immediate Repair and the Cost for the same has been considered in FY22.

12. The TMS and WIMs were replaced recently in the month of April'2021 and the next replacement of the same has been considered at every 6 years during the remaining operation period.
13. O&M Costs have been estimated till the end of Revised Concession period i.e., till 15.09.2043 as against 15.09.2038 (original Concession end date)
14. The applicable Manual for this project is IRC: SP:84-2009 and as per this manual, the roughness Survey shall be carried out twice in a year and BBD Survey shall be carried out once in 5 years.
15. As per pavement design report, stage construction has been adopted during initial construction. Accordingly, bituminous layers are designed for 10 years and granular layers are designed for full concession period.
16. There is no Mandatory Functional Overlay prescribed for this project as per CA. the Road has to be maintained as per CA and Roughness values shall be maintained below 2500mm/Km.
17. Even though Overlay is not required now, 30 mm thickness of BC is proposed throughout the project length in the FY22/FY23 by considering the age of the pavement and surface condition. Accordingly, Major Maintenance work for the entire stretch contract awarded and the work is in progress and Client informed that the work is expect to complete on July 2022.
18. Future Overlays have been estimated by using HDM-4 Model. Considering the balance concession period and O&M criteria for MM schedules are evaluated whenever the Roughness value exceeds 2500mm/Km and it is observed that Three Overlays (excluding the recent Overlay work in progress) are required for remaining Concession period.

#### V. COST ABSTRACT:

O&M Cost Abstract schedule is as below:

- 1.1. Cost Abstract (**without escalation**): Three Overlays (excluding the presently proposed Overlay) are required for remaining Concession period with 40mm BC:

S. No	FY	Immediate Repair's Cost +Routine and Operational Cost (in Crores)	Periodic Maintenance Cost (in Crores)	Total Cost (in Crores)
1	2023	14.67	-	14.67
2	2024	14.67	-	14.67
3	2025	14.67	-	14.67
4	2026	14.67	-	14.67
5	2027	14.67	-	14.67
6	2028	14.67	-	14.67
7	2029	14.67	51.40	66.07
8	2030	14.67	62.67	77.34
9	2031	14.67	-	14.67

10	2032	14.67	-	14.67
11	2033	14.67	-	14.67
12	2034	14.67	-	14.67
13	2035	14.67	-	14.67
14	2036	14.67	25.47	40.13
15	2037	14.67	24.80	39.47
16	2038	14.67	-	14.67
17	2039	14.67	-	14.67
18	2040	14.67	-	14.67
19	2041	14.67	-	14.67
20	2042	14.67	50.85	65.51
21	2043	14.67	2.32	16.98
22	2044	6.79	-	6.79
	<b>Total:</b>	<b>314.80</b>	<b>217.50</b>	<b>532.30</b>

**Note:**

1. Base Cost are arrived for FY2023
  2. All the material rates are February 2022 Rates
  3. All labour rates are taken from Central minimum wages (October'2021 cycle) and 2.5% escalation applied on the same to arrive FY2023 Rates
  4. All the costs are without any Escalation.
- All the Cost presented in the above table are excluding Head Office (HQ) Expenses.

# DUEDILIGENCE REPORT

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## 1.1 INTRODUCTION

The **Govt. of India (GOI)** through Ministry of Shipping, Road Transport & Highways is contemplating to enhance the road capacity and safety for efficient transshipment of goods as well as passenger traffic on the heavily trafficked National Highway sections. MoRTH had identified one such corridor to Design, Construction, Development, Finance, Operation and Maintenance of the Rehabilitation and Upgrading to **Four Lane of NH 65 from Km 308 to Km 366 & includes bypass to Pali starting from Km 366 of NH-65, connecting NH-14 at Km 114 (Length 71.535 km) existing 2 lane Highway section of NH-65 between Jodhpur to Pali in the state of Rajasthan** south-east Corridor Under (Public private Partnership) on Design, Build, Finance, Operate and Transfer (DBFOT).

The **Government of Rajasthan** acting through the Chief Engineer, **Public Work Department (PWD)**, Government of Rajasthan has awarded the work of 4 laning of above stretch of highway, on Design, Build, Finance, Operate and Transfer (DBFOT). Toll Basis to the Consortium Company lead by **M/s. G.R.INFRA Project Ltd.**, under Package No: F.7 (269)/pt-IV/BOT/PPP-NH/D-480dt.

Consequent to this, **M/S G.R.INFRA Project Ltd.**, formed a Special Purpose Vehicle (SPV) in the name of **Jodhpur- Pali Expressway Ltd.**, for implementation/execution of the project, registered under the companies act, 1956. The Concession Agreement was signed between PWD and the SPV, **M/s. Jodhpur Pali Expressways Pvt. Ltd.** (formerly known as **Jodhpur Pali Expressways Ltd.**).

The Concessionaire completed the project and obtained PCOD-I on 31.10.2014 for 60.015 km out of 71.535 km with a punch list of items to be completed within 90 days. Subsequently the Concessionaire obtained PCOD-II on 10.10.2015 for 71.093 km out of 71.535 km. Final COD has been achieved on 8<sup>th</sup> March 2018 with a condition that the Concessionaire shall complete the balance works as agreed in supplementary agreement dated on 08.03.2018 between Authority and Concessionaire.

The project is presently under operation and maintenance by concessionaire **JODHPUR PALI EXPRESSWAY PRIVATE LIMITED (JPEPL)**. Samarth Infraengg Technocrats Pvt. Ltd. has been engaged as Technical/ Engineering Due Diligence Advisor for Highways Infrastructure Trust purpose.

This report highlights the findings of due diligence study undertaken by consultants on the project.

## 1.2 PROJECT AT A GLANCE

National Highway 65 connects Ambala in Haryana and Pali in Rajasthan. This 690 km road starts from the junction of Grand Trunk Road and National Highway 22 at Ambala. It then traverses south-west for 240 km before entering Rajasthan at Jhumpa; Kaithal, Narwana, Barwala and Hissar are some major towns that lie along the National Highway 62 on the Haryana side. In Rajasthan, the road passes through Rajgarh, Jhunjhunu, Nagaur and Jodhpur before terminating at Pali, 30 km south-east of Rohat.

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**Table 1: Project Corridor Chainage System**

Referencing system	Project Corridor Start Point (km)	Project Corridor End Point (km)	Length (km)
Existing Chainage	308.000	12.315 of NH-14	70.315
CA Design Chainage	308.000	379.535	71.535

The Project Corridor section starts from Jodhpur and runs south-east towards (Pali side) and ends on NH-14. Photograph showing the start and end point of the project road are presented below:



Following Table highlights the total project at a glance:

SI No.	Description	Date
1.	Date of Signing the Concession Agreement	28 <sup>th</sup> Feb'2013

2.	Appointment Date	16 <sup>th</sup> September 2013
3.	Scheduled Project completion	20 <sup>th</sup> March 2015
4.	Scheduled End of Concession	25 Years
5.	Date of issue of Provisional Completion Certificate	31 <sup>st</sup> October 2014/10 <sup>th</sup> October 2015
6.	Date of Commencement of Commercial Operation	31 <sup>st</sup> October 2014
7.	Date of Issue of Final Completion Certificate	8 <sup>th</sup> March 2018

**Table 2: Salient Features of Project Corridor**

Sl. No.	Particulars	Length/No
1	No of Grade Separated Structures	2 Nos.
2	Service Roads	11.565
3	ROBs	1Nos.
4	ROB location (chainage)	367.473 Km
5	No of Bypass	1 Nos
6	Length of Bypass	Total Bypass Length - 12.335 km 1. Pali Bypass km 367.200 - km 379.535 = km 12.335
7	No of Major Bridges	6 Nos
8	No of Minor Bridges	6 Nos.
11	No of Culvert	6 Nos. Box, 8 No. Slab Culverts, 50 Nos. Pipe Culvert
9	No of VUP	1 Nos.
10	No of PUP/Cattle underpass	2 Nos.
11	No of major intersection/Junction	12 Nos.
12	No of Toll Plaza	2 Nos.
13	Location of Toll Plaza (change)	338+350,365+400
14	No of Truck Lay bye	1 Nos.
15	No of Bus Bays with Shelter	12 Nos. Bus Bays with Shelter
16	Stone Pitching	5.93 km's _Both Sides
17	RCC Wall	0.0450 km's_ Both Sides
18	RE Wall	6.010 km's Both Sides
19	Delineators	1051 No's
20	RCC Covered Drain	23.25 Km's
21	Lined Drain	0.710 Km's
22	Median drain	8.947m Km's
23	Earthen Drain	54 Km's
24	Major Junctions	12 No's
25	Minor Junctions	33 No's
26	High Mast Lighting	5 No's
27	Double Arm Lightning	205 No's excluding the lighting provided by Jodhpur Urban Area (JDA) from 308+460 to 315+400.
28	Single Arm Lightning's	26
29	Median Openings	42 No's
30	Median Chutes	714 No's

Sl. No.	Particulars	Length/No
31	Median Damages	30 Locations
32	Median Plantation_ Functional	71.103 Km's
33	Median Plantation_ Non-Functional	0.45 Km's
34	Metal Beam Crash Barrier	11.394 Km's
35	Concrete Safety barrier	12.244 Km's
36	Pedestrian Guard Rails	3 Km's
37	Concrete Railing	0.930 Km's
38	Service/Slip Roads	11.565 Km's
39	Solar Blinkers	77 No's
40	Km Stones LHS	66 No's
41	Hectometer Stone LHS	228 No's
42	Km Stones RHS	66 No's
43	Hectometer Stone RHS	229 No's
44	Guard Posts	521 No's
45	Road Signs	752 No's

### 1.3 OBJECTIVE AND SCOPE OF SERVICES - FOR DUE DILIGENCE

The main objective of the study is to review the current status of project corridor including details pertaining to its construction and maintenance and to provide requisite technical information for processing the acquisition of said project by client. Objective of the study can be broadly defined with following tasks:

#### 1.3.1 General

- Review of all documents related to Project including but not limited to provisional completion certificates, punch list items completion certificate, clearances, monthly IE reports, important correspondence if any.
- Review of Change of Scope/ other Claims submitted and to be submitted to Authority / IC, comment on the veracity of the same and approval status.
- Highlight any non-compliance of the terms of the CA or O&M manual and IC inspection reports etc.
- Review of any pending issues related to Utility shifting, maintenance etc. in accordance with the Concession Agreement.
- Comment on issues including any balance work that may have a potential impact on the maintenance costs going forward and which may warrant a one-time expense in future.
- In general review the toll plaza systems (incl. AVCC, weigh bridge, sensors, ETC etc.) and the hardware installed therein and comment on the adequacy and level of maintenance of the same to meet the requirements under CA.
- Review of as built drawings.
- Determine the appropriate level and frequency of routine and major maintenance activities required to keep the road assets in good condition and to meet the performance and O&M standards, specifications and requirements.

- Review the major maintenance work undertaken, and prepare projections for future major maintenance expenses (incl. any hand-back requirements), so as to ensure compliance with the terms of CA.
- Review of condition of SPV assets including all equipment and vehicles etc.
- Report on balance acquisition of land if any and possibility of acquisition.
- Report on current encroachments on the project stretch and future expected problems due to the same.
- Review of O&M Contracts

### 1.3.2 Assessment of Asset Condition

- i. Assessment of road assets in conformance with specifications, standards and codes stipulated in CA and O&M manual etc.
- ii. A detailed inventory survey of road assets including main carriageway, structures, service roads, lightings, drains, slope protection works, retaining walls, bus bays, bus shelters, truck lay byes, O&M center, road furniture including signages, MCB, guard rails etc. other safety measures, toll collection infrastructure, buildings, plantation, vehicles and other objects.
- iii. Assessment of condition of the structures including but not limited to visual inspections of bearings, expansion joints, superstructure, substructures, foundations, associated components, pre-stress anchorages (if any), review of geotechnical assumptions, perform geotechnical due diligence, review as-built design and assess design assumptions and provide a detailed report thereon.
- iv. Assessment of condition of the road pavement including but not limited to visual inspections of the pavement, review as-built design and assess design assumptions and provide a detailed report thereon.
- v. Assessment of physical dimensions/ condition of the infrastructure to determine useful lives of the materials and equipment requiring rehabilitation and/or replacement.
- vi. Recommendations for any major repair/ rehabilitation and strengthening based on the condition survey and design reports.
- vii. To provide a detail photographic report of the infrastructure assets and its condition to withstand till end of concession period. Suggestion and cost evaluation for any additional repair / rectification / modification required.

### 1.3.3 Investigations to be carried out

- 1.1. Assessing maintenance needs and its valuation according to the level of deterioration.
- 1.2. Assessing maintenance needs and its valuation according to the level of deterioration.
- 1.3. Evaluation of overall condition of flexible pavement including PQC/ BT at toll plaza, BC, DBM, Base/Sub base and sub grade and drainage condition survey.
- 1.4. Carry out visual condition survey for rigid (toll plaza) and flexible pavement
- 1.5. Reviewed the FWD report provided by Concessionaire and analysed for periodic maintenance schedule .

- 1.6. Review of roughness test reports provided by concessionaire in each lane of carriageway for flexible pavement.
- 1.7. Carry out drainage survey to asses any potential future problems which will cause by moisture and runoff.
- 1.8. Review of subgrade Test pit data provided by concessionaire.
- 1.9. Review of axle load survey report provided by concessionaire for the assessment of axle loading pattern and estimation of VDF. Assessment of traffic loading in terms of MSA based on VDF as obtained & traffic numbers (AADT) and traffic projection (supplied by concessionaire) and comment on the road construction and design on the basis of the same.
- 1.10. Assessment of variation/ COS orders on the project, if any, and evaluate their impact on expenditure, time to completion, future O&M obligations and tolling revenue.
- 1.11. Comment on the pavement crust composition (Design vs. Actual) for PQC/ BT at toll plaza, BC, DBM, overlay and non-bituminous layer etc.

#### **1.3.4 O&M Assessment and Submission of Report**

- Develop a detailed O&M cost forecast for each year of the concession period and a detailed major maintenance cost forecast along with estimation of costs towards handover requirements.

Provide comprehensive report by covering all scope of work mentioned herein this Engagement Letter.

#### **1.4 SURVEYS AND INVESTIGATIONS**

The main objective of undertaking Surveys and Investigations is to appreciate the existing engineering features along the project corridor and to understand the present condition of the various elements of the project road and to prepare inputs required for various rehabilitation and maintenance strategies.

Following Survey and Investigations have been undertaken as a part of study with an objective to understand the present condition of the road and there by access the quality of construction and as well to prepare requisite rehabilitation/corrective designs where necessary.

- Road Inventory Surveys
- Visual Pavement Condition
- Structure Inventory and Condition Surveys

##### **1.4.1 Road Inventory**

The project corridor has flexible pavement in the entire length. Generally, it has 7.25m wide carriageway flanked by 1.5m to 2m wide earthen shoulders. In the initial section, i.e. up to 15.500 km 1.5m paved shoulder on either side in each direction.

The project corridor generally runs in plain terrain. The predominant land use along the project road is Agricultural. It passes through urban settlements like Jodhpur, Mogra, Kankani, Nimbali, Rohat, Gajangarh.

In general, road embankments are in the range of 0.5m-1.5m height. Embankments higher than 1.5m are observed mainly in the approaches of CD structures and Grade Separate locations. Maximum embankment height is observed near ROBs and Grade Separate locations.

The Project Road has twelve (12) major junctions. Further, it has about 33 minor junctions along its length. Photographs showing the Four Major Junctions are presented below:



About 5 numbers of High mast lighting is observed along the project road. Two numbers are located at Major Junctions and Two nos. at each Toll Plaza location. Few photos showing High mast lighting are presented below:



Altogether, the Project road has about Twelve (12) Bus Bay with shelters. Few photos taken at the bus shelters and bus bays are presented below:



Bus shelter near km 346+450, RHS



Bus Bay with Shelter near km 346.500, LHS



Bus Bay With Shelter near km : 336+450, RHS MC



Bus Bay With Shelter near km 336+500, LHS MC

The Project Road has one Truck lay Bye at km 350.500 on LHS side. It has been provided with Flexible Pavement and the condition appears to be good. Truck lay bye provided with Toilet Blocks. Separator is provided between main carriageway and Truck lay bye portion. Lighting in the form of single arm and Double arm poles have been provided on outer edge of the truck lay. 5 Single Arm & 4 Double arm lights are observed and almost all are found to be in good condition.

Few photos depicting the truck lay bye portion are presented below:



Truck Lay bye on LHS km 350.400



Toilet Block at Truck Lay bye on LHS km 350.400

Service road/slip roads have been observed between km 315+300 to 316+650, at km 323+300 to km 324+700, at km 332+280 to 333+100(New), 346+680 to 347.450 & 372.510 to 373.448(New) which covers a small built-up area and a Flyover. Few photos depicting the service road pavement surface type, condition and the other associated features like covered drain, pedestrian guard railing are presented below.

Service Roads exist only at Flyover and Built-Up Area.



#### 1.4.2 Visual Pavement Condition Surveys

The present condition of pavement appears to be good except minor surface related distresses such as minor cracking and raveling is observed along the project road at few locations and the riding quality is satisfactory. These are mainly surface related distresses and the cracking appears to be top-down cracking. Longitudinal cracking is noted at few locations. No potholes are seen along the project. Patches have been observed at few locations. Rutting is seen between km: 346 to km: 347 (i.e., Rohet village section) along the wheel paths in LHS carriageway. During site visit it is observed that major maintenance work is in progress. Few photos are presented below showing existing pavement condition:



### 1.4.3 Falling Weight Deflectometer (FWD) Surveys

#### 1.4.3.1 Falling Weight Deflectometer Survey

In order to evaluate the structural strength of the existing pavement, Falling Weight Deflectometer (FWD) survey has been carried out by the Concessionaire and same was shared with consultant for the analysis.

Few photos taken during the progress of FWD Surveys are presented below:



Deflection Measurement in progress



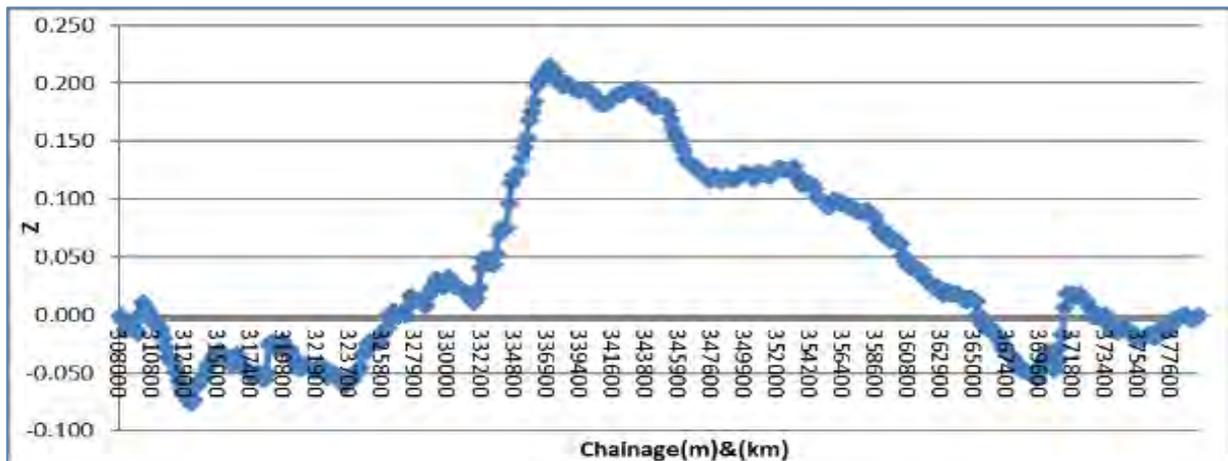
Deflection Measurement in progress

The identified homogenous sections in each direction (i.e., LHS & RHS) for the project stretch have been given in the below table along the graph.

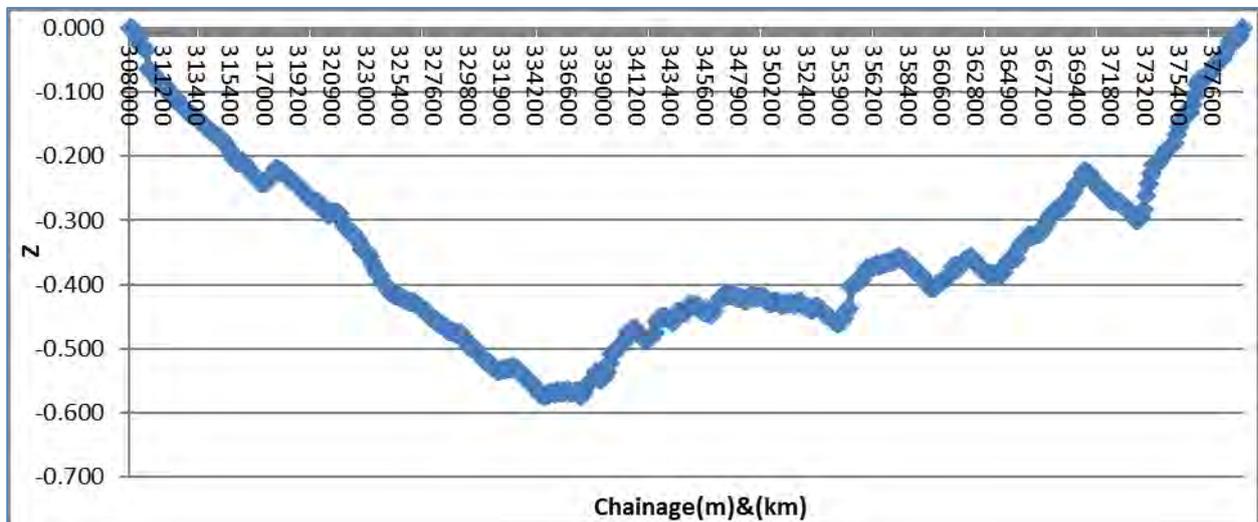
**Table 3: Summary of Homogenous Section - LHS & RHS**

S. No	Side	From	To	Length (km)
1	LHS	308.00	310.60	2.6
2	LHS	310.60	313.80	3.2
3	LHS	313.80	318.20	4.4
4	LHS	318.20	323.30	5.1
5	LHS	323.30	326.20	2.9
6	LHS	326.20	331.80	5.6
7	LHS	331.80	336.20	4.4
8	LHS	336.20	340.80	4.6
9	LHS	340.80	345.40	4.6
10	LHS	345.40	348.40	3.0
11	LHS	348.40	351.40	3.0
12	LHS	351.40	355.40	4.0
13	LHS	355.40	359.40	4.0
14	LHS	359.40	361.80	2.4
15	LHS	361.80	364.80	3.0
16	LHS	364.80	368.60	3.8
17	LHS	368.60	371.80	3.2
18	LHS	371.80	373.60	1.8
19	LHS	373.60	375.80	2.2
20	LHS	375.80	379.40	3.6
<b>Separator</b>				
1	RHS	308.00	311.20	3.2
2	RHS	311.20	314.90	3.7
3	RHS	314.90	318.20	3.3
4	RHS	318.20	320.80	2.6
5	RHS	320.80	324.40	3.6
6	RHS	324.40	326.60	2.2
7	RHS	326.60	328.80	2.2
8	RHS	328.80	333.60	4.8
9	RHS	333.60	336.90	3.3
10	RHS	336.90	340.60	3.7
11	RHS	340.60	343.40	2.8
12	RHS	343.40	347.00	3.6
13	RHS	347.00	351.40	4.4

S. No	Side	From	To	Length (km)
14	RHS	351.40	353.70	2.3
15	RHS	353.70	357.60	3.9
16	RHS	357.60	360.80	3.2
17	RHS	360.80	364.20	3.4
18	RHS	364.20	366.80	2.6
19	RHS	366.80	370.90	4.1
20	RHS	370.90	372.70	1.8
21	RHS	372.70	375.60	2.9
22	RHS	375.60	379.40	3.8



**Delineation of Homogeneous Section - LHS**



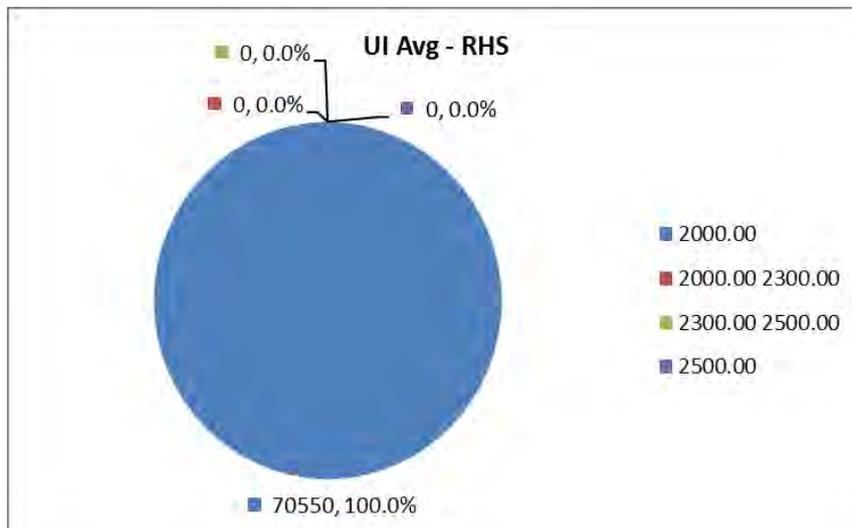
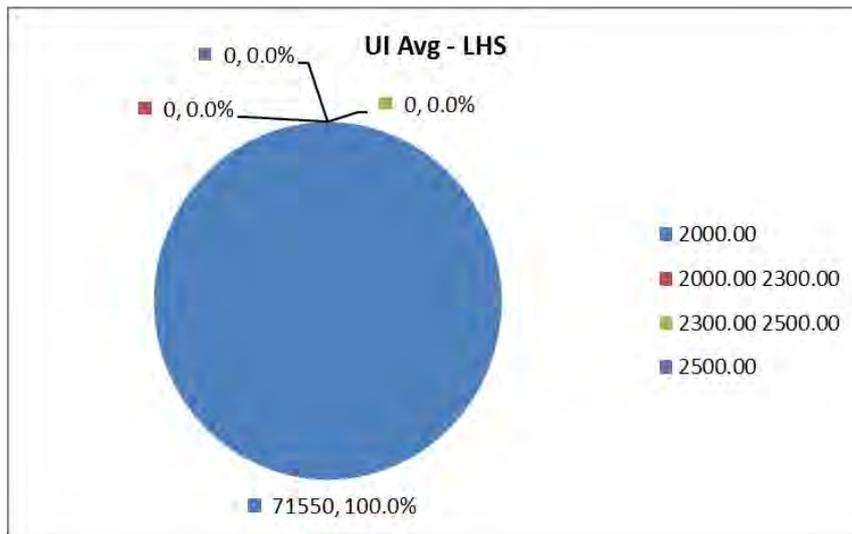
**Delineation of Homogeneous Section - RHS**

#### 1.4.4 Roughness surveys

The Roughness data received indicates that the roughness has been collected using 5<sup>th</sup> wheel bump integrator (SETCO-366) in the month of October 2021 and analyzed the data in terms of Unevenness Index (UI), separately for each lane, for both direction of travel.

As per IRCP:16-2004, Bituminous Concrete pavement is surface is considered to be good when its UI value is less than 2000 mm/km and the same is considered to be average for UI values between 2000 and 3000 mm/km whilst the surface is treated as Poor for UI values greater than 3000 mm/km.

Average UI values along the corridor were grouped in to four categories, Pie chart showing the range of UI values in each carriageway of the project road have been presented below:



It can be seen from the above charts that entire length of the Project Road has good riding quality (UI<2000 mm/km) in LHS and RHS carriageway.

#### 1.4.5 Pavement Composition Surveys (Test PITS)

The composition of the existing pavement crust has been noted from test pit surveys. Test pits have been undertaken at an interval of 5.0 km (staggered Interval) along the project road. Thus, a total of 18 pits have been dug along the corridor and the data on composition of pavement has

been noted. Sixteen out of 18 pits done on Main Carriageway edge and remaining two test pits done on Service road edge. Photographs have been taken at all test pit locations depicting the crust thickness and nature of material in the pavement. Few sample photos taken are presented below:



km 317+200 RHS (JP-TP-1)



km 320+000 LHS (JP-TP-2)



km 324+900 RHS (JP-TP-3)



km 329+200 LHS (JP-TP-4)



km 334+950 RHS (JP-TP-5)



km 340+100 LHS (JP-TP-6)



km 345+000 RHS (JP-TP-7)



km 350+200 LHS (JP-TP-8)



km 355+600 RHS (JP-TP-9)



km 360+200 LHS (JP-TP-10)



km 365+000 RHS (JP-TP-11)



km 369+300 LHS (JP-TP-12)



Review of the test pit survey showing average thickness of pavement layers and same is presented in the Table below.

**Table 4: Pavement Composition**

S. No	Test Pit Number	Design Chainage	Direction	BT, mm	WMM, mm	GSB, mm	Total
1	JP-TP-1	317+200	RHS	150	210	200	560
2	JP-TP-2	320+200	LHS	140	240	200	580
3	JP-TP-3	324+900	RHS	150	270	270	690
4	JP-TP-4	329+200	LHS	145	270	130	545
5	JP-TP-5	334+900	RHS	150	190	190	530
6	JP-TP-6	340+100	LHS	155	200	230	585
7	JP-TP-7	345+000	RHS	150	220	190	560
8	JP-TP-8	350+200	LHS	150	230	200	580
9	JP-TP-9	355+600	RHS	150	220	210	580
10	JP-TP-10	360+200	LHS	120	250	200	570
11	JP-TP-11	365+000	RHS	150	230	180	560
12	JP-TP-12	369+300	LHS	145	200	210	555
13	JP-TP-13	375+200	RHS	150	240	200	590
14	JP-TP-14	378+700	LHS	150	230	180	560
15	JP-SR-TP-1	324+600	RHS	100	250	170	520
16	JP-SR-TP-2	372+600	LHS	70	230	160	460

Total average crust thickness of the MCW pavement is 575mm. The average thickness of bituminous layer is 147mm. Pavement is mainly composed of a BT layer, WMM & GSB base over subgrade.

**Table 5: Pavement Composition at Toll Plaza locations**

S. No	Test Pit Number	Design Chainage	Direction	PQC, mm	DLC, mm	GSB, mm	Total
1	JP-TP-15 TOLL-1	338+200	LHS	300	150	200	650
2	JP-TP-16 TOLL-2	365+250	LHS	300	150	200	650

#### 1.4.6 Subgrade Investigations & Laboratory Testing

Sub-grade Investigations have been carried out to examine the subgrade soil characteristics along the project road. A total number of 18 Test pits have been carefully dug from the pavement surface up to sub-grade level. Sixteen out of 18 pits done on Main Carriageway edge and remaining two test pits done on Service road edge. Field density tests have been conducted for subgrade samples and a small quantity of sample has also been collected in airtight containers for determining the field moisture content. Upon completion of the field density test, representative sample of sub-grade soil has been collected in bulk, in gunny bags, from each test pit for laboratory testing.

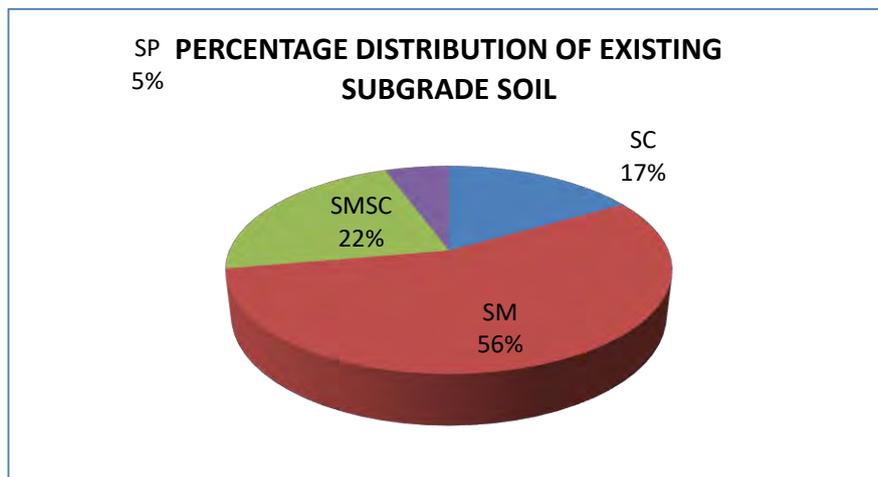
The soil samples collected have been tested for the following properties to assess the existing sub-grade soil properties.

- Sieve analysis
- Atterberg limits
- Heavy compaction

- Four (4) days soaked CBR as per IS standards at 97% of MDD as applicable for sub-grade (Heavy Compaction)
- Free swelling index

Soil classification has been done according to IS Classification of Soils (ISC) as detailed in IS 1498 - 1978. Laboratory test results indicate that all the Subgrade soil samples collected belongs to Coarse Grained Soil. About 10 samples belong to SM, 3 samples belong to SC, 4 samples belongs to SM-SC and one sample belongs to SP.

Pie Chart showing the percentage distribution of soil classification of existing subgrade sample is presented below:



#### 1.4.7 Axle Load Surveys

Traffic loading has a significant impact on pavement performance and design. This is because the damage that vehicles create to a road depends very strongly on the axle loads of the vehicles. The exact relationship is influenced by the type of road structure and the way the road deteriorates but a “fourth power” damage law gives a good approximation.

Concessionaire has shared the Axle load survey data and the same was reviewed and Vehicle Damage Factors have been calculated using the standard axle loadings given in IRC: 37-2018. The standard axle loadings adopted have been presented in the following table

**Table 6: Details of Standard Axles Used**

Axle Configuration	Standard Axle load (Tonnes)*	Remarks
Single Wheel, Single Axle	6.60	As per IRC 37-2018
Dual Wheel, Single Axle	8.16	As per IRC 37-2018
Dual Wheel, Tandem Axle group	15.10	As per IRC 37-2018
Dual Wheel, Tridem Axle group	22.90	As per IRC 37-2018

Direction wise VDF for each mode of commercial traffic has been estimated. Results of axle load surveys have been presented in the following table.

**Table 7: VDF Values Estimated at the Toll Plaza Location (Near km 338+400)**

Mode Type	UP	DOWN
LCV	0.995	1.569
2 Axle Truck	7.756	3.477
3 Axle Truck	6.157	6.669
MAV (4-6 Axle)	9.629	11.519
Buses*	1.000	1.000

**Table 8: VDF Values Estimated at the Toll Plaza Location (Near km 365+400)**

Mode Type	UP	DOWN
LCV	1.093	1.454
2 Axle Truck	6.655	3.205
3 Axle Truck	6.001	6.996
MAV (4-6 Axle)	11.060	12.744
Buses*	1.000	1.000

## 1.5 VALIDATION OF EXECUTED WORKS

The project road has been closely inspected to verify the executed works on ground vis-à-vis the scope envisaged in CA. The as-built drawings made available have been studied in detail before examining them on ground. Each and every structure has been inspected to note down its structural configuration and condition. The following works highlight the findings on executed works on ground.

### 1.5.1 Road Works

The project corridor appears to have been constructed with the cross-sectional elements matching to those given in above TCS drawings. From Km 308.000 to Km 315.400 the urban area the carriageway width is 7m flanked by paved Shoulder varies from 1.5 to 3m with shyness of 0.25m. From Km 316.500 to Km 323.600 the carriageway width is 7m flanked by paved Shoulder With 1.5 Width and with shyness of 0.25m Plus 1.5m Earthen Shoulder. From Km 324.500 to Km 379.535 the carriageway width is 7m and with shyness of 0.25m Plus 1.5m Earthen Shoulder Except Structure locations and built-up Area

Service roads/Slip roads are constructed to a width as shown in TCS. Location of service roads and slip roads as constructed are as below

**Table 9: Service Road/Slip Road Locations**

S. No.	Chainage		Side	Pavement Type	Length(km)	Width (m)	Remarks
	From (km)	To (km)					
1	308.000	308.490	LHS	BT	0.490	7.0	

S. No.	Chainage		Side	Pavement Type	Length(km)	Width (m)	Remarks
	From (km)	To (km)					
2	308.000	308.420	RHS	BT	0.420	7.0	
3	315.300	315.800	LHS	BT	0.500	14.5	
4	315.300	315.800	RHS	BT	0.500	10.5	
5	315.800	316.650	LHS	BT	0.850	7.0	
6	315.800	316.620	RHS	BT	0.820	7.0	
7	323.300	324.700	LHS	BT	1.400	5.5	
8	323.475	324.600	RHS	BT	1.125	5.5	
9	332.280	333.100	LHS	BT	0.820	5.5	COS
10	332.280	333.100	RHS	BT	0.820	5.5	COS
11	346.680	347.450	LHS	BT	0.770	5.5	Poor Condition
12	346.680	347.650	RHS	BT	0.970	5.5	
13	372.510	373.550	LHS	BT	1.040	5.5	COS
14	372.510	373.550	RHS	BT	1.040	5.5	COS
As per Site Total Length on both sides (Km)					<b>11.565</b>		
As per Schedule (Km) on both sides					<b>11.540</b>		

Lined Covered drains exist only at service road locations and Built-up Area along the project road where these are presented between the service road and main carriageway. Cleaning is needed to require for flow of water from service road and these sections are presented in the Table below:

**Table 10: Lined Covered Drain Locations**

S. No.	Chainage		Side	Type	Length (Km)	Width	Depth
	From (km)	To (km)					
1	308.020	308.380	LHS	Lined	0.360	0.55	0.43
2	308.380	316.500	LHS	Covered	8.120	1.3	0.8
3	308.030	308.380	RHS	Lined	0.350	0.55	0.43
4	308.380	316.485	RHS	Covered	8.105	1.30	0.80
5	323.150	324.450	LHS	Covered	1.300	1.50	0.95
6	323.540	324.450	RHS	Covered	0.910	1.50	0.95
7	332.280	332.900	LHS	Covered	0.620	1.50	0.90
8	332.280	332.900	RHS	Covered	0.620	1.50	0.90
9	346.900	347.500	LHS	Covered	0.600	1.30	0.85
10	346.720	347.700	RHS	Covered	0.980	1.30	0.85
11	372.510	373.448	LHS	Covered	0.938	1.50	0.90
12	372.520	373.580	RHS	Covered	1.060	1.50	0.90
Total Length of Covered (Km)					<b>23.253</b>		
Total Lined Drain (KM)					<b>0.710</b>		

Unlined drains existing majority of length of project road and the locations are as listed in Table below:

**Table 11: Earthen Drains**

S. No.	Chainage		Side	Type	Length (Km)
	From (km)	To (km)			
1	325.000	329.000	LHS	Earthen	4.000
2	325.000	329.000	RHS	Earthen	4.000
3	338.000	339.000	RHS	Earthen	1.000
4	340.000	344.000	RHS	Earthen	4.000
5	342.000	343.000	LHS	Earthen	1.000
6	348.000	349.000	LHS	Earthen	1.000
7	349.000	351.000	RHS	Earthen	2.000
8	352.000	354.000	LHS	Earthen	2.000
9	352.000	353.000	RHS	Earthen	1.000
10	354.000	355.000	RHS	Earthen	1.000
11	355.000	367.000	LHS	Earthen	12.000
12	357.000	362.000	RHS	Earthen	5.000
13	368.000	374.000	LHS	Earthen	6.000
14	367.000	376.000	RHS	Earthen	9.000
15	375.000	376.000	LHS	Earthen	1.000
<b>Total Length(km)</b>					<b>54.000</b>

On curved sections with super-elevation, median chutes were provided and are presented in table below:

**Table 12: Median Chutes**

S.No.	Chainage		Length (Km)	No of Chutes	Condition	Remarks
	From (km)	To (km)				
1	318.150	318.550	0.400	41	Good	
2	318.600	318.772	0.172	7	Good	
3	319.280	319.550	0.270	22	Good	
4	319.590	319.700	0.110	10	Good	
5	323.000	323.450	0.450	27	Good	
6	325.150	325.410	0.260	19	Good	
7	326.600	326.920	0.320	27	Good	
8	333.920	334.000	0.080	0	Good	
9	334.080	334.375	0.295	0	Good	
10	334.650	334.830	0.180	0	Good	
11	346.140	346.600	0.460	41	Good	
12	347.780	348.400	0.620	57	Good	
13	348.690	349.000	0.310	29	Good	
14	351.680	352.180	0.500	47	Good	
15	353.360	353.750	0.390	37	Good	
16	353.920	354.410	0.490	51	Good	

S.No.	Chainage		Length (Km)	No of Chutes	Condition	Remarks
	From (km)	To (km)				
17	355.260	355.600	0.340	35	Good	
18	358.920	359.300	0.380	26	Good	
19	359.700	360.220	0.520	45	Good	
20	365.800	366.300	0.500	39	Good	
21	366.870	367.240	0.370	40	Good	
22	369.030	369.320	0.290	21	Good	
23	370.290	370.460	0.170	14	Good	
24	371.600	372.200	0.600	56	Good	
25	378.250	378.720	0.470	23	Good	
Total Length & Cuts			8.947	714		

Stone Pitching is found in approaches of some of the Grade-Separators/ROB/Major Bridges along the Project. Side kerb and chutes are also observed in the approaches whereas the dissipation chambers are covered with garbage and soil. Slope Protection details and side kerb details are listed in the tables below.

**Table 13: Slope Protection Details**

S. No	Chainage		Length	Side	Embankment	Stone Pitching	RE Wall	RCC Wall	Toe Wall	Chutes	Remarks
	From	To									
1	308.120	308.380	0.520	BHS	-	-	YES	-	-	-	
2	315.500	315.840	0.680	BHS	-	-	YES	-	-	-	
3	315.950	316.360	0.820	BHS	-	-	YES	-	-	-	
4	318.545	318.590	0.045	LHS	-	-	-	YES	-	-	
5	318.705	318.745	0.040	LHS	-	YES	-	-	-	1	
6	318.510	318.590	0.080	RHS	-	YES	-	-	-	-	
7	318.710	318.745	0.035	RHS	-	YES	-	-	-	-	
8	323.200	323.500	0.300	RHS	-	-	-	-	YES	-	stone masonry wall
9	323.540	323.900	0.720	BHS	-	-	YES	-	-	-	
10	324.000	324.400	0.800	BHS	-	-	YES	-	-	-	
11	325.545	325.610	0.065	LHS	-	YES	-	-	-	8	
12	325.540	325.610	0.070	RHS	-	YES	-	-	-	10	
13	325.615	325.660	0.045	LHS	-	YES	-	-	-	5	
14	325.615	325.665	0.050	RHS	-	YES	-	-	-	6	
15	326.500	326.608	0.108	LHS	YES	-	-	-	-	-	
16	326.608	326.618	0.010	LHS	-	YES	-	-	-	-	
17	326.622	326.632	0.010	LHS	-	YES	-	-	-	-	
18	326.500	326.618	0.118	RHS	YES	-	-	-	-	-	
19	326.622	326.820	0.198	RHS	YES	-	-	-	-	-	
20	328.019	328.028	0.009	LHS	-	YES	-	-	-	-	
21	328.032	328.041	0.009	RHS	-	YES	-	-	-	-	
22	333.473	333.963	0.490	LHS	-	YES	-	-	-	39	
23	334.068	334.698	0.630	LHS	-	YES	-	-	-	24	

S. No	Chainage		Length	Side	Embankment	Stone Pitching	RE Wall	RCC Wall	Toe Wall	Chutes	Remarks
	From	To									
24	334.962	334.997	0.035	LHS	-	YES	-	-	-	-	
25	333.873	333.963	0.090	Median	-	YES	-	-	-	-	
26	334.068	334.698	0.630	Median	-	-	-	-	YES	-	cement lining at median
27	334.960	335.030	0.070	Median	-	YES	-	-	-	-	
28	333.751	333.963	0.212	RHS	-	YES	-	-	-	17	
29	334.068	334.698	0.630	RHS	-	YES	-	-	-	29	
30	334.962	335.072	0.110	RHS	-	YES	-	-	-	10	
31	338.580	338.716	0.272	BHS	YES	-	-	-	-	-	
32	338.746	339.000	0.508	BHS	YES	-	-	-	-	-	
33	339.527	339.532	0.010	BHS	-	YES	-	-	-	-	
34	339.550	339.555	0.010	BHS	-	YES	-	-	-	-	
35	339.400	339.532	0.132	RHS	YES	-	-	-	-	-	
36	339.550	339.600	0.050	RHS	YES	-	-	-	-	-	
37	343.239	343.243	0.004	RHS	-	YES	-	-	-	-	
38	343.255	343.259	0.004	RHS	-	YES	-	-	-	-	
39	343.100	343.243	0.143	LHS	YES	-	-	-	-	-	
40	343.255	343.350	0.095	LHS	YES	-	-	-	-	-	
41	345.996	346.002	0.006	RHS	-	YES	-	-	-	-	
42	346.036	346.042	0.006	RHS	-	YES	-	-	-	-	
43	348.995	349.155	0.160	LHS	-	YES	-	-	-	15	
44	349.305	349.380	0.075	LHS	-	YES	-	-	-	6	
45	349.045	349.155	0.110	RHS	-	YES	-	-	-	10	
46	349.305	349.380	0.075	RHS	-	YES	-	-	-	4	
47	350.650	350.790	0.140	LHS	-	YES	-	-	-	12	
48	350.650	350.790	0.140	RHS	-	YES	-	-	-	12	
49	354.395	354.610	0.215	LHS	-	YES	-	-	-	18	
50	354.770	355.100	0.330	LHS	-	YES	-	-	-	30	
51	354.500	354.610	0.110	RHS	-	YES	-	-	-	13	
52	354.770	355.100	0.330	RHS	-	YES	-	-	-	32	
53	358.780	359.010	0.230	LHS	-	YES	-	-	-	18	
54	358.700	359.030	0.330	RHS	YES	-	-	-	-	-	
55	358.780	359.010	0.230	LHS	-	YES	-	-	-	18	
56	358.700	359.030	0.330	RHS	YES	-	-	-	-	-	
57	360.551	360.556	0.005	LHS	-	YES	-	-	-	-	
58	360.560	360.565	0.005	LHS	-	YES	-	-	-	-	
59	360.551	360.556	0.005	RHS	-	YES	-	-	-	-	
60	360.560	360.565	0.005	RHS	-	YES	-	-	-	-	
61	366.845	367.425	0.580	Median	-	YES	-	-	-	-	
62	367.545	367.955	0.410	Median	-	YES	-	-	-	-	
63	367.175	367.425	0.250	LHS	-	-	YES	-	-	-	

S. No	Chainage		Length	Side	Embankment	Stone Pitching	RE Wall	RCC Wall	Toe Wall	Chutes	Remarks
	From	To									
64	367.545	367.875	0.330	LHS	-	-	YES	-	-	-	
65	366.900	367.425	0.525	RHS	-	-	YES	-	-	-	
66	367.545	367.950	0.405	RHS	-	-	YES	-	-	-	
67	371.229	371.239	0.010	LHS	-	YES	-	-	-	-	
68	371.507	371.542	0.035	LHS	-	YES	-	-	-	-	
69	371.159	371.239	0.080	RHS	YES	-	-	-	-	-	
70	371.507	371.602	0.095	RHS	YES	-	-	-	-	-	
71	372.820	373.300	0.480	LHS	-	-	YES	-	-	-	
72	372.820	373.300	0.480	RHS	-	-	YES	-	-	-	
		Total	15.374							337	

**Table 14: Side Kerb and chute Details**

S.no	Chainage		Length (Km)	Side	No. of Chutes	Remarks
	From	To				
1	318.705	318.745	0.040	LHS	1	
2	325.545	325.610	0.065	LHS	8	
3	325.540	325.610	0.070	RHS	10	
4	325.615	325.660	0.045	LHS	5	
5	325.615	325.665	0.050	RHS	6	
6	333.473	333.963	0.490	LHS	39	
7	334.068	334.698	0.630	LHS	24	
8	333.751	333.963	0.212	RHS	17	
9	334.068	334.698	0.630	RHS	29	
10	334.962	335.072	0.110	RHS	10	
11	348.995	349.155	0.160	LHS	15	
12	349.305	349.380	0.075	LHS	6	
13	349.045	349.155	0.110	RHS	10	
14	349.305	349.380	0.075	RHS	4	
15	350.650	350.790	0.140	LHS	12	
16	350.650	350.790	0.140	RHS	12	
17	354.395	354.610	0.215	LHS	18	
18	354.770	355.100	0.330	LHS	30	
19	354.500	354.610	0.110	RHS	13	
20	354.770	355.100	0.330	RHS	32	
21	358.780	359.010	0.230	LHS	18	
22	358.780	359.010	0.230	LHS	18	
			<b>Total</b>		<b>337</b>	

Median width of 4.5m was generally adopted along the project road. Median opening and Solar Blinkers are presenting Tables below:

**Table 15: Locations of Median Openings**

S. No.	Chainage (km)	Width (m)	Length (m)	Reserve lane	Remarks
1	308.700	1.1	20	No	

S. No.	Chainage (km)	Width (m)	Length (m)	Reserve lane	Remarks
2	309.090	1.1	15	No	
3	309.180	1.0	25	No	
4	309.450	1.0	20	No	
5	310.100	1.0	20	No	
6	310.350	1.0	30	No	
7	311.450	1.5	50	No	
8	311.800	1.0	20	No	
9	312.380	1.0	20	No	
10	312.900	1.0	30	No	
11	313.800	1.5	30	No	
12	314.600	1.1	10	No	
13	314.810	1.1	10	No	
14	315.100	1.1	10	No	
15	317.550	1.0	30	yes	
16	319.560	1.0	30	yes	
17	322.170	1.0	30	yes	
18	325.140	1.0	30	yes	
19	327.160	1.0	30	yes	
20	328.200	1.0	30	yes	
21	329.300	1.0	30	yes	
22	332.550	1.0	30	yes	
23	332.810	1.0	30	yes	
24	333.400	4.5	10	No	
25	336.050	1.0	30	yes	
26	340.550	1.0	30	yes	
27	342.000	4.5	20	No	
28	344.050	1.0	30	yes	
29	345.820	1.0	30	yes	
30	346.650	1.0	30	yes	
31	347.750	2.5	30	yes	
32	350.730	1.0	30	yes	
33	352.520	1.0	30	yes	
34	355.800	1.0	30	yes	
35	357.010	1.0	30	yes	
36	360.600	1.0	30	yes	
37	361.780	1.0	30	yes	
38	368.050	1.0	30	yes	
39	369.550	1.0	30	yes	
40	370.800	4.5	25	Yes	
41	375.900	1.0	30	yes	
42	377.890	1.0	30	yes	

Median openings and cross road locations with Solar Blinkers are presented below:

**Table 16: Details of Solar Blinkers**

S. No	Chainage (km)	Location	No. of Solar Blinker's	Condition
1	308.700	Median	2	Working
2	309.090	Median	2	Working
3	309.180	Median	2	Working
4	309.450	Median	2	Working
5	310.100	Median	4	Working
6	310.350	Median	4	Working
7	312.380	Median	2	Working
8	312.900	Median	2	Working
9	313.800	Median	2	Working
10	314.350	Median	3	Working
11	317.550	Median	2	Working
12	319.450	Median	2	Working
13	322.170	Median	2	Working
14	325.140	Median	1	Working
15	327.160	Median	2	Working
16	328.200	Median	1	Working
17	329.300	Median	2	Working
18	332.550	Median	2	Working
19	332.810	Median	2	Working
20	333.400	Median	2	Working
21	336.050	Median	2	Working
22	340.550	Median	2	Working
23	344.050	Median	2	Working
24	345.850	Median	2	Working
25	346.650	Median	2	Working
26	347.750	Median	2	Working
27	350.730	Median	2	Working
28	352.520	Median	2	Working
29	355.800	Median	2	Working
30	357.010	Median	2	Working
31	360.600	Median	2	Working
32	361.780	Median	1	Working
33	368.050	Median	2	Working
34	369.550	Median	2	Working
35	370.800	Median	2	Working
36	372.650	Median	1	Working
37	375.900	Median	2	Working
38	377.890	Median	2	Working
<b>Total</b>			<b>77</b>	

There are few unauthorized median cuts and damaged medians exist along the project corridor and are presented in Table below:

**Table 17: Median Damaged Locations**

S. No	Chainage (Km)	Description	Length (m)
1	321.35	Unauthorized	0.5
2	325.8	Unauthorized	20
3	333.42	Unauthorized	20
4	349.65	Unauthorized	0.5
5	351.46	Unauthorized	23
6	356.65	Unauthorized	150
7	363.56	Unauthorized	0.5
8	374.36	Unauthorized	10
		Total damaged length	224.50 m

Safety barriers have been provided along the project road at high embankments where embankment height is >3m at sharp curve locations, at approaches of grade separated and cross drainage Structures. Details of safety barriers provided along the corridor include the following

**Table 18: Metal Beam Crash Barrier Locations**

S. No.	Chainage		Side	Length (m)	Condition	Remarks
	From (Km)	To (Km)				
1	315.380	315.840	Median	0.460	Good	
2	315.930	316.470	Median	0.540	Good	
3	318.300	318.750	RHS	0.450	Good	
4	318.520	318.545	LHS	0.025	Good	
5	318.700	318.735	LHS	0.035	Good	
6	323.470	323.900	Median	0.430	Good	
7	323.900	324.380	Median	0.480	Good	
8	325.498	325.594	LHS	0.096	Good	
9	325.500	325.750	RHS	0.250	Good	
10	325.616	325.760	LHS	0.144	Good	
11	326.550	326.610	LHS	0.060	Good	
12	328.220	328.290	LHS	0.070	Good	
13	333.770	334.800	RHS	1.030	Good	
14	333.786	333.980	LHS	0.194	Good	
15	333.920	333.980	Median	0.060	Good	
16	334.000	334.390	Median	0.390	Good	
17	334.630	334.690	Median	0.060	Good	
18	334.630	334.650	LHS	0.020	Good	
19	335.150	335.220	LHS	0.070	Good	
20	335.200	335.600	RHS	0.400	Good	
21	335.300	335.570	LHS	0.270	Good	
22	336.200	336.400	RHS	0.200	Good	
23	336.230	336.260	LHS	0.030	Good	
24	336.280	336.300	LHS	0.020	Good	
25	338.600	338.800	RHS	0.200	Good	
26	338.600	338.800	LHS	0.200	Good	

S. No.	Chainage		Side	Length (m)	Condition	Remarks
	From (Km)	To (Km)				
27	339.450	339.510	RHS	0.060	Good	
28	339.480	339.560	LHS	0.080	Good	
29	343.180	343.200	LHS	0.020	Good	
30	343.200	343.300	RHS	0.100	Good	
31	343.250	343.290	LHS	0.040	Good	
32	345.850	345.900	RHS	0.050	Good	
33	345.920	346.100	LHS	0.180	Good	
34	345.950	346.050	RHS	0.100	Good	
35	346.500	346.550	RHS	0.050	Good	
36	349.000	349.080	RHS	0.080	Good	
37	349.000	349.090	LHS	0.090	Good	
38	349.230	349.300	RHS	0.070	Good	
39	349.250	349.300	LHS	0.050	Good	
40	350.030	350.100	LHS	0.070	Good	
41	350.050	350.150	RHS	0.100	Good	
42	350.650	350.700	RHS	0.050	Good	
43	351.500	351.600	RHS	0.100	Good	2
44	351.520	351.580	LHS	0.060	Good	
45	352.450	352.500	RHS	0.050	Good	
46	353.200	353.320	LHS	0.120	Good	
47	353.200	353.400	RHS	0.200	Good	
48	354.300	354.500	RHS	0.200	Good	
49	354.420	354.580	LHS	0.160	Good	
50	354.750	355.000	LHS	0.250	Good	
51	354.800	355.000	RHS	0.200	Good	
52	355.310	355.340	RHS	0.030	Good	
53	356.310	356.340	LHS	0.030	Good	
54	356.850	356.900	RHS	0.050	Good	
55	358.760	359.000	LHS	0.240	Good	
56	358.800	359.000	RHS	0.200	Good	
57	360.500	360.530	LHS	0.030	Good	
58	360.500	360.700	RHS	0.200	Good	
59	365.050	365.100	RHS	0.050	Good	
60	365.700	365.800	LHS	0.100	Good	
61	365.700	365.800	RHS	0.100	Good	
62	366.350	366.420	LHS	0.070	Good	
63	366.400	366.500	RHS	0.100	Good	
64	366.930	367.400	Median	0.470	Good	
65	367.140	367.190	LHS	0.050	Good	
66	367.490	367.950	LHS	0.460	Good	
67	367.900	367.950	RHS	0.050	Good	
68	370.910	370.970	LHS	0.060	Good	5

S. No.	Chainage		Side	Length (m)	Condition	Remarks
	From (Km)	To (Km)				
69	370.910	370.970	RHS	0.060	Good	
70	371.130	371.200	LHS	0.070	Good	
71	371.480	371.510	LHS	0.030	Good	
72	371.660	371.730	LHS	0.070	Good	
73	371.700	371.740	RHS	0.040	Good	
74	374.240	374.300	LHS	0.060	Good	
75	374.240	374.300	RHS	0.060	Good	
<b>Total Length</b>				11.394		

**Table 19: Concrete Crash Barrier Locations**

S.No.	Chainage		Length (Km)	Side	Remarks
	From (Km)	To (Km)			
1	315.350	316.400	1.050	LHS	
2	315.580	315.974	0.394	Median	
3	315.580	316.300	0.720	RHS	
4	318.550	318.600	0.050	LHS	
5	318.550	318.600	0.050	Median	
6	318.560	318.680	0.120	RHS	
7	318.670	318.710	0.040	LHS	
8	318.670	318.710	0.040	Median	
9	323.550	324.380	0.830	RHS	
10	323.940	324.010	0.070	Median	
11	323.540	324.370	0.830	LHS	
12	325.580	325.620	0.040	RHS	
13	325.600	325.610	0.010	RHS	
14	325.600	325.610	0.010	LHS	
15	335.150	335.210	0.060	RHS	
16	335.150	335.210	0.060	LHS	
17	335.150	335.210	0.060	Median	
18	336.200	336.280	0.080	RHS	
19	336.200	336.280	0.080	LHS	
20	338.640	338.690	0.050	RHS	
21	338.640	338.690	0.050	LHS	
22	338.640	338.690	0.050	Median	
23	338.740	338.770	0.030	RHS	
24	338.740	338.770	0.030	LHS	
25	338.740	338.770	0.030	Median	
26	339.090	339.100	0.010	RHS	
27	339.090	339.100	0.010	LHS	
28	339.500	339.550	0.050	RHS	
29	339.500	339.550	0.050	LHS	
30	343.210	343.250	0.040	LHS	
31	343.210	343.250	0.040	Median	

S.No.	Chainage		Length (Km)	Side	Remarks
	From (Km)	To (Km)			
32	343.310	343.330	0.020	LHS	
33	343.310	343.350	0.040	Median	
34	346.680	347.450	0.770	RHS	
35	346.680	347.450	0.770	LHS	
36	346.680	347.730	1.050	Median	
37	348.900	349.200	0.300	RHS	
38	348.900	349.200	0.300	LHS	
39	348.990	349.200	0.210	Median	
40	349.960	349.990	0.030	LHS	
41	349.960	349.990	0.030	Median	
42	350.030	350.060	0.030	LHS	
43	350.030	350.060	0.030	Median	
44	354.590	354.750	0.160	LHS	
45	359.000	359.040	0.040	RHS	
46	360.500	360.540	0.040	RHS	
47	360.540	360.550	0.010	LHS	
48	366.450	366.500	0.050	RHS	
49	366.450	366.500	0.050	LHS	
50	367.000	368.000	1.000	RHS	
51	367.200	367.500	0.300	RHS	
52	367.400	367.460	0.060	LHS	
53	367.150	367.800	0.650	LHS	
54	367.150	367.850	0.700	Median	
55	371.200	371.480	0.280	LHS	
56	371.200	371.480	0.280	Median	
57	374.270	374.280	0.010	LHS	
<b>Total Length</b>			12.244		

**Table 20: Concrete Railing Locations**

S.No.	Chainage		Side	Length (Km)	Condition	Remarks
	From (Km)	To (Km)				
1	318.600	318.670	LHS	0.070	Good	
2	318.600	318.670	Median	0.070	Good	
3	333.980	334.100	LHS	0.120	Good	
4	333.980	334.100	Median	0.120	Good	
5	334.330	334.700	LHS	0.370	Good	
6	338.700	338.740	LHS	0.040	Good	
7	338.700	338.740	Median	0.040	Good	
8	343.280	343.310	Median	0.030	Good	
9	343.280	343.310	LHS	0.030	Good	
10	349.990	350.030	LHS	0.040	Good	
<b>Total Length</b>				0.930		

Pedestrian Guard Rails are observed at only the Bus bay locations and are presented in Table below:

**Table 21: Details of Pedestrian Guard Rails**

S. No.	Chainage		Side/Location	Length (km)	Condition
	From (km)	To (km)			
1	308.000	308.140	Median	0.140	Good
2	313.100	314.260	Median	1.160	Good
3	314.360	315.310	Median	0.950	Good
4	318.540	318.660	LHS	0.120	Good
5	318.540	318.660	Median	0.120	Good
6	340.700	340.740	LHS	0.040	4m Damage
7	340.700	340.740	Median	0.040	Good
8	356.810	356.850	RHS	0.040	Good
9	357.010	357.050	LHS	0.040	2m Damage
10	360.720	360.760	LHS	0.040	Good
11	371.480	371.720	RHS	0.240	Good
12	371.130	371.200	RHS	0.070	Good
Total Length				3.000	6M Damage

List of major and minor junctions developed are presented in table below:

**Table 22: List of Major Junctions**

S. No.	Design Chainage	Category of Road	Type of Junction	Width of the access Road	Remarks
1	310.100	Railway Station Road	T	4-lane	
2	311.500	Basni	Y	4-lane	
3	311.800	Urban Road	T	4-lane	
4	314.350	Jalamand circle	rotary	14.0/4-lane	
5	315+900	Dangiyawas Bypass	X	7.0/7.0	
6	316.950	Salawas	T	4-lane	
7	323.950	boranada	X	7.0/4-lane	
8	325.140	Mogra	Y	4-lane	
9	332.810	Luni	Y	7	
10	347.750	State highway	Y	7	
11	367.100	pali Bypass	Y	9	
12	373.000	MDR	X	9.0/9.0	

**Table 23: List of Minor Junctions**

S.No.	Design Chainage(Km)	Side (Left / Right)	Carriageway Width (m)	Category
1	309.090	Left/Right	6.0/10.0	U.R
2	309.180	Left/Right	7.0/6.0	U.R
3	309.450	Left	9.0/-	U.R
4	310.350	Left	4lane/-	Collage road

S.No.	Design Chainage(Km)	Side (Left / Right)	Carriageway Width (m)	Category
5	312.380	Right	-/7	U.R
6	312.900	Right	-/5	U.R
7	313.800	Left/Right	5.0/5.0	U.R
8	315.000	Left	4.0/-	V.R
9	317.000	Left	7	V.R
10	317.550	Right	-/7	V.R
11	318.460	Left	7.0/-	V.R
12	318.950	Left	4.5/-	V.R
13	319.450	Left	4lane/-	Industrial Road
14	325.140	Left	3/-	V.R
15	326.420	Left/Right	4.5/4.5	V.R
16	327.250	Left	5.5	V.R
17	328.200	Left	3.5/-	V.R
18	329.050	Left	3.5/-	V.R
19	329.150	Right	3.5	Quarry Road
20	329.300	Left/Right	3.5/3.5	Quarry Road
21	332.550	Left/Right	4.5/4.5	V.R
22	336.050	Left/Right	4.5/3.5	V.R
23	340.550	Right	-/3.5	V.R
24	345.800	Left/Right	3.5/3.5	V.R
25	346.650	Left	3.5/-	V.R
26	346.740	Left	6.0/-	Street Road
27	346.755	Left	3.5/-	Street Road
28	350.730	Right	-/3.5	V.R
29	351.460	Right	3.5	V.R
30	352.420	Left	3.5/-	V.R
31	355.800	Left/Right	4.5/3.5	V.R
32	359.800	Left	3.5/-	V.R
33	360.600	Left/Right	3.5/3.5	V.R
34	361.780	Left/Right	4.5/4.5	V.R
35	368.050	Left/Right	9.0/7.0	V.R
36	369.550	Right	-/4.5	V.R
37	370.800	Left	9.0/-	V.R
38	373.400	Left	5.0/-	V.R
39	374.000	Left/Right	5.0/4.0	V.R

Road furniture in the form of Signs/Markings, Gantry signs and traffic safety blinkers, lighting, high mast lights have been provided along the project road at few locations and are presented in the Tables below:

**Table 24: Locations of High mast Lighting**

S. No	Chainage	Location	Remarks	As per site	Condition
1	338.400	Shoulder	Toll Plaza	2	Functional
2	365.400	Shoulder	Toll Plaza	2	Functional

S. No	Chainage	Location	Remarks	As per site	Condition
3	367.100	Median	Major Junction	1	Functional
Total				5	

**Table 25: Locations of Highway Lighting along Main Carriageway**

S.no	Chainage		1-arm	2-arm	3-arm	Location	Remarks
	From	To					
1	308.500	315.400	-	213	-	Median	Provided by JDA (Not in Scope)
2	315.500	316.450	-	29	-	LHS Shoulder	
3	315.500	316.450	-	29	-	RHS Shoulder	
4	323.460	324.500	-	34	-	LHS Shoulder	
5	323.550	324.500	-	29	-	RHS Shoulder	
6	337.950	338.900	-	24	-	Median	
7	346.650	347.500	-	32	-	Median	
8	350.250	350.740	9	4	-	LHS Shoulder	
9	364.900	365.850	-	24	-	Median	
Total			9	205			Under Concessionaire's Scope

**Table 26: Locations of Highway Lighting along Service Roads**

S.No.	Chainage (Km)		Side	1-arm	2-arm	3-arm	Location	Damaged
	From	To						
1	308.000	308.400	LHS	1	-	-	Shoulder	-
2	316.450	316.650	LHS	8	-	-	LHS Shoulder	-
3	316.450	316.650	LHS	8	-	-	RHS Shoulder	-
Total				17				

### 1.5.2 Bridge Works

List of Bridges found during the inventory surveys along the corridor are as follows:

**Table 27: Details of CD & Other Structures**

S. No.	Chainage as Per CA	Chainage as Per Site	Type of Structure	Span as per Schedule	Span as per Site	Deck width as per site	Structure in Schedule	Structure on Site	Skew angle
1	-	315+886	Flyover	-	2 x 15 + 1 x 44	2 x 10	-	Yes	-
2	-	346+019	MNB	-	5 x 6.9	2 x 12	-	Yes	-
3	-	318+642	MJB	-	LHS 11 x 8.8 RHS 6 x 17.65	2 x 12	-	Yes	-
4	-	323+988	Flyover	-	2 x 15 + 1 x 44	2 x 10	-	Yes	-
5	-	325+600	CUP	-	1 x 4 x 3.5	2 x 12	-	Yes	-
6	-	333+998	MJB	-	LHS 8 x 8.8 RHS 4 x 17.6	2 x 12	-	Yes	-
7	-	334+830	MJB	-	LHS 30 x 8.8 RHS 15 x 17.6	2 x 12	-	Yes	-
8	-	335+285	MNB	-	3 x 6.8	2 x 12	-	Yes	-
9	-	335+324	MNB	-	3 x 6.8	2 x 12	-	Yes	-

S. No.	Chainage as Per CA	Chainage as Per Site	Type of Structure	Span as per Schedule	Span as per Site	Deck width as per site	Structure in Schedule	Structure on Site	Skew angle
10	-	335+736	MNB	-	6 x 6.8	2 x 12	-	Yes	-
11	-	339+541	MNB	-	3 x 5.8	2 x 12	-	Yes	-
12	-	343+249	MNB	-	2 x 6.7	2 x 12	-	Yes	-
13	-	349+230	MJB	-	10 x 15	2 x 11	-	Yes	-
14	-	354+690	MJB	-	9 x 17.5	2 x 11	-	Yes	-
15	-	360+500	CUP	-	1 x 4 x 3.5	2 x 12	-	Yes	-
16	-	367+485	ROB	-	1 x 18.57 + 1 x 41.1	2 x 16.5	-	Yes	-
17	-	371+373	MJB	-	12 x 22	2 x 12	-	Yes	-

## 1.6 QUALITY AUDIT

### 1.6.1 Embankment & Subgrade

The embankment for project road has been constructed with available soils from nearby areas. The soil appears to be sandy clay in nature and embankment appears to be in good condition over the entire length of project. No settlements or depressions have been noted even at high embankment locations. There are no marshy/water logging areas along the length of project road.

The subgrade of the project road appears to be in good condition as revealed by test pit investigations. Laboratory results conducted on subgrade indicates that most of subgrade soils are of SM (Silty Sand) type with Non-Plasticity Index. Condition of subgrade appears to intact as no major evidence of subsidence or depressions exists along the corridor. CBR of subgrade soils for lab testing indicates a good value greater than 10% at all the locations. Results of Subgrade CBR are as follows:

**Table 28: Details of Soaked CBR values**

Lab Sample No	Site Identification		Grain Size Analysis					Atterberg Limits (%)			Soil Class	MDD (gm/cc)	OMC (%)	Soaked CBR 97% MDD	Free Swelling Index (%)
	Location (km)	Up/Dn	Percentage passing from					LL	PL	PI					
			4.75 mm IS Sieve	425 mics IS Sieve	75 mics IS Sieve	Gravel %	Sand %								
JP-TP-1	317+200	RHS	100	99	4	0	96	-	NP	NP	SP	1.64	14.40	NA	0.00
JP-TP-2	320+200	LHS	100	95	15	0	85	-	NP	NP	SM	1.78	12.20	6.52	10.00
JP-TP-3	324+900	RHS	93	79	27	7	66	-	NP	NP	SM	2.12	8.00	17.71	14.29
JP-TP-4	329+200	LHS	90	41	23	10	67	-	NP	NP	SM	2.15	8.60	17.71	10.00
JP-TP-5	334+900	RHS	100	59	16	0	84	-	NP	NP	SM	2.05	9.00	15.23	10.00
JP-TP-6	340+100	LHS	93	75	43	7	50	24	15	9	SC	2.01	10.00	12.36	27.27
JP-TP-7	345+000	RHS	88	44	27	12	61	-	NP	NP	SM	2.14	9.60	17.71	10.00
JP-TP-8	350+200	LHS	100	96	19	0	81	-	NP	NP	SM	1.94	9.00	9.73	20.00

Lab Sample No	Site Identification		Grain Size Analysis					Atterberg Limits (%)			Soil Class	MDD (gm/cc)	OMC (%)	Soaked CBR 97% MDD	Free Swelling Index (%)
	Location (km)	Up/Dn	Percentage passing from					LL	PL	PI					
			4.75 mm IS Sieve	425 mics IS Sieve	75 mics IS Sieve	Grave l %	Sand %								
JP-TP-9	355+600	RHS	100	96	16	0	84	-	NP	NP	SM	1.93	10.30	9.73	10.00
JP-TP-10	360+200	LHS	100	92	22	0	78	-	NP	NP	SM	2.05	9.20	15.23	9.09
JP-TP-11	365+000	RHS	100	45	33	0	67	38	31	7	SM-SC	2.01	12.10	12.26	20.00
JP-TP-12	369+300	LHS	77	48	40	23	37	33	28	5	SM-SC	2.12	8.60	15.91	25.00
JP-TP-13	375+200	RHS	82	42	25	18	57	40	31	9	SC	2.06	9.00	12.36	25.00
JP-TP-14	378+700	LHS	94	57	29	6	65	31	26	5	SM-SC	2.05	9.60	12.26	20.00
JP-TP-15 TOLL-1	338+200	LHS	87	63	25	13	62	-	NP	NP	SM	1.99	9.40	12.19	9.09
JP-TP-16 TOLL-2	365+250	LHS	68	21	16	32	52	36	32	4	SM-SC	2.15	8.60	15.91	25.00
JP-SR-TP-1	324+600	RHS	99	77	20	1	79	-	NP	NP	SM	1.77	9.20	6.52	10.00
JP-SR-TP-2	372+600	LHS	90	62	43	10	47	28	18	10	SC	2.09	8.60	12.36	0.00

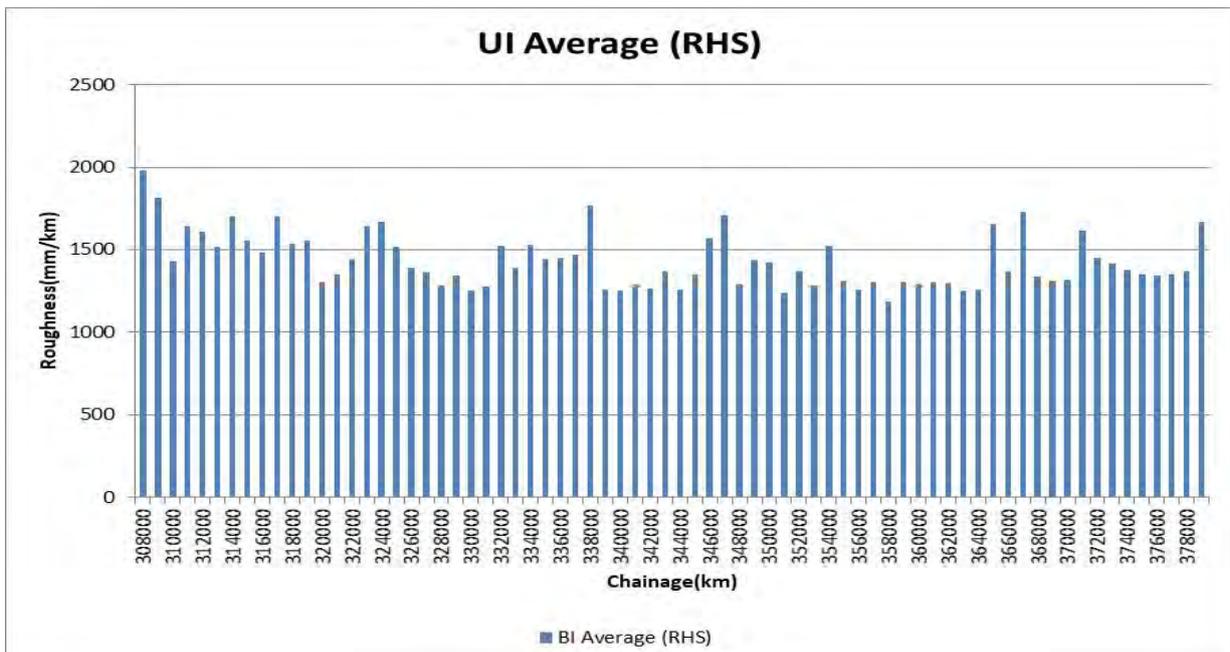
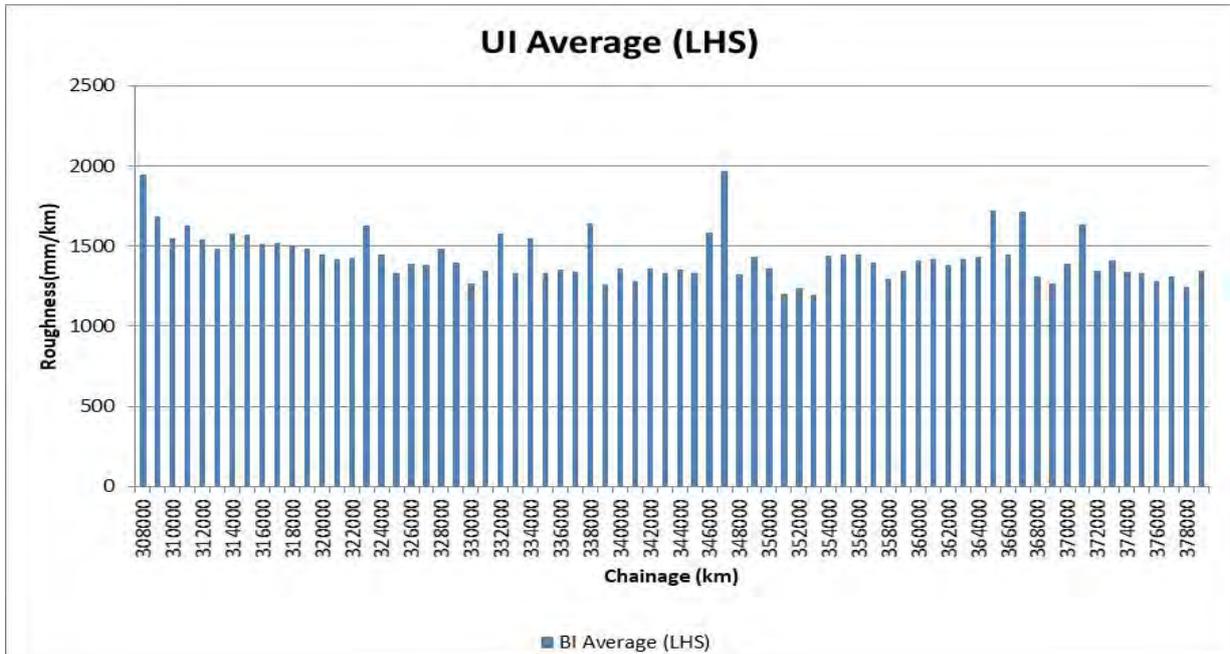
The following observations can be made from the above test results conducted on of existing subgrade samples

- Liquid limit for seven existing subgrade samples varies between 24 and 40. Eleven samples are non-plastic. All samples satisfying the liquid limit criterion ( $LL \leq 50$ ).
- Plasticity Index for seven out of Eighteen Subgrade samples varies between 4 and 10. All samples satisfying the Plasticity Index criterion ( $PI \leq 25$ ).
- Maximum Dry Density for all subgrade samples varies between 1.64 and 2.15 gm/cc. Most of the samples except one sample satisfying the MDD criterion ( $MDD \geq 1.75$  gm/cc).
- OMC for existing subgrade samples varies between 8.00 and 14.0
- Free Swelling Index for existing subgrade samples varies between 0.0 and 27.27 All samples satisfying the FSI criterion ( $FSI \leq 50\%$ ).

*On the whole, it can be concluded that the existing subgrade is in good condition.*

### 1.6.2 Roughness

The roughness surveys data received from client indicates that, the survey conducted along the corridor in the month of October 2021. The summary of Roughness data indicates good riding quality over the length of project corridor. Bar diagrams showing the Kilometer wise roughness along the project road are presented below:



From the above charts, the entire project road appears good riding quality and No functional overlay requires as unevenness Index (UI) is below 2500 mm/km.

### 1.6.3 FWD Analysis and Assessment of Overlay Requirement

The FWD data collected has been analyzed as per IRC guidelines and presented in the tables below.

**Table 29: Summary of Design Moduli of different layers - LHS**

S.No.	From	To	Length (km)	15 <sup>th</sup> Percentile MR values		
				MR for BT	MR for Granular	MR for Subgrade
1	308.00	310.60	2.6	2038	237	87
2	310.60	313.80	3.2	2061	206	87
3	313.80	318.20	4.4	2085	192	87
4	318.20	323.30	5.1	2722	164	87
5	323.30	326.20	2.9	2716	180	83
6	326.20	331.80	5.6	3515	162	87
7	331.80	336.20	4.4	3517	182	87
8	336.20	340.80	4.6	3580	189	73
9	340.80	345.40	4.6	3555	173	67
10	345.40	348.40	3.0	2890	177	80
11	348.40	351.40	3.0	2899	162	87
12	351.40	355.40	4.0	2894	154	71
13	355.40	359.40	4.0	3075	182	87
14	359.40	361.80	2.4	3286	185	69
15	361.80	364.80	3.0	2798	161	75
16	364.80	368.60	3.8	2755	169	68
17	368.60	371.80	3.2	2275	175	87
18	371.80	373.60	1.8	2292	171	80
19	373.60	375.80	2.2	2171	181	76
20	375.80	379.40	3.6	2167	193	75

**Table 30: Summary of Design Moduli of different layers - RHS**

S.No.	From	To	Length (m)	15 <sup>th</sup> Percentile MR values		
				MR for BT	MR for Granular	MR for Subgrade
1	308.00	311.20	3.2	2050	193	85
2	311.20	314.90	3.7	2062	185	87
3	314.90	318.20	3.3	2040	185	87
4	318.20	320.80	2.6	2273	169	84
5	320.80	324.40	3.6	2131	188	87
6	324.40	326.60	2.2	2242	172	86
7	326.60	328.80	2.2	2370	166	86
8	328.80	333.60	4.8	2326	166	87
9	333.60	336.90	3.3	2315	171	87
10	336.90	340.60	3.7	2345	166	87
11	340.60	343.40	2.8	2591	162	87
12	343.40	347.00	3.6	2609	152	87
13	347.00	351.40	4.4	2660	163	87
14	351.40	353.70	2.3	2730	169	87
15	353.70	357.60	3.9	2703	164	87
16	357.60	360.80	3.2	2731	158	87
17	360.80	364.20	3.4	2769	156	87
18	364.20	366.80	2.6	2750	181	87
19	366.80	370.90	4.1	2539	175	82

S.No.	From	To	Length (m)	15th Percentile MR values		
				MR for BT	MR for Granular	MR for Subgrade
20	370.90	372.70	1.8	2539	173	74
21	372.70	375.60	2.9	2511	169	87
22	375.60	379.40	3.8	2536	175	87

#### 1.6.3.1 Observations on FWD Results

It can be noticed from the above table that the layer moduli for the three layers are varying along the length and direction. The MR value for BT layer is 2038 Mpa to 3580Mpa in LHS & 2040Mpa to 2769Mpa in RHS Carriageway. The MR value for Granular Layers is 154 Mpa to 237Mpa in LHS & 152Mpa to 193Mpa in RHS Carriageway. Similarly, the MR value for Subgrade Layer is 67Mpa to 87Mpa in LHS & 74Mpa to 87Mpa in RHS Carriageway.

The MR value of BT layers is moderated in Overlay design and considered 3000Mpa where it is more than 3000 Mpa as the suggested upper limit in IRC 115 is 3000MPA.

#### 1.6.4 Pavement Composition

TCS drawing shows crust composition for the main carriageway and service road is as:

Main carriageway		Service Road	
BC, mm	50	BC, mm	30
DBM, mm	80	DBM, mm	50
WMM, mm	250	WMM, mm	250
GSB, mm	200	GSB, mm	150
Total mm above Subgrade	580	Total mm above Subgrade	480

However, from the test pits data it indicates the following

##### a) Main Carriageway Crust

	BT, mm	WMM, mm	GSB, mm	Total Crust, mm
Average	147	229	199	575

##### b) Service Road Crust

	BT, mm	WMM, mm	GSB, mm	Total Crust, mm
Average	85	240	165	490

#### 1.6.5 CD Structures

The CD structures along the corridor are constructed appears to be as per the standards and specifications. Presently, all structures appear new and seem to be in fair condition without any major distress.

##### Major Structures List including COS

List of Structures	As Per Schedule	As Per Site
Grade separator	2	2
Major Bridge	6	6
Minor Bridge	6	6

List of Structures	As Per Schedule	As Per Site
Cattle/Pedestrian Underpass	2	2
Railway Over Bridge	1	1
Vehicular Underpass	-	1
Foot Over Bridge	-	-

**Culverts List including COS**

List of Structures	As Per Schedule	As Per Site
Box Culvert	5	7
Slab Culvert	9	8
Pipe Culvert	30	49
Extra Pipe Culvert	-	4
Not Found at Site	-	2

**Age of Structures:**

Sl.no.	Structure (2Lane)	LHS		RHS		Total (Nos)	
		Old	New	Old	New	Old	New
1	MJB	3	1	1	7	4	8
2	MNB	6	0	0	6	6	6
3	ROB	1	0	0	1	1	1
4	Flyover	0	2	0	2	0	4
5	VUP	0	1	0	1	0	2
6	CUP	0	2	0	2	0	4

**Summary of Expansion joints and Bearings:**

S.No.	Structure	Expansion joints		No. of Bearings					
				Rocker Roller		Elastomeric		POT PTFE	
		Old	New	Old	New	Old	New	Old	New
1	MJB	-	82	-	-	-	450	-	-
2	MNB	-	-	-	-	-	-	-	-
3	ROB	3	3	-	-	16	6	-	8
4	Flyover	0	16	-	-	-	64	-	-
5	VUP	-	-	-	-	-	-	-	-
6	CUP	-	-	-	-	-	-	-	-
<b>Total No's</b>		<b>3</b>	<b>101</b>	<b>0</b>	<b>0</b>	<b>16</b>	<b>520</b>	<b>0</b>	<b>8</b>

**Summary of Super Structures:**

S.No.	Type of Super structure	MJB	MNB	FLYOVER	ROB	VUP	PUP/ CUP	Total No's
1	Steel girder	-	-	-	1	-	-	1
2	PSC Box Girder	-	-	2	-	-	-	2
3	PSC girder	-	-	-	1	-	-	1
4	RCC Girder	8	-	2	2	-	-	12
5	RCC Box Type	-	6	-	-	1	2	9
6	Solid Slab	5	6	-	-	-	-	11
<b>Total no. of Structures</b>		<b>13</b>	<b>12</b>	<b>4</b>	<b>4</b>	<b>1</b>	<b>2</b>	<b>36</b>

**Deviations from Schedule:**

- Pipe Culverts as per Schedule -B are 30 No's & as per Site are 53 No's.
- Box Culverts as per Schedule -B are 05 No's & as per Site are 07 No's.
- Slab Culverts as per Schedule -B are 09 No's & as per Site are 08 No's.
- 1 VUP was constructed under COS.

BR. NO.315+886

### GENERAL DESCRIPTION

• Chainage	:	Km 315+886 LHS
• Type of structure	:	Flyover
• Span Arrangement	:	2 x 15 + 1 x 44 m
• Total outer width of structure	:	2 x 10 m
• Men Width	:	-
• Type of Foundation	:	-
• Type of substructure	:	RCC Circular type
• Type of Superstructure	:	RCC girder and PSC box girder
• Type of Bearing	:	Elastomeric
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

### OBSERVATIONS

Visual Observations on condition of the structure are as below:

- Minor Honey comb observed on girders, cross girders and Dirt walls at couple of locations.
- Corrosion stains were observed on A1 to P1 location.
- When heavy vehicles are passing vibrations observed.



BR. NO.315+886

### GENERAL DESCRIPTION

• Chainage	:	Km 315+886 RHS
• Type of structure	:	Flyover
• Span Arrangement	:	2 x 15 + 1 x 44 m
• Total outer width of structure	:	1 x 10.5 m
• Median Width	:	-
• Type of Foundation	:	-
• Type of substructure	:	RCC Circular Type
• Type of Superstructure	:	RCC girder and PSC Box
• Type of Bearing	:	Elastomeric
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

### OBSERVATIONS

Visual Observations on condition of the structure are as below:

- Corrosion stains were observed soffit of Deck and Girders.
- Minor Honey combing observed on girders.



BR. NO.323+988

### GENERAL DESCRIPTION

• Chainage	:	km 323+988 LHS
• Type of structure	:	Flyover
• Span Arrangement	:	2 x 15 + 1 x 44 m
• Total outer width of structure	:	2 x 10 m
• Type of Foundation	:	-
• Type of substructure	:	RCC Circular Type
• Type of Superstructure	:	RCC girder and PSC box
• Type of Bearing	:	Elastomeric
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

### OBSERVATIONS

Visual Observations on condition of the structure are as below:

- Corrosion stains were observed on bottom of the girder.
- Minor honey combing observed in soffit of girder & slab.
- Steel observed on top slab at P2 to A2 location.



BR. NO.323+988

### GENERAL DESCRIPTION

• Chainage	:	Km 323+988 RHS
• Type of structure	:	Flyover
• Span Arrangement	:	2 x 15 + 1 x 44 m
• Total outer width of structure	:	1 x 10.5 m
• Type of Foundation	:	-
• Type of substructure	:	RCC Circular Type
• Type of Superstructure	:	RCC girder and PSC box girder
• Type of Bearing	:	Elastomeric
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

### OBSERVATIONS

Visual Observations on condition of the structure are as below:

- Honeycomb observed on soffit girders.
- Corrosion stains were observed on bottom of girder.
- Rubber sealant damaged at P2 expansion joint.



BR. NO.318+642

### GENERAL DESCRIPTION

• Chainage	:	Km 318+642 LHS
• Type of structure	:	MJB
• Span Arrangement	:	11 x 8.8
• Total outer width of structure	:	1 x 12.2 m
• Type of Foundation	:	-
• Type of substructure	:	Stone masonry
• Type of Superstructure	:	Solid Slab
• Type of Bearing	:	-
• Type of Railing	:	RCC Hand Rail
• Method of Inspection	:	Visual

### OBSERVATIONS

Visual Observations on condition of the structure are as below:

- Minor Cracks were observed on pier cap at some locations.
- Spalling and Reinforcement exposing on Deck slab in Span-3.
- Minor Cracks were observed on substructure.



BR. NO.318+642

### GENERAL DESCRIPTION

• Chainage	:	Km 318+642 RHS
• Type of structure	:	MJB
• Span Arrangement	:	5 x 17.65 + 1 x 8.85
• Total outer width of structure	:	1 x 10.25 m
• Type of Foundation	:	-
• Type of substructure	:	RCC Circular Type
• Type of Superstructure	:	RCC Girders
• Type of Bearing	:	Elastomeric
• Type of Railing	:	RCC Crash Barrier
• Method of Inspection	:	Visual

### OBSERVATIONS

Visual Observations on condition of the structure are as below:

- Sealant rubber damaged in expansion joint at P3 and P4 location.
- Hair line Cracks observed on top slab & Girder bottom.
- Minor Corrosion stain and Minor Honey comb observed on girders.



BR. NO.333+998

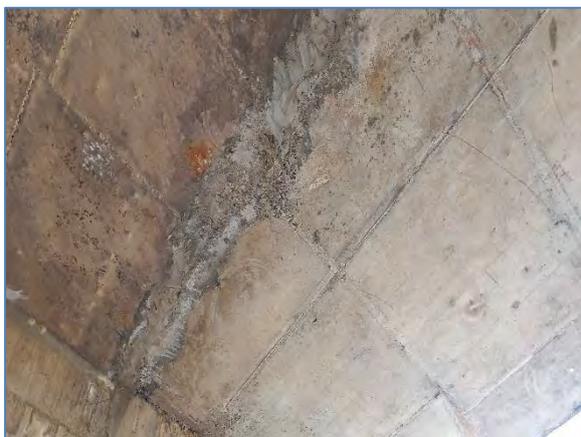
### GENERAL DESCRIPTION

• Chainage	:	Km 333+998 LHS
• Type of structure	:	MJB
• Span Arrangement	:	8 x 8.8
• Total outer width of structure	:	1 x 10.8 m
• Type of Foundation	:	-
• Type of substructure	:	Stone masonry & RCC
• Type of Superstructure	:	Solid Slab
• Type of Bearing	:	-
• Type of Railing	:	Hand rail
• Method of Inspection	:	Visual

### OBSERVATIONS

Visual Observations on condition of the structure are as below:

- Minor Cracks observed on top slab, side walls and pier cap.
- Previous repair works are done.
- Structure is in fair condition.



BR. NO.333+998

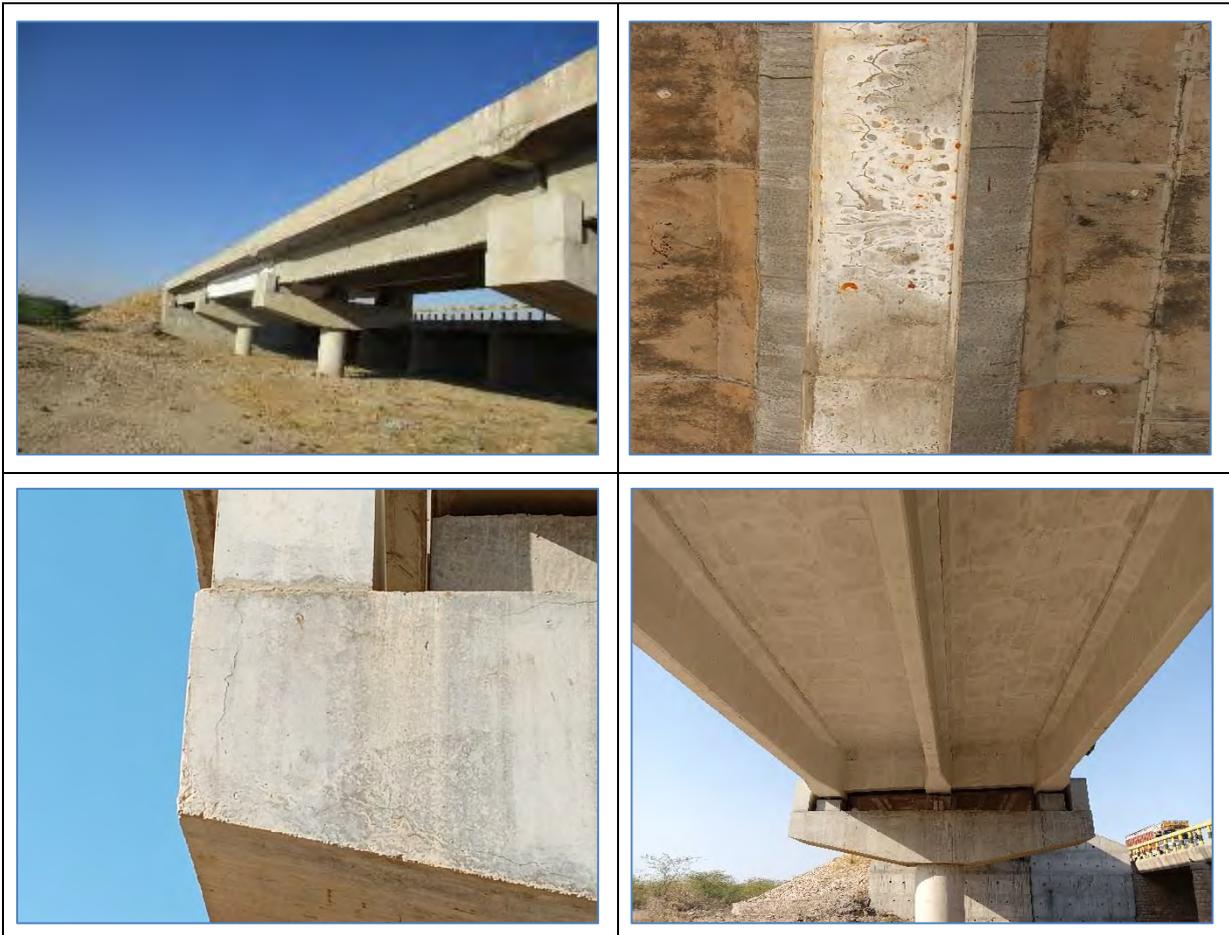
### GENERAL DESCRIPTION

• Chainage	:	Km 333+998 RHS
• Type of structure	:	MJB
• Span Arrangement	:	4 x 17.6
• Total outer width of structure	:	1 x 10.25 m
• Type of Foundation	:	-
• Type of substructure	:	RCC Circular Type
• Type of Superstructure	:	RCC Girders
• Type of Bearing	:	Elastomeric
• Type of Railing	:	Crash Barrier
• Method of Inspection	:	Visual

### OBSERVATIONS

Visual Observations on condition of the structure are as below:

- Minor Cracks observed on top slab, Girders and Pier cap.
- Honey comb observed on girders and cross girders.
- Corrosion stains were observed on bottom of girders and pier cap.



BR. NO.334+830

### GENERAL DESCRIPTION

• Chainage	:	Km 334+830 LHS
• Type of structure	:	MJB
• Span Arrangement	:	30 x 8.8
• Total outer width of structure	:	1 x 10.9 m
• Type of Foundation	:	-
• Type of substructure	:	Stone masonry & RCC
• Type of Superstructure	:	Solid Slab
• Type of Bearing	:	-
• Type of Railing	:	Hand railing
• Method of Inspection	:	Visual

### OBSERVATIONS

Visual Observations on condition of the structure are as below:

- Honey comb and spalling on top slab and Cracks observed on side wall and pier cap.
- Small portion Steel exposed on top slab near P3 and P4.
- Minor Spalling & Reinforcement exposed on Hand Railing.
- Shotcrete work done for top slab and pier cap.



BR. NO.334+830

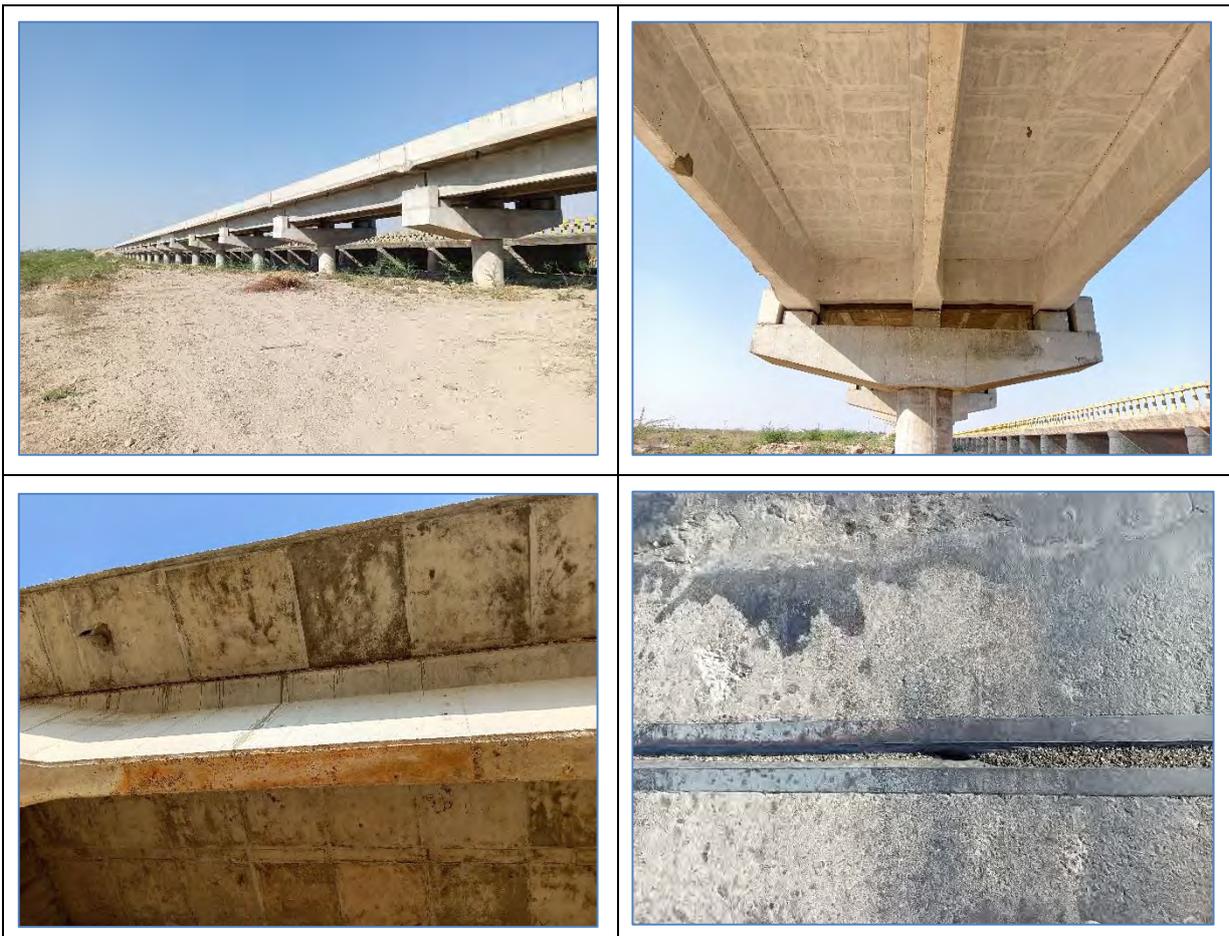
**GENERAL DESCRIPTION**

• Location of structure	:	-
• Chainage	:	Km 334+830 RHS
• Type of structure	:	MJB
• Span Arrangement	:	15 x 17.6
• Total outer width of structure	:	1 x 10.25 m
• Median Width	:	-
• Type of Foundation	:	-
• Type of substructure	:	RCC circular type
• Type of Superstructure	:	RCC girders
• Type of Bearing	:	Elastomeric
• Type of Railing	:	RCC Crash Barrier
• Method of Inspection	:	Visual

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- Corrosion stains observed on bottom of girders.
- Rubber sealant damaged in all Expansion joints & Filled with Silt.



BR. NO.349+230

**GENERAL DESCRIPTION**

• Chainage	:	Km 349+230 LHS
• Type of structure	:	MJB
• Span Arrangement	:	10 x 15
• Total outer width of structure	:	1 x 10.25 m
• Type of Foundation	:	-
• Type of substructure	:	RCC Circular type
• Type of Superstructure	:	RCC girders
• Type of Bearing	:	Elastomeric
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- Steel exposed on dirt wall at A1 side and P4 pier cap.
- Honey combing & Corrosion stains are observed on bottom of the girders.
- Rubber sealant damaged in Expansion joint on P2, P3, P6, P7, P9, A2 locations.



BR. NO.349+230

**GENERAL DESCRIPTION**

• Chainage	:	Km 349+230 RHS
• Type of structure	:	MJB
• Span Arrangement	:	10 x 15
• Total outer width of structure	:	1 x 10.25 m
• Type of Foundation	:	-
• Type of substructure	:	RCC Circular type
• Type of Superstructure	:	RCC girders
• Type of Bearing	:	Elastomeric
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- Honey comb observed on bottom of the girder.
- Minor Corrosion stains were observed on bottom of the girders.
- Rubber sealant damaged in Expansion joint on A1, P5 locations.



BR. NO.354+690

#### GENERAL DESCRIPTION

• Chainage	:	Km 354+690 LHS
• Type of structure	:	MJB
• Span Arrangement	:	9 x 17.85
• Total outer width of structure	:	1 x 10.25 m
• Type of Foundation	:	-
• Type of substructure	:	RCC Circular type
• Type of Superstructure	:	RCC girders
• Type of Bearing	:	Elastomeric
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

#### OBSERVATIONS

Visual Observations on condition of the structure are as below:

- Hair line cracks were observed on top slab and bottom of girders.
- Corrosion stains were observed on bottom of the girders.
- Rubber sealant damaged in Expansion joint on P4, P6, P7, P8 locations.
- Spalling & steel observed on girder bottom.



BR. NO.354+690

**GENERAL DESCRIPTION**

- Chainage : Km 354+690 RHS
- Type of structure : MJB
- Span Arrangement : 9 x 17.85
- Total outer width of structure : 1 x 10.25 m
- Type of Foundation : -
- Type of substructure : RCC Circular type
- Type of Superstructure : RCC girders
- Type of Bearing : Elastomeric
- Type of Railing : RCC Crash barrier
- Method of Inspection : Visual

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- Steel exposed on P5 cross girder.
- Hair line cracks were observed on top slab.
- Corrosion stains were observed on bottom of the girders.
- Rubber sealant damaged in Expansion joint on P4, P6, P7, P8 locations.



BR. NO.371+373

**GENERAL DESCRIPTION**

• Chainage	:	Km 371+373 LHS
• Type of structure	:	MJB
• Span Arrangement	:	12 x 22.4
• Total outer width of structure	:	1 x 10.25 m
• Type of Foundation	:	-
• Type of substructure	:	RCC Circular type
• Type of Superstructure	:	RCC girders
• Type of Bearing	:	Elastomeric
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- Corrosion stains were observed on bottom of the girders.
- Rubber sealant damaged in Expansion joint on P1, P3, P4, P7, A2 locations.
- Vibrations observed while heavy vehicles were moving on structure.



BR. NO.371+373

### GENERAL DESCRIPTION

• Chainage	:	Km 371+373 RHS
• Type of structure	:	MJB
• Span Arrangement	:	24 x 11.2
• Total outer width of structure	:	1 x 12.10 m
• Type of Foundation	:	-
• Type of substructure	:	Stone masonry
• Type of Superstructure	:	Solid slab
• Type of Bearing	:	-
• Type of Railing	:	Steel Hand rails
• Method of Inspection	:	Visual

### OBSERVATIONS

Visual Observations on condition of the structure are as below:

- Minor Cracks & Honey comb observed on top slab.
- Previous repair works are observed.
- Minor Corrosion stains were observed girders at A2 side.



BR. NO.335+285

### GENERAL DESCRIPTION

• Chainage	:	Km 335+285 LHS
• Type of structure	:	MNB (Old construction)
• Span Arrangement	:	3 x 6.8
• Total outer width of structure	:	1 x 10.2 m
• Type of Foundation	:	-
• Type of substructure	:	Stone masonry & RCC
• Type of Superstructure	:	Solid Slab
• Type of Bearing	:	NA
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

### OBSERVATIONS

Visual Observations on condition of the structure are as below:

- Hair line cracks observed on deck slab & pier cap.
- Delamination observed on pier cap.
- Spalling and steel observed on top slab.



BR. NO.335+285

### GENERAL DESCRIPTION

• Chainage	:	Km 335+285 RHS
• Type of structure	:	MNB
• Span Arrangement	:	3 x 6.8
• Total outer width of structure	:	1 x 10.5 m
• Type of Foundation	:	-
• Type of substructure	:	RCC Box type
• Type of Superstructure	:	RCC Box type
• Type of Bearing	:	NA
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

### OBSERVATIONS

Visual Observations on condition of the structure are as below:

- Minor Honey comb observed on side wall and bottom of top slab.
- Hair line cracks observed on top slab.
- Steel Exposed on top slab at drainage spout location.
- Structure is in good condition.



BR. NO.335+324

### GENERAL DESCRIPTION

• Chainage	:	Km 335+324 LHS
• Type of structure	:	MNB
• Span Arrangement	:	3 x 6.8
• Total outer width of structure	:	1 x 10.2 m
• Type of Foundation	:	-
• Type of substructure	:	Stone masonry & RCC
• Type of Superstructure	:	Solid Slab
• Type of Bearing	:	NA
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

### OBSERVATIONS

Visual Observations on condition of the structure are as below:

- Minor Honey comb and minor spalling observed on top slab.
- Steel exposed on the top slab.



BR. NO.335+324

### GENERAL DESCRIPTION

• Chainage	:	Km 335+324 RHS
• Type of structure	:	MNB
• Span Arrangement	:	3 x 6.8
• Total outer width of structure	:	1 x 10.5 m
• Type of Foundation	:	-
• Type of substructure	:	RCC Box type
• Type of Superstructure	:	RCC Box type
• Type of Bearing	:	NA
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

### OBSERVATIONS

Visual Observations on condition of the structure are as below:

- Steel exposed at the down take pipe.
- Structure condition good.



BR. NO.338+736

### GENERAL DESCRIPTION

• Chainage	:	Km 338+736 LHS
• Type of structure	:	MNB
• Span Arrangement	:	6 x 6.8
• Total outer width of structure	:	1 x 12 m
• Type of Foundation	:	-
• Type of substructure	:	Stone masonry
• Type of Superstructure	:	Solid Slab
• Type of Bearing	:	NA
• Type of Railing	:	RCC Hand Rails
• Method of Inspection	:	Visual

### OBSERVATIONS

Visual Observations on condition of the structure are as below:

- Quadrant stone pitching not provided.
- Spalling & reinforcement exposed on deck slab.
- Honey comb observed on top slab and also steel exposed.
- Steel exposed on Pier and RCC hand rails.



BR. NO.338+736

### GENERAL DESCRIPTION

• Chainage	:	Km 338+736 RHS
• Type of structure	:	MNB
• Span Arrangement	:	6 x 6.8
• Total outer width of structure	:	1 x 10.2 m
• Type of Foundation	:	-
• Type of substructure	:	RCC Box type
• Type of Superstructure	:	RCC Box type
• Type of Bearing	:	NA
• Type of Railing	:	RCC Crash Barrier
• Method of Inspection	:	Visual

### OBSERVATIONS

Visual Observations on condition of the structure are as below:

- Minor honey comb observed on top slab.
- Hair line cracks observed on every top slab and side walls.



BR. NO.339+541

### GENERAL DESCRIPTION

• Chainage	:	Km 339+541 LHS
• Type of structure	:	MNB
• Span Arrangement	:	3 x 5.8
• Total outer width of structure	:	1 x 12 m
• Type of Foundation	:	-
• Type of substructure	:	Stone masonry
• Type of Superstructure	:	Solid Slab
• Type of Bearing	:	NA
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

### OBSERVATIONS

Visual Observations on condition of the structure are as below:

- Minor honey comb observed on top slab.
- Structure is in good condition.



BR. NO.339+541

### GENERAL DESCRIPTION

• Chainage	:	Km 339+541 RHS
• Type of structure	:	MNB
• Span Arrangement	:	2 x 6.8 + 1 x 6.0
• Total outer width of structure	:	1 x 10.25 m
• Type of Foundation	:	-
• Type of substructure	:	RCC Box Type
• Type of Superstructure	:	RCC Box Type
• Type of Bearing	:	NA
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

### OBSERVATIONS

Visual Observations on condition of the structure are as below:

- Steel exposed on P1 side wall.
- Structure is in good condition.



BR. NO.343+249

### GENERAL DESCRIPTION

• Chainage	:	Km 343+249 LHS
• Type of structure	:	MNB
• Span Arrangement	:	2 x 6.7
• Total outer width of structure	:	1 x 12.0 m
• Type of Foundation	:	-
• Type of substructure	:	RCC wall type
• Type of Superstructure	:	Solid Slab
• Type of Bearing	:	NA
• Type of Railing	:	RCC Hand rail
• Method of Inspection	:	Visual

### OBSERVATIONS

Visual Observations on condition of the structure are as below:

- Recent repair works noticed on top slab.
- Structure is in fair condition.



BR. NO.343+249

**GENERAL DESCRIPTION**

• Chainage	:	Km 343+249 RHS
• Type of structure	:	MNB
• Span Arrangement	:	2 x 6.7
• Total outer width of structure	:	1 x 10.25 m
• Type of Foundation	:	-
• Type of substructure	:	RCC Box type
• Type of Superstructure	:	RCC Box type
• Type of Bearing	:	NA
• Type of Railing	:	RCC Hand rail
• Method of Inspection	:	Visual

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- Minor Cracks observed on top slab and side walls.
- Structure is in good condition.



BR. NO.346+000

### GENERAL DESCRIPTION

• Chainage	:	Km 346+000 LHS
• Type of structure	:	MNB
• Span Arrangement	:	5 x 6.9
• Total outer width of structure	:	1 x 12 m
• Type of Foundation	:	-
• Type of substructure	:	RCC wall type
• Type of Superstructure	:	Solid Slab
• Type of Bearing	:	NA
• Type of Railing	:	RCC Hand rail
• Method of Inspection	:	Visual

### OBSERVATIONS

Visual Observations on condition of the structure are as below:

- Honey comb observed and Steel exposed on top slab.
- Structure condition fair.



BR. NO.346+000

### GENERAL DESCRIPTION

• Chainage	:	Km 346+000 RHS
• Type of structure	:	MNB
• Span Arrangement	:	5 x 6.9
• Total outer width of structure	:	1 x 10.25 m
• Type of Foundation	:	-
• Type of substructure	:	RCC Box Type
• Type of Superstructure	:	RCC Box Type
• Type of Bearing	:	NA
• Type of Railing	:	RCC Hand rail
• Method of Inspection	:	Visual

### OBSERVATIONS

Visual Observations on condition of the structure are as below:

- Hair line cracks observed on bottom of top slab and side walls.
- Structure is in fair condition.



BR. NO.325+600

### GENERAL DESCRIPTION

• Chainage	:	Km 325+600
• Type of structure	:	CUP
• Span Arrangement	:	1.0 x 4.0 x 3.5 m
• Total outer width of structure	:	2 x 12.0 m
• Median Width	:	4.5
• Type of Foundation	:	Raft
• Type of substructure	:	RCC Box Type
• Type of Superstructure	:	RCC Box Type
• Type of Bearing	:	NA
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

### OBSERVATIONS

Visual Observations on condition of the structure are as below:

- Minor Honey comb observed on side walls.
- Structure is in good condition.



BR. NO.360+500

### GENERAL DESCRIPTION

• Chainage	:	Km 360+500
• Type of structure	:	CUP
• Span Arrangement	:	1.0 x 4.0 x 3.5 m
• Total outer width of structure	:	2 x 12.0 m
• Median Width	:	4.5
• Type of Foundation	:	Raft
• Type of substructure	:	RCC Box Type
• Type of Superstructure	:	RCC Box Type
• Type of Bearing	:	NA
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

### OBSERVATIONS

Visual Observations on condition of the structure are as below:

- Honey comb and cracks were observed on side walls.
- Structure condition good.



BR. NO.372+980

### GENERAL DESCRIPTION

• Chainage	:	Km 372+980
• Type of structure	:	VUP
• Span Arrangement	:	1.0 x 12.5 x 5.5 m
• Total outer width of structure	:	2 x 12.0 m
• Median Width	:	4.5
• Type of Foundation	:	Raft
• Type of substructure	:	RCC Box Type
• Type of Superstructure	:	RCC Box Type
• Type of Bearing	:	NA
• Type of Railing	:	RCC Crash barrier
• Method of Inspection	:	Visual

### OBSERVATIONS

Visual Observations on condition of the structure are as below:

- Structure is in good condition.



BR. NO.367+485

### GENERAL DESCRIPTION

• Chainage	:	Km 367+485 LHS
• Type of bridge	:	ROB
• Span Arrangement	:	1 x 18.0 + 1 x 41.1 m
• Total outer width of bridge	:	1 x 12.0 m
• Type of Foundation	:	Open
• Type of substructure	:	RCC wall
• Type of Superstructure	:	RCC & PSC girder
• Type of Bearing	:	Elastomeric.
• Type of Railing	:	RCC Crash barrier.
• Method of Inspection	:	Visual

### OBSERVATIONS

Visual Observations on condition of the bridge are as below:

- Corrosion stains were observed on pier cap.
- Rubber sealant damaged in Expansion joint on A1, P1, A2 locations.



BR. NO.367+485

### GENERAL DESCRIPTION

• Chainage	:	Km 367+485 RHS
• Type of bridge	:	ROB
• Span Arrangement	:	1 x 18.0 + 1 x 41.1 m
• Total outer width of bridge	:	1 x 10.25 m
• Type of Foundation	:	Open
• Type of substructure	:	RCC wall
• Type of Superstructure	:	RCC & Steel girder
• Type of Bearing	:	POT-PTFE & Elastomeric
• Type of Railing	:	RCC Crash barrier.
• Method of Inspection	:	Visual

### OBSERVATIONS

Visual Observations on condition of the bridge are as below:

- Three RCC girders for P1 to A2 and are in good condition.
- Crash barrier damaged and also steel exposed.



Photos of some culverts at site



Km 28+030



Km 350+100



Km 366+400



Km 371+701



Km 339+090



Km 367+970



Km 374+042



Km 376+217

**Details of Culverts**

S. No	Type as per CA	Type as per site	Proposed chainage	Proposed chainage as per site	Proposed span arrangement (No.× Length) (m)	Proposed span arrangement as per site (No.× Length) (m)	Existing deck width as per site	Skew angle	Vertical clearance (m)	Slab thickness (m)	Remarks
1	-	Pipe Culverts	-	316+600	-	1 x 1.2	31.8	No	-	-	1. Merged into drain at both sides
2	-	Pipe Culverts	-	318+305	-	1 x 1.2	33.9	No	-	-	1. Structure is in good condition 2. Not visible at LHS
3	-	Pipe Culverts	-	319+720	-	1 x 0.6	18.25	No	-	-	1. Median drain culvert available at RHS
4	-	Pipe Culverts	-	323+220	-	1 x 0.6	16.65	No	-	-	1. Median drain culvert available at LHS
5	-	Pipe Culverts	-	325+390	-	1 x 0.6	18.05	No	-	-	1. Median drain culvert available at RHS 2. No stone pitching at LHS
6	Slab Culverts	-	325+619	-	1 x 2	-	-	-	-	-	1. Not found at site
7	Box Culverts	Box Culverts	326+620	326+622	1 x 2	1 x 2	24.5	No	2	-	1. Structure is in good condition
8	Box Culverts	Box Culverts	328+030	328+278	1 x 2	1 x 2	26.3	No	2	-	1. Hair line cracks were observed on slab 2. Honey comb on side walls
9	Slab Culverts	Slab Culverts	336+302	336+306	2 x 2.5	1 x 3.5	27.3	No	1.031	0.3	1. No stone protection at RHS
10	Pipe Culverts	Pipe Culverts	339+090	339+040	3 x 0.9	3 x 0.9	28.3	No	-	-	1. Parapet wall damaged 2. Steel exposed on pipe

S. No	Type as per CA	Type as per site	Proposed chainage	Proposed chainage as per site	Proposed span arrangement (No.× Length) (m)	Proposed span arrangement as per site (No.× Length) (m)	Existing deck width as per site	Skew angle	Vertical clearance (m)	Slab thickness (m)	Remarks
11	-	Pipe Culverts	-	346+630	-	1 x 0.6	15.95	No	-	-	
12	Slab Culverts	Slab Culverts	346+772	346+772	1 x 1.9	1 x 1.2	29	No	1.2	0.3	1. Vegetation on stone pitching.
13	-	Pipe Culverts	-	347+560	-	2 x 0.9	22.2	No	-	-	1.Stone protection at BHS required.
14	-	Pipe Culverts	-	347+610	-	2 x 0.9	22.2	No	-	-	
15	-	Pipe Culverts	-	348+045	-	1 x 0.6	16.35	No	-	-	
16	-	Pipe Culverts	-	348+870	-	1 x 0.6	13.35	No	-	-	
17	-	Box Culverts	-	350+075	-	1 x 2	25.8	No	2	-	1. Structure is in good condition.
18	Box Culverts	Box Culverts	350+680	350+710	1 x 2	1 x 2	32.85	No	2.5	-	1. Structure is in good condition.
19	-	Pipe Culverts	-	351+720	-	1 x 0.6	14.25	No	-	-	
20	-	Box Culverts	-	351+780	-	1 x 2	23.8	No	2.5	-	1. Structure is in good condition.
21	-	Pipe Culverts	-	352+200	-	1 x 0.6	14.05	No	-	-	

S. No	Type as per CA	Type as per site	Proposed chainage	Proposed chainage as per site	Proposed span arrangement (No.× Length) (m)	Proposed span arrangement as per site (No.× Length) (m)	Existing deck width as per site	Skew angle	Vertical clearance (m)	Slab thickness (m)	Remarks
22	Box Culverts	Box Culverts	353+310	353+310	1 x 2	1 x 2	24.9	No	2	-	1. Hair line cracks observed on slab 2. Honey comb observed on slab and side walls
23	-	Pipe Culverts	-	353+730	-	1 x 0.6	16.85	No	-	-	
24	-	Pipe Culverts	-	354+240	-	1 x 0.6	14.05	No	-	-	
25	-	Pipe Culverts	-	355+280	-	1 x 0.6	16.35	No	-	-	
26	Slab Culverts	Slab Culverts	356+349	356+344	1 x 2.8	1 x 2.1	23.6	Yes	1.188	0.3	1. Structure is in good condition.
27	-	Pipe Culverts	-	358+200	-	1 x 1.2	33.6	No	-	-	1. Structure is in good condition.
28	-	Pipe Culverts	-	358+940	-	1 x 1.2	34.1	No	-	-	
29	-	Pipe Culverts	-	360+220	-	1 x 0.6	14.05	No	-	-	
30	-	Pipe Culverts	-	361+735	-	1 x 1.2	27.2	No	-	-	1. Structure is in good condition.
31	-	Pipe Culverts	-	363+520	-	1 x 1.2	25.6	No	-	-	1. Structure is in good condition.

S. No	Type as per CA	Type as per site	Proposed chainage	Proposed chainage as per site	Proposed span arrangement (No.× Length) (m)	Proposed span arrangement as per site (No.× Length) (m)	Existing deck width as per site	Skew angle	Vertical clearance (m)	Slab thickness (m)	Remarks
32	Box Culverts	Box Culverts	365+100	365+110	1 x 2	1 x 2	25.2	No	1.5	-	1. Structure is in good condition.
33	Slab Culverts	Slab Culverts	365+781	365+772	2 x 3.8	2 x 3.2	23.9	No	1.2	0.3	1. Minor damage on parapet wall at RHS 2. Stone apron partially damaged
34	Slab Culverts	Slab Culverts	366+463	366+447	1 x 3.6	1 x 3	23.8	No	1.984	0.3	1. Crack observed on parapet wall 2. Structure is in good condition.
35	-	Pipe Culverts	-	366+980	-	1 x 0.6	17.4	No	-	-	
36	Pipe Culverts	Pipe Culverts	367+778	367+839	1 x 1.2	1 x 1.2	22.3	Yes	-	-	Old structure at LHS
37	-	Pipe Culverts	-	368+009	-	1 x 0.6	15.45	No	-	-	1. Structure is in good condition.
38	Pipe Culverts	Pipe Culverts	368+104	368+070	1 x 1.2	1 x 1.2	29	No	-	-	1. Structure is in good condition.
39	Pipe Culverts	Pipe Culverts	368+126	368+150	1 x 1.2	1 x 1.2	30.7	No	-	-	1. Structure is in good condition.
40	-	Pipe Culverts	-	369+325	-	1 x 0.6	16.35	No	-	-	
41	Pipe Culverts	Pipe Culverts	369+621	369+662	1 x 1.2	1 x 1	30.15	No	-	-	1. Structure is in good condition.
42	-	Pipe Culverts	-	370+460	-	1 x 0.6	16.05	No	-	-	

S. No	Type as per CA	Type as per site	Proposed chainage	Proposed chainage as per site	Proposed span arrangement (No.× Length) (m)	Proposed span arrangement as per site (No.× Length) (m)	Existing deck width as per site	Skew angle	Vertical clearance (m)	Slab thickness (m)	Remarks
43	Slab Culverts	Slab Culverts	370+957	370+944	1 x 2.65	1 x 2	29.5	No	2.057	0.3	1 parapet wall at RHS required
44	Slab Culverts	Slab Culverts	371+707	371+697	1 x 2.4	1 x 1.9	34.85	Yes	3.066	0.3	1 wing walls at RHS required
45	Pipe Culverts	Pipe Culverts	372+244	372+220	1 x 1.2	1 x 1.2	31.1	No	-	-	1. Structure is in good condition.
46	Pipe Culverts	Pipe Culverts	372+472	372+453	1 x 1.2	1 x 1.2	30.7	No	-	-	
47	Pipe Culverts	Pipe Culverts	372+682	372+664	1 x 1.2	1 x 1.2	36.1	No	-	-	1. Merged into drain at both sides
48	Pipe Culverts	Pipe Culverts	373+045	373+000	1 x 1.2	1 x 1.2	31.1	No	-	-	1. Merged into drain at both sides
49	Pipe Culverts	Pipe Culverts	373+071	373+070	1 x 1.2	1 x 1.2	31.1	No	-	-	1. Merged into drain at both sides
50	Pipe Culverts	Pipe Culverts	373+321	373+390	1 x 1.2	1 x 1.2	32.6	No	-	-	1. Merged into drain at both sides
51	Pipe Culverts	Pipe Culverts	373+492	373+476	1 x 1.2	1 x 1.2	33.2	No	-	-	1. Culvert merged into drain at RHS side.
52	Pipe Culverts	Pipe Culverts	373+989	373+972	1 x 1.2	1 x 1.2	30.1	No	-	-	1. wing walls at BHS required
53	Pipe Culverts	Pipe Culverts	374+042	374+025	1 x 1.2	1 x 1.2	30.3	No	-	-	1. Minor damage on wing wall. 2. Structure is in good condition.
54	Slab Culverts	Slab Culverts	374+315	374+298	1 x 2.5	1 x 2.5	23.1	No	1.342	0.3	1. Structure is in good condition.

S. No	Type as per CA	Type as per site	Proposed chainage	Proposed chainage as per site	Proposed span arrangement (No.× Length) (m)	Proposed span arrangement as per site (No.× Length) (m)	Existing deck width as per site	Skew angle	Vertical clearance (m)	Slab thickness (m)	Remarks
55	Pipe Culverts	Pipe Culverts	374+684	374+667	1 x 1.2	1 x 1.2	30.5	No	-	-	1. Structure is in good condition.
56	Pipe Culverts	Pipe Culverts	374+870	374+853	1 x 1.2	1 x 1.2	30.4	No	-	-	1. Structure is in good condition.
57	Pipe Culverts	Pipe Culverts	374+990	374+971	1 x 1.2	1 x 1.2	28.8	Yes	-	-	1. Structure is in good condition.
58	Pipe Culverts	Pipe Culverts	375+259	375+242	1 x 1.2	1 x 1.2	30.25	No	-	-	1. Minor damage on wing wall 2. Structure is in good condition.
59	Pipe Culverts	Pipe Culverts	375+598	375+583	1 x 1.2	1 x 1.2	30.55	No	-	-	1. Structure is in good condition.
60	Pipe Culverts	Pipe Culverts	375+780	375+764	1 x 1.2	1 x 1.2	30.65	No	-	-	1. Wing wall partially damaged at LHS.
61	Pipe Culverts	Pipe Culverts	376+122	376+102	1 x 1.2	1 x 1.2	30.9	Yes	-	-	1. Structure is in fair condition.
62	Pipe Culverts	Pipe Culverts	376+217	376+200	1 x 1.2	1 x 1.2	30.35	No	-	-	1. Structure is in fair condition.
63	Pipe Culverts	Pipe Culverts	376+341	376+325	1 x 1.2	1 x 1.2	30.35	No	-	-	1. Structure is in fair condition.
64	Pipe Culverts	Pipe Culverts	376+512	376+433	1 x 1.2	1 x 1.2	33	No	-	-	1. wing walls presented at LHS required
65	Pipe Culverts	Pipe Culverts	377+225	377+208	1 x 1.2	1 x 1.2	30.3	No	-	-	1. Wing wall damaged at LHS side.

S. No	Type as per CA	Type as per site	Proposed chainage	Proposed chainage as per site	Proposed span arrangement (No.× Length) (m)	Proposed span arrangement as per site (No.× Length) (m)	Existing deck width as per site	Skew angle	Vertical clearance (m)	Slab thickness (m)	Remarks
66	Pipe Culverts	Pipe Culverts	377+721	377+780	1 x 1.2	1 x 1.2	32.9	No	-	-	1. wing walls presented at LHS required.
67	Pipe Culverts	Pipe Culverts	377+824	377+888	1 x 1.2	1 x 1.2	37.2	Yes	-	-	1. Minor damage at LHS Wing wall
68	Pipe Culverts	Pipe Culverts	378+306	378+290	1 x 1.2	1 x 1.2	30.8	No	-	-	1. Minor damage at RHS Wing wall
69	Pipe Culverts	Pipe Culverts	378+729	378+707	1 x 1.0	1 x 1.2	30.8	No	-	-	1. Structure is in good condition.
70	Pipe Culverts	-	379+542	-	1 x 1.2	-	-	-	-	-	1. Not found at site.

### 1.6.6 Drainage and Slope Protection

Lined Covered drains observed at urban road and service road Locations along the corridor. Open unlined drains at few locations are not functioning properly and require some attention.

Median drains at curve locations are in good condition except for few locations where they need cleaning. No major distress is observed on the carriageway on downstream side at median drain locations. This will help preventing distress on carriageway in the long run.

Slope protection in the form of Stone pitching has been provided along the corridor. At few locations, the slope protection is not in a proper condition and is mentioned in the tables above.

### 1.6.7 Traffic Safety and Road Furniture

Metal beam crash barriers provided along the project corridor without end treatments which shall be required with proper tapering. Pedestrian guard rails installed only at bus bay foot path location and are appear in good condition.

Four (4) Out of 77 Nos of Solar blinkers were not in working condition along the corridor and street lighting and High Mast Lighting is in good working condition except at couple of locations, where the rectification work is in progress.

### 1.6.8 Road User Facilities

The bus stop and bus bay, Truck lay bye provided along the corridor appear to be good condition.

## 1.7 REHABILITATION PLANS AND DESIGNS

### 1.7.1 Design Traffic Loading

Design Traffic loading has been estimated by considering the latest traffic (given) and VDFs as estimated from the latest axle load survey data and with the 5% growth rates. The Estimated design traffic for 5 years, 10 years and 15 years design period as below:

**Table 31: Estimated Design Traffic loading near (km338+350)**

Year	Design Lane MSA on Existing Carriageway	
	UP	DN
5 <sup>th</sup> year from Now	18.7	18.5
10 <sup>th</sup> year from Now	42.5	42.0
15 <sup>th</sup> year from Now	72.9	72.1

**Table 32: Estimated Design Traffic loading near (km365+400)**

Year	Design Lane MSA on Existing Carriageway	
	UP	DN
5 <sup>th</sup> year from Now	18.8	19.4
10 <sup>th</sup> year from Now	42.9	44.1
15 <sup>th</sup> year from Now	73.6	75.7

Since it is essential to monitor the pavement structural strength every 10 years as per 4 laning manual, design traffic corresponding to 10 years period has been considered for overlay design.

### 1.7.2 Pavement Rehabilitation and Strengthening

For Design the Overlay Thickness the following method as suggested in IRC: 115 has been used

- The existing pavement is considered as a 3-layer system consisting of subgrade, granular and bituminous layer. The remaining life of existing pavement in terms of Fatigue and Rutting life (MSA) are estimated
- The remaining life is compared with design traffic loading. An overlay with assumed thickness is considered on existing pavement where required.
- The Total system including the proposed Overlay (Trial thickness) is assumed as a four-layer system and considered the relevant MR values for all the four layers namely New BT layer, existing bituminous surface, Total existing Granular layers and Subgrade layers.
- The MR value for the New BT is assumed as 3000 MPA (considering VG40 Bituminous grade) and for all the remaining three layers, the MR Values derived and finalized from the FWD Analysis are considered
- Critical Tensile strains and Vertical strains are found out by using the IIT PAVE Software at the bottom of existing bituminous layer and at the top of the subgrade layer respectively.
- The Fatigue and Rutting equations (equation 16 & 17 given in the IRC: 115) have been used to estimate the Fatigue and Rutting Life of The Pavement system.
- The Obtained Fatigue and Rutting Life are compared with the required life for the assumed trial overlay thickness.
- Analysis is carried out for individual homogeneous sections as well for minimum and Average Modulus Values on each direction separately.

Remaining life of the existing pavement from the above analysis is presented in the following tables:

**Table 33: Remaining life of the existing pavement on Both Carriageways**

Sections	From	To	Length	Existing - BT layer MR value	MR of Granular Layer Thickness	MR (or) E-Subgrade	Existing BT layer (mm)	Existing Granular layer (mm)	Total BT Layer thickness	Total Crust	E- BT layer	ver. Strain(Ev)	tan. Strain(Et)	Nf- Fatigue life, %	Rutting life, mSA	Critical Life
LHS																
1	308.00	310.60	2.6	2038	237	87	150	430	150	580	2038	287.9	206.2	72	470	72
2	310.60	313.80	3.2	2061	206	87	150	430	150	580	2061	297.0	219.8	55	408	55
3	313.80	318.20	4.4	2085	192	87	150	430	150	580	2085	300.7	226.0	49	386	49
4	318.20	323.30	5.1	2722	164	87	150	430	150	580	2722	291.1	211.1	51	447	51
5	323.30	326.20	2.9	2716	180	83	150	430	150	580	2716	295.4	203.7	59	419	59
6	326.20	331.80	5.6	3515	162	87	150	430	150	580	3000	284.7	200.8	57	495	57
7	331.80	336.20	4.4	3517	182	87	150	430	150	580	3000	280.1	191.8	68	533	68
8	336.20	340.80	4.6	3580	189	73	150	430	150	580	3000	308.2	190.2	71	345	71
9	340.80	345.40	4.6	3555	173	67	150	430	150	580	3000	329.1	198.0	60	256	60
10	345.40	348.40	3.0	2890	177	80	150	430	150	580	2890	298.5	198.7	61	399	61
11	348.40	351.40	3.0	2899	162	87	150	430	150	580	2899	287.2	204.8	55	476	55
12	351.40	355.40	4.0	2894	154	71	150	430	150	580	2894	327.6	211.0	49	262	49
13	355.40	359.40	4.0	3075	182	87	150	430	150	580	3000	280.1	191.8	68	533	68
14	359.40	361.80	2.4	3286	185	69	150	430	150	580	3000	319.4	192.4	68	294	68
15	361.80	364.80	3.0	2798	161	75	150	430	150	580	2798	317.5	210.8	50	302	50
16	364.80	368.60	3.8	2755	169	68	150	430	150	580	2755	334.6	209.3	52	238	52
17	368.60	371.80	3.2	2275	175	87	150	430	150	580	2275	300.3	226.0	46	388	46
18	371.80	373.60	1.8	2292	171	80	150	430	150	580	2292	316.7	228.1	44	305	44
19	373.60	375.80	2.2	2171	181	76	150	430	150	580	2171	326.7	228.9	45	265	45
20	375.80	379.40	3.6	2167	193	75	150	430	150	580	2167	324.7	222.3	51	273	51
RHS																
1	308.00	311.20	3.2	2050	193	85	150	430	150	580	2050	305.6	227.4	49	359	49
2	311.20	314.90	3.7	2062	185	87	150	430	150	580	2062	303.6	231.3	45	370	45
3	314.90	318.20	3.3	2040	185	87	150	430	150	580	2040	304.3	232.6	45	366	45

Sections	From	To	Length	Existing - BT layer MR value	MR of Granular Layer Thickness	MR (or) E- value	Existing BT layer (mm)	Existing Granular layer(mm)	Total BT Layer thickness	Total Crust	E- BT layer	ver. Strain(Ev)	tan. Strain(Et)	Nf- Fatigue life,	Rutting life,mSA	Critical Life
4	318.20	320.80	2.6	2273	169	84	150	430	150	580	2273	308.7	229.9	43	343	43
5	320.80	324.40	3.6	2131	188	87	150	430	150	580	2131	300.6	225.9	48	387	48
6	324.40	326.60	2.2	2242	172	86	150	430	150	580	2242	304.3	229.5	44	366	44
7	326.60	328.80	2.2	2370	166	86	150	430	150	580	2370	302.3	226.5	44	377	44
8	328.80	333.60	4.8	2326	166	87	150	430	150	580	2326	301.4	228.6	43	382	43
9	333.60	336.90	3.3	2315	171	87	150	430	150	580	2315	300.3	226.2	45	388	45
10	336.90	340.60	3.7	2345	166	87	150	430	150	580	2345	300.8	227.7	43	386	43
11	340.60	343.40	2.8	2591	162	87	150	430	150	580	2591	295.0	218.0	47	421	47
12	343.40	347.00	3.6	2609	152	87	150	430	150	580	2609	297.0	222.8	43	408	43
13	347.00	351.40	4.4	2660	163	87	150	430	150	580	2660	292.9	214.3	49	435	49
14	351.40	353.70	2.3	2730	169	87	150	430	150	580	2730	289.7	208.2	54	457	54
15	353.70	357.60	3.9	2703	164	87	150	430	150	580	2703	291.6	211.9	51	444	51
16	357.60	360.80	3.2	2731	158	87	150	430	150	580	2731	292.3	213.8	49	439	49
17	360.80	364.20	3.4	2769	156	87	150	430	150	580	2769	291.8	213.3	48	443	48
18	364.20	366.80	2.6	2750	181	87	150	430	150	580	2750	286.1	201.5	61	484	61
19	366.80	370.90	4.1	2539	175	82	150	430	150	580	2539	303.7	213.8	52	369	52
20	370.90	372.70	1.8	2539	173	74	150	430	150	580	2539	323.4	215.8	50	278	50
21	372.70	375.60	2.9	2511	169	87	150	430	150	580	2511	295.4	217.8	49	419	49
22	375.60	379.40	3.8	2536	175	87	150	430	150	580	2536	293.1	213.5	52	434	52

It can be seen from the above table that remaining life of existing pavement is more than 49 MSA in Section-1 on LHS carriageway and more than 44 MSA in Section-2 on LHS and remaining life of existing pavement is more than 43 MSA on RHS carriageway in Section-1 and more than 48 MSA in Section-2 on RHS carriageway.

From the above table it is clear that no immediate overlay is required for the entire length of the project corridor as the remaining life of the pavement is more than or equal to 10<sup>th</sup> year design MSA of each Homogeneous Section; **however, considering minor cracks and age of pavement 30mm overlay is being carried out at site.**

### 1.7.3 Structural Rehabilitation

All the structure found to be in good condition, only minor distresses noticed and same is suggested for repair. Some of them fall under Routine Maintenance and the work for the same is in progress.

## 1.8 OPERATION AND MAINTENANCE

### 1.8.1 Introduction

Looking at the contractual requirements of maintaining project road under specified level of roughness it is felt that roughness is the most important criterion for finalizing the O&M schedule for the project. Accordingly, the methodology adopted by present consultants includes predicting the roughness year by year under the traffic using a well acknowledged HDM-4 model developed for developing countries like India after lot of research by World Bank. The said model is widely prescribed by MORTH and NHAI during the preparation of detailed project reports for several projects in doing economic analysis for the projects. The economic analysis mainly consists of two parts:

1. Predicting the road deterioration and estimating VOC
2. Estimating Benefits

Considering its importance and present use in India, consultants felt prudent to use the first part, i.e., estimating road deterioration and predicting roughness in HDM 4 model to finalize the O&M schedule for the project. This approach is more scientific as it does not assume hypothetical deflection values at 10<sup>th</sup> and 20<sup>th</sup> year and includes main criterion of maintaining roughness at 2500mm/Km as per Schedule K.

### 1.8.2 CA specifications for Major Maintenance

- Schedule K of CA species that Roughness values exceed 2500 mm/km in a length of KM, needs to be corrected within 180 days.
- No specific requirement with respect to deflection (BBD) measurement
- O&M manual submitted by SPV indicates that strengthening measures will be undertaken whenever deflection values are more than 1.2mm as per IRC SP 84-2014.

### 1.8.3 Inputs for O&M

### 1.8.4 Schedule

#### 1.8.4.1 Project Sections

Since roughness is the main criterion for major maintenance, Project Corridor has been divided in to 4 sections depending the present roughness values:

- Case 1: Roughness value <2000 mm/Km
- Case 1: Roughness values >2000<2300 mm/Km
- Case 3: Roughness>2300<2500 mm/Km

- Case 4: Roughness>2500 mm/KM

Present corridor does not have roughness values more than 2000mm/Km, hence only one case in each homogeneous section for each carriageway is considered in the present case.

Direction wise analysis has been done separately for LHS (UP)/RHS (DN) and each direction length has been divided into sections based on above.

#### 1.8.4.2 Traffic (AADT)

The following traffic data has been used in the analysis is as below:

Vehicle/Mode	AADT at 2021 (Vehicles) Km338+350	AADT at 2021 (Vehicles) Km365+400
LCV	578	434
2A truck	794	683
3A truck	600	582
MAV truck	1311	1335
BUS	478	412

**Note:** 50:50 directional distributions are considered.

#### 1.8.4.3 Vehicle Damage Factors (VDF)

VDF values as obtained from axle load surveys are used for various sections are as given below:

Mode Type	UP	DOWN
LCV	0.995	1.569
2 Axle Truck	7.756	3.477
3 Axle Truck	6.157	6.669
MAV (4-6 Axle)	9.629	11.519
Buses*	1.000	1.000

Mode Type	UP	DOWN
LCV	1.093	1.454
2 Axle Truck	6.655	3.205
3 Axle Truck	6.001	6.996
MAV (4-6 Axle)	11.060	12.744
Buses*	1.000	1.000

#### 1.8.4.4 Deflection (FWD) Values & Roughness Values

FWD and Roughness values are used as obtained from surveys and investigations as below:

LHS: Section-1	Section-1	Section-2	Section-3	Section-4
	<2000	>=2000 and <2300	>=2300 and <2500	>2500

Length (m)	39000	0	0	0
Roughness(mm/KM)	1576	0	0	0
IRI	2.27	0.00	0.00	0.00
Deflection	0.32	0.00	0.00	0.00
Cracking	1.93%	0.00	0.00	0.00
Raveling	0.01%	0.00	0.00	0.00
BT Crust	150	0.00	0.00	0.00

RHS: Section-1	Section-1	Section-2	Section-3	Section-4
	<2000	>=2000 and <2300	>=2300 and <2500	>2500
Length (m)	38000	0	0	0
Roughness(mm/KM)	1629	0	0	0
IRI	2.34	0.00	0.00	0.00
Deflection	0.32	0.00	0.00	0.00
Cracking	6.99%	0.00	0.00	0.00
Raveling	0.00	0.00	0.00	0.00
BT Crust	150	0.00	0.00	0.00

LHS: Section-2	Section-1	Section-2	Section-3	Section-4
	<2000	>=2000 and <2300	>=2300 and <2500	>2500
Length (m)	32550	0	0	0
Roughness(mm/KM)	1610	0	0	0
IRI	2.31	0.00	0.00	0.00
Deflection	0.34	0.00	0.00	0.00
Cracking	1.14%	0.00	0.00	0.00
Raveling	0.00	0.00	0.00	0.00
BT Crust	150	0.00	0.00	0.00

RHS: Section-2	Section-1	Section-2	Section-3	Section-4
	<2000	>=2000 and <2300	>=2300 and <2500	>2500
Length (m)	32550	0	0	0
Roughness(mm/KM)	1654	0	0	0
IRI	2.37	0.00	0.00	0.00
Deflection	0.35	0.00	0.00	0.00
Cracking	0.74%	0.00	0.00	0.00
Raveling	0.00	0.00	0.00	0.00
BT Crust	150	0.00	0.00	0.00

### 1.8.5 Options for O&M schedule

Following options were considered in the analysis:

- Base Case: MCS at Roughness of 2500mm/Km with regular maintenance

- Option-1: Responsive Overlay with BC/BC+DBM whenever roughness is >2500mm/KM with regular maintenance

### 1.8.6 O&M Schedule

Using the HDM-4 deterioration model, roughness progression for each section under each alternative maintenance cases has been evaluated for above options. Accordingly, Year wise O&M schedule is presented below for each homogeneous section on either carriageway:

**Table 34: Adopted Overlay Schedule**

S.No	FY	Section-1 (LHS CW)	Section-1 (RHS CW)	Section-2 (LHS CW)	Section-2 (RHS CW)	Remarks
1	2023					
2	2024					
3	2025					
4	2026					
5	2027					
6	2028					
7	2029		80		80	
8	2030	80		80		
9	2031					
10	2032					
11	2033					
12	2034					
13	2035					
14	2036		30		30	
15	2037	30		30		
16	2038					
17	2039					
18	2040					
19	2041					
20	2042	30	30	30	30	
21	2043					
22	2044					

### 1.9 COST

Cost Component for various items and activities have been worked out by considering the Best Industry practice and most appropriate methods. The gist of the cost components considered are presented below

- Immediate Repair's Cost
- Routine Maintenance Cost

- Routine Maintenance of Road
- Repair and Replacement of various road items
- Tolling system AMC cost
- Incident management
- Routine Maintenance for Structures
- Electricity bill of lighting areas near cities, I/C and other areas & Fuel expenditure
- Periodic Maintenance Cost
  - Functional + Structural overlay MCW Section & service road
  - dismantling existing & relaying wearing coarse over major structures
  - Replacement of Toll Hardware and software at later date
- Toll Plaza Operation cost, Highway Patrolling and maintenance supervision staff cost
- Maintenance of utilities and public amenities
- Operation and management costs of rest areas and lay byes
- Safety audit and other inspection costs @Rs15 Lacs per annum
- Insurance
- I.C for O&M period
- Administrative Cost and Grand Total

Abstracts and summary of cost estimates without escalation are presented below

**Table 35: Abstract of Cost Estimates without escalation**

S. No	FY	Immediate Repair's Cost +Routine and Operational Cost (in Crores)	Periodic Maintenance Cost (in Crores)	Total Cost (in Crores)
1	2023	14.67	-	14.67
2	2024	14.67	-	14.67
3	2025	14.67	-	14.67
4	2026	14.67	-	14.67
5	2027	14.67	-	14.67
6	2028	14.67	-	14.67
7	2029	14.67	51.40	66.07
8	2030	14.67	62.67	77.34
9	2031	14.67	-	14.67
10	2032	14.67	-	14.67
11	2033	14.67	-	14.67
12	2034	14.67	-	14.67
13	2035	14.67	-	14.67
14	2036	14.67	25.47	40.13
15	2037	14.67	24.80	39.47
16	2038	14.67	-	14.67
17	2039	14.67	-	14.67
18	2040	14.67	-	14.67
19	2041	14.67	-	14.67

20	2042	14.67	50.85	65.51
21	2043	14.67	2.32	16.98
22	2044	6.79	-	6.79
	<b>Total:</b>	<b>314.80</b>	<b>217.50</b>	<b>532.30</b>

**Table 36: Summary of Cost Estimates without Escalation**

FY	Routine Maintenance						Periodic Maintenance			Toll Plaza Operation cost	SPV cost	Survey Costs	Insurance & Audit charges	IE Fee	Administrative Cost	Total Recurring cost
	Routine Maintenance	R&R of Road items	Toll and HTMS AMC cost	Incident management	R&R of Structures	Electricity bill of lighting	Functional +Structural overlay MCW+S/R	Major Maintenance of TMS & HTMS	Structure specified repairs							
2023	2.16	1.88	0.30	2.01	0.39	0.88	0.00		-	3.29	1.90	0.14	0.71	0.82	0.19	<b>14.67</b>
2024	2.16	1.88	0.30	2.01	0.39	0.88	0.00		-	3.29	1.90	0.14	0.71	0.82	0.19	<b>14.67</b>
2025	2.16	1.88	0.30	2.01	0.39	0.88	0.00		-	3.29	1.90	0.14	0.71	0.82	0.19	<b>14.67</b>
2026	2.16	1.88	0.30	2.01	0.39	0.88	0.00		-	3.29	1.90	0.14	0.71	0.82	0.19	<b>14.67</b>
2027	2.16	1.88	0.30	2.01	0.39	0.88	0.00		-	3.29	1.90	0.14	0.71	0.82	0.19	<b>14.67</b>
2028	2.16	1.88	0.30	2.01	0.39	0.88	0.00		-	3.29	1.90	0.14	0.71	0.82	0.19	<b>14.67</b>
2029	2.16	1.88	0.30	2.01	0.39	0.88	51.40		-	3.29	1.90	0.14	0.71	0.82	0.19	<b>66.07</b>
2030	2.16	1.88	0.30	2.01	0.39	0.88	53.71	2.90	6.06	3.29	1.90	0.14	0.71	0.82	0.19	<b>77.34</b>
2031	2.16	1.88	0.30	2.01	0.39	0.88	0.00		-	3.29	1.90	0.14	0.71	0.82	0.19	<b>14.67</b>
2032	2.16	1.88	0.30	2.01	0.39	0.88	0.00		-	3.29	1.90	0.14	0.71	0.82	0.19	<b>14.67</b>
2033	2.16	1.88	0.30	2.01	0.39	0.88	0.00		-	3.29	1.90	0.14	0.71	0.82	0.19	<b>14.67</b>
2034	2.16	1.88	0.30	2.01	0.39	0.88	0.00		-	3.29	1.90	0.14	0.71	0.82	0.19	<b>14.67</b>
2035	2.16	1.88	0.30	2.01	0.39	0.88	0.00		-	3.29	1.90	0.14	0.71	0.82	0.19	<b>14.67</b>
2036	2.16	1.88	0.30	2.01	0.39	0.88	22.14	2.90	0.43	3.29	1.90	0.14	0.71	0.82	0.19	<b>40.13</b>
2037	2.16	1.88	0.30	2.01	0.39	0.88	24.80		-	3.29	1.90	0.14	0.71	0.82	0.19	<b>39.47</b>

FY	Routine Maintenance						Periodic Maintenance			Toll Plaza Operation cost	SPV cost	Survey Costs	Insurance & Audit charges	IE Fee	Administrative Cost	Total Recurring cost
	Routine Maintenance	R&R of Road items	Toll and HTMS AMC cost	Incident management	R&R of Structures	Electricity bill of lighting	Functional +Structural overlay MCW+S/R	Major Maintenance of TMS & HTMS	Structure specified repairs							
2038	2.16	1.88	0.30	2.01	0.39	0.88	0.00		-	3.29	1.90	0.14	0.71	0.82	0.19	<b>14.67</b>
2039	2.16	1.88	0.30	2.01	0.39	0.88	0.00		-	3.29	1.90	0.14	0.71	0.82	0.19	<b>14.67</b>
2040	2.16	1.88	0.30	2.01	0.39	0.88	0.00		-	3.29	1.90	0.14	0.71	0.82	0.19	<b>14.67</b>
2041	2.16	1.88	0.30	2.01	0.39	0.88	0.00		-	3.29	1.90	0.14	0.71	0.82	0.19	<b>14.67</b>
2042	2.16	1.88	0.30	2.01	0.39	0.88	44.62	2.90	3.33	3.29	1.90	0.14	0.71	0.82	0.19	<b>65.51</b>
2043	2.16	1.88	0.30	2.01	0.39	0.88	2.32		-	3.29	1.90	0.14	0.71	0.82	0.19	<b>16.98</b>
2044	0.99	0.86	0.13	0.92	0.18	0.40	0.00		-	1.51	0.87	0.14	0.32	0.38	0.09	<b>6.79</b>
<b>Total :</b>	<b>46.28</b>	<b>40.30</b>	<b>6.33</b>	<b>43.24</b>	<b>8.36</b>	<b>18.90</b>	<b>198.99</b>	<b>8.70</b>	<b>9.81</b>	<b>70.66</b>	<b>40.68</b>	<b>3.08</b>	<b>15.20</b>	<b>17.70</b>	<b>4.08</b>	<b>532.30</b>

**Notes:**

1. Base Cost are arrived for FY2023
2. All the material rates are February 2022 Rates
3. All labour rates are taken from Central minimum wages (October'2021 cycle) and 2.5% escalation applied on the same to arrive FY2023 Rates
4. All the costs are without any Escalation.
5. All the Cost presented in the above table are excluding Head Office (HQ) Expenses.

## 1.10 Change of Scope Details as on Dec-2020

Construction of 2 Nos. VUP under COS has been sanctioned by MORT&H letter no: RW/NH-37019/18/2010-NHDP-IV dt. 29.09.2017

The combined revised proposal with change location of VUP at Kakani has been approved by CE cum ROMORT&H Jaipur vide letter No RJ/PPP/AP/2015-16/960/677 dated 06.02.2020.

### 1. VUP at Mandia:

#### A. Drain with cover:

- (i) 854.900 RM (LHS) completed.
- (ii) 1031.000 RM (RHS) completed.

#### B. Service road:

- (i) 785.000 RM (LHS) with 150-meter taper portion completed.
- (ii) 785.000 RM (RHS) with 150-meter taper portion completed.

#### C. Approaches MCW:

- (i) 710.00 RM (Jodhpur side) completed (from start of MCW to centre of desk slab).
- (ii) 710.00 RM (Pali side) completed (from centre of desk slab to end of MCW).

#### E. VUP completed and opened to traffic in the month of August 2019.

### 2. VUP at Kakani:

#### A. Drain with cover:

- (i) 768.000 RM (LHS) completed & 120.000 RM yet to be done.
- (ii) 738.000 RM (RHS) completed & 120.000 RM yet to be done.

#### B. Service road:

- (i) 1040.000 RM (LHS) with 150-meter taper portion completed up to DBM layer.
- (ii) 1040.000 RM (RHS) with 150-meter taper portion completed up to DBM layer.

#### C. Approaches MCW:

- (i) 418 RM (Jodhpur side) not taken up.
- (ii) 452.00 RM (Pali side) not taken up.

#### D. VUP Box at Ch. 332.498: Not taken up.

Kakani VUP construction work stopped on 18th November 2020 due to local villager's Agitation. In this regard Concessionaire already represented PWD to resolve the matter at the earliest. But till date local issue not been resolved by PWD.

### 1.11 Status of Supplementary Agreements Works

S.No.	Supplementary Agreement Items	Current Status
1	Toll plaza Administration Building, Traffic Aid Posts, Medical Aid Posts, Medical Resident Quarters and Vehicle Rescue Post at Km 338+400.	After handing over of land, locals are not allowing to commence the work. Confirmation requested from PWD by JPEPL vide letter dated 08.04.2021 which is pending. As informed by Concessionaire, as soon as land made available by PWD, work will be taken up.
2	Rest area Facilities at Truck Lay Bye at Km 350+500 (LHS)	Rest Area and Toilet blocks construction work completed
3	Construction of balance length of wing wall/return wall on RHS at Km 326+622	Completed
4	Service Road and Drain work in a distance of 50 m on both sides from flaring from Km. 323+475 to Km. 324+500.	Completed
5	Bus bays and bus shelter on both sides at Km 333+485 (Kakani) and 346+400 (LHS) at Rohat.	At km: 333+485 (kakani), due to delay in the completion VUP at Kakani under COS, work is yet to be taken up. At Km: 346+400 (LHS) Bus bay with shelter completed.
6	Bus shelter on LHS at Km 336+500 (Nimbla)	Completed.
7	Median filling and Plantation from Km 336+200 to Km 336+820	Completed.
8	Drain work, median (NJCB) work on LHS from Km 346+750 to Km 347+510 (Rohat)	Median NJCB work completed. Due to the LA issues Drain and Utilities work not able to complete.
9	Fixing boundary stones on both sides from Km 308+000 to Km 328+000	Completed.
10	Unlined drain, avenue plantation and ROW clearance on both sides from Km 308+000 to Km 328+000	Completed.

## 1.12 CONCLUSIONS

Foregoing discussions on various elements of project highway leads to following Conclusions

1. The Appointed Date was declared as 16.09.2013 and scheduled Project Completion date was 20.03.2015 considering the construction period of the Project Highway as 550 days (as stipulated in CA). The Scheduled Project Completion date has been further extended up to October 2015.
2. Concession period for this project is 25 Years i.e., the original end date of Concession is 15.09.2038 however as informed by the Concessionaire, the Concessionaire expects 5 years extension in concession period on account of traffic variation as per Article 29 of CA. Accordingly the latest end date of Concession for future cost analysis is 15.09.2043
3. First Provisional Completion Certificate for the length of 60.015 Km out of 71.535 Km has been issued on 31.10.2014
4. Second Provisional Completion Certificate for the length of 71.093 Km (60.015 Km of First PCC plus additional 10.078 Km after First PCC) out of 71.535 (as per CA length) has been issued on 10.10.2015
5. Supplementary Agreement was made on 08.03.2018 indicates that the Concessionaire shall complete the balance works as and when the Land is made available to him by Authority. Most of the works have been completed except small works which are highlighted in Section 1.11 of this Report
6. COS works for 2 VUPs has been awarded. VUP works at Mandia was completed and opened to Traffic in the month of August 2019. Kakani VUP construction work stopped on dated 18th November 2020 due to local villager's Agitation. In this regard Concessionaire already represented PWD to resolve the matter at the earliest. But, till date local issue not been resolved by PWD.
7. From Km 308.000 to Km 315.400 the urban area the carriageway width is 7m flanked by paved Shoulder varies from 1.5 to 3m with shyness of 0.25m. From Km 316.500 to Km 323.600 the carriageway width is 7m flanked by paved Shoulder With 1.5 Width and with shyness of 0.25m Plus 1.5m Earthen Shoulder. From Km 324.500 to Km 379.535 the carriageway width is 7m and with shyness of 0.25m Plus 1.5m Earthen Shoulder Except Structure locations and built-up Area
8. The project road in general has good pavement condition except for few surface related distress. The cracking appears to top-down cracking rather than bottom-up cracking.
9. There are no undulations or depressions are observed along the corridor indicating good Subgrade quality.
10. Roughness surveys along corridor indicate at an average roughness is far less than 2500 mm/km and does not require Immediate Overlay from Roughness Consideration as the limiting value is 2500mm/Km as per CA.
11. Test pit surveys indicated average crust of 575 mm consisting of 147 mm blacktop and 428mm of granular layers over subgrade.
12. The subgrade quality the corridor appears to be good with CBR above 8% at all locations.

13. Vehicle damage factors arrived from axle load surveys indicate that VDF for 2-Axle Truck is more in LHS Carriageway than RHS Carriageway but the VDF for 3 Axle trucks and Multi Axle Trucks is more in RHS Carriageway than in LHS Carriageway
14. The Remaining life of the existing pavement is more than the 10 years design MSA, hence no immediate Overlay is required from Structural Consideration; however, it felt prudent to consider 30mm overlay in the year FY22/FY23 as preventive overlay and accordingly work is in progress
15. W-beam crash barriers provided along the corridor are in good condition and provided with hazard markers at the ends in the traffic direction.
16. Though Minor distresses were observed; all structures along the project road are having good condition. Some of the distresses observed are of routine in nature and rectification work for the same is in progress.
17. Distresses or deficiencies noticed along the project Road (Pavement/highway/Drainage/Structures) are considered for immediate Repair and the Cost for the same has been considered in FY23.
18. The TMS and WIMs were replaced recently in the month of Apr 2021 and the next replacement of the same has been considered at every 6 years during the remaining operation period.
19. O&M Costs have been estimated till the end of Concession period i.e., till 15.09.2043 as against 15.09.2038 (original Concession end date)
20. The applicable Manual for this project is IRC: SP:84-2009 and as per this manual, the roughness Survey shall be carried out twice in a year and BBD Survey shall be carried out once in 5 years.
21. As per pavement design report, stage construction has been adopted during initial construction. Accordingly, bituminous layers are designed for 10 years and granular layers are designed for full concession period.
22. There is no Mandatory Functional Overlay prescribed for this project as per CA. the Road has to be maintained as per CA and Roughness values shall be maintained below 2500mm/Km.
23. Even though Overlay is not required now, 30 mm thickness of BC is carrying our throughout the project length by considering the age of the pavement and surface condition. Accordingly, Major Maintenance work for the entire stretch contract awarded and the work is in progress and Client informed that the work is expect to complete on July 2022.
24. Future Overlays have been estimated by using HDM-4 Model. Considered 40mm BC whenever the Roughness value exceeds 2500mm/Km. Accordingly Three Overlays (excluding the presently proposed Overlay) are required for remaining Concession period.

**RESOTECH****CONSULTANCY SERVICES PVT. LTD.**

CIN - U74140MP2008PTC020576

**RESOTECH CONSULTANCY SERVICES PVT. LTD.**58, Shri Mangal Nagar, Near Elite Anmol Multi, Bicholi Hapsi Road,  
Indore 452 018 (M.P.) Telefax : 0731-4006024. e-mail : contact@resotechindia.com  
Website: www.resotechindia.com GSTIN:23AADCR9601G1ZL**RCSPL/VIIMPL/TDD/D-B/22-23/107****Date : 24.06.2022**

To,  
M/s Virescent Infrastructure Investment Manager Private Limited  
10th Floor, Parinee Crescenzo  
C-30,'G' Block, Bandra Kurla Complex  
Bandra (East), Mumbai 400 051  
Maharashtra, India  
Tel: +91 9971622660

Sub:-Consultancy Services for Technical Due Diligence for Kadatal (Km 278.000) Armur (Km 308.000)  
Road section of NH-7 in the State of Telangana.

Dear Sir,

This is with reference to our letter No. **RCSPL/VIIMPL/TDD/D-B/SA-22/439** dated **28.02.2022** vide which we have submitted the final Technical Due Diligence Report for NBL & discussions regarding difference in the cost of major maintenance on account of change in the price of Bitumen.

The Bitumen price considered in the cost estimation as part of the TDD report submitted by us was Rs.42,520/- Per MT. On considering the prevailing Bitumen price of Rs.50,000/- Per MT the revised cost of major maintenance, works out to Rs.31.85 Cr. (including GST) as against Rs.29.60 Cr. (including GST) given in the final TDD report.

Thanking you,

Yours truly,

For **RESOTECH CONSULTANCY SERVICES PVT. LTD.**



**RAJNISH MISHRA**

**DIRECTOR**

RCSPL/VIIMPL/TDD/D-B/21-22/439

Date: 28.02.2022

To,  
M/s Virescent Infrastructure Investment Manager Private Limited  
10th Floor, Parinee Crescenzo  
C-30, 'G' Block, Bandra Kurla Complex  
Bandra (East), Mumbai 400 051  
Maharashtra, India  
Tel: +91 99716 22660

Sub:-Consultancy Services for Technical Due Diligence for Kadatal (Km 278.000) Armur (Km 308.000) Road section of NH-7 in the State of Telangana.

Ref.: Work order No. HC1/Tech/2021-22/016 dated 18.01.2022.

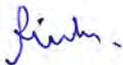
Dear Sir,

This is with reference to work order cited above vide which we have been awarded the work mentioned in subject above. The Final Report pertaining to Technical Due Diligence is enclosed herewith for your needful.

Thanking you,

Yours truly,

**For RESOTECH CONSULTANCY SERVICES PVT. LTD.**



**RAJNISH MISHRA**  
**DIRECTOR**

# **NIRMAL BOT LIMITED**

**Four Lane section from Km 282.617 (Kadtal) to Km 313.507 (Armur) on NH-7 (New NH-44) in the state of Telangana on BOT (Annuity) Basis**



## **Technical Due Diligence Report**

**For**

**Virescent Infrastructure Investment Manager Private Limited  
(For The Purpose of Highways Infrastructure Trust)**

**FEBRUARY 2022**

### **Resotech Consultancy Services Pvt. Ltd.**

58, Shri Mangal Nagar Near Elite Anmol, Bicholi Hapsi Road,  
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**NIRMAL BOT LIMITED**

**TECHNICAL DUE DILIGENCE REPORT**

**EXECUTIVE SUMMMARY**

## EXECUTIVE SUMMARY

### E.01 THE PROJECT ROAD

The Project Road is a Section of NH-7 which starts from Kadtal in Adilabad District (New Ch. 282+617) and ends at Armur in Nizamabad District (New Ch. 313+507). The Project Road crosses the Godavari river at the major bridge Ch. 289+834 (36x20.9m) and has a length of **30.890km**. This Project for up-gradation of the existing road to four lane carriageway with paved shoulders was awarded by the National Highways Authority of India to M/s. Nirmal BOT Limited for a Concession Period of 20 years on BOT (Annuity) basis. The Concessionaire had appointed M/s Hindustan Construction Company Ltd. as their EPC contractor for execution of work under EPC mode. The Concession Agreement was signed on 04<sup>th</sup> May 2007 and the Project commencement date was fixed as 30<sup>th</sup> October 2007 and commercial operation started on 22<sup>nd</sup> July 2009. On 23<sup>rd</sup> December 2015 Highway Concessions One Pvt. Ltd. had acquired 74% of controlling stake in Nirmal BOT Limited and balance 26% was acquired on 06<sup>th</sup> March 2019. Further, on 17<sup>th</sup> December 2021, Galaxy Investments II Pte. Ltd. has acquired control of 100% stakes of M/s Nirmal BOT Ltd. from Highway Concessions One Pvt. Ltd.

### E.02 BROAD SCOPE OF TECHNICAL DUE DILIGENCE:

*M/s Resotech Consultancy Services Pvt. Ltd.* has been engaged as Technical/Engineering Due Diligence Advisor for *Highways Infrastructure Trust* for the purpose to carry out a Technical Due Diligence for the Project. The Broad Scope of Technical Due Diligence is as under:

- i) Review of all Project Documents
- ii) Assessment of road assets in conformance with specifications, standards and codes stipulated in CA and O&M manual etc
- iii) Evaluation of overall condition of the pavement, structures and other road assets by visual observations and analysis of the available investigation reports
- iv) Assessment of Maintenance needs of the project road and development of a detailed O&M and Major Maintenance Cost Projection for the Concession period.

### E.03 SALIENT DETAILS OF THE PROJECT ROAD

**Table E.1: Salient Details of the Project Road**

S. No	Parameter	Description
1	Roadway	Four laned divided Carriageway with 1.5m paved shoulders
2	ROW	60m all along the length
3	Pavement Type	Flexible
4	Bypasses	Balkonda Bypass (6.8km)
5	Service Road/Slip Road (5.5m)	Total length of 14.477 km (both side)
6	Toll Plaza	Located at Ch. 285.938 near Gamjal(6+6 Lanes)
7	Major Junctions	3 nos.

S. No	Parameter	Description
8	Minor Junctions	8 nos.
9	Bus Bays	30 nos.
10	Truck Laybys	4 nos.
11	Grade Separator	Vehicular Under Passes - 04 nos. & Pedestrian Under Passes - 12 nos.
12	Major Bridges	2 nos. (New Ch. 285+217 & Ch. 298+845)
13	Minor Bridges	6 nos.
14	Culverts	83nos. (55 HPC, 20 Box Culvert & 8 Slab Culvert)

#### E.04 MAJOR FINDINGS AND CONCLUSIONS

- i) The Project Road has been constructed in accordance with the requirements of the Concession Agreement with NHAI and it conforms with the requirements of the Technical Specifications. There are no pending items of works from the Scope of work as per the Concession Agreement.
- ii) From review of the records of the Maintenance works it is seen that the Concessionaire has taking care of its O & M liabilities in accordance with the requirements of the CA.
- iii) Various assets of the Project Road are in good condition. The Major Maintenance work on the road has been completed in 2019 and the pavement condition is good. All the structures are in good condition. The road signs, markings, furniture items and other project facilities are also seen to be maintained in good condition.
- iv) On review of the asset condition, the requirements of the Concession agreement there does not appear to be any requirement of any major maintenance on the project road apart from the Routine Operations and Maintenance and Periodic Renewal of the wearing course of the carriageway required after every five years as per provisions of the Concession Agreement.
- v) O & M Cost Projection is shown in Table E.2.

**Table E.2 Operation & Maintenance Cost Projections**

Sl. No	Year	Periodic Maintenance Costs incl. GST (in Cr.)	Routine Operations and Maintenance Cost incl. GST (in Cr.)
1	2022-23		6.20
2	2023-24	14.80	5.90
3	2024-25	14.80	5.90
4	2025-26		6.20
5	2026-27		6.20
6	2027-28 (Oct 27) *		3.62
7	Expenses towards Handing over cost	1.50	
	<b>TOTAL</b>	<b>31.10</b>	<b>34.01</b>

\* Reduced cost for Routine maintenance has been considered in the year of Periodic Renewal

Note: Rates of Telangana 2021-22 SOR have been adopted based on 2022-23 base rates.

## **TECHNICAL DUE DILIGENCE REPORT**

### **TABLE OF CONTENTS**

<b>1.0</b>	<b>INTRODUCTION</b>	<b>01</b>
1.1	BACKGROUND	01
1.2	PROJECT ROAD LOCATION	01
1.3	SALIENT FEATURES OF PROJECT	02
1.4	SCOPE OF WORK FOR THE STUDY	03
1.4.1	GENERAL	03
1.4.2	ASSESSMENT OF ASSET CONDITION	03
1.4.3	INVESTIGATIONS TO BE CARRIED OUT	04
1.4.4	O&M ASSESSMENT	04
<b>2.0</b>	<b>REVIEW OF DOCUMENTS</b>	<b>05</b>
2.1	REVIEW OF CONCESSION AGREEMENT	05
2.1.1	SPECIFIC COMMENTSON ARTICLES OF CONCESSION AGREEMENT	05
2.1.2	CONCLUSIONS ON OBSERVATIONS ON CONCESSION AGREEMENT	18
2.2	REVIEW OF O&M MANUAL	18
2.2.1	PROVISIONS OF O&M MANUAL	18
2.2.2	CONCULSIONS ON REVIEW OF O&M MANUAL	21
2.3	REVIEW OF O&M CONTRACTS	21
2.3.1	CONCTRACT FOR OPERATION AND MAINTENANCE	21
2.3.2	CONTRACT FOR PERIODIC MAINTANACE	21
2.3.3	CONCLUSION ON REVIEW OF O&M CONTRACTS	22
2.4	REVIEW OF OTHER DOCUMETS	22
<b>3.0</b>	<b><u>REVIEW OF DESIGNS AND AS BUILT DRAWINGS</u></b>	<b>23</b>
3.1	REVIEW OF DESIGNS AND AS-BUILT DRAWINGS	23
3.1.1	AS-BUILT DRAWINGS OF HIGHWAYS	23
3.1.2	AS-BUILT DRAWINGS OF STRUCTURES	27
3.2	REVIEW OF PAVEMENT DESIGN REQUIREMENTS	31
3.2.1	FLEXIBLEPAVEMENT REQUIREMENTS - NEW CONSTRUCTION	31
3.2.2	FLEXIBLE PAVEMENT REQUIREMENTS - STRENGHTENING OF EXISTING CARRIAGEWAY	31
3.2.3	PAVEMENT COMPOSITION FOR SLIP ROAD / SERVICE ROAD	31
3.2.4	RIGID PAVEMENT REQUIREMENTS	31
3.3	REVIEW OF PAVEMENT DESIGN OF THE CONCESSIONAIRE	32
3.3.1	REVIEW OF PAVEMENT DESIGN REPORT	32
3.3.2	REVIEW OF OVERLAY DESIGN	32
3.3.3	REVIEW OF RIGID PAVEMENT DESIGN	33
3.3.4	CONCLUSIONS OF PAVEMENT DESIGN	33

3.4	REVIEW OF DESIGN BASIS OF STRUCTURES	34
3.4.1	MAJOR AND MINOR BRIDGES	34
3.5	PROJECT FACILITIES	34
3.6	CONCLUSIONS ON REVIEW OF DESIGNS AND DRAWINGS	35
3.5	DETAILS OF COS ORDERS	35
<b>4.0</b>	<b><u>EXISTING INVENTORY &amp; CONDITION SURVEY</u></b>	<b>36</b>
4.1	PROJECT DETAILS	36
4.1.1	AS-BUILT DRAWINGS OF HIGHWAYS	37
4.1.2	AS-BUILT DRAWINGS OF STRUCTURES	37
4.2	OVERVIEW OF ROAD ASSETS AND APPURTENANCES	37
4.2.1	HIGHWAY INVENTORY	38
4.2.2	PAVEMENT CONDITION	42
4.2.3	SERVICE ROADS	44
4.2.4	MAJOR JUNCTION	46
4.2.5	MINOR JUNCTIONS	47
4.2.6	MEDIAN OPENINGS	49
4.2.7	BUS BAYS	51
4.2.8	TRUCK LAY-BYES	54
4.2.9	DRAIN	55
4.2.10	SIGN BOARDS	59
4.2.11	METAL BEAM CRASH BARRIERS	65
4.2.12	PEDESTRIAN GUARD RAIL	67
4.2.13	LIGHTING	67
4.2.14	KM STONES	68
4.3	OBSERVATIONS ON STRUCTURES	69
4.3.1	MAJOR BRIDGES	69
4.3.1.1	MAJOR BRIDGE STRUCTURE DETAILS	69
4.3.1.2	OBSERVATION ON THE CONDITION OF THE MAJOR BRIDGES	70
4.3.2	MINOR BRIDGES	71
4.3.2.1	MINOR BRIDGE STRUCTURE DETAILS	71
4.3.2.2	OBSERVATION ON THE CONDITION OF THE MINOR BRIDGES	73
4.3.3	VEHICULAR UNDERPASSES (VUP)	75
4.3.4	PEDESTRIAN UNDERPASSES (PUP)	76
4.3.5	CULVERTS	78
4.3.5.1	BOX/ SLAB CULVERT STRUCTURE DETAILS	78
4.3.5.2	OBSERVATIONS IN RESPECT OF BOX/ SLAB CULVERT	79
4.3.5.3	HUME PIPE CULVERT STRUCTURE DETAILS	81
4.3.5.4	OBSERVATIONS IN RESPECT OF HUME PIPE CULVERTS	82

<b>5.0</b>	<b>OPERATION &amp; MAINTENANCE</b>	<b>82</b>
5.1	OPERATIONS - REQUIREMENTS OF CONCESSION AGREEMENT	82
5.2	PERIODIC MAINTENANCE STRATEGY	82
5.3	ROUTINE PAVEMENT MAINTENANCE	83
5.3.1	DETAILS OF LATEST BBD TESTS	84
5.3.2	LATEST ROUGHNESS MEASUREMENT STUDIES	86
5.4	REVIEW OF DESIGN MSA CALCULATION AND RESIDUAL LIFE OF PAVEMENT	87
5.4.1	DESIGN MSA CALCULATIONS AS PER INITIAL PAVEMENT DESIGN REPORT	87
5.4.2	ALTERNATIVE DESIGN MSA CALCULATIONS CONSIDERING UNIFORM GROWTH RATE OF 5%	88
5.4.3	ALTERNATIVE DESIGN MSA CALCULATIONS BASED ON THE ASSESSED TRAFFIC GROWTH RATE ON THE BASIS OF PRESENT TOLL DATA.	89
5.5.4	COMPARISON OF MSA PROJECTION IN DIFFERENT SCENARIOS.	90
5.5	STATUS OF O&M	91
<b>6.0</b>	<b>OPERATION AND MAINTENANCE COSTS</b>	<b>92</b>
6.1	OPERATIONS & MAINTENANCE COSTS AND FUTURE STRATEGY	92
6.1.1	BROAD STRATEGY	92
6.1.2	ASSESSMENT OF COSTS AS PER PRESENT CONDITION SURVEY	92
6.2	PERIODIC MAINTENANCE COSTS	93
6.2.2	ROUTINE OPERATION & MAINTENANCE COSTS	94
6.2.2.1	ROUTINE & PREVENTIVE MAINTENANCE	94
6.2.2.2	OPERATIONAL EXPENSES	97
6.3	CONCLUSIONS ON O&M REQUIREMENTS	97

## Tables

Table 1.1	Salient Details of Project	02
Table 2.1	Comments on Concession Agreement	05
Table 2.2	Comments on Schedule-L of Concession Agreement	12
Table 2.3	Maintenance Intervention Levels	19
Table 2.4	Frequency of Inspection	20
Table 3.1	Review of As-built Drawings for Highway	23
Table 3.2	Review of As-built Drawings for Structures	27
Table 3.3	Main carriageway crust details	31
Table 3.4	Service Road crust details	31
Table 3.5	Summary of Flexible Pavement Design as per Pavement Design Report	32
Table 3.6	Summary of Flexible Pavement Design as adopted by Concessionaire	32
Table 3.7	Overlay design for existing pavement as per pavement design report	33
Table 3.8	Summary of Rigid Pavement Design	33

Table 4.1	Major Details of Project Road	36
Table 4.2	Details of Main Carriageway Inventory	40
Table 4.3	Details of Pavement Condition	43
Table 4.4	Details of Service Road/ Slip Road	45
Table 4.5	Details of Major Junctions	47
Table 4.6	Details of Major Junctions	47
Table 4.7	Details of Median Opening	50
Table 4.8	Details of Bus Bays	52
Table 4.9	Details of Truck Lay bye	55
Table 4.10	Details of Pucca Drain	56
Table 4.11	Details of Sign Boards	61
Table 4.12	Details of Metal Beam Crash Barriers	66
Table 4.13	Details of Metal Beam Crash Barriers	67
Table 4.14	Details of Lighting	68
Table 4.15	Details of Major Bridges	69
Table 4.16	Details of Minor Bridges	71
Table 4.17	Details of Vehicular Underpasses	75
Table 4.18	Details of Pedestrian Underpasses	76
Table 4.19	Details of Culverts on the Project Road	78
Table 4.20	Observations highlighting repair and maintenance needs for Box/Slab Culverts	79
Table 4.21	Observations highlighting repair and maintenance needs for Hume Pipe Culverts	81
Table 5.1	Pavement Maintenance criteria	84
Table 5.2	Summary of Latest BBD Test	85
Table 5.3	Latest Roughness Measurement Values using Fifth Wheel Bump Integrator	86
Table 5.4	Growth rate of vehicles as per Pavement Design Report	87
Table 5.5	CVPD & VDF as per Pavement Design Report	87
Table 5.6	MSA calculation as per Pavement Design Report	88
Table 5.7	MSA Calculation for Fixed 5% growth rate	88
Table 5.8	Toll Data from MPR Jan 21	89
Table 5.9	Assessed Traffic growth rate	89
Table 5.10	MSA calculations based on Present Toll data	90
Table 5.11	Summary of MSA scenarios	90
Table 6.1	Base O&M and Periodic Maintenance Costs at FY 2021 level which is used for future year with escalation	92
Table 6.2	Operation& Maintenance Cost Projections	92
Table 6.3A	Cost of Periodic Renewal	93
Table 6.3B	Cost of Periodic Renewal	93
Table 6.4A	Cost of Routine & Preventive Maintenance	94
Table 6.4B	Yearly Routine maintenance and Cleaning Costs	96
Table 6.5	Costs for Operational Expenses	97

## Figures

Fig 1.1	Project Road Map	01
Fig 4.1	Section between Ch. 282-287 (LHS)	38
Fig 4.2	Section between Ch. 287-292 (LHS)	38
Fig 4.3	Section between Ch. 292-297(LHS)	38
Fig 4.4	Section between Ch. 297-302 (LHS)	38
Fig 4.5	Section between Ch. 302-307 (LHS)	38
Fig 4.6	Section between Ch. 307-313.6 (LHS)	38
Fig 4.7	Section between Ch. 282-287(RHS)	39
Fig 4.8	Section between Ch. 287-292 (RHS)	39
Fig 4.9	Section between Ch. 292-297 (RHS)	39
Fig 4.10	Section between Ch. 297-302(RHS)	39
Fig 4.11	Section between Ch. 302-307(RHS)	39
Fig 4.12	Section between Ch. 307-313.6 (RHS)	39
Fig 4.13	Pavement Condition at Ch. 284+800 (LHS)	42
Fig 4.14	Pavement Condition at Ch. 301+900 (LHS)	42
Fig 4.15	Pavement Condition at Ch. 311+100 (LHS)	42
Fig 4.16	Pavement Condition at Ch. 285+200 (RHS)	42
Fig 4.17	Pavement Condition at Ch. 301+300 (RHS)	42
Fig 4.18	Pavement Condition at Ch. 313+000 (RHS)	42
Fig 4.19	Service Road at Ch. 296+200 LHS	44
Fig 4.20	Service Road at Ch. 301+600 LHS	44
Fig 4.21	Service Road at Ch. 307+500 LHS	44
Fig 4.22	Service Road at Ch. 286+900 RHS	45
Fig 4.23	Service Road at Ch. 300+200 RHS	45
Fig 4.24	Service Road at Ch. 306+600 RHS	45
Fig 4.25	Major Junction at Ch. 292+750 RHS	46
Fig 4.26	Major Junction at Ch. 299+200 RHS	46
Fig 4.27	Major Junction at Ch. 306+000 RHS	46
Fig 4.28	Minor junction at Ch. 285+000 LHS	47
Fig 4.29	Minor junction at Ch. 288+900 LHS	47
Fig 4.30	Minor junction at Ch. 290+600 LHS	47
Fig 4.31	Minor junction at Ch. 288+222 RHS	48
Fig 4.32	Minor junction at Ch. 295+800 RHS	48
Fig 4.33	Minor junction at Ch. 306+800 RHS	48
Fig 4.34	Median Opening at Ch. 300+700	49
Fig 4.35	Median Opening at Ch. 304+800	49
Fig 4.36	Median Opening at Ch. 312+700	49
Fig 4.37	Median Opening at Ch. 303+400	50
Fig 4.38	Median Opening at Ch. 288+250	50
Fig 4.39	Median Opening at Ch. 311+500	50
Fig 4.40	Bus Shelter at Ch. 285+000 LHS	51
Fig 4.41	Bus Shelter at Ch. 292+000 LHS (On S.R)	51

Fig 4.42	Bus Shelter at Ch. 309+500 LHS	51
Fig 4.43	Bus Shelter at Ch. 288+222 RHS	52
Fig 4.44	Bus Shelter at Ch. 297+800 RHS	52
Fig 4.45	Bus Shelter at Ch. 306+800 RHS	52
Fig 4.46	Truck Lay Bye at Ch. 293+600 LHS	55
Fig 4.47	Truck Lay Bye at Ch. 311+800 RHS	55
Fig 4.48	Truck Lay Bye at Ch. 298+400 RHS	55
Fig 4.49	Drain at Ch. 282+900 LHS	56
Fig 4.50	Drain at Ch. 293+900 LHS	56
Fig 4.51	Drain at Ch. 293+000 to 282+101 RHS	56
Fig 4.52	Drain at Ch. 286+400 RHS	56
Fig 4.53	Drain at Ch. 297+200 RHS	56
Fig 4.54	Drain at Ch. 299+200 RHS	56
Fig 4.55	Sign Boards at Ch. 285 LHS	59
Fig 4.56	Sign Boards at Ch.287+100 RHS	59
Fig 4.57	Sign Boards at Ch. 288+800 LHS	59
Fig 4.58	Sign Boards at Ch.289+200 RHS	59
Fig 4.59	Sign Boards at Ch. 290+400 LHS	59
Fig 4.60	Sign Boards at Ch.305+900 RHS	59
Fig 4.61	Sign Boards at Ch.306+200 RHS	60
Fig 4.62	Sign Boards at Ch.286++200 LHS	60
Fig 4.63	Sign Boards at Ch. 284+900 RHS	60
Fig 4.64	Sign Boards at Ch. 309+700 RHS	60
Fig 4.65	Sign Boards at Ch. 285+938	60
Fig 4.66	Gaurd Stones at Ch. 309+700 (RHS)	60
Fig 4.67	MBCB at Ch.296+400 LHS	65
Fig 4.68	MBCB at Ch.299+300 RHS	65
Fig 4.69	MBCB at Ch.306+500 LHS	65
Fig 4.70	MBCB at Ch.306-202 PUP RHS	65
Fig 4.71	MBCB at Ch.300+600 LHS	65
Fig 4.72	MBCB at Ch.300+600 RHS	65
Fig 4.73	Lighting on median at Ch. 288.250	67
Fig 4.74	Lighting at Truck lay bye at Ch. 293 LHS	67
Fig 4.75	Lighitng at junction at Ch. 306.000	70
Fig 4.76	Major Bridge at Ch. 289+834	70
Fig4.77	Major Bridge at Ch. 289+834	70
Fig 4.78	Major Bridge at Ch. 289+834	71
Fig 4.79	Major Bridge at Ch. 303+462	71
Fig 4.80	Major Bridge at Ch. 303+462	71
Fig 4.81	Major Bridge at Ch. 303+462	71
Fig 4.82	Minor Bridge at Ch.284+360	74
Fig 4.83	Minor Bridge at Ch.284+360	74

Fig 4.84	Minor Bridge at Ch.284+360	74
Fig 4.85	Minor Bridge at Ch. 298+580	74
Fig 4.86	Minor Bridge at Ch.305+528	74
Fig 4.87	Minor Bridge at Ch.305+528	74
Fig 4.88	VUP at Ch. 290+050	75
Fig 4.89	VUP at Ch. 296+173	75
Fig 4.90	VUP at Ch. 296+173	75
Fig 4.91	VUP at Ch. 300+301	76
Fig 4.92	VUP at Ch. 300+301	76
Fig 4.93	VUP at Ch. 304+977	76
Fig 4.94	PUP at Ch.283+402	77
Fig 4.95	PUP at Ch. 299+892	77
Fig 4.96	PUP at Ch. 286+622	77
Fig 4.97	PUP at Ch. 311+120	77
Fig 4.98	PUP at Ch. 306+202	77
Fig 4.99	PUP at Ch. 300+914	77
Fig 4.100	Box Culvert at Ch. 286+917	78
Fig 4.101	Slab Culvert at Ch. 291+545	78
Fig 4.102	Box Culvert at Ch. 297+728	78
Fig 4.103	Box Culvert at Ch. 299+577	79
Fig 4.104	Slab Culvert at 299+309	79
Fig 4.105	Box Culvert at Ch. 308+214	79
Fig 4.106	HPC at Ch. 283+632(LHS)	80
Fig 4.107	HPC at Ch. 282+904	80
Fig 4.108	HPC at Ch. 283+925	80
Fig 4.109	HPC at Ch. 286+030	80
Fig 4.110	HPC at Ch. 287+167	80
Fig 4.111	HPC at Ch. 288+448	80

### LIST OF ABBREVIATIONS USED

Abbreviations	Meaning
ATMS	Automatic Toll Management System
AVCC	Automatic Vehicle Count Classifier
BBD	Benkelman Beam Deflection
BC	Bituminous Concrete
BOQ	Bill of Quantities
BOT	Build Operate and Transfer
B/T	Bituminous
B/s	Both Sides
CA	Concession Agreement

Abbreviations	Meaning
CB	Crash Barrier
CBR	California Bearing Ratio
CC	Cement Concrete
c/c	Centre to Centre
CD	Cross Drainage
Ch	Chainage
COD	Commercial Operation Date
COM	Communication Port
COS	Change of Scope
C/s	Cross-section
Cr.	Crores
cum	Cubic Meter
DBM	Dense Bituminous Macadam
DC	Design Chainage
Dept.	Department
Dia	diameter
DL	Dead Load
DLC	Dry Lean Concrete
DLP	Defect Liability Period
D/s	Downstream
Dwg	Drawing
ECW	Existing Carriageway
Emb	Embankment
EPC	Engineering Procurement Construction
Etc.	Etcetra
ETC	Electronic Toll Collection
Fe415, Fe500	Grade of Steel
Fig.	Figure
FME	Force Majeure Event
FWD	Falling Weight Deflectometer
gms	Grams
GSB	Granular Sub Base
HD	High Definition
HDD	Hard Disk Drive
Hm	Hectometer
HPC	Hume Pipe Culvert
HYSD	High Yield Stress Deformed
IC / IE	Independent Consultant / Engineer

Abbreviations	Meaning
IRC	Indian Road Congress
Jn.	Junction
Kg	Kilogram
Km	Kilometer
Km/h	Kilometer per hour
L	Length
LCV	Light Commercial Vehicle
LHS	Left Hand Side
LL	Live Load
LMV	Light Motor Vehicle
LOA	Letter of Award
Ltd	Limited
m	Meter
M15, M30, M35	Grades of Concrete
MAV	Multi Axle Vehicle
Max	Maximum
MBCB	Metal Beam Crash Barrier
MCW	Main Carriageway
Min	Minimum
MoRTH	Ministry of Road Transport & Highways
MP	Mega Pixel
NHAI	National Highway Authority of India
M/s	Messer's
MSA, msa	Million Standard Axles
mm	Millimeter
MjB	Major Bridge
MnB	Minor Bridge
MoEF	Ministry of Environment and Forests
NA	Not Applicable
NBC	National Building Code
NH	National Highway
NOC	No Objection Certificate
Nos, No.	Numbers
O&M	Operation & Maintenance
PCC	Plain Cement Concrete
PCOD	Provisional Commercial Operation Date
PQC	Pavement Quality Concrete
PR	Project Road

Abbreviations	Meaning
PUP, u/p	Pedestrian Underpass
PWD	Public Works Department
Pvt. Ltd.	Private Limited
Res.	Residence
RCC	Reinforced Cement Concrete
R/f	Reinforcement
RFID	Radio Frequency Identification
RHS	Right Hand Side
ROW	Right of Way
SBC	Safe Bearing Capacity
SC	Slab Culvert
Sch.	Schedule
SG	Sub-grade
SH	State Highway
SIDL	Super Imposed Dead Load
SMPS	Switch Mode Power Supply
SP	Special Publication
SPV	Special Purpose Vehicle
Sqm.	Square Meter
SR	Service Road
Str.	Structure
TCS	Typical Cross Section
TFT	Thin Film Transistor Monitor
T/m <sup>2</sup>	Tonne per square meter
TMS	Toll Management System
UPS	Uninterrupted Power Supply
U/s	Upstream
VDF	Vehicle Damage Factor
VUP	Vehicular Underpass
W	Width
WIM	Weigh in Motion
WMM	Wet Mix Macadam
WPI	Wholesale Price Index
&	and
X	Cross Junction
T	T-Junction
Y	Y-Junction

## CHAPTER 1.0: INTRODUCTION

### 1.1 BACKGROUND

National *Highways Authority of India (NHAI)* has up-graded the Nagpur-Hyderabad Section from New Ch.282.617 (Kadtal) to Ch. 313.507 (Armur) (Old Ch. 278.000 to Ch. 308.000) of NH-7 in the State of Telangana from Two lane with paved shoulders to Four lane with paved shoulders under the North-South Corridor (NHDP Phase II). This Project was awarded to M/s. Nirmal BOT Limited for a Concession Period of 20 years. The Concessionaire had appointed M/s Hindustan Construction Company Ltd. as their EPC contractor for execution of work under EPC mode. The Concession Agreement was signed on 04<sup>th</sup> May 2007 and the Project commencement date was fixed as 30<sup>th</sup> October 2007 and commercial operation started on 22<sup>nd</sup> July 2009.

### 1.2 PROJECT ROAD LOCATION

The National Highway 07 is a section of the North - South Corridor (length 3745 km) which starts from Varanasi and connects major cities like Jabalpur, Nagpur, Hyderabad, Kurnool, Bangalore, Salem and Madurai. The Project Road is a Section of which starts from Kadtal in Adilabad District (New Ch. 282+617) and ends at Armur in Nizamabad District (New Ch. 313+507). The Project Road crosses the Godavari river at the major bridge Ch. 289+834 (36x20.9m) and has a length of **30.890km**. The location map of the project road is shown in fig. 1.1 below:

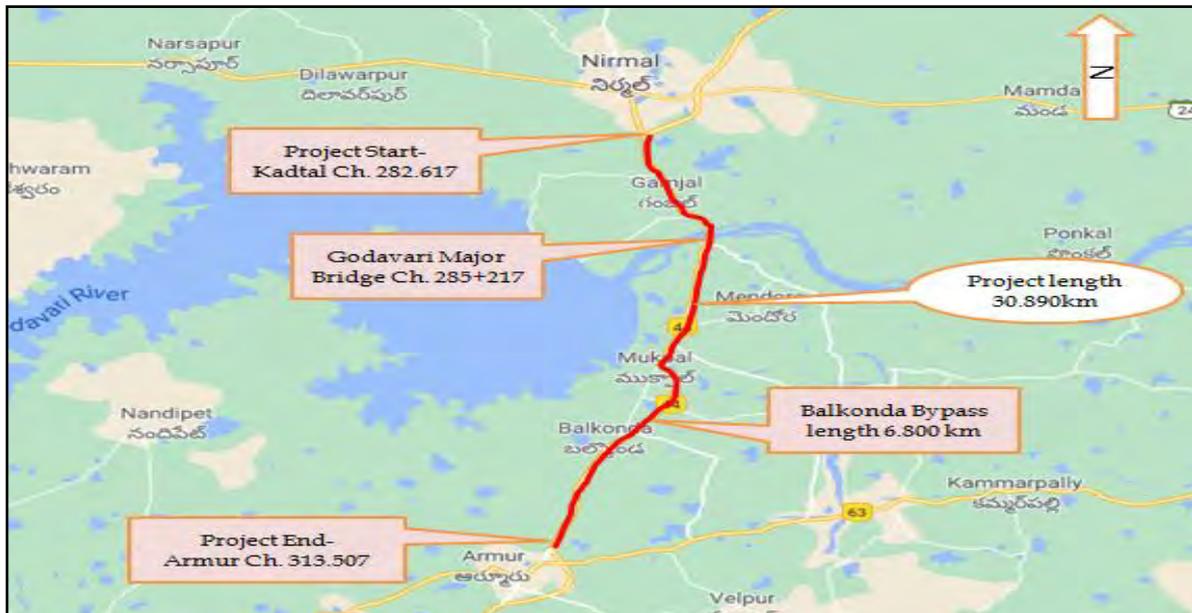


Fig 1.1: Project Road Map

### 1.3 SALIENT FEATURES OF PROJECT

The Salient Features of the Project are brought out in **Table 1.1** below.

**Table 1.1: Salient Details of Project**

S. No	Parameter	Description
<b>A.</b>	<b>Basic Details</b>	
1	Project Name	Design, Construction, Development, Finance, Operation and Maintenance of 4-lane dual carriageway from New Ch. 282.617 (Kadtal) to Ch. 313.507 (Armur) of NH-7 section in the State of Telangana on BOT Annuity basis.
2	State	Telangana
3	NH	NH-7
4	Section	*New Ch. 282.617 (Old Ch. 278.000) (Kadthal) to Ch. 313.507 (Old Ch. 308.000) of NH-44(Armur)
5	Length of the Project	30.890 km
<b>B.</b>	<b>Contract Details</b>	
1	Concessionaire	M/s Nirmal BOT Ltd.
2	Independent Consultant (during Development)	Aarvee Associates Architects Engineers & Consultants Pvt. Ltd.
3	Independent Consultant (Current)	Aarvee Associates Architects Engineers & Consultants Pvt. Ltd. in association with Shree Bhawani Consultancy Services Pvt. Ltd.
4	Date of Award (LOA)	04 <sup>th</sup> May, 2007
5	Appointed Date/ Commencement Date	30 <sup>th</sup> October, 2007
6	Provisional Completion Date / (COD)	22 <sup>th</sup> July, 2009
7	Final Completion Certificate issued	03 <sup>rd</sup> October, 2018
8	Concession Period	20 years (from Commencement Date)
9	Concession Completion Date	29 <sup>th</sup> Oct., 2027
<b>C.</b>	<b>Project Details</b>	
1	Roadway	4 laned divided Carriageway with 1.5m paved shoulders
2	ROW	60m all along the length
3	Pavement Type	Flexible
4	Bypasses	Balkonda Bypass (6.8km)
5	Service Road/Slip Road (5.5m)	Total length of 14.477 km (both side)
6	Toll Plaza	Located at New Ch. 285.938 near Gamjal (5+5 Lanes)
7	Major Junctions	3 nos.
8	Minor Junctions	8 nos.
9	Bus Bays	26 nos.

S. No	Parameter	Description
10	Truck Laybyes	4 nos.
11	Grade Separator	VUP - 04 nos. & PUP - 12 nos.
12	Major Bridge	2 nos. (New Ch. 285+217 & Ch. 298+845)
13	Minor Bridge	6 nos.
14	Culverts	83nos. (55 HPC, 20 Box Culvert & 8 Slab Culvert)

\* Note: For the purpose of report we have used new chainages of the project road. Please note, new chainage Km. 282.617 corresponds to old Km. 278.000. Accordingly other chainages are to be referred in the report.

## 1.4 SCOPE OF WORK FOR THE STUDY

### 1.4.1 GENERAL

- a. Review of all documents related to Project including but not limited to provisional completion certificates, punch list items completion certificate, clearances, monthly IE reports, important correspondence if any.
- b. Review of Change of Scope/ other Claims submitted and to be submitted to Authority / IC, comment on the veracity of the same and approval status.
- c. Highlight any non-compliance of the terms of the CA or O&M manual and IC inspection reports etc.
- d. Review of any pending issues related to Utility shifting, maintenance etc. in accordance with the Concession Agreement.
- e. Comment on issues including any balance work that may have a potential impact on the maintenance costs going forward and which may warrant a one-time expense in future.
- f. Review of As-Built drawings.
- g. Determine the appropriate level and frequency of routine and major maintenance activities required to keep the road assets in good condition and to meet the performance and O&M standards, specifications and requirements.
- h. Review the major maintenance work undertaken, and prepare projections for future major maintenance expenses (incl. any hand-back requirements), so as to ensure compliance with the terms of CA.
- i. Review of condition of SPV assets including all equipment and vehicles etc.
- j. Report on balance acquisition of land if any and possibility of acquisition.
- k. Report on current encroachments on the project stretch and future expected problems due to the same.

### 1.4.2 ASSESSMENT OF ASSET CONDITION

- a. Assessment of road assets in conformance with specifications, standards and codes stipulated in CA and O&M manual etc.
- b. A detailed inventory survey of road assets including main carriageway, structures, service roads, lightings, drains, slope protection works, retaining walls, bus bays, bus shelters, truck lay byes, O&M center, road furniture including signages, MCB, guard rails etc. other

safety measures, toll collection infrastructure, buildings, plantation, vehicles and other objects.

- c. Assessment of condition of the structures including but not limited to visual inspections of bearings, expansion joints, superstructure, substructures, foundations, associated components, pre-stress anchorages (if any), review of geotechnical assumptions, perform geotechnical due diligence, review as-built design and assess design assumptions and provide a detailed report thereon.
- d. Assessment of condition of the road pavement including but not limited to visual inspections of the pavement, review as-built design and assess design assumptions and provide a detailed report thereon.
- e. Assessment of physical dimensions/ condition of the infrastructure to determine useful lives of the materials and equipment requiring rehabilitation and/or replacement.
- f. Recommendations for any major repair/ rehabilitation and strengthening based on the condition survey and design reports.
- g. To provide a detail photographic report of the infrastructure assets and its condition to withstand till end of concession period. Suggestion and cost evaluation for any additional repair / rectification / modification required.

#### **1.4.3 INVESTIGATIONS TO BE CARRIED OUT**

- a. Assessing maintenance needs and its valuation according to the level of deterioration.
- b. Evaluation of overall condition of flexible pavement including PQC/ BT at toll plaza, BC, DBM, Base/Sub base and sub grade and drainage condition survey.
- c. Carry out visual condition survey for rigid (toll plaza) and flexible pavement
- d. Carry out drainage survey to asses any potential future problems which will cause by moisture and runoff.
- e. Assessment of variation/ COS orders on the project, if any, and evaluate their impact on expenditure, time to completion, future O&M obligations and tolling revenue.

#### **1.4.4 O&M ASSESSMENT AND SUBMISSION OF REPORTS**

- a. To Develop a detailed O&M cost forecast for each year of the concession period and a detailed major maintenance cost forecast along with estimation of costs towards handover requirements.
- b. Provide comprehensive report for InvIT by covering all scope of work mentioned herein above.

## CHAPTER 2.0: REVIEW OF DOCUMENTS

### 2.1 REVIEW OF CONCESSION AGREEMENT

The *National Highway Authority of India (NHAI)* in accordance with the statutory powers vested on it by the Ministry of Road Transport and Highways (MoRTH), Government of India has entered into a Concession Agreement on 04<sup>th</sup> May 2007 with *M/s Nirmal BOT Limited*, a Special Purpose Vehicle (SPV) formed for implementing this project, a company incorporated under Indian Companies Act, 1956 for Construction, Development, Finance, Operation and Maintenance of Km 278.000 (Kadtal) to km 308.000 (armur) on NH-7 in the state of Telangana under North-South Corridor (NHDP Phase II) on BOT (Annuity ) Basis.

Our observations on the major relevant provisions of the Concession Agreement are given below.

#### 2.1.1 SPECIFIC COMMENTS ON ARTICLES OF CONCESSION AGREEMENT

Since the Project has been completed and is presently under the Operation Period, we have reviewed the provisions pertaining to Operation and Maintenance under the various clauses of the Concession Agreement and our specific comments are indicated below clause-wise.

**Table 2.1: Comments on Concession Agreement**

SI No.	Article, Clause No. & Page No.	Subject	Information in Brief	Remarks
1.	Chapter I, Article II, Cl. 2.1, p 16.	Scope of Project	The scope of the Project shall include performance and execution by the Concessionaire of all design, engineering, financing, procurement, construction, completion, operation and maintenance of the Project Highway as described in Schedule B and Schedule C of this Agreement. It shall also include the performance and fulfilment of other obligations by the Concessionaire under this Agreement	Since all the phases of work has been completed and COD has been issued, the work is presently in Operation and maintenance stage.
2.	Chapter II, Article III, p 18	Grant of concession	NHAI hereby grants to the Concessionaire and the Concessionaire hereby accepts the Concession for a period of 20 (twenty) years commencing from the Commencement Date. The Concession Period shall	As per definition the Commencement date means the date 180 days from the date of signing of the Concession Agreement (Commencement date is

SI No.	Article, Clause No. & Page No.	Subject	Information in Brief	Remarks
			commence on the Commencement Date and shall end on the Termination Date.	30.10.2007). As per definition the Termination date means the date on which this Agreement and the Concession hereunder expires pursuant to the provisions of this Agreement or is terminated by a Termination Notice.
3.	Chapter II, Article VI, p 21	Annuity	Subject to the provisions of this Agreement and in consideration of the Concessionaire accepting the Concession and undertaking to perform and discharge its obligations in accordance with the terms, conditions and covenants set forth in this Agreement, NHAI agrees and undertakes to pay to the Concessionaire, on each Annuity Payment Date, the sum of Rupees Twenty-three crores and eighty lakhs only. (Annuity).	This article and clauses from 6.1 to 6.4 describe the amount, payment mechanism and other relevant details of annuity. The Clause 6.2 also provides for Bonus/Reduction in Annuity for early/delayed completion of the project.
4.	Chapter II, Article VII, p 25	Levy and collection of fees	The Concessionaire shall not levy, demand or collect from or in respect of any vehicle or Person, for the use of Project Facilities. The Concessionaire agrees that unless otherwise provided in this Agreement, the Project revenue shall consist of Annuity only.	This article and subsequent clauses specify that for the Concessionaire the project revenue shall consist of Annuity only and NHAI shall have the authority to levy toll on the vehicles using the Project Facilities.
5.	Chapter II, Article VIII, p 26	Capacity Augmentation	The NHAI may, following a detailed traffic study conducted by it, at any time after the COD decide to augment / increase the capacity of the Project (Capacity Augmentation) with a view to provide the desired	As per the information available, there is no such proposal for capacity augmentation from NHAI till date.

SI No.	Article, Clause No. & Page No.	Subject	Information in Brief	Remarks
			level of service to the users of Project Facility. The Concessionaire shall have option to submit its proposal for Capacity Augmentation. In case the Concessionaire after participating in the bidding process, fails to give the lowest offer, the Concessionaire shall be given the first right of refusal to match the preferred offer. If the Concessionaire matches the preferred offer, the parties shall enter into a suitable agreement supplement to this agreement to give effect to the changes in scope of the Project, Concession Period and all other necessary and consequential changes. In case the Concessionaire chooses not to submit its proposal or is not the preferred bidder and fails or declines to match the preferred offer, NHAI shall be entitled to terminate this agreement upon payment to the Concessionaire of the Termination Payment which shall be an amount equivalent to the Discounted Value of the Future Net Cashflows.	
6.	Chapter III Article IX	Obligations of the Concessionaire	Clauses 9.1 to 9.7 spell out various obligations of the Concessionaire during the Concession Period	The obligations of the Concessionaire are covered comprehensively
7.	Chapter III Article X	Obligations of NHAI	Clause 10.1 spells out various obligations of the NHAI during the Concession Period	The obligations of the NHAI are covered comprehensively.
8.	Chapter III, Article XI, Cl. 11.1 (xiii), p 36	Representation s and Warrants	The equity share holding of the single entity and their Associates as the case may be in the issued and paid-up equity share capital of the Concessionaire shall not be less	This clause restricts the dilution of shareholding.

SI No.	Article, Clause No. & Page No.	Subject	Information in Brief	Remarks
			than 26% during the balance remaining Operations Period.	
9.	Chapter IV, Article XVII, Cl. 17.5, p 47	Value Addition-Improvement to Project Assets and Project Highway	NHAI may request improvement to the Project Assets and Project Highway, subject to a limit of 20% of the Project Cost, during the Operation Period.	Work may be executed under COS through the existing Concessionaire subject to the limit of 20% of the Contract Value. The cost shall be borne by NHAI.
10.	Chapter IV, Article XVIII, Cl. 18.1, p 48	Operation and Maintenance	The Concessionaire shall operate and maintain the Project Highway by itself or through O&M contractor	This clause specifies the Concessionaire's obligations during Operations Period. The Concessionaire is bound by the Agreement to maintain the Project Highway as per specifications and standards and adhere to safety standards as mentioned in Schedule S.
11.	Chapter IV, Article XVIII, Cl. 18.2, p 48	Maintenance manual	The Concessionaire shall in consultation with the IC prepare not later than 180 days before the Scheduled Project Completion Date, the Repair and Maintenance Manual for the regular and periodic maintenance and shall ensure and procure that, at all times during the Operations Period, the Project Highway is maintained in a manner that it complies with the Specifications and Standards and minimum maintenance requirements.	An O & M Manual has been prepared by the Concessionaire and is on record.
12.	Chapter IV, Article XVIII, Cl. 18.3, p 48	Maintenance Programme	Not later than 45 days before the beginning of each Accounting Year, the Concessionaire shall in consultation with IC prepare and provide to NHAI, its proposed programme of preventive and other scheduled	The items to be included in Maintenance Programme including intervals for carrying out inspection and Preventive Maintenance Schedule are specified.

SI No.	Article, Clause No. & Page No.	Subject	Information in Brief	Remarks
			maintenance.	
13.	Chapter IV, Article XVIII, Cl. 18.4, p 49	Operation and Maintenance	Maintenance shall include replacement of equipment/ consumables, horticultural maintenance and upkeep of all Project Assets in good order and working condition.	Concessionaire is bound by agreement to maintain these.
14.	Chapter IV, Article XIX, Cl. 19.1, p 52	Maintenance Report	The Concessionaire shall undertake periodic (at least once every calendar month but once every week during monsoons) inspection of the Project Highway to determine the condition of the Project Highway including its compliance with the Maintenance Manual, the Maintenance Programme, Specifications and Standards and the maintenance required and shall submit reports of such inspection ("Maintenance Reports") to NHAI and the Independent Consultant.	Concessionaire is bound by agreement to submit these reports in time and the same is being submitted as part of the Monthly Progress Reports.
15.	Chapter IV, Article XIX, Cl. 19.2, p 52	O&M Inspection Report	The IE shall review the Maintenance Reports and inspect the Project Highway once a month during the Operations Period and make out an Inspection Report of such inspection. The Concessionaire upon receipt of this Report shall remedy the defects and deficiencies, if found any.	The Inspection report by the Independent Consultant is submitted as part of the Monthly Progress Report submitted by the IC.
16.	Chapter IV, Article XX, Cl. 20.1 and 20.4, p 53	Independent Consultant	NHAI shall appoint a consulting engineer firm to be the Independent Consultant who will report to NHAI. One half of the remuneration, cost and expenses of the IC shall be reimbursed by the Concessionaire to NHAI. The NHAI may at any time at its own cost appoint a Technical	The Independent Consultant is expected to protect the interests of both the Authority and the Concessionaire within the framework of the Concession Agreement.

SI No.	Article, Clause No. & Page No.	Subject	Information in Brief	Remarks
			Auditor in the nature of a Proof Consultant to review the work carried out by the IC.	
15.	Chapter V, Article XXV, Cl. 25.3.2, p 58	Escrow Account	From the date which is 2 years prior to the expiry of the Concession Period a sum equal to 15% of the Annuity or higher for renewal works will be retained in Escrow account. Within 14 days after the issue of Vesting Certificate the sum thus retained shall be released to the Concessionaire.	The Clause provides security to the Authority to make the Concessionaire bound to carry out any renewal work which may be required before the expiry of the Concession Agreement.
16.	Chapter V, Article XXVII, Cl. 27.2, p 59	Insurance during the Operations Period	During Operations Period, the Concessionaire shall obtain and maintain such insurance as may be required under any of the Financing Documents, Applicable Law etc.	Insurance Cover to be maintained during Operations Period have been specified.
17.	Chapter VII, Article XXXIII, Cl. 33.3, p 74	Divestment of rights and interests	Not earlier than 3 (three) months before the expiry of the Concession Period but not later than 30 (thirty) days before such expiry, the IC shall verify, in the presence of a representative of the Concessionaire, compliance by the Concessionaire with the Divestment Requirements set forth in Clause 33.2 in relation to the Project Highway and, if required, cause appropriate tests to be carried out at the Concessionaire's cost for determining the compliance therewith. If any shortcomings in the Divestment Requirements are found by either Party, it shall notify the other of the same and the Concessionaire shall rectify the same at its cost.	The Vesting Certificate is to be issued after compliance of Divestment Requirements.
18.	Chapter VIII, Article XXXIV, p 76	Defects Liability	The Concessionaire and IE shall jointly inspect (Initial Inspection) the Project Highway and Project Facilities 30-36	The Concessionaire needs to ensure by having an adequate system of preventive maintenance

SI No.	Article, Clause No. & Page No.	Subject	Information in Brief	Remarks
			months prior to expiry of Concession Period. Upon agreement on proposals for renewal works if any, the Concessionaire shall carry out the renewal works at his own cost. The Second Inspection shall be carried out 9-12 months prior to expiry of Concession Period. From the date which is 2 years prior to the expiry of the Concession Period a sum equal to 15% of the Annuity or a higher sum estimated by the Independent Consultant for Renewal Works will be retained in the Escrow Account. If following the Second Inspection, it is agreed or determined that no renewal works are required, then within 14 days of such agreement, 50% of the sums retained in accordance with Clause 34.11 shall be released from the Escrow Account to the Concessionaire. Within 14 days of issuance of Vesting Certificate full amount will be released.	that requirements of any such renewal or a rectification is kept at the minimum.
19.	Schedule C Clause 1	Project Facilities - General	The following sections of this Schedule provide the minimum functional and spatial requirements of the facilities to be provided on the Project Highway. The Concessionaire shall review the adequacy of the proposed facilities at regular interval of 5 years and accordingly provide additional facilities with necessary approval from the IC in order to meet the demand of the road	The provision is open ended and does not specify the requirement of COS order for providing additional required facilities. It is not clear as to who will bear the cost of such additional facilities. As informed by the Concessionaire no such reviews have been conducted till date.

SI No.	Article, Clause No. & Page No.	Subject	Information in Brief	Remarks
			users till the end of the concession period.	
20.	Schedule D Cl. 3.5.6.1, p 135	Highway Patrolling	Highway Patrolling establishment should have three shifts of 8 hours each. It would consist of 1(one) Sub Inspector, 1 (one) head constable, 3 (three) constables and 1 (one) driver. The Concessionaire shall reach an agreement for hiring the aforesaid personnel with the concerned department of the State Government of Andhra Pradesh.	The clause mandates hiring of the Patrolling staff with the concerned department of the State Govt of AP. However it is noted that the patrolling staff are being arranged by the concessionaire only.
21.	Schedule X	Reporting and Record requirements	Reporting and Record requirements during Operations phase has been specified	The Concessionaire has to fulfil these requirements as per agreement.

The Schedule-L of the Concession Agreement which pertains to the Operation and Maintenance requirements has specifically been reviewed and our observations on some of the important clauses in the same have been brought out in **Table 2.2** below.

**Table 2.2: Comments on Schedule-L of Concession Agreement**

SI No.	Clause No. & Page No.	Subject	Information in Brief	Remarks
1.	Cl. 1, p 190.	Introduction	The period during which the Concessionaire shall comply with the O&M requirements covers the entire Concession Period including the Construction Period.	This clause specifies that the operation and maintenance is to be carried out during entire Concession Period

Sl No.	Clause No. & Page No.	Subject	Information in Brief	Remarks
2.	Cl. 2.1.11, p 192.	Operation and Maintenance (O&M) Requirements	In general, the limit of the Concessionaire's responsibility is to maintain all areas within the Right-of-Way (RoW) of the Project Highways inclusive of all facilities such as interchanges, street lighting facilities, traffic light facilities, emergency telephone networks and other facilities constructed by the Concessionaire within the Project Highways.	This clause specifies scope for operation and maintenance. It also limits the Concessionaire's responsibility regarding another road joining or crossing the concession limit.
3.	Cl. 2.2 to 2.4, 2.6 and 2.7, p 193	Traffic management and lane closure	Traffic Management plan and programme for a planned scheduled construction and/or maintenance activity shall be prepared in advance of that activity and got approved by the Independent Consultant/NHAI as the case may be.	These clauses along with their sub clauses specify guidelines regarding traffic management during scheduled and unscheduled maintenance activities.
4.	Cl. 3.1 to 3.8 p 199	Operations and Maintenance Manual (Maintenance Manual)	The Concessionaire shall in consultation with the Independent Consultant evolve an Operations and Maintenance Manual (Maintenance Manual)	These clauses specify that Maintenance Manual is to be evolved in consultation with IC. The details to be included in Operations part of manual, types and frequency of Inspection and strategy for preventive maintenance are specified.
5.	Cl. 4.1.3, p204	Guidelines for Maintenance Manual	The following MORT&H and IRC publications shall be referred for preparation the "Operation and Maintenance Manual" <ul style="list-style-type: none"> <li>• MORT&amp;H Manual for Maintenance of Roads.</li> <li>• IRC-SP-35-1990, Guidelines for Inspection and Maintenance of Bridges.</li> <li>• The manufacturer's</li> </ul>	Codes and Standards for preparation of Maintenance Manual have been specified. The manufacturer's Maintenance manuals of the equipment to be used in Project Highway Operations are to be included in Maintenance manual.

Sl No.	Clause No. & Page No.	Subject	Information in Brief	Remarks
			Maintenance manual(s) of the equipment to be used in the Project Highway Operations shall form part of the said O&M Manual.	
6.	Cl. 4.2.1.1, p 205	Routine Maintenance	Routine Maintenance broadly includes, Maintenance of pavement, turfed areas, landscaping, drainage system, CD structures, buildings, Right-of-Way fences, Highway Accessories, guardrails, other miscellaneous responsibilities such as standby/on-call, emergency plant & equipment, stray animal catching operations etc, traffic and safety control devices during the routine maintenance works or any accident	The Concessionaire is required to develop maintenance sheets for each component of the works. The Concessionaire has to utilise mechanised equipment, method and innovative solutions and technology to perform these obligations and include such process in the Maintenance Manuals. All maintenance activities are to be carried out in accordance with relevant IRC Codes, Guidelines and Special Publications as are applicable to National Highways, MORT&H specifications and Technical circulars with all updates.
7.	Cl 2,6.1 and 4.3 p 198 and 206	Periodic Maintenance	Regular periodic maintenance activities:  i) Renewal of the wearing surface of the road pavement laid every 5 years after initial construction or where the roughness value reaches 3000mm/km;  ii) Strengthening course to be provided on 'as required' basis.	The framework of activities relating to pavement maintenance and rehabilitation in respect of flexible and rigid pavement are given in the flow charts at Appendices of this Schedule. The Concessionaire shall set forth in the Operations and Maintenance Manual the detailed procedures to be followed under each of these activities.
8.	Cl. 4.3.1 p 206	Pavement	The riding quality of the pavement shall be ensured by	This clause specifies Surface roughness of

Sl No.	Clause No. & Page No.	Subject	Information in Brief	Remarks
		Riding Quality	<p>satisfying the minimum requirements as specified herein under</p> <p>i) Surface roughness of the Project Highway on completion of construction shall be 2000 mm/km as measured by vehicle mounted Bump Integrator.</p> <p>ii) Surface roughness shall not exceed 3000 mm/km during the service life of pavement at any time. A renewal coat of bituminous concrete shall be laid every 5 years after initial construction or where the roughness value reaches 3000 mm/km whichever is earlier to bring it to the initial value of 2000 mm/km.</p>	<p>Project Highway on completion of construction to be 2000 mm/km. As per Cl. 2.5.5 of Schedule D "Specifications and Standards", the Unevenness index of the pavement on completion shall not be more than 1800 mm/km. As per Cl. 1.4.2 (i) on p 16 of Concession Agreement, in case of ambiguities or discrepancies "between two Clauses of this Agreement, the provisions of the specific clause relevant to the issue under consideration shall prevail over those in other Clauses".</p> <p>Since the project is in O&amp;M stage so provision of this clause will apply.</p>
9.	Cl. 4.3.2 p 206	Structural Condition of the Pavement	<p>The structural condition of the flexible pavement of the Project Highway shall be assessed every year by taking Benkelman Beam Deflections and working out characteristic deflections of homogeneous sections of the Project Highway as per IRC-81-1997. Whenever the characteristic deflection exceeds 1.2 mm a bituminous overlay shall be provided appropriately designed according to IRC-81-1997 or its latest versions.</p>	<p>Recycling of existing crust using milling as an option can be explored by the Concessionaire in consultation with the IC to maintain the FRL at the same level throughout the concession period. However, while adopting such measures, the residual strength of existing pavement shall be estimated and equivalent thickness of new material added before laying the designed overlay. The design of profile with</p>

Sl No.	Clause No. & Page No.	Subject	Information in Brief	Remarks
				altered pavement treatments shall be finalised in consultation with IC. In the case of cement concrete pavement, joints shall be thoroughly inspected every year and the loss of sealing compounds made good.
10.	Cl 4.3.3 p 207	Preventive Maintenance	Preventive Maintenance shall include the activities related to each element and the system as a whole of the Project Highway to ensure that during the Concession Period and at its end, it is in sound, durable and functional condition	The Concessionaire needs to ensure by having an adequate system of preventive maintenance that requirements of any renewal or rectification is kept at the minimum at the time of issue of Vesting Certificate.
11.	Cl 4.3.4 p 207	Special Repairs	Damages occurring due to natural calamities like heavy floods, sand storms, hurricanes, cyclones, earthquakes to any element or system of the Project Highway, shall be rectified and the system restored to function as per programme prepared in consultation with IC. All such activities shall fall under 'Maintenance' and shall form a part of the said Maintenance Manual.	This clause spells out the obligation of the Concessionaire to carry out special repairs to restore the system in case of damages caused by natural calamities.
12.	Cl. 4.4 and 4.5 p 207 and 213	Minimum Maintenance Requirement	Steps as mentioned in O&M manual shall be followed by the Concessionaire for repairing the breaches.	Time period for attending to major breaches, minor cuts, shoulders and all other elements of Project Highway has been specified.
13.	Cl. 4.6, p 217	Incident Management	The Concessionaire shall initiate, co-ordinate and maintain an Incident Management System (IMS)	The Concessionaire shall set up a steering committee, which shall include representatives of

Sl No.	Clause No. & Page No.	Subject	Information in Brief	Remarks
			and supply regular incident statistics to client.	the various relevant agencies, to identify current & potential issues and problem areas which need addressing.
14.	Cl. 4.7, p 219	Safety Management	The Concessionaire shall maintain a comprehensive register and database of all accidents occurring on the Project Highway Section. The Concessionaire shall utilize this data to define and identify "Black Spots" and the like, make the necessary analysis of the cause of the "Black Spot".	The Concessionaire shall provide educational programs for the improvement of safety for the Users of Roads under operation. This shall occur four times per annum. This shall be carried out by the issuing of pamphlets, billboards, etc. The Road Patrols shall in addition take every opportunity at events such as accidents and the like to educate the Users.
15.	Cl. 4.8.2, p 220	Encroachments:	From the date of the commencement of O&M period, the Concessionaire shall be required to determine all encroachments and unauthorised accesses to the highway. The Concessionaire shall list the encroachments with a description, location and extent of each encroachment	The Concessionaire shall draw up a method statement and programme for the removal of the Unauthorized accesses or encroachments for approval by the client. All encroachments shall be removed, and unauthorised accesses closed within 3 months of the commencement of O&M period.
16.	Cl. 4.8.3, p 221	Inspections	The Concessionaire shall draft Inspection procedures for each part and component of the National Highway Section that requires periodic inspection. The inspection reports will be submitted to the IC and the NHAI. Based on reports, detailed investigations shall be undertaken by the	The Concessionaire shall carry out any maintenance, repair or rehabilitation works found necessary by these investigations in accordance with the Maintenance Manual and this Agreement.

Sl No.	Clause No. & Page No.	Subject	Information in Brief	Remarks
			Concessionaire itself and/or on advice of the IC and the NHAI.	
17.	Cl. 5, p 222	Transfer Certificate	The Concessionaire shall obtain a Transfer Certificate as per Schedule L1 appended to this Schedule.	This is a mandatory requirement for Divestment and subsequent issue of Vesting Certificate.

## 2.1.2 CONCLUSIONS ON OBSERVATIONS ON CONCESSION AGREEMENT

The Concession Agreement is comprehensive and covers all the issues concerned with the Construction and Operation of the Project.

## 2.2 REVIEW OF O&M MANUAL

### 2.2.1 PROVISIONS OF O&M MANUAL

As per Clause 18.2 of the Concession Agreement, the Concessionaire shall in consultation with the Independent Consultant prepare the repair and Maintenance Manual (Maintenance Manual) for the regular and periodic maintenance and shall ensure that at all times during the Operations period, the Project Highway is maintained in a manner that it complies with the Specifications and Standards and the minimum maintenance requirements set forth in Schedule L of the Concession Agreement. The O&M Manual describes guidelines for implementing the O&M requirements successfully by prescribing the procedures and systems for activities involved as per the Concession Period. This Manual shall act as guideline to assist the Concessionaire and the IE, who has to independently inspect the maintenance and report to NHAI. Certain forms and procedures have been annexed therein, which facilitates proper supervision and also enable the maintenance works to progress in an orderly and efficient manner.

The Manual reflects the best practices for maintenance of highways / bridges of this type and has been generated based on standard practices. The broad structure of the O&M Manual is as under:

### SECTION 1: PROJECT DETAILS

This section gives the Project background, the requirements and scope of Operations and Maintenance and the suggested Organisation Structure of the Concessionaire Team.

### SECTION 2: OPERATIONS

This section describes the procedures and protocols to be followed during the activities pertaining to Operations under the following heads.

- i) Traffic Management
- ii) Emergency Response Protocol

- iii) Environment Management Plan for mitigating the adverse impact of Air quality, Noise, water quality and improper land use.
- iv) Regular Operations of Systems like Highway Patrolling System, Rescue and Medical Aid Services, Lighting System and the Highway Traffic Management System

### SECTION 3: MAINTENANCE

This section describes the methodology and procedures to be followed for undertaking the Maintenance activities under the following heads.

- i) Maintenance Methodology and programme for Routine Maintenance , Periodic Maintenance and repairs for the Major breaches in the the Roadways
- ii) Maintenance Intervention Levels  
The maintenance Manual prescribes the intervention levels as described in Table 2.3 below. These intervention levels are in accordance with the requirement of the Concession Agreement.

**Table 2.3: Maintenance Intervention Levels**

Sl. No.	Service Factor	Level of Service
1	Roughness by Bump Integrator (Max. permissibility)	3000mm/km
2	Potholes/km (max) i) Less than 75mm deep ii) More than 75mm deep	Nil Nil
3	Percent Cracking	Up to 10% of length of Project Highway
4	Rut Depth not exceeding 10mm	Up to 10% of length of Project Highway
5	User Information	All road signs, km post and road marking in good condition.
6	Percentage Defective Bridge Deck area and bump at approach	Nil
7	Camber i) Mainline ii) Service Road	(+ or -) 0.15% variation from the Camber as per Design Requirements (+ or -) 0.20% variation from the Camber as per Design Requirements
8	Drainage	No visible water pool within the Project Highway
9	Characteristic Deflections as per IRC:81-1997	Upto 1.2 mm

- iii) Safety Management Programme- to be followed during the construction and maintenance activities
- iv) Inspection procedures for undertaking inspections of varying degrees like visual inspection, close inspection & thorough inspection, frequencies of such

inspections and also provides formats for such inspections. Frequencies under normal circumstances are as given in the Table 2.4 below.

**Table 2.4 Frequency of Inspection**

Sl. No.	Object	Item	Daily	Monthly	Quarterly	Before and after rains
1	Riding Surface	Pavement	V	C		T
		Expansion Joints	V	C		T
2	Median	Kerb	V	C		T
3	Side Slopes	Shape	V		C	T
		Turfing		V		T
		Pitching & Masonary		V		T
		Retainin Wall		C		T
4	Drainage	Shoulder Drain	R	C		
		Median Drain	R	C		
		Slip Slope Drain	R	C		
		Bridge Catch Basin	R	C		
		Gullies & Catch Pits	R	C		
5	Bridges	Super structure			C	T
		Substructure			C	T
		Head wing walls and aprons			C	T
		Painting				T
		Hand Rail		C	T	
6	Culverts	Box/Slab				T
		Hume Pipe				T
7	Guard Rail	Shoulder/Medina	V		C	T
8	Traffic Operation Facilites	Signs		C	T	
		Marking	V	C	T	
		Delineator	V	C	T	
		Lighting	V		C	
9	Other Facilities	Vegetation/Landscaping	V	C	T	
		Truck Lay Bye	V	C		
		Way side amenities	V	C		
10	Traffic Conditions		V	T	C	
11	Encroachemnts		V	T		

**NOTE:** V= Visual Inspection, C=Close Inspection, T= Through Inspection & R= Visual Inspection during rainy season only.

- v) Requirement of Monthly MPR and other reporting requirements.

## 2.2.2 CONCLUSIONS ON REVIEW OF O&M MANUAL

The O&M Manual is comprehensively covering all the aspects of Operations and Maintenance requirements for the Project Road as prescribed in the Concession Agreement and also the best industry practices.

## 2.3 REVIEW OF O&M CONTRACTS

### 2.3.1 CONTRACT FOR OPERATION AND MAINTENANCE

The Concessionaire has issued work order to M/s RPM Infra for the operation and maintenance of the road on 08.01.2016. The work order was issued for a period of One year from 2016. Thereafter amendments to the work orders are being issued for the extension of the duration. The latest amendment is amendment 7<sup>th</sup> as per which the contract has been extended up to 31.03.2022. The contract provides for the Bill of Quantity for the Routine maintenance which covers the following major items:

- a) Cleaning of Main carriageway
- b) Cleaning of Project facilities
- c) Cleaning of ROW
- d) Cleaning of Structure
- e) Maintenance of lined drain
- f) Maintenance of Median and Avenue Plantation
- g) Electrical Maintenance
- h) Maintenance of Toll Plaza
- i) Routine Maintenance Supervision

The contract also provides for Incidence Management patrol vehicles and Incidence Management with ambulance. Apart from the above BOQ items the contract also provides for repair work items to be operated with the work notice from M/s Nirmal BOT Ltd. Items like Metal Beam Crash Barrier, Sign Boards etc are to be supplied by the Concessionaire to the Contractor. Further the contract also provides for provisional items for supply of labour and equipments as per the instruction from the Concessionaire.

### 2.3.2 CONTRACT FOR PERIODIC MAINTANACE

The concessionaire entered into a contract for carrying out major / periodic maintenance of the road sections with M/s Marko Lines Traffic Controls Pvt. Ltd. The scope of work of the contractor includes milling of existing Bitumenous layers as may be required, overlay with BC/DBM wherever required. Provision of Tack coat, kerb topping, kerb painting, construction of repair of earthen shoulders. The contract furhters provides for the variation in the BOQ quantities to any extent during actual execution depending on the site condition at the same unit rates as metioned in the BOQ. The only price variation allowed is, for increase or decrease in Bitumen price. The work under the contract was completed on 24.09.2019 and NHAI has issued Completion certificate for the major maintenance vide letter dated 28.01.2021.

### **2.3.3 CONCLUSIONS ON REVIEW OF O&M CONTRACTS**

The work order/Contracts for operation and maintenance activity are found to be covering all the requirement stipulated in the concession agreement comprehensively.

### **2.4 REVIEW OF OTHER DOCUMENTS**

The documents related to Provisional Completion certificates, Completion Certificates, project clearances and monthly IE reports (current), etc were reviewed and it is noted that there are no pending issues or balance work that may have potential impact on the maintenance cost or which may warrant a one time expense in future.

## CHAPTER 3.0: REVIEW OF DESIGNS AND AS BUILT DRAWINGS

### 3.1 REVIEW OF DESIGNS AND AS-BUILT DRAWINGS

The As-built drawings for highways and structures as prepared by the Concessionaire were studied by us and our observations for the same have been presented in the subsequent paragraphs below. It is noted that there is difference in the project chainages as given in the schedule, as mentioned in the As-built drawings and as found on the Kilometer stone at site. As per Schedule the Starting Chainage is 278+000 and End Chainage is 308+000. As per As-Built Drawings the Starting Chainage is 278+000 and End Chainage is 308+890 while as per the site the Starting Chainage is 282+617 and End Chainage is 313+507.

#### 3.1.1 AS-BUILT DRAWINGS OF HIGHWAYS

Our observations on the development provisions mentioned in the Technical Schedules of Concession Agreement viz a viz the As- Built Drawings have been presented in **Table 3.1** below.

**Table 3.1: Review of As-built Drawings for Highways**

Sl. No.	Name of Item	As per Agreement Schedule	As per As -Built Drawing	Remarks
1	Project Length	30.890 km	30.890 km	
2	Design Speed	100 kmph	100 kmph (however some speed restrictions have been put in place at some locations)	
3	Horizontal Curves	Minimum radii - 360 m	Under Limits	
4	Vertical curves	Minimum Gradient 3.3%	Under Limit	
5	Stopping Sight Distance	As per IRC: SP-23	Under Limits	

Sl. No.	Name of Item	As per Agreement Schedule				As per As -Built Drawing				Remarks		
		Name of Town	From	To	Length (in km)	Name of Town	From	To	Length (in km)			
6	Length of Bypass	Balkonda	294+600	301+400	7.10	Balkonda	294+690	301+350	6.80			
7	Length of Service Road/Slip Road	S. No	From	To	Length	Side	S. No.	From	To	Side	Length	Remarks
		1	278+400	279+200	0.80	BS	1	278+100	278+810	LHS	2.2	Kadtal
								278+200	279+653	RHS		
		2	282+000	282+200	0.20	BS	2	281+686	282+286	LHS	1.4	Gamjal
								281+575	282+390	RHS		
		3	287+400	287+600	0.20	BS	3	286+981	287+800	LHS	1.6	Doodgaon
								286+981	287+800	RHS		
		4	287+600	289+600	2.00	BS	4	287+900	288+607	LHS	1.5	Pochampadu
								287+800	288+607	RHS		
		5	290+000	290+200	0.20	BS	Not found in As-built Drawing					Sonpet
6	291+000	292+000	1.00	BS	5	290+600	292+000	LHS	2.9	Bussapur		
						290+530	292+000	RHS				
7	292+800	293+700	0.90	BS	6	292+490	293+464	LHS	1.9	Nallur		
						292+580	293+458	RHS				
8	306+300	306+700	0.40	BS	7	306+200	306+908		1.4	Srirampur		

Sl. No.	Name of Item	As per Agreement Schedule				As per As -Built Drawing				Remarks
								LHS		
						306+200	306+844	RHS		
		Total Length (km)		11.40	Total Length (km)		12.80			
8	Design of pavement	Flexible pavement design as per IRC-37-2001				Flexible pavement design as per IRC-37-2001				
		Rigid pavement as per IRC-58				Rigid pavement as per IRC-58				
9	Design Life	Flexible pavement 20 years				Flexible pavement 20 years				
		Rigid pavement 30 years				Rigid pavement 30 years				
10	Crust Details	<b>MCW</b>		<b>Service Road</b>		<b>MCW</b>		<b>Service Road</b>		
		BC = 50mm		SDBC = 25mm		BC = 50mm		SDBC = 25mm		
		DBM = 130mm		DBM = 50mm		DBM = 130mm		DBM = 50mm		
		WMM = 250mm		WMM = 250mm		WMM = 250mm		WMM = 250mm		
		GSB = 200mm		GSB = 200mm		GSB = 200mm		GSB = 200mm		
		SG = 500mm		SG = 500mm		SG = 500mm		SG = 500mm		
		Total = 1130mm		Total = 1025mm		Total = 1130mm		Total = 1025mm		
11	Major Junctions	2 Nos.				3 Nos.				
		287+500	4 Legged Jn for Entry to Pochampad			288+150	Entry to Pochampad			
		293+200	3 Legged Jn for Entry			294+670	Entry to Balkonda			
						301+356	Exit from Balkonda			
12	Minor Junctions	7 nos as per the Schedule B				8 Nos.				
13	Truck Laybye	<b>Sl. No</b>	<b>From</b>	<b>To</b>	<b>Side</b>	<b>Sl. No</b>	<b>From</b>	<b>To</b>	<b>Side</b>	As per standards
		1	288+400	288+600	LHS	1	288+850	289+200	LHS	
		2	293+800	294+000	RHS	2	293+605	293+900	RHS	

Sl. No.	Name of Item	As per Agreement Schedule				As per As -Built Drawing				Remarks
		Sl. No	LHS	RHS	Location	Sl. No.	LHS	RHS	Location	
		3	294+300	294+400	LHS	3	294+060	294+410	LHS	
		4	306+000	306+200	RHS	4	307+070	307+350	RHS	
14	Bus Bays					1	278+490	278+910	On SR	As per standard
		1	279+200	279+100	Kadtal	2	280+350	280+350	On MCW	
		2	282+100	282+150	Ganjaj	3	281+955	282+070	On SR	
		3	283+650	283+700	Soampet	4	283+540	283+540	On MCW	
		4	284+400	284+500	Soan	5	284+470	284+500	On MCW	
		5	287+400	287+500	Doodgaon	6	287+370	287+380	On SR	
		6	288+100	288+250	Pochampadu	7	288+160	288+075	On SR	
						8	290+700	290+700	On MCW	
						9	291+490	291+510	On SR	
						10	293+140	293+100	On SR	
		7	304+000	304+000	Chittapur	11	306+440	306+560	On SR	
		8	305+600	305+00	Srampur	12	307+520	307+580	On MCW	
		15	Toll Plaza	<b>Chainage</b>		<b>Name of Location</b>	<b>No. of Lanes</b>	<b>Chainage</b>		
280+400				Near Gamjal	6+6	281+320		Near Gamjal	6+6	

### 3.1.2 AS-BUILT DRAWINGS OF STRUCTURES

Our observations on the development provisions mentioned in the Technical Schedules of Concession Agreement viz a viz the as- built Drawings have been presented in **Table 3.2** below.

**Table 3.2: Review of As-built Drawings for Structures**

Sl. No.	Type of Structure	PROPOSAL AS PER AGREEMENT SCHEDULE						AS PER AS-BUILT DRAWING				
		Sl. No	Chainage	Arrang. of Structure	Span Arrang. (m)	Length of Str. (m)	Proposal	Sl. No	Chainage	Arrang. of Structure	Span Arrang.	Length of Str. (m)
1	Major Bridge	2 Nos.						2 Nos.				
		1	287+400	RCC Deck Slab with PSC Girder	36x20.90	752.4	New 4 lane bridge on Godavari	1	284+855	RCC Deck Slab with PSC Girder	26X20.745+ 10X21.945	758.82
		2	298+845	RCC Deck Slab with PSC Girder	4x17.6	70.4	New 4 lane bridge in Balkonda bypass	2	298+802	RCC Deck Slab with PSC Girder	2X20.745 + 2X21.945	85.38
2	Minor Bridge	4 Nos.						6 Nos.				
								1	279+744	RCC Deck Slab	1X7.967	7.967
								2	288+303	RCC Deck Slab with PSC Girder	3X21.48	64.44
		1	290.35	RCC Deck Slab	7X6 + 1X7.25	49.35	Widening of existing bridge	3	293+963	RCC Deck Slab with PSC Girder	2X15.750	31.44

Sl. No.	Type of Structure	PROPOSAL AS PER AGREEMENT SCHEDULE						AS PER AS-BUILT DRAWING				
		Sl. No	Chainage	Arrang. of Structure	Span Arrang. (m)	Length of Str. (m)	Proposal	Sl. No	Chainage	Arrang. of Structure	Span Arrang.	Length of Str. (m)
	Minor Bridge	2	295+980	RCC Deck Slab	2X6.6	13.2	Widening of existing bridge	4	295+482	RCC Box type (Skew)	2X5	11.5
		3	302+880	RCC Deck Slab	1X13.5	13.5	New Construction	5	300+911	RCC Box type	2X6.75	15.4
		4	310+270	RCC Deck Slab	1X8	8	Widening of existing bridge	6	308+287	RCC Solid Slab	1x8	8.0
3	Underpasses (VUP)	<b>4 Nos.</b>						<b>4 Nos.</b>				
		1	293+535	Box Type	1X12	12	New Construction	1	291+556	Box Type	1X12	12
		2	297+672	Box Type	1X12	12	New Construction	2	295+681	Box Type	1X12	12
		3	299+300	Box Type	1X12	12	New Construction	3	298+008	Box Type	1X12	12
		4	302+310	Box Type	1X12	12	New Construction	4	300+360	Box Type	1X12	12

Sl. No.	Type of Structure	PROPOSAL AS PER AGREEMENT SCHEDULE						AS PER AS-BUILT DRAWING				
		Sl. No	Chainage	Arrang. of Structure	Span Arrang. (m)	Length of Str. (m)	Proposal	Sl. No	Chainage	Arrang. of Structure	Span Arrang.	Length of Str. (m)
4	Under-passes (PUP)	11 Nos.						11 Nos.				
		1	284+040	Box Type	1X5	5m	New Construction	1	278+785	Box Type	1X5	5m
		2	289+42	Box Type	1X5	5m	New Construction	2	282+005	Box Type	1X5	5m
		3	293+100	Box Type	1X5	5m	New Construction	3	287+422	Box Type	1X5	5m
		4	294+650	Box Type	1X5	5m	New Construction	4	291+140	Box Type	1X5	5m
		5	297+262	Box Type	1X5	5m	New Construction	5	293+049	Box Type	1X5	5m
		6	298+281	Box Type	1X5	5m	New Construction	6	295+275	Box Type	1X5	5m
		7	299+995	Box Type	1X5	5m	New Construction	7	296+297	Box Type	1X5	5m

Sl. No.	Type of Structure	PROPOSAL AS PER AGREEMENT SCHEDULE						AS PER AS-BUILT DRAWING				
		Sl. No	Chainage	Arrang. of Structure	Span Arrang. (m)	Length of Str. (m)	Proposal	Sl. No	Chainage	Arrang. of Structure	Span Arrang.	Length of Str. (m)
		8	301+294	Box Type	1X5	5m	New Construction	8	297+322	Box Type	1X5	5m
		9	302+000	Box Type	1X5	5m	New Construction	9	299+305	Box Type	1X5	5m
		10	303+430	Box Type	1X5	5m	New Construction	10	300+005	Box Type	1X6.5	6.5m
		11	305+541	Box Type	1X5	5m	New Construction	11	301+595	Box Type	1X5	5m
4	Culverts	1	BC	6 Nos.			1	BC	20Nos.			
		2	SC	22 Nos.			2	SC	8 Nos.			
		3	HPC	48 Nos.			3	HPC	55Nos.			

## 3.2 REVIEW OF PAVEMENT DESIGN REQUIREMENTS

As per Clause 7 of Schedule B the pavement designs including overlay and that of the service roads shall be done in accordance with Schedule-D of the Concession Agreement. Provision of flexible pavement was specified for new two lanes and paved shoulders & service roads while provision of rigid pavement was specified for toll plaza locations, truck laybys, and for pavement below all underpasses and for cross roads leading to underpasses within the ROW limits. The Pavement Design was to be based on the following two parameters:

- a) Traffic Forecast : As per Project Report or as assessed by the Concessionaire
- b) Design Life : 20 years for Flexible Pavement, 30 years for Rigid Pavement

### 3.2.1 FLEXIBLE PAVEMENT REQUIREMENTS - NEW CONSTRUCTION

- a) Design life: 20 years
- b) Minimum Subgrade CBR: 10 %
- c) Minimum Crust composition

**Table 3.3 Main carriageway crust details**

Sl no.	Layer Composition	Thickness (mm)
1	BC	40
2	DBM	130
3	WMM	250
4	GSB	200

The pavement composition for paved shoulders shall be same as that of Main Carriageway.

### 3.2.2 FLEXIBLE PAVEMENT REQUIREMENTS - STRENGTHENING OF EXISTING CARRIAGEWAY

Strengthening of existing Flexible Pavement was provisioned to be done with not less than 40 mm BC and 125 mm DBM over Profile Corrective Course.

### 3.2.3 PAVEMENT COMPOSITION FOR SLIP ROAD / SERVICE ROAD

For the Service roads the minimum composition of pavement was to be as per Table 3.4 below.

**Table 3.4 Service Road crust details**

Sl no.	Layer Composition	Thickness (mm)
1	SDBC	25
2	BM	50
3	WMM	250
4	GSB	200

### 3.2.4 RIGID PAVEMENT REQUIREMENTS

Rigid Pavement was provisioned to be done in accordance with IRC: 58- 2002 considering 30 years Design Life with an effective K value of 180 Mpa/m.

### 3.3 REVIEW OF PAVEMENT DESIGN OF THE CONCESSIONAIRE

#### 3.3.1 REVIEW OF PAVEMENT DESIGN REPORT

The Flexible Pavement for Main Carriageway and Service Roads has been designed as per IRC: 37-2001. In the pavement design report on the new carriageway, the Flexible pavement crust was designed for a traffic of 40 MSA and for the Rigid pavement crust was for a traffic of 50 MSA and the VDF adopted was Bus-0.7, LCV-0.336, Truck (2A/3A)-2.475 & MAV-4.747. The pavement composition on widening portion of existing carriageway is also kept same as the pavement composition of new carriageway as shown in Table 3.5. The pavement composition actually adopted by the Concessionaire is summarized in Table 3.6 below.

**Table 3.5: Summary of Flexible Pavement Design as per Pavement Design Report**

Composition of Pavement	MCW	Service Road/ Slip Road	Unit
Bituminous Concrete	40	-	mm
Semi Dense Bituminous Concrete	-	25	mm
Dense Bituminous Macadam (DBM)	100	50	mm
Wet Mix Macadam	250	250	mm
Granular Sub -base	200	200	mm
Subgrade	500	500	mm
CBR	10	10	%

**Table 3.6: Summary of Flexible Pavement Design as adopted by Concessionaire**

Composition of Pavement	MCW	Service Road /Slip Road	Unit
Bituminous Concrete	40	-	mm
Semi Dense Bituminous Concrete	-	25	mm
Dense Bituminous Macadam (DBM)	130	50	mm
Wet Mix Macadam	250	250	mm
Granular Sub -base	200	200	mm
Subgrade	500	500	mm
CBR	10	10	%

#### 3.3.2. REVIEW OF OVERLAY DESIGN DURING INITIAL CONSTRUCTION

Based on Benkelman Beam Deflection studies the overlay design for the existing pavement as given in different homogeneous sections in the pavement design report is furnished in Table 3.7 below.

**Table 3.7 Overlay design for existing pavement as per pavement design report**

Chainage		Recommended Overlay (mm)	
From	To	DBM	BC
278+000	288+000	80	40
288+000	292+000	50	40
292+000	301+000	110	40
301+000	308+000	70	40

### 3.3.3 REVIEW OF RIGID PAVEMENT DESIGN

The Rigid Pavement has been designed with thickness of PQC as 300mm over DLC layer of thickness 100mm and WMM of 150mm thickness. The Rigid pavement has been designed for 30 years. The summary of pavement design has been shown below in **Table 3.8**.

**Table 3.8: Summary of Rigid Pavement Design**

Flexural Strength of Plain Concrete (90 days)	40	kg/cm <sup>2</sup>	
Thickness of Pavement Quality Concrete (M 40 Grade)	300	mm	
Polythene Layer between PQC and DLC	125	micron	
Dry Lean Concrete layer	100	mm	
Wet Mix Macadam	150	mm	
CBR	10	%	
Length of slab or spacing between consecutive Transverse joints	3.125	m	
Width of slab or spacing between consecutive Longitudinal joints	5.0	m	
Dowel Bars (Mild Steel)	Dia	32	mm
	Spacing	200	mm
	Length	500	mm
Deformed (HYSD) Tie Bars	Dia	12	mm
	Spacing	400	mm
	Length	640	mm

### 3.3.4 CONCLUSIONS ON PAVEMENT DESIGN

The Pavement Design of the Flexible and Rigid Pavements has been done in accordance with the relevant codes and also satisfying the provisions laid down in the Concession Agreement.

### 3.4 REVIEW OF DESIGN BASIS OF STRUCTURES

#### 3.4.1 MAJOR AND MINOR BRIDGES

There are two Major Bridges and four Minor Bridges which have been reconstructed and two Minor bridges which have been newly constructed for the new carriageway portion as per the Concession Agreement. The codes which have been followed for the design are IRC: 78-2000, IRC: 6-2000 and IRC: 21-2000. Following Design Parameters have been considered:

I The abutments for the Major Bridges at Ch. 289+834 have been designed as Box type and for Major Bridge at Ch. 303+462 these are designed as Wall type. Piers for both Bridges have been designed as Wall type. The Foundations are open type and the superstructure is PSC Girder (Pre-tensioned) with RCC slabs. Following design parameters have been considered.

- a) Material : M-30 Concrete for Piers, Abutments, Pier & Abutment Caps, Superstructure, M45 for PSC Girder, M40 for Crash Barrier, PCC M15 for Return Walls.
- b) Cover R/f : Nominal cover provided is 50mm and Min. clear cover is 35mm.
- c) SBC considered : Details not available.
- d) Bearings : Elastomeric bearings
- e) Expansion joints : Strip seal type

II The abutments and piers for the Minor Bridges (Ch. 292+920 and Ch. 298+580) have been designed as Wall Type. The Foundations are open type and the superstructure is RCC slabs with RCC Girder (Ch. 298+580) and Pre-tensioned Girder (Ch. 292+920). Following design parameters have been considered.

- a) Material : PCC M15 for Piers, Abutments, M30 for Pier & Abutment Caps, Superstructure, M40 for Crash Barrier (Ch. 298+580), M40 Parapet (Ch. 292+920).
- b) Cover R/f : 75mm on earthen face & foundation, 50mm on front face of stem, Minimum Nominal cover- 40mm.
- c) SBC considered : For Minor Bridge at Ch. 298+580 Soil Bearing Capacity is 20 Ton/sqm. For other Minor Bridge details not available.
- d) Bearings : Elastomeric Bearings
- e) Expansion joints : Strip seal type

### 3.5 PROJECT FACILITIES

As per schedule C paragraph 1 it is mentioned that "The Concessionaire shall review the adequacy of the proposed facilities at regular intervals of 5 years and accordingly provide additional facilities with necessary approval from the Independent Consultant in order to meet the demand of the road till the end of the concession period." As these are additional facilities, same shall be carried out under change of scope. As per discussion with the Concessionaire, additional facilities are constructed in O&M phase under Change of Scope from NHAI.

### 3.6 CONCLUSIONS ON REVIEW OF DESIGNS AND DRAWINGS

On the basis of the review of Designs and As-built drawings for the Project, it is confirmed that the Project has been developed in accordance with the provisions of the Schedules of Concession Agreement. As per the design report the pavement composition adopted by the Concessionaire for the slip road is same as that of the service road.

### 3.7 DETAILS OF COS ORDERS

- a) VUP (Grade II) at Soan Ch. 284.160 (new 289+067) on account of Road Safety by Push Box Method: Approved on 03.10.2018 amounting to 11.47 Cr.
- b) Provising Toilet block at the Toll Plaza under Swachh Bharat Mission: Approved on date 19.02.2018 amounting to 0.26 Cr.
- c) Construction of Service road for Petrol Bunk from Ch.307+840 to Ch. 307+400 on RHS near Balkonda: Approved on 26.07.2018 amounting to 0.77 Cr.
- d) Major junction improvement work by carrying out geometrical improvements at Balkonda village at Km 305+947 under Black Spot rectification (BS TG-70) amounting to 0.66 Cr.
- e) Construction of Highway Mini Nest at Toll Plaza: Approved on 29.12.2017 amounting to 0.46 Cr.
- f) Additional PQC for accommodating loops of ETC equipment and segregation of Traffic islands: Approved on 10.03.2016 amounting to 0.105 Cr
- g) Construction of Kothapalli Service road and Bus Shelters: Approved on 30.10.2019 amounting to 4.2 Cr.
- h) Short Term Improvement of Black Spot (BS-TG - 02 - 413) at Ch. 301+330 (old chainage) near Soan to Madhapur section from Ch. 288+500 to Ch. 289+000. Approved on 15.05.2020 amounting to 0.09 Cr.

## CHAPTER 4.0: EXISTING INVENTORY & CONDITION SURVEY

### 4.1 PROJECT DETAILS

The Project Road is the Section of NH-07 Starting at Kadtal at Ch. 282+617 (Old Km. 278+000) in Adilabad District towards Nagpur side and Ends at Armur at Ch. 313+507 (Old Ch. 308+00) in Nizamabad District. The Project road crosses the Godavari River at New Ch. 289+807 of NH-7 in Nizamabad District. The Length of Project Road is **30.890 km**. The notable built-up areas through which the Project Road passes are Kadtal, Gamjal, Doodgaon, Pochampadu, Sonpet, Bussapur, Nallur and Srirampur and it bypasses the Balkonda town.

The road traverses through mainly plain terrain and is designed for 100 kmph speed. The major details of the Project are presented in **Table 4.1** below.

**Table 4.1: Major Details of Project Road**

SL. No	Parameter	Description		
1.	Main Carriageway Details	4 laned divided Carriageway with 1.5 m paved shoulders and 1.0 m earthen shoulder in rural and median width of 4.5 m		
2.	ROW	60 m all along the length		
3.	Service Road/Slip Road is 5.5 m wide Total Length (both side) = 14.477 km	LHS - S.R.	RHS - S.R.	Name of Village
		282+817 to 283+417	282+917 to 284+167	Kadtal
		286+297 to 286+917	286+277 to 286+917	Gamjal
		290+617 to 290+817	291+677 to 292+217	Doodgaon
		291+677 to 292+217	292+217 to 292+317	
		292+567 to 282+700	292+217 to 293+117	Pochampad
		292+740 to 293+117		
		295+317 to 296+617	295+247 to 295+617	Bussapur
			295+617 to 296+617	
		297+397 to 297+977	297+297 to 297+977	Nallur
306+017 to 306+577	306+017 to 306+577	Balkonda		
310+837 to 311+417	310+837 to 311+437	Srirampur		
4.	Pavement Type (Flexible for MCW and SR, Rigid at Toll Plaza)	MCW	40 mm BC 130 mm DBM 250 mm WMM 200 mm GSB 500 mm SG (10% CBR)	Service Road
			25mm SDBC 50mm BM 250mm WMM 200mm GSB 500mm SG (10% CBR)	
		300 mm PQC, 150 mm DLC, 150 mm WMM, 500 mm Subgrade		For Toll Plazas
Dowel Bars (MS) - 32 mm dia, 250mm c/c, 500 mm Tie Bars (Plain ) - 12 mm dia, 350 mm c/c, 580 mm				
5.	Junctions	3 nos. (Major junctions) & 8 nos. (Minor junctions)		

SL. No	Parameter	Description
6.	Major Bridges	2 nos.
7.	Minor Bridges	6 nos.
8.	Underpasses	VUPs - 5 nos. (1 no. VUP under COS) and PUPs -12 nos.
9.	Culverts	55 nos. (HPCs), 8 nos. (Slab Culverts) & 20 nos. (Box Culverts)
10.	Toll Plaza	1 nos. (6+6 Lanes including Oversized vehicle lane)
11.	Bus Bays/ Bus Shelters	30 nos.
12.	Truck Lay Bys	4 nos.

#### 4.2 OVERVIEW OF ROAD ASSETS AND APPURTENANCES

Detailed inspection of the site was carried out by our team of Engineers in February 2022 for assessment of status and condition of various Road Assets and Appurtenances. Inventories of various road assets and structures were prepared.

Status of various road furniture items, painting, road markings, safety fixtures, way-side amenities, horticulture and landscaping with respect to the provisions of Concession Agreement and their condition were checked. Assessment of condition of various assets was made on the basis of visual inspections. Overall the Project Road conforms to the specifications laid down in Concession Agreement. Barring some locations which require minor repair works, all work items have been seen to be in good condition. Some road furniture items and signages etc are found to be damaged or missing. The summarised details in respect of inventory/condition survey of road assets for the Project are presented in subsequent para. below.

#### 4.2.1 HIGHWAY INVENTORY

The basic dimensional parameters for the Project Road were observed and noted for every 100m interval. Details pertaining to the Carriageway widths, shoulders, Embankment heights, land use, etc. were noted. This information has been presented in **Table 4.2** along with the representative photographs of each 5 km stretch of the project road is shown in **Figures** below.



Fig 4.1: Section between Ch. 282-287 (LHS)



Fig 4.2: Section between Ch. 287-292 (LHS)



Fig 4.3: Section between Ch. 292-297(LHS)



Fig 4.4: Section between Ch. 297-302 (LHS)



Fig 4.5: Section between Ch. 302-307 (LHS)



Fig 4.6: Section between Ch. 307-313.507 (LHS)



Fig 4.7: Section between Ch. 282-287(RHS)



Fig 4.8: Section between Ch. 287-292 (RHS)



Fig 4.9: Section between Ch. 292-297 (RHS)



Fig 4.10: Section between Ch. 297-302(RHS)



Fig 4.11: Section between Ch. 302-307(RHS)



Fig 4.12: Section between Ch. 307-313.5 (RHS)

Table 4.2: Details of Main Carriageway Inventory

Sl. no.	Chainage (Km)		LHS				Median	RHS			
	From	To	Land use	Embankment Height (m)	LHS Earthen Shoulder (m)	Width MCW (m)	Width (m)	Width-MCW (m)	RHS Earthen Shoulder (m)	Embankment Height (m)	Land use
1	282+617	283+000	Agri	1-4.2	0.7-2.7	8.7-11.9	4.3-4.4	8.7-12	1-3.7	1-4.5	Agri
2	283+000	283+200	Built up	2.3-2.4	2.2-2.4	8.8	4.4	8.7-8.9	1.4	2.8-3	Built up
3	283+200	284+100	Agri	0 - 3	0-1.6	8.6-11.1	3-4.4	8.8-11	0-1.2	0-3	Built up
5	284+100	285+000	Agri	1.5-5	0-8.7	8.6-11.9	0-4.4	8.8-12.4	0-5	0-3	Agri
6	285+000	285+100	Built up	1.0	3.6	8.7	0.9	10.5	1.6	1.0	Agri
7	285+100	285+200	Built up	1.0	3.5	8.8	4.4	8.7	1.6	1.0	Agri
8	285+200	285+700	Agri	1.8-3.5	1.8-2.5	8.3-8.6	4.4	10.8	1.2-1.6	2.0-3.0	Agri
9	285+700	286+100	Toll Plaza								
10	286+100	286+500	Agri	0-6	1-1.8	8.6-14.1	0.9-4.4	1.5-17	1.2	1.0-3.0	Agri
11	286+500	286+800	Built up	1.0-3.0	0.0	8.6-11.6	4.4	8.8	1-1.2	1.0-3.0	Agri
13	286+800	289+500	Agri	1.2-10	0-3.5	8.6-14.5	4.4 -13.9	8.7-12.9	1-3.8	1.0-10	Agri
14	289+500	289+600	River	-	-	-	Bridge	-	-	-	River
15	289+600	290+200	River	-	-	-	Bridge	-	-	-	River
16	290+200	290+800	Agri	0-10	1.1-2	8.75-17	1-13.7	8.7-8.8	2-2.5	2.0-8	Agri
17	290+800	290+900	Built up	0.0	1.0	19.3	0.9	12.3	1.5	4.0	Agri
18	290+900	292+000	Agri	1.5-3.5	1.2-2.7	8.7-9	4.4	8.8-8.9	0-2	1.0-4.0	Agri
19	292+000	292+100	Built up	2.0	1.3	9.8	4.4	11.0	0.0	2.0	Agri
20	292+100	292+200	Built up	2.0	1.2	8.8	4.4	8.7	2.5	2.0	Built up
21	292+200	292+500	Agri	1.2-3	1.2-2.8	8.7-8.9	4.4	8.7	1.5-4.3	0-2	Built up
23	292+500	293+300	Built up	0-2	0-4.6	8.6-12.2	0.9-6.8	8.6-15	0-4.5	0-2	Built up
24	293+300	295+800	Agri	0-3.5	0-2	8.2-12.3	0.9-4.4	8.7-13.8	1.0-3.0	0-3.5	Agri
25	295+800	295+900	Built up	3	1.0	8.8	4.4	8.8	1.0	3.5	Agri

Sl. no.	Chainage (Km)		LHS				Median	RHS			
	From	To	Land use	Embankment Height (m)	LHS Earthen Shoulder (m)	Width MCW (m)	Width (m)	Width-MCW (m)	RHS Earthen Shoulder (m)	Embankment Height (m)	Land use
26	295+900	296+000	Built up	3.5	0.0	8.8	4.4	8.8	1.0	3.5	Agri
27	296+000	296+100	Built up	3.5	0.0	8.8	4.4	8.8		3.5	Agri
28	296+100	296+500	Built up	5.5	0.0	8.8-8.9	4.4	8.7-11	0.5-1	5.5	Built up
29	296+500	296+600	Agri	3.0	0.0	8.8	3.8	8.7	-	6.0	Built up
30	296+600	296+700	Agri	3.0	0.0	8.8	0.9	8.7	1.0	3.0	Built up
31	296+700	297+400	Agri	2-2.5	1-1.2	8.7-9.1	0.9-4.4	8.8-12	1.2-1.5	1-4.5	Agri
32	297+400	297+500	Built up	3.0	1.0	8.8	4.4	8.8	1.2	4.5	Agri
33	297+500	298+800	Agri	0-4.5	0-1.5	7.5-14	4.4	8.7-11.2	1-2.2	0-6	Agri
34	298+800	298+900	Agri	0.0	0.0	8.5	4.4	14.0	1	0.0	Built up
35	298+900	299+000	Agri	2.5	1.5	8.5	4.4	14.0	1	0.0	Built up
36	299+000	299+200	Agri	1.2-2.5	1.2-1.5	8.5-12.3	2.5-4.4	8.7-11.6	2-2.2	0-3	Agri
37	299+200	299+300	Agri	1.2	1.2	10.0	0.9	8.7	2.3	4.0	Built up
38	299+300	305+300	Agri	1-2	1-2.5	8.5-12.2	0.9-4.4	8.7-12.2	1-2.6	1.0-2.0	Agri
39	305+300	306+100	Agri	0-1.5	0-1.5	8.8-13.9	1.5-4.4	8.7-18.6	0-1.8	2.0-3.0	Built up
41	306+100	306+300	Built up	3.0	1.0	8.8	4.4	8.6-8.7	0-1	3.0	Built up
42	306+300	306+400	Built up	3.0	1.0	8.8	4.4	8.6	1.5	3.2	Agri
43	306+400	313+400	Agri	1.0-3.0	1-2.5	8.6-12.2	0.8-4.4	8.6-14	0-2.5	0-4	Agri
44	313+400	313+507	Agri	1.5	1.0	8.8	0-4.4	8.8	1.0	1.0	Private property

## 4.2.2 PAVEMENT CONDITION

The pavement is found to be in Good condition generally. Some repair works carried out on the pavement surface are seen in the form of patch works. The details in this regards are provided in Table 4.3 below. Representative photographs showing the Pavement Condition are presented in Figures below.



Fig 4.13: Pavement Condition at Ch. 285+200 (LHS)



Fig 4.14: Pavement Condition at Ch. 285+200 (RHS)



Fig 4.15 Pavement Condition at Ch. 285+200 (RHS)



Fig 4.16 Pavement Condition at Ch. 312+905



Fig 4.17 Pavement Condition at Ch. 282+400



Fig 4.18 Pavement Condition at Ch. 297+400

Table 4.3: Details of Pavement Condition

Sl.no.	Chainage (km)		LHS Patchwork		RHS Patchwork		Condition
	From	To	Area (Sqm)	Percentage	Area (Sqm)	Percentage	
1	282.617	283.000	0.0	0.0	0.00	0.00	Good
2	283.000	284.000	771.4	8.6	0.00	0.00	Good
3	284.000	285.000	0.0	0.0	2230.00	23.54	Good
4	285.000	286.000	571.8	6.7	2590.00	30.37	Fair Narrow Cracks area 1.29%.
5	286.000	287.000	45.6	0.4	3120.00	29.49	Good
6	287.000	288.000	0.0	0.0	0.00	0.00	Good
7	288.000	289.000	0.0	0.0	0.00	0.00	Good
8	289.000	290.000	3.9	0.0	12.18	0.13	Good
9	290.000	291.000	0.0	0.0	0.00	0.00	Good
10	291.000	292.000	39.9	0.5	69.11	0.78	Good
11	292.000	293.000	0.0	0.0	0.00	0.00	Good
12	293.000	294.000	134.1	1.5	0.00	0.00	Good
13	294.000	295.000	830.5	9.0	0.00	0.00	Good
14	295.000	296.000	875.0	9.7	0.00	0.00	Good
15	296.000	297.000	140.0	1.6	0.00	0.00	Good
16	297.000	298.000	770.0	8.7	0.00	0.00	Good
17	298.000	299.000	364.7	3.8	0.00	0.00	Good
18	299.000	300.000	460.0	5.0	0.00	0.00	Good
19	300.000	301.000	1963.7	21.1	0.00	0.00	Good
20	301.000	302.000	2415.0	26.4	0.00	0.00	Good
21	302.000	303.000	4410.0	50.2	0.00	0.00	Good

Sl.no.	Chainage (km)		LHS Patchwork		RHS Patchwork		Condition
	From	To	Area (Sqm)	Percentage	Area (Sqm)	Percentage	
22	303.000	304.000	1057.0	11.6	0.00	0.00	Good
23	304.000	305.000	4600.0	51.2	0.00	0.00	Good
24	305.000	306.000	2685.0	28.9	0.00	0.00	Good
25	306.000	307.000	525.0	5.9	0.00	0.00	Good
26	307.000	308.000	0.0	0.0	0.00	0.00	Good
27	308.000	309.000	0.0	0.0	0.00	0.00	Good
28	309.000	310.000	890.0	9.9	0.00	0.00	Good
29	310.000	311.000	0.0	0.0	0.00	0.00	Good
30	311.000	312.000	1200.0	13.1	0.00	0.00	Good
31	312.000	313.000	350.0	4.0	0.00	0.00	Good
32	313.000	313.507	0.0	0.0	0.00	0.00	Good

#### 4.2.3 SERVICE ROADS/ SLIP ROADS

Total length of Service road/ Slip road is 14.477 Km. Representative photographs of some of the Service roads/Slip Roads sections are presented in **Figures** below. The details of the service road are bought out in **Table 4.4** below.



Fig 4.19 Service Road at Ch. 282+700 RHS



Fig 4.20 Service Road at Ch. 283+100 RHS



Fig 4.21 Service Road at Ch. 286+500 LHS



Fig 4.22 Service Road at Ch. 297+400 LHS

Fig 4.23 Service Road at Ch. 302+900 RHS

Fig 4.24 Service Road at Ch. 306+200 LHS

Table 4.4: Details of Service Road/ Slip Road

Sl.no.	Village name	Chainage (Km)		Side LHS/RHS	Length (m)	Width (m)	Condition
		From	To				
1	Kadtal	282.700	284.100	RHS	1300	4.6	Good
		282.900	283.300	LHS	400	5.4	Good
2	Gamjal	286.375	286.825	RHS	450	4.7	Good
		286.400	286.800	RHS	400	4.7	Good
3	Soan	288.300	289.300	RHS	1000	5.5	Good
4	Chakiryala	290.650	290.750	LHS	100	6.0	Good
5	Doodgaon	291.700	292.300	LHS	600	5.7	Good
6	Pocharam X road	291.775	293.025	RHS	1250	5.6	Good
		292.600	293.000	LHS	400	5.3	Good
7	Bussapur	295.275	296.525	RHS	1250	5.3	Good
		295.375	296.525	LHS	1150	5.4	Good
8	Nallur	297.375	297.925	LHS	550	4.4	Good
		297.375	297.925	RHS	550	5.2	Good
9	Kothapalli	300.200	300.500	LHS	300	5.4	Good

Sl.no.	Village name	Chainage (Km)		Side LHS/RHS	Length (m)	Width (m)	Condition
		From	To				
		300.175	300.525	RHS	350	5.5	Good
10	Balkonda	306.100	306.600	LHS	500	5.5	Good
		306.250	306.450	RHS	200	5.5	Good
		307.375	307.725	RHS	350	5.5	Good
		310.875	311.325	RHS	450	5.6	Good
11	Sirampur	310.875	311.325	RHS	450	5.6	Good
		310.975	311.425	LHS	450	5.5	Good

#### 4.2.4 MAJOR JUNCTION

There are 3 Nos. of Major junctions on the Main Carriageway which are in a Good condition. Auxiliary lanes for turning are not provided as per the standards. Highmast lighting and solar blinkers are provided at these locations. The details of the Major junction are furnished in Table 4.5 below. Representative photographs of some of the Major Junctions are presented in **Figures** below.



Fig 4.25: Major Junction at Ch. 292+750 RHS



Fig 4.26 : Major Junction at Ch. 299+200 RHS



Fig 4.27: Major Junction at Ch. 306+000 RHS

Table 4.5: Details of Major Junctions

Sl.no	Chainage	Type (T/X/Y)	Side Road RHS		No. of Islands	Lighting	Signage	Marking	Remarks
			W (m)	Condition		High Mast			
1	292+750	T	5.0	Good	2	1	Good	Good	To Sri Ram Sagar
2	299+200	Y	4.3	Good	3	1	Good	Good	To Balkonda Village
3	306+000	T	4.5	Good	3	1	Good	Good	To Balkonda village

#### 4.2.5 MINOR JUNCTIONS

There are total 10 no. of Minor Junctions out of which Cross (X) junction is 1 No., Y- junctions are 2 Nos. and T-junctions are 7 Nos. The details of the Minor junctions are furnished in **Table 4.6** below. Representative photographs of some of the Minor Junctions are presented in **Figures** below.



Fig 4.28 : Minor junction at Ch. 285+000 LHS



Fig 4.29 : Minor junction at Ch. 288+900 LHS



Fig 4.30 : Minor junction at Ch. 290+600 LHS



Fig 4.31 : Minor junction at Ch. 288+222 RHS



Fig 4.32 : Minor junction at Ch. 290+700 RHS



Fig 4.33 : Minor junction at Ch. 306+543 RHS

Table 4.6: Details of Minor Junctions

Sl. No	Chainage	Type (T / X / Y)	Side Road LHS		Side Road RHS		No. of Islands		Signage	Remarks
			W (m)	Condition	W (m)	Condition	LHS	RHS		
1	285+000	X	4.8	Fair	2.50	Good	-	-	Good	Sangampet village (LHS), Jaffrapur village (RHS)
2	288+900	Y	3.8	Good	-	-	-	-	Good	Soan Village
3	290+600	Y	3.3	Fair	-	-	-	-	Good	Doodgaon Village
4	309+600	T	3.9	Good	-	-	1	-	Good	Chittapur Village
5	312+200	T	2.0	Good	-	-	-	-	Good	Chepur Village
6	288+222	T	-	-	3.95	Good	3	-	Good	Auxiliary lane (L=100m & W=4.8m) Madhapur Village
7	295+300	T	-	-	3.85	Good	-	-	Good	
8	306+800	T	-	-	4.00	Good	0	1	Good	Balkonda Village
9	309+619	T	-	-	4.00	Good	0	0	Good	Komanpally Village/Fattepur

\*Note - Good- all necessary sing boards are provided and are in good condition, Fair- Some sign boards are missing

#### 4.2.6 MEDIAN OPENINGS

The details of Median Openings are furnished in **Table 4.7** below. Representative photographs of some of the Median Opening are presented in **Figures** below. At most of the Median opening locations Solar Blinkers have been provided.



Fig 4.34 : Median Opening at Ch. 294+300



Fig 4.35 : Median Opening at Ch. 288+900



Fig 4.36: Median Opening at Ch. 307+400



Fig 4.37 : Median Opening at Ch. 286+400



Fig 4.38 : Median Opening at Ch.284+200\*



Fig 4.39 : Median Opening at Ch. 311+400

Table 4.7: Details of Median Opening

Sl.no.	Chainage	Median opening		Storage lane				Condition	Sign Board	Solar Blinker
		Length	Width	LHS		RHS				
				Length	Width	Length	Width			
1	284+150	30	5	120	3.5	124	3.5	Good	Yes	Yes
2	284+950	27	5	129	3.5	116	3.5	Good	Yes	Yes
3	286+250	29	4.4	-	-	138	3.5	Good	Yes	Yes
4	288+250*	25.6	5.2	100	3.5	52	3.5	Good	No	Yes
5	290+850	30	5	117	3.5	137.5	3.5	Good	Yes	Yes
6	292+750	26	1.9	77.5	3.5	42	3.5	Good	Yes	Yes
7	294+350	30	5	130	3.5	125	3.5	Good	Yes	Yes
8	295+350	14.8	4.4	-	-	-	-	Good	Yes	Yes
9	296+750	20	4.9	110	3.5	130	3.5	Good	Yes	Yes
10	299+250	20.2	5.3	80	3.5	-	-	Good	Yes	No
11	301+250	25	5.2	128	3.5	150	3.5	Good	Yes	Yes
12	303+250	25	5.2	100	3.5	110	3.5	Good	Yes	Yes
13	305+950	21.9	5	-	-	98	3.5	Good	No	Yes
14	307+450	10	5.2	113	3.5	110	3.5	Good	Yes	Yes
15	309+550	26	5.2	129	3.5	-	-	Good	Yes	Yes
16	309+650	25	5.2	-	-	124	3.5	Good	Yes	Yes
17	311+450	25	5	100	3.5	102	3.5	Good	Yes	Yes
18	312+150	25	2.4	-	-	110	3.5	Good	No	Yes

\*Median opening is closed using Temporary Barricading from safety considerations

#### 4.2.7 BUS BAYS

There are 10 nos. of Bus bay with Bus Bay Shelter and 20 nos. are only Bus Shelters. Condition of Bus Bays Shelter/Bus Shelters is presented in **Table 4.8** below. Representative photographs of some of the BusBays/Bus Shelters are presented in **Figures** below.



Fig 4.40: Bus Shelter at Ch. 283+100 LHS



Fig 4.41 : Bus Shelter at Ch.286+500 LHS



Fig 4.42 Bus Shelter at Ch. 290+600 LHS



Fig 4.43 Bus Shelter at Ch. 295+200 RHS



Fig 4.44 Bus Shelter at Ch. 306+625 RHS



Fig 4.45 Bus Shelter at Ch. 312+200 LHS

Table 4.8: Details of Bus Bays

Sl.no	Chainage	Side	Bus Bay Lane		Pavement		Entry / Exit (Taper Y/N)	Marking	Lighting	Remark
			Length (m)	Paved Width (m)	Type	Condition				
1	283+100	LHS	45	9.3	BT	Good	Y	Good	Panchayat street light	Physical separator provided
2	283+430	RHS	Only shelter		BT	Good	N	Fair	Panchayat street light	
3	285+000	LHS	Only shelter		BT	Good	N	Fair	N	
4	285+33	RHS	Only shelter		BT	Good	N	Fair	Panchayat street light	
5	286+600	LHS	Only shelter		BT	Good	N	Good	Panchayat street light	
6	286+683	RHS	Only shelter		BT	Good	N	Good	Panchayat street light	
7	288+100	LHS	110	5.3	BT	Good	Y	Good	N	
8	288+153	RHS	70	4.8	BT	Good	Y	Good	N	
9	289+090	LHS	99	4.22	BT	Good	Y	Good	Y	
10	289+118	RHS	94	5	BT	Good	Y	Good	N	
11	290+729	RHS	100	5	BT	Good	Y	Good	N	
12	290+900	LHS	96	4.97	BT	Good	Y	Good	N	

Sl.no	Chainage	Side	Bus Bay Lane		Pavement		Entry / Exit (Taper Y/N)	Marking	Lighting	Remark
			Length (m)	Paved Width (m)	Type	Condition				
13	292+000	RHS	Only shelter		BT	Good	N	Fair	N	
14	292+700	RHS	Only shelter		BT	Good	N	Good	N	
15	292+850	LHS	Only shelter		BT	Good	N	Good	Panchayat street light	
16	295+200	LHS	Only shelter		BT	Good	N	Good	N	
17	295+300	RHS	Only shelter		BT	Good	N	Fair	N	
18	296+100	LHS	Only shelter		BT	Good	N	Good	Panchayat street light	
19	296+100	LHS	Only shelter		BT	Good	N	Good		
20	297+100	RHS	Only shelter		BT	Good	N	Fair	N	
21	297+700	RHS	Only shelter		BT	Good	N	Good	Panchayat street light	
22	297+850	LHS	Only shelter		BT	Good	N	Good		
23	306+650	LHS	Only shelter		BT	Good	N	Good	Panchayat street light	
24	306+650	RHS	Only shelter		BT	Good	N	Good		
25	306+800	RHS	115	4.5	BT	Good	Y	Good	N	
26	309+500	RHS	61	4.5	BT	Good	Y	Good	N	

Sl.no	Chainage	Side	Bus Bay Lane		Pavement		Entry / Exit (Taper Y/N)	Marking	Lighting	Remark
			Length (m)	Paved Width (m)	Type	Condition				
27	309+517	LHS	152	4.5	BT	Good	Y	Good	N	
28	311+057	LHS	Only shelter		BT	Good	N	Good	Panchayat street light	
29	312+100	LHS	Only shelter		BT	Good	N	Good	N	
30	312+230	RHS	Only shelter		BT	Good	N	Good	N	

**\*Note** – Good- All necessary facilities at Bus shelter were clean, Sign boards & Road markings are provided and are in good condition.  
Fair- Some Cleaning needs to be carried out and road markings has faded

#### 4.2.8 TRUCK LAY-BYES

There are Total 4 nos. of Truck lay byes (2 nos. of truck lay bye are provided on each side of the Main carriageway). Details are furnished in Table 4.9 below. Representative photographs of some of the Truck lay-bye are presented in figures below.



Fig 4.46 : Truck Lay Bye at Ch. 293+600 LHS



Fig 4.47: Truck Lay Bye at Ch. 298+867 LHS



Fig 4.48 : Truck Lay Bye at Ch. 298+860 LHS

Table 4.9: Details of Truck Lay bye

Sl. No	Chainage	Side	Truck Parking		Physical Island			Pavement		Cond. of Pucca Drain	Facilities provided		
			L (m)	Paved Width (m)	L (m)	W (m)	Cond.	Type	Cond.		Toilet	Road Marking/ Sinage	Lighting
1	293+660	LHS	100	11.00	100	2.4	Good	CC	Good	Good	Y	Fair	6
2	298+400	RHS	95	11.00	140	3.0	Good	CC	Good	Good	Y	Good	6
3	298+867	LHS	142	11.00	142	3.0	Good	CC	Good	Good	Y	Fair	6
4	311+800	RHS	95	11.50	140	3.0	Good	CC	Good	Good	Y	Good	6

#### 4.2.9 DRAIN

Pucca Drains are provided mostly provided along the slip/service road. Covered drains are provided in the built-up stretches towards the outer side of the service road. Uncovered Toe Drains are provided towards the inner side of the service road. Besides these earthen (unlined) drain are provided in the remaining stretches. The details of the drains are presented in **Table 4.10** below. Representative photographs of some of the Drains are presented in **Figures** below.



Fig 4.49 Drain at Ch. 283+000 LHS



Fig 4.50 Drain at Ch. 283+100 RHS



Fig 4.51 Drain at Ch. 292+600 LHS



Fig 4.52 Drain at Ch. 306+200 LHS



Fig 4.53 Drain at Ch. 306+543 LHS



Fig 4.54 Drain at Ch. 297+200 RHS

Table 4.10: Details of Pucca Drain

S.no	LHS RCC Drain			Transverse Median Drain			RHS RCC Drain		
	From	To	Condition	From	To	Condition	From	To	Condition
1	282+816	282+900	Good	283+400	284+000	Good	282+816	282+900	Good
2	282+900	283+000	Good	284+500	284+800	Good	282+900	284+000	Good
3	283+000	283+100	Good	285+450	25+800	Good	284+000	283+100	Good
4	283+100	283+200	Good	286+150	286+400	Good	283+100	283+200	Good
5	283+200	283+300	Good	287+500	287+900	Good	283+200	283+300	Good
6	283+300	283+400	Good	288+750	289+000	Good	283+300	283+400	Good
7	286+300	286+400	Good	289+000	289+350	Good	283+400	283+500	Good
8	286+400	286+500	Good	289+350	289+600	Good	283+500	283+600	Good
9	286+500	286+600	Good	290+600	290+700	Good	283+600	283+700	Good
10	286+600	286+700	Good	290+700	290+800	Good	283+700	283+800	Good
11	286+700	286+800	Good	291+180	291+400	Good	283+800	283+900	Good
12	286+800	286+900	Good	291+900	292+000	Good	283+900	284+000	Good
13	292+300	292+339	Good	292+000	292+100	Good	284+000	284+100	Good
14	292+500	292+600	Good	292+100	292+200	Good	284+100	284+200	Good

S.no	LHS RCC Drain			Transverse Median Drain			RHS RCC Drain		
	From	To	Condition	From	To	Condition	From	To	Condition
15	292+600	292+700	Good	292+200	292+300	Good	286+300	286+400	Good
16	293+510	293+810	Good	292+300	292+600	Good	286+400	286+500	Good
17	297+300	297+400	Good	296+400	296+500	Good	286+500	286+600	Good
18	297+400	297+500	Good	296+500	296+600	Good	286+600	286+700	Good
19	297+500	297+600	Good	297+300	297+400	Good	286+700	286+800	Good
20	297+600	297+700	Good	297+400	297+500	Good	286+800	286+900	Good
21	297+700	297+800	Good	297+500	297+600	Good	291+700	291+800	Good
22	297+800	297+900	Good	299+000	300+100	Good	291+901	293+000	Good
23	297+900	298+000	Good	300+150	300+200	Good	293+000	292+101	Good
24	298+696	299+038	Good	300+200	300+300	Good	292+100	292+200	Good
25	306+100	306+200	Good	300+300	300+400	Good	292+200	292+300	Good
26	306+200	306+300	Good	300+400	300+500	Good	292+300	292+400	Good
27	306+300	306+400	Good	300+500	300+600	Good	292+400	292+500	Good
28	306+400	306+500	Good	300+600	300+800	Good	292+500	292+600	Good
29	306+500	306+600	Good	301+850	302+000	Good	292+600	292+700	Good
30				302+000	302+600	Good	292+700	292+800	Good
31				305+700	305+900	Good	292+800	292+900	Good
32				306+100	306+200	Good	292+901	294+000	Good
33				306+200	306+300	Good	294+000	293+101	Good
34				306+300	306+400	Good	297+300	297+400	Good
35				306+400	306+500	Good	297+400	297+500	Good
36				306+500	306+600	Good	297+500	297+600	Good
37				306+600	306+800	Good	297+600	297+700	Good
38				309+800	310+000	Good	297+700	297+800	Good
39				311+100	311+300	Good	297+800	297+900	Good
41				311+300	311+400	Good	297+900	298+000	Good

S.no	LHS RCC Drain			Transverse Median Drain			RHS RCC Drain		
	From	To	Condition	From	To	Condition	From	To	Condition
42							298+253	298+548	Good
43							300+150	300+200	Good
44							300+200	300+300	Good
45							300+300	300+400	Good
46							300+400	300+500	Good
47							300+500	300+600	Good
48							307+300	307+400	Good
49							307+400	307+500	Good
50							307+500	307+600	Good
51							307+600	307+700	Good
52							311+653	311+948	Good





Fig 4.61 : Sign Boards at Ch. 309+400 LHS



Fig 4.62 : Sign Boards at Ch. 285+6050 LHS\*



Fig 4.63 : Sign Boards at Ch. 284+900 RHS



Fig 4.64 : Sign Boards at Ch.309+700 RHS



Fig 4.65 : Sign Boards at Ch. 285+938



Fig 4.66: Gaurd Stones at Ch. 309+700 (RHS)

Table 4.11: Details of Sign Boards

Sl. No	Chainage (km)	282-283	283-284	284-285	285-286	286-287	287-288	288-289	289-290	290-291	291-292	292-293	293-294	294-295
1	Junction ahead/ Direction inform.	2	2	4	4	10	-	7	7	4	1	7	3	-
2	Chevron	-	5	-	-	-	-	-	-	27	32	47	-	-
3	Route marker	2	-	1	-	-	2	5	1	1	-	1	-	-
4	T/Y/+ /Straggered	1	-	-	-	-	-	4	-	4	-	3	-	-
5	U-Turn	1	-	-	-	-	-	1	-	-	-	-	-	-
6	Accident prone area	2	-	-	-	-	-	1	1	-	-	-	-	-
7	Object Hazard Marker	1	2	5	2	3	2	8	1	4	5	9	3	2
8	Delineators	-	-	-	-	-	-	-	-	-	-	-	-	-
9	Gap in median	-	-	4	1	4	-	2	-	6	-	2	-	3
10	Solar Blinker	-	-	5	-	1	1	5	4	2	-	2	-	2
11	Left/ Right Hand Curve	-	2	2	-	-	2	2	1	2	2	2	-	-
12	Helpline No. /Emergency	1	2	-	-	1	2	-	-	1	-	2	-	-
13	Overhed gantry	1	-	-	-	-	-	-	-	-	-	-	-	-
14	Overhed gantry (VMS)				1		1							
15	Cantiliver gantry	-	-	1	1	2	-	-	-	-	-	-	-	-
16	Petrol Pump	-	-	-	-	-	-	-	-	-	-	1	-	-
17	Toll Plaza sign board	-	-	1	-	2	-	-	-	-	-	-	-	-

Sl. No	Chainage (km)	282-283	283-284	284-285	285-286	286-287	287-288	288-289	289-290	290-291	291-292	292-293	293-294	294-295
18	Speed Breaker/ Rumble strip	1	-	-	-	-	-	2	2	-	-	1	-	-
19	Toll rates/ Exempted vehicle	-	-	-	4	-	-	-	-	-	-	-	-	-
20	Pedestrian crossing	1	-	-	1	-	-	3	1	3	-	5	-	-
21	Guard Stones	140	201	192	136	77	154	39	21	42	273	18	63	31
22	Speed limit	4	-	-	-	2	-	2	2	2	1	1	-	-
23	No Entry	-	-	1	-	1	-	-	-	-	-	-	-	-
24	Truck Lay bye	-	-	-	-	-	-	-	-	-	-	-	1	-
25	Bus Stop	-	1	-	-	-	-	2	2	2	1	-	-	-
26	No Overtaking	1	-	-	-	-	-	1	1	-	-	-	-	-
27	No Stopping	2	-	-	-	-	-	2	1	-	1	-	-	-
29	Lane Merging	-	1	-	-	-	-	-	-	-	-	1	-	-
30	Electric line	-	-	-	-	-	-	-	-	-	-	-	1	1
Sl. No	Chainage (km)	295-296	296-297	297-298	298-299	299-300	300-301	301-302	302-303	303-304	304-305	305-306	306-307	307-308
1	Junction ahead/ Direction inform.	4	3	9	4	4	1	-	-	-	1	2	4	1
2	Chevron	-	-	-	19	38	-	-	-	-	-	19	5	-
3	Route marker	-	-	-	1	1	-	-	-	-	-	1	1	-
4	T/Y/+/Straggered	3	-	1	2	2	-	-	-	-	-	1	3	-
5	STOP	-	-	-	-	-	1	-	-	-	-	-	-	-
6	Accident prone area	-	-	-	1	-	-	-	-	-	-	1	-	1
7	Object Hazard Marker	6	5	6	9	6	7	4	5	4	7	5	4	6

Sl. No	Chainage (km)	295-296	296-297	297-298	298-299	299-300	300-301	301-302	302-303	303-304	304-305	305-306	306-307	307-308
8	Delineators	-	-	-	-	-	-	-	-	-	-	-	-	-
9	Gap in median	-	3	-	2	4	2	2	2	2	-	1	-	3
10	Solar Blinker	3	2	-	1	1	-	1	-	1	1	1	-	2
11	Left/ Right Hand Curve	-	-	-	2	2	-	-	-	-	-	2	2	1
13	Helpline No. /Emergency	-	-	2	-	1	-	-	-	2	1	1	-	2
14	Stray animal	1	-	-	-	-	-	-	-	-	-	-	-	-
15	Overhed gantry	-	-	-	-	1	-	-	-	-	-	1	-	-
16	Petrol Pump	-	-	-	1	-	-	-	-	-	-	-	-	-
17	Speed Breaker/ Rumble strip	-	-	-	-	-	2	-	-	-	-	1	-	1
18	Pedestrian crossing	-	1	-	2	1	-	-	-	-	-	1	2	-
19	Guard Posts	53	27	120	-	106	-	-	-	15	-	-	60	50
20	Speed limit	-	-	-	-	-	2	-	-	-	-	-	3	-
21	No Entry	-	-	-	-	-	1	-	-	-	-	-	-	-
22	Truck Lay bye	-	-	-	1	-	-	-	-	-	-	-	-	-
23	Bus Stop	-	-	-	-	-	-	-	-	-	-	-	2	-
24	U turn prohibited	2	-	-	-	-	-	-	-	-	-	-	-	-
25	One way	-	-	-	-	-	-	-	-	-	-	-	1	1
26	No Right/Left turn	-	-	-	-	-	2	-	-	-	-	-	-	-
27	No Overtaking	-	-	-	-	-	-	-	-	-	-	1	1	-
28	No Stopping	-	-	-	-	-	-	-	-	-	-	1	1	-
29	Lane Merging	-	-	-	-	-	2	-	-	-	-	-	2	1

Sl. No	Chainage (km)	308-309	309-310	310-311	311-312	312-313	313-314							
1	Junction ahead/ Direction inform.	-	7	1	2	5	1							
2	Route marker	1	3	-	-	2	-							
3	T/Y/+ /Straggered	-	3	-	-	3	-							
4	Object Hazard Marker	3	5	-	5	4	2							
5	Delineators	-	-	-	-	-	-							
6	Gap in median	-	4	-	4	-	-							
7	Solar Blinker	-	2	-	2	2	-							
8	Left/ Right Hand Curve	-	2	-	-	-	-							
9	Helpline No. /Emergency	-	1	-	-	1	-							
10	Overhed gantry	-	-	-	-	-	1							
11	Petrol Pump	1	-	-	-	-	-							
12	Pedestrian crossing	-	3	-	-	3	-							
13	Speed limit	-	-	1	-	-	-							
14	Bus Stop	-	1	-	-	2	-							

#### 4.2.11 METAL BEAM CRASH BARRIERS

The details of the Metal Beam Crash Barriers are furnished in **Table 4.12** below. At some of the locations the MBCB were damaged and repair works were also seen to be under progress. Representative photographs of some of the MBCB are presented in **Figures** below.



Fig 4.67 MBCB at Ch.285+480 LHS



Fig 4.68 MBCB at Ch.290+400 LHS



Fig 4.69 MBCB at Ch.310+500 LHS



Fig 4.70 MBCB at Ch.306+300 LHS



Fig 4.71 MBCB at Ch. 306+000 LHS



Fig 4.72 MBCB at Ch. 305+600 LHS

Table 4.12: Details of Metal Beam Crash Barriers.

Sl. No	Chainage		Length LHS (m)	Length Median (m)	Length RHS (m)	Condition (length of damage)
	From	To				
1	283.000	284.000	317		135	Good
2	284.000	285.000	352	393	120	Good
3	285.000	286.000	109	117	165	Damaged - 10m (LHS)
4	286.000	287.000	100	142		Good
5	287.000	288.000			117	Good
6	288.000	289.000	742	297	700	Good
7	289.000	290.000	395	90	500	Good
8	290.000	291.000	383	292.13	302	Damaged - 20m (LHS)
9	291.000	292.000	230		528	Good
10	292.000	293.000	196	1195	66	Good
11	293.000	294.000		28		Good
12	294.000	295.000		389		Good
13	295.000	296.000	290			Good
14	296.000	297.000	400	230	500	Good
15	297.000	298.000	100		460	Good
16	299.000	300.000	500	220	660	Good
17	300.000	301.000	800		1000	Good
18	301.000	302.000	600	280	700	Good
19	302.000	303.000	80		880	Good
20	303.000	304.000	300	310	200	Good
21	304.000	305.000	1000		1000	Good
22	305.000	306.000	700	133	620	Good
23	306.000	307.000	80		400	Good
24	307.000	308.000		233		Good
25	309.000	310.000	80	254	80	Good
26	310.000	311.000	500		200	Good
27	311.000	312.000	300	235	100	Good
28	312.000	313.000		234		Good

#### 4.2.12 PEDESTRIAN GUARD RAIL

Details of the Pedestrian Guard Rails are furnished in **Table 4.13** below.

**Table 4.13: Condition of Pedestrian Guard Rails**

Sl. No	Chainage From	Chainage To	Side	Length (m)	Remark
1	292.592	292.708	LHS	116	Pochampad Village
2	292.788	292.912	LHS	124	
3	292.608	292.738	RHS	130	
4	292.788	292.912	RHS	124	
5	292.987	293.070	RHS	83	

#### 4.2.13 LIGHTING

Details of Lighting provided on the Project Road are furnished in **Table 4.14** below. Representative photos of same are shown in **Figures** below.



**Fig 4.73** Lighting at Ch. 288+900



**Fig 4.74** Lighting at Ch. 292+800



**Fig 4.75** Lighting on service Road at Ch. 298+600

**Table 4.14: Details of Lighting**

S.no	Chainages	Side	Type of lighting	Numbers	Remarks
1	285+939	B/S	High mast	4	2 on each side
1	292+750	RHS	High mast	1	
2	299+200	RHS	High mast	1	
3	306+000	RHS	High mast	1	
4	293+660	LHS	Single arm	6	
5	298+400	RHS	Single arm	6	
6	298+867	LHS	Single arm	6	
7	311+800	RHS	Single arm	6	
8	283+402	BS	Lamp	6	Not functional
9	286+622	BS	Lamp	6	Not functional
10	292+039	BS	Lamp	6	Not functional
11	295+757	BS	Lamp	6	
12	297+666	BS	Lamp	6	
13	300+914	BS	Lamp	6	
14	301+939	BS	Lamp	6	
15	306+202	BS	Lamp	6	
16	311+120	BS	Lamp	6	
17	296+173	BS	Lamp	6	
18	300+301	BS	Lamp	6	Not functional
19	288+800 to 288+900	Median	Double arm solar	1	
20	288+900 to 289+000	Median	Double arm solar	3	
21	289+000 to 289+100	Median	Double arm solar	3	
22	289+100 to 289+200	Median	Double arm solar	1	

#### 4.2.14 KM STONES

Kilometer stones are generally seen to be available on the project road and are seen to be in Good condition. Some hectometre stones were found to be missing.

### 4.3 OVERVIEW OF STRUCTURES

Detailed inventory of structures has been carried out. It is found that most of the structures are in Good condition with requirement pertaining mainly to routine maintenance and cleaning. The summarized details of the Inventory & Condition Survey for various structures are brought out in subsequent paras.

#### 4.3.1 MAJOR BRIDGES

##### 4.3.1.1 MAJOR BRIDGE STRUCTURE DETAILS

There are two Major Bridges on the Project Road. The details of these are furnished in Table 4.15 below. The condition survey of these bridges on both LHS/RHS carriageways was conducted by visual inspection.

Table 4.15: Details of Major Bridges

S. No	Location	Chainage	Str. No.	Type of Str.	Span Arrangement (L/R)	Side	Overall Length (m)	Carriageway width (m)	Overall width(m)	Type of Super Structure	Type of Sub Structure	Railing / Crash Barrier
1	Near Soan village on Godavari river	289+834	290/1	MjB	36X21.95m	L	790.2 m	9.0 m	12.0 m	RCC Deck Slab with PSC Girder	RCC Wall Type Abutments & RCC Wall type piers	RCC Crash Barrier
					36X21.95m	R	790.2 m	9.0 m	12.0 m	RCC Deck Slab with PSC Girder	RCC Wall Type Abutments & RCC Wall type piers	RCC Crash Barrier

S. No	Location	Chainage	Str. No.	Type of Str.	Span Arrangement (L/R)	Side	Overall Length (m)	Carriageway width (m)	Overall width(m)	Type of Super Structure	Type of Sub Structure	Railing / Crash Barrier
2	Near Kisan nagar Village	303+462	304/3	MjB	(2X20.745m) + (2X21.945 m)	L	85.38 m	9.0 m	12.0 m	RCC Deck Slab with PSC Girder	RCC Wall Type Abutments & RCC Wall type piers	RCC Crash Barrier
					(2X20.745m) + (2X21.945 m)	R	85.38 m	9.0 m	12.0 m	RCC Deck Slab with PSC Girder	RCC Wall Type Abutments & RCC Wall type piers	RCC Crash Barrier

#### 4.3.1.2 OBSERVATION ON THE CONDITION OF THE MAJOR BRIDGES

Representative photographs of the Major bridges are shown in Figures below. Requirement of some minor repairs has been identified after general visual observation, as per the detail below.

**Major Bridge (RHS) at Ch.289+834 (36X21.95m):** Rubber seals of expansion joints are seen to be damaged.



Fig. 4.76: Major Bridge at Ch. 289+834



Fig. 4. 77: Major Bridge at Ch. 289+834



Fig. 4. 78: Major Bridge at Ch. 289+834



Fig. 4.79 : Major Bridge at Ch. 303+462



Fig. 4. 80: Major Bridge at Ch. 303+462



Fig. 4.81 : Major Bridge at Ch. 303+462

## 4.3.2 MINOR BRIDGES

### 4.3.2.1 MINOR BRIDGE STRUCTURE DETAILS

There are 6 numbers of Minor Bridges on the Project Road. Details for the Minor Bridges are furnished in Table 4.16 below.

Table 4.16: Details of Minor Bridges

S. No.	Chainage	Side	Span Arrangement	Overall Length (m)	Carriageway Width(m)	Overall width (m)	Type of Super Structure	Type of Substructure	Safety Barrier
1	284+360	LHS	1X8m	8	11	12	RCC Deck Slab	PCC Gravity Wall Type Abutments	RCC Crash Barriers
		RHS	1X8m	8	11	12	RCC Deck Slab	PCC Gravity Wall Type Abutments	RCC Crash Barriers

S. No.	Chainage	Side	Span Arrangement	Overall Length (m)	Carriageway Width(m)	Overall width (m)	Type of Super Structure	Type of Substructure	Safety Barrier
2	292+920	LHS	3X21.48m	64.44	11	22	RCC Deck Slab withPSC Girder	RCC Wall Type Abutments & RCC Wall type piers	RCC Crash Barriers
		RHS	3X21.48m	64.44	11	22	RCC Deck Slab withPSC Girder	RCC Wall Type Abutments & RCC Wall type piers	RCC Crash Barriers
3	298+580	LHS	2X16m	32	11	12	RCC Deck Slab with PSC Girder	RCC Wall Type Abutments & RCC Wall type piers	RCC Crash Barriers
		RHS	2X16m	32	9	12	RCC Deck Slab withPSC Girder	RCC Wall Type Abutments & RCC Wall type piers	RCC Crash Barriers
4	300+099	LHS	2X6.5(skew) X3.5	42.5 (clear)	9	33m (straight)	RCC Box type	RCC Box type	MBCB
		RHS	2X6.5 (skew) X3.5	42.5 (clear)	9	33 (straight)	RCC Box type	RCC Box type	MBCB
5	305+528	LHS	2X7X3	16	9	27	RCC Box type	RCC Box type	MBCB
		RHS	2X7X3	16	11	27	RCC Box type	RCC Box type	MBCB
6	312+904	LHS	1x9	9	11	12	RCC Solid Slab	RCC Wall Type Abutments	RCC Crash Barriers
		RHS	1X9	9	11	12	RCC Solid Slab	RCC Wall Type Abutments	RCC Crash Barriers

#### 4.3.2.2 OBSERVATION ON THE CONDITION OF THE MINOR BRIDGES

Representative photographs of the Minor bridges are shown in Figures below. The condition of the Minor Bridges are found to be in Good condition. Some of the Critical site observations made in respect of some of structures are summarised below.

a) **Minor Bridge (RHS) at Ch.284+360 (1x8m)**

Some Sagging in observed on the top slab but no cracks are observed which indicates that this defect is due to the poor workmanship during construction but is not leading to any structural damage.

b) **Minor Bridge (RHS) at Ch.292+920 (3X21.48m)**

The Old masonry structure needs to dismantled to avoid obstruction in the waterway.

c) **Minor Bridge (RHS) at Ch.298+580 (2x16m)**

The Old masonry structure needs to dismantled to avoid obstruction in the waterway.



Fig. 4.82 : Minor Bridge at Ch.284+360



Fig. 4. 83: Minor Bridge at Ch.284+360



Fig. 4.84: Minor Bridge at Ch.284+360



Fig. 4.85 : Minor Bridge at Ch. 298+580



Fig. 4.86 : Minor Bridge at Ch.305+528



Fig. 4.87 : Minor Bridge at Ch.305+528

### 4.3.3 VEHICULAR UNDERPASSES (VUP)

There are 5 nos. VUP on the project road and are in Good condition. The details of the structures are mentioned in Table 4.17 below.

Table 4.17: Details of Vehicular Underpasses

S. No.	Chainage	Span Arrangement	Overall width of Structure	Type of Super Str.	Safety Barrier
1	286+500	1X12X5.5	29.5m	Box Type	RCC Crash Barriers
2	296+173	1X12X5.5	27.5 m	Box Type	RCC Crash Barriers
3	300+301	1X12X5.5	34.5 m	Box Type	RCC Crash Barriers
4	302+625	1X12X5.5	29.9 m	Box Type	RCC Crash Barriers
5	304+977	1X12X5.5	29.9 m	Box Type	RCC Crash Barriers



Fig. 4.88 : VUP at Ch. 286+500



Fig. 4. 89: VUP at Ch. 296+190



Fig. 4.90 : VUP at Ch. 300+200



Fig. 4.91 : VUP at Ch. 300+301



Fig. 4.92 : VUP at Ch. 300+301



Fig. 4.93 : VUP at Ch. 304+977

#### 4.3.4 PEDESTRIAN UNDERPASSES (PUP)

There are 12 nos. of PUPs on the project road and are in Good condition. The details of the structures are mentioned in Table 4.18 below.

**Table 4.18: Details of Pedestrian Underpasses**

Sl. No.	Chainage	Span Arrang.	Width of Structure	Type of Super Structure	Safety Barrier
1	283+402	1X5X3	27 m	Box Type	RCC Crash Barriers
2	286+622	1X5X3	27 m	Box Type	RCC Crash Barriers
3	292+039	1X5X3	27.5 m	Box Type	RCC Crash Barriers
4	295+757	1X5X3	27.5 m	Box Type	RCC Crash Barriers
5	297+666	1X5X3	27.5 m	Box Type	RCC Crash Barriers
6	299+892	1X5X3	27.5 m	Box Type	RCC Crash Barriers
7	300+914	1X5X3	27.5 m	Box Type	RCC Crash Barriers
8	301+939	1X5X3	27.5 m	Box Type	RCC Crash Barriers
9	303+922	1X5X3	27.5 m	Box Type	RCC Crash Barriers
10	304+622	1X6.5X4.5	27.5 m	Box Type	RCC Crash Barriers
11	306+202	1X5X3	27.5 m	Box Type	RCC Crash Barriers
12	311+120	1X5X3	27.5 m	Box Type	RCC Crash Barriers



Fig. 4.94 : PUP at Ch. 283+402



Fig. 4.95 : PUP at Ch. 299+892



Fig. 4.96 : PUP at Ch. 286+622



Fig. 4.97 : PUP at Ch.311+120



Fig. 4.98: PUP at Ch. 306+202



Fig. 4.99 : PUP at Ch. 300+914

### 4.3.5 CULVERTS

The total 83 number of culverts are there on the Project Road and they are summarized in Table 4.19 below.

#### 4.3.5.1 CULVERT STRUCTURE DETAILS

The total number of culverts on the Project Road are summarized in Table 4.19 below.

**Table 4.19: Details of Culverts on the Project Road**

Sl. No.	Type of Structure	Number
1	Slab Culvert	8
2	Box Culvert	22
3	Hume Pipe Culvert	55

#### 4.3.5.2 OBSERVATIONS IN RESPECT OF BOX/ SLAB CULVERT

Most of the culverts are in good condition some repair/maintenance work are required to be carried out on some culverts. The details of such culverts are summarized in Table 4.20. In most of the culvert it is observed that general cleaning of vegetation and garbage from the water way is required. In some structures it is found that Object Hazard Markers are missing.



**Fig. 4.100 : Box Culvert at Ch. 286+917**



**Fig. 4.101: Slab Culvert at Ch. 291+545**



**Fig. 4.102: Box Culvert at Ch. 297+728**



Fig. 4.103 : Box Culvert at Ch. 299+577



Fig.4.104: Slab Culvert at 301+387



Fig. 4.105 : Box Culvert at Ch. 308+214

Table 4.20: Observations highlighting repair and maintenance needs for Box/Slab Culverts

Sl. No.	Chainage	Type of Structure	Span Arrangement	Observations on LHS side	Observations on RHS side
1	286+917	BC	1X2m	Stone boulder pitching covered with vegetation.	Stone boulder pitching covered with vegetation.
2	299+577	BC	1X2m	Honeycombing observed in crash barrier. General cleaning required over pitching.	Honey combing observed in crash barrier.
3	304+006	BC	1X3m	General cleaning required over pitching.	Honey combing observed over box opening.
4	308+214	SC	1x4m	Vegetation to be cleared from the waterway. Stone Pitching is covered with vegetation.	Top Edge of Slab is damaged and the reinforcement is exposed in about 4m length. Minor repair works are required. Stone Pitching is covered by vegetation.

### 4.3.5.3 OBSERVATIONS IN RESPECT OF HUME PIPE CULVERTS

It is observed that the condition of the Hume Pipe Culverts is generally good, however on some Pipe culverts the water way is seen to be blocked and there is a requirement of removal of vegetation/garbage to clear the water way. The details in this regard are summarized in Table 4.21. Representative photos of the Pipe Culverts are shown in Figures below.



Fig. 4.106 : HPC at Ch. 283+632(LHS)



Fig. 4.107: HPC at Ch. 295+165 (LHS).



Fig. 4.108 : HPC at Ch. 290+600



Fig. 4.109 : HPC at Ch. 286+030



Fig. 4.110 : HPC at Ch. 291+000



Fig. 4.111 : HPC at Ch. 305+900

**Table 4.21: Observations highlighting repair and maintenance needs for Hume Pipe Culverts**

Sl. No.	Chainage	Span Arrangement	Observations on LHS side	Observations on RHS side
1	283+632	1x1.2m	Pipe not functional and is buried completely and need to be cleared.	Waterway obstructed by debris.
2	285+875	1x1.2m	Water way obstructed with bushes.	Waterway is obstructed with bushes, garbage, and debris.
3	287+167	2x1.2m	Water way obstructed with bushes.	Waterway obstructed with bushes.
4	288+448	3x1.2m	Good condition	Water way obstructed with bushes and garbage. Backfilling eroded.
5	292+062	1x1.2m	Dumped garbage obstructing the Waterway needs to be cleared.	Bushes and debris blocking the waterway and need to be cleared.
6	296+888	2x1.2m	Waterway obstructed with garbage and debris.	Waterway obstructed by garbage and bushes.
7	297+313	1x1.2m	Good condition	Pipe Opening obstructed by filled up soil
8	298+881	1x1.2m	Pipe Opening obstructed by filled up soil	Pipe Opening obstructed by filled up soil
9	304+347	1x1.2m	Waterway obstructed by dumped pipe	Good condition
10	311+439	2x1.2m	Good condition	Waterway obstructed by bushes and garbage.
11	312+737	1x1.2m	Good condition	Water way obstructed by bushes.
12	313+413	1x1.2m	Pipe Opening obstructed by filled up soil	Waterway obstructed by garbage.

**Note:** As the cleaning of structures is being carried out twice in a year i.e before and after monsoon.

## **CHAPTER 5.0: OPERATION & MAINTENANCE**

### **5.1 OPERATION & MAINTENANCE - REQUIREMENTS OF CONCESSION AGREEMENT**

The Scope of Works for O&M stage has been mentioned in the Schedule-L of the Concession Agreement and also the O&M Manual as described earlier. The O&M Manual is a guideline to assist the Concessionaire. Certain forms and procedures are annexed as part of the Manual for facilitating proper supervision and implementation of various O&M activities. The Concessionaire is expected to cover the following two aspects during the entire Operations Period.

#### **a) OPERATIONS PART**

This includes ensuring smooth and uninterrupted flow of traffic during normal operating conditions, functioning of patrolling system, functioning of rescue and medical aid services, functioning of the Project Facilities, public toilets and other sanitary facilities and solid waste disposal system.

#### **b) MAINTENANCE PART**

This includes maintaining the Project Road in traffic worthy conditions and the Project's Ancillary Facilities in usable condition satisfying the performance criteria as provided in the Concession Agreement throughout the Concession Period through regular maintenance and preventive maintenance of the various items and elements of the Project Highway.

### **5.2 PERIODIC MAINTENANCE STRATEGY**

Periodic Maintenance for the carriageway shall be carried out as required and renewal layer shall be laid every 5 years after the initial construction (from COD). This periodic maintenance shall also include profile corrective course of overlays with the periodic renewal of the wearing course of the road pavement. Paved shoulders shall also be treated in similar manner as applicable to the main carriageway lanes. The periodic renewal shall result in improvement of the riding quality and road roughness value shall be restored to meet the relevant standards. As per the above provisions of the Concession Agreement since the COD has been achieved in the year 2009 and the Concession Period ends in October 2027, the periodic maintenance activity needs to be carried out in the years 2014, 2019 & 2024. The Periodic maintenance required in the years 2014 and 2019 have been completed by the Concessionaire. The First periodic maintenance (2014) was delayed and completed in December 2015 instead of 2014 and the Second periodic maintenance was completed in September 2019.

As per Article XXIV of Concession Agreement "the Concessionaire and IE shall jointly inspect (Initial Inspection) the Project Highway and Project Facilities 30-36 months prior to expiry of Concession Period. Upon agreement on proposals for renewal works if any, the Concessionaire shall carry out the renewal works at his own cost. The Second Inspection shall be carried out 9-12 months prior to expiry of Concession Period. From the date which is 2 years prior to the expiry of the Concession Period a sum equal to 15% of the Annuity or a

higher sum estimated by the Independent Consultant for Renewal Works will be retained in the Escrow Account. If following the Second Inspection, it is agreed or determined that no renewal works are required, then within 14 days of such agreement, 50% of the sums retained in accordance with Clause 34.11 shall be released from the Escrow Account to the Concessionaire. Within 14 days of issuance of Vesting Certificate full amount will be released. Road marking as specified and other roadside features shall also be restored to meet the relevant standards". Thus the over all strategy of the concessionaire should be to carryout the Routine and Periodic Maintenance as per the required frequency so that no major requirements come up at the time of issuance of Vesting Certificate.

### 5.3 ROUTINE PAVEMENT MAINTENANCE

The pavement shall be treated for various distresses occurring as per cl. 4.4.7. of Sch. L of the Concession Agreement as mentioned in Table 5.1 below:

**Table 5.1: Pavement Maintenance criteria**

Sl. no.	Type of Distress	Limiting value of Distress	Treatment of Distress
1 a)	Cracking of Bituminous pavement i.e hairline, alligator, longitudinal, transverse, shrinkage, reflective and edge cracking, linear & slippage etc.	For any 50 m section of the pavement the cracked area shall not exceed 0.5 sq.m. at a place.	Treatment needs to be done within 7 days after their detection.
1 b)		Width of crack not less than 3 mm and is resulting in settlement of pavement upto 10 mm in depth and exceeding 0.5 sq.m.	Crack shall be repaired by slurry seal as per MORTH specification 516.
1 c)		Width of crack not less than 3 mm and is resulting in settlement of pavement exceeding 10 mm in depth and exceeding 0.5 sq.m	Area shall be repaired by patching as per MORTH specification 3004.
1 d)	Alligator crack		Patching upto full depth.
1 e)	Slippage cracks		Repair by removing the affected bituminous layer and replacing it with surface patch.
1 f)	Edge cracking		Reconstruction of the shoulder with good quality material.
2	Rutting	For any 50 m section of the pavement, ruts shall not be	Treatment shall be done within 15 days after their

Sl. no.	Type of Distress	Limiting value of Distress	Treatment of Distress
		deeper than 10 mm and length shall not be more than 5 m	detection as per IRC:82-1982 specifications.
3	Corrugations and Shoving	Damage exceeds 1 sq.m at any place and depth /height of corrugation /shoving exceeds 10 mm.	Shall be rectified /corrected within 2 days after its detection as per IRC:82-1982 specifications.
4	Settlement & Great depression	Damage exceeds 1 sq.m at any place and depth is within 10 mm.	Shall be rectified /corrected within 3 days after its detection as per IRC:82-1982 specifications.
5	Upheaval or Swell	For any 50 m section of the pavemnet, upheaval or swell shall not exceed 0.5 sq.m, if height is nore than 10 mm.	Shall be treated within 7 days after detection as per IRC:82-1982.
6	Ravelling	For any 50 m section of pavement, if raveling of bitumenous surface is not more than 3% the pavemnet surface of that section and ravelled area does not exceed 1 sq.m. at a place.	Shall be rectified within 7 days after their detection by slurry seal treatment in accordance with MORT&H specification.
7	Potholes	No potholes shall be on the pavement surface irrespective of the size and depth.	Potholes shall be repiared within 2 days after their detection.

### 5.3.1 DETAILS OF LATEST BBD TESTS

The Concessionaire has been conducting the BBD studies in the Operation period last one has been conducted in Dec. 2021. Based on the information provided by the Concessionaire, bituminous overlay on the entire Project Road has been carried out twice (2015 & 2019) since COD and next overlay is being planned by the Concessionaire in FY 2024 and FY 2025.

The Benkelman Beam Deflection studies have been carried out by the Concessionaire in 13<sup>th</sup> Jan to 16<sup>th</sup> Dec. 2021, the report of which has been submitted by the Concessionaire. Summary of the same has been presented in Table 5.2 below.

**Table 5.2: Summary of Latest BBD Test**

Sr. No.	Chainage		Side	Characteristic Deflection	Side	Characteristic Deflection
	From	To				
1	282.600	283.600	LHS	0.574	RHS	0.527
2	283.600	284.600	LHS	0.488	RHS	0.550
3	284.600	285.600	LHS	0.469	RHS	0.485
4	285.600	286.600	LHS	0.416	RHS	0.496
5	286.600	287.600	LHS	0.422	RHS	0.570
6	287.600	288.600	LHS	0.428	RHS	0.480
7	288.600	289.600	LHS	0.485	RHS	0.504
8	289.600	290.600	LHS	0.432	RHS	0.482
9	290.600	291.600	LHS	0.438	RHS	0.454
10	291.600	292.600	LHS	0.422	RHS	0.514
11	292.600	293.600	LHS	0.591	RHS	0.459
12	293.600	294.600	LHS	0.479	RHS	0.478
13	294.600	295.600	LHS	0.456	RHS	0.491
14	295.600	296.600	LHS	0.482	RHS	0.464
15	296.600	297.600	LHS	0.445	RHS	0.496
16	297.600	298.600	LHS	0.457	RHS	0.519
17	298.600	299.600	LHS	0.558	RHS	0.516
18	299.600	300.600	LHS	0.424	RHS	0.519
19	300.600	301.600	LHS	0.470	RHS	0.451
20	301.600	302.600	LHS	0.445	RHS	0.543
21	302.600	303.600	LHS	0.474	RHS	0.453
22	303.600	304.600	LHS	0.463	RHS	0.450
23	304.600	305.600	LHS	0.420	RHS	0.428
24	305.600	306.600	LHS	0.478	RHS	0.513
25	306.600	307.600	LHS	0.501	RHS	0.511
26	307.600	308.600	LHS	0.498	RHS	0.454
27	308.600	309.600	LHS	0.479	RHS	0.483
28	309.600	310.600	LHS	0.480	RHS	0.488
29	310.600	311.600	LHS	0.422	RHS	0.500
30	311.600	312.600	LHS	0.443	RHS	0.503
31	312.600	313.500	LHS	0.521	RHS	0.512
			<b>Average</b>	<b>0.469</b>		<b>0.493</b>

As per the Sch. L of the Concession Agreement, wherever the characteristic deflection exceeds 1.2 mm a bituminous overlay shall be provided appropriately designed according to IRC 81-1997. From the above Table 5.2, it can be seen that the deflection values are within the acceptable limits. Thus, there is no requirement of any overlay as per the BBD test results.

### 5.3.2 LATEST ROUGHNESS MEASUREMENT STUDIES

Roughness Measurement by using Fifth Wheel Bump Integrator is being done by the Concessionaire on regular intervals as mentioned in the O&M Manual. The O&M Manual specifies that Concessionaire has to ensure that at no point during the Operations Period, the roughness in the road surface shall exceed the prescribed acceptable Roughness Values given in para 4.3.1 of the Concession Agreement, i.e. surface roughness shall not exceed 3000mm/km during the service life of pavement at any time. A renewable coat of bituminous concrete shall be laid every 5 year after initial construction or where the roughness value reaches 3000 mm /km which ever is earlier to bring it to the initial value of 2000 mm/km.

The latest Roughness Measurement Report, made available to us is for studies done on 16<sup>th</sup> Dec. 2021. The Calibrated Roughness values mm/km for both the carriageways have been represented in **Table 5.3** below.

**Table 5.3: Latest Roughness Measurement Values using Fifth Wheel Bump Integrator**

S.No.	Chainage from	Chainage to	LHS	RHS
1	282.600	283.000	1586	1796
2	283.000	284.000	1831	1770
3	284.000	285.000	1863	1863
4	285.000	286.000	1988	1866
5	286.000	287.000	1828	1916
6	287.000	288.000	1789	1845
7	288.000	289.000	1961	1882
8	289.000	290.000	1910	2167
9	290.000	291.000	1821	1999
10	291.000	292.000	1793	1896
11	292.000	293.000	1966	1994
12	293.000	294.000	1812	1807
13	294.000	295.000	1798	1798
14	295.000	296.000	1826	1812
15	296.000	297.000	1756	1789
16	297.000	298.000	1793	1803
17	298.000	299.000	1849	1877
18	299.000	300.000	1868	1896
19	300.000	301.000	1947	1789
20	301.000	302.000	1784	1835
21	302.000	303.000	1961	1863
22	303.000	304.000	1831	1868
23	304.000	305.000	1938	1849
24	305.000	306.000	1873	1868
25	306.000	307.000	1775	1891

S.No.	Chainage from	Chainage to	LHS	RHS
26	307.000	308.000	1779	1826
27	308.000	309.000	1756	1817
28	309.000	310.000	1789	1891
29	310.000	311.000	1765	1835
30	311.000	312.000	1849	1896
31	312.000	313.000	1793	1891
32	313.000	313.500	1835	1667
<b>Maximum Values</b>			<b>1988</b>	<b>2167</b>
<b>Average Values</b>			<b>1834</b>	<b>1861</b>

As seen from above, the maximum Roughness Values on LHS and RHS carriageway are seen to be 1988 mm/km and 2167 mm/km respectively which are within the Acceptable Range. The pavement surface on an average is seen to have a Roughness Value of 1834 mm/km and 1861 mm/km on LHS and RHS respectively which also are within the Acceptable Range.

#### 5.4 REVIEW OF DESIGN MSA CALCULATION AND RESIDUAL LIFE OF PAVEMENT

##### 5.4.1 Design MSA calculations as per initial Pavement Design Report.

The growth rates for MSA calculation adopted are as per Table 5.4 below.

**Table 5.4: Growth rate of vehicles as per Pavement Design Report**

Growth Rate of Vehicle Class in percentage				
Year (2005)	Bus	LCV	Truck	
			2-Axle	4-6 Axle
2005 to 2013	3.0	8.0	8.0	8.0
2014-2023	3.0	7.0	7.0	7.0
2023-2029	2.5	6.5	6.5	6.5

VDF and Commercial Vehicles per day adopted as per Traffic Survey carried out in 2005-2006 (Pavement Design Report) are brought out in Table 5.5 below.

**Table 5.5: CVPD & VDF as per Pavement Design Report**

Vehicle category	Standard Bus	LCV	2 Axle Truck	4-6 Axle
<b>Number of vehicles</b>	441	330	1849	77
<b>VDF</b>	<b>0.70</b>	<b>0.34</b>	<b>2.48</b>	<b>4.75</b>

The calculation of design MSA on the basis of the above parameters as considered in the Pavement Design Report is brought out in Table 5.6 below:

**Table 5.6: MSA calculation as per Pavement Design Report**

Design Period	Concession Period	Year	Standard Bus	LCV	2 Axle Truck	4-6 Axle	CVPD	E.S.A.L	Cumulative M.S.A.
	<b>Base Year</b>	2005	441	330	1849	77	2697	733838	
Construction Period		2006	454	356	1997	83	2891	790432	<b>0.79</b>
	1	2007	468	385	2157	90	3099	851491	<b>1.64</b>
	2	2008	482	416	2329	97	3324	917369	<b>2.56</b>
1	3	2009	496	449	2516	105	3566	988450	<b>3.55</b>
2	4	2010	511	485	2717	113	3826	1065148	<b>4.61</b>
3	5	2011	527	524	2934	122	4107	1147911	<b>5.76</b>
4	6	2012	542	566	3169	132	4409	1237221	<b>7.00</b>
5	7	2013	559	611	3422	143	4734	1333600	<b>8.33</b>
6	8	2014	575	654	3662	152	5043	1424811	<b>9.76</b>
7	9	2015	593	699	3918	163	5373	1522343	<b>11.28</b>
8	10	2016	610	748	4193	175	5726	1626636	<b>12.91</b>
9	11	2017	629	801	4486	187	6102	1738160	<b>14.64</b>
10	12	2018	648	857	4800	200	6504	1857422	<b>16.50</b>
11	13	2019	667	917	5136	214	6934	1984960	<b>18.49</b>
12	14	2020	687	981	5496	229	7392	2121350	<b>20.61</b>
13	15	2021	708	1049	5880	245	7882	2267212	<b>22.87</b>
14	16	2022	729	1123	6292	262	8406	2423204	<b>25.30</b>
15	17	2023	751	1202	6732	280	8965	2590035	<b>27.89</b>
16	18	2024	770	1280	7170	299	9518	2755510	<b>30.64</b>
17	19	2025	789	1363	7636	318	10106	2931669	<b>33.57</b>
18	20	2026	809	1451	8132	339	10731	3119204	<b>36.69</b>
19	21	2027	829	1546	8661	361	11396	3318854	<b>40.01</b>

**5.4.2 Alternative Design MSA calculations considering uniform growth rate of 5%:**

In this alternative design calculation, the details of the commercial vehicles and VDF have been taken as per the pavement design report however uniform growth rate of 5% has been considered throughout the concession period. The MSA projection on this basis is furnished in the Table 5.7 below.

**Table 5.7: MSA Calculation for Fixed 5% growth rate**

Design Period	Concession Period	Year	Standard Bus	LCV	2 Axle Truck	4-6 Axle	CVPD	E.S.A.L	Cumulative M.S.A.
	<b>Base Year</b>	2005	441	330	1849	77	2697	733838	
Construction Period		2006	463	347	1941	81	2832	770530	<b>0.77</b>
	1	2007	486	364	2039	85	2973	809056	<b>1.58</b>
	2	2008	511	382	2140	89	3122	849509	<b>2.43</b>
1	3	2009	536	401	2247	94	3278	891985	<b>3.32</b>
2	4	2010	563	421	2360	98	3442	936584	<b>4.26</b>

Design Period	Concession Period	Year	Standard Bus	LCV	2 Axle Truck	4-6 Axle	CVPD	E.S.A.I	Cumulative M.S.A.
3	5	2011	591	442	2478	103	3614	983413	5.24
4	6	2012	621	464	2602	108	3795	1032584	6.27
5	7	2013	652	488	2732	114	3985	1084213	7.36
6	8	2014	684	512	2868	119	4184	1138424	8.50
7	9	2015	718	538	3012	125	4393	1195345	9.69
8	10	2016	754	564	3162	132	4613	1255112	10.95
9	11	2017	792	593	3321	138	4843	1317868	12.26
10	12	2018	832	622	3487	145	5086	1383761	13.65
11	13	2019	873	653	3661	152	5340	1452949	15.10
12	14	2020	917	686	3844	160	5607	1525597	16.63
13	15	2021	963	720	4036	168	5887	1601876	18.23
14	16	2022	1011	756	4238	176	6182	1681970	19.91
15	17	2023	1061	794	4450	185	6491	1766069	21.68
16	18	2024	1114	834	4672	195	6815	1854372	23.53
17	19	2025	1170	876	4906	204	7156	1947091	25.48
18	20	2026	1229	919	5151	215	7514	2044445	27.52
19	21	2027	1290	965	5409	225	7889	2146668	29.67

### 5.4.3 Alternative Design MSA calculations based on the assessed Traffic growth rate on the basis of Present Toll Data.

As per Dec. MPR the details of daily traffic are furnished in Table 5.8 under:

**Table 5.8 Toll Data from MPR Dec 21**

Vehicle category	Car	LCV	Bus / Truck	3 Axle Truck	MAV	OSV
Dec-21 (Monthly)	125531	17131	64469	49220	71743	84
Dec-21 (Avg. daily)	4049	552	2080	1588	2314	3

The tentative assessment of growth rates which could have led to increase in traffic level from 2005 to 2021 has been made and is furnished in Table 5.9 below:

**Table 5.9: Assessed Traffic growth rate**

Vehicle category	Bus	LCV	2-Axle /3- Axle	4-6 Axle
2005-06 (Avg. daily)	441	330	1849	77
2020-21 (Avg. daily) *	504	371	2091	1594
Growth Rates	0.91	0.80	0.81	22.40

\* SCF of 0.9 has been considered for the month of January

The MSA projection based on these assessed growth rates are brought out in Table 5.10 below:

**Table 5.10: MSA calculations based on Present Toll data**

Design Period	Concession Period	Year	Standard Bus	LCV	2 Axle Truck	4-6 Axle	CVPD	E.S.A.L	Cumulative M.S.A.
	<b>Base Year</b>	2005	441	330	1849	77	2697	733838	
Construction Period		2006	445	333	1864	94	2736	750558	<b>0.75</b>
	1	2007	449	335	1879	115	2778	769832	<b>1.52</b>
	2	2008	453	338	1894	141	2826	792224	<b>2.31</b>
1	3	2009	457	341	1909	173	2879	818422	<b>3.13</b>
2	4	2010	461	343	1924	212	2940	849269	<b>3.98</b>
3	5	2011	465	346	1940	259	3010	885796	<b>4.87</b>
4	6	2012	470	349	1955	317	3090	929266	<b>5.80</b>
5	7	2013	474	352	1971	388	3184	981224	<b>6.78</b>
6	8	2014	478	355	1986	475	3294	1043562	<b>7.82</b>
7	9	2015	482	357	2002	581	3423	1118594	<b>8.94</b>
8	10	2016	487	360	2018	711	3577	1209154	<b>10.15</b>
9	11	2017	491	363	2035	871	3759	1318709	<b>11.47</b>
10	12	2018	495	366	2051	1066	3978	1451504	<b>12.92</b>
11	13	2019	500	369	2067	1304	4241	1612734	<b>14.53</b>
12	14	2020	504	372	2084	1597	4557	1808758	<b>16.34</b>
13	15	2021	509	375	2100	1954	4939	2047360	<b>18.39</b>
14	16	2022	514	378	2117	2392	5401	2338065	<b>20.73</b>
15	17	2023	518	381	2134	2928	5961	2692535	<b>23.42</b>
16	18	2024	523	384	2151	3584	6642	3125041	<b>26.54</b>
17	19	2025	528	387	2168	4387	7470	3653053	<b>30.20</b>
18	20	2026	532	390	2186	5369	8477	4297953	<b>34.49</b>
19	21	2027	537	393	2203	6572	9705	5085912	<b>39.58</b>

#### 5.5.4 Comparison of MSA projection in Different Scenarios.

A comparative assessment of the MSA is brought out in Table 5.11 below.

**Table 5.11: Summary of MSA scenarios**

Scenario	Adopted Growth Rate	Cum. MSA consumed from COD till present day (2021-22)(in Cr.)	Cum. MSA consumed at the End of C.P. (in Cr.)
Scenario 1	As per Projected growth rates in Pavement Design Report	<b>22.87</b>	<b>40.01</b>
Scenario 2	Uniform growth rate of 5%	<b>18.23</b>	<b>29.67</b>
Scenario 3	Assessed growth rate on the basis of present toll data	<b>19.25</b>	<b>39.58</b>

From the aforementioned table the following inferences can be drawn.

The pavement design for the project road has been carried out for design traffic of 40 MSA. Although the traffic growth projected for different categories of vehicles in the pavement design report does not seem to be matching with the actual traffic growth rate seen from the present traffic growth rate data, the cumulative MSA calculated at the end of the concession period even on the basis of the growth rates assessed in para 5.6.3 is less than the design traffic of 40 MSA.

From the above it can be said that the pavement design adopted for the project road is adequate for the remaining concession period and there should not be any need for carrying out any structural overlay.

## 5.5 STATUS OF O&M

- a. The COD for the project road was on 22<sup>nd</sup> July 2009 and first overlay was carried out from 2014 to 2015. It is pertinent to note here that damages for delay in carrying out the renewal work was imposed by NHAI on the Concessionaire stating that the first renewal should have been completed prior to the completion of five years from 5 years of COD and there was a delay of 490 days. However, the Arbitral Tribunal on 21.08.2019 observed that imposition of damages by NHAI is not tenable under the provisions of Concession Agreement. As per details provided by Concessionaire, the matter is settled with NHAI and NHAI has already refunded the damages recovered from Annuity payment.
- b. Second overlay was carried out from 15.03.2019 to 24.09.2019 by the Concessionaire and the Completion Certificate was issued by NHAI without imposition of any damages for delay.
- c. From the detailed site inventory carried out, it is noted that the O&M requirements for the project are being catered to adequately. The condition of the pavement is generally good. The markings and signages are provided adequately, barring missing sign boards at some locations. Condition of the structures is found to be satisfactory. Some MBCB are damaged and the repair works are seen under progress.

## CHAPTER 6.0: OPERATION AND MAINTENANCE COSTS

### 6.1 OPERATIONS & MAINTENANCE COSTS AND FUTURE STRATEGY

#### 6.1.1 BROAD STRATEGY

Looking to the condition of the Project Highway, it was found that the Project Road is in a Good condition. The renewal of the wearing course has been carried out as per the renewal cycle specified in the Concession Agreement. The Concession Agreement specifies at least one renewal layer laid every 5 years after the initial construction. As per this the next renewal cycle have considered 50% works in the year's 2023-2024 & 2024-2025.

For the structures and other road assests, regular upkeep and repairs needs to carried out during the routine maintenance as specified in the O & M manual. From the condition surevy it is seen that, there is little likelihood of any major maintenance for the structures in the remaining concession period.

#### 6.1.2 ASSESSMENT OF COSTS AS PER PRESENT CONDITION SURVEY

The assessment of the O&M costs has been done by considering works pertaining to functional overlay and repair to the minor damages to the road furniture. Rates of Telangana 2021-22 SOR have been adopted. A summary of O&M Cost for the year 2022-23 is furnished in **Table 6.1** below. The break-up of these costs are presented in the subsequent paras.

**Table 6.1: Base O&M and Periodic Maintenance Costs in year 2022-23 level is used for future year**

Sl.No	Details	Amount (Rs in Cr.)
1	Periodic Maintenance Costs	29.60
2	Routine Maintenance & Operations Costs	
i)	Operational Expense	3.80
ii)	Routine Maintenance Expense	2.40

2022-2023 is adopted as the Base year and the year on year costs so worked out are brought out in the **Table 6.2** below.

**Table 6.2: Operation& Maintenance Cost Projections at 2022-23 base rate**

Sl. No	Year	Periodic Maintenance Costs incl. GST (in Cr.)	Routine Operations and Maintenance Cost incl. GST (in Cr.)
1	2022-23		6.20
2	2023-24	14.80	5.90
3	2024-25	14.80	5.90
4	2025-26		6.20
5	2026-27		6.20
6	2027-28 (Oct 27) *		3.62
7	Expenses towards Handing over cost	1.50	
	<b>TOTAL</b>	<b>31.10</b>	<b>34.01</b>

## 6.2 PERIODIC MAINTENANCE COSTS

The O&M Manual specifies that Concessionaire has to ensure that at no point during the Operations Period, the roughness in the road surface shall exceed the prescribed acceptable Roughness Values given in para 4.3.1 of the Concession Agreement i.e. surface roughness shall not exceed 3000 mm/km during the service life of pavement at any time. A renewable coat of bituminous concrete shall be laid every 5 year after initial construction or where the roughness value reaches 3000 mm /km which ever is earlier to bring it to the initial value of 2000 mm/km. Based on the Test results and site inspection it is seems that no structural requirement is foreseen and hence for the functional overlay 30mm BC is considered for the entire Main carriageway. Cost for Periodical Renewal has been worked out as per Rates of Telangana 2021-22 SOR and summarized in the **Table 6.3A** and **Table 6.3B** below.

**Table 6.3 A: Cost of Periodic Renewal**

Main Carriageway Paved area – Rigid	8901	Sqm
Main Carriageway Paved area – Flexible	575396	Sqm
Service/ Slip Road – Flexible	69665	Sqm
Structure Deck Carriageway Area	12415	Sqm
Major/ Minor Junctions Area – Flexible	8445	Sqm

**Table 6.3 B: Cost of Periodic Renewal at 2022-23 base rate**

Sl. No.	Items	Unit	Qty for complete length renewal	Rates as per Telanagana SOR 21-22	Amount
1	Functional overlay with 30 mm BC for MCW +bus bay	Cum	17262	11560	9,95,47,333
2	Functional overlay with 25 mm SDBC for Service road + Junctions	Cum	1953	9883	1,92,99,028
3	Tack Coat on BT Layer	Sqm	653506	9	5,881,554
4	Cats Eye (Studs)	Nos	4126	361	1,489,486
5	Replacement of Wearing coat on structures 25mm	Sqm	12415	849	10,540,335
6	Lane Marking	Sqm	21869	516	11,284,163
7	Crash Barrier Concrete	Rm	62	4578	284,294
8	Median & Other Crash Barrier (RE Wall) Painting	sqm	23790	58	1,379,834
9	PGR Painting	sqm	270	96	25,939
10	Kerb Painting	Rm	22300	76	1,694,788
11	Expansion joint (50mm wide strip seal joints)	Rm	302	10431	3,150,162
12	Retexturing and Grinding (as per Cl 6.3.4.1 of IRC-58-2015) 100%	Sqm	8901	27	240,327
13	Replacement of PQC Slab (1%) every 5 <sup>th</sup> year	cum	28	7,406	210,947
14	Joint sealant replacement every 5th Year (5%)	Lm	324.957	100	32,496
	<b>Total including GST @ 12% (in Cr.)</b>				<b>29.60</b>

## 6.2.2 ROUTINE OPERATION & MAINTENANCE COSTS

These costs comprises of two categories - The Routine & Preventive Maintenance and Operational Expenses. Our assessments regarding both of these are presented in the paras below.

### 6.2.2.1 ROUTINE & PREVENTIVE MAINTENANCE

The Routine Maintenance and cleaning have been considered to include broadly three categories.

- A) Routine and Preventive Maintenance
- B) Cleaning of road and other assets, removal of vegetation, cleaning of drains, etc.
- C) Electrical Maintenance

For the purpose of assessing of Routine and Preventive Maintenance, we have assigned weightages on all such works of highways that might need continued attention for repair. Our assessments of these costs are presented in the **Table 6.4A** and **Table 6.4B** below.

**Table 6.4A: Details of Routine Preventive Maintenance**

Sl. no.	Activities	Unit	Project Qty. For 12 months	Weight-age Assigned	Rates	Total Amount	
1	Replacement of sign boards	Sqm	36	9000	5%	3,20,400	
2	Replacement of cat eyes	Nos	124	361	3%	44,685	
3	Repair of MBCB	m	899	2852	4%	25,63,948	
4	Replacement/ repairs of Guard Post	Nos	91	140	5%	12,726	
5	Repair of guard rail	Rm	12	1500	3%	18,000	
6.A	Pot hole filling (flexipvmt)-MCW	Sqm	173	1500	0.03%	2,58,928	
6.B	Pot hole filling (flexipav.)- Service Road	Sqm	21	1500	0.03%	31,349	
6.C	Rigid pavement repair	Km	1.050	30000		31,500	
6.D	Flexiable pavement repair	Km	30.890	18000		5,56,020	
6 E	Repairs of Drain	Km	15.607	10000		1,56,070	
7 A	Sign boards	Sign boards	Nos			-	
7 B	Painting on Fixtures	5 th km	Nos	1	238	5%	143
		Km		2	80	5%	192
		Hect m stone	Nos	10	21	5%	212
		Conc. crash barrier	Sqm	62	76	5%	4,720
		Railing	Rm	20	86	5%	1,720
		Guard Post	Nos	91	41	5%	3,727

Sl. no.	Activities		Unit	Project Qty. For 12 months	Weight-age Assigned	Rates	Total Amount	
		Kerb stone	Sqm	446	86	2%	38,356	
7 C		Road Marking	Rm	21869	663	20%	28,99,768	
8	High Mast repair	Truck lay bye junction & Toll plaza	Nos	7	25000		1,75,000	
	Highway lamps under the underpasses-		Nos	7	3000		19,800	
	Highway light- Single arm pole		Nos	2	11000		26,400	
	Highway light- Double arm pole		Nos	1	13000		10,400	
9A	Replacement of km stone		Nos	0.5	4800	1%	2,304	
9B	Replacement of hectometer stone		Nos	4	685	2%	2,767	
10 A	Replacement of dead plant	Median	Nos	1,884	570	15%	10,73,795	
10 B		Avenue	Nos	1,745	570	15%	9,94,365	
11	Repair to the Major structure		LS/no/month	24	3000		8,64,000	
12	Repair to Minor structure		LS/no/month	83	500		4,98,000	
13	Repair of Earthen shoulders		Cum	697	414	10%	2,88,684	
		<b>TOTAL (in Cr.)</b>						<b>1.09</b>

**Table 6.4B: Yearly Routine maintenance and Cleaning Costs**

Sl. No	Description	Unit	Quantity	Rates	Amount	Remarks
1	Routine and Preventive maintenance	Km	30.89	365606	11293574	as calculated in Table 6.4A
i	Repairs of distresses on flexible pavement on approaches and slip road, service road flushing by fine aggregates during monsoon, resurfacing hungry areas by MSS					
ii	Repair of joint seals, concrete spall and edge breaking, Sealing of minor cracks with epoxy in concrete pavement					
iii	Removal and readjustment of footpath tiles to remove rut and ravel, replacement of damaged tiles					
iv	Repair of median, kerbs, footpath, Sign Boards, Road Markings etc					
v	Epoxy grouting in cracks in concrete in structure and epoxy coating/ painting on damaged concrete portions, cement plaster and /or repair with cement mortar					
vi	Replacement of seals of expansion joints					
vii	Replacement of damaged / stolen sign boards, fixtures such as cats eyes, delineators					
viii	Replacement of damaged electric poles / consumables/high mast lamps/street light					
ix	Landscaping: Grass cutting & pruning of shrubs & trees, Watering, Applying manure, pesticide					
2	Cleaning of road and other assets, removal of vegetation, cleaning of drains, etc.	Km	30.89	218500	6749465	as per current contract
i	Cleaning of Main Carriageway:					
ii	Cleaning of Project facilities:					
iii	Cleaning of service road, Junctions, Median Openings etc					
iv	Cleaning of Structures					
v	Cleaning of ROW					
vi	Lined Drain Maintenance					
vii	RCC Drain Maintenance					
viii	Transverse Drain Maintenance					
ix	Maintenance of the Toll plaza					

Sl. No	Description	Unit	Quantity	Rates	Amount	Remarks
x	Median planation maintenance					
3	Potable Drinking Water Maintenance	LS			779700	as per current contract
4	Electrical Maintenance	Km	30.89		669300	
	<b>Total</b>				19492039	
	<b>Add 10 % for unforeseen and contingencies charges</b>				1949204	
	<b>Total including GST @12 % at the rate of 2022-23 (in Cr.)</b>				<b>2.40</b>	

### 6.2.2.2 OPERATIONAL EXPENSES

These generally include the staff salaries, consumables, security expenses, electricity, Incidence Management charges, etc. These costs have been assessed by us in accordance with other projects of similar nature and standard industry practice. These costs are brought out in Table 6.5 below.

**Table 6.5: Costs for Operational Expenses**

Sl. no	Description	Amount ( in Lakh)	
		Monthly	Annually
1	Staff salaries and Other expenses	7.55	90.60
2	Consumables (Like diesel for DG operations, HSD for vehicles, stationary, printers, cartridge, etc)	2.00	24.00
3	Electricity charges	1.00	12.00
4	Incidence management expenses (Ambulance, Crane and patrolling vehicle)	6.00	72.00
5	Professional consultancy charges for IE		35.00
6	Professional consultancy charges for carrying out BBD, Roughness Index test, etc.		42.00
7	House keeping and other misc. charges	2.00	24.00
8	Administration charge		5.00
9	Additional insurance charges for the project road		75.00
	<b>Total ( in Cr.)</b>		<b>3.80</b>

**NOTE:** As Nirmal BOT is an Anunity based project hence the operational expenses for the Toll Plaza are not part of the liability of the Concessionaire.

### 6.3 CONCLUSIONS ON O&M REQUIREMENTS

The O&M Cost Projections have been worked out on the basis of the condition assessment of the Project Road taking into account the Routine/Preventive maintenance Strategy and the assesment that there does not appear to be any major maintenance requirements for the structures during the concession period.

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Date: June 24, 2022

To

**Virescent Infrastructure Investment Manager Private Limited**

10th Floor, Parinee Crescenzo

C- 30 'G' Block

Bandra Kurla Complex

Bandra (East),

Mumbai 400051, Maharashtra, India

Dear Sir,

**Sub:: Submission of Revised Periodic Maintenance cost of Project from 2-laning of Shillong bypass connecting NH-40 and NH-44 from km 61/800 of NH-40 to km 34/850 on NH-44 in the state of Meghalaya based revised Bitumen Prices.**

**Ref:** Technical DD report of Shillong Bypass Expressway Pvt. Ltd. (SEPL) dated February 28, 2022

With reference to the captioned matter, we are here with submitting the Revised Periodic Maintenance Cost considering the Bitumen price per ton as Rs. 50,000/- excluding GST. A comparison statement of Periodic Maintenance Cost as per the earlier submission and present consideration is present below;

<b>Periodic Maintenance Cost (INR in Crores)</b>		
<b>FY</b>	<b>As per Feb'22 Report with Bitumen price of Rs.41,500/- Per ton</b>	<b>With revised Bitumen price of Rs.50,000/- per ton</b>
2022-2023	31.83	-
2023-2024	-	34.17*
2024-2025	-	-
2025-2026	1.48	1.48

\*Since company informed that, SPV has not planned for major maintenance in this year, major maintenance has been shifted to FY 2024. No additional implication foreseen on account of this.

There are no other changes in the routine maintenance cost.

Yours faithfully,

For **Samarth Infraengg Technocrats Pvt. Ltd.**  


**Authorized Signatory**  
Kalva Kiran Kumar

**Registered Office**

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Date: February 28, 2022

To

**Virescent Infrastructure Investment Manager Private Limited**

10th Floor, Parinee Crescenzo

C- 30 'G' Block

Bandra Kurla Complex

Bandra (East),

Mumbai 400051, Maharashtra, India

Dear Sir,

**Re: Submission of Final Report of Technical due diligence study for the project "Shillong Expressways Private Limited (SEPL)".**

With reference to the captioned matter, we are here with submitting the Final Report of "Technical Diligence for 2-laning of Shillong bypass connecting NH-40 and NH-44 from km 61/800 of NH-40 to km 34/850 on NH-44 in the state of Meghalaya on Build, Operate and Transfer (BOT Annuity) Basis."

Yours faithfully,

For **Samarth Infraengg Technocrats Pvt. Ltd.**



**Authorized Signatory**

Kalva Kiran Kumar

**Technical Diligence for 2-laning of Shillong bypass connecting NH-40 and NH-44 from km 61/800 of NH-40 to km 34/850 on NH-44 in the state of Meghalaya on Build, Operate and Transfer (“BOT Annuity”) Basis.**

**For Virescent Infrastructure Investment Manager Private Limited (For the purpose of Highways Infrastructure Trust)**

**Final Report**

**SAMARTH INFRAENGG Technocrats Private Limited**



**FEBRUARY 2022**

## TABLE OF CONTENTS

1.1	Introduction .....	1
1.2	Project at a glance .....	1
1.3	Objective and Scope of services - for due diligence .....	4
1.3.1	General .....	4
1.3.2	Assessment of Asset Condition.....	4
1.3.3	Investigations to be carried out .....	5
1.3.4	O&M Assessment and Submission of Report .....	5
1.4	Surveys and Investigations .....	5
1.4.1	Road Inventory .....	6
1.4.2	Visual Pavement Condition Surveys.....	8
1.4.3	Falling Weight Deflectometer (FWD) Surveys .....	10
1.4.4	Roughness surveys .....	11
1.4.5	Pavement Composition Surveys (Test Pits) .....	13
1.4.6	Subgrade Investigations & Laboratory Testing .....	14
1.4.7	Axle Load Surveys.....	15
1.5	Validation of Executed Works .....	15
1.5.1	Road Works .....	16
1.5.2	Bridge Works.....	27
1.6	Quality Audit .....	28
1.6.1	Embankment & Subgrade.....	28
1.6.2	Pavement Condition .....	29
1.6.3	FWD Analysis and Assessment of Overlay Requirement.....	29
1.6.4	Pavement Composition.....	30
1.6.5	CD Structures .....	30
1.6.6	Drainage and Slope Protection .....	60
1.6.7	Traffic Safety and Road Furniture .....	60
1.7	Rehabilitation Plans and Designs.....	60
1.7.1	Design Traffic Loading .....	60
1.7.2	Pavement Rehabilitation and Strengthening .....	60
1.7.3	Structural Rehabilitation .....	62
1.7.4	Land Slide Locations.....	62
1.8	Operation and Maintenance.....	63
1.8.1	Introduction.....	63
1.8.2	CA specifications for Major Maintenance .....	63
1.8.3	Inputs for O&M schedule.....	63
1.8.4	Options for O&M schedule.....	65
1.8.5	Roughness progression .....	65
1.8.6	O&M schedule .....	67
1.9	COST .....	68
1.10	Conclusions .....	71

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## LIST OF TABLES

Table 1: Salient Features of Project Corridor.....	3
Table 2: Summary of Homogenous Section – BHS.....	11
Table 3: Pavement Composition .....	14
Table 4: Adopted VDF Values .....	15
Table 5: RCC Open Drain Locations .....	16
Table 6: Details of Solar Blinkers .....	18
Table 7: Metal Beam Crash Barrier Locations .....	19
Table 8: Concrete Crash Barrier Locations .....	24
Table 9: List of Major Junctions .....	25
Table 10: List of Minor Junctions .....	25
Table 11: Locations of Lighting .....	26
Table 12: Details of Bus Bays and Bus Shelters .....	27
Table 13: List of Structures excluding Culverts .....	27
Table 14: Existing Subgrade Test Results .....	28
Table 15: Summary of Design Moduli of different layers – BHS .....	29
Table 16: Details of Culverts:.....	47
Table 17: Estimated Design traffic loading .....	60
Table 18: Remaining life of the existing pavement .....	61
Table 19: Remaining life of the existing pavement .....	62
Table 20: Abstract of Cost Estimate .....	68
Table 21: Cost Summary Without Escalation.....	70

## I. INTRODUCTION

Government of India had entrusted to the NHAI, the development, maintenance and management of NH-40 and NH-44 from Km 61.800 of NH-40 to Km 34.850 of NH-44 in the state of Meghalaya.

The Authority has resolved to construct 2 lane Shillong Bypass Connecting NH-40 and NH-44 from km 61+800 on NH-40 (Design Chainage at km 0+600) to km 34+850 on NH-44 (Design Chainage at km 48+766) on the Shillong bypass section of NH-40 and NH-44 in the state of Meghalaya on Build, Operate and Transfer (“BOT Annuity”) Basis.

Accordingly, NHAI invited proposals from the bidders and selected the consortium comprising of **GR Infra projects Ltd.** and **Chetak Enterprises Ltd.** (Collectively referred as **Consortium**). Consequent to this, **Consortium** formed a Special Purpose Vehicle (SPV) in the name of **Shillong Expressway Pvt. Ltd.**, for implementation/execution of the project.

On 31.03.2017, **India Infrastructure Fund II (IIF-II)** acquired control of 90.5% stake of **M/s Shillong Expressway Pvt. Ltd.** and balance 9.5% was acquired on 28.03.2018. Further, on 13.01.2022, **Galaxy Investments II Pte. Ltd.** acquired control of 100% stakes of **M/s SHILLONG EXPRESSWAY PRIVATE LIMITED** from **India Infrastructure Fund-II**.

The project is presently under operation and maintenance by concessionaire, **Shillong Expressways Private Limited (SEPL)**. **Samarth Infraengg Technocrats Pvt. Ltd.** has been engaged as Technical/ Engineering Due Diligence Advisor for Highways Infrastructure Trust purpose.

This report highlights the findings of due diligence study undertaken by consultants on the project

## II. PROJECT AT A GLANCE

The project corridor takes off from Km 61.800 of NH 40 near Barapani and ends on NH 44 at km 34/850. The entire project road passes through rural & Forest area with very thin inhabitations. Bhoilymbong, the only town in the area which is bypassed.

The total length of project road is 48.766 kms. The project corridor has flexible pavement in the entire length with 7.0m wide carriageway flanked by 1.5m to 2.5m earthen shoulder on each side.

The project corridor generally runs in rolling/hilly terrain for most of length except in few locations where it is slightly plain. The land use along the project road is mostly Forest.

It passes through small village settlements like Umroi, Nongtrah, Diengpasoh, Thangshalai, Mawryngkneng etc.

- The Project received LOA on 11.05.2010 and the agreement was signed on 14.07.2010.

- Appointed date was declared on 07.02.2011 and the Project received Provisional Certificate on 28.02.2013 (subsequently modified from 25.03.2013 based on Arbitral Award dated 27.06.2018) and received Final Completion Certificate on 30.03.2017.
- As per CA, the Concession Period for the project is 15 Years from Appointed date. i.e., Concession end date is 06.02.2026. Accordingly end date of concession i.e., 06.02.2026 has been considered for costing purpose.

### III. SALIENT FEATURES

Sl. No.	Particulars	Length/No
1	Start chainage	0.000
2	End Chainage	48.766
3	Length of the Project Road	48.766 Km
4	No of Major Bridges	3 No's
5	No of Minor Bridges	8 No's
6	No of Culvert	240 No's
7	No of VUP	1 No's
8	No of Toll Plaza	1 No's at Km 24+900
9	Major Junctions	2 No's
10	Minor Junctions	64 No's
11	High Mast Lighting	2 No's
12	RCC Wall	0.090
13	Bus bay with shelter	13 No's
14	Wayside Amenities	0 No's
15	Delineators	754 No's
16	RCC open lined Drain	40.075 km
17	Metal Beam Crash Barrier	19.768 km
18	Concrete Safety barrier	1.220 km
19	Solar Blinkers	29 No's
20	Km Stones	48 No's
21	Hectometer Stone	171 No's
22	Guard Posts	2063 No's
23	Road Signs	1054 No's

### IV. IMPORTANT FINDINGS AND CONCLUSION

1. The project corridor takes off from 61.800 of NH 40 near Barapani and ends on NH 44 at km 34/850. The entire project road passes through rural & Forest area with very thin inhabitations.

2. The Total Project length is 48.766 kms and complete length is having two lane width i.e., 7.0m wide carriageway flanked by 1.5m to 2.5m earthen shoulder on each side with Flexible Pavement.
3. The project corridor generally runs in rolling/hilly terrain for most of length except in few locations where it is slightly plain. The land use along the project road is mostly Forest. It passes through small village settlements like Umroi, Nongtrah, Diengpasoh, Thangshalai, Mawryngkneng etc.
4. The Project Road has 2 major junctions and about 64 minor junctions along the project road and the condition of these junctions is good
5. All together the Project road has about 13 No. of Bus Bays with Bus shelters and the condition of these is fair to good
6. About 4 numbers of High mast lighting is observed along the project road. Two numbers are located at Major Junctions, one Toll Plaza location and one at Minor Junction. Concessionaire informed that, Maintenance of only Two High mast lights, one near Km 10+120 and the other one near Km 48+766 is under Concessionaire’s scope.
7. The present condition of pavement is fair along the project road. Cracking and raveling has developed on some part of the Carriageway. These are mainly surface related distresses and the cracking appears to be top-down cracking. Crocodile cracking is noted at few locations.
8. Crack sealing is also being done / in progress at some of the locations along the project corridor. The present surface condition appears slightly dry surface; because of which the cracking might have initiated at most of the locations. No potholes are seen along the project. Remedial treatment at distressed locations carried out with BC material.
9. There are no major undulations or depressions observed along the corridor indicating good Subgrade quality.
10. Roughness data indicates that the Average Roughness values along the project road is 1915 mm/Km and the maximum Roughness Values is 2064 mm/Km. From Roughness consideration, Overlay is not required for the project road as the unevenness Index (UI) is less than Permissible Value of 2500 mm/km
11. Test pit surveys indicated average crust of 564mm consisting of 140 mm blacktop and 438 mm of granular layers over subgrade.
12. The remaining concession period is 5 years; however, requirement of overlay has been verified by considering the 10<sup>th</sup> year design MSA. The estimated 10<sup>th</sup> year Design traffic loading is 38 MSA. FWD Analysis indicates that the remaining life of the existing pavement is less than 38 MSA for a length of 17.20km and remaining length of the project road is having remaining life more than 38 MSA.
13. From FWD consideration, overlay is required for a length of 17.2 Km. For all the 17.2 Km 40mm Overlay is sufficient except for a length of 1.40km where the overlay requirement is 30mm BC+50mm DBM apart from this another 4Kms of lengths where roughness is more

than 2000 mm/km is also considered with 30mm BC + 50mm DBM. For remaining length where there is no structural overlay requirement, it may be prudent to consider at least 40mm BC considering the age of the pavement.

14. Majority of road furniture items are intact with very few damages. Regular maintenance being carried out at site like replacement of MCB / Studs and relaying of lane marking etc.
15. As per site condition, it appears that, no overlay done since project completion. Concessionaire confirmed that, not done any major maintenance for total Project Length except patch work and crack sealing works
16. The project Road has 3 Major bridges and 8 Minor bridges and 1 VUP. There 240 number of Culverts exists along the project road.
17. All CD structures along the project road are having good condition except 1 Major bridge near Km 12+865 (which was constructed by PWD). Bridge at Km 12+865 is having developed Vertical Flexural and Shear cracks due to overloading of Heavy Vehicular Traffic.
18. On the side of existing old bridge at Km 12+865, bailey bridge construction is completed and this bridge is operational.
19. Bailey Bridge launching was completed and the approach road was completed by the Concessionaire under COS. Concessionaire informed that Bailey Bridge was inaugurated on 25.03.2021 in presence of Hon'ble deputy Chief Minister Meghalaya
20. At Km 38+500 (LHS) land slide occurred earlier and is one of the crucial locations. However, Client informed that there was no land slide in the project highway after that.
21. The Project Road has 25 number of ECBs along the Project Road.
22. The Project road has one Toll plaza along the project road. Toll plaza @ km.24+900 is having 6 lanes (BHS). All lanes are provided with rigid pavement and the tapering portions of the Toll plaza are provided with flexible pavement.
23. The Project road has 1 number of Highway Patrolling Vehicle, 1 number of Ambulance and 1 number of recovery van with 20 Metric Ton capacity
24. For this project, a Project specific Manual is provided in Schedule-D. The allowable threshold value of roughness is 2500 mm/km as per Schedule-K.
25. As per CA, there is no requirement of mandatory overlay during the Concession Period
26. Couple of works under COS were executed such as Highway Mini Nest at Toll Plaza and bio toilet apart from Bailey Bridge.
27. As on today, Concessionaire could not complete three pending punch list items as land is not handed over to Concessionaire by NHAI; One Punch list item is flaring of Airport Junction and the second one is widening of Curve for visibility at 3 locations and the third one is construction of RCC Drain for a length of 470m near between Km 0+650 and 1+120 on LHS.

**V. COST ABSTRACT**

S. No	FY	Abstract of Cost Without escalation		
		Immediate Repair's Cost +Routine and Operational Cost	Periodic Maintenance Cost	Total Cost
1	2023	6.29	31.83	<b>38.11</b>
2	2024	6.29	-	<b>6.29</b>
3	2025	6.29	-	<b>6.29</b>
4	2026	5.36	1.48	<b>6.85</b>
	<b>Total:</b>	<b>24.22</b>	<b>33.31</b>	<b>57.53</b>

1. Base Cost are arrived for FY2023
2. All the material rates are February 2022 Rates
3. All labour rates are taken from Central minimum wages (October'2021 cycle) and 2.5% escalation applied on the same to arrive FY2023 Rates
4. All the costs are without any Escalation.
5. All the Cost presented in the above table are excluding Head Office (HQ) Expenses.

# TECHNICAL DUE DILIGENCE REPORT

---

## 1.1 INTRODUCTION

Government of India had entrusted to the NHAI, the development, maintenance and management of NH-40 and NH-44 from Km 61.800 of NH-40 to Km 34.850 of NH-44 in the state of Meghalaya.

The Authority has resolved to construct 2 lane Shillong Bypass Connecting NH-40 and NH-44 from km 61+800 on NH-40 (Design Chainage at km 0+600) to km 34+850 on NH-44 (Design Chainage at km 48+766) on the Shillong bypass section of NH-40 and NH-44 in the state of Meghalaya on Build, Operate and Transfer (“BOT Annuity”) Basis.

Accordingly, NHAI invited proposals from the bidders and selected the consortium comprising of **GR Infra projects Ltd.** and **Chetak Enterprises Ltd.** (Collectively referred as **Consortium**). Consequent to this, **Consortium** formed a Special Purpose Vehicle (SPV) in the name of **Shillong Expressway Pvt. Ltd.**, for implementation/execution of the project.

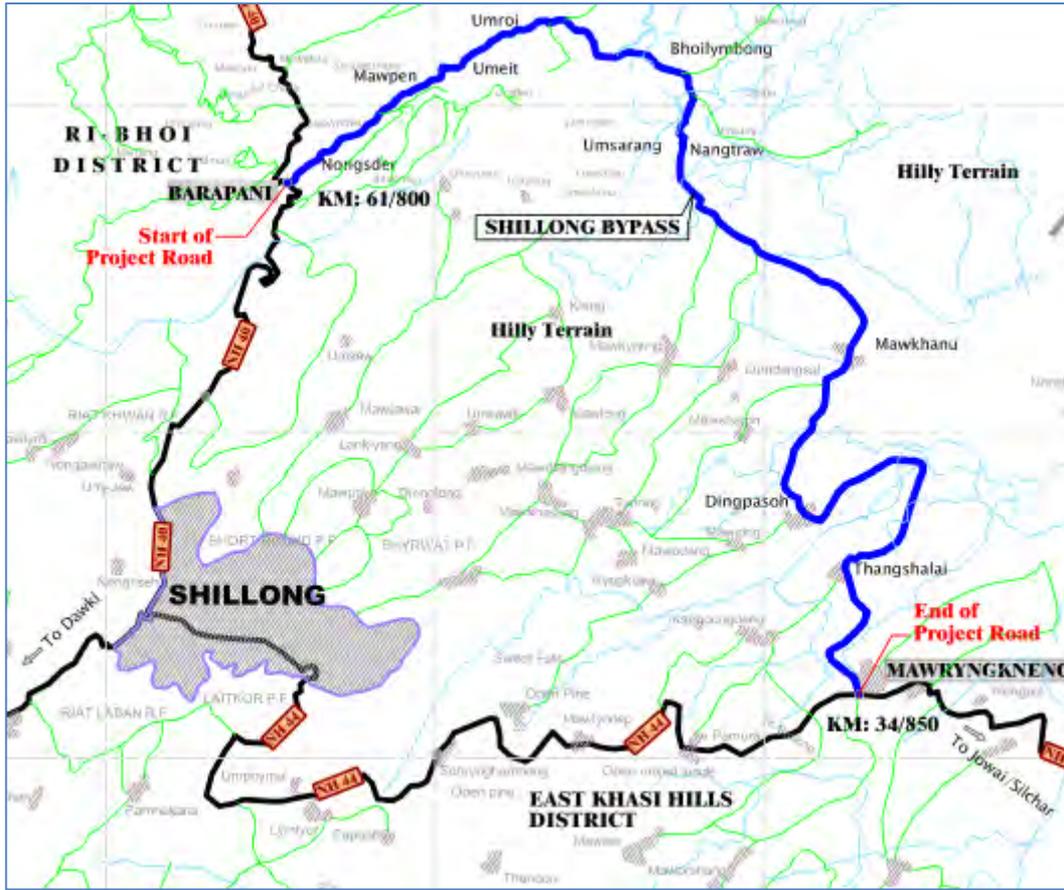
The Concessionaire obtained PCOD on 28.02.2013 (Revised from 25.03.2013) as per Arbitral award dated 27.06.2018. Final COD has been achieved on 30.03.2017.

The project is presently under operation and maintenance by concessionaire, **Shillong Expressways Private Limited (SEPL)**. Samarth Infraengg Technocrats Pvt. Ltd. has been engaged as Technical/ Engineering Due Diligence Advisor for Highways Infrastructure Trust purpose.

This report highlights the findings of due diligence study undertaken by consultants on the project

## 1.2 PROJECT AT A GLANCE

The project corridor takes off from Km 61.800 of NH 40 near Barapani and ends on NH 44 at km 34/850. The entire project road passes through rural & Forest area with very thin inhabitations. Bhoilymbong, the only town in the area which is bypassed. The entire corridor runs through rolling or hilly terrain. The total length of project road is about 48.766 kms.



Photograph showing the start and end point of the project road are presented below:



Start Point at km.0.000



End Point at km.48.766

Following Table highlights the total project at a glance:

SI No.	Description	Date
1.	Letter of Award (LOA) Issued on	11.05.2010
2.	Date of Signing the Concession Agreement	14.07.2010
3.	Appointment Date	07.02.2011
4.	Construction Period	3 years from Appointed date
5.	Scheduled Project completion	06.02.2014
6.	Concession Period	15yrs from Appointed date
7.	Scheduled End of Concession	06.02.2026
8.	Date of issue of Provisional Completion Certificate	28.02.2013
9.	Date of Issue of Final Completion Certificate	30.03.2017

**Table 1:Salient Features of Project Corridor**

SI. No.	Particulars	Length/No
1	Start chainage	0.000
2	End Chainage	48.766
3	Length of the Project Road	48.766 Km
4	No of Major Bridges	3 No's
5	No of Minor Bridges	8 No's
6	No of Culvert	240 Nos
7	No of VUP	1 No's
8	No of Toll Plaza	1 No's at Km 24+900
9	Major Junctions	2 No's
10	Minor Junctions	64 No's
11	High Mast Lighting	2 No's
12	RCC Wall	0.090
13	Bus bay with shelter	13 No's
14	Wayside Amenities	0 No's
15	Delineators	366 No's
16	RCC open lined Drain	48.900 km
17	Metal Beam Crash Barrier	24.300 km
18	Concrete Safety barrier	1.220 km
19	Solar Blinkers	19 No's
20	Km Stones	48 No's
21	Hectometer Stone	171 No's
22	Guard Posts	2063 No's
23	Road Signs	1001 No's

### 1.3 OBJECTIVE AND SCOPE OF SERVICES - FOR DUE DELIGENCE

The main objective of the study is to review the current status of project corridor including details pertaining to its construction and maintenance. Objective of the study can be broadly defined with following tasks:

#### 1.3.1 General

- Review of all documents related to Project including but not limited to provisional completion certificates, punch list items completion certificate, clearances, monthly IE reports, important correspondence if any.
- Review of Change of Scope/ other Claims submitted and to be submitted to Authority / IC, comment on the veracity of the same and approval status.
- Highlight any non-compliance of the terms of the CA or O&M manual and IC inspection reports etc.
- Review of any pending issues related to Utility shifting, maintenance etc. in accordance with the Concession Agreement.
- Comment on issues including any balance work that may have a potential impact on the maintenance costs going forward and which may warrant a one-time expense in future.
- Review of as built drawings.
- Determine the appropriate level and frequency of routine and major maintenance activities required to keep the road assets in good condition and to meet the performance and O&M standards, specifications and requirements.
- Review the major maintenance work undertaken, and prepare projections for future major maintenance expenses (incl. any hand-back requirements), so as to ensure compliance with the terms of CA.
- Review of condition of SPV assets including all equipment and vehicles etc.
- Report on balance acquisition of land if any and possibility of acquisition.
- Report on current encroachments on the project stretch and future expected problems due to the same.

#### 1.3.2 Assessment of Asset Condition

- i. Assessment of road assets in conformance with specifications, standards and codes stipulated in CA and O&M manual etc.
- ii. A detailed inventory survey of road assets including main carriageway, structures, service roads, lightings, drains, slope protection works, retaining walls, bus bays, bus shelters, truck lay byes, O&M center, road furniture including signages, MCB, guard rails etc. other safety measures, toll collection infrastructure, buildings, plantation, vehicles and other objects.
- iii. Assessment of condition of the structures including but not limited to visual inspections of bearings, expansion joints, superstructure, substructures, foundations, associated components, pre-stress anchorages (if any), review of geotechnical assumptions,

- perform geotechnical due diligence, review as-built design and assess design assumptions and provide a detailed report thereon.
- iv. Assessment of condition of the road pavement including but not limited to visual inspections of the pavement, review as-built design and assess design assumptions and provide a detailed report thereon.
  - v. Assessment of physical dimensions/ condition of the infrastructure to determine useful lives of the materials and equipment requiring rehabilitation and/or replacement.
  - vi. Recommendations for any major repair/ rehabilitation and strengthening based on the condition survey and design reports.
  - vii. To provide a detail photographic report of the infrastructure assets and its condition to withstand till end of concession period. Suggestion and cost evaluation for any additional repair / rectification / modification required.

### **1.3.3 Investigations to be carried out**

- 1.1. Assessing maintenance needs and its valuation according to the level of deterioration.
- 1.2. Evaluation of overall condition of flexible pavement including PQC/ BT at toll plaza, BC, DBM, Base/Sub base and sub grade and drainage condition survey.
- 1.3. Carry out visual condition survey for rigid (toll plaza) and flexible pavement
- 1.4. Carry out drainage survey to assess any potential future problems which will cause by moisture and runoff.
- 1.5. Assessment of variation/ COS orders on the project, if any, and evaluate their impact on expenditure, time to completion, future O&M obligations and tolling revenue.

### **1.3.4 O&M Assessment and Submission of Report**

- Develop a detailed O&M cost forecast for each year of the concession period and a detailed major maintenance cost forecast along with estimation of costs towards handover requirements.
- Provide comprehensive report by covering all scope of work mentioned herein this Engagement Letter.

## **1.4 SURVEYS AND INVESTIGATIONS**

The main objective of undertaking Surveys and Investigations is to appreciate the existing engineering features along the project corridor and to understand the present condition of the various elements of the project road and to prepare inputs required for various rehabilitation and maintenance strategies.

Following Survey and Investigations have been undertaken as a part of study with an objective to understand the present condition of the road and there by assess the quality of construction and as well to prepare requisite rehabilitation/corrective designs where necessary.

---

- Road Inventory Surveys
- Visual Pavement Condition
- FWD Survey (data supplied by Concessionaire)
- Roughness Surveys (data supplied by Concessionaire)
- Test Pits& Subgrade Investigations (data supplied by Concessionaire)
- Structure Inventory and Condition Surveys

### 1.4.1 Road Inventory

The project corridor has flexible pavement in the entire length with 7.0m wide carriageway flanked by 1.5m to 2.5m earthen shoulder on each side. The project corridor generally runs in rolling/hilly terrain for most of length except in few locations where it is slightly plain. The land use along the project road is mostly Forest. It passes through small village settlements like Umroi, Nongtrah, Diengpasoh, Thangshalai, Mawryngkneng etc.

The Project Road has 2 major junctions and about 64 minor junctions along the project road. Photographs showing the Major & Minor Junctions are presented below:





Towards Shillong Airport at km 10.130RHS



Towards Nongtrah at km 11.270 RHS



Towards Mynsian at km 13.960LHS



Towards Diengpasoh at km 33.530 RHS



Towards Thangashalai at km 41.720RHS



Towards Mawryngkneng at km 47.600 LHS

All together the Project road has about 13 No. of Bus Bays with Bus shelters. Few photos taken at the bus shelters and bus bays are presented below:



Bus Bay with Bus Shelter near km 1.500 LHS



Bus Bay with Bus Shelter near km 4.450 RHS

About 4 numbers of High mast lighting is observed along the project road. Two numbers are located at Major Junctions, one Toll Plaza location and one at Minor Junction. Concessionaire informed that, Maintenance of only Two High mast lights, one near Km 10+120 and the other one near Km 48+766 is under Concessionaire’s scope. Few photos showing High mast lighting are presented below:



High mast lighting near km 24.900



High mast lighting near km 48.600

#### 1.4.2 Visual Pavement Condition Surveys

The present condition of pavement is fair along the project road. Cracking and raveling has developed on Carriageway at some locations. These are mainly surface related distresses and the cracking appears to be top-down cracking. Crocodile cracking is noted at isolated locations. Crack sealing is also being done / in progress at some of the locations along the project corridor. The present surface condition appears slightly dry surface; because of which the cracking might have initiated at most of the locations. Crack sealing is also being done / in progress at some of the locations along the project corridor. The present surface condition appears slightly dry surface; because of which the cracking might have initiated at most of the

locations. No potholes are seen along the project. Remedial treatment at distressed locations carried out with BC material.



**Fog Seal @ km 1.800**



**Cracks @ km 4.010**



**Near Km 6.900**



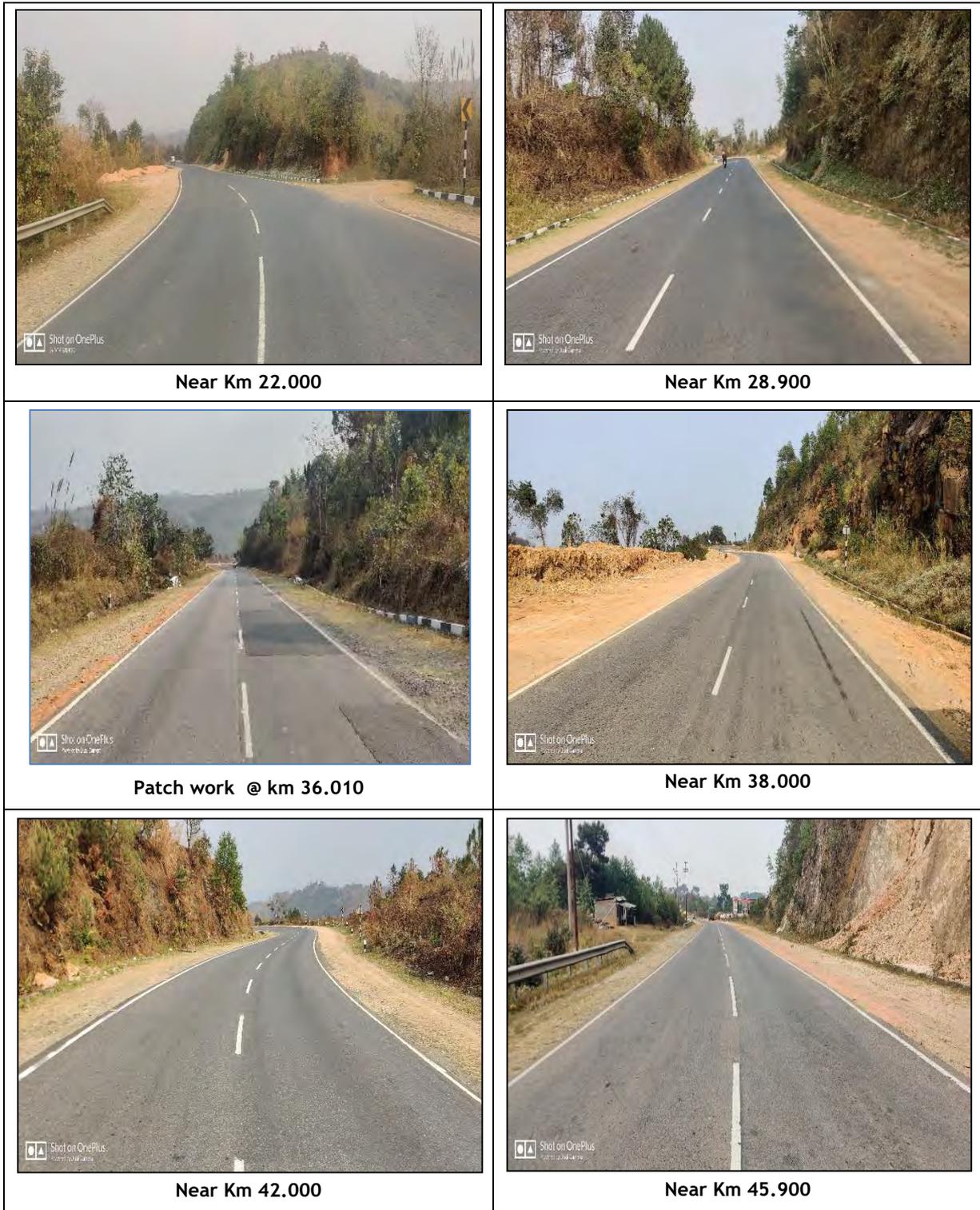
**Near Km 9.900**



**Near Km 16.000**



**Near Km 18.000**



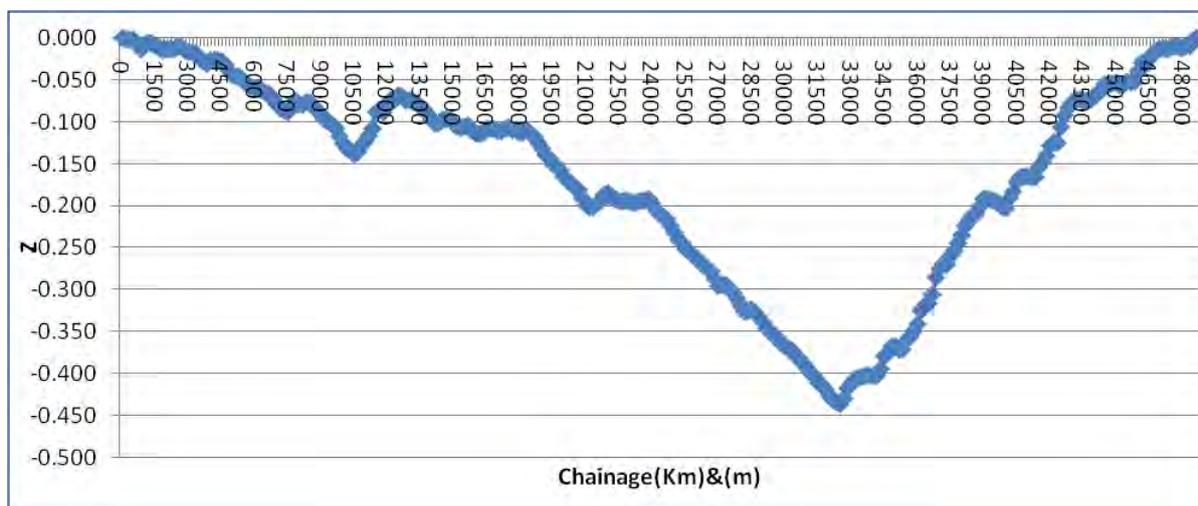
### 1.4.3 Falling Weight Deflectometer (FWD) Surveys

In order to evaluate the structural strength of the existing pavement, Falling Weight Deflectometer (FWD) survey data has been supplied by the Concessionaire.

The identified homogenous sections for the project stretch have been given in the below table along the graph.

**Table 2: Summary of Homogenous Section - BHS**

S.No	Side	From	To	Length (km)
1	BHS	0.00	4.20	4.2
2	BHS	4.20	7.30	3.1
3	BHS	7.30	10.30	3.0
4	BHS	10.30	12.50	2.2
5	BHS	12.50	17.80	5.3
6	BHS	17.80	21.00	3.2
7	BHS	21.00	23.60	2.6
8	BHS	23.60	27.80	4.2
9	BHS	27.80	32.20	4.4
10	BHS	32.20	35.20	3.0
11	BHS	35.20	36.60	1.4
12	BHS	36.60	39.00	2.4
13	BHS	39.00	42.60	3.6
14	BHS	42.60	46.00	3.4
15	BHS	46.00	48.766	2.766



**Delineation of Homogeneous Section -BHS**

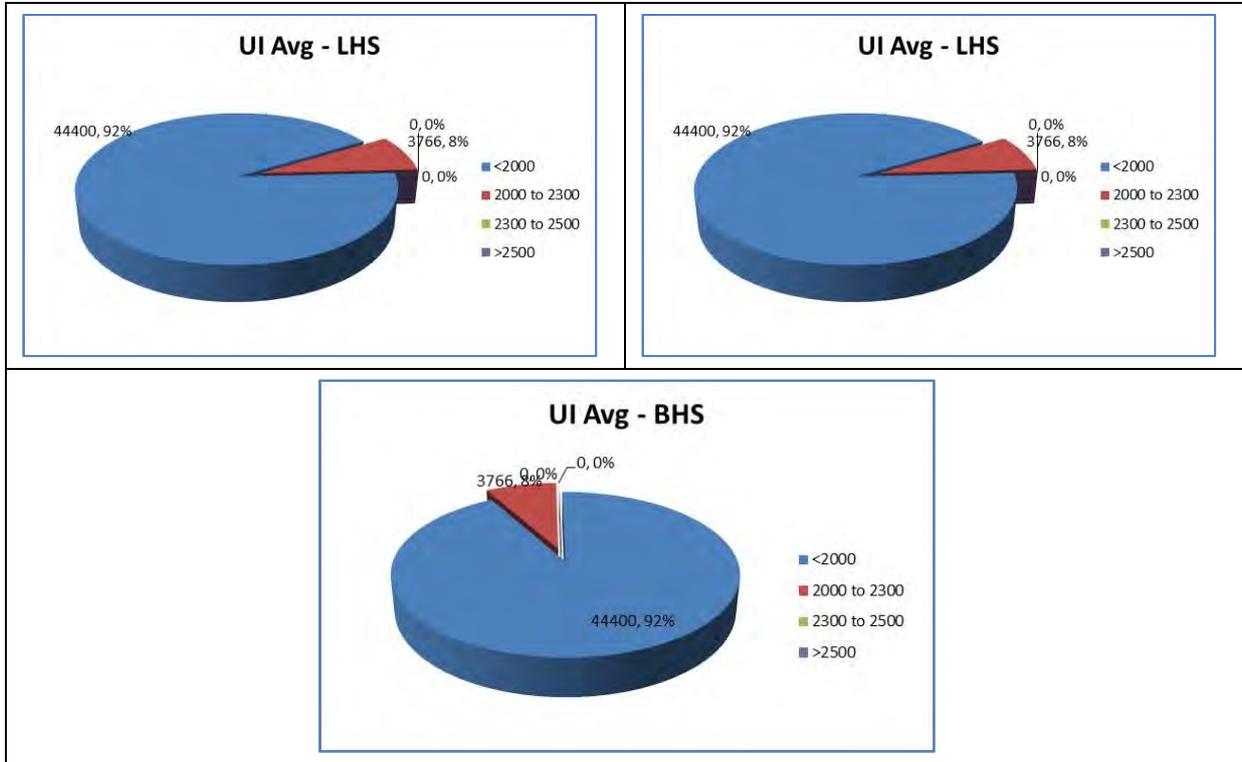
#### 1.4.4 Roughness surveys

Report on Roughness Survey provided by the Concessionaire indicates that the Roughness surveys was carried in the month of August 2021.

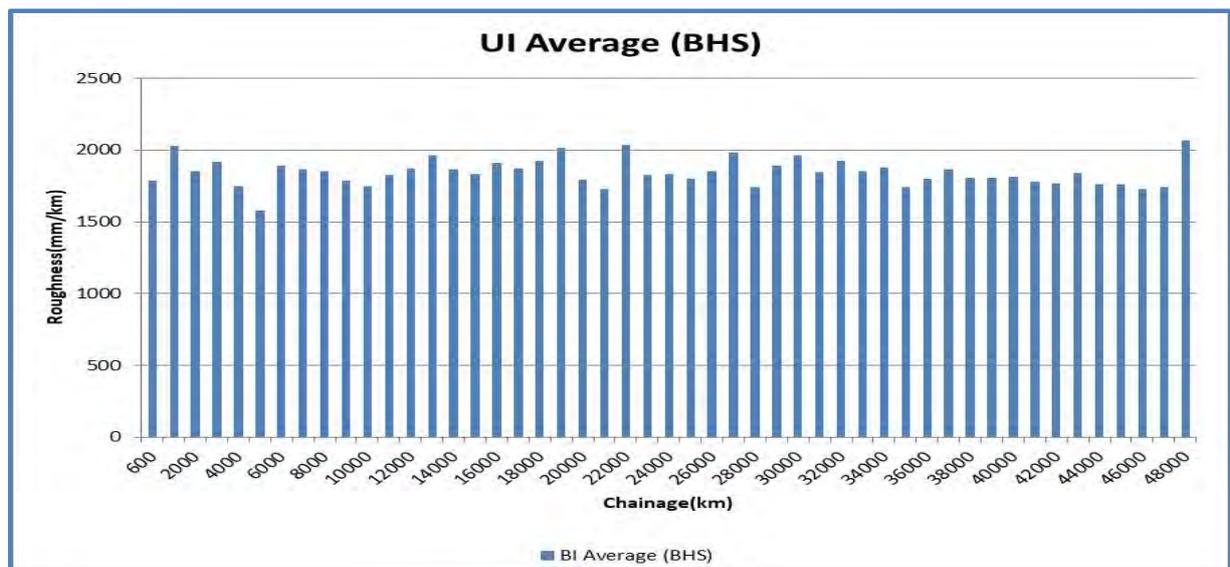
As per IRCSP:16-2004, Bituminous Concrete pavement is surface is considered to be good when its UI value is less than 2000 mm/km and the same is considered to be average for UI values

between 2000 and 3000 mm/km whilst the surface is treated as Poor for UI values greater than 3000 mm/km.

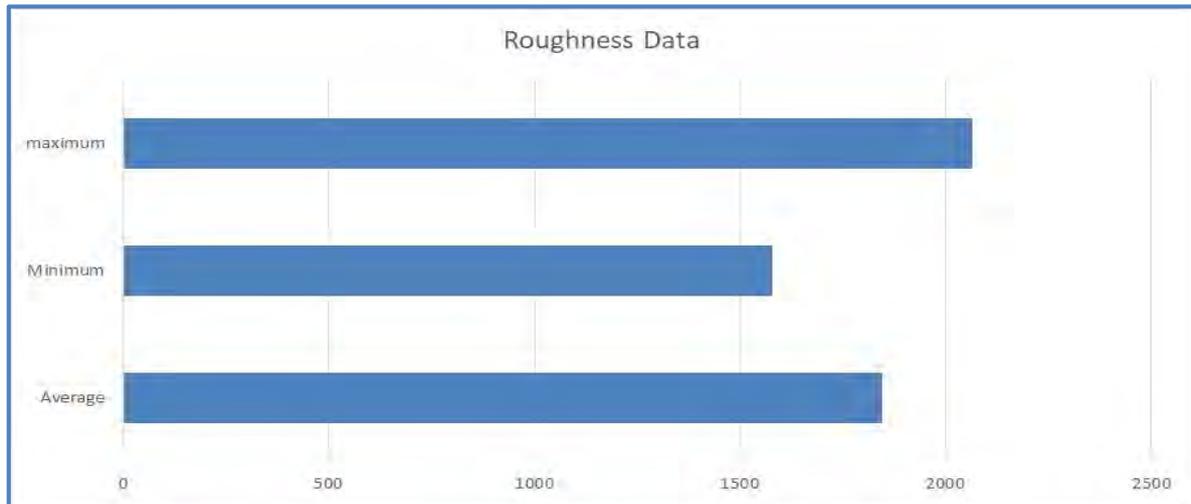
Average UI values along the corridor were grouped in to four categories, Pie chart showing the range of UI values in each carriageway of the project road have been presented below:



It can be seen from the above pie charts that all the kilometers in LHS lane and RHS lane having roughness values less than 2500mm/Km. Even average of both lanes is also indicating that the project road has roughness values within the permissible limits as per the provision of Concession Agreement i.e., less than 2500mm/Km. Bar diagrams showing the Kilometer wise roughness along the project road are presented below:



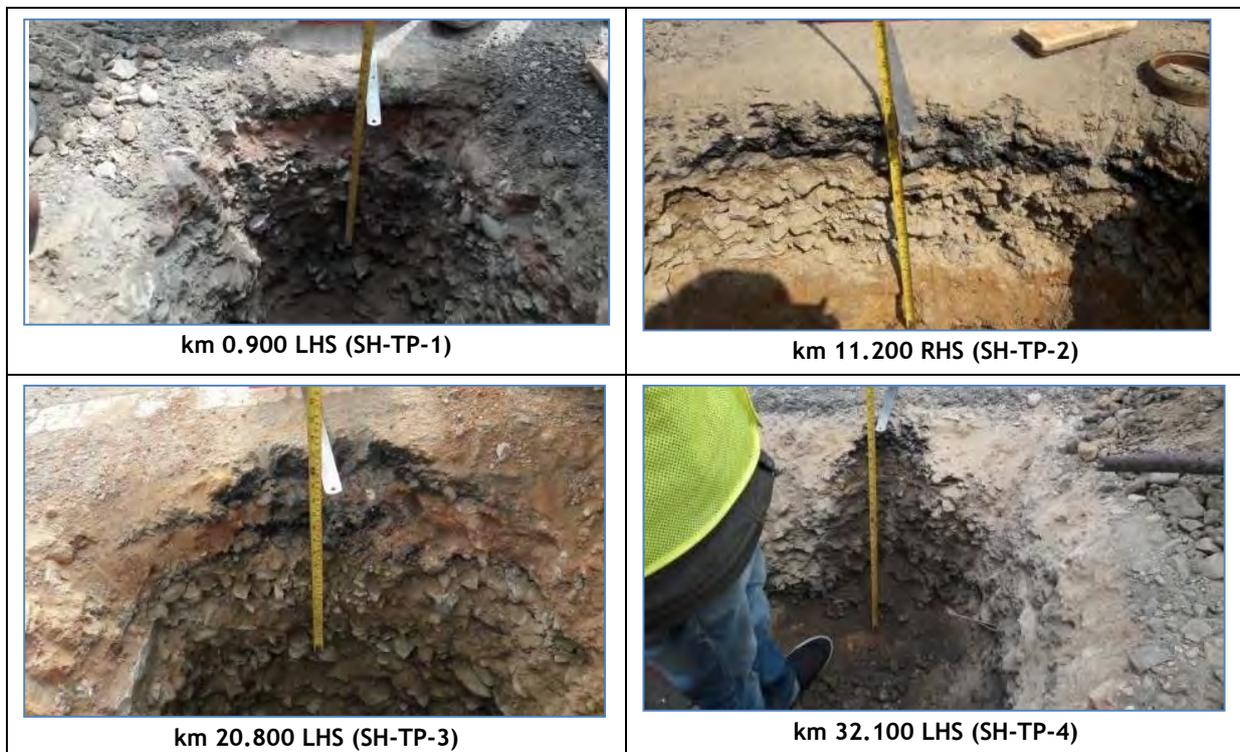
Summary of the Roughness Values analyzed is presented in the following chart

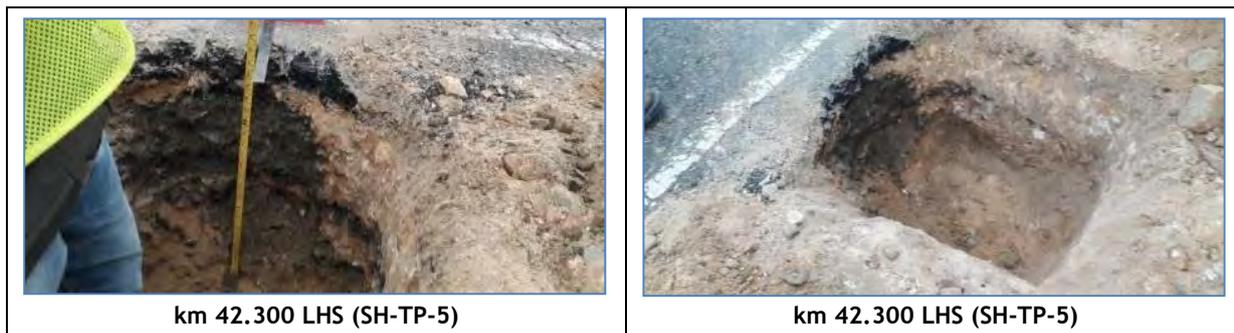


From the above it can be noticed that the Average Roughness values along the project road are 1844 mm/Km. The maximum Roughness Values are around 2065 mm/Km. From the above it can be concluded that none of the section of the project road requires functional overlay as unevenness Index (UI) is less than 2500 mm/km.

#### 1.4.5 Pavement Composition Surveys (Test Pits)

The composition of the existing pavement crust has been provided by concessionaire from test pit surveys. Few photographs of test pits depicting the crust thickness and nature of material in the pavement. Few sample photos taken are presented below:





Results of the test pit survey showing average thickness of pavement layers are presented in the Table below.

**Table 3: Pavement Composition**

Sl.No	Test Pit Number	Existing Chainage	Direction	BT	WMM	GSB	Total
1	SH-TP-1	0+900	LHS	140	250	190	580
2	SH-TP-2	11+200	RHS	135	200	190	525
3	SH-TP-3	20+800	LHS	150	230	180	560
4	SH-TP-4	32+100	RHS	140	330	200	670
5	SH-TP-5	42+300	LHS	135	220	200	555

Total average crust thickness of the MCW pavement is 578mm. The average thickness of bituminous layer is 140mm. Pavement is mainly composed of a BT layer, WMM & GSB base over subgrade.

#### 1.4.6 Subgrade Investigations & Laboratory Testing

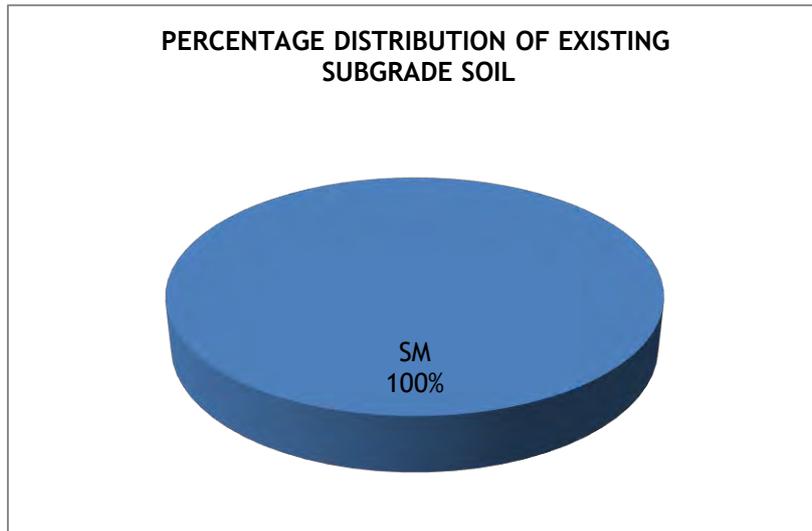
Sub-grade Investigations have been carried out to examine the subgrade soil characteristics along the project road. A total number of 5 Test pits have been carefully dug from the pavement surface up to sub-grade level. Field density tests have been conducted for subgrade samples and a small quantity of sample has also been collected in airtight containers for determining the field moisture content. Upon completion of the field density test, representative sample of sub-grade soil has been collected in bulk, in gunny bags, from each test pit for laboratory testing.

The soil samples collected have been tested for the following properties to assess the existing sub-grade soil properties.

- Sieve analysis
- Atterberg limits
- Heavy compaction
- Four (4) days soaked CBR as per IS standards at 97% of MDD as applicable for sub-grade (Heavy Compaction)
- Free swelling index

Soil classification has been done according to IS Classification of Soils (ISC) as detailed in IS 1498-1970. Laboratory test results indicate that all the Subgrade soil samples collected belongs

to Coarse Grained Soil. About 5 Numbers belongs to SM type. Pie Chart showing the percentage distribution of soil classification of existing subgrade sample is presented below:



#### 1.4.7 Axle Load Surveys

**Table 4: Adopted VDF Values**

Mode Type	Considered VDF
LCV	1.500
2 Axle Truck	4.500
3 Axle Truck	8.000
MAV (4-6 Axle)	10.000
Buses	1.000

Note: In the absence of Axle load data, the above VDF values are assumed. During site visits, it was observed that 3 Axle and multi axle vehicle with heavy loads are plying on the adjoining Road, hence adopted higher VDF for 3-Axles and MAVs.

#### 1.5 VALIDATION OF EXECUTED WORKS

The project road has been closely inspected to verify the executed works on ground vis-à-vis the scope envisaged in CA. The as-built drawings made available have been studied in detail before examining them on ground. Each and every structure has been inspected to note down its structural configuration and condition. The following works highlight the findings on executed works on ground.

### 1.5.1 Road Works

The project corridor has been constructed with the cross-sectional elements matching to those given in above TCS drawings. The carriageway width of 7.0m and Earthen shoulders of 1.5m to 2.5m on either side of carriageway have also been provided.

Lined open drains exist along the project road on Hill side. The condition of the Drain appears to be good and the cleaning and maintenance of the drain shall be undertaken in routine maintenance activities for its proper functioning. The open lined drain locations are presented in the Table below:

**Table 5: RCC Open Drain Locations**

S.No	Chainage		Length	Side	Drain Type	Remarks
	From	To				
1	1.120	1.620	0.500	LHS	Lined Drain	
2	1.720	1.740	0.020	LHS	Lined Drain	
3	1.900	2.100	0.200	LHS	Lined Drain	
4	2.190	2.745	0.555	LHS	Lined Drain	
5	2.830	2.980	0.150	LHS	Lined Drain	
6	3.280	4.530	1.250	LHS	Lined Drain	
7	4.640	6.165	1.525	LHS	Lined Drain	
8	6.330	6.380	0.050	LHS	Lined Drain	
9	6.480	6.550	0.070	LHS	Lined Drain	
10	6.610	6.970	0.360	LHS	Lined Drain	
11	7.050	7.210	0.160	LHS	Lined Drain	
12	7.300	7.600	0.300	LHS	Lined Drain	
13	7.690	8.700	1.010	LHS	Lined Drain	
14	8.900	9.129	0.229	LHS	Lined Drain	
15	9.250	9.390	0.140	LHS	Lined Drain	
16	10.290	10.370	0.080	RHS	Lined Drain	
17	10.405	10.650	0.245	LHS	Lined Drain	
18	10.450	10.650	0.200	RHS	Lined Drain	
19	11.535	11.640	0.105	LHS	Lined Drain	
20	12.320	12.665	0.345	LHS	Lined Drain	
21	12.870	13.180	0.310	RHS	Lined Drain	
22	14.160	14.445	0.285	LHS	Lined Drain	
23	14.730	14.780	0.050	LHS	Lined Drain	
24	14.820	14.940	0.120	LHS	Lined Drain	
25	15.870	16.035	0.165	LHS	Lined Drain	
26	16.080	16.260	0.180	RHS	Lined Drain	
27	16.080	16.260	0.180	LHS	Lined Drain	
28	16.300	16.550	0.250	LHS	Lined Drain	
29	16.650	16.720	0.070	RHS	Lined Drain	
30	16.650	16.690	0.040	LHS	Lined Drain	

S.No	Chainage		Length	Side	Drain Type	Remarks
31	16.750	16.900	0.150	LHS	Lined Drain	
32	17.030	17.260	0.230	LHS	Lined Drain	
33	17.150	17.200	0.050	RHS	Lined Drain	
34	17.380	17.900	0.520	LHS	Lined Drain	
35	17.400	17.578	0.178	RHS	Lined Drain	
36	18.400	18.600	0.200	LHS	Lined Drain	
37	18.400	18.600	0.200	RHS	Lined Drain	
38	18.650	18.680	0.030	LHS	Lined Drain	
39	18.650	18.990	0.340	RHS	Lined Drain	
40	19.400	19.760	0.360	LHS	Lined Drain	
41	19.400	19.620	0.220	RHS	Lined Drain	
42	19.680	19.970	0.290	RHS	Lined Drain	
43	19.970	20.200	0.230	LHS	Lined Drain	
44	20.200	20.300	0.100	RHS	Lined Drain	
45	20.500	20.600	0.100	LHS	Lined Drain	
46	20.650	20.750	0.100	RHS	Lined Drain	
47	20.780	20.820	0.040	LHS	Lined Drain	
48	20.950	21.000	0.050	LHS	Lined Drain	
49	21.070	21.580	0.510	LHS	Lined Drain	
50	21.550	22.580	1.030	RHS	Lined Drain	
51	22.520	22.580	0.060	LHS	Lined Drain	
52	22.730	23.410	0.680	RHS	Lined Drain	
53	23.350	25.370	2.020	LHS	Lined Drain	
54	25.425	25.900	0.475	LHS	Lined Drain	
55	25.670	25.790	0.120	RHS	Lined Drain	
56	25.980	26.290	0.310	RHS	Lined Drain	
57	25.270	26.778	1.508	LHS	Lined Drain	
58	26.860	27.100	0.240	LHS	Lined Drain	
59	26.860	27.100	0.240	RHS	Lined Drain	
60	27.240	27.340	0.100	RHS	Lined Drain	
61	27.500	27.600	0.100	RHS	Lined Drain	
62	27.530	27.550	0.020	LHS	Lined Drain	
63	27.712	28.330	0.618	LHS	Lined Drain	
64	27.800	28.120	0.320	RHS	Lined Drain	
65	28.510	28.560	0.050	LHS	Lined Drain	
66	28.420	28.510	0.090	RHS	Lined Drain	
67	28.850	29.240	0.390	LHS	Lined Drain	
68	28.900	30.080	1.180	RHS	Lined Drain	
69	29.540	29.600	0.060	LHS	Lined Drain	
70	29.715	30.010	0.295	LHS	Lined Drain	
71	30.210	30.400	0.190	RHS	Lined Drain	

S.No	Chainage		Length	Side	Drain Type	Remarks
72	30.380	30.440	0.060	LHS	Lined Drain	
73	30.610	30.770	0.160	LHS	Lined Drain	
74	30.670	30.800	0.130	RHS	Lined Drain	
75	30.830	31.280	0.450	RHS	Lined Drain	
76	30.900	31.142	0.242	LHS	Lined Drain	
77	31.190	31.400	0.210	LHS	Lined Drain	
78	31.500	32.220	0.720	RHS	Lined Drain	
79	32.100	32.630	0.530	LHS	Lined Drain	
80	32.600	32.890	0.290	RHS	Lined Drain	
81	32.930	33.550	0.620	RHS	Lined Drain	
82	32.970	33.820	0.850	LHS	Lined Drain	
83	33.570	33.880	0.310	RHS	Lined Drain	
84	33.900	34.040	0.140	RHS	Lined Drain	
85	34.180	34.490	0.310	RHS	Lined Drain	
86	34.230	34.530	0.300	LHS	Lined Drain	
87	34.530	35.000	0.470	RHS	Lined Drain	
88	35.570	37.010	1.440	RHS	Lined Drain	
89	37.025	37.600	0.575	RHS	Lined Drain	
90	37.700	38.750	1.050	RHS	Lined Drain	
91	38.300	38.550	0.250	LHS	Lined Drain	
92	38.900	39.970	1.070	RHS	Lined Drain	
93	39.670	41.185	1.515	LHS	Lined Drain	
94	41.190	42.370	1.180	RHS	Lined Drain	
95	42.390	43.700	1.310	RHS	Lined Drain	
96	43.780	45.375	1.595	RHS	Lined Drain	
97	45.860	46.900	1.040	LHS	Lined Drain	
98	47.000	47.200	0.200	RHS	Lined Drain	
99	47.080	47.200	0.120	LHS	Lined Drain	
100	47.440	47.780	0.340	RHS	Lined Drain	
101	48.200	48.600	0.400	RHS	Lined Drain	
102	48.700	48.760	0.060	LHS	Lined Drain	
<b>Total Length (km)</b>			<b>4.1075</b>			

Details of Solar Blinkers including the locations and working condition is presented in the following table:

**Table 6: Details of Solar Blinkers**

S.no	Chainage	Side	Remarks
1	0.000	RHS	Working
2	1.100	RHS	Working
3	1.150	RHS	Working

S.no	Chainage	Side	Remarks
4	1.740	LHS	Working
5	1.830	RHS	Working
6	9.250	RHS	Working
7	10.110	LHS	Working
8	10.450	RHS	Working
9	11.300	RHS	Working
10	11.350	RHS	Working
11	13.950	RHS	Working
12	17.830	LHS	Working
13	17.920	RHS	Working
14	33.510	LHS	Working
15	33.600	RHS	Working
16	38.900	RHS	Working
17	47.580	LHS	Working
18	47.670	RHS	Working
19	48.600	Median	Working

Safety barriers have been provided along the project road on valley side, at sharp curve locations, cross drainage Structures. Details of safety barriers provided along the corridor include the following:

**Table 7: Metal Beam Crash Barrier Locations**

S.NO	Chainage		Length	Side	Damage	Remarks
	From	To				
1	0.160	0.360	0.200	LHS	-	Good
2	4.500	4.600	0.100	LHS	-	Good
3	6.270	6.300	0.030	LHS	-	Good
4	6.970	7.030	0.060	LHS	-	Good
5	7.600	7.740	0.140	LHS	-	Good
6	9.180	9.270	0.090	LHS	-	Good
7	9.770	9.870	0.100	LHS	-	Good
8	9.900	10.120	0.220	LHS	-	Good
9	10.270	10.400	0.130	LHS	-	Good
10	10.900	11.230	0.330	LHS	-	Good
11	11.240	11.370	0.130	LHS	-	Good
12	11.380	11.530	0.150	LHS	-	Good
13	11.900	12.100	0.200	LHS	-	Good
14	13.860	13.950	0.090	LHS	2	Good
15	14.530	14.660	0.130	LHS	5	Good
16	14.930	15.070	0.140	LHS	-	Good
17	15.730	15.770	0.040	LHS	-	Good
18	16.100	16.140	0.040	LHS	-	Good

S.NO	Chainage		Length	Side	Damage	Remarks
19	16.650	16.750	0.100	LHS	-	Good
20	17.350	17.380	0.030	LHS	-	Good
21	18.000	18.150	0.150	LHS	-	Good
22	18.990	19.000	0.010	LHS	-	Good
23	19.090	19.110	0.020	LHS	-	Good
24	19.930	19.980	0.050	LHS	-	Good
25	20.200	20.350	0.150	LHS	-	Good
26	20.390	20.480	0.090	LHS	-	Good
27	20.650	20.750	0.100	LHS	-	Good
28	21.000	21.080	0.080	LHS	-	Good
29	21.590	25.720	4.130	LHS	-	Good
30	21.750	21.800	0.050	LHS	-	Good
31	21.810	21.900	0.090	LHS	-	Good
32	21.950	22.030	0.080	LHS	-	Good
33	22.250	22.350	0.100	LHS	-	Good
34	22.600	22.620	0.020	LHS	-	Good
35	22.710	22.720	0.010	LHS	-	Good
36	23.300	23.350	0.050	LHS	-	Good
37	24.000	24.120	0.120	LHS	-	Good
38	25.900	26.100	0.200	LHS	-	Good
39	26.110	26.150	0.040	LHS	-	Good
40	26.270	26.300	0.030	LHS	-	Good
41	27.110	27.280	0.170	LHS	3	Good
42	27.470	27.580	0.110	LHS	3	Good
43	28.800	28.840	0.040	LHS	-	Good
44	30.050	30.080	0.030	LHS	-	Good
45	30.170	30.200	0.030	LHS	-	Good
46	30.470	30.610	0.140	LHS	-	Good
47	30.780	30.800	0.020	LHS	-	Good
48	31.380	31.400	0.020	LHS	-	Good
49	31.500	31.560	0.060	LHS	-	Good
50	31.630	31.800	0.170	LHS	-	Good
51	31.850	31.880	0.030	LHS	-	Good
52	32.000	32.090	0.090	LHS	-	Good
53	32.730	32.850	0.120	LHS	-	Good
54	32.880	32.900	0.020	LHS	-	Good
55	34.800	35.040	0.240	LHS	-	Good
56	35.220	35.280	0.060	LHS	-	Good
57	35.330	35.400	0.070	LHS	-	Good
58	35.410	35.490	0.080	LHS	-	Good
59	35.410	35.550	0.140	LHS	-	Good

S.NO	Chainage		Length	Side	Damage	Remarks
60	35.750	35.810	0.060	LHS	-	Good
61	36.280	36.350	0.070	LHS	-	Good
62	36.770	36.830	0.060	LHS	-	Good
63	37.000	37.020	0.020	LHS	-	Good
64	37.050	37.070	0.020	LHS	-	Good
65	37.100	37.200	0.100	LHS	5	Good
66	37.210	37.230	0.020	LHS	-	Good
67	37.310	37.330	0.020	LHS	-	Good
68	37.600	37.620	0.020	LHS	-	Good
69	37.670	37.700	0.030	LHS	-	Good
70	38.040	38.250	0.210	LHS	-	Good
71	38.570	38.600	0.030	LHS	-	Good
72	38.630	38.780	0.150	LHS	-	Good
73	38.800	38.830	0.030	LHS	-	Good
74	39.010	39.030	0.020	LHS	-	Good
75	39.080	39.100	0.020	LHS	-	Good
76	39.200	39.220	0.020	LHS	-	Good
77	39.450	39.470	0.020	LHS	-	Good
78	39.580	39.600	0.020	LHS	-	Good
79	41.170	41.200	0.030	LHS	-	Good
80	41.400	41.600	0.200	LHS	-	Good
81	42.570	42.570	0.000	LHS	-	Good
82	42.590	43.290	0.700	LHS	-	Good
83	43.330	43.350	0.020	LHS	10	Good
84	43.450	43.580	0.130	LHS	-	Good
85	43.610	43.910	0.300	LHS	-	Good
86	44.000	44.070	0.070	LHS	-	Good
87	44.100	44.120	0.020	LHS	-	Good
88	44.150	44.180	0.030	LHS	-	Good
89	44.450	44.460	0.010	LHS	-	Good
90	44.610	44.780	0.170	LHS	-	Good
91	44.800	44.900	0.100	LHS	-	Good
92	44.980	45.100	0.120	LHS	-	Good
93	45.550	45.570	0.020	LHS	-	Good
94	45.650	45.790	0.140	LHS	-	Good
95	46.900	46.960	0.060	LHS	-	Good
96	47.020	47.120	0.100	LHS	-	Good
97	47.280	47.400	0.120	LHS	-	Good
98	47.650	47.800	0.150	LHS	-	Good
99	48.010	48.260	0.250	LHS	-	Good
100	48.390	48.420	0.030	LHS	-	Good

S.NO	Chainage		Length	Side	Damage	Remarks
101	48.570	48.600	0.030	LHS	-	Good
102	48.200	48.100	0.100	RHS	2	Good
103	48.090	48.000	0.090	RHS	3	Good
104	47.890	47.780	0.110	RHS	-	Good
105	47.380	47.250	0.130	RHS	-	Good
106	46.900	46.590	0.310	RHS	-	Good
107	46.350	46.120	0.230	RHS	-	Good
108	46.070	45.990	0.080	RHS	-	Good
109	45.900	45.800	0.100	RHS	-	Good
110	45.670	45.500	0.170	RHS	-	Good
111	42.500	42.480	0.020	RHS	-	Good
112	42.420	42.400	0.020	RHS	-	Good
113	41.330	41.300	0.030	RHS	-	Good
114	41.180	41.100	0.080	RHS	-	Good
115	41.080	40.880	0.200	RHS	-	Good
116	40.600	40.440	0.160	RHS	-	Good
117	40.420	40.400	0.020	RHS	-	Good
118	40.300	40.250	0.050	RHS	-	Good
119	40.100	40.070	0.030	RHS	20	Good
120	38.880	38.860	0.020	RHS	-	Good
121	38.800	38.780	0.020	RHS	-	Good
122	37.730	37.710	0.020	RHS	-	Good
123	37.650	37.630	0.020	RHS	-	Poor
124	37.120	37.100	0.020	RHS	-	Good
125	37.020	37.000	0.020	RHS	-	Good
126	35.550	35.450	0.100	RHS	-	Good
127	35.430	35.300	0.130	RHS	-	Good
128	35.150	34.990	0.160	RHS	-	Good
129	32.600	32.200	0.400	RHS	-	Good
130	31.580	31.560	0.020	RHS	-	Good
131	31.400	31.300	0.100	RHS	-	Good
132	30.210	30.150	0.060	RHS	-	Good
133	28.890	28.800	0.090	RHS	-	Good
134	28.750	28.600	0.150	RHS	-	Good
135	28.550	28.500	0.050	RHS	-	Good
136	28.420	28.300	0.120	RHS	-	Good
137	27.850	27.750	0.100	RHS	-	Good
138	27.570	27.490	0.080	RHS	-	Good
139	27.210	27.100	0.110	RHS	-	Good
140	26.860	26.790	0.070	RHS	-	Good
141	26.500	26.470	0.030	RHS	-	Good

S.NO	Chainage		Length	Side	Damage	Remarks
142	25.980	25.870	0.110	RHS	-	Good
143	25.650	25.600	0.050	RHS	-	Good
144	25.430	25.350	0.080	RHS	-	Good
145	25.280	25.250	0.030	RHS	-	Good
146	24.550	23.490	1.060	RHS	-	Good
147	22.730	22.720	0.010	RHS	-	Good
148	22.630	22.600	0.030	RHS	-	Good
149	21.600	21.500	0.100	RHS	-	Good
150	21.420	21.250	0.170	RHS	-	Good
151	21.200	21.000	0.200	RHS	-	Good
152	20.990	20.900	0.090	RHS	-	Good
153	20.890	20.870	0.020	RHS	-	Good
154	20.650	20.550	0.100	RHS	3	Good
155	20.450	20.370	0.080	RHS	-	Good
156	20.180	19.940	0.240	RHS	-	Good
157	19.690	19.600	0.090	RHS	-	Good
158	19.400	19.350	0.050	RHS	-	Good
159	19.060	19.040	0.020	RHS	-	Good
160	19.000	18.980	0.020	RHS	3	Good
161	18.130	18.080	0.050	RHS	-	Good
162	17.910	17.850	0.060	RHS	-	Good
163	17.400	17.200	0.200	RHS	3	Good
164	16.850	16.730	0.120	RHS	-	Good
165	16.330	16.240	0.090	RHS	-	Good
166	16.090	16.050	0.040	RHS	-	Good
167	15.870	15.790	0.080	RHS	-	Good
168	15.070	14.930	0.140	RHS	-	Good
169	14.650	14.600	0.050	RHS	-	Good
170	14.530	14.400	0.130	RHS	-	Good
171	13.820	13.780	0.040	RHS	-	Good
172	12.910	12.890	0.020	RHS	3	Good
173	12.750	12.660	0.090	RHS	-	Good
174	12.600	12.520	0.080	RHS	-	Good
175	12.510	12.420	0.090	RHS	-	Good
176	12.390	12.360	0.030	RHS	-	Good
177	12.090	11.920	0.170	RHS	-	Good
178	10.590	10.530	0.060	RHS	-	Good
179	10.350	10.320	0.030	RHS	-	Good
180	9.800	9.650	0.150	RHS	-	Good
181	9.240	9.130	0.110	RHS	-	Good
182	7.700	7.680	0.020	RHS	-	Good

S.NO	Chainage		Length	Side	Damage	Remarks
183	7.440	7.310	0.130	RHS	-	Good
184	7.060	6.950	0.110	RHS	5	Good
185	6.730	6.290	0.440	RHS	5	Good
186	6.020	5.670	0.350	RHS	-	Good
187	5.660	5.550	0.110	RHS	-	Good
188	5.480	5.350	0.130	RHS	-	Good
189	5.240	5.150	0.090	RHS	-	Good
190	5.110	4.950	0.160	RHS	-	Good
191	4.880	4.700	0.180	RHS	-	Good
192	4.570	4.470	0.100	RHS	-	Good
193	4.150	4.120	0.030	RHS	-	Good
194	4.000	3.900	0.100	RHS	-	Good
195	3.680	3.650	0.030	RHS	-	Good
196	3.490	3.390	0.100	RHS	2	Good
197	2.730	2.620	0.110	RHS	-	Good
198	2.350	2.290	0.060	RHS	-	Good
199	2.210	2.100	0.110	RHS	-	Good
200	1.950	1.900	0.050	RHS	-	Good
201	1.800	1.700	0.100	RHS	-	Good
202	1.680	1.650	0.030	RHS	-	Good
203	1.490	1.460	0.030	RHS	-	Good
204	1.340	1.250	0.090	RHS	-	Good
205	0.810	0.790	0.020	RHS	-	Good
206	0.210	0.190	0.020	RHS	-	Good
<b>Total Length (Kms)</b>			<b>24.300</b>		<b>80</b>	

**Table 8: Concrete Crash Barrier Locations**

S.No	From	To	Length(m)	Side	Remarks
1	7.770	7.790	0.020	Both Sides	Good
2	11.890	11.910	0.020	Both Sides	Good
3	12.820	12.900	0.080	Both Sides	Good
4	15.730	15.740	0.010	Both Sides	Good
5	18.970	19.030	0.060	Both Sides	Good
6	22.590	22.690	0.100	Both Sides	Good
7	31.350	31.490	0.140	Both Sides	Good
8	32.580	32.620	0.040	Both Sides	Good
9	37.010	37.030	0.020	Both Sides	Good
10	37.570	37.640	0.070	Both Sides	Good
11	38.730	38.760	0.030	Both Sides	Good
12	42.390	42.410	0.020	Both Sides	Good
<b>Total Length</b>			<b>1.220</b>		

List of major and minor junctions developed are presented in table below:

**Table 9: List of Major Junctions**

S.No	Chainage	Junction Type	Surface Type	Side	Carriageway width(M)	Remarks
1	0+000	3-Arm	BT	RHS	7	Shillong
2	48+600	3-Arm	BT	RHS	7	Shillong

**Table 10: List of Minor Junctions**

S.NO	Chainage	Surface Type	Side	Intersecting Road	Carriage way width(m)	Remarks
1	1.110	Bituminous	RHS	Agriculture College Road	3.0	
2	1.450	Bituminous	RHS	Agriculture College Road	3.0	
3	1.770	Bituminous	BHS	Nonster	5.0	LHS-3m B.T
4	1.920	Bituminous	LHS	Village Road	3.0	
5	2.285	Bituminous	BHS	Village Road	3.0	LHS-3.5m B.T
6	3.350	Bituminous	LHS	Village Road	3.0	
7	3.450	Bituminous	RHS	Military Station (Umroi)	5.5	
8	4.130	Earthen	LHS	Village Road	3.0	
9	4.200	Earthen	LHS	Village Road	3.0	
10	4.470	Bituminous	LHS	Mawpun	3.0	
11	4.520	Earthen	LHS	Village Road	3.5	
12	4.620	Earthen	LHS	Hill Road	3.5	
13	4.650	Earthen	LHS	Village Road	3.0	
14	6.170	Bituminous	LHS	Mawthei	3.5	
15	6.800	Earthen	RHS	Village Road	3.0	
16	7.030	Earthen	LHS	Village Road	3.0	
17	8.710	Bituminous	BHS	Umroi	3.0	LHS-3m CC
18	8.800	Bituminous	RHS	Village Road	3.0	
19	8.850	Bituminous	RHS	Village Road	3.0	
20	8.920	Bituminous	LHS	Village Road	3.0	
21	9.080	Bituminous	BHS	Village Road	3.0	LHS-3m Earthen
22	9.220	Bituminous	LHS	Umroi Madan	7.0	
23	9.380	Bituminous	BS	Umroi	3.5	
24	9.610	Bituminous	LHS	Umroi	3.0	
25	9.760	Bituminous	BHS	Umroi	3.0	RHS-3m Earthen
26	10.130	Bituminous	BHS	Umroi	5.5	RHS-5.5m B.T
27	10.260	Bituminous	LHS	Umroi	3.0	
28	10.530	Bituminous	RHS	Nongtraw	5.5	
29	10.690	Bituminous	BHS	Umsawriang	3.5	RHS-5.5m B.T
30	11.270	Bituminous	RHS	Village Road	5.5	
31	11.350	Bituminous	LHS	Umktich	5.5	
32	11.420	Bituminous	RHS	Village Road	3.0	
33	12.200	Bituminous	RHS	Lumkshlama	3.5	
34	12.250	Bituminous	RHS	Village Road	3.0	
35	13.090	Bituminous	RHS	Madan	3.0	

S.NO	Chainage	Surface Type	Side	Intersecting Road	Carriage way width(m)	Remarks
36	13.960	Bituminous	LHS	Mynsian	3.5	
37	14.730	Bituminous	LHS	Bhoirymbong	5.5	
38	16.460	Bituminous	LHS	Nongtraw	3.5	
39	17.250	Bituminous	LHS	Nongtraw	3.5	
40	17.580	Bituminous	LHS	Nongtraw	3.0	
41	17.850	Earthen	RHS	Nongtraw	3.0	
42	18.000	Bituminous	LHS	Nongtraw	3.5	
43	18.450	Bituminous	LHS	Nongtraw	3.5	
44	19.350	Earthen	LHS	Village Road	3.0	
45	19.700	Earthen	LHS	Village Road	3.0	
46	19.790	Bituminous	LHS	Lumrit	3.5	
47	20.800	Bituminous	RHS	Village Road	3.5	
48	20.910	Earthen	LHS	Village Road	3.0	
49	21.830	Bituminous	LHS	Kyrdeng	3.0	
50	22.020	Earthen	RHS	Village Road	3.0	
51	24.840	Earthen	RHS	Village Road	3.0	
52	25.150	Earthen	LHS	Village Road	3.0	
53	27.670	Earthen	LHS	Village Road	3.0	
54	28.380	Earthen	LHS	Village Road	3.0	
55	29.080	Earthen	RHS	Village Road	3.0	
56	30.770	Bituminous	RHS	Village Road	3.0	
57	33.530	Bituminous	RHS	Diengpasoh	5.5	
58	34.180	Earthen	RHS	Village Road	3.0	
59	41.720	Bituminous	RHS	Thangshalai	3.0	
60	43.080	Earthen	RHS	Village Road	3.5	
61	43.700	Earthen	RHS	Hill Road	3.0	
62	43.750	Earthen	RHS	Hill Road	3.0	
63	44.950	Earthen	LHS	Village Road	3.0	
64	47.600	Bituminous	LHS	Mawkeliang	5.0	

Details of high mast lighting locations are presented in the following table

**Table 11: Locations of Lighting**

S. No	From	Side	No's	Location	Remarks
1	0.000	RHS	High mast Lights - 6 No's	Major Junction	Not in Concessionaire Scope
2	10.130	LHS	High mast Lights - 6 No's	Major Junction	
3	24.900	Median	High mast Lights - 12 No's	Toll plaza	Not in Concessionaire Scope
4	48.600	RHS	High mast Lights - 6 No's	Major Junction	

*Concessionaire informed that, the lighting at Toll Plaza and at Km 0.000 are not in Concessionaire's scope.*

The project Road has 13 number of bus shelters with Bus bays. The details of the Bus shelter and Bus Bays are provided below

**Table 12: Details of Bus Bays and Bus Shelters**

S.No	Chainage	Side	Type	Condition	Remarks
1	1.500	LHS	Bus Bay with Shelter	Good	
2	3.450	LHS	Bus Bay with Shelter	Good	
3	3.800	RHS	Bus Bay with Shelter	Good	
4	4.470	RHS	Bus Bay with Shelter	Good	
5	4.750	LHS	Bus Bay with Shelter	Good	
6	6.660	LHS	Bus Bay with Shelter	Good	
7	6.920	RHS	Bus Bay with Shelter	Good	
8	9.230	LHS	Bus Shelter	Good	Extra
9	9.850	RHS	Bus Bay with Shelter	Good	
10	9.940	LHS	Bus Bay with Shelter	Good	
11	10.130	LHS	Bus Shelter	Good	Extra
12	10.140	LHS	Bus Shelter	Good	Extra
13	10.700	RHS	Bus Shelter	Good	Extra
14	14.860	RHS	Bus Bay with Shelter	Good	
15	14.910	LHS	Bus Bay with Shelter	Good	
16	43.100	LHS	Bus Bay with Shelter	Good	
17	43.210	RHS	Bus Bay with Shelter	Good	

*Note: Concessionaire informed that, 4 number of extra bus shelters found pertains to Villagers and the same are not in Concessionaire scope*

### 1.5.2 Bridge Works

The project Road has 3 numbers of major bridges, 8 numbers of minor bridges and 1 number of VUP along the project road apart from Culverts.

Details of the structures excluding the culverts is presented in the following table

**Table 13: List of Structures excluding Culverts**

S.No.	Chainage as Per CA	Chainage as Per Site	Type of Str	Span as per Schedule	Span as per Site	Deck width as per site	Structure in Schedule	Structure on Site	Skew angle
1	7+780	7+780	MNB	1 x 11.6	1 x 11.6	1 x 8.4	Yes	Yes	-
2	12+025	11+900	MNB	1 x 11.6	1 x 10.0	1 x 10	Yes	Yes	-
3	12+865	12+865	MJB	3 x 18.0	3 x 25.5	1 x 11	Yes	Yes	-
4	-	15+740	MNB	NA	1 x 7 (SQ) 1 x 8.3(SK)	1 x 12.2(SQ) 1 x 14(SK)	No	Yes	15
5	18+885	19+000	MNB	1 x 12 + 1 x 20+ 1 x 12	1 x 10.3 + 1 x 20+ 1 x 12	1 x 12	Yes	Yes	
6	22+640	22+640	MJB	1 x 20+1 x 40+1 x	1 x 15+1 x 45+1 x 25	1 x 12	Yes	Yes	-

				20					
7	31+270	31+420	MJB	3 x 40	1 x 30 + 2 x 45	1x 12	Yes	Yes	-
8	32+045	32+868	MNB	1 x 8.0	1 x 24	1 x 12	Yes	Yes	-
9	35+950	37+020	MNB	1 x 15.0	1 x 15.0	1 x 12	Yes	Yes	-
10	36+580	37+600	MNB	2 x 25.5	2 x 25.3	1 x 8.5	Yes	Yes	-
11	-	38+480	VUP	NA	1 x 18	1 x 12	No	Yes	-
12	-	42+400	MNB	NA	1 x 7.75(SQ) 1 x 9.8(SK)	1 x 12.9(SQ) 1 x 13.1(SK)	No	Yes	15

## 1.6 QUALITY AUDIT

### 1.6.1 Embankment & Subgrade

The embankment for project road has been constructed with available soils from nearby areas. The soil appears to be Silty Sand in nature and embankment appears to be in good condition over the entire length of project. No major settlements or depressions have been noted even at high embankment locations. There are no marshy/water logging areas along the length of project road.

The subgrade of the project road appears to be in good condition as revealed by test pit investigations. Laboratory results conducted on subgrade indicates that most of subgrade soils are of SM (Silty Sand) type with low PI values. Condition of subgrade appears to intact as no major evidence of subsidence of depressions exists along the corridor. CBR of subgrade soils for lab testing indicates a good value greater than 10% at three locations. Results of Subgrade CBR are as follows:

**Table 14: Existing Subgrade Test Results**

Lab Sample No	Location (km) / Up/Dn		Grain Size Analysis					Atterberg Limits (%)			Soil Class	MDD (gm/cc)	OMC (%)	Soaked CBR 97% MDD	Free Swelling Index (%)
			Percentage passing from					LL	PL	PI					
			4.75 mm IS Sieve	425 mic IS Sieve	75 mic IS Sieve	Gravel %	Sand %								
TP-1	0+900	LHS	100	41	27	0	73	31	29	3	SM	1.76	15.10	10.80	0.00
TP-2	11+200	RHS	100	59	26	0	74	27	NP	NP	SM	1.82	13.70	9.30	10.00
TP-3	20+800	LHS	100	37	19	0	81	19	NP	NP	SM	1.97	11.10	9.20	20.00
TP-4	32+100	RHS	100	76	20	0	80	19	NP	NP	SM	1.75	11.40	10.20	6.80
TP-5	42+300	LHS	100	89	24	0	76	23	NP	NP	SM	1.76	11.00	10.80	6.00

The following observations can be made from the above test results conducted on of existing subgrade samples

- Liquid limit for existing subgrade samples varies between 19 and 31. All the samples satisfying the liquid limit criterion ( $LL \leq 50$ ).
- Plasticity Index for 1 out of 5 samples subgrade samples is 3 and remaining 4 are not plastic.
- Maximum Dry Density for all subgrade samples varies between 1.75 and 1.97 gm/cc. All the samples satisfying the MDD criterion ( $MDD \geq 1.75$  gm/cc).
- OMC for existing subgrade samples varies between 11.0 to 15.10
- Free Swelling Index for existing subgrade samples varies between 0.00 and 20.00 All samples satisfying the FSI criterion ( $FSI \leq 50\%$ ).

*On whole, it can be concluded that the existing subgrade is in good condition.*

### 1.6.2 Pavement Condition

Concessionaire informed that, after Construction, till date not done any major maintenance or periodic Overlay on the pavement surface. For the last 8 years, Concessionaire is maintaining the project road in traffic worthy condition with good riding quality., however surface related distresses such as narrow cracking and Ravelling is observed on the project road. crack sealing/fog seal is noticed along at some distressed locations. Patching also seen along the project road. Due to oxidization undergone for the last 8 years, the surface appears dry surface.

### 1.6.3 FWD Analysis and Assessment of Overlay Requirement

The FWD data collected has been analyzed as per IRC guidelines and presented below.

**Table 15: Summary of Design Moduli of different layers - BHS**

Sl.No	From	To	Length (km)	15th Percentile MR values		
				MR for BT	MR for Granular	MR for Subgrade
1	0.00	4.20	4.2	2263	178	77
2	4.20	7.30	3.1	2264	301	77
3	7.30	10.30	3.0	2270	250	77
4	10.30	12.50	2.2	2160	185	77
5	12.50	17.80	5.3	2178	214	77
6	17.80	21.00	3.2	2171	298	77
7	21.00	23.60	2.6	2149	218	77
8	23.60	27.80	4.2	2210	362	77
9	27.80	32.20	4.4	2227	365	77
10	32.20	35.20	3.0	2086	234	77
11	35.20	36.60	1.4	2383	61	77
12	36.60	39.00	2.4	2382	128	77
13	39.00	42.60	3.6	2447	171	77
14	42.60	46.00	3.4	2427	162	77
15	46.00	48.766	2.766	2443	190	77

### 1.6.3.1 Observations on FWD Results

It can be noticed from the above table that the layer moduli for the three layers are varying along the length and direction. The MR value for BT layer is 2086 Mpa to 2447 Mpa in BHS Carriageway. The MR value for Granular Layers is 61 Mpa to 365 Mpa in BHS Carriageway. Similarly, the MR value for Subgrade Layer is 77 Mpa BHS Carriageway.

### 1.6.4 Pavement Composition

As per approved pavement thickness, as per IRC 37, for 55 MSA and 10% subgrade CBR, the recommended pavement thickness for new flexible pavement is given below:

S.No	Layer	Thickness
1	BC	50mm
2	DBM	100mm
3	WMM	250mm
4	GSB	200mm
5	Subgrade	500mm (CBR 10%)

However, from the test pits dug at five locations along the project road, the average Bituminous layer thickness observed is 140 mm and the average granular layer thickness is 438mm. Variation may be due to Secondary Compaction over the period.

### 1.6.5 CD Structures

The CD structures along the corridor appear to be as per the standards and specifications. Presently, all structures appear new and seem to be in good condition without any major distress. Structure wise conditions along the project corridor are presented below:

Details of Major Structure as per Schedule and as on site:

List of Structures	As Per Site
Major Bridge	3
Minor Bridge	8
Cattle/Pedestrian Underpass	0
Railway Over Bridge	0
Vehicular Underpass	1
Culverts	240

**BR. NO. 7+780(MNB)**

**GENERAL DESCRIPTION**

- Chainage : Km 7+780
- Type of structure : Minor Bridge
- Span Arrangement : 1 x 11.6m
- Total outer width of structure : 8.4 m
- Skew angle : NA
- Type of Foundation : Open
- Type of Substructure : RCC wall type
- Type of Superstructure : RCC 3 girder system and Deck slab
- Type of Bearing : Elastomeric
- Type of Railing : RCC Crash barrier
- Method of Inspection : Visual

**OBSERVATIONS**

Visual Observations on condition of the bridge are as below:

- Overall structure appears to be good in good condition
- Honey combs are observed on soffit of the slab.
- In wing wall minor cracks observed at some locations.



**Km 7+780**



**Km 7+780**

**BR. NO. 11+900 (MNB)**

**GENERAL DESCRIPTION**

- Chainage : Km 11+900
- Type of structure : Minor Bridge
- Span Arrangement : 1 x 10m
- Total outer width of structure : 10 m
- Skew angle : NA
- Type of Foundation : Open
- Type of Substructure : RCC wall type
- Type of Superstructure : LHS- RCC 4 girder system and RHS- RCC Solid slab
- Type of Bearing : No Bearings
- Type of Railing : RCC Crash barrier
- Method of Inspection : Visual

**OBSERVATIONS**

Visual Observations on condition of the bridge are as below:

- Overall structure appears to be in good condition
- Weep holes are not provided on wing walls.



**Km 11+900**

**Km 11+900**

**BR. NO. 12+865 (MJB)****GENERAL DESCRIPTION**

- Chainage : Km 12+865
- Type of structure : MJB
- Span Arrangement : 3 x 25.5 m
- Deck width of bridge : 11 m
- Skew Angle : NA
- Type of Foundation : Open
- Type of Substructure : RCC Wall type
- Type of Superstructure : RCC 3 Girder system and Deck slab
- Type of Bearing : No Bearings
- Type of Railing : RCC Crash barrier
- Method of Inspection : Visual

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- Expansion joint rubber seals are damaged.
- In third span major cracks are observed on girders.
- Weep holes are not provided in abutment wall.
- Honeycombs are observed on the pier walls
- Bearing are not provided.
- In second span, bottom of the girder damaged, spalling of concrete & reinforcement is exposed.

**NOTE:**

During site visit, this Bridge was opened only for light vehicular traffic. Heavy vehicles were not allowed. The distress affecting the capacity of the bridge are shown in the photographs. Such as cracks in the bottom flange propagating on to the web as well are shown.

1. Bridge at Km 12+865 is having developed Vertical Flexural and Shear cracks due to overloading of Heavy Vehicular Traffic.
2. As per NHAI instructions, presently, heavy vehicles are not allowed on this bridge and the traffic is being diverted through Shillong Town.
3. On the side of existing old bridge, bailey bridge construction was under progress. Bailey bridge fabrication and support work of pier p1 and p2 was being executed by New India Construction (BRO nominated Contractor). The Concessionaire got COS approval for construction of Bailey bridge with the ancillary support and approach roads for this bailey bridge.
4. Bailey Bridge launching was completed by the BRO and the approach road was completed by the Concessionaire under COS. Concessionaire informed that Bailey Bridge was inaugurated on 25.03.2021 in presence of Hon’ble deputy Chief Minister Meghalaya.
5. As per information by the Concessionaire, NHAI has taken up the construction of new bridge independently.



12+865

Km



Km 12+865



Km 12+865



Km 12+865

**BR. NO. 15+740 (MNB) (Extra)**

**GENERAL DESCRIPTION**

- |                                  |                              |
|----------------------------------|------------------------------|
| • Chainage                       | : Km 15+740                  |
| • Type of structure              | : Minor Bridge               |
| • Span Arrangement               | : 1 x 7m (SQ), 1 x 8.3m (SK) |
| • Total outer width of structure | : 12.2m(SQ), 14m(SK)         |
| • Skew angle                     | : Nearly 15°                 |
| • Type of Foundation             | : Open                       |
| • Type of Substructure           | : RCC wall type abutment.    |
| • Type of Superstructure         | : RCC Solid Slab             |
| • Type of Bearing                | : No Bearings                |
| • Type of Railing                | : RCC Crash barrier          |
| • Method of Inspection           | : Visual                     |

**OBSERVATIONS**

Visual Observations on condition of the bridge are as below:

- Overall Structure Condition is good
- Drainage spout down take pipe is not provided.



**Km 15+740**



**Km 15+740**



**BR. NO. 19+000 (MNB)**

**GENERAL DESCRIPTION**

• Chainage	: Km 19+000
• Type of structure	: MNB
• Span Arrangement	: 1 x 10.3 +1 x 20 + 1 x 12 m
• Total outer width of structure	:12 m
• Skew angle	: NA
• Type of Foundation	: Open
• Type of Substructure	:RCC Wall type
• Type of Superstructure	:RCC 4 Girder system
• Type of Bearing	: Pot PTFE, Pin Bearings
• Type of Railing	:RCC Crash barrier
• Method of Inspection	:Visual

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- Overall Structure Condition is good
- Floor apron damaged at first span.
- Minor Cracks are observed on approach slab.
- Expansion joints rubber are damaged.
- Cracks observed on crash barrier at some locations.
- Steel pipe hand railing is damaged.
- Minor damage on second span, third girder.



**Km 19+000**



**Km 19+000**



Km 19+000



Km 19+000



Km 19+000



Km 19+000



Km 19+000



Km 19+000

**BR. NO. 22+640 (MJB)**

**GENERAL DESCRIPTION**

- Chainage : Km 22+640
- Type of structure : MJB
- Span Arrangement : 1 x 15 + 1 x 45 + 1 x 25 m
- Total outer width of structure : 12 m
- Skew angle : NA
- Type of Foundation : Open
- Type of Substructure :RCC Column type piers and wall type abutment
- Type of Superstructure :RCCGirder system and composite steel structure
- Type of Bearing : Pot PTFE, Pin Bearings
- Type of Railing :RCC Crash barrier
- Method of Inspection :Visual

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- Overall Structure Condition is good
- Expansion joint rubber joints are damaged.
- Drainage spout down take pipe is not provided.
- Minor Cracks are observed on beside of the expansion joint.



Km 22+640



Km 22+640



Km 22+640



Km 22+640

**BR. NO. 31+420 (MJB)**

**GENERAL DESCRIPTION**

• Chainage	: Km 31+420
• Type of structure	: MJB
• Span Arrangement	: 1 x 30 + 2 x 45 m
• Deck width of bridge	: 12 m
• Skew Angle	: NA
• Type of Foundation	: Open
• Type of Substructure	: RCC column type piers and wall type abutment
• Type of Superstructure	: Composite steel structure
• Type of Bearing	: POT PTFE, Pin Bearings
• Type of Railing	: RCC Crash barrier
• Method of Inspection	: Visual

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

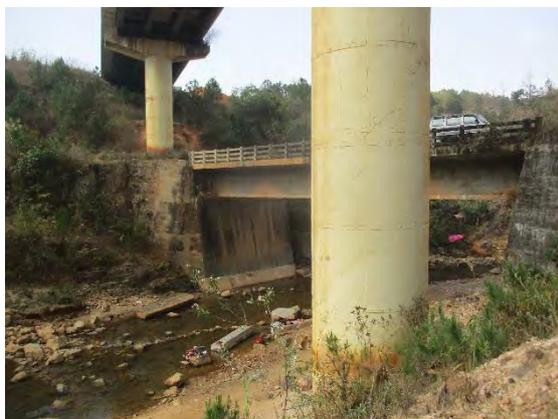
- Overall Structure Condition is good
- Expansion joint rubber selling is damaged.
- Drainage spout down take pipe is not provided.
- Minor Crack observed on crash barrier at some locations.



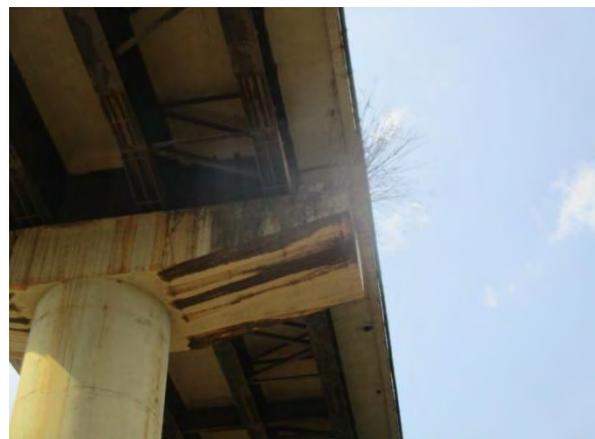
Km 31+420



Km 31+420



Km 31+420



Km 31+420

**BR. NO. 32+868 (MNB)**

**GENERAL DESCRIPTION**

- |                                  |                                     |
|----------------------------------|-------------------------------------|
| • Chainage:                      | : Km 32+868                         |
| • Type of structure              | : Minor Bridge                      |
| • Span Arrangement               | : 1 x 24 m                          |
| • Total outer width of structure | : 12m                               |
| • Skew Angle                     | : NA                                |
| • Type of Foundation             | : Open                              |
| • Type of Substructure           | : RCC wall type abutment.           |
| • Type of Superstructure         | : RCC 4 Girder system and Deck slab |
| • Type of Bearing                | : Pot PTFE & Pin bearings           |
| • Type of Railing                | : RCC Crash barrier                 |
| • Method of Inspection           | : Visual                            |

**OBSERVATIONS**

Visual Observations on condition of the bridge are as below:

- Overall Structure Condition is good
- Expansion joint rubber joints are damaged.
- Floor apron is damaged.



Km 32+868



Km 32+868



Km 32+868



Km 32+868

**BR. NO. 37+020 (MNB)**

**GENERAL DESCRIPTION**

- |                                  |                                     |
|----------------------------------|-------------------------------------|
| • Chainage:                      | : Km 37+020                         |
| • Type of structure              | : Minor Bridge                      |
| • Span Arrangement               | : 1 x 15 m                          |
| • Total outer width of structure | : 12 m                              |
| • Skew Angle                     | : NA                                |
| • Type of Foundation             | : Open                              |
| • Type of Substructure           | : RCC wall type abutment.           |
| • Type of Superstructure         | : RCC 4 Girder system and Deck slab |
| • Type of Bearing                | : Pot PTFE & Pin Bearings           |
| • Type of Railing                | : RCC Crash barrier                 |
| • Method of Inspection           | : Visual                            |

**OBSERVATIONS**

Visual Observations on condition of the bridge are as below:

- Overall Structure Condition is good
- Minor Crack observed on crash barrier wall at some locations.
- Minor Cracks observed on expansion joints sides.



**Km 37+020**



**Km 37+020**



**Km 37+020**



**Km 37+020**

**BR. NO. 37+600 (MNB)**

**GENERAL DESCRIPTION**

- Chainage: : Km 37+600
- Type of structure : Minor Bridge
- Span Arrangement : 2 x 25.30 m
- Total outer width of structure : 8.5 m
- Skew Angle : NA
- Type of Foundation : Open
- Type of Substructure : RCC wall type pier and abutments
- Type of Superstructure : RCC Girder system
- Type of Bearing : NA
- Type of Railing : RCC Head wall
- Method of Inspection : Visual

**OBSERVATIONS**

Visual Observations on condition of the bridge are as below:

- Overall Structure Condition is good
- Expansion joints rubber joints sealing is damaged.
- Minor damage on head wall at small portion



**Km 37+600**



**Km 37+600**



**Km 37+600**



**Km 37+600**

**BR. NO. 38+480 (VUP) (Extra)**

**GENERAL DESCRIPTION**

• Chainage	: Km 38+750
• Type of bridge	: VOP/VUP
• Span Arrangement	: 1 x 18 m
• Total outer width of bridge	: 12 m
• Median Width	:-
• Skew Angle	: NA
• Type of Foundation	: Open
• Type of Substructure	: RCC Circular type Abutment
• Type of Superstructure	: RCC 4 Girder system and deck slab.
• Type of Bearing	: Pot PTFE, Pin Bearings
• Type of Railing	: RCC Crash barrier
• Method of Inspection	: Visual

**OBSERVATIONS**

Visual Observations on condition of the bridge are as below:

- Overall Structure Condition is good
- Drainage spout down take pipes are not provided.
- Expansion joints are buried with debris
- Minor crack observed on RCC crash barrier at some locations



**Km 38+750**



**Km 38+750**



**Km 38+750**



**Km 38+750**

**BR. NO. 42+400 (MNB) (Extra)**

**GENERAL DESCRIPTION**

• Chainage	: Km42+400
• Type of bridge	: MNB
• Span Arrangement	: 1 x 7.75m(SQ) and 1 x 9.8m (SK)
• Total outer width of bridge	: 12.9 m (SQ) and 13.1 m (SK)
• Skew Angle	: Nearly 15°
• Type of Foundation	: Open
• Type of substructure	: RCC wall type Abutment
• Type of Superstructure	: RCC Solid Slab
• Type of Bearing	: NA
• Type of Railing	: RCC Crash barrier
• Method of Inspection	: Visual

**OBSERVATIONS**

Visual Observations on condition of the bridge are as below:

- Overall Structure Condition is good
- Drainage spout down take pipes are not provided
- Minor Crack observed on footpath location at 1 location.



**Km 42+400**



**Km 42+400**

Photos depicting the existing culvert are presented below :





**Km 0+735**



**Km 4+150**



**Km 4+570**



**Km 6+284**



**Km 8+053**



**Km 44+820**

**Table 16:Details of Culverts:**

*For most of the culverts, Quadrant pitching and slope protection is not Visible*

S.No	Structure type	Chainage	Span arrangement (No.x length)	Vertical clearance (m)	Slab thickness (m)	CW width (m)	Existing deck width	Remarks
1	Pipe	0+365	1 x 1.2	0.0(LHS) & 0.0(RHS)		7	10.3	
2	Pipe	0+465	1 x 1.2	0.0(LHS) & 0.0(RHS)		7	15.1	
3	Box	0+655	1 x 1.5 x 1.5					
4	Box	0+735	1 x 1.5 x 1.5	1.3	0.3	7	15.1	
5	Pipe	0+802	1x1.0	0.4(LHS) & 0.3(RHS)		7	14.1	Minor cracks on head wall.
6	Pipe	1+120	1 x 1.2 (skew angle is 15 <sup>0</sup> )	0.4(LHS) & 0.4(RHS)		7	17.7	Minor damage on head wall.
7	Pipe	1+359	1 x 1.0	0.3(LHS) & 0.5(RHS)		7	16.5	
8	Pipe	1+450	2 x 1.2 (skew angle is 15 <sup>0</sup> )	0.5(LHS) & 0(RHS)		7	12.8	
9	Pipe	1+570	1x1.0	1 (LHS)		7	15.3	1.RHS side house is constructed
10	Pipe	1+773	1x1.0					
11	Pipe	1+951	1x 1.0	Buried with bushes		7	17.4	
12	Pipe	2+160	2x1.20	1m (BHS)		7	16.2	
13	Pipe	2+230	1x 1.0	1m (LHS) & 0.3 (RHS)		7	14.3	
14	Pipe	2+330	1x1.2	Buried with bushes		7	16.7	
15	Pipe	2+446	1x1.0	1m (LHS) & 0.3 (RHS)		7	15.7	
16	Pipe	2+745	1 x 1.0	0.4m (LHS) & 0.3 (RHS)		7	17.3	

S.No	Structure type	Chainage	Span arrangement (No.x length)	Vertical clearance (m)	Slab thickness (m)	CW width (m)	Existing deck width	Remarks
17	Pipe	2+883	1x1.0	0.9(BHS)		7	15.4	
18	Pipe	3+071	1x1.0	0.3(LHS) 0.2(RHS)		7	13.6	
19	Pipe	3+250	1 x 1.0	Buried with bushes (LHS) 0.3m(RHS)		7	20.9	
20	Pipe	3+280	2 x 1.0	0.3(LHS) 0.4(RHS)		7	12.8	
21	Pipe	3+388	1x1.0	Buried with bushes		7	15.4	
22	Pipe	3+495	1x1.0	Buried (LHS) & 0.3 (RHS)		7	14.3	
23	Pipe	3+600	1x1.0	0.4 (LHS) Buried with Bushes (RHS)		7	15.9	
24	Pipe	3+675	1x1.0	0.3 (LHS) & 0.6 (RHS)		7	13.2	
25	Pipe	3+833	1x 1.2	0.4(BHS)		7	16.8	
26	Pipe	3+965	1x1.0	Buried with sand		7	13.1	
27	Box	4+150	1 x 3.0 x 3.0	2.5	0.4	8.5	17.5	
28	Pipe	4+316	1x1.0	0.9 (LHS) & 0 (RHS)		8.5	13.2	
29	Pipe	4+540	1 x 1.2 (skew angle is 10°)	0.4 (RHS)		7	16.8	
30	Box	4+570	1 x 3.0 x 4.0	2	0.3	7	13.1	
31	Box	4+598	1 x 1.5x1.5 (skew angle is 20°)	1.5	0.3	7	17.5	
32	Pipe	4+655	1x1.2	0.0(LHS) & 0.0(RHS)		7	13.2	
33	Pipe	4+700	1x1.2	0.4 (LHS) & 0.3 (RHS)		9	17.6	
34	Pipe	4+838	1x 1.0	0.3 (LHS) & 0.0 (RHS)		9	10.3	

S.No	Structure type	Chainage	Span arrangement (No.x length)	Vertical clearance (m)	Slab thickness (m)	CW width (m)	Existing deck width	Remarks
35	Pipe	5+010	1 x 1.0	0.3 (LHS) & 0.0 (RHS)		9	12.5	
36	Pipe	5+234	1 x 1.0	0.3 (LHS) & Closed (RHS)		9	15.5	
37	Pipe	5+334	1x1.0	Closed (LHS) & 0.3(RHS)		7	14	
38	Pipe	5+425	1x1.0	Closed (LHS) & 0.4(RHS)		7	13.9	
39	Pipe	5+540	1x1.2	0.9 (LHS) & closed (RHS)		7	16.2	
40	Pipe	5+605	1x1.0	0.4 (LHS) & 0.5 (RHS)		7	15	
41	Pipe	5+691	1 x 1.0	0.6 (LHS) & 0.6 (RHS)		7	14.4	
42	Pipe	5+920	1 x 1.20	0.5 (LHS) Closed with bushes (RHS)		7	16.2	
43	Pipe	6+102	1 x 1.2	1m (LHS) & Closed with bushes (RHS)		7	17.2	
44	Pipe	6+166	1 x 1.0	0.0 (LHS) & 0.0 (RHS)		7	17	
45	Pipe	6+225	1 x 1.2	0.0 (LHS) & 0.2 (RHS)		7	17.6	
46	Box	6+284	1x3.0x3	2	0.6	7	14.6	
47	Pipe	6+681	1x1.2	0.0 (LHS) 7 0.2 (RHS)		7	17.9	
48	Pipe	7+025	1x1.0	0.0 (LHS) & 0.0 (RHS)		7	16.7	
49	Pipe	7+300	1 x 1.20	1.2 (LHS) & 1 (RHS)		7	21.7	
50	Pipe	7+450	1x1.20	0.4 (BHS)		7	20.7	
51	Pipe	7+525	1 x 1.20	0.3 (LHS) & 0.0 (RHS)		7	14.5	
52	Box	7+600	1 x 1.5 x 1.5	1	0.3	7	15.7	

S.No	Structure type	Chainage	Span arrangement (No.x length)	Vertical clearance (m)	Slab thickness (m)	CW width (m)	Existing deck width	Remarks
53	Pipe	7+690	1x 1.2 (skew angle is 15 <sup>0</sup> )	1(LHS) & closed with bushes(RHS)		7	13	
54	Pipe	7+710	1x1.2	1(LHS) & 0.5 (RHS)		7	14.4	
55	Pipe	7+940	1 x 1.0	0.2(LHS) & 0.2 (RHS)		7	14.5	
56	Box	8+053	1x 1.5x1.5 (skew angle is 20 <sup>0</sup> )	1.5	0.3	7	16.1	
57	Pipe	8+149	1 x 1.0	1 m(BHS)		7	15.3	
58	Pipe	8+333	1x1.2	0.5(LHS) & 0.9 (RHS)		7	15.9	
59	Box	8+417	1 x 1.5 x 1.5	1.3	0.3	7	12.6	
60	Pipe	8+537	1x1.2	1.2 (LHS) & 0.6 (RHS)		7	15.8	
61	Pipe	8+605	1x1.2	0.3 (LHS) & 0.1 (RHS)		7	12.7	
62	Pipe	8+653	1 x 1.2	0.3 (LHS) & 0.0 (RHS)		7	12.6	
63	Pipe	8+910	1x1.2	0.3 (LHS) & 0.5 (RHS)		7	15.7	
64	Pipe	9+130	1 x 1.2	0.3 (LHS) & 0.3 (RHS)		7	15.8	
65	Pipe	9+190	3x1.2	0.4 (LHS) & 0.2 (RHS)		7	10.6	
66	Pipe	9+210	1x1.2	0.0 (LHS) & 0.0 (RHS)		7	16.3	
67	Pipe	9+230	2x1.2	0.0 (LHS) & 0.0 (RHS)		7	10.2	Shop is constructed on LHS side and RHS side buried.
68	Pipe	9+625	2x1.2	0.0 (LHS) & 0.0 (RHS)		7	18	
69	Pipe	9+770	1x1.2	0.5 (LHS) & 0.0 (RHS)		7	18.7	
70	Pipe	9+940	1x1.2	Buried		7	18.1	
71	Pipe	10+261	1 x 1.0	0.0 (LHS) & 0.0 (RHS)		8.5	12.2	

S.No	Structure type	Chainage	Span arrangement (No.x length)	Vertical clearance (m)	Slab thickness (m)	CW width (m)	Existing deck width	Remarks
72	Pipe	10+405	1 x 1.0 (skew angle is 10 <sup>0</sup> )	0.2 (LHS) & 0.3 (RHS)		7	16.7	
73	Pipe	10+765	1x1.2	0.2 (LHS) & Buried (RHS)		7	15.2	
74	Pipe	10+950	2x1.2	1 m (LHS) & 1.2 m (RHS)		7	13.3	
75	Pipe	11+170	1x 1.2	0.0 (LHS) & 0.0 (RHS)		7	14.7	
76	Pipe	11+275	2 x 1.2	0.0 (LHS) & 0.0 (RHS)		7	17.4	
77	Pipe	11+535	1x1.0	0.3 (LHS) & 0.3 (RHS)		7	14.2	
78	Pipe	11+660	1 x 1.0	0.5 (LHS) & 0.4 (RHS)		7	15.4	
79	Pipe	11+935	1x1.2	Buried		7	16.1	Buried
80	Box	12+049	1 x 3.0 x 3.0	2.5	0.4	7	15.5	
81	Pipe	12+435	1 x 1.2	0.4 (LHS) & 0.5 (RHS)		7	13.6	
82	Pipe	12+515	1 x 1.2	0.4 (LHS) & 0.5 (RHS)		7	13.6	
83	Pipe	12+610	1 x 1.2	0.3 (LHS) & 0.0 (RHS)		7	13.2	
84	Pipe	12+657	1 x 1.2	0.0 (LHS) & 0.4 (RHS)		7	13.7	
85	Pipe	13+815	1x1.2	0.4 (LHS) & 0.5 (RHS)		7	15.2	
86	Pipe	13+861	1 x 1.2	0.2 (LHS) & 0.3 (RHS)		7	16.1	
87	Pipe	13+946	1x1.2	Buried		7	16.7	Buried
88	Pipe	13+994	1 x 1.2	Buried		7	15.8	Buried
89	Pipe	14+060	1x1.2	0.2 (LHS) & 0.3 (RHS)		7	16.1	
90	Pipe	14+272	1 x 1.2	0.2 (LHS) & 0.3 (RHS)		9	16	
91	Pipe	14+452	1x 1.2	1 (LHS) & 0.6 (RHS)		7	15.4	

S.No	Structure type	Chainage	Span arrangement (No.x length)	Vertical clearance (m)	Slab thickness (m)	CW width (m)	Existing deck width	Remarks
92	Pipe	14+573	2x1.2	0.5 (LHS) 7 Buried (RHS)		7	17.9	RHS side fire station is constructed
93	Pipe	14+610	1 x 1.2	0.6 (LHS) & 0.5 (RHS)		7	13.2	
94	Pipe	14+645	2x1.2	0.0 (LHS) & 0.0 (RHS)		7	16.7	
95	Pipe	14+780	1 x 1.2	0.4 (LHS) & 0.0 (RHS)		7	15.5	
96	Pipe	14+950	1 x 1.2	0.0 (LHS) & 0.0 (RHS)		7	15.9	
97	Pipe	15+010	1x1.2	0.4 (LHS) & 0.0 (RHS)		7	16.2	
98	Pipe	15+065	1x1.2	0.3 (LHS) & 0.2 (RHS)		7	15.7	
99	Pipe	15+460	1 x 1.2	0.9 (LHS) & 0.6 (RHS)		7	16.5	
100	Pipe	15+730 (Extra)	1 x 1.2	1m(LHS) Buried (RHS)		7	16	
101	Pipe	15+870	1x1.2	0.3 (LHS) & 0.4 (RHS)		7	16.2	
102	Pipe	16+080	1 x 1.2	0.3 (LHS) & 0.4 (RHS)		7	15.1	
103	Pipe	16+260	1x 1.2	0.5 (LHS) & 0.5 (RHS)		7	15.1	
104	Pipe	16+385	1 x 1.2	0.3 (LHS) & 0.4 (RHS)		7	19.3	
105	Pipe	16+970	1x1.2	1.0 (LHS) & 0.3 (RHS)		7	18.1	
106	Pipe	17+265	1x1.2	0.0 (LHS) & 0.3 (RHS)		7	14.6	
107	Pipe	17+360	2x1.2	0.0 (LHS) & 1.0 (RHS)		7	14.8	
108	Pipe	17+578	1 x 1.2	1.0 (LHS) & 0.9 (RHS)		7	13.8	
109	Pipe	17+658	1x1.2	0.2 (LHS) & 0.5 (RHS)		7	14.1	
110	Pipe	17+956	1 x 1.2	0.4 (LHS) & 0.2(RHS)		7	17.7	
111	Pipe	18+222	1x1.2	0.4 (LHS) & 0.5(RHS)		7	17.1	

S.No	Structure type	Chainage	Span arrangement (No.x length)	Vertical clearance (m)	Slab thickness (m)	CW width (m)	Existing deck width	Remarks
112	Pipe	18+633	1x1.2	0.3 (LHS) & 0.4 (RHS)		7	12.3	
113	Pipe	18+680	1x1.2	0.1 (LHS) & 0.3 (RHS)		7	16.2	
114	Pipe	18+800	1 x 1.2	1.1 (LHS) & 1.0 (RHS)		7	16.4	
115	Pipe	18+980	1x1.2	0.4 (LHS) & 1.0 (RHS)		7	18.4	
116	Pipe	19+070	1x1.2	1.2 (LHS) & 1.0 (RHS)		7	13.3	
117	Pipe	19+230	1 x 1.2	1.0 (LHS) & 0.6 (RHS)		7	14.2	
118	BOX	19+400	1 x 2 (skew angle is 10 <sup>0</sup> )	1.0 (LHS) & 0.6 (RHS)		7	9.3	
119	Pipe	20+035	1x1.2	0.4 (LHS) & 0.3 (RHS)		7	11.4	
120	Pipe	21+135	1 x 1.2	0.2 (LHS) & 0.3 (RHS)		7	12.5	
121	Pipe	21+230	1x 1.2	1.2 (LHS) & 0.3 (RHS)		7	13.1	
122	Pipe	21+717	1 x 1.2	1.0 (LHS) & 0.3 (RHS)		7	13.5	
123	Pipe	21+900	1x1.2	0.4 (LHS) & 0.3 (RHS)		9	12.3	
124	Pipe	21+910	1 x 1.2	0.3 (LHS)& 1.2 (RHS)		9	13.9	
125	Pipe	22+230	1x1.2	1.1 (LHS) & 0.4 (RHS)		7	12.3	
126	Pipe	22+500	1x1.2	1.1 (LHS) & 0.9 (RHS)		7	12	
127	Pipe	22+954	2 x 1.2	0.6 (LHS) & 0.5 (RHS)		7	12.9	
128	Pipe	23+170	2x1.2	1.2 (LHS) & 1.2 (RHS)		7	21.3	
129	Pipe	23+480	1x1.2	0.5 (LHS) & 0.3 (RHS)		7	15.5	

S.No	Structure type	Chainage	Span arrangement (No. x length)	Vertical clearance (m)	Slab thickness (m)	CW width (m)	Existing deck width	Remarks
130	Pipe	23+690	1x1.2	1.0 (LHS) & 1.2 (RHS)		7	15.2	
131	Pipe	23+810	1 x 1.2	1.0 (LHS) & 1.2 (RHS)		7	13.6	
132	Pipe	24+160	1x1.2	0.5 (LHS)& Closed (RHS)		7	36.9	
133	Pipe	24+590	1 x 1.2	0.3 (LHS) 0.1 (RHS)		7	16.1	
134	Pipe	24+730	1 x 1.2	1.0 (LHS) & 0.4 (RHS)		7	15.4	
135	Pipe	24+940	1x1.2	0.3 (LHS) & Closed (RHS)		7	13.1	
136	Pipe	25+170	1x 1.2	0.2 (LHS) & 0.9 (RHS)		7	12.1	
137	Pipe	25+425	1 x 1.2	0.4 (LHS) & 0.3 (RHS)		7	13.8	
138	Pipe	25+503	1x1.2	0.6 (LHS) & 0.5 (RHS)		7	12.7	
139	Pipe	25+868	1 x 1.2	1.1 (LHS) & 0.3 (RHS)		7	13.5	
140	Pipe	25+982	1x1.2	0.2 (LHS) & 0.3 (RHS)		7	14.5	
141	Pipe	26+452	1 x 1.2	1.2 (LHS) & 0.3 (RHS)		7	13.8	
142	Pipe	26+592	1 x 1.2	0.9 (LHS) & 0.5 (RHS)		7	16	
143	Pipe	26+680	1x1.2	0.6 (LHS) & 0.3 (RHS)		7	13.2	
144	Pipe	26+778	1x1.2	0.7 (LHS) & 1.0 (RHS)		7	16.8	
145	Pipe	26+860	1 x 1.2	1.0 (LHS) & 1.0 (RHS)		7	13.8	
146	Pipe	27+712	1x1.2	1.0 (LHS) & 1.0 (RHS)		7	12.4	
147	Pipe	27+830	2 x 1.2	1.0 (LHS) & 0.3 (RHS)		7	12.5	
148	Pipe	28+205	1 x 1.2	0.5 (LHS) & 0.9 (RHS)		7	13.2	
149	Pipe	28+295	1x1.2	0.5 (LHS) & 0.3 (RHS)		7	11.6	

S.No	Structure type	Chainage	Span arrangement (No.x length)	Vertical clearance (m)	Slab thickness (m)	CW width (m)	Existing deck width	Remarks
150	Pipe	28+510	1x 1.2	1.1 (LHS) & 0.9 (RHS)		7	16.5	
151	Pipe	28+900	1 x 1.2	0.6 (LHS) & 1.2 (RHS)		7	15.7	
152	Pipe	29+130	1 x 1.2	0.2 (LHS) & 0.3 (RHS)		7	14.1	
153	Pipe	29+260	1 x 1.2	0.2 (LHS) & 0.3 (RHS)		7	15.6	
154	Pipe	29+440	1 x 1.2	0.2 (LHS) & 0.3 (RHS)		7	14.5	
155	Pipe	29+540	1x1.2	0.5 (LHS) & 0.6 (RHS)		7	13.4	
156	Pipe	29+715	1x1.2	0.2 (LHS) & 0.3 (RHS)		7	17.1	
157	Pipe	29+780	1 x 1.2 (skew angle is 25°)	0.2 (LHS) & 0.0 (RHS)		7	17.5	
158	Pipe	29+935	1 x 1.2	0.2 (LHS) & 0.2(RHS)		7	14.3	
159	Pipe	30+050	1x1.2	0.2 (LHS) & 0.0 (RHS)		7	14.6	
160	Pipe	30+180	2 x 1.2	1.2(BHS)		7	16	
161	Pipe	30+337	1x1.2	0.1 (BHS)		7	16	
162	Pipe	30+400	1x 1.2	0.5 (LHS) & 0.6 (RHS)		7	14.4	
163	Pipe	30+770	1 x 1.2	0.3 (LHS) & 0.6 (RHS)		7	22.2	
164	Pipe	30+900	1x1.2	0.0 (LHS) & 0.4 (RHS)		7	13.4	
165	Pipe	31+132	2 x 1.2	0.6 (LHS) & 0.4 (RHS)		7	11.9	
166	Pipe	31+680	2 x 1.2 (skew angle is 25°)	1.2 (LHS) & 1.0 (RHS)		7	15.8	
167	Pipe	31+860	2 x 1.2	0.0 (LHS) & 0.3 (RHS)		7	15	
168	Pipe	32+300	1 x 1.2	0.3 (LHS) & 0.3 (RHS)		9	16.1	
169	Pipe	33+780	1x1.2	0.5 (LHS) & 0.4 (RHS)		7	14.7	

S.No	Structure type	Chainage	Span arrangement (No. x length)	Vertical clearance (m)	Slab thickness (m)	CW width (m)	Existing deck width	Remarks
170	Pipe	34+050	1 x 1.2	1.1 (LHS) 0.2 (RHS)		7	15.8	
171	Pipe	34+160	1 x 1.2	0.4 (LHS) & 0.6 (RHS)		7	17.2	
172	Pipe	34+530	2x1.2	0.3 (LHS) & 0.3 (RHS)		7	15.7	
173	Pipe	34+700	1 x 1.2	0.3 (LHS) & 0.0 (RHS)		7	14.6	
174	Pipe	34+840	1 x 1.2	0.3 (LHS) & 0.3 (RHS)		7	16.1	
175	Pipe	35+390	1 x 1.2	1.2 (LHS) & 0.2 (RHS))		7	13.1	
176	pipe	35+497	2x1.2	1.0 (LHS) & 1.2 (RHS)		7	12.7	Head wall is not provided
177	Pipe	35+780	1 x 1.2	0.4 (LHS) & 1.2 (RHS)		7	13.7	
178	Box	35+960	1 x 1.5 x 1.5	1.5	0.3	7	14.5	
179	Pipe	36+045	1 x 1.2	0.4 (LHS) & 1.2 (RHS)		7	11.7	
180	Pipe	36+195	2x1.2	0.9 (LHS) & 1.2 (RHS)		7	13.5	
181	Pipe	36+410	2x1.2	0.9 (LHS) & 1.2 (RHS)		7	14.4	
182	Pipe	36+575	2x1.2	0.3 (LHS) & 0.4 (RHS)		7	18.3	
183	Pipe	36+780	2x1.2	0.6 (LHS) & 0.6 (RHS)		7	16.6	
184	Pipe	36+900	1x1.2	0.1 (LHS) & 0.2 (RHS)		7	15.2	
185	Pipe	37+216	1x 1.2	0.3 (LHS) & 0.4 (RHS)		7	15	
186	Box	37+261	1x2x2.5					
187	Pipe	37+360	2x1.2	0.3 (LHS) & 0.4 (RHS)		7	12.9	
188	Pipe	37+700	1 x 1.2	1.1 (LHS) & 1.0 (RHS)		7	23.5	
189	Pipe	37+860	1x1.2	0.0 (LHS) & 0.3 (RHS)		7	14.9	

S.No	Structure type	Chainage	Span arrangement (No. x length)	Vertical clearance (m)	Slab thickness (m)	CW width (m)	Existing deck width	Remarks
190	Pipe	38+062	2x1.2	0.3 (LHS) & 0.4 (RHS)		7	13.5	
191	Pipe	38+220	1x1.2	0.4 (LHS) & 0.4 (RHS)		7	11.4	
192	Pipe	38+340	1x1.2	0.3 (LHS) & 0.0 (RHS)		7	13.2	
193	Pipe	38+812	1x1.2	1.2 (LHS) & 1.0 (RHS)		7	12.3	
194	Pipe	39+020	1x1.2	0.3 (LHS) & 0.3 (RHS)		7	14	Minor damages on head wall
195	Pipe	39+120	1x1.2	0.3 (LHS) & 0.3 (RHS)		7	16.3	
196	Pipe	39+210	1x1.2	1.0 (LHS) & 1.0 (RHS)		7	13.2	
197	Pipe	39+450	1 x 1.2	0.6 (LHS) & 0.4 (RHS)		7	15.4	
198	Box	39+590	1 x 3.0 x 3.0	2	0.4	7	15.3	1.Minor damages on slope apron
199	Pipe	39+970	1x1.2	0.6 (LHS) & 0.6 (RHS)		7	12.2	
200	Pipe	40+080	1x1.2	Closed (LHS) 0.6 (RHS)		7	14.3	1.LHS side is closed with cement mortar
201	Pipe	40+410	1x1.2	0.2 (LHS) & 0.4 (RHS)		7	11.9	
202	Pipe	40+755	1x1.2	0.3 (LHS) & 0.4 (RHS)		7	11.6	
203	Pipe	40+940	1x1.2	0.3 (LHS) Closed (RHS)		7	9.6	
204	Box	41+185	1 x 3.0 x 3.0	2	0.3	7	11.8	
205	Pipe	41+300	1x1.2	0.3 (LHS) & 0.4 (RHS)		7	12.8	
206	Box	41+400	1 x 3.0 x 3.0	2	0.3	7	16.6	
207	Box	41+810	1 x 1.5 x 1.5	2	0.4	7	15.8	
208	Box	42+070	1 x 2.0 x 2.0 (skew angle is 15°)	2	0.5	7	14.8	Minor damages on head wall at some location
209	Box	42+300	1 x 2.0 x 2.0	0.2 (LHS) & 0.3 (RHS)	0.3	7	17	Minor damages on head

S.No	Structure type	Chainage	Span arrangement (No.x length)	Vertical clearance (m)	Slab thickness (m)	CW width (m)	Existing deck width	Remarks
								wall at some location
210	Pipe	42+630	1x1.2	0.3 (LHS) & 0.3 (RHS)		7	14	
211	Pipe	42+820	1 x 1.2	0.4 (LHS) Buried (RHS)		7	16	Minor damages on head wall at some location
212	Box	42+860	1 x 1.5 x 1.5	0.3 (LHS) & 0.6 (RHS)		7	16.6	Minor damages on head wall at some location
213	Pipe	43+080	1 x 1.2	0.5 (LHS) & 0.6 (RHS)		7	13.3	apron is damaged.
214	Pipe	43+190	1 x 1.2	1.2 (LHS) & 1.2 (RHS)		7	16.7	
215	Pipe	43+375	1 x 1.2	Closed (LHS) 0.4 (RHS)		7	14.35	Minor damages on head wall at some location
216	Pipe	43+622	1x1.2	Buried		9	14	1.Both sides buried.
217	Pipe	43+700	1 x 1.2	40. (LHS) & 0.5 (RHS)		7	12.3	Slope apron is damaged.
218	Pipe	44+020	1 x 1.2	0.2 (LHS) & 0.3 (RHS)		7	15.2	
219	Pipe	44+110	1x1.2	0.5(LHS) & 0.2(RHS)		7	14	Slope apron is damaged.
220	Pipe	44+190	1 x 1.2	0.2 (LHS) & 0.3 (RHS)		7	17.9	Slope and Floor apron damaged.
221	Pipe	44+300	1x1.2	0.3 (LHS) & 0.4 (RHS)		7	13.7	Slope and Floor apron damaged.
222	Pipe	44+390	1 x 1.2	0.2 (LHS) & 0.3 (RHS)		7	13.1	Slope and Floor apron damaged.
223	Box	44+470	1 x 1.5 x 1.5	1m		7	15.6	Slope and Floor apron damaged.
224	Pipe	44+543	1x1.2	0.2 (LHS) & 0.3 (RHS)		7	13.6	Slope and Floor apron damaged.
225	Pipe	44+670	1 x 1.2	0.3 (LHS) & 0.4 (RHS)		7	10.1	Slope and Floor apron damaged.
226	Box	44+820	1 x 1.5 x 1.5	0.0 (LHS) & 0.3 (RHS)		7	15	Slope and Floor apron damaged.

S.No	Structure type	Chainage	Span arrangement (No. x length)	Vertical clearance (m)	Slab thickness (m)	CW width (m)	Existing deck width	Remarks
227	Pipe	44+975	1x1.2	0.6 (LHS) & 0.9 (RHS)		7	10.9	Slope and Floor apron damaged.
228	Pipe	45+155	1x 1.2	1.2 (LHS) & 0.6 (RHS)		7	18.6	Slope and Floor apron damaged.
229	Pipe	45+375	1x1.2	0.5 (LHS) & 0.6 (RHS)		7	16.5	
230	Pipe	45+900	1x1.2	0.2 (LHS) & 0.1 (RHS)		7	15.5	
231	Box	46+034	1 x 1.5 x 1.5	0.3 (LHS) & 0.3 (RHS)		7	26.5	
232	Pipe	46+190	1x1.2	0.2 (LHS) & 0.6 (RHS)		7	15	
233	Pipe	46+360	1x1.2	0.2 (LHS) & 0.4 (RHS)		7	15	
234	Pipe	46+605	1 x 1.2	0.0 (LHS) & 0.4 (RHS)		7	15	LHS side buried with sand
235	Pipe	46+745	1 x 1.2	0.3m (BS)		7	15	
236	Pipe	47+820	4x1.2	1.2m (BS)		7	77.5	Head wall is not provided
237	Pipe	48+049	3 x 1.2	1.2m (BS)		7	65	Head wall is damaged
238	Pipe	48+113	2 x 1.2	1.2m (BS)		7	62.5	Minor Crack observed on top of the pipe
239	Pipe	48+400	1 x 1.2	1.0m (BS)		7	15.0	
240	Pipe	48+485	1 x 1.2	1.0m (BS)		7	27.5	

### 1.6.6 Drainage and Slope Protection

Open lined drains constructed along the corridor appear to be in sound condition for most of length and are functioning well.

### 1.6.7 Traffic Safety and Road Furniture

Metal beam crash barriers provided along the project road appear to be intact over entire length except for few locations where it got damaged and are being repaired in the routine maintenance.

Roadway delineators installed along the length of corridor appear to be good condition. Emergency Call Boxes are also provided along the project corridor but are locked.

Traffic solar blinkers established along the corridor at major/minor junctions. Two High mast lighting provided are functioning well.

## 1.7 REHABILITATION PLANS AND DESIGNS

### 1.7.1 Design Traffic Loading

Design Traffic loading has been estimated by considering the adopted VDFs, the traffic data received from Company with 5% growth rates. The Estimated design traffic for 5 years, 10 years and 15 years design period as below:

Table 17: Estimated Design traffic loading

Year	Design Lane MSA on Existing Carriageway
5 <sup>th</sup> year from Now	17
10 <sup>th</sup> year from Now	38
15 <sup>th</sup> year from Now	65

### 1.7.2 Pavement Rehabilitation and Strengthening

For Design the Overlay Thickness the following method as suggested in IRC: 115 has been used

- The existing pavement is considered as a 3-layer system consisting of subgrade, granular and bituminous layer. The remaining life of exiting pavement in terms of Fatigue and Rutting life (MSA) are estimated
- The remaining life is compared with design traffic loading. An overlay with assumed thickness is considered on exiting pavement where required.
- The Total system including the proposed Overlay (Trial thickness) is assumed as a four-layer system and considered the relevant MR values for all the four layers namely New BT layer, existing bituminous surface, total existing Granular layers and Subgrade layers.

- The MR value for the New BT is assumed as 3000 MPA (considering VG40 Bituminous grade) and for all the remaining three layers, the MR Values derived and finalized from the FWD Analysis are considered
- Critical Tensile strains and Vertical strains are found out by using the IIT PAVE Software at the bottom of existing bituminous layer and at the top of the subgrade layer respectively.
- The Fatigue and Rutting equations (equation 16 & 17 given in the IRC: 115) have been used to estimate the Fatigue and Rutting Life of The Pavement system.
- The Obtained Fatigue and Rutting Life are compared with the required life for the assumed trial overlay thickness.
- Analysis is carried out for individual homogeneous sections as well for minimum and Average Modulus Values on each direction separately.

Remaining life of the existing pavement from the above analysis is presented in the following tables:

**Table 18: Remaining life of the existing pavement**

Sections	From	To	Length	EBT layer MR value	MR of Granular	MR of Subgrade	Existing BT layer	Existing Granular layer(mm)	Total BT Layer thickness	Total Crust	E- BT layer	ver. Strain(Ev)	tan. Strain(Et)	NF- Fatigue life, MSA	Rutting life,MSA	Critical Life
1	0.00	4.20	4.2	2263	178	77	140	430	140	570	2263	339.9	240.5	36	222	36
2	4.20	7.30	3.1	2264	301	77	140	430	140	570	2264	294.2	184.5	101	426	101
3	7.30	10.30	3.0	2270	250	77	140	430	140	570	2270	311.7	203.7	69	328	69
4	10.30	12.50	2.2	2160	185	77	140	430	140	570	2160	340.2	242.1	37	221	37
5	12.50	17.80	5.3	2178	214	77	140	430	140	570	2178	327.9	224.9	48	261	48
6	17.80	21.00	3.2	2171	298	77	140	430	140	570	2171	297.3	188.8	96	407	96
7	21.00	23.60	2.6	2149	218	77	140	430	140	570	2149	327.1	224.1	50	264	50
8	23.60	27.80	4.2	2210	362	77	140	430	140	570	2210	276.7	167.0	152	563	152
9	27.80	32.20	4.4	2227	365	77	140	430	140	570	2227	275.5	165.7	156	574	156
10	32.20	35.20	3.0	2086	234	77	140	430	140	570	2086	322.6	219.3	55	281	55
11	35.20	36.60	1.4	2383	61	77	140	430	140	570	2383	360.0	347.5	8	171	8
12	36.60	39.00	2.4	2382	128	77	140	430	140	570	2382	354.9	268.0	23	182	23
13	39.00	42.60	3.6	2447	171	77	140	430	140	570	2447	337.1	234.9	37	230	37
14	42.60	46.00	3.4	2427	162	77	140	430	140	570	2427	341.2	241.7	33	218	33
15	46.00	48.766	2.76	2443	190	77	140	430	140	570	2443	329.9	224.5	44	254	44

From the above table it is clear that homogeneous Section 1,4 and 11 to 14 requires strengthening Overlay and remaining sections does not require Overlay as the remaining life of these sections is more than the design MSA i.e., 38 MSA.

Summary of the above analysis is presented in the following tables;

**Table 19: Remaining life of the existing pavement**

Sections	From	To	Length	Existing - BT layer MR Value	MR of Granular Layer Thickness	MR (or) E- Subgrade	Existing BT layer (mm)	Existing Granular layer(mm)	Proposed BT(mm)	Total Crust	E- BT layer	Ver. Strain (Ev)	tan. Strain (Et)	Nf- Fatigue life, mSA	Rutting life, mSA	Critical Life
1	0.00	4.20	4.2	2263	178	77	140	430	40	610	2263	267.8	185.5	99	653	99
4	10.30	12.50	2.2	2160	185	77	140	430	40	610	2160	267.9	186.8	100	652	100
11	35.20	36.60	1.4	2383	61	77	140	430	80	660	2383	210.9	189.4	87	1928	87
12	36.60	39.00	2.4	2382	128	77	140	430	40	610	2382	275.3	203.7	66	576	66
13	39.00	42.60	3.6	2447	171	77	140	430	40	610	2447	272.6	196.1	75	602	75
14	42.60	46.00	3.4	2427	162	77	140	430	40	610	2427	268.5	185.8	93	645	93

From FWD consideration, overlay is required for a length of 17.2 Km. For all the 17.2 Km 40mm Overlay is sufficient except for a length of 1.40km where the overlay requirement is 30mm BC+50mm DBM apart from this another 4Kms of lengths where roughness is more than 2000 mm/km is also considered with 30mm BC + 50mm DBM. For remaining length where there is no structural overlay requirement, it may be prudent to consider at least 40mm BC considering the age of the pavement.

### 1.7.3 Structural Rehabilitation

All the structure found to be in good condition except little minor treatment like repair of stone pitching, cleaning of drainage spouts, cleaning of vegetation etc., may be required.

### 1.7.4 Land Slide Locations

The following table presents locations of Land slide

Land slide Locations		
S. No	Chainage	Side
1	5.250	LHS
2	21.200	LHS
3	22.100	RHS
4	23.500	LHS
5	33.000	BHS
6	38.500	LHS
7	39.210	RHS
8	40.940	LHS
9	44.300	RHS
10	44.540	RHS

Among all the above locations, at Km 38+500 (LHS) is the crucial one, where major land slide occurred on 26.09.2020. After this there were no landslides reported.

## 1.8 OPERATION AND MAINTENANCE

### 1.8.1 Introduction

Looking at the contractual requirements of maintaining project road under specified level of roughness it is felt that roughness is the most important criterion for finalizing the O&M schedule for the project. Accordingly, the methodology adopted by present consultants includes predicting the roughness year by year under the traffic using a well acknowledged HDM-4 model developed for developing countries like India after lot of research by World Bank. The said model is widely prescribed by MORTH and NHAI during the preparation of detailed project reports for several projects in doing economic analysis for the projects. The economic analysis mainly consists of two parts:

1. Predicting the road deterioration and estimating VOC
2. Estimating Benefits

Considering its importance and present use in India, consultants felt prudent to use the first part, i.e. estimating road deterioration and predicting roughness in HDM 4 model to finalize the O&M schedule for the project. This approach is more scientific as it does not assume hypothetical deflection values at 10<sup>th</sup> and 20<sup>th</sup> year and includes main criterion of maintaining roughness at 2500mm/Km as per Schedule K.

### 1.8.2 CA specifications for Major Maintenance

- Schedule K of CA species that Roughness values exceeds 2500mm/km in a length of KM, needs to be corrected within 180 days.
- No specific requirement with respect to deflection (BBD) measurement

### 1.8.3 Inputs for O&M schedule

#### 1.8.3.1 Project Sections

Since roughness is the main criterion for major maintenance, Project Corridor has been divided in to various cases depending the present roughness values:

- Case 1: Roughness value <2000 mm/Km
- Case 2: Roughness values >2000<2300 mm/Km
- Case 3: Roughness>2300<2500 mm/Km
- Case 4: Roughness>2500 mm/KM

Present corridor does not have roughness values greater than 2300 mm/km and accordingly two cases have been considered in the present project.

As the project Road is two lane road, Average of both the lanes considered as representative parameter for each section and HDM analysis carried out.

### 1.8.3.2 Traffic (AADT)

The following traffic data has been used in the analysis is as below:

Vehicle/Mode	Both Direction AADT at 2021 (Vehicles)
LCV	412
2A truck	699
3A truck	242
MAV truck	940
BUS	93

### 1.8.3.3 Vehicle Damage Factors (VDF)

Adopted VDF values are given below:

Mode Type	Considered VDF
LCV	1.00
2 Axle Truck	4.50
3 Axle Truck	8.00
MAV (4-6 Axle)	10.00
Buses	1.00

### 1.8.3.4 Deflection (FWD) Values & Roughness Values

FWD and Roughness values are used as obtained from surveys and investigations as below:

Both side	Overlay Sections- FY2022/23	
	case-1	case-2
Length	16200	1000
Roughness	1888	2064
IRI	2.66	2.88
Deflection	0.30	0.26
Cracking	23.3%	20.0%
Ravelling	1.7%	4.0%
Patching	4.0%	2.0%

Both side	No Overlay FY2022/23	
	case-1	case-2
Length	27566	4000
Roughness	1909	2033
IRI	2.69	2.85

Both side	No Overlay FY2022/23	
	case-1	case-2
Deflection	0.27	0.25
Cracking	16.5%	9.5%
Ravelling	1.9%	3.8%
Patching	0.9%	0.3%

### 1.8.4 Options for O&M schedule

Based on the requirements of CA, various options have been considered to be used as responsive overlays triggered at specified level of roughness of 2500mm/km.

Following options were considered in the analysis:

- Base Case: Micro surfacing whenever roughness is >2500mm/KM with regular maintenance
- Case 1: Responsive Overlay of 30mm BC whenever roughness is >2500mm/KM with regular maintenance
- Opt-2: Responsive Overlay of 40mm BC whenever roughness is >2500mm/KM with regular maintenance

### 1.8.5 Roughness progression

Roughness progression for each section under each alternative maintenance option has been done using the deterioration models in HDM-4. Following graphs represents the roughness progression for each alternative:

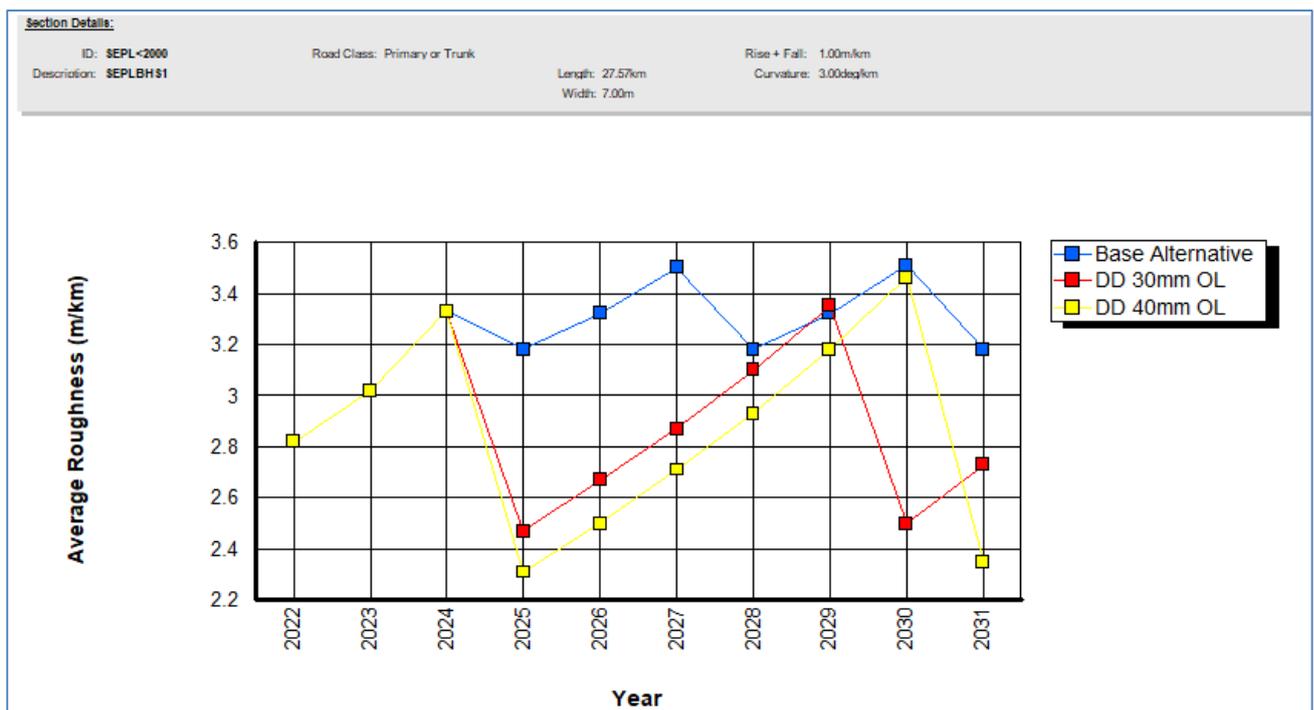


Figure 1: Average Roughness along the Project Road (No OL Section<2000mm/Km)

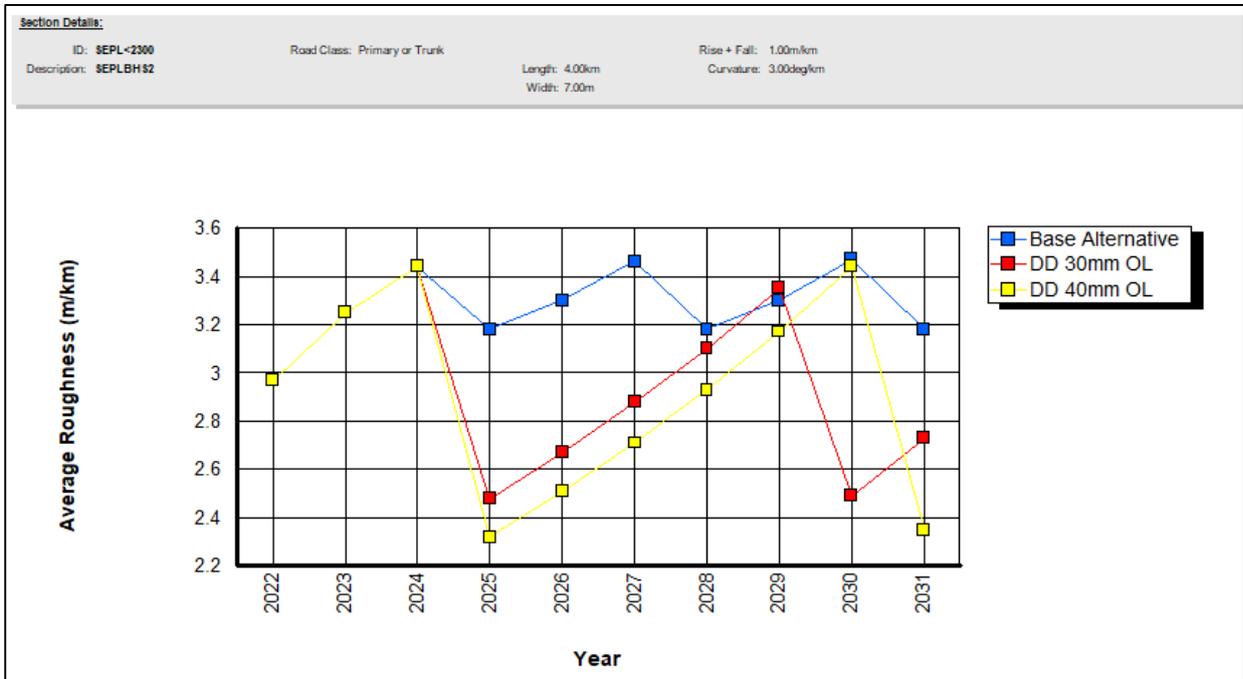


Figure 2: Average Roughness along the Project Road (No OL Section<2300mm/Km)

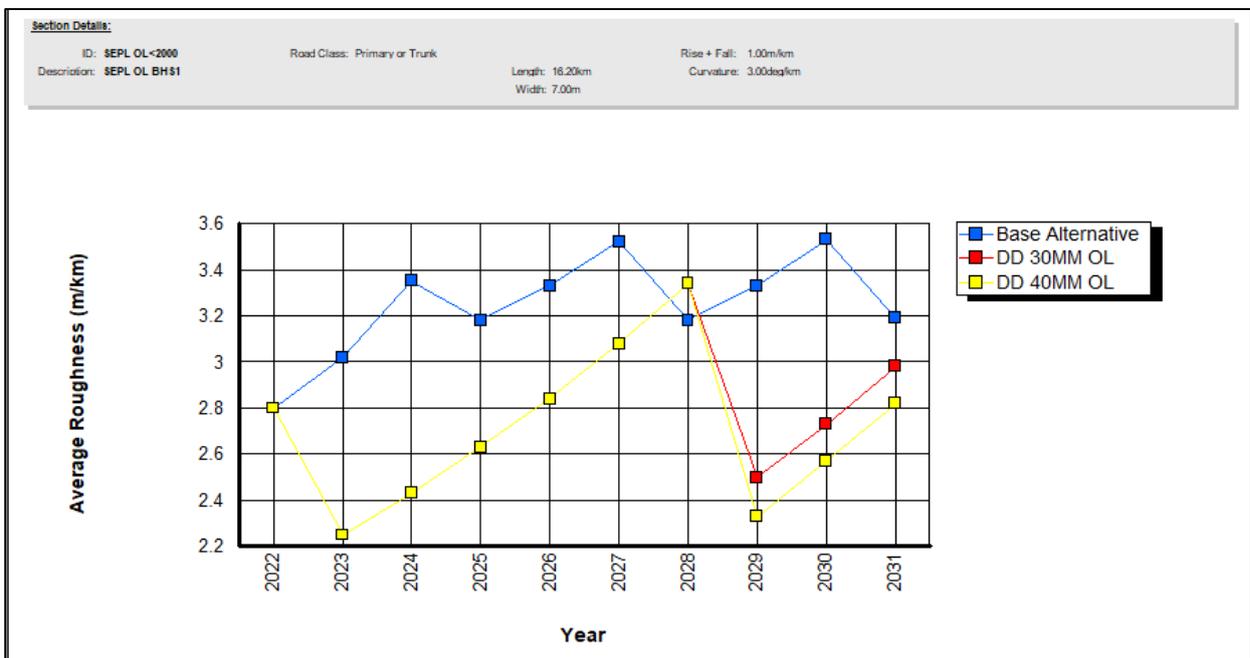


Figure 3: Average Roughness along the Project Road (OL Section<2000mm/Km)

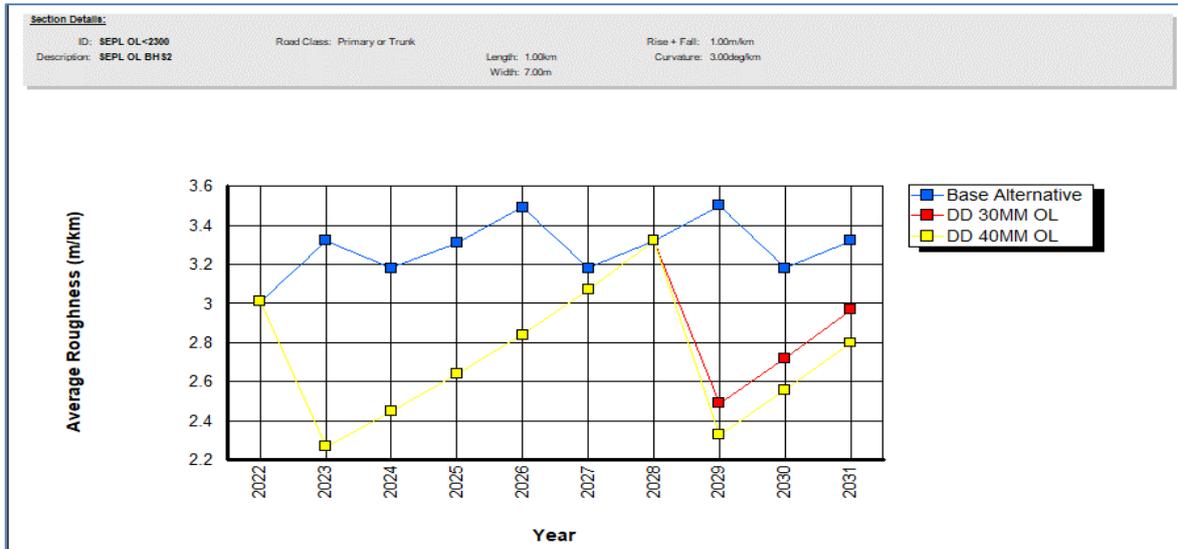


Figure 4: Average Roughness along the Project Road (OL Section<2300mm/Km)

### 1.8.6 O&M schedule

Based on the forgoing discussions and inputs, the O&M schedule for the project for various options considered above for individual sections have been prepared for varying overlay thickness are as below:

#### No Overlay Section:

	Overlay Section	
	Criteria:	IRI<2000
Length:	27.566	4.000
Financial Year	Case-1	Case-2
2023	40mm BC	30mm BC + 50mm DBM
2024		
2025		
2026		

#### Overlay Section:

	No Overlay section	
	Criteria:	IRI<2000
Length:	16.200	1.000
Financial Year	Case-1	Case-2
2023	40mm BC	30mm BC + 50mm DBM
2024		
2025		
2026		

## 1.9 COST

Cost Component for various items and activities have been worked out by considering the Best Industry practice and most appropriate methods. The gist of the cost components considered are presented below

- Immediate Repair's Cost
- Routine Maintenance Cost
  - Routine Maintenance of Road
  - Repair and Replacement of various road items
  - Tolling system and HTMS maintenance AMC cost
  - Incident management
  - Routine Maintenance for Structures
  - Electricity bill of lighting areas near cities, I/C and other areas & Fuel expenditure
- Periodic Maintenance Cost
  - Functional +Structural overlay MCW Section I
  - Overlay on Service Road
  - Major Maintenance of Structures (Expansion joint replacement, Bearing replacement etc.)
  - Replacement of Toll Hardware and software & HTMS at later date
- Toll Plaza Operation cost and Highway Patrolling and maintenance supervision staff cost
- Maintenance of utilities and public amenities
- Safety audit and other inspection costs
- Insurance
- I.C for O&M period
- Administrative Cost
- Additional cost Required for capacity augmentation
- Grand Total Cost

**Table 20: Abstract of Cost Estimate**

S. No	FY	Abstract of Cost Without escalation		
		Immediate Repair's Cost +Routine and Operational Cost	Periodic Maintenance Cost	Total Cost
1	2023	6.29	31.83	<b>38.11</b>
2	2024	6.29	-	<b>6.29</b>
3	2025	6.29	-	<b>6.29</b>
4	2026	5.36	1.48	<b>6.85</b>
	<b>Total:</b>	<b>24.22</b>	<b>33.31</b>	<b>57.53</b>

**Notes:**

1. Base Cost are arrived for FY2023
2. All the material rates are February 2022 Rates

3. All labour rates are taken from Central minimum wages (October’2021 cycle) and 2.5% escalation applied on the same to arrive FY2023 Rates
4. All the costs are without any Escalation.
5. All the Cost presented in the above table are excluding Head Office (HQ) Expenses.

**Table 21: Cost Summary Without Escalation**

S. No	Year	Routine Maintenance						Periodic Maintenance			Toll Plaza Operation cost & SPV Cost	Maintenance of utilities and public amenities	SPV Cost	Survey Costs	Insurance & Audit charges	IE Fee	Total Recurring cost
		Routine Maintenance	R&R of Road items	Toll and HTMS AMC cost	Incident management	R&R of Structures	Electricity bill of lighting	Functional +Structural overlay MCW+S/R	Replacement of Toll Hardware and software & HTMS at later date	Structure specified repairs							
1	2023	1.67	0.97	0.03	1.18	0.12	0.05	31.521		0.30	0.00	-	0.98	0.05	0.70	0.55	38.11
2	2024	1.67	0.97	0.03	1.18	0.12	0.05	0.000		0.00	0.00	-	0.98	0.05	0.70	0.55	6.29
3	2025	1.67	0.97	0.03	1.18	0.12	0.05	0.000		0.00	0.00	-	0.98	0.05	0.70	0.55	6.29
4	2026	1.43	0.83	0.03	1.00	0.10	0.04	1.250		0.23	0.00	-	0.83	0.05	0.60	0.46	6.85
<b>Total:</b>		<b>6.45</b>	<b>3.74</b>	<b>0.13</b>	<b>4.53</b>	<b>0.45</b>	<b>0.17</b>	<b>32.77</b>	<b>0.00</b>	<b>0.54</b>	<b>0.00</b>	<b>0.00</b>	<b>3.77</b>	<b>0.19</b>	<b>2.70</b>	<b>2.10</b>	<b>57.53</b>

**Notes:**

1. Base Cost are arrived for FY2023
2. All the material rates are February 2022 Rates
3. All labour rates are taken from Central minimum wages (October’2021 cycle) and 2.5% escalation applied on the same to arrive FY2023 Rates
4. All the costs are without any Escalation.
5. All the Cost presented in the above table are excluding Head Office (HQ) Expenses.

## 1.10 CONCLUSIONS

Foregoing discussions on various elements of project highway, following critical issues pertaining to project need careful attention for acquiring the same:

1. The Total Project length is 48.766 kms and complete length is having two lane width i.e., 7.0m wide carriageway flanked by 1.5m to 2.5m earthen shoulder on each side with Flexible Pavement.
2. The project corridor generally runs in rolling/hilly terrain for most of length except in few locations where it is slightly plain. The land use along the project road is mostly Forest. It passes through small village settlements like Umroi, Nongtrah, Diengpasoh, Thangshalai, Mawryngkneng etc.
3. The Project Road has 2 major junctions and about 64 minor junctions along the project road and the condition of these junctions is good
4. All together the Project road has about 13 No. of Bus Bays with Bus shelters and the condition of these is good
5. About 4 numbers of High mast lighting is observed along the project road. Two numbers are located at Major Junctions, one Toll Plaza location and one at Minor Junction. Concessionaire informed that, Maintenance of only Two High mast lights, one near Km 10+120 and the other one near Km 48+766 is under Concessionaire’s scope.
6. The present condition of pavement is fair along the project road. Cracking and raveling has developed on some part of the Carriageway. These are mainly surface related distresses and the cracking appears to be top-down cracking. Crocodile cracking is noted at few locations.
7. Crack sealing is also being done / in progress at some of the locations along the project corridor. The present surface condition appears slightly dry surface; because of which the cracking might have initiated at most of the locations. No potholes are seen along the project. Remedial treatment at distressed locations carried out with BC material.
8. There are no major undulations or depressions observed along the corridor indicating good Subgrade quality.
9. Roughness data indicates that the Average Roughness values along the project road is 1844 mm/Km and the maximum Roughness Values is 2065 mm/Km. From Roughness consideration, Overlay is not required for the project road as the unevenness Index (UI) is less than Permissible Value of 2500 mm/km
10. Test pit surveys indicated average crust of 564mm consisting of 140 mm blacktop and 438 mm of granular layers over subgrade.
11. The remaining concession period is 4 years; however, requirement of overlay has been verified by considering the 10<sup>th</sup> year design MSA. The estimated 10<sup>th</sup> year Design traffic loading is 38 MSA. FWD Analysis indicates that the remaining life of the existing

pavement is less than 38 MSA for a length of 17.20Km and remaining length of the project road is having remaining life more than 38 MSA.

12. From FWD consideration, overlay is required for a length of 17.2 Km. For all the 17.2 Km 40mm Overlay is sufficient except for a length of 1.40km where the overlay requirement is 30mm BC+50mm DBM apart from this another 4Kms of lengths where roughness is more than 2000 mm/km is also considered with 30mm BC + 50mm DBM. For remaining length where there is no structural overlay requirement, it may be prudent to consider at least 40mm BC considering the age of the pavement.
13. Majority of road furniture items are intact with very few damages. Regular maintenance being carried out at site like replacement of MCB / Studs and relaying of lane marking etc.
14. As per site condition, it appears that, no overlay done since project completion. Concessionaire confirmed that, not done any major maintenance for total Project Length except patch work and crack sealing works
15. The project Road has 3 Major bridges and 8 Minor bridges and 1 VUP. There 240 number of Culverts exists along the project road.
16. All CD structures along the project road are having good condition except 1 Major bridge near Km 12+865 (which was constructed by PWD). Bridge at Km 12+865 is having developed Vertical Flexural and Shear cracks due to overloading of Heavy Vehicular Traffic.
17. On the side of existing old bridge at Km 12+865, bailey bridge construction is completed and this bridge is operational.
18. Bailey Bridge launching was completed and the approach road was completed by the Concessionaire under COS. Concessionaire informed that Bailey Bride was inaugurated on 25.03.2021 in presence of Hon’ble deputy Chief Minister Meghalaya
19. At Km 38+500 (LHS) land slide occurred earlier and is one of the crucial locations. However, Client informed that there was no land slide in the project highway after that.
20. The Project Road has 25 number of ECBs along the Project Road.
21. The Project road has one Toll plaza along the project road. Toll plaza @ km.24+900 is having 6 lanes (BHS). All lanes are provided with rigid pavement and the tapering portions of the Toll plaza are provided with flexible pavement.
22. The Project road has 1 number of Highway Patrolling Vehicle, 1 number of Ambulance and 1 number of recovery van with 20 Metric Ton capacity
23. For this project, a Project specific Manual is provided in Schedule-D. The allowable threshold value of roughness is 2500 mm/km as per Schedule-K.
24. As per CA, there is no requirement of mandatory overlay during the Concession Period

25. Couple of works under COS were executed such as Highway Mini Nest at Toll Plaza and bio toilet apart from Bailey Bridge.
26. As on today, Concessionaire could not complete three pending punch list items as land is not handed over to Concessionaire by NHAI; One Punch list item is flaring of Airport Junction and the second one is widening of Curve for visibility at 3 locations and the third one is construction of RCC Drain for a length of 470m near between Km 0+650 and 1+120 on LHS.

Date: June 24, 2022

To  
**Virescent Infrastructure Investment Manager Private Limited**  
10th Floor, Parinee Crescenzo  
C- 30 'G' Block  
Bandra Kurla Complex  
Bandra (East),  
Mumbai 400051, Maharashtra, India

Dear Sir,

**Sub:: Submission of Revised Periodic Maintenance cost of Project from Tindivanam to Ulundurpet section of NH-45 from km 121.000 to km 193.900 of length 72.900 kms in the State of Tamil Nadu based revised Bitumen Prices.**

**Ref:** Technical DD report of Ulundurpet Expressways Pvt. Ltd. (UEPL) dated February 28, 2022

With reference to the captioned matter, we are here with submitting the Revised Periodic Maintenance Cost considering the Bitumen price per ton as Rs. 50,000/- excluding GST. A comparison statement of Periodic Maintenance Cost as per the earlier submission and present consideration is present below;

<b>Periodic Maintenance Cost (INR in Crores)</b>		
<b>FY</b>	<b>As per Feb'22 Report with Bitumen price of Rs.41500/- Per ton</b>	<b>With revised Bitumen price of Rs.50,000/- per ton</b>
2022-2023	-	-
2023-2024	37.47	41.19
2024-2025	28.48	31.19
2025-2026	-	-
2026-2027	1.74	1.85

There are no other changes in the routine maintenance cost.

Yours faithfully,  
For **Samarth Infraengg Technocrats Pvt. Ltd.**

  
  
**Authorized Signatory**  
Kalva Kiran Kumar

---

**Registered Office**

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Telangana. India - 500 003. Tel:+91.40.2790.2730

Date: February 28, 2022

To

**Virescent Infrastructure Investment Manager Private Limited**

10th Floor, Parinee Crescenzo

C- 30 'G' Block

Bandra Kurla Complex

Bandra (East),

Mumbai 400051, Maharashtra, India

Dear Sir,

**Re: Submission of Final Report of Technical due diligence study for the project "Ulundurpet Expressways Pvt. Ltd (UEPL)".**

With reference to the captioned matter, we are here with submitting the Final Report of "Technical Due Diligence for Tindivanam to Ulundurpet section of NH-45 from km 121.000 to km 193.900 of Length 72.900 kms in the State of Tamil Nadu".

Yours faithfully,

For **Samarth Infraengg Technocrats Pvt. Ltd.**

**Authorized Signatory**

Kalva Kiran Kumar



**Technical Due Diligence for Tindivanam  
to Ulundurpet section of NH-45 from km  
121.000 to km 193.900 of Length  
72.900 kms in the State of Tamil Nadu.**

**For Virescent Infrastructure Investment  
Manager Private Limited (For the purpose of  
Highways Infrastructure Trust)**

**Final Report**

**SAMARTH INFRAENGG Technocrats Private Limited**



**FEBRUARY 2022**

**TABLE OF CONTENTS**

1.1	INTRODUCTION .....	1
1.2	PROJECT AT A GLANCE .....	1
1.3	OBJECTIVE AND SCOPE OF SERVICES - FOR DUE DILIGENCE .....	4
1.3.1	General.....	5
1.3.2	Assessment of Asset Condition.....	5
1.3.3	Investigations to be carried out .....	6
1.3.4	O&M Assessment and Submission of Report.....	6
1.4	SURVEYS AND INVESTIGATIONS.....	6
1.4.1	Road Inventory.....	7
1.4.2	Visual Pavement Condition Surveys .....	10
1.4.3	Latest Deflection Data.....	12
1.4.4	Roughness surveys .....	13
1.4.5	Pavement Composition Data .....	16
1.4.6	Aggerate Sources .....	16
1.5	VALIDATION OF EXECUTED WORKS .....	16
1.5.1	Road Works .....	16
1.5.2	Major Structure.....	42
1.6	QUALITY AUDIT.....	44
1.6.1	Pavement Composition.....	44
1.6.2	CD Structures .....	44
1.6.3	Drainage and Slope Protection.....	87
1.6.4	Traffic Safety and Road Furniture .....	87
1.6.5	Road User Facilities.....	87
1.7	REHABILITATION PLANS AND DESIGNS .....	87
1.7.1	Pavement Rehabilitation and Strengthening.....	87
1.7.2	Structural Rehabilitation.....	87
1.8	OPERATION AND MAINTENANCE.....	88
1.8.1	Introduction .....	88
1.8.2	CA specifications for Major Maintenance .....	88
1.8.3	Inputs for O&M Schedule.....	88
1.8.4	Options for O&M schedule .....	90
1.8.5	O&M schedule .....	90
1.9	COST.....	91
1.10	COS Works Details .....	93
1.11	CONCLUSIONS.....	94

**LIST OF TABLES**

Table 1: Project Corridor Chainage System .....	2
Table 2: Salient Features of Project Corridor .....	3
Table 3: Toll Plaza Details .....	9
Table 4: Service Road/Slip Road Locations -LHS.....	16
Table 5: Service Road/Slip Road Locations-RHS .....	17
Table 6: Lined Covered Drain Locations - As per Site .....	18
Table 7: Median Cuts .....	18
Table 8: Slope Protection Details .....	19
Table 9: Locations of Median Openings .....	22
Table 10: Details of Solar Blinkers .....	24
Table 11: Median Damaged Locations .....	27
Table 12: Metal Beam Crash Barrier Locations .....	28
Table 13: Details of Pedestrian Guard Rails .....	36
Table 14: List of Major Junctions.....	37
Table 15: List of Minor Junctions.....	37
Table 16: Locations of High mast Lighting .....	40
Table 17: Locations of additional High mast Lighting .....	40
Table 18: Locations of Highway Lighting along Main Carriageway .....	40
Table 19: Details of Major Structures.....	42
Table 20: Abstract of Cost Estimates: .....	91
Table 21: Detailed Cost Summary .....	92

## I. INTRODUCTION

The Govt. of India (GOI) through Ministry of Road transport & Highways (MoRT&H) has authorized National Highways Authority of India (NHAI) for widening the existing 2-lane to 4 lane from **km 121.000 (Tindivanam) to km 193.900 (Ulundurpet)** covering 72.900 kms of NH-45 in the state of Tamil Nadu, through Build, Operate and Transfer (BOT) basis. The project has been awarded to the Consortium lead by **M/s. GMR Infrastructure Ltd.**,

Consequent to this, M/s. GMR Infrastructure Ltd., formed a Special Purpose Vehicle (SPV) in the name of **Ulundurpet Expressways Pvt. Ltd.**, for implementation/execution of the project, registered under the companies act 1956.

The Concessionaire completed the project and obtained PCOD on 23.07.2009 with a punch list of items to be completed within 120 days. Final completion certificate received on 04.08.2016 with final completion date as 15.01.2010.

On 17.02.2014, **India Infrastructure Fund (IIF)** acquired control of 74% stakes of M/s Ulundurpet Expressways Pvt. Ltd. and balance 26% was acquired on 17.10.2016. Further, on 17.12.2021, Galaxy Investments II Pte. Ltd. acquired control of 100% stakes of M/s Ulundurpet Expressways Pvt. Ltd. from India Infrastructure Fund.

The project is presently under operation and maintenance by the Concessionaire Ulundurpet Expressways Pvt. Ltd. (UEPL”). Samarth Infraengg Technocrats Pvt. Ltd. has been engaged as Technical/ Engineering Due Diligence Advisor for Highways Infrastructure Trust purpose.

This report highlights the findings of due diligence study undertaken by consultants on the project.

## II. PROJECT AT A GLANCE

The National Highway 45 (NH-45) begins in southern Chennai at the Kathipara Junction. Connecting many cities and towns in various districts in the State of Tamil Nadu and ends at Dindigul. The Total Length of the NH-45 is 417kms.

The Project Corridor start chainage is Km 121.000 and end Chainage is 193.900, the Total length of the Project Corridor is 72.900 Kms

The project corridor has flexible pavement in the entire length except at Toll Plaza Location where it is Rigid Pavement for a length of 50m, along the Project Corridor. The Project Road has 4-lane divided Carriageway with 7.0m wide carriageway and shyness of 0.25m flanked by 1.5m wide paved shoulder plus 1.0m earthen shoulder, except at approaches to underpasses where it is 6lane configuration

- The agreement was signed on 19.04.2006 and the Appointed date was taken on 16.10.2006.
- The project achieved Provisional Completion Certificates on 23.07.2009 for entire project length with condition to complete the punch list items within 120 days of PCOD. The Commercial Operations started from 23.07.2009

- The Effective date of Final Completion is 15.01.2010 for entire project length but the FCC was issued on 04.08.2016.
- The Concession Period for the project is 20 years and as per the CA original Concession Period end date is 15.10.2026. Subsequently the Project got extension of 98 days during construction and 38 days during operation; With this the revised end of Concession is due on 28.02.2027. The Remaining Concession Period is about 5 Years 1 month.

### III. SALIENT FEATURES

Sl. No.	Description	Length/ Nos.	Details
1	Start Chainage (Km)	Km	121.000
2	End chainage (Km)	Km	193.900
3	Length of the Project Corridor	Kms	72.900
4	Service Road / Slip Road	Kms	36.443
5	Toll Plaza	Nos.	1
6	No. of Toll Lanes (Both side)	Nos.	12
7	ROBs	Nos.	3
8	Interchange /Grade Separators	Nos.	1
9	VUPs	Nos.	2+(1COS)
10	PUP's/CUP's	Nos.	6
11	Major Bridges	Nos.	6
12	Minor Bridges	Nos.	14
13	Culverts (Pipe)	Nos.	56
14	Culvert (Slab/Box)	Nos.	66
15	Major Junctions	Nos.	4
16	Minor junctions	Nos.	97
17	High Embankments with Stone Pitching	Kms	25.781
18	RCC Wall	Kms	2.66
19	RE Wall	Kms	8.180
20	Bus Bays with Shelter	Nos.	34
21	Bus Bays	Nos.	34
22	Truck Lay bye	Nos.	3
23	High Mast Lights	Nos.	28
24	Highway Lighting (length only)	Kms	8.850
25	Single Arm Lightnings	Nos.	29
26	Double Arm Lightnings	Nos.	215
27	Solar Blinkers	Nos.	102
28	Traffic Blinker (installed by Traffic police)	Nos.	138
29	Solar Lights	Nos.	23
30	RCC Cover Drain	ms	27662
31	Median drain	Kms	7.025
32	Median Plantation	Kms	53.115
33	W-Beam Safety Barriers	Kms	64.377

#### IV. IMPORTANT FINDINGS AND CONCLUSION

1. The project road in general has good pavement condition except for minor surface related distresses such as minor surface cracking at isolated locations.
2. Patching is observed at few locations and the condition of the patch is good and importantly No Pot holes are seen along the project road.
3. There are no major undulations or depressions are observed along the corridor indicating good Subgrade quality.
4. For this project, a Project specific Manual is provided in Schedule-D. the allowable threshold value of roughness is 3000 mm/km as per Schedule-L.
5. Roughness surveys along corridor indicate that the maximum Roughness in LHS Carriageway is 1586 mm/Km and the maximum Roughness in RHS Carriageway is 1632 mm/Km whilst the allowable roughness as per CA is 3000 mm/Km. It can be concluded that, no immediate overlay is required for entire length of the Project Road from Roughness consideration.
6. Benkelman Beam Survey Data indicates that the maximum characteristic deflection in LHS carriageway is 0.693 mm and the maximum characteristic deflection in RHS carriageway is 0.657 mm whilst the maximum allowable characteristic deflection as per CA is 1.2mm. it can be concluded that the, no immediate overlay is required for entire length from Pavement Deflection consideration.
7. As per CA, mandatory overlay shall be done every 5 years after Initial Construction and There is no mention regarding the minimum Overlay thickness. There is no mandatory overlay specified in the last year of Concession Period
8. Maintenance requirements stipulates that, the Surface shall not exceed 3000mm/Km during the service life of pavement at any time. A renewal coat of Bituminous concrete shall be laid every 5year after initial Construction or where the Roughness values reaches 3000mm/Km whichever is earlier to bring it to the initial value of 2000mm/Km. There is no mention regarding the minimum Overlay thickness.
9. Amendment was issues to IRC:81-1997 “Guidelines for Strengthening of Flexible Road Pavements, Using Benkelman Beam Deflection Technique” As per this Amendment (No. 1/IRC:81-1997/August, 2014 to IRC:81-1997), from structural considerations, the recommended minimum bituminous overlay thickness is 40 mm, however Clause 7.6 of IRC:81-1997stipulates that, where structural deficiency is not indicated from deflection values, thin surfacing may be provided to improve the riding quality as required.
10. As per Clause 507.1 of MoRTH, Specifications for Roads and Bridge Works (Fifth Revision), Single layer of 30mm thick Bituminous Concrete (BC) can be laid on previously prepared bituminous bound surface
11. Considering the above, For the next Major maintenance which is due in Year 2024-25, overlay thickness of 30mm BC for Main Carriageway and Service Road is consider in Costing as this is the Renewal Coat.

12. Concessionaire installed Solar System of capacity 1x60 KW in the recent past.
13. The Project road has One Toll plazas along the project road with rigid pavement. The Condition of the Rigid Pavement is Good
14. The concessionaire is maintaining the project facilities like truck lay byes, Toilets, Water supply, drinking water and power supply as per the agreement clauses and specifications which have been reviewed
15. Construction of Toilet Block under Swatch Bharat Mission is functional at Vikravandi Toll Plaza RHS. Due to local problem, the construction of toilet block in LHS at vikravandi Toll Plaza has been not started
16. Construction of Highway Nest (Mini) is completed and functioning at Vikravandi Toll Plaza RHS. Due to local problem, the construction of Nest (Mini) in LHS at vikravandi Toll Plaza has been not started.
17. Construction of VUP at Black Spot ID TN-98/TN-093-03 (Gingee Junction): Construction of VUP and approaches completed and open to traffic during December 2021.

#### V. COST ABSTRACT

S. No	FY	Immediate Repair's Cost + Routine and Operational Cost (Rs. Cr.)	Periodic Maintenance Cost (Rs. Cr.)	Total Cost (Rs. Cr)
1	2023	18.21	-	18.21
2	2024	18.21	37.47	55.69
3	2025	18.21	28.48	46.69
4	2026	18.21	-	18.21
5	2027	14.75	1.74	16.49
	<b>Total:</b>	<b>87.59</b>	<b>67.69</b>	<b>155.29</b>

Note:

1. Above costs are absolute numbers based on FY23 rates.
2. All the material rates are Feb 2022 Rates
3. All labour rates are taken from Central minimum wages (October'2021 cycle) and 2.5% escalation applied on the same to arrive FY2023 Rates
4. All numbers are without any Escalation.
5. Overlay thickness of 30mm BC considered in next MM (part length in FY24 and part length in FY 25)
6. All the Cost presented in the above table are excluding Head Office (HQ) Expenses

# DUE DILIGENCE REPORT

---

## 1.1 INTRODUCTION

The Govt. of India (GOI) through Ministry of Road transport & Highways (MoRT&H) has authorized National Highways Authority of India (NHA) for widening the existing 2-lane to 4-lane from **km 121.000 (Tindivanam) to km 193.900 (Ulundurpet)** covering 72.900 kms of NH-45 in the state of Tamil Nadu, through Build, Operate and Transfer (BOT) basis. The project has been awarded to the Consortium lead by **M/s. GMR Infrastructure Ltd.**,

Consequent to this, M/s. GMR Infrastructure Ltd., formed a Special Purpose Vehicle (SPV) in the name of **Ulundurpet Expressways Pvt. Ltd.**, for implementation/execution of the project, registered under the companies act 1956.

The Concessionaire completed the project and obtained PCOD on 23.07.2009 with a punch list of items to be completed within 120 days. Final completion certificate received on 04.08.2016 with final completion date as 15.01.2010.

This report highlights the findings of due diligence study undertaken by consultants on the project.

## 1.2 PROJECT AT A GLANCE

The National Highway 45 (NH-45) begins in southern Chennai at the Kathipara Junction. Connecting many cities and towns in various districts in the State of Tamil Nadu and ends at Dindigul. The Total Length of the NH-45 is 417kms.



**Table 1: Project Corridor Chainage System**

Referencing system	Project Corridor Start Point (km)	Project Corridor End Point (km)	Length (km)
Existing Chainage	121.000	193.900	72.900
Design Chainage	0.000	72.900	72.900

The Project Corridor starts from Tindivanam and runs towards Vikravandi, Villupuram, Madapatu and ends at Ulundurpet in Tamil Nadu. Photographs showing the start and end of the project road are presented below:



Start Point km 121.000

End Point km 193.900

Following Table highlights the total project at a glance:

Sl. No.	Description	Date
1.	Date of Signing the Concession Agreement	19.04.2006
2.	Appointment Date	16.10.2006
3.	Scheduled End of Concession	28.02.2027 ( extension with 98 days during construction and 38 days during operation)
4.	Date of issue of Provisional Completion Certificate (COD)	23.07.2009
5.	Date of Commencement of Commercial Operation	23.07.2009
6.	Final Completion Date	15.01.2010 but letter issued on 04.08.2016

**Table 2: Salient Features of Project Corridor**

Sl. No.	Particulars	Length/ Nos.	As per Site
1	Start Chainage (Km)	Km	121.000
2	End chainage (Km)	Km	193.900
3	Length of the Project Corridor	Kms	72.900
4	Service Road / Slip Road	Kms	36.443
5	Toll Plaza	Nos.	1
6	No. of Toll Lanes (Both side)	Nos.	12
7	ROBs	Nos.	3
8	Interchange /Grade Separators	Nos.	1
9	VUPs	Nos.	2+(1COS)
10	PUP's/CUP's	Nos.	6
11	Major Bridges	Nos.	6
12	Minor Bridges	Nos.	14
13	Culverts (Pipe)	Nos.	56
14	Culvert (Slab/Box)	Nos.	65
15	Major Junctions	Nos.	4
16	Minor junctions	Nos.	97

Sl. No.	Particulars	Length/ Nos.	As per Site
17	High Embankments	Kms	25.781
18	Stone Pitching	Kms	25.781
19	RCC Wall	Kms	2.66
20	RE Wall	Kms	8.180
21	Bus Bays with Shelter	Nos.	34
22	Bus Bays	Nos.	34
23	Truck Lay bye	Nos.	3
24	High Mast Lights	Nos.	28
25	Highway Lighting (length only)	Kms	8.850
26	Single Arm Lightnings	Nos.	29
27	Double Arm Lightnings	Nos.	215
28	Solar Blinkers	Nos.	102
29	Traffic Blinker (installed by Traffic police)	Nos.	138
30	Solar Lights	Nos.	23
31	RCC Cover Drain	ms	27662
32	Median drain	Kms	7.025
33	Median Drainage chutes	Nos.	634
34	Embankment Chute drains	Nos.	992
35	Median Opening	Nos.	74
36	Median Damages	ms	105
37	Separator Damages	ms	4
38	Median Plantation	Kms	53.115
39	W-Beam Safety Barriers	Kms	64.377
40	Pedestrian Guard Rails	ms	560
41	Delineators	Nos.	138
42	Guard Posts	Nos.	103
43	Kilometer Stones	Nos.	144
44	Hectometer Stones	Nos.	558
45	Road Signs	Nos.	1842
46	Gantry Sign Boards	Nos.	9
47	Cantilever Sign Boards	Nos.	4
48	Varying Message Signs(VMS)	Nos.	12
49	Emergency Call Box	Nos.	65
50	Advanced Traffic Management System (ATMS)	Nos.	Nil

### 1.3 OBJECTIVE AND SCOPE OF SERVICES - FOR DUE DILIGENCE

The main objective of the study is to review the current status of project corridor including details pertaining to its construction and maintenance and to provide requisite technical information for processing the acquisition of said project by client. Objective of the study can be broadly defined with following tasks:

### 1.3.1 General

- Review of all documents related to Project including but not limited to provisional completion certificates, punch list items completion certificate, clearances, monthly IE reports, important correspondence if any.
- Review of Change of Scope/ other Claims submitted and to be submitted to Authority / IC, comment on the veracity of the same and approval status.
- Highlight any non-compliance of the terms of the CA or O&M manual and IC inspection reports etc.
- Review of any pending issues related to Utility shifting, maintenance etc. in accordance with the Concession Agreement.
- Comment on issues including any balance work that may have a potential impact on the maintenance costs going forward and which may warrant a one-time expense in future.
- In general review the toll plaza systems (incl. AVCC, weigh bridge, sensors, ETC etc.) and the hardware installed therein and comment on the adequacy and level of maintenance of the same to meet the requirements under CA.
- Review of as built drawings.
- Determine the appropriate level and frequency of routine and major maintenance activities required to keep the road assets in good condition and to meet the performance and O&M standards, specifications and requirements.
- Review the major maintenance work undertaken, and prepare projections for future major maintenance expenses (incl. any hand-back requirements), so as to ensure compliance with the terms of CA.
- Review of condition of SPV assets including all equipment and vehicles etc.
- Report on balance acquisition of land if any and possibility of acquisition.
- Report on current encroachments on the project stretch and future expected problems due to the same.

### 1.3.2 Assessment of Asset Condition

- i. Assessment of road assets in conformance with specifications, standards and codes stipulated in CA and O&M manual etc.
- ii. A detailed inventory survey of road assets including main carriageway, structures, service roads, lightings, drains, slope protection works, retaining walls, bus bays, bus shelters, truck lay byes, O&M center, road furniture including signages, MCB, guard rails etc. other safety measures, toll collection infrastructure, buildings, plantation, vehicles and other objects.
- iii. Assessment of condition of the structures including but not limited to visual inspections of bearings, expansion joints, superstructure, substructures, foundations, associated components, pre-stress anchorages (if any), review of geotechnical assumptions, perform geotechnical due diligence, review as-built design and assess design assumptions and provide a detailed report thereon.

- iv. Assessment of condition of the road pavement including but not limited to visual inspections of the pavement, review as-built design and assess design assumptions and provide a detailed report thereon.
- v. Assessment of physical dimensions/ condition of the infrastructure to determine useful lives of the materials and equipment requiring rehabilitation and/or replacement.
- vi. Recommendations for any major repair/ rehabilitation and strengthening based on the condition survey and design reports.
- vii. To provide a detail photographic report of the infrastructure assets and its condition to withstand till end of concession period. Suggestion and cost evaluation for any additional repair / rectification / modification required.

### **1.3.3 Investigations to be carried out**

- 1.1. Assessing maintenance needs and its valuation according to the level of deterioration.
- 1.2. Carry out visual condition survey for rigid (toll plaza) and flexible pavement
- 1.3. Carry out drainage survey to assess any potential future problems which will cause by moisture and runoff.
- 1.4. Assessment of variation/ COS orders on the project, if any, and evaluate their impact on expenditure, time to completion, future O&M obligations and tolling revenue.

### **1.3.4 O&M Assessment and Submission of Report**

- Develop a detailed O&M cost forecast for each year of the concession period and a detailed major maintenance cost forecast along with estimation of costs towards handover requirements.
- Provide comprehensive report by covering all scope of work mentioned herein this Engagement Letter.

## **1.4 SURVEYS AND INVESTIGATIONS**

The main objective of undertaking Surveys and Investigations is to appreciate the existing engineering features along the project corridor and to understand the present condition of the various elements of the project road and to prepare inputs required for various rehabilitation and maintenance strategies.

Following Survey and Investigations have been undertaken as a part of study with an objective to understand the present condition of the road and there by access the quality of construction and as well to prepare requisite rehabilitation/corrective designs where necessary.

- Road Inventory Surveys
- Visual Pavement Condition
- BBD Surveys (data will be provided by Client)
- Roughness Surveys (data will be provided by Client)
- Test Pits& Subgrade Investigations

- Structure Inventory and Condition Surveys

### 1.4.1 Road Inventory

The project corridor has flexible pavement in the entire length except at Toll Plaza Location where it is Rigid Pavement for a length of 50m, along the Project Corridor. The Project Road has 4-lane divided Carriageway with 7.0m wide carriageway and shyness of 0.25m flanked by 1.5m wide paved shoulder plus 1.0m earthen shoulder, except at approaches to underpasses where it is 6lane configuration.

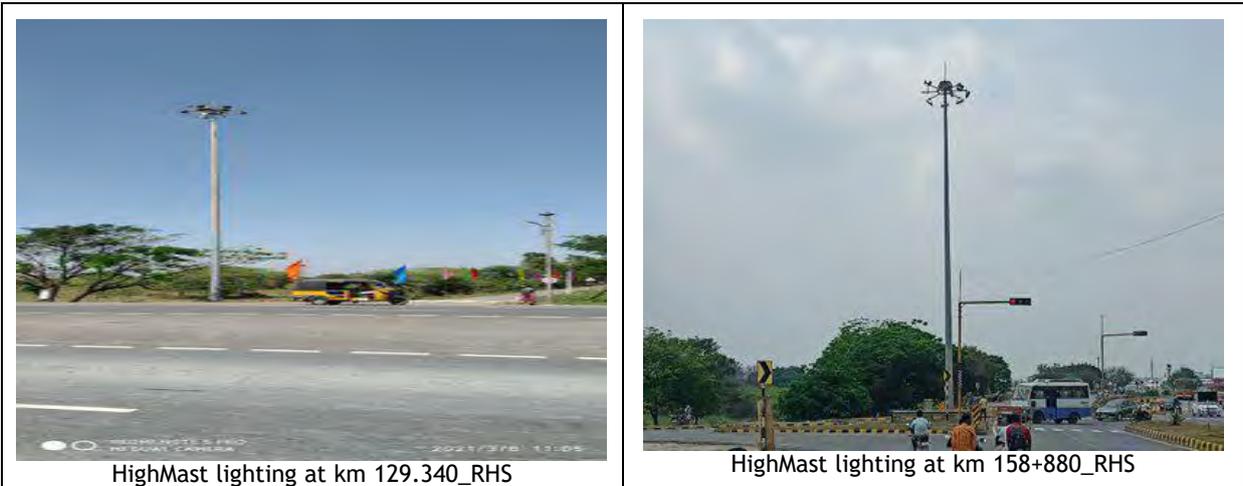
The project corridor generally runs in plain terrain for most of length except in few locations where it is rolling. The land use along the project road is mostly Agriculture. It passes through settlements like Vikravandi, Villupuram, Madapatu and ends at Ulundurpet in Tamil Nadu.

In general, road embankments are in the range of 0.3m-1.0m height. Embankments higher than 3.0m are observed mainly in the approaches of CD structures and Underpass locations. Maximum embankment height is observed near Major Bridge& ROB locations.

The Project Road has 4 major junctions and about 97 minor junctions along the project road. Photographs showing the Four major junctions are presented below:



About 28 numbers of High mast lighting is observed along the project road. Few photos showing High mast lighting are presented below:



Altogether, the Project road has about 34 Bus Bay with shelters. Few photos taken at the bus shelters and bus bays are presented below:



The Project Road has 3 Truck lay Bye at km 134.900 on LHS side & at km 184.600 on Both Sides. It has been provided with Flexible Pavement and the condition appears to be good. Toilet blocks and 6 High Mast Lighting have been provided at truck lay byes which are in good condition.

Few photos depicting the truck lay bye portion are presented below:



Truck Lay bye on LHS km 184.600

Truck Lay bye on LHS km 134+900

**Table 3: Toll Plaza Details**

Sl. No.	Chainage	Toll Plaza	Pavement Type	Length (m)	Width (m)	No. of Lanes in each direction	Office	Toilets
1	150+250	Vikravandi	Rigid	275	70	5+1	Yes	Yes

Few photos taken at toll plaza locations are presented below:



Vikravandi Toll Plaza at km 150.250 (5+1lanes in each direction)

Administrative Building

Service road/slip roads have been observed along the Project Corridor at Urban locations. The Condition of these Roads are Good. Few photos depicting the service road pavement surface type, condition and the other associated features like drain, pedestrian guard railing are presented below.



Service Road @ km 121+830-LHS\_5.5m wide



Service Road @ km 123+180-LHS\_5.5m wide



Service Road @ km 128+530-LHS\_5.5m wide



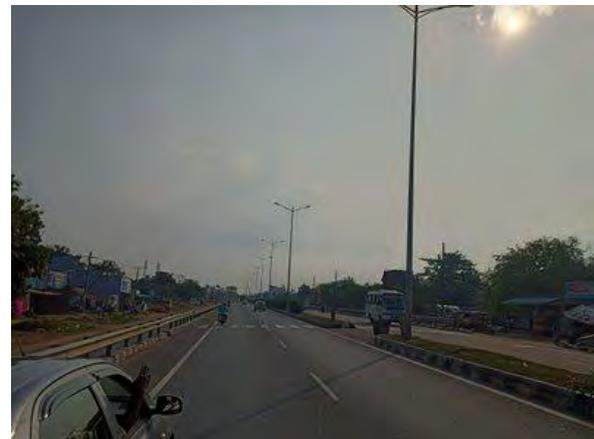
Service Road @ km 131+630-LHS\_5.5m wide

#### 1.4.2 Visual Pavement Condition Surveys

The present condition of pavement appears to be good. However, minor cracking is observed along the project road and Patching at few Locations. No potholes and no undulations are observed along the project. Few photos are presented below showing existing pavement condition:



Good Condition km 128+870



Good Condition km 131+540



Good Condition @ km 142+450



Good Condition km 133+770



Good Condition km 144+860



Good Condition @ km 149+880



Good Condition km 161+000



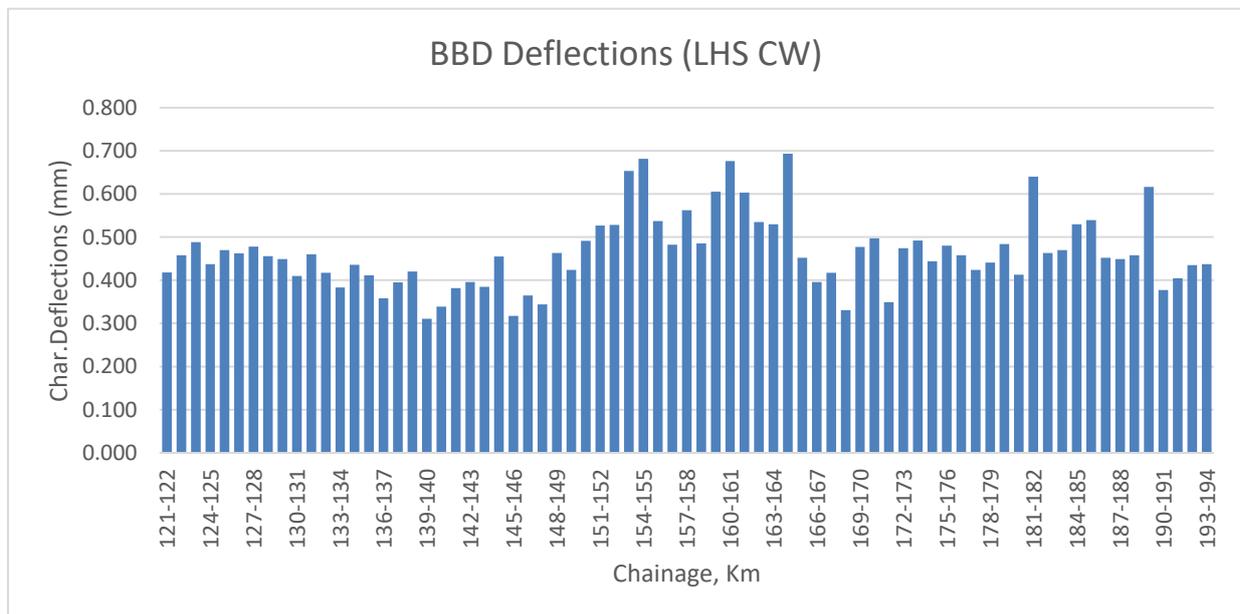
Good Condition km 165+030

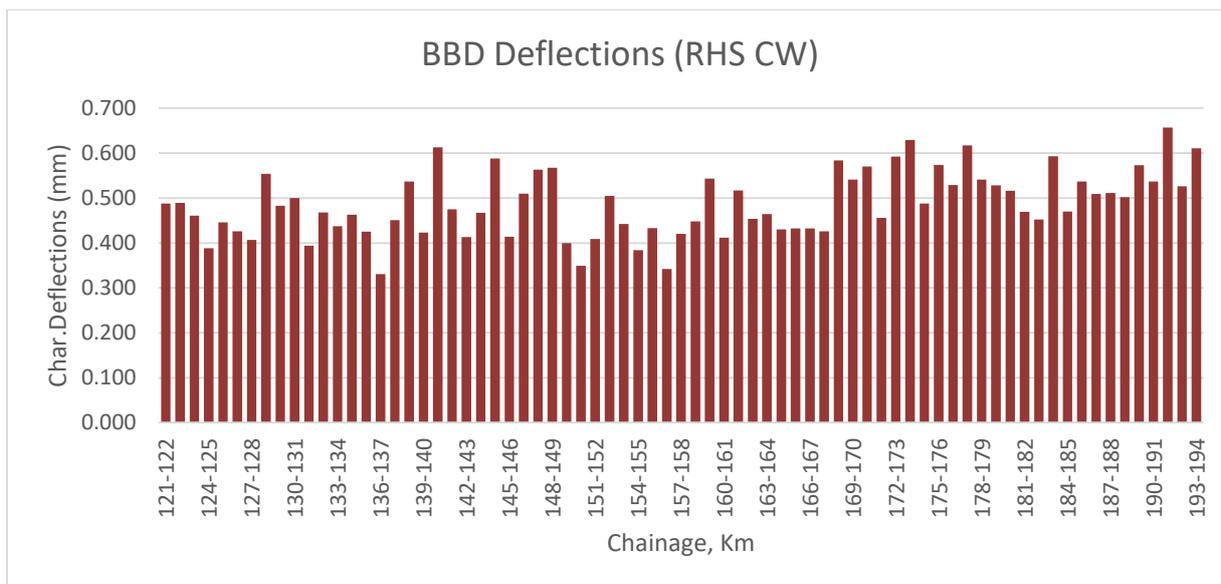


### 1.4.3 Latest Deflection Data

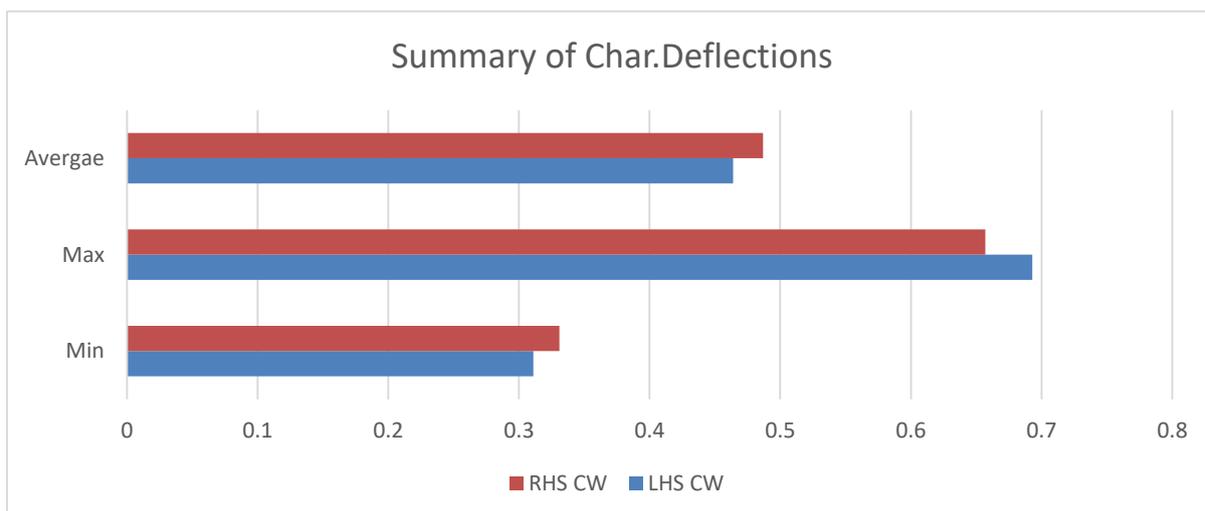
#### 1.4.3.1 Benkelmen Beam Deflection Survey

Report on Benkelman Beam Deflection Survey provided by the Concessionaire indicates that the BBD surveys was carried in the month of September 2021. The Report Reveals that the Survey has been carried out by using instrument manufactured by STECO, New Delhi. Bar diagrams showing the kilometer wise characteristic Deflection values along the project road are presented below





Summary of the BBD Data analyzed is presented in the following chart:



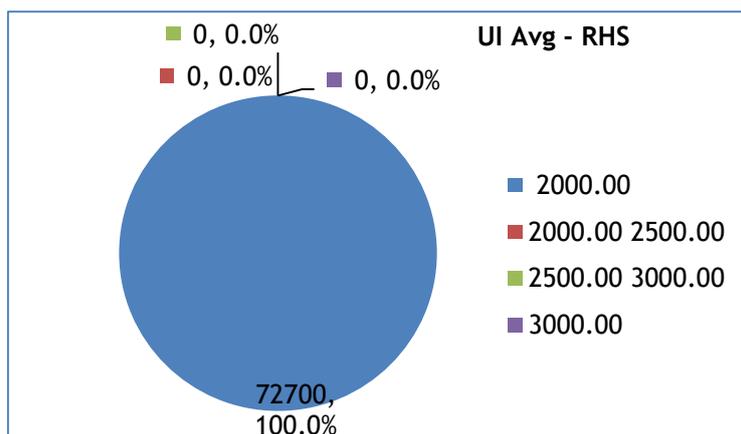
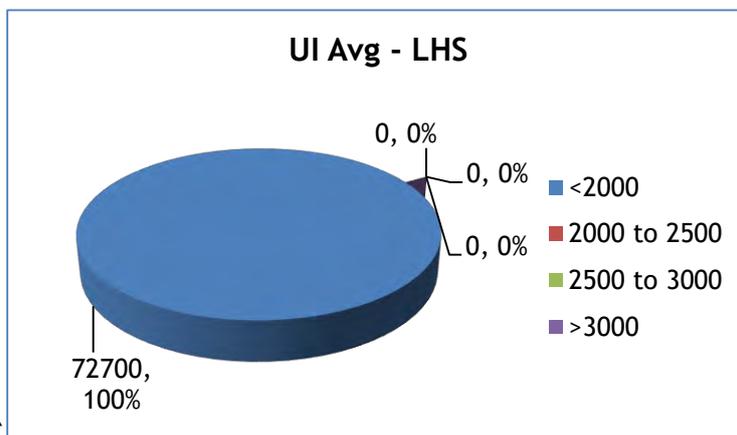
From the above it can be noticed that the Average characteristic values along the project road are 0.464 mm and 0.487 mm in LHS and RHS Carriageways respectively. The maximum Characteristic Deflection Values are 0.693 mm and 0.657 mm in LHS and RHS Carriageways respectively. From the above it can be concluded that none of the section of the project road requires strengthening overlay as the maximum Characteristic Deflection value is less 1.20 mm (Maximum allowed as per Schedule-L) in all sections.

#### 1.4.4 Roughness surveys

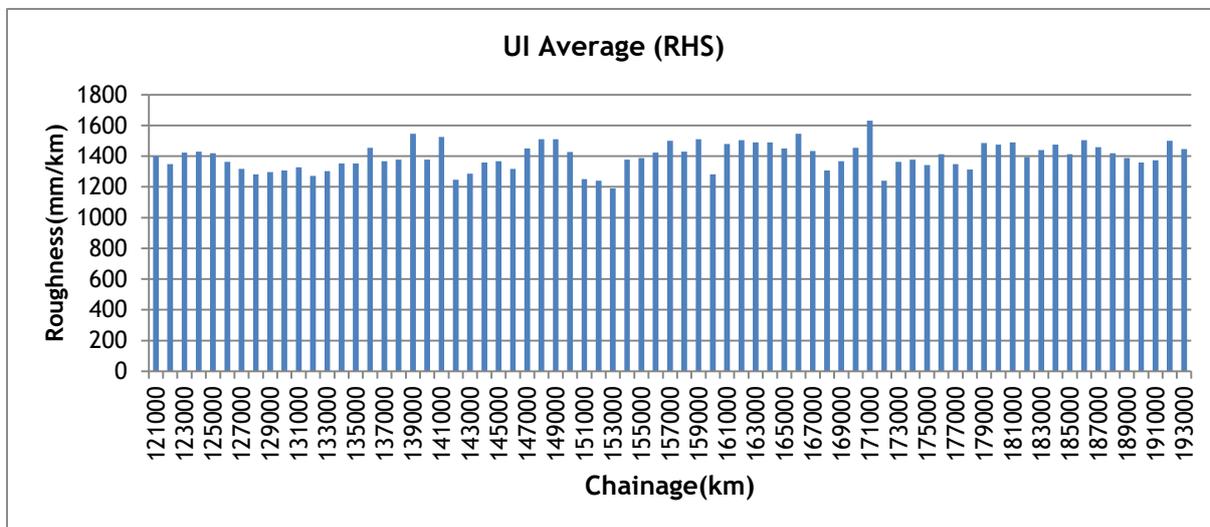
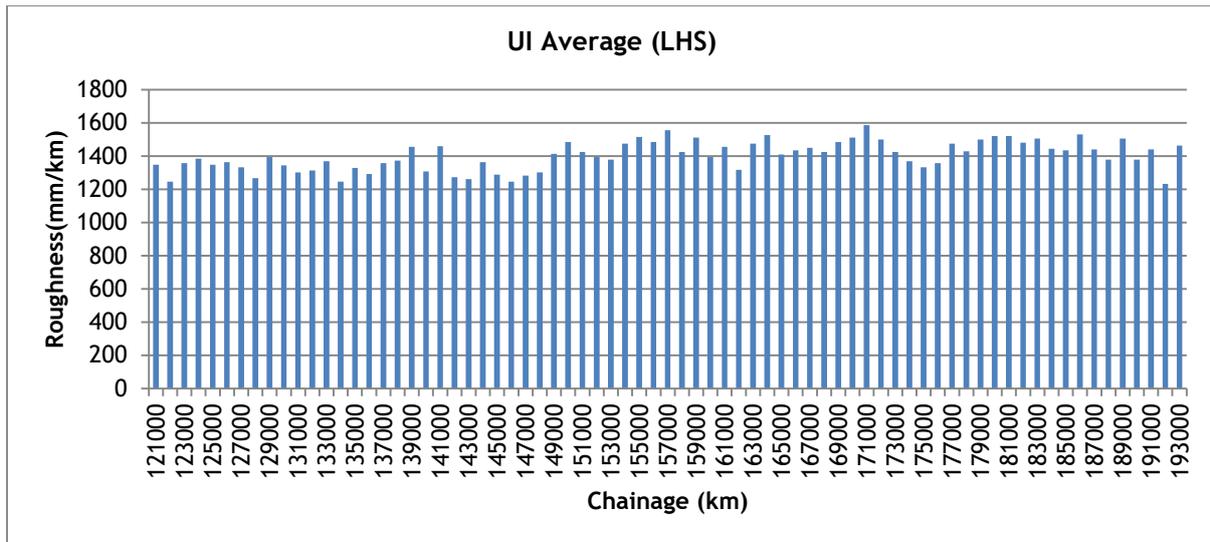
Report on Roughness Survey provided by the Concessionaire indicates that the Roughness surveys was carried in the month of August 2021. The Report Reveals that the Survey has been carried out by using 5<sup>th</sup> wheel Bump Integrator manufactured by STECO, New Delhi.

As per IRCSP:16-2004, Bituminous Concrete pavement surface is considered to be good when its UI value is less than 2000 mm/Km and the same is considered to be average for UI values between 2000 and 3000 mm/Km whilst the surface is treated as Poor for UI values greater than 3000 mm/Km.

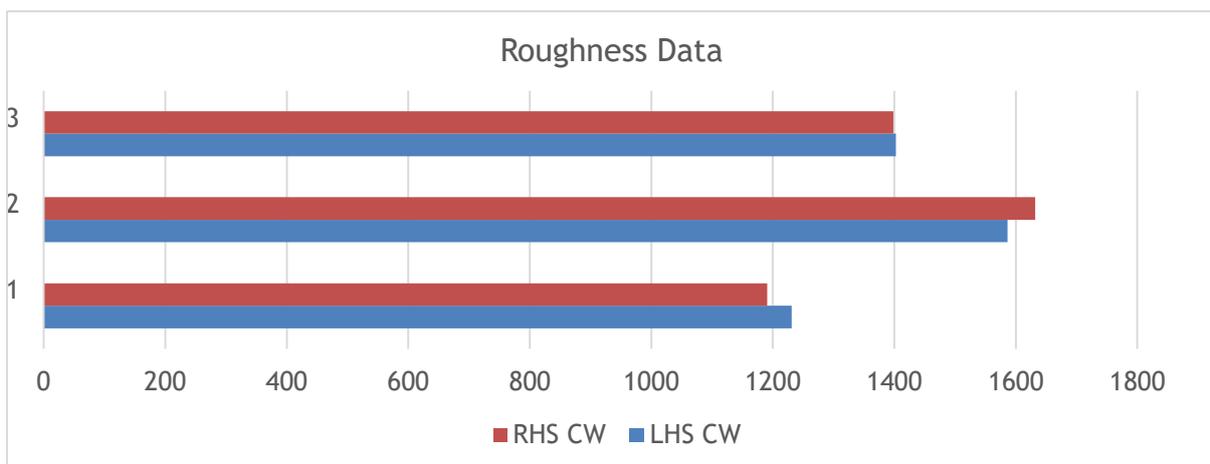
Average UI values along the corridor have been grouped in to four categories, Pie chart showing the range of UI values in each carriageway of the project road have been presented below:



It can be seen from the above pie charts, that about total length of the both carriageways having good riding quality (UI<2000 mm/km) along the project road. Bar diagrams showing the Kilometer wise roughness along the project road are presented below:



Summary of the Roughness Values analyzed is presented in the following chart



From the above it can be noticed that the Average Roughness values along the project road are 1402mm/Km and 1398 mm/Km in LHS and RHS Carriageways respectively. The maximum Roughness Values are around 1586 mm/Km and 1632 mm/Km in LHS and RHS Carriageways

respectively. From the above it can be concluded that none of the section of the project road requires functional overlay as unevenness Index (UI) is less than 3000 mm/km.

#### 1.4.5 Pavement Composition Data

Test Pit Data provided by Client indicates that initial Construction was done with the following Pavement Crust 50mm BC+175mm DBM+250mm WMM+200mm GSB+100mm Drainage layer and subsequently two overlays done with 40mm BC in the year 2014-15 and in the year 2019-20.

#### 1.4.6 Aggerate Sources

Good quality of aggregate material required for overlay work and concrete work is available along the project road at Km 124.5 (LHS) and Km 137.800 (LHS) within a reasonable lead of about 8 to 15 Km.

### 1.5 VALIDATION OF EXECUTED WORKS

The project road has been closely inspected to verify the executed works on ground vis-à-vis the scope envisaged in CA. Each and every structure has been inspected to note down its structural configuration and condition. The following works highlight the findings on executed works on ground.

#### 1.5.1 Road Works

The Project Road has 4-lane divided Carriageway and is provided with width of 7.0 m carriageway plus paved shoulders of 1.5m and a shyness of 0.25m and Earthen shoulders of 1.0m has been provided on each side of median over the entire length except at flyover locations where the road has 6-lane configuration.

Location of service roads and slip roads as constructed are as below:

**Table 4: Service Road/Slip Road Locations -LHS**

Sl. No.	Chainage		Length (m)	Side	Pavement Type	Width (m)	Remarks
	from (Km)	To (Km)					
1	121180	121670	490	LHS	Flexible	5.5	
2	123300	124300	1000	LHS	Flexible	7.0	
3	126200	127000	800	LHS	Flexible	5.5	
4	128600	128950	350	LHS	Flexible	3.5	
5	131900	132180	280	LHS	Flexible	3.5	
6	132600	133900	1300	LHS	Flexible	5.5	
7	134750	134950	200	LHS	Flexible	3.5	
8	135600	136450	850	LHS	Flexible	5.5	
9	137200	138150	950	LHS	Flexible	5.5	
10	142500	143000	500	LHS	Flexible	3.5	
11	146630	148600	1970	LHS	Flexible	5.5	

Sl. No.	Chainage		Length (m)	Side	Pavement Type	Width (m)	Remarks
	from (Km)	To (Km)					
12	149400	150000	600	LHS	Flexible	5.5	
13	150600	152100	1500	LHS	Flexible	7.0	
14	152500	156200	3700	LHS	Flexible	5.5	
15	159240	160440	1.200	LHS	Flexible	5.5	VUP_SR_COS
16	163800	164110	310	LHS	Flexible	5.5	
17	166890	168380	1490	LHS	Flexible	5.5/7.0	
18	169580	170220	640	LHS	Flexible	5.5	
19	172230	172580	350	LHS	Flexible	5.5	
20	172750	173500	750	LHS	Flexible	5.5	
21	180180	183700	3520	LHS	Flexible	5.5/7.0	
22	185400	186200	800	LHS	Flexible	5.5	
23	190770	191300	530	LHS	Flexible	5.5	
<b>As per Site Total Length (m)</b>			<b>24080</b>				

**Table 5: Service Road/Slip Road Locations-RHS**

Sl. No.	Chainage		Length (m)	Side	Pavement Type	Width(m)	Remarks
	From (Km)	To (Km)					
1	124250	123250	1000	RHS	Flexible	5.5	
2	127000	126000	1000	RHS	Flexible	5.5	
3	133900	132750	1150	RHS	Flexible	3.5/5.5	
4	136450	135600	850	RHS	Flexible	5.5	
5	138200	137400	800	RHS	Flexible	3.5/5.5	
6	148600	146980	1620	RHS	Flexible	7.0	
7	156200	152380	3820	RHS	Flexible	7.0/5.5	
8	157800	156960	840	RHS	Flexible	3.5/5.5	
9	159240	160440	1.200	RHS	Flexible	5.5	VUP_SR_COS
10	164650	162120	2530	RHS	Flexible	5.5	
11	167260	166900	360	RHS	Flexible	5.5	
12	170200	169580	620	RHS	Flexible	5.5	
13	176320	177420	1100	RHS	Flexible	5.5	
14	176900	175500	1400	RHS	Flexible	5.5	
15	180250	179900	350	RHS	Flexible	5.5	
16	182100	181000	1100	RHS	Flexible	7.0	
17	186200	185400	800	RHS	Flexible	5.5	
<b>As per Site Total Length(m)</b>			<b>19640</b>				

Lined Covered drains exist at Service Road locations in entire length of the project road and these sections are presented in the Table below:

**Table 6: Lined Covered Drain Locations - As per Site**

Sl. No.	Chainage		Length (m)	Side	Drain Dimenions		Remarks
	from	To			Width (m)	Depth (m)	
1	126200	127000	800	LHS	1.5	1.2	
2	132600	133900	1300	LHS	1.5	1.2	
3	135600	136450	850	LHS	1.5	1.2	
4	137200	138150	950	LHS	1.5	1.2	
5	146630	148600	1970	LHS	1.5	1.2	
6	151300	152100	800	LHS	1.5	1.2	
7	152500	156200	3700	LHS	1.5	1.2	
8	159.280	160.400	1.120	1.5	1.2	LHS	VUP_SR_COS
9	159.280	160.400	1.120	1.5	1.2	RHS	VUP_SR_COS
10	169580	170200	620	RHS	1.5	1.2	
11	169580	170220	640	LHS	1.5	1.2	
12	172750	173500	750	LHS	1.5	1.2	
13	176320	177420	1100	LHS	1.5	1.2	
14	180990	183600	2610	LHS	1.5	1.2	
15	190770	191300	530	LHS	1.5	1.2	
16	152380	156200	3820	RHS	1.5	1.2	
17	146980	148600	1620	RHS	1.5	1.2	
18	137400	138200	800	RHS	1.5	1.2	
19	135600	136450	850	RHS	1.5	1.2	
20	132750	133900	1150	RHS	1.5	1.2	
21	126000	127000	1000	RHS	1.5	1.2	
22	123250	124250	1000	RHS	1.5	1.2	
23	185400	186200	800	RHS	1.5	1.2	
<b>Total Length</b>			<b>27660</b>				

On curved sections with super-elevation, chutes in median were provided and are presented in table below:

**Table 7: Median Chutes**

Sl. No.	Chainage		Length	No of Chutes	Damage	Condition
	From (km)	To (km)				
1	121.080	121.250	0.170	3	-	Good
2	121.530	121.650	0.120	13	-	Good
3	121.990	122.500	0.510	54	-	Good
4	124.000	124.500	0.500	29	-	Good
5	125.570	125.605	0.035	5	-	Good
6	125.780	126.000	0.220	9	-	Good
7	126.100	126.120	0.020	2	-	Good
8	126.900	127.970	1.070	10	-	Good

Sl. No.	Chainage		Length	No of Chutes	Damage	Condition
	From (km)	To (km)				
9	128.570	128.630	0.060	6	-	Good
10	129.360	129.550	0.190	28	-	Good
11	137.400	137.550	0.150	9	-	Good
12	138.600	139.000	0.400	15	-	Good
13	140.970	141.200	0.230	22	-	Good
14	141.500	141.600	0.100	7	-	Good
15	141.980	142.150	0.170	11	-	Good
16	148.100	148.230	0.130	30	-	Good
17	149.430	149.580	0.150	13	-	Good
18	151.400	151.500	0.100	10	-	Good
19	154.000	154.300	0.300	28	-	Good
20	157.970	158.185	0.215	18	-	Good
21	158.550	158.750	0.200	18	-	Good
22	158.800	158.950	0.150	17	-	Good
23	164.080	164.200	0.120	9	-	Good
24	164.230	164.400	0.170	13	-	Good
25	166.730	166.870	0.140	15	-	Good
26	166.900	167.100	0.200	14	-	Good
27	174.950	175.170	0.220	19	-	Good
28	177.550	177.750	0.200	17	-	Good
29	187.100	187.280	0.180	9	-	Good
30	187.420	187.900	0.480	31	-	Good
31	187.980	188.270	0.290	27	-	Good
32	189.200	189.440	0.240	37	-	Good
33	189.750	189.900	0.150	15	-	Good
34	190.300	190.650	0.350	29	-	Good
35	191.200	191.410	0.210	42	-	Good
<b>Total Length</b>			<b>8.140</b>	<b>634</b>		

RE/RCC walls and Pitching are found in approaches of some of the Grade-Separators/ROB/Major Bridges along the Project Corridor and are listed in the table below.

**Table 8: Slope Protection Details**

Sl. No.	Chainage (km)		Length (m)	Side	Embankment	Stone Pitching	Chutes	RE Wall	RCC Wall	Grouting	Remarks
	From (km)	To (km)									
1	121.250	121.650	0.400	LHS	Yes	Yes	25	-	-	-	
2	121.700	121.710	0.010	LHS	Yes	Yes	-	-	-	-	
3	121.720	122.570	0.850	LHS	Yes	Yes	-	-	-	-	
4	122.570	121.710	0.860	RHS	Yes	Yes	22				
5	122.590	122.800	0.210	LHS	Yes	Yes	12	-	-	-	

Sl. No.	Chainage (km)		Length (m)	Side	Embankment	Stone Pitching	Chutes	RE Wall	RCC Wall	Grouting	Remarks
	From (km)	To (km)									
6	122.690	121.670	1.020	RHS	Yes	Yes	-				
7	122.800	122.600	0.200	RHS	Yes	Yes	8				
8	122.820	123.250	0.430	LHS	Yes	Yes	-	-	-	-	
9	123.180	122.830	0.350	RHS	Yes	Yes	-				
10	123.300	123.200	0.100	RHS	Yes	Yes	-				
11	124.300	124.380	0.080	LHS	Yes	Yes	-	-	-	-	
12	124.390	124.780	0.390	LHS	Yes	Yes	-	-	-	-	
13	124.770	124.400	0.370	RHS	Yes	Yes	-				
14	124.830	125.100	0.270	LHS	Yes	Yes	-	-	-	-	
15	125.080	124.830	0.250	RHS	Yes	Yes	-				
16	125.120	125.600	0.480	LHS	Yes	Yes	10	-	-	-	
17	125.150	125.100	0.050	RHS	Yes	Yes	-				
18	125.700	125.740	0.040	LHS	Yes	Yes	-	-	-	-	
19	125.750	125.600	0.150	RHS	Yes	Yes	-				
20	125.760	125.800	0.040	LHS	Yes	Yes	-	-	-	-	
21	125.970	125.800	0.170	RHS	Yes	Yes	-				
22	130.700	130.410	0.290	RHS	Yes	Yes	-				
23	134.930	134.790	0.140	RHS	Yes	Yes	-				
24	135.070	134.950	0.120	RHS	Yes	Yes	-				
25	139.000	139.120	0.120	LHS	Yes	Yes	3	-	-	-	
26	139.200	139.450	0.250	LHS	Yes	Yes	4	-	-	-	
27	141.250	141.150	0.100	RHS	Yes	Yes	1				
28	141.600	141.500	0.100	RHS	Yes	Yes	-				
29	141.650	141.620	0.030	RHS	Yes	Yes	-				
30	148.780	149.200	0.420	LHS	Yes	Yes	-	-	-	-	
31	149.100	148.600	0.500	RHS	Yes	Yes	-				
32	149.960	149.610	0.350	RHS	Yes	Yes	8				
33	150.080	150.000	0.080	RHS	Yes	Yes	3				
34	157.400	157.100	0.300	RHS	Yes	Yes	-				
35	157.600	157.420	0.180	RHS	Yes	Yes	-				
36	157.900	158.200	0.300	LHS	Yes	Yes	6	-	-	-	
37	157.950	157.700	0.250	RHS	Yes	Yes	15				
38	158.150	158.120	0.030	RHS	Yes	Yes	-				
39	158.240	158.200	0.040	RHS	Yes	Yes	-				
40	158.760	158.900	0.140	LHS	Yes	Yes	-	-	-	-	
41	158.995	159.600	0.605	LHS	Yes	Yes	-	-	-	-	
42	159.440	158.970	0.470	RHS	Yes	Yes	47				
43	159.570	159.480	0.090	RHS	Yes	Yes	10				
44	159.630	159.600	0.030	RHS	Yes	Yes	-				
45	159.850	160.560	0.710	LHS	Yes	Yes	28	-	-	-	

Sl. No.	Chainage (km)		Length (m)	Side	Embankment	Stone Pitching	Chutes	RE Wall	RCC Wall	Grouting	Remarks
	From (km)	To (km)									
46	160.570	160.200	0.370	RHS	Yes	Yes	28				
47	161.200	161.650	0.450	LHS	Yes	Yes	45	-	-	-	
48	161.600	160.650	0.950	RHS	Yes	Yes	76				30 Damage
49	161.700	161.970	0.270	LHS	Yes	Yes	19	-	-	-	
50	162.150	161.650	0.500	RHS	Yes	Yes	16				
51	162.650	163.130	0.480	LHS	Yes	Yes	38	-	-	-	
52	163.150	162.570	0.580	RHS	Yes	Yes	45				
53	163.200	163.750	0.550	LHS	Yes	Yes	40	-	-	-	
54	163.760	163.200	0.560	RHS	Yes	Yes	42				
55	163.830	164.050	0.220	LHS	Yes	Yes	-	-	-	-	
56	164.190	164.210	0.020	LHS	Yes	Yes	-	-	-	-	
57	164.200	164.180	0.020	RHS	Yes	Yes	-				
58	164.230	164.370	0.140	LHS	Yes	Yes	-	-	-	-	
59	164.240	164.220	0.020	RHS	Yes	Yes	-				
60	164.430	164.560	0.130	LHS	Yes	Yes	-	-	-	-	
61	165.400	165.600	0.200	LHS	Yes	Yes	16	-	-	-	3 Damage
62	165.550	165.250	0.300	RHS	Yes	Yes	25				
63	165.900	165.700	0.200	RHS	Yes	Yes	6				
64	166.100	166.300	0.200	LHS	Yes	Yes	-	-	-	-	
65	166.320	166.500	0.180	LHS	Yes	Yes	11	-	-	-	
66	166.320	165.970	0.350	RHS	Yes	Yes	-				
67	166.630	166.350	0.280	RHS	Yes	Yes	15				
68	166.700	166.840	0.140	LHS	Yes	Yes	-	-	-	-	
69	167.180	167.250	0.070	LHS	Yes	Yes	1	-	-	-	
70	167.220	167.050	0.170	RHS	Yes	Yes	9				
71	168.250	168.450	0.200	LHS	Yes	Yes	6	-	-	-	
72	168.330	168.280	0.050	RHS	Yes	Yes	5				
73	168.470	168.350	0.120	RHS	Yes	Yes	19				
74	168.480	168.660	0.180	LHS	Yes	Yes	9	-	-	-	
75	168.650	168.500	0.150	RHS	Yes	Yes	12				
76	168.680	168.800	0.120	LHS	Yes	Yes	10	-	-	-	
77	168.900	168.800	0.100	RHS	Yes	Yes	8				
78	170.540	170.500	0.040	RHS	Yes	Yes	-				
79	170.550	170.900	0.350	LHS	Yes	Yes	26	-	-	-	
80	170.570	170.480	0.090	RHS	Yes	Yes	-				
81	170.900	170.570	0.330	RHS	Yes	Yes	-				
82	170.960	171.400	0.440	LHS	Yes	Yes	42	-	-	-	
83	171.440	171.003	0.437	RHS	Yes	Yes	27				
84	172.000	172.160	0.160	LHS	Yes	Yes	13	-	-	-	
85	172.300	172.050	0.250	RHS	Yes	Yes	20				

Sl. No.	Chainage (km)		Length (m)	Side	Embankment	Stone Pitching	Chutes	RE Wall	RCC Wall	Grouting	Remarks
	From (km)	To (km)									
86	172.370	172.360	0.010	RHS	Yes	Yes	-				
87	172.550	172.400	0.150	RHS	Yes	Yes	-				
88	176.020	176.040	0.020	LHS	Yes	Yes	-	-	-	-	
89	176.191	176.210	0.019	LHS	Yes	Yes	-	-	-	-	
90	181.150	181.300	0.150	LHS	Yes	Yes	17	-	-	-	
91	181.360	181.200	0.160	RHS	Yes	Yes	15				
92	181.400	181.670	0.270	LHS	Yes	Yes	19	-	-	-	
93	181.800	181.400	0.400	RHS	Yes	Yes	19				
94	184.020	183.980	0.040	RHS	Yes	Yes	8				
95	184.240	184.050	0.190	RHS	Yes	Yes	12				
96	186.350	186.450	0.100	LHS	Yes	Yes	11	-	-	-	
97	186.450	186.360	0.090	RHS	Yes	Yes	13				
98	186.770	186.920	0.150	LHS	Yes	Yes	11	-	-	-	
99	187.200	186.800	0.400	RHS	Yes	Yes	36				
100	123.400	124.250	0.850	LHS	-	-	-	yes	-	-	-
101	123.400	124.250	0.850	RHS	-	-	-	yes	-	-	-
102	150.840	151.400	0.560	LHS	-	-	-	yes	-	-	-
103	150.840	151.400	0.560	RHS	-	-	-	yes	-	-	-
104	152.800	153.200	0.400	LHS	-	-	-	-	yes	-	-
105	152.800	153.200	0.400	RHS	-	-	-	-	yes	-	-
106	155.490	155.830	0.340	LHS	-	-	-	-	yes	-	-
107	155.490	155.830	0.340	RHS	-	-	-	-	yes	-	-
108	156.870	157.900	1.030	LHS	-	-	-	yes	-	-	-
109	156.870	157.900	1.030	RHS	-	-	-	yes	-	-	-
110	167.160	168.810	1.650	LHS	-	-	-	yes	-	-	-
111	167.160	168.810	1.650	RHS	-	-	-	yes	-	-	-
112	181.200	181.650	0.450	LHS	Yes	yes	-	-	-	-	-
113	181.200	181.650	0.450	RHS	Yes	yes	-	-	-	-	-
114	185.420	186.010	0.590	LHS	-	-	-	-	yes	-	-
115	185.420	186.010	0.590	RHS	-	-	-	-	yes	-	-
<b>Total Length</b>			<b>36.621</b>			<b>Total No's</b>	<b>992</b>				

Median width of 5m was generally adopted along the project road. There are about 75 Median openings locations and about 102 Solar Blinker locations, the details of the same are presented in tables below:

**Table 9: Locations of Median Openings**

Sl. No.	Chainage (km)	Width (m)	Length (m)	Reserve lane	Remarks
1	121.200	1.2	16	Yes	
2	123.250	1.2	16	Yes	
3	124.790	5	17.4	No	

Sl. No.	Chainage (km)	Width (m)	Length (m)	Reserve lane	Remarks	
4	126.000	5	43.5	No		
5	126.470	5	17.8	No		
6	126.820	5	8.2	No		
7	126.990	5	15.5	No		
8	128.950	5	20	No		
9	129.360	1.2	26.2	Yes		
10	130.950	1.2	20	Yes		
11	131.950	5.0/1.2	20.2	No (Up Direction) / Yes (Down direction)		
12	132.600	5	16	No		
13	133.290	5	8.2	No		
14	133.650	5	20.5	No		
15	134.750	5.0/1.2	19.2	No (Up Direction) / Yes (Down direction)		
16	134.950	1.2	20	Yes		
17	135.595	5	15.2	No		
18	136.000	5	8.2	No		
19	136.450	5	18.8	No		
20	137.230	5	18	No		
21	137.860	5	18.8	No		
22	139.700	5	17.9	No		
23	140.850	5	15.5	No		
24	141.610	1.2/5.0	20	Yes (Up direction)/ No (Down direction)		
25	142.980	1.2/5.0	21.5	Yes (Up direction)/ No (Down direction)		
26	144.750	1.2	34	Yes		
27	146.430	5.0/1.2	23.6	No (Up Direction) / Yes (Down direction)		
28	147.250	5	18	No		
29	148.000	5	15.5	No		
30	148.300	5	15.3	No		
31	149.350	5	15.3	No (Up Direction) / Yes (Down direction)		
32	150.210	5			Toll	
33	150.480	5	15.4	No		
34	151.190	VUP over Location				
35	151.250					
36	151.990	5	15.4	No		
37	153.850	5	15.8	No		
38	154.000	1.2	15.8	No		
39	154.276	1.2	15.8	No		
40	154.740	5	13.3	No		
41	155.400	5	20	No		
42	156.200	5	20	No		

Sl. No.	Chainage (km)	Width (m)	Length (m)	Reserve lane	Remarks
43	156.770	5	18	No	
44	158.780	5.0/1.2	18	No (Up Direction) / Yes (Down direction)	
45	158.950	5	18.5	No	
46	159.820	1.2	40	Yes	
47	160.610	5	19.5	No	
48	161.640	5	20	No	
49	162.140	5	20	No	
50	164.100	1.2	22	Yes	
51	164.400	1.2	16	Yes	
52	166.890	5.0/1.2	16	No (Up Direction) / Yes (Down direction)	
53	168.380	5	16.3	No	
54	169.440	1.2	18	Yes	
55	170.280	1.2	20	Yes	
56	170.980	1.2	20	Yes	
57	172.580	5	15.5	No	
58	173.290	1.2	18.2	Yes	
59	175.500	5	31.5	No	
60	176.280	1.2	50.5	Yes	
61	177.230	5	20.5	No	
62	177.900	1.2	20.6	No (Up Direction) / Yes (Down direction)	
63	178.805	5	15.2	No	
64	180.180	1.2	20.5	Yes	
65	181.880	5	18.2	No	
66	183.690	5.0/1.2	19.5	No (Up Direction) / Yes (Down direction)	
67	184.770	1.2	29.8	Yes	
68	186.180	1.2	21	Yes	
69	187.390	1.2	16.2	Yes	
70	188.405	5	22.2	No	
71	189.450	5	18.3	No	
72	190.050	1.2	18.5	Yes	
73	191.005	1.2	20	Yes	
74	191.850	5	20.6	No	
75	193.450	1.2	18.7	Yes	

Median openings and cross road locations with Solar Blinkers are presented below:

**Table 10: Details of Solar Blinkers**

Sl. No.	Chainage (km)	Location	Solar Panels	No. of Blinker's	Condition
1	121.090	Median	Yes	1	working
2	121.350	Median	Yes	1	working

Sl. No.	Chainage (km)	Location	Solar Panels	No. of Blinker's	Condition
3	123.360	Median	Yes	1	working
4	124.605	Median	Yes	1	Not working
5	124.900	Median	Yes	1	working
6	125.850	Median	Yes	1	working
7	126.160	Median	Yes	1	Not working
8	127.770	Median	Yes	1	Not working
9	127.970	Median	Yes	1	Not working
10	128.940	Median	Yes	1	working
11	128.980	Median	Yes	1	working
12	129.240	Median	Yes	1	working
13	129.500	Median	Yes	1	working
14	130.800	Median	Yes	1	working
15	131.070	Median	Yes	1	working
16	131.790	Median	Yes	1	working
17	132.050	Median	Yes	1	working
18	133.550	Median	Yes	1	working
19	133.820	Median	Yes	1	working
20	134.800	Median	Yes	1	working
21	135.050	Median	Yes	1	working
22	137.750	Median	Yes	1	Not working
23	137.960	Median	Yes	1	Not working
24	139.580	Median	Yes	1	working
25	139.790	Median	Yes	1	working
26	140.720	Median	Yes	1	working
27	141.000	Median	Yes	1	working
28	141.595	Median	Yes	1	working
29	141.650	Median	Yes	1	working
30	142.800	Median	Yes	1	working
31	143.160	Median	Yes	1	working
32	144.670	Median	Yes	1	working
33	144.770	Median	Yes	1	working
34	146.300	Median	Yes	1	working
35	146.570	Median	Yes	1	working
36	148.210	Median	Yes	1	working
37	148.450	Median	Yes	1	working
38	148.480	Median	Yes	1	working
39	149.300	Median	Yes	1	working
40	149.360	Median	Yes	1	working
41	151.350	Median	Yes	1	working

Sl. No.	Chainage (km)	Location	Solar Panels	No. of Blinker's	Condition
42	151.800	Median	Yes	1	working
43	152.100	Median	Yes	1	working
44	154.590	Median	Yes	1	working
45	154.880	Median	Yes	1	working
46	155.260	Median	Yes	1	working
47	155.640	Median	Yes	1	working
48	156.050	Median	Yes	1	working
49	156.350	Median	Yes	1	working
50	156.615	Median	Yes	1	working
51	156.770	Median	Yes	1	working
52	156.930	Median	Yes	1	working
53	158.590	Median	Yes	1	working
54	158.870	Median	Yes	1	working
55	159.660	Median	Yes	1	working
56	160.020	Median	Yes	1	working
57	160.450	Median	Yes	1	working
58	160.750	Median	Yes	1	working
59	161.500	Median	Yes	1	working
60	161.770	Median	Yes	1	working
61	162.010	Median	Yes	1	Not working
62	162.300	Median	Yes	1	working
63	163.910	Median	Yes	1	working
64	164.280	Median	Yes	1	working
65	166.750	Median	Yes	1	working
66	167.050	Median	Yes	1	working
67	168.240	Median	Yes	1	working
68	168.500	Median	Yes	1	working
69	169.420	Median	Yes	1	working
70	169.490	Median	Yes	1	working
71	170.150	Median	Yes	1	working
72	170.410	Median	Yes	1	working
73	170.810	Median	Yes	1	working
74	171.180	Median	Yes	2	working
75	172.410	Median	Yes	1	working
76	172.740	Median	Yes	1	working
77	173.170	Median	Yes	1	working
78	173.470	Median	Yes	1	working
79	175.300	Median	Yes	1	working
80	175.620	Median	Yes	1	working
81	176.200	Median	Yes	1	working
82	176.500	Median	Yes	1	working

Sl. No.	Chainage (km)	Location	Solar Panels	No. of Blinker's	Condition
83	176.470	Median	Yes	1	working
84	177.720	Median	Yes	1	working
85	178.040	Median	Yes	1	working
86	180.030	Median	Yes	1	working
87	180.300	Median	Yes	1	working
88	184.750	Median	Yes	1	working
89	184.810	Median	Yes	1	working
90	186.040	Median	Yes	1	working
91	186.360	Median	Yes	1	working
92	187.220	Median	Yes	1	working
93	187.350	Median	Yes	1	working
94	189.300	Median	Yes	1	working
95	189.580	Median	Yes	1	working
96	189.850	Median	Yes	1	working
97	190.190	Median	Yes	1	working
98	191.840	Median	Yes	1	working
99	191.880	Median	Yes	1	working
100	193.300	Median	Yes	1	working
101	193.600	Median	Yes	1	working
<b>Total No. of Solar Blinkers</b>				<b>102</b>	

There are few unauthorized median cuts and damaged medians exist along the project corridor and are presented in Table below:

**Table 11: Median Damaged Locations**

S.No	Chainage	Length	Side	Remarks
1	146.300	2	RHS	
2	138.316	2	Both Side	Un-Authorized
3	134.200	2	Both Side	Un-Authorized
4	132.920	1		Median Opening
5	126.010	1		Island @ Major Junction
6	129.520	6	Both Side	Un-Authorized
7	131.950	2	LHS	
8	151.900	4	Both Side	Un-Authorized
9	157.150	6	LHS	
10	158.000	15	Both Side	Un-Authorized
11	163.800	6	LHS	
12	176.900	6	Both Side	Un-Authorized
13	178.820	4		Median Opening
14	179.300	2	Both Side	Un-Authorized
15	182.410	6	Both Side	Un-Authorized
17	192.900	4	Both Side	Un-Authorized

S.No	Chainage	Length	Side	Remarks
18	193.900	2	Both Side	Un-Authorized
19	180.220	2	RHS	
20	177.220	4	RHS	
21	173.050	2	RHS	
22	168.600	6	Both Side	Un-Authorized
23	163.800	6	Both Side	Un-Authorized (Closed)
24	158.700	2		Median Opening
25	156.730	2	RHS	
26	156.210	2		Median Opening
27	155.340	2		Median Opening
28	152.700	4	RHS	
29	152.420	2	RHS	
<b>Total Length (Km)</b>		<b>105</b>		

Safety barriers have been provided along the project road at high embankments where embankment height is >3m, at sharp curve locations, at approaches of grade separated and cross drainage structures. The length of metal beam crash barrier provided along the project corridor is 64.377 km out of which 86m has got damaged. The Details of safety barriers provided along the corridor include the following:

**Table 12: Metal Beam Crash Barrier Locations**

Sl. No.	Chainage		Side	Length (m)	Damage (m)	Condition
	From (km)	To (km)				
1	121.100	121.180	Median	0.080		Good
2	121.200	121.240	Median	0.040		Good
3	121.260	121.650	LHS	0.390	1	Damage
4	121.670	121.700	LHS	0.030		Good
5	121.690	121.220	RHS	0.470		Good
6	121.720	122.570	LHS	0.850	6	Damage
7	121.730	121.710	RHS	0.020		Good
8	122.520	121.750	RHS	0.770		Good
9	122.560	122.530	RHS	0.030		Good
10	122.590	122.830	LHS	0.240		Good
11	122.820	122.580	RHS	0.240		Good
12	122.850	123.180	LHS	0.330	2	Damage
13	123.200	123.250	LHS	0.050		Good
14	123.310	122.840	RHS	0.470		Good
15	123.350	123.320	RHS	0.030		Good
16	123.390	123.410	LHS	0.020	6	Damage
17	123.420	123.390	RHS	0.030		Good
18	124.240	124.260	LHS	0.020		Good
19	124.260	124.370	LHS	0.110		Good

Sl. No.	Chainage		Side	Length (m)	Damage (m)	Condition
	From (km)	To (km)				
20	124.260	124.240	RHS	0.020	10	Damage
21	124.350	124.300	RHS	0.050		Good
22	124.400	124.770	LHS	0.370		Good
23	124.590	124.550	RHS	0.040		Good
24	124.750	124.730	RHS	0.020		Good
25	124.820	125.140	LHS	0.320		Good
26	125.160	125.830	LHS	0.670	2	Damage
27	125.180	124.830	RHS	0.350		Good
28	125.220	125.190	RHS	0.030		Good
29	125.781	125.750	RHS	0.031		Good
30	125.850	125.870	LHS	0.020		Good
31	125.850	125.820	RHS	0.030		Good
32	125.890	125.910	LHS	0.020		Good
33	126.400	126.450	LHS	0.050	2	Damage
34	126.440	126.251	RHS	0.189		Good
35	126.470	126.820	LHS	0.350		Good
36	126.830	126.950	LHS	0.120		Good
37	126.950	126.460	RHS	0.490		Good
38	127.050	127.070	LHS	0.020		Good
39	127.070	127.050	RHS	0.020		Good
40	127.180	127.100	RHS	0.080		Good
41	127.480	127.500	Median	0.020		Good
42	127.500	127.480	RHS	0.020		Good
43	127.520	127.550	Median	0.030		Good
44	127.550	127.580	LHS	0.030		Good
45	127.550	127.520	RHS	0.030		Good
46	127.610	127.640	LHS	0.030		Good
47	128.630	128.950	LHS	0.320		Good
48	129.180	129.200	LHS	0.020	1	Damage
49	129.210	129.190	RHS	0.020		Good
50	129.230	129.325	Median	0.095		Good
51	130.690	130.410	RHS	0.280		Good
52	130.790	130.950	Median	0.160		Good
53	131.420	131.400	RHS	0.020		Good
54	131.950	132.050	Median	0.100		Good
55	131.960	132.170	LHS	0.210		Good
56	132.390	132.410	LHS	0.020		Good
57	132.630	133.640	LHS	1.010		Good
58	133.250	132.800	RHS	0.450		Good
59	133.630	133.260	RHS	0.370		Good

Sl. No.	Chainage		Side	Length (m)	Damage (m)	Condition
	From (km)	To (km)				
60	133.700	133.850	LHS	0.150		Good
61	133.850	133.650	RHS	0.200		Good
62	134.040	134.050	LHS	0.010		Good
63	134.100	134.080	RHS	0.020		Good
64	134.600	134.580	RHS	0.020		Good
65	134.750	134.900	LHS	0.150		Good
66	134.800	134.900	Median	0.100		Good
67	134.900	134.800	RHS	0.100		Good
68	134.960	135.100	Median	0.140		Good
69	135.100	134.940	RHS	0.160		Good
70	135.610	136.400	LHS	0.790		Good
71	136.002	135.615	RHS	0.387		Good
72	136.210	136.010	RHS	0.200		Good
73	136.400	136.230	RHS	0.170		Good
74	136.560	136.540	RHS	0.020		Good
75	136.750	136.770	LHS	0.020		Good
76	137.230	137.840	LHS	0.610		Good
77	137.840	137.440	RHS	0.400		Good
78	137.860	138.150	LHS	0.290		Good
79	138.150	137.860	RHS	0.290		Good
80	138.230	138.250	LHS	0.020		Good
81	138.240	138.220	RHS	0.020		Good
82	138.600	138.700	LHS	0.100		Good
83	138.730	138.800	LHS	0.070		Good
84	138.765	139.050	Median	0.285		Good
85	138.820	139.050	LHS	0.230		Good
86	139.050	139.020	RHS	0.030		Good
87	139.160	139.560	Median	0.400		Good
88	139.180	139.160	RHS	0.020		Good
89	139.500	139.300	RHS	0.200		Good
90	139.840	139.860	LHS	0.020		Good
91	139.870	139.850	RHS	0.020		Good
92	141.230	141.260	LHS	0.030		Good
93	141.420	141.440	Median	0.020		Good
94	141.440	141.390	RHS	0.050		Good
95	141.500	141.520	Median	0.020		Good
96	141.610	141.520	RHS	0.090		Good
97	141.750	141.650	RHS	0.100		Good
98	142.020	142.040	LHS	0.020		Good
99	142.050	142.030	RHS	0.020		Good

Sl. No.	Chainage		Side	Length (m)	Damage (m)	Condition
	From (km)	To (km)				
100	142.470	142.970	LHS	0.500		Good
101	142.830	142.950	Median	0.120		Good
102	142.880	142.860	RHS	0.020		Good
103	143.440	143.420	RHS	0.020		Good
104	144.360	144.380	LHS	0.020		Good
105	144.370	144.350	RHS	0.020		Good
106	144.600	144.730	Median	0.130	2	Damage
107	144.760	144.850	Median	0.090		Good
108	146.250	146.270	LHS	0.020		Good
109	146.380	146.360	RHS	0.020		Good
110	146.440	146.530	Median	0.090		Good
111	146.840	148.300	LHS	1.460		Good
112	146.940	147.230	Median	0.290		Good
113	147.200	146.960	RHS	0.240		Good
114	147.230	147.210	RHS	0.020		Good
115	147.250	148.010	Median	0.760		Good
116	148.010	147.250	RHS	0.760		Good
117	148.030	148.350	Median	0.320		Good
118	148.330	148.420	LHS	0.090		Good
119	148.350	148.030	RHS	0.320		Good
120	148.370	148.440	Median	0.070		Good
121	148.430	148.460	LHS	0.030		Good
122	148.480	148.500	LHS	0.020		Good
123	148.550	148.370	RHS	0.180		Good
124	148.700	148.750	LHS	0.050		Good
125	148.780	149.350	LHS	0.570		Good
126	149.190	148.600	RHS	0.590		Good
127	149.300	149.470	Median	0.170		Good
128	149.470	149.300	RHS	0.170		Good
129	149.840	149.860	LHS	0.020		Good
130	149.870	149.610	RHS	0.260		Good
131	149.980	150.005	LHS	0.025		Good
132	150.000	150.100	Median	0.100		Good
133	150.800	150.000	RHS	0.800		Good
134	151.000	150.900	RHS	0.100		Good
135	151.350	151.000	RHS	0.350		Good
136	151.400	151.960	LHS	0.560		Good
137	151.970	152.080	LHS	0.110		Good
138	152.190	154.750	LHS	2.560		Good
139	152.320	152.300	RHS	0.020		Good

Sl. No.	Chainage		Side	Length (m)	Damage (m)	Condition
	From (km)	To (km)				
140	152.350	152.370	LHS	0.020		Good
141	152.540	152.350	RHS	0.190		Good
142	152.570	152.820	LHS	0.250		Good
143	152.820	152.570	RHS	0.250		Good
144	153.160	153.860	Median	0.700		Good
145	153.860	153.180	RHS	0.680		Good
146	153.900	154.270	Median	0.370		Good
147	154.280	153.900	RHS	0.380		Good
148	154.300	154.670	Median	0.370		Good
149	154.670	154.300	RHS	0.370		Good
150	154.720	155.400	Median	0.680		Good
151	154.780	155.420	LHS	0.640	6	Damage
152	155.400	154.700	RHS	0.700		Good
153	155.840	156.130	Median	0.290		Good
154	155.850	156.220	LHS	0.370		Good
155	156.130	155.840	RHS	0.290		Good
156	156.200	155.420	RHS	0.780		Good
157	156.750	156.730	RHS	0.020		Good
158	156.860	157.000	LHS	0.140		Good
159	156.900	157.400	Median	0.500		Good
160	157.390	156.950	RHS	0.440		Good
161	157.460	157.760	Median	0.300		Good
162	157.790	157.400	RHS	0.390		Good
163	157.850	158.040	LHS	0.190		Good
164	157.900	157.800	RHS	0.100		Good
165	158.000	157.800	RHS	0.200		Good
166	158.100	158.150	LHS	0.050		Good
167	158.200	158.230	LHS	0.030		Good
168	158.200	158.370	Median	0.170		Good
169	158.200	158.180	RHS	0.020		Good
170	158.350	158.320	RHS	0.030		Good
171	158.750	158.860	Median	0.110		Good
172	158.780	158.900	LHS	0.120		Good
173	158.780	158.770	RHS	0.010		Good
174	158.960	159.420	LHS	0.460		Good
175	159.480	158.980	RHS	0.500		Good
176	159.600	159.500	RHS	0.100		Good
177	159.650	159.840	Median	0.190		Good
178	159.890	160.000	Median	0.110		Good
179	160.180	160.570	LHS	0.390		Good

Sl. No.	Chainage		Side	Length (m)	Damage (m)	Condition
	From (km)	To (km)				
180	160.570	160.420	RHS	0.150		Good
181	160.700	160.720	LHS	0.020		Good
182	160.900	161.650	LHS	0.750		Good
183	161.570	160.700	RHS	0.870		Good
184	161.690	162.995	LHS	1.305		Good
185	162.070	161.720	RHS	0.350		Good
186	162.700	163.150	LHS	0.450	4	Damage
187	163.150	162.570	RHS	0.580		Good
188	163.210	163.760	LHS	0.550		Good
189	163.750	163.200	RHS	0.550		Good
190	163.900	164.020	Median	0.120		Good
191	163.980	164.050	LHS	0.070		Good
192	164.150	164.220	Median	0.070		Good
193	164.190	164.220	LHS	0.030		Good
194	164.210	164.190	RHS	0.020		Good
195	164.250	164.400	LHS	0.150		Good
196	164.250	164.230	RHS	0.020		Good
197	165.240	165.260	LHS	0.020		Good
198	165.250	165.230	RHS	0.020		Good
199	165.390	165.580	LHS	0.190		Good
200	165.560	165.270	RHS	0.290		Good
201	165.900	165.820	RHS	0.080		Good
202	165.940	165.910	RHS	0.030		Good
203	166.100	166.350	LHS	0.250		Good
204	166.370	165.950	RHS	0.420		Good
205	166.380	166.500	LHS	0.120		Good
206	166.600	166.400	RHS	0.200		Good
207	166.750	166.850	LHS	0.100		Good
208	166.900	167.050	Median	0.150		Good
209	167.150	167.220	LHS	0.070		Good
210	167.340	166.800	RHS	0.540		Good
211	167.570	167.360	RHS	0.210		Good
212	167.850	167.830	RHS	0.020		Good
213	168.245	168.350	LHS	0.105		Good
214	168.390	168.500	LHS	0.110		Good
215	168.540	168.190	RHS	0.350		Good
216	168.640	168.760	LHS	0.120	6	Damage
217	168.770	168.560	RHS	0.210		Good
218	169.350	169.440	Median	0.090		Good
219	169.350	169.330	RHS	0.020		Good

Sl. No.	Chainage		Side	Length (m)	Damage (m)	Condition
	From (km)	To (km)				
220	169.390	169.410	LHS	0.020		Good
221	169.460	169.430	RHS	0.030		Good
222	169.470	169.560	Median	0.090		Good
223	169.600	169.650	LHS	0.050		Good
224	169.670	169.580	RHS	0.090		Good
225	170.160	170.240	Median	0.080		Good
226	170.260	170.410	Median	0.150		Good
227	170.570	170.850	LHS	0.280		Good
228	170.580	170.450	RHS	0.130		Good
229	170.720	170.580	RHS	0.140		Good
230	170.890	171.440	LHS	0.550		Good
231	170.900	170.800	RHS	0.100		Good
232	170.940	170.990	Median	0.050		Good
233	171.000	171.160	Median	0.160		Good
234	171.440	171.070	RHS	0.370		Good
235	171.920	172.040	LHS	0.120		Good
236	172.000	172.150	LHS	0.150		Good
237	172.000	172.450	Median	0.450		Good
238	172.300	172.050	RHS	0.250		Good
239	172.370	172.350	RHS	0.020		Good
240	172.720	172.740	LHS	0.020		Good
241	172.780	172.760	RHS	0.020		Good
242	172.850	173.260	LHS	0.410		Good
243	173.190	173.260	Median	0.070		Good
244	173.280	173.450	LHS	0.170		Good
245	173.280	173.450	Median	0.170		Good
246	175.300	175.330	LHS	0.030		Good
247	175.350	175.380	LHS	0.030		Good
248	175.350	175.320	RHS	0.030		Good
249	175.400	175.370	RHS	0.030		Good
250	175.470	175.490	LHS	0.020		Good
251	175.500	175.480	RHS	0.020		Good
252	175.970	176.070	Median	0.100		Good
253	176.050	176.070	LHS	0.020		Good
254	176.100	176.070	RHS	0.030		Good
255	176.200	176.210	Median	0.010		Good
256	176.210	176.260	Median	0.050		Good
257	176.220	176.190	RHS	0.030		Good
258	176.360	176.440	LHS	0.080		Good
259	176.360	176.410	Median	0.050		Good

Sl. No.	Chainage		Side	Length (m)	Damage (m)	Condition
	From (km)	To (km)				
260	176.450	176.850	LHS	0.400		Good
261	176.860	177.260	LHS	0.400		Good
262	177.050	176.980	RHS	0.070		Good
263	177.260	177.430	LHS	0.170		Good
264	177.260	177.430	Median	0.170		Good
265	177.690	177.670	RHS	0.020		Good
266	177.760	177.870	Median	0.110		Good
267	177.800	177.820	LHS	0.020		Good
268	179.990	180.010	LHS	0.020		Good
269	180.000	179.900	RHS	0.100		Good
270	180.010	179.990	RHS	0.020		Good
271	180.030	180.150	Median	0.120		Good
272	180.170	180.000	RHS	0.170		Good
273	180.180	180.960	LHS	0.780		Good
274	180.180	180.300	Median	0.120		Good
275	181.150	181.360	LHS	0.210		Good
276	181.150	181.360	Median	0.210		Good
277	181.360	181.200	RHS	0.160		Good
278	181.400	181.640	LHS	0.240		Good
279	181.400	181.770	Median	0.370		Good
280	181.640	181.400	RHS	0.240		Good
281	182.000	182.400	LHS	0.400		Good
282	182.210	182.190	RHS	0.020		Good
283	182.410	183.450	LHS	1.040		Good
284	183.470	183.690	LHS	0.220		Good
285	183.730	183.830	Median	0.100		Good
286	183.960	184.050	Median	0.090		Good
287	184.030	184.050	LHS	0.020		Good
288	184.070	184.370	Median	0.300		Good
289	184.700	184.770	Median	0.070		Good
290	184.795	184.950	Median	0.155		Good
291	185.970	186.020	LHS	0.050		Good
292	186.050	186.170	Median	0.120		Good
293	186.180	185.980	RHS	0.200		Good
294	186.200	186.350	Median	0.150		Good
295	186.250	185.950	RHS	0.300		Good
296	186.320	186.450	LHS	0.130		Good
297	186.780	186.870	LHS	0.090		Good
298	187.250	187.390	Median	0.140		Good
299	187.400	186.800	RHS	0.600		Good

Sl. No.	Chainage		Side	Length (m)	Damage (m)	Condition
	From (km)	To (km)				
300	187.410	187.430	Median	0.020		Good
301	188.440	188.460	LHS	0.020		Good
302	188.470	188.450	RHS	0.020		Good
303	189.900	190.040	Median	0.140		Good
304	190.060	190.190	Median	0.130		Good
305	190.390	190.410	LHS	0.020		Good
306	190.410	190.390	RHS	0.020		Good
307	190.840	191.020	Median	0.180	2	Damage
308	191.040	191.100	Median	0.060		Good
309	192.670	192.650	RHS	0.020		Good
310	192.680	192.700	LHS	0.020		Good
311	193.300	193.450	Median	0.150		Good
312	193.480	193.600	Median	0.120	6	Damage
<b>Total Length (Km)</b>				<b>64.377</b>	<b>86</b>	

Pedestrian Guard Rails are observed at only the Bus bay locations and are presented in Table below:

**Table 13: Details of Pedestrian Guard Rails**

Sl. No.	Chainage		Length	Condition
	From	to		
1	126.420	126.440	0.020	Good
2	126.420	126.440	0.020	Good
3	128.990	129.010	0.020	Good
4	131.990	132.010	0.020	Good
5	133.610	133.630	0.020	Good
6	136.290	136.310	0.020	Good
7	139.240	139.260	0.020	Fair
8	141.600	141.620	0.020	Good
9	144.780	144.800	0.020	Fair
10	148.490	148.510	0.020	Fair
11	151.960	151.980	0.020	Good
12	151.990	152.010	0.020	Good
13	152.990	153.010	0.020	Good
14	153.190	153.210	0.020	Good
15	154.190	154.210	0.020	Good
16	154.590	154.610	0.020	Good
17	154.770	154.790	0.020	Good
18	166.940	166.960	0.020	Good
19	168.365	168.385	0.020	Good

Sl. No.	Chainage		Length	Condition
	From	to		
20	170.290	170.310	0.020	Good
21	170.970	170.990	0.020	Good
22	174.540	174.560	0.020	Good
23	175.490	175.510	0.020	Good
24	176.230	176.250	0.020	Good
25	177.990	178.010	0.020	Good
26	180.090	180.110	0.020	Good
27	181.350	181.370	0.020	Good
28	187.460	187.480	0.020	Good

List of major and minor junctions developed are presented in table below:

**Table 14: List of Major Junctions**

Sl. No.	Existing Chainage	Type of Junction	Surface Type		Width of Access road		Speed Breaker	Culvert	Sign Boards	
			LHS	RHS	LHS (m)	RHS (m)			LHS	RHS
1	121200	Y-Junction		BT Road		7.2	Yes	No		Go Slow, Stop, Speed Breaker, Place Identification
2	126000	Y-Junction		BT Road		7.2	Yes	No		Speed Breaker, T-Junction, Hazard
3	158750	Y-Junction	BT Road		7.2		Yes	Yes	Stop, Speed Breaker, Hazard	
4	166890	Y-Junction	BT Road		14.0		Yes	No	Stop, Speed Breaker, Keep Left	

**Table 15: List of Minor Junctions**

Sl. No.	Chainage	Side	LHS Width (m)	RHS Width (m)	Pavement Type
1	124790	LHS	5.8	-	Bituminous
2	124790	RHS	-	3.5	Bituminous
3	126470	RHS	-	6.0	Bituminous
4	127880	RHS	-	7.2	Bituminous
5	128610	LHS	3.5	-	Bituminous
6	128800	LHS	3.5	-	Bituminous
7	128950	LHS	3.0	-	Bituminous
8	128970	RHS	-	3.5	Bituminous
9	129370	LHS	4.5	-	Bituminous
10	129380	RHS	-	3.5	Bituminous
11	130950	RHS	-	3.5	Bituminous
12	131900	LHS	4.5	-	Bituminous
13	133650	RHS	-	5.5	Bituminous
14	133700	LHS	7.2	-	Bituminous
15	134750	LHS	3.5	-	Bituminous

Sl. No.	Chainage	Side	LHS Width (m)	RHS Width (m)	Pavement Type
16	134950	RHS	-	3.5	Bituminous
17	136000	RHS	-	3.0	Bituminous
18	136250	LHS	3.5	-	Bituminous
19	137900	LHS	7.2	-	Bituminous
20	138800	LHS	3.5	-	Bituminous
21	139260	RHS	-	3.5	Bituminous
22	139580	RHS	-	3.5	Bituminous
23	140850	LHS	3.5	-	Bituminous
24	141570	RHS	-	3.5	Bituminous
25	142500	LHS	3.5	-	Bituminous
26	142970	RHS	-	3.5	Bituminous
27	144720	LHS	3.5	-	Bituminous
28	144800	RHS	-	3.5	Bituminous
29	145560	LHS	3.5	-	Bituminous
30	146630	LHS	3.5	-	Bituminous
31	148100	RHS	-	3.5	Bituminous
32	148300	LHS	7.2	-	Bituminous
33	148550	RHS	-	7.0	Bituminous
34	149400	LHS	7.2	-	Bituminous
35	149420	RHS	-	3.5	Bituminous
36	150520	RHS	-	4.0	Bituminous
37	151000	LHS	7.2	-	Bituminous
38	151100	LHS	7.2	-	Bituminous
39	151900	LHS	5.0	-	Bituminous
40	152390	RHS	-	4.0	Bituminous
41	152820	LHS	7.0	-	Bituminous
42	153050	RHS	-	6.0	Bituminous
43	154100	RHS	-	7.2	Bituminous
44	154250	RHS	-	7.2	Bituminous
45	154300	LHS	3.5	-	Bituminous
46	155400	LHS	3.5	-	Bituminous
47	155550	LHS	3.5	-	Bituminous
48	156800	RHS	-	5.5	Bituminous
49	158020	LHS	3.5	-	Bituminous
50	158910	LHS	3.5	-	Bituminous
51	158940	RHS	-	3.5	Bituminous
52	159480	RHS	-	3.0	Bituminous
53	159840	RHS	-	9.2	Bituminous
54	160600	RHS	-	3.5	Earthen
55	160610	LHS	3.5	-	Bituminous
56	160630	RHS	-	3.5	Bituminous

Sl. No.	Chainage	Side	LHS Width (m)	RHS Width (m)	Pavement Type
57	161650	RHS	-	3.5	Bituminous
58	162100	LHS	3.5	-	Bituminous
59	162120	RHS	-	4.3	Bituminous
60	163800	LHS	6.0	-	Bituminous
61	163820	RHS	-	4.0	Bituminous
62	164080	RHS	-	9.2	Bituminous
63	164110	LHS	16.0	-	Bituminous
64	164400	LHS	3.5	-	Bituminous
65	164420	RHS	-	4.0	Bituminous
66	170190	RHS	-	3.5	Bituminous
67	170280	RHS	-	3.5	Earthen
68	170990	RHS	-	3.5	Bituminous
69	172355	RHS	-	3.5	Bituminous
70	172580	LHS	3.5	-	Bituminous
71	173280	LHS	3.5	-	Bituminous
72	173315	RHS	-	5.5	Bituminous
73	175490	RHS	-	7.0	Concrete
74	175510	RHS	-	3.5	Bituminous
75	176270	LHS	6.5	-	Bituminous
76	176360	RHS	-	11.3	Bituminous
77	177910	RHS	-	3.5	Bituminous
78	178805	RHS	-	3.5	Bituminous
79	179950	RHS	-	3.5	Bituminous
80	180180	LHS	3.5	-	Bituminous
81	180190	RHS	-	3.5	Earthen
82	181410	LHS	7.0	-	Bituminous
83	181410	RHS	-	7.0	Bituminous
84	182000	RHS	-	3.5	Bituminous
85	183300	LHS	6.0	-	Bituminous
86	183450	LHS	3.5	-	Bituminous
87	184800	RHS	-	3.5	Bituminous
88	187350	RHS	-	3.5	Bituminous
89	187390	LHS	3.5	-	Bituminous
90	188415	LHS	4.0	-	Bituminous
91	189360	RHS	-	3.5	Earthen
92	189460	LHS	3.5	-	Bituminous
93	190050	LHS	3.5	-	Bituminous
94	191005	RHS	-	3.5	Earthen
95	191830	RHS	-	5.3	Bituminous
96	193460	LHS	3.5	-	Bituminous
97	193465	RHS	-	3.5	Bituminous

Road furniture in the form of signs/markings, gantry signs and traffic safety blinkers, lighting, high mast lights have been provided along the project road at few locations and are presented in the Tables below:

**Table 16: Locations of High mast Lighting**

Sl. No.	Chainage	Location	Remarks	As per site	Condition
1	121.180	Separator	Major Junction	1	Good
2	126.015	Separator	Major Junction	1	Good
3	Toll Plaza	Shoulder	Toll Plaza	4	Good
4	158.780	separator	Major Junction	1	Good
5	159.840	separator	Major Junction	1	Good
6	166.875	Median	Major Junction	1	Good
7	134.900	Shoulder	Truck Lay Bye	2	Good
8	184.600	Shoulder	Truck Lay Bye	2	Good
9	184.600	Shoulder	Truck Lay Bye	2	Good
<b>Total No's</b>				<b>15</b>	

**Table 17: Locations of additional High mast Lighting**

Sl. No.	Chainage	Location	Remarks	As per site	Condition
1	129.350	Shoulder	Hotel	1	Good
2	134.940	Shoulder	Minor Junction	1	Good
3	139.680	Shoulder	Minor Junction	1	Good
4	151.950	Shoulder	Bus Stop	1	Good
5	160.620	Shoulder	Minor Junction	1	Good
6	164.070	Shoulder	Minor Junction	1	Good
7	173.310	Shoulder	Minor Junction	1	Good
8	130.935	Shoulder	Minor Junction	1	Good
9	137.800	Shoulder	Minor Junction	1	Good
10	142.960	Shoulder	Minor Junction	1	Good
11	146.200	Shoulder	Minor Junction	1	Good
12	156.800	Shoulder	Bus Stop	1	Good
13	170.350	Shoulder	Bus Stop	1	Good
<b>Total No's</b>				<b>13</b>	

**Table 18: Locations of Highway Lighting along Main Carriageway**

Sl. No.	Chainage		Single Arm	Double Arm	Location	Condition	Remarks	Length (Km)
	From	To						
1	124.790	-	1	-	Median	Good	Solar Panels	-
2	126.315	126.605	-	9	Median	Good		0.290
3	131.950	-	1	-	Median	Good	Solar Panels	-
4	133.280	133.795	-	13	Median	Good		0.515
5	133.660	-	-	1	Median	Good	Solar Panels	-

Sl. No.	Chainage		Single Arm	Double Arm	Location	Condition	Remarks	Length (Km)
	From	To						
6	135.975	136.605	-	16	Median	Good		0.630
7	137.350	137.930	-	16	Median	Good		0.580
8	140.860	-	1	-	Separator	Good	Solar Panels	-
9	140.880	-	1	-	Median	Good	Solar Panels	-
10	146.530	147.730	-	34	Median	Good		1.200
11	148.030	148.420	-	11	Median	Good		0.390
12	150.010	150.175	-	4	Median	Good		0.165
13	150.400	150.600	-	5	Median	Good		0.200
14	151.795	152.050	-	7	Median	Good		0.255
15	153.000	153.100	3	-	Service Road (LHS)	Good		0.100
16	153.110	155.500	-	60	Median	Good		2.390
17	155.600	155.700	6	-	Service Road (LHS & RHS)	Good		0.100
18	155.850	156.235	-	10	Median	Good		0.385
19	156.770	-	1	-	Median	Good	Solar Panels	-
20	156.790	-	1	-	Median	Good	Solar Panels	-
21	160.605	-	-	1	Median	Good	Solar Panels	-
22	160.625	-	1	-	Median	Good	Solar Panels	-
23	161.620	-	1	-	Median	Good	Solar Panels	-
24	161.630	-	-	1	Shoulder	Good	Solar Panels	-
25	161.640	-	1	-	Median	Good	Solar Panels	-
26	162.180	-	1	-	Median	Good	Solar Panels	-
27	170.000	170.100	6	-	Service Road (LHS & RHS)	Good		0.100
28	170.280	-	1	-	Median	Good	Solar Panels	-
29	170.300	-	1	-	Median	Good	Solar Panels	-
30	173.290	-	1	-	Median	Good	Solar Panels	-
31	173.290	-	-	1	Shoulder	Good	Solar Panels	-
32	175.440	175.710	-	7	Median	Good		0.270
33	176.240	176.650	-	11	Median	Good		0.410
34	181.980	-	1	-	Median	Good	Solar Panels	-
35	182.000	-	1	-	Median	Good	Solar Panels	-
36	182.420	-	1	-	Service Road Edge	Good	Solar Panels	-
37	182.510	-	1	-	Service Road Edge	Good	Solar Panels	-
38	183.290	183.620	-	10	Median	Good		0.330

Sl. No.	Chainage		Single Arm	Double Arm	Location	Condition	Remarks	Length (Km)
	From	To						
39	185.700	185.800	6	-	Service Road (LHS & RHS)	Good		0.100
40	186.180	-	1	-	Median	Good	Solar Panels	-
41	193.430	-	1	-	Median	Good	Solar Panels	-
Total No's			40	217	Total Length			8.410

However, from the Client it is understood that actual Inventory of Single arm is 29 and Double arm is 215 only. The difference may be due to some of the lights may be operated by local panchayats

### 1.5.2 Major Structure

List of Structures found during the inventory surveys along the corridor are as follows:

**Table 19: Details of Major Structures**

Sl No.	Design chainage	Type of Str	Side	Structure on	Age of Structure	Span Arrangement (No x Length)
1	139+138	MJB	LHS	MCW	New	4 x 19.2 + 1 x 29.5
2	139+138	MJB	RHS	MCW	Old	2 x 9.0 + 9 x 9.8
3	141+362	MJB	LHS	MCW	Old	2 x 19.0 + 9 x 20
4	141+362	MJB	RHS	MCW	New	2 x 19.0 + 9 x 20
5	149+933	MJB	LHS	MCW	Old	2 x 9.0 + 7 x 9.8
6	149+933	MJB	RHS	MCW	New	3 x 29.0
7	158+193	MJB	LHS	MCW	Old	13 x 5.6
8	158+193	MJB	RHS	MCW	New	2 x 23.2 + 1 x 29
9	171+728	MJB	LHS	MCW	Old	30 x 20
10	171+728	MJB	RHS	MCW	New	30 x 20
11	186+614	MJB	LHS	MCW	Old	15 x 21.7
12	186+614	MJB	RHS	MCW	New	15 x 21.7
13	124+787	MNB	LHS	MCW	New	2x8.0
14	124+787	MNB	RHS	MCW	New	2x8.0
15	125+725	MNB	LHS	MCW	New	2 x 6
16	125+725	MNB	RHS	MCW	New	2 x 6
17	127+510	MNB	LHS	MCW	Old	2 x 6.8
18	127+510	MNB	RHS	MCW	New	2 x 5.8
19	151+083	MNB	LHS	MCW	New	5.0 x 6.0
20	151+083	MNB	RHS	MCW	New	5.0 x 6.0
21	157+725	MNB	LHS	ROB Approach	New	5 x 8.6

Sl No.	Design chainage	Type of Str	Side	Structure on	Age of Structure	Span Arrangement (No x Length)
22	157+725	MNB	RHS	ROB Approach	New	5 x 8.6
23	164+235	MNB	LHS	MCW	New	1 x 11
24	164+235	MNB	RHS	MCW	New	1 x 11
25	166+348	MNB	LHS	MCW	New	1 x 11
26	166+348	MNB	RHS	MCW	New	1 x 11
27	167+750	MNB	LHS	ROB Approach	New	3 x 4
28	167+750	MNB	RHS	ROB Approach	New	3 x 4
29	170+950	MNB	LHS	MCW	New	3 x 11
30	170+950	MNB	RHS	MCW	New	3 x 11
31	175+280	MNB	LHS	MCW	New	2 x 3.6
32	175+280	MNB	RHS	MCW	Old	2 x 3.3
33	176+120	MNB	LHS	MCW	New	5 x 6
34	176+120	MNB	RHS	MCW	Old	5 x 6.3
35	176+165	MNB	LHS	MCW	New	8 x 6
36	176+165	MNB	RHS	MCW	Old	12 x 3
37	176+415	MNB	LHS	SR	New	1 x 10.6
38	176+415	MNB	RHS	MCW	Old	2 x 5.3
39	184+054	MNB	LHS	MCW	Old	3 x 5.8
40	184+054	MNB	RHS	MCW	New	3 x 5.8
41	157+433	ROB	LHS	MCW	New	2 x 10 + 1 x 22.4
42	157+433	ROB	RHS	MCW	Old	1 x 13.7
43	163+220	ROB	LHS	MCW	New	3 x 20 + 1 x 24.7
44	163+220	ROB	RHS	MCW	New	3 x 20 + 1 x 24.7
45	167+660	ROB	LHS	MCW	New	2 x 10 + 1 x 22.4
46	167+660	ROB	RHS	MCW	New	2 x 10 + 1 x 22.4
47	123+833	Flyover	LHS	MCW	New	1 x 21.7
48	123+833	Flyover	RHS	MCW	New	1 x 21.7
49	151+140	VUP	LHS	MCW	New	1 x 20.5
50	151+140	VUP	RHS	MCW	New	1 x 20.5
51	181+430	VUP	LHS	MCW	New	1 x 22.5
52	181+430	VUP	RHS	MCW	New	1 x 22.5
53	159+850	VUP	LHS	MCW	New	2 x 12.0
54	159+850	VUP	RHS	MCW	New	2 x 12.0

Sl No.	Design chainage	Type of Str	Side	Structure on	Age of Structure	Span Arrangement (No x Length)
55	121+700	PUP	LHS	MCW	New	1 x 9.0
56	121+700	PUP	RHS	MCW	New	1 x 9.0
57	153+030	PUP	LHS	MCW	New	1 x 9.5
58	153+030	PUP	RHS	MCW	New	1 x 9.5
59	155+681	PUP	LHS	MCW	New	1 x 9.6
60	155+681	PUP	RHS	MCW	New	1 x 9.6
61	167+247	PUP	LHS	MCW	New	1 x 3.0
62	167+247	PUP	RHS	MCW	New	1 x 3.0
63	169+990	PUP	LHS	MCW	New	1 x 9.6
64	169+990	PUP	RHS	MCW	New	1 x 9.6
65	185+774	PUP	LHS	MCW	New	1 x 3.0
66	185+774	PUP	RHS	MCW	New	1 x 3.0

## 1.6 QUALITY AUDIT

### 1.6.1 Pavement Composition

As per CA approved thickness given below:

Designation of Pavement Layer	Layer thickness in mm
Bituminous concrete (BC/AC)	50
Dense Bituminous Macadam (DBM)	175
Wet Mix Macadam (WMM)	250
Granular Mix Sub base (GSB)	200
Drainage/Filter layer	100
Selected Subgrade (8% CBR)	500

After Construction, till date two mandatory Overlays have been done with 40mm BC.

### 1.6.2 CD Structures

The CD structures along the corridor are constructed appears to be as per the standards and specifications as no design calculations/ as-built drawings for structures made available to verify the same. Presently, all structures appear new and seem to be in good condition. Structure wise conditions along the project corridor are presented below:

Sl. No.	Description	No's as Per As Built Drawings	No's As Per Site	Remarks
1	Major Bridges	6	6	-
2	Minor Bridges	14	14	-
3	ROB	3	3	-
4	Grade Separators	1	1	-
5	VUP	2	3	1 COS
6	PUP	6	6	-
7	Box and Slab Culverts	65	65	-
8	Pipe Culverts	58	58	-
<b>Total Structures</b>		<b>155</b>	<b>156</b>	-

## BR.CH 139+138 MJB

### GENERAL DESCRIPTION

- Chainage : Km 139+138
- Type of structure : MJB
- Span Arrangement : LHS - 4 x 19.2m + 1 x 29.5m, RHS - 2 x 9.0m + 9 x 9.8m
- Deck Width : 13.50m -LHS & 9.0m -RHS
- Median Width : 5.0 (Median open to Sky)
- Type of Foundation : Not Visible
- Type of substructure : LHS - RCC Circular Pier & RHS - RCC Wall Type Pier
- Type of Superstructure : LHS - RCC Girder & RHS - RCC Slab
- Type of Bearing : POT-PTFE
- Type of Railing : Crash barrier and Handrails
- Method of Inspection : Visual

### OBSERVATIONS

Visual Observations on condition of the structure are as below:

- Cleaning required for Expansion Joints
- Bridges are constructed with Split Carriageway.
- RHS seems to be old and LHS seems to be New.
- Repairs done earlier on BHS.



139+138 MJB (LHS)



139+138 MJB (RHS)

## BR.CH 141+362 MJB

### GENERAL DESCRIPTION

- Chainage : Km 141+362
- Type of structure : MJB
- Span Arrangement : 2 x 19.0m + 9 x 20m (BHS)
- Deck Width : 13.50m -RHS & 9.0m -LHS
- Median Width : 5.0 (Median open to Sky)
- Type of Foundation : Not Visible
- Type of substructure : RCC Circular Pier (BHS)
- Type of Superstructure : RCC Girder (BHS)
- Type of Bearing : Pot-RHS & Elastomeric -LHS
- Type of Railing : Crash barrier and Handrails
- Method of Inspection : Visual

### OBSERVATIONS

Visual Observations on condition of the structure are as below:

- RHS seems to be New and LHS Seems to be old.
- Fair condition.



141+362 MJB (LHS)



141+362 MJB (RHS)

## BR.CH 149+933 MJB

### GENERAL DESCRIPTION

- Chainage : Km 149+933
- Type of structure : MJB
- Span Arrangement : 2 x 9.0m + 7 x 9.8m (LHS) & 3 x 29.0m (RHS)
- Deck Width : 13.50 m - RHS, 9.0 m - LHS
- Median Width : 5.0 (Median open to Sky)
- Type of Foundation : Not Visible
- Type of substructure : RCC Circular Pier (RHS) & RCC Wall Type Pier (LHS)
- Type of Superstructure : RCC Girder -RHS & RCC Solid Slab -LHS
- Type of Bearing : Pot
- Type of Railing : Crash barrier and Handrails
- Method of Inspection : Visual

### OBSERVATIONS

Visual Observations on condition of the structure are as below:

- Leaching observed on entire deck of bridge on LHS and fog seal to be applied over wearing coat as a remedy.
- LHS seems to be old and RHS seems to be New.
- Concrete spalling observed on Pier P5 on LHS.
- Partial delamination of the concrete observed in span 1,2 &3.



149+933 MJB (LHS)



149+933 MJB (RHS)

## BR.CH 158+193 MJB

### GENERAL DESCRIPTION

- Chainage : Km 158+193
- Type of structure : MJB
- Span Arrangement : 13 x 5.6m (LHS) & 2 x 23.2m +1 x 29m (RHS)
- Deck Width : 13.50m - RHS & 9.0m -LHS
- Median Width : 5.0 (Median open to Sky)
- Type of Foundation : Not Visible
- Type of substructure : RCC Circular Pier (RHS) &RCC Wall Type Pier (LHS)
- Type of Superstructure : RCC Girder - RHS & RCC Solid Slab - LHS
- Type of Bearing : Pot - RHS
- Type of Railing : Crash barrier and Handrails
- Method of Inspection : Visual

### OBSERVATIONS

Visual Observations on condition of the structure are as below:

- Foot path damaged in RHS
- LHS seems to be old and RHS Seems to be New
- Fair condition.



158+193 MJB (LHS)



158+193 MJB (RHS)

## BR.CH 171+728 MJB

### GENERAL DESCRIPTION

- Chainage : Km 171+728
- Type of structure : MJB
- Span Arrangement : 30 x 20m (BHS)
- Deck Width : 13.50m - RHS & 9.0m -LHS
- Median Width : 5.0 (Median open to Sky)
- Type of Foundation : Well Foundation in LHS
- Type of substructure : RCC Circular Pier (RHS) & RCC Wall Type Pier (LHS)
- Type of Superstructure : RCC Girder (BHS)
- Type of Bearing : Pot -RHS & Elastomeric -LHS
- Type of Railing : Crash barrier and Handrails
- Method of Inspection : Visual

### OBSERVATIONS

Visual Observations on condition of the structure are as below:

- Corrosion Strains are observed in RHS
- Concrete spalling and reinforcement exposure observed on Hand railing - LHS
- Reinforcement exposed at slab and piers (P4 - P9 & P13 -P21) on LHS and Slab reinforcement exposed in span -1 on RHS.
- Spalling of concrete observed in girders of span-1 on LHS.
- Spalling observed at dirt wall junction on RHS.



171+728 MJB (LHS)



171+728 MJB (RHS)

**BR.CH 186+614 MJB**

**GENERAL DESCRIPTION**

- Chainage : Km 186+614
- Type of structure : MJB
- Span Arrangement : 15 x 21.7m (BHS)
- Deck Width : 13.50 m - RHS & 9.0 m -LHS
- Median Width : 5.0 (Median open to Sky)
- Type of Foundation : Well Foundation in LHS
- Type of substructure : RCC Circular Pier (BHS)
- Type of Superstructure : RCC Girder (BHS)
- Type of Bearing : Pot
- Type of Railing : Crash barrier and Handrails
- Method of Inspection : Visual

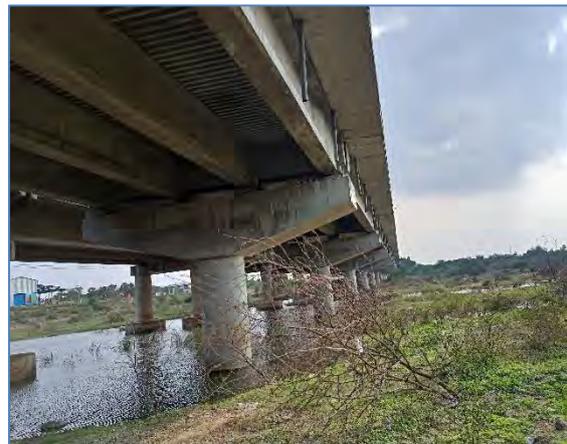
**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- Corrosion Strains Are Observed in the Girder Soffit Level at RHS
- Reinforcement exposed in pier cap (P4) on LHS.
- Reinforcement exposure and minor cracks observed at girder resting portions at P5 & P9 locations.
- Foot path damaged.
- Cracks and spalling observed on Hand railing on LHS.



186+614 MJB (LHS)



186+614 MJB (RHS)

**BR.CH 124+787 MNB**

**GENERAL DESCRIPTION**

- Chainage : Km 124+787
- Type of structure : MNB
- Span Arrangement : 2x8.0m(BHS)
- Deck Width : 10.0 m
- Median Width : 5.0 (Median open to Sky)
- Type of Foundation : Not Visible
- Type of substructure : RCC Circular Pier (BHS)
- Type of Superstructure : RCC Slab (BHS)
- Type of Bearing : Elastomeric
- Type of Railing : Crash barrier
- Method of Inspection : Visual

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- By Visual observation Condition is good.
- Footpath slab damaged on RHS.



124+787 MNB (LHS)



124+787 MNB (RHS)

**BR.CH 125+725 MNB**

**GENERAL DESCRIPTION**

- Chainage : Km 125+725
- Type of structure : MNB
- Span Arrangement : 2 x 6m (BHS)
- Deck Width : 12.0 m - RHS, 10.0 m -LHS
- Median Width : 5.0 m
- Type of Foundation : Not Visible
- Type of substructure : RCC Box (BHS)
- Type of Superstructure : -
- Type of Bearing : No
- Type of Railing : Crash barrier
- Method of Inspection : Visual

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- Quadrant pitching damaged on RHS.
- By Visual Observation Structure seems to be Good Condition



125+725 MNB (LHS)



125+725 MNB (RHS)

**BR.CH 127+510 MNB**

**GENERAL DESCRIPTION**

- Chainage : Km 127+510
- Type of structure : MNB
- Span Arrangement : 2 x 6.8m (LHS) & 2 x5.8m (RHS)
- Deck Width : 9.50m -RHS & 10.5m -LHS
- Median Width : 5.0 (Median open to Sky)
- Type of Foundation : Not Visible
- Type of substructure : RCC Circular Pier (RHS) & RCC Wall Type Pier (LHS)
- Type of Superstructure : RCC Slab (BHS)
- Type of Bearing : Elastomeric (RHS)
- Type of Railing : Crash barrier
- Method of Inspection : Visual

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- LHS seems to be old and RHS Seems to New.
- Quadrant pitching damaged on RHS.



127+510 MNB (LHS)



127+510 MNB (RHS)

**BR.CH 151+083 MNB**

**GENERAL DESCRIPTION**

- Chainage : Km 151+083
- Type of structure : MNB
- Span Arrangement : 5.0 x 6.0m (BHS)
- Deck Width : 32.5 m.
- Median Width : 5.0 m.
- Type of Foundation : Not Visible
- Type of substructure : RCC Box (BHS)
- Type of Superstructure : -
- Type of Bearing : -
- Type of Railing : Crash barrier
- Method of Inspection : Visual

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- Honey comb observed at the top slab.
- Repair works done and It appears that it is in good condition.



151+083 MNB (LHS)



151+083 MNB (RHS)

**BR.CH 157+725 MNB**

**GENERAL DESCRIPTION**

- Chainage : Km 157+725
- Type of structure : MNB
- Span Arrangement : 5 x 8.6m (BHS)
- Deck Width : 29 m Overall
- Median Width : 5.0
- Type of Foundation : Not visible
- Type of substructure : RCC Box (BHS)
- Type of Superstructure : -
- Type of Bearing : -
- Type of Railing : Crash barrier
- Method of Inspection : Visual

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- It comes under approach of ROB
- Retaining wall reinforcement exposed on LHS.
- Reinforcement exposed at 3<sup>rd</sup> intermediate wall.



157+725 MNB (LHS)



157+725 MNB (RHS)

**BR.CH 164+235 MNB**

**GENERAL DESCRIPTION**

- Chainage : Km 164+235
- Type of structure : MNB
- Span Arrangement : 1 x 11m (BHS)
- Deck Width : 10.5 m (BHS)
- Median Width : 5.0 (Median open to Sky)
- Type of Foundation : Not visible
- Type of substructure : RCC Solid Wall type Abutment (BHS)
- Type of Superstructure : RCC Solid Slab (BHS)
- Type of Bearing : Elastomeric
- Type of Railing : Crash barrier
- Method of Inspection : Visual

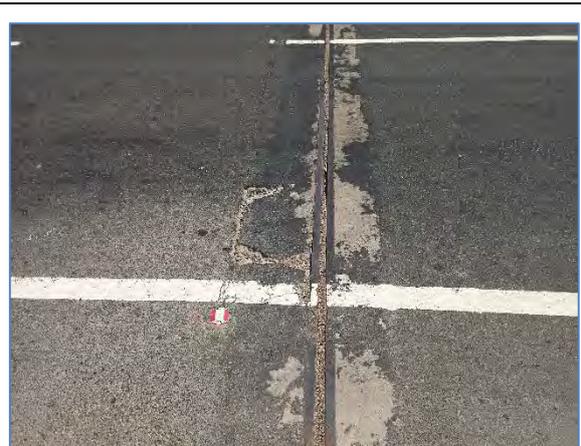
**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- Expansion joint concrete damaged at EJ-1 location on RHS.
- Reinforcement exposed in median for small portion where Median is open to sky.
- Small portion of Stone pitching damaged on RHS.



164+235 MNB (LHS)



164+235 MNB (RHS)

**BR.CH 166+348 MNB**

**GENERAL DESCRIPTION**

- Chainage : Km 166+348
- Type of structure : MNB
- Span Arrangement : 1 x 11m (BHS)
- Deck Width : 10.5 m (BHS)
- Median Width : 5.0 (Median open to Sky)
- Type of Foundation : Not visible
- Type of substructure : RCC Solid Wall type Abutment (BHS)
- Type of Superstructure : RCC Solid Slab (BHS)
- Type of Bearing : Elastomeric
- Type of Railing : Crash barrier
- Method of Inspection : Visual

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- Structure is good in condition.



166+348 MNB (LHS)



166+348 MNB (RHS)

**BR.CH 167+750 MNB**

**GENERAL DESCRIPTION**

- Chainage : Km 167+750
- Type of structure : MNB
- Span Arrangement : 3 x 4 m (BHS)
- Deck Width : 25.0 m
- Median Width : 5.0 (Median open to Sky)
- Type of Foundation : Not visible
- Type of substructure : RCC Box
- Type of Superstructure : -
- Type of Bearing : -
- Type of Railing : Crash barrier
- Method of Inspection : Visual

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- It comes under approach of ROB.
- Structure is in good condition.



167+750 MNB (LHS)



167+750 MNB (RHS)

**BR.CH 170+950 MNB**

**GENERAL DESCRIPTION**

- Chainage : Km 170+950
- Type of structure : MNB
- Span Arrangement : 3 x 11 (BHS)
- Deck Width : 30 Overall
- Median Width : -
- Type of Foundation : Not visible
- Type of substructure : RCC Box (BHS)
- Type of Superstructure : -
- Type of Bearing : -
- Type of Railing : Crash barrier
- Method of Inspection : Visual

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- Overall condition good.
- Cleaning of Drainage Spouts is required.



170+950 MNB (LHS)



170+950 MNB (RHS)

**BR.CH 175+280 MNB**

**GENERAL DESCRIPTION**

- Chainage : Km 175+280
- Type of structure : MNB
- Span Arrangement : 2 x 3.6 m (LHS), 2 x 3.3 m (RHS)
- Deck Width : 12.0 m (BHS)
- Median Width : 5.0 (Median open to Sky)
- Type of Foundation : Not visible.
- Type of substructure : RCC Pier Wall (RHS) & RCC Box (LHS)
- Type of Superstructure : RCC Slab (BHS)
- Type of Bearing : -
- Type of Railing : Crash barrier
- Method of Inspection : Visual

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- Reinforcement is exposed in pier at RHS.
- Reinforcement exposed at the joints in abutment.



175+280 MNB (LHS)



175+280 MNB (RHS)

**BR.CH 176+120 MNB**

**GENERAL DESCRIPTION**

- Chainage : Km 176+120
- Type of structure : MNB
- Span Arrangement : 5 x 6 (RHS), 5 x 6.3 (LHS)
- Deck Width : 10.3 (RHS), 11.8 (LHS)
- Median Width : 5.0 (Median open to Sky)
- Type of Foundation : Not visible
- Type of substructure : RCC Box (BHS)
- Type of Superstructure : -
- Type of Bearing : -
- Type of Railing : Crash barrier
- Method of Inspection : Visual

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- Portion of the Quadrant pitching damaged on LHS.
- Structure is good in condition.



176+120 MNB (LHS)



176+120 MNB (RHS)

**BR.CH 176+165 MNB**

**GENERAL DESCRIPTION**

- Chainage : Km 176+165
- Type of structure : MNB
- Span Arrangement : 12 x 3 m(RHS), 8 x 6 m (LHS)
- Deck Width : 9.0 (RHS), 12.5 (LHS)
- Median Width : 5.0 (Median open to Sky)
- Type of Foundation : Not visible.
- Type of substructure : RCC Box (BHS)
- Type of Superstructure : -
- Type of Bearing : -
- Type of Railing : Crash barrier.
- Method of Inspection : Visual.

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- Cleaning of Drainage spouts is required.
- Reinforcement exposed on top slab on LHS.



176+165 MNB (LHS)



176+165 MNB (RHS)

**BR.CH 176+415 MNB**

**GENERAL DESCRIPTION**

- Chainage : Km 176+415
- Type of structure : MNB
- Span Arrangement : 2 x 5.3 m (RHS), 1 x 10.6 m (LHS)
- Deck Width : 8.5 m (RHS), 14.5 m (LHS)
- Median Width : 6.0 (Median open to Sky)
- Type of Foundation : Not visible
- Type of substructure : RCC Pier wall (RHS).
- Type of Superstructure : RCC Slab (BHS).
- Type of Bearing : Elastomeric (LHS)
- Type of Railing : Crash barrier
- Method of Inspection : Visual

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- Stone pitching damaged on LHS.
- Reinforcement exposed at face of the slab on LHS.



176+415 MNB (LHS)



176+415 MNB (RHS)

**BR.CH 184+054 MNB**

**GENERAL DESCRIPTION**

- Chainage : Km 184+054
- Type of structure : MNB
- Span Arrangement : 3 x 5.8 m (BHS)
- Deck Width : 8.7 (RHS), 9.0 (LHS)
- Median Width : 4.0 (Median open to Sky)
- Type of Foundation : Not visible
- Type of substructure : RCC Pier wall (LHS), RCC Box (RHS)
- Type of Superstructure : RCC Slab (BHS)
- Type of Bearing : Elastomeric (LHS)
- Type of Railing : Crash barrier
- Method of Inspection : Visual

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- repair works done already done, the Condition of Bridge is Good.



184+054 MNB (LHS)



184+054 MNB (LHS)

**BR.CH 157+433 ROB**

**GENERAL DESCRIPTION**

- Chainage : Km 157+433
- Type of structure : ROB
- Span Arrangement : LHS - 2 x 10m + 1 x 22.4m & RHS - 1 x 13.7m
- Deck Width : 11.0 m - LHS, 11.0 m -RHS
- Median Width : 15 (Median open to Sky)
- Type of Foundation : Not Visible
- Type of substructure : LHS - RCC Wall type Pier
- Type of Superstructure : RCC Girder (BHS)
- Type of Bearing : Pot -LHS & Elastomeric - RHS
- Type of Railing : Crash barrier and Handrails
- Method of Inspection : Visual

**OBSERVATIONS**

- ROB on RHS is old ROB and it is under railway maintenance. Concessionaire paying the maintenance fee. ROB on LHS is constructed and maintained by Concessionaire
- Minor damage in Mid span end girder resting portion is noticed.
- Reinforcement Exposed near the Cantilever Portion of 1 m<sup>2</sup> and Abutment for 0.5 m<sup>2</sup> - RHS
- Wing wall damaged on RHS.
- Cleaning of Expansion joints is required



157+433 ROB (LHS)



157+433 ROB (RHS)

**BR.CH 163+220 ROB & VUP**

**GENERAL DESCRIPTION**

- Chainage : Km 163+220
- Type of structure : ROB
- Span Arrangement : 3 x 20m + 1 x 24.7m
- Deck Width : 10.50 m - BHS
- Median Width : 5.0 (Median open to Sky)
- Type of Foundation : Not Visible
- Type of substructure : RCC Wall Type Pier
- Type of Superstructure : RCC Girder (BHS)
- Type of Bearing : Pot, Elastomeric
- Type of Railing : Crash barrier and Handrails
- Method of Inspection : Visual

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- Cleaning of Expansion Joints is required.
- Leakage through expansion joints observed.
- Reinforcement exposed in pier cap on RHS for small length.
- Rubber sealant damaged at EJ-5 on LHS.
- Spalling and reinforcement exposure observed on soffit of the slab at P3 location on LHS.



163+220 ROB (LHS)



163+220 ROB (RHS)

**BR.CH 167+660 ROB**

**GENERAL DESCRIPTION**

- Chainage : Km 167+660
- Type of structure : ROB
- Span Arrangement : 2 x 10m + 1 x 22.4m - BHS
- Deck Width : 11.0 m - LHS & 11.0 m - RHS
- Median Width : 5.0 (Median open to Sky)
- Type of Foundation : Not Visible
- Type of substructure : RCC Wall Type Pier
- Type of Superstructure : RCC Girder (BHS)
- Type of Bearing : Pot
- Type of Railing : Crash barrier and Handrails
- Method of Inspection : Visual

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- Cleaning of Drainage spout and Expansion Joints is required.



167+660 ROB (LHS)



167+660 ROB (RHS)

## BR.CH 123+883 Grade Separator

### GENERAL DESCRIPTION

- Chainage : 123+883
- Type of structure : Separator
- Span Arrangement : 1 x 21.7 m
- Deck Width : 13.50 m
- Median Width : 5.0m
- Type of Foundation : Not Visible
- Type of substructure : RCC Circular Pier
- Type of Superstructure : RCC Girder
- Type of Bearing : Pot
- Type of Railing : Crash barrier and Handrails
- Method of Inspection : Visual

### OBSERVATIONS

Visual Observations on condition of the structure are as below:

- Approach of Grade Separator is in Curvilinear.
- By Visual observation seems to New.
- Fair condition.



123+883 GRADE SEPERATOR (LHS)



123+883 GRADE SEPERATOR (RHS)

## BR.CH 151+140 VUP

### GENERAL DESCRIPTION

- Chainage : Km 151+140
- Type of structure : VUP
- Span Arrangement : 1 x 20.5m- only LHS
- Deck Width : 12.35 m
- Median Width : -
- Type of Foundation : Not Visible
- Type of substructure : RCC Circular Pier
- Type of Superstructure : RCC Girder
- Type of Bearing : Pot
- Type of Railing : Crash barrier and Handrails
- Method of Inspection : Visual

### OBSERVATIONS

Visual Observations on condition of the structure are as below:

- Approach of VUP is in Curvilinear.
- By Visual observation seems to New.
- Cleaning of Expansion joint and Drainage Spout are required
- Dirt wall and crash barrier junction portion slightly damaged.
- Mild bulging in RE panels is noticed and it is understood from Concessionaire that this is there since construction and was monitored closely from then onwards and there is no further deterioration observed.



151+140 VUP (LHS)



151+140 VUP (LHS)

**BR.CH 181+430 VUP**

**GENERAL DESCRIPTION**

- Chainage : Km 181+430
- Type of structure : VUP
- Span Arrangement : 1 x 22.5 m
- Deck Width : 12.35 m
- Median Width : 5.0 (Median open to Sky)
- Type of Foundation : Not Visible
- Type of substructure : RCC Wall Type Pier
- Type of Superstructure : RCC Girder (BHS)
- Type of Bearing : Pot
- Type of Railing : Crash barrier and Handrails
- Method of Inspection : Visual

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- Structure seems to be in Good Condition.



181+430 VUP (LHS)



181+430 VUP (RHS)

**BR.CH 159+853 VUP (COS)**

**GENERAL DESCRIPTION**

- Chainage : Km 159+853
- Type of structure : VUP
- Span Arrangement : 2 x 12.0 m
- Deck Width : 2 x 13.5 m
- Median Width : 3.0 (Median open to Sky)
- Type of Foundation : Not Visible
- Type of substructure : -
- Type of Superstructure : RCC Box (BHS)
- Type of Bearing : -
- Type of Railing : Crash barrier
- Method of Inspection : Visual

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- Construction completed and opened to traffic.



159+853 VUP (LHS)



159+853 VUP (RHS)

**BR.CH 121+700 PUP**

**GENERAL DESCRIPTION**

- Chainage : Km 121+700
- Type of structure : PUP
- Span Arrangement : 1 x 9.0m
- Deck Width : 22.5 m
- Type of Foundation : Not Visible
- Type of substructure : RCC Box
- Type of Superstructure : RCC Box
- Type of Bearing : -
- Type of Railing : Crash barrier
- Method of Inspection : Visual

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- By Visual observation seems to Good Condition.



121+700 PUP (LHS)



121+700 PUP (RHS)

## BR.CH 153+030 PUP

### GENERAL DESCRIPTION

- Chainage : Km 153+030
- Type of structure : PUP
- Span Arrangement : 1 x 9.5 x 2.6m
- Deck Width : 21.5 m
- Type of Foundation : Not Visible
- Type of substructure : RCC Box
- Type of Superstructure : RCC Box
- Type of Bearing : -
- Type of Railing : Crash barrier
- Method of Inspection : Visual

### OBSERVATIONS

Visual Observations on condition of the structure are as below:

- By Visual observation seems to Good Condition.



153+030 PUP (LHS)



153+030 PUP (RHS)

**BR.CH 155+681 PUP**

**GENERAL DESCRIPTION**

- Chainage : Km 155+681
- Type of structure : PUP
- Span Arrangement : 1 x 9.6 x 2.6m
- Deck Width : 20.6 m
- Type of Foundation : Not Visible
- Type of substructure : RCC Box
- Type of Superstructure : RCC Box
- Type of Bearing : -
- Type of Railing : Crash barrier
- Method of Inspection : Visual

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- By Visual observation seems to Good Condition.



155+681 PUP (LHS)



155+681 PUP (RHS)

**BR.CH 167+247 PUP**

**GENERAL DESCRIPTION**

- Chainage : Km 167+247
- Type of structure : PUP
- Span Arrangement : 1 x 3 x 2.5m
- Deck Width : 25.0 m
- Type of Foundation : Not Visible
- Type of substructure : RCC Box
- Type of Superstructure : RCC Box
- Type of Bearing : -
- Type of Railing : Crash barrier
- Method of Inspection : Visual

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- Comes under approach of ROB.
- By Visual observation seems to Good Condition.



167+247 PUP (LHS)



167+247 PUP (RHS)

**BR.CH 169+990 PUP**

**GENERAL DESCRIPTION**

- Chainage : Km 169+990
- Type of structure : PUP
- Span Arrangement : 1 x 9.6 m
- Deck Width : 20.6 m
- Vertical Clearance : 2.5 m
- Type of Foundation : Not Visible
- Type of substructure : RCC Box
- Type of Superstructure : RCC Box
- Type of Bearing : -
- Type of Railing : Crash barrier
- Method of Inspection : Visual

**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- By Visual observation seems to Good Condition.



169+990 PUP (LHS)



169+990 PUP (RHS)

**BR.CH 185+774 PUP**

**GENERAL DESCRIPTION**

- Chainage : Km 185+774
- Type of structure : PUP
- Span Arrangement : 1 x 3.0 m
- Deck Width : 25 m
- Vertical Clearance : 2.5 m
- Type of Foundation : Not Visible
- Type of substructure : RCC Box
- Type of Superstructure : RCC Box
- Type of Bearing : -
- Type of Railing : Crash barrier
- Method of Inspection : Visual

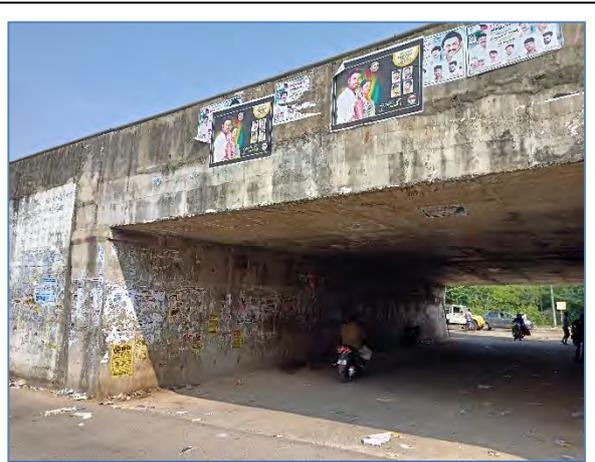
**OBSERVATIONS**

Visual Observations on condition of the structure are as below:

- By Visual observation seems to Good Condition.



185+774 PUP (LHS)



185+774 PUP (RHS)

Photos of some culverts at site

	
km 121+735	km @ 129+850
	
km 136+600	km 184+983
	
km 138+400	km 173+540
	
km 136+716	km 163+670

**Details of Culverts: -**

Sl. No.	Type of structure	Chainage as per Site	Span arrangement (m)	Vertical clearance (m)	Slab Thickness (m)	Remarks
1	Box	121+735	1 x 4.0	4.0	0.4	<ul style="list-style-type: none"> <li>Overall condition is good.</li> </ul>
2	Pipe	121+990	1 x 1.0	-		<ul style="list-style-type: none"> <li>Overall condition is good</li> </ul>
3	Box	122+450	1 x 4.0	3.2	0.3	<ul style="list-style-type: none"> <li>Local People using as PUP</li> </ul>
4	Box	122+842	1 x 4.0	3.5	0.3	<ul style="list-style-type: none"> <li>Overall condition is good.</li> </ul>
5	Box	123+182	1 x 4.0	2.5	0.3	<ul style="list-style-type: none"> <li>Overall condition is good.</li> </ul>
6	Box	124+372	1 x 4.0	3.5	0.3	<ul style="list-style-type: none"> <li>Stagnation of Water observed</li> </ul>
7	Box	125+130	1 x 4.0	3.5	0.3	<ul style="list-style-type: none"> <li>It is satisfactory</li> </ul>
8	Pipe	125+380	2 x 1.0	-	-	<ul style="list-style-type: none"> <li>Good Condition</li> </ul>
9	Slab	126+115	1 x 2.0	2.3	0.3	<ul style="list-style-type: none"> <li>Both Side Service roads widened 1.7 on LHS</li> </ul>
10	Slab	126+854	1 x 3.0	2.0	0.3	<ul style="list-style-type: none"> <li>Stagnation of water and debris.</li> <li>Honey Comb in side wall &amp; leaching.</li> </ul>
11	Slab	127+041	1 x 1.5	1.7	0.2	<ul style="list-style-type: none"> <li>Median Drains are in good Condition.</li> </ul>
12	Slab	127+938	1 x 4.0	3.5	0.3	<ul style="list-style-type: none"> <li>Honeycombing is observed in Slab.</li> <li>Minor Cracks observed in wing wall joint.</li> </ul>
13	Slab	128+240	1 x 4.0	2.7	0.2	<ul style="list-style-type: none"> <li>Minor damage on Wing wall joint</li> </ul>
14	Pipe	129+530	2 x 1.0			
15	Slab	129+850	1 x 2.0	2.5	0.2	<ul style="list-style-type: none"> <li>Minor Honeycombing is observed in side wall.</li> <li>Minor Spalling of concrete observed.</li> <li>Reinforcement is exposed at small length</li> <li>Minor Cracks in Wing Wall.</li> </ul>
16	Slab	131+652	1 x 3.0	3.0	0.3	<ul style="list-style-type: none"> <li>Stagnation of water</li> <li>Honeycomb &amp; minor Cracks found in Slab</li> <li>Minor damage at Wing Wall</li> </ul>

Sl. No.	Type of structure	Chainage as per Site	Span arrangement (m)	Vertical clearance (m)	Slab Thickness (m)	Remarks
17	Pipe	133+730	1 x 0.9			•
18	Slab	133+980	1 x 2.0	1.8	0.3	• Partially Buried on LHS
19	Slab	134+217	1 x 2.0	1.8	0.3	• Reinforcement is exposed in Wing wall joint.
20	Slab	135+246	1 x 2.0			• Minor Cracks found in Wing walls.
21	Slab	136+067	1 x 2.0	1.5	0.25	• Overall condition is good.
22	Pipe	136+590	2 x 0.9			• Stagnation of water observed
23	Slab	136+716	1 x 2.0	1.2	0.25	• Reinforcement exposed in joints • Buried at RHS.
24	Pipe	137+650	1 x 0.9			• Cleaning is required.
25	Slab	138+409	1 x 2.0	1.8	0.25	• RHS Side is Arch type.
26	Slab	139+065	1 x 3.4	4.8	0.3	• Overall Condition is good. • Culvert located Near to the MNB.
27	Slab	139+744	1 x 2.0	1.8	0.2	• Minor damage on Wing joints and rectification is in progress • good in condition.
28	Pipe	140+953	1 x 0.9			• Partially Buried at RHS.
29	Pipe	142+654	3 x 0.9			• Overall condition is good.
30	Slab	143+893	1 x 2.0	2.5	0.25	• Cleaning of Vegetation is required • Mild Damage on Head wall.
31	Slab	145+042	1 x 2.0	1.7	0.4	• Reinforcement observed in slab & top Slab • 1m widened on LHS. • Cracks in wing wall.
32	Slab	146+615	1 x 2.0	1.8	0.25	• LHS seems to be old, top slab damaged • Honeycombing & Reinforcement Exposed in side wall.
33	Pipe	146+991	1 x 0.9			• Partially buried at RHS side.
34	Slab	148+433	1 x 5.7		0.4	• Buried at RHS side.

Sl. No.	Type of structure	Chainage as per Site	Span arrangement (m)	Vertical clearance (m)	Slab Thickness (m)	Remarks
35	Pipe	148+500	2 x 0.9			<ul style="list-style-type: none"> <li>Buried at RHS side.</li> </ul>
36	Slab	149+202	1 x 2.0	4.2	0.25	<ul style="list-style-type: none"> <li>good in condition.</li> </ul>
37	Pipe	149+600	1 x 1.0	-	-	<ul style="list-style-type: none"> <li>Started from median and may be constructed to discharge drain water.</li> </ul>
38	Box	150+125	1 x 3.0	3.5	0.4	<ul style="list-style-type: none"> <li>Stagnation of water.</li> </ul>
39	Slab	150+772	1 x 3.0			<ul style="list-style-type: none"> <li>Median side wall is damaged.</li> </ul>
40	Pipe	151+170	3 x 0.9			<ul style="list-style-type: none"> <li>Domestic waste observed.</li> <li>Reinforcement Exposed in pipes</li> </ul>
41	Slab	152+300	1 x 0.2	1.8	0.4	<ul style="list-style-type: none"> <li>Good in Condition.</li> </ul>
42	Slab	153+410	1 x 2.0	1.3	0.25	<ul style="list-style-type: none"> <li>Reinforcement Exposed in joints</li> <li>Partially filled with wastage in LHS.</li> <li>Honey comb observed in side wall.</li> </ul>
43	Slab	154+705	1 x 1.5			<ul style="list-style-type: none"> <li>Good Condition</li> <li>Buried at LHS side.</li> </ul>
44	Slab	154+776	1 x 2.5	2	0.25	<ul style="list-style-type: none"> <li>Cleaning of Vegetation required Reinforcement Exposed in side wall.</li> <li>RHS stagnation of water.</li> </ul>
45	Pipe	155+060	2 x 0.9			<ul style="list-style-type: none"> <li>LHS completely buried.</li> </ul>
46	Pipe	155+504	2 x 0.9			<ul style="list-style-type: none"> <li>Overall condition is good.</li> </ul>
47	Pipe	157+011	2 x 0.9			<ul style="list-style-type: none"> <li>Good in Condition</li> </ul>
48	Pipe	158+521	2 x 0.9			<ul style="list-style-type: none"> <li>Buried on LHS.</li> </ul>
49	Pipe	158+860	1 x 1.0			<ul style="list-style-type: none"> <li>Good in Condition.</li> </ul>
50	Box	158+960	1 x 4.0	2.5	0.5	<ul style="list-style-type: none"> <li>Overall condition is good.</li> </ul>
51	Box	159+610	1 x 4.0	2.5	0.5	<ul style="list-style-type: none"> <li>MCW under construction.</li> </ul>
52	Pipe	159+810	1 x 1.0			<ul style="list-style-type: none"> <li>Cleaning is required</li> </ul>

Sl. No.	Type of structure	Chainage as per Site	Span arrangement (m)	Vertical clearance (m)	Slab Thickness (m)	Remarks
53	Pipe	160+210	1 x 1.0			<ul style="list-style-type: none"> <li>Structure is in good condition.</li> </ul>
54	Pipe	160+460	1 x 1.0			<ul style="list-style-type: none"> <li>Structure is in good condition.</li> </ul>
55	Pipe	160+660	1 x 1.0			<ul style="list-style-type: none"> <li>Good Condition</li> </ul>
56	Pipe	160+960	1 x 1.0			<ul style="list-style-type: none"> <li>Buried at LHS side.</li> </ul>
57	Pipe	161+180	1 x 1.0			<ul style="list-style-type: none"> <li>Structure is in good condition.</li> </ul>
58	Box	161+682	1 x 4.0			<ul style="list-style-type: none"> <li>Good Condition</li> </ul>
59	Pipe	162+160	1 x 1.0			<ul style="list-style-type: none"> <li>Good Condition</li> </ul>
60	Pipe	162+439	1 x 1.0			
61	Pipe	163+108	1 x 1.0			<ul style="list-style-type: none"> <li>Partially buried with debris.</li> </ul>
62	Pipe	163+255	2 x 1.0			<ul style="list-style-type: none"> <li>Fair Condition</li> </ul>
63	Pipe	163+670	1 x 1.0			<ul style="list-style-type: none"> <li>Culvert is in approach</li> </ul>
64	Pipe	164+030	1 x 1.0			<ul style="list-style-type: none"> <li>vegetation growth is observed</li> <li>Utilities are passing.</li> </ul>
65	Pipe	164+460	1 x 1.0			<ul style="list-style-type: none"> <li>Good in condition.</li> </ul>
66	Pipe	164+860	1 x 1.0			<ul style="list-style-type: none"> <li>Good in condition.</li> </ul>
67	Pipe	165+100	1 x 1.0			<ul style="list-style-type: none"> <li>Good in condition.</li> </ul>
68	Pipe	165+410	1 x 1.0			<ul style="list-style-type: none"> <li>Overall condition is Very good.</li> </ul>
69	Pipe	165+690	1 x 1.0			<ul style="list-style-type: none"> <li>Good in condition.</li> </ul>
70	Pipe	166+040	1 x 1.0			<ul style="list-style-type: none"> <li>Good in condition.</li> </ul>
71	Pipe	166+630	1 x 1.0			<ul style="list-style-type: none"> <li>Partially buried with soil.</li> </ul>
72	Box	166+880	1 x 3.0	3.5	0.4	<ul style="list-style-type: none"> <li>Reinforcement Exposed in joints</li> </ul>
73	Pipe	167+010	1 x 1.0			<ul style="list-style-type: none"> <li>LHS box and RHS pipe were found.</li> </ul>
74	Pipe	167+355	2 x 0.9			<ul style="list-style-type: none"> <li>Good in condition.</li> </ul>
75	Pipe	168+031	1 x 1.0			<ul style="list-style-type: none"> <li>Not visible due to vegetation.</li> </ul>

Sl. No.	Type of structure	Chainage as per Site	Span arrangement (m)	Vertical clearance (m)	Slab Thickness (m)	Remarks
76	Box	168+228	1 x 3.0	4.5	0.4	<ul style="list-style-type: none"> <li>Stagnation of water.</li> </ul>
77	Box	168+528	1 x 3.0	4.5	0.45	<ul style="list-style-type: none"> <li>Water stagnation</li> <li>Honeycombing is observed in side wall.</li> </ul>
78	Box	168+783	1 x 3.0	1	0.45	<ul style="list-style-type: none"> <li>Good in condition.</li> </ul>
79	Pipe	169+075	2 x 0.9			<ul style="list-style-type: none"> <li>Box provided at LHS Pipe at RHS.</li> </ul>
80	Box	170+330	1 x 2.0	3	0.4	<ul style="list-style-type: none"> <li>Domestic Wastage</li> <li>Fully Vegetation growth.</li> </ul>
81	Box	170+490	1 x 2.0	3	0.3	<ul style="list-style-type: none"> <li>Good in condition.</li> </ul>
82	Box	170+575	1 x 4.4	3	0.4	<ul style="list-style-type: none"> <li>Good in condition.</li> </ul>
83	Slab	172+370	1 x 2.8	3.8	0.4	<ul style="list-style-type: none"> <li>Honeycombing is observed.</li> <li>Vegetation growth observed.</li> <li>Reinforcement is exposed on side walls.</li> </ul>
84	Slab	172+641	1 x 1.5	1.5	0.25	<ul style="list-style-type: none"> <li>Vegetation growth observed.</li> <li>Honey comb is observed in extended portion.</li> </ul>
85	Pipe	172+778	1 x 0.9			<ul style="list-style-type: none"> <li>Water is passing, Encasement Damaged</li> </ul>
86	Box	173+292	1 x 2.5			<ul style="list-style-type: none"> <li>Good in condition.</li> </ul>
87	Box	173+540	1 x 1.5	3.3	0.3	<ul style="list-style-type: none"> <li>Good in condition.</li> </ul>
88	Pipe	173+847	1 x 0.9			<ul style="list-style-type: none"> <li>RHS covered with vegetation.</li> </ul>
89	Pipe	174+238	1 x 0.9			<ul style="list-style-type: none"> <li>Buried &amp; fill is presented.</li> <li>Head wall damaged at RHS.</li> </ul>
90	Pipe	175+021	1 x 0.9			<ul style="list-style-type: none"> <li>Good in condition.</li> </ul>
91	Slab	175+228	1 x 1.85	2.3	0.3	<ul style="list-style-type: none"> <li>LHS is good.</li> <li>Clearing of Vegetation is required</li> </ul>
92	Pipe	175+647	1 x 1.0			<ul style="list-style-type: none"> <li>Good in condition.</li> </ul>
93	Slab	176+331	1 x 3.0	3	0.25	<ul style="list-style-type: none"> <li>Good in condition.</li> </ul>
94	Pipe	176+605	1 x 0.9			<ul style="list-style-type: none"> <li>Good in condition.</li> </ul>

Sl. No.	Type of structure	Chainage as per Site	Span arrangement (m)	Vertical clearance (m)	Slab Thickness (m)	Remarks
95	Pipe	177+790	1 x 0.9			<ul style="list-style-type: none"> <li>• Good in condition.</li> </ul>
96	Pipe	177+904	1 x 0.9			<ul style="list-style-type: none"> <li>• Half of the pipe is buried at RHS</li> </ul>
97	Slab	179+376	1 x 3.0	3	0.3	<ul style="list-style-type: none"> <li>• Good in condition.</li> </ul>
98	Slab	179+505	1 x 2.9	2.8	0.3	<ul style="list-style-type: none"> <li>• Good in condition.</li> </ul>
99	Slab	180+372	1 x 2.9	2.5	0.3	<ul style="list-style-type: none"> <li>• Good in condition.</li> </ul>
100	Pipe	180+864	1 x 0.9			<ul style="list-style-type: none"> <li>• Good in condition.</li> </ul>
101	Pipe	181+210	1 x 0.9			<ul style="list-style-type: none"> <li>• Good in condition.</li> </ul>
102	Pipe	181+640	1 x 0.9			<ul style="list-style-type: none"> <li>• Good in condition.</li> </ul>
103	Slab	181+778	1 x 3.0	3	0.5	<ul style="list-style-type: none"> <li>• Clearing of Vegetation is required</li> </ul>
104	Pipe	182+286	3 x 0.9			<ul style="list-style-type: none"> <li>• Good in condition.</li> </ul>
105	Box	182+897	1 x 3.0	1.5	0.4	<ul style="list-style-type: none"> <li>• Good in condition.</li> </ul>
106	Pipe	183+115	1 x 0.9			<ul style="list-style-type: none"> <li>• Clearing of Vegetation is required</li> </ul>
107	Pipe	183+366	1 x 1.0			<ul style="list-style-type: none"> <li>• Good in condition.</li> </ul>
108	Pipe	183+623	1 x 0.9			<ul style="list-style-type: none"> <li>• Fair Condition</li> </ul>
109	Slab	183+782	1 x 2.0	2.5	0.2	<ul style="list-style-type: none"> <li>• Fair Condition</li> </ul>
110	Slab	183+912	1 x 6.0	1.8	0.5	<ul style="list-style-type: none"> <li>• Wing wall joints damaged at LHS.</li> <li>• Clearing of Vegetation is required</li> <li>• RHS Head wall mild Damaged at end.</li> </ul>
111	Slab	184+117	1 x 2.0	2.8	0.25	<ul style="list-style-type: none"> <li>• Reinforcement Exposed in side wall.</li> <li>• Wing wall joints damaged.</li> <li>• Honey comb is in side walls.</li> <li>• LHS old, RHS New.</li> </ul>
112	Pipe	184+226	2 x 0.9			<ul style="list-style-type: none"> <li>• Good in condition.</li> </ul>
113	Pipe	184+983	2 x 0.9			<ul style="list-style-type: none"> <li>• Fully damaged at LHS&amp; reinforcement exposed for pipe.</li> </ul>

Sl. No.	Type of structure	Chainage as per Site	Span arrangement (m)	Vertical clearance (m)	Slab Thickness (m)	Remarks
114	Pipe	185+467	1 x 0.9			<ul style="list-style-type: none"> <li>Stagnation water observed.</li> </ul>
115	Slab	187+880	1 x 6.0	1.5	0.42	<ul style="list-style-type: none"> <li>Widening at RHS side.</li> </ul>
116	Pipe	188+912	1 x 0.9			<ul style="list-style-type: none"> <li>Good in condition.</li> </ul>
117	Slab	189+772	1 x 2.0	2.0	0.25	<ul style="list-style-type: none"> <li>Good in condition.</li> </ul>
118	Slab	190+201	1 x 3.0	1.2	0.3	<ul style="list-style-type: none"> <li>Cracks are in slab&amp; steel exposed.</li> <li>Wing walls are partially damaged.</li> </ul>
119	Slab	190+372	1 x 1.9	1.3	0.3	<ul style="list-style-type: none"> <li>Vegetation growth observed.</li> </ul>
120	Slab	191+048	1 x 2.0	2.0	0.2	<ul style="list-style-type: none"> <li>Good in condition.</li> </ul>
121	Slab	191+344	1 x 2.0	2.5	0.5	<ul style="list-style-type: none"> <li>Good in condition.</li> </ul>
122	Slab	191+913	1 x 2.0	2.5	0.3	<ul style="list-style-type: none"> <li>Good in condition.</li> </ul>
123	Slab	192+734	1 x 2.0	2.3	0.3	<ul style="list-style-type: none"> <li>Widened 1.5m at LHS side.</li> </ul>
124	Slab	193+045	1 x 3.0	2.8	0.3	<ul style="list-style-type: none"> <li>Good in condition.</li> </ul>
125	Pipe	193+756	1 x 0.9			<ul style="list-style-type: none"> <li>Good in condition at LHS.</li> <li>Buried at RHS side.</li> </ul>

### **1.6.3 Drainage and Slope Protection**

Lined Covered drains are observed at service road locations along the project corridor.

Median drains at curve locations are in good condition except for few locations where they need cleaning. No major distress is observed on the carriageway on downstream side at median drain locations.

Slope protection in the form of Stone pitching has been provided along the corridor. At few locations improvement is required to keep the slope intact.

### **1.6.4 Traffic Safety and Road Furniture**

Metal beam crash barriers provided along the project road appear to good in entire length except for few locations where it got damaged and the repairing of the damaged crash barrier is in progress.

Pedestrian guard rails installed at Bus Bay locations appears to be in good condition.

Traffic blinkers established along the corridor and street lighting and high mast lighting are all functioning well.

### **1.6.5 Road User Facilities**

There are 34 No's Bus Bays without shelters and 3 No's Truck lay Bys observed along the project corridor.

## **1.7 REHABILITATION PLANS AND DESIGNS**

### **1.7.1 Pavement Rehabilitation and Strengthening**

Based on the following it is concluded that the immediate Overlay is not required for the project Road

- latest pavement condition data indicates that the pavement is in good condition.
- Latest Roughness data indicates the Roughness values are far lower than threshold value of 3000mm/Km
- Latest BBD Data indicates that the Characteristic Deflection values are far lower than the threshold value of 1.2mm

### **1.7.2 Structural Rehabilitation**

All the structure found to be in good condition except little minor distresses and Cleaning of Expansion Joints, cleaning of drainage spouts and Bearings required.

## 1.8 OPERATION AND MAINTENANCE

### 1.8.1 Introduction

Looking at the contractual requirements of maintaining project road under specified level of roughness it is felt that roughness is the most important criterion for finalizing the O&M schedule for the project. Accordingly, the methodology adopted by present consultants includes predicting the roughness year by year under the traffic using a well acknowledged HDH-4 model developed for developing countries like India after lot of research by World Bank. The said model is widely prescribed by MORTH and NHAI during the preparation of detailed project reports for several projects in doing economic analysis for the projects. The economic analysis mainly consists of two parts:

1. Predicting the road deterioration and estimating VOC
2. Estimating Benefits

Considering its importance and present use in India, consultants felt prudent to use the first part, i.e. estimating road deterioration and predicting roughness in HDM 4 model to finalize the O&M schedule for the project. This approach is more scientific as it does not assume hypothetical deflection values at 10<sup>th</sup> and 20<sup>th</sup> year and includes main criterion of maintaining roughness at 3000mm/Km as per Schedule L.

### 1.8.2 CA specifications for Major Maintenance

- Schedule L of CA species that Roughness values should not exceed 3000mm/km in a length of Km.
- A renewal coat of bituminous concrete shall be laid every 5 years after initial construction or where the roughness value reaches 3000mm/km whichever is earlier.
- The structural condition of the flexible pavement can be assessed every year by taking Benkelman Beam Deflection (BBD) measurement. Where ever the characteristic deflection exceeds 1.2mm a bituminous over lay shall be provided appropriately designed according to IRC-81 or its latest versions or amendments to it.

### 1.8.3 Inputs for O&M Schedule

#### 1.8.3.1 Project Sections

Since roughness is the main criterion for major maintenance, Project Corridor has been divided in to various cases depending the present roughness values:

- Case 1: Roughness value <2000 mm/Km
- Case 2: Roughness values >2000<2500 mm/Km
- Case 3: Roughness>2500<3000 mm/Km
- Case 4: Roughness>3000 mm/KM

Direction wise analysis has been done separately for LHS (UP)/RHS (DN) and each direction length has been divided into sections based on above.

**1.8.3.2 Traffic (AADT)**

The following traffic data supplied by client has been used in the analysis is as below:

Vehicle/Mode	AADT numbers (FY2022) at Ch.156+250
LCV	1,743
Bus	2,244
2A truck	1,575
MAV truck	2,794

**Note:** 50:50 directional distributions are considered.

**1.8.3.3 Vehicle Damage Factors (VDF)**

The following VDF Factors used based on Good Industry Practice

Mode Type	LHS Ch.150+250	RHS Ch.150+250
LCV	1.0	1.0
2 Axle Truck	4.5	4.5
3 Axle Truck	6.0	6.0
MAV (4-6 Axle)	8.0	8.0
Buses	1.0	1.0

**1.8.3.4 Deflection (BBD) Values & Roughness Values**

BBD and Roughness values are used as obtained from surveys and investigations as below:

LHS:	case-1	case-2	case-3	case-4
	<2000	>=2000 and <2500	>=2500 and <3000	>3000
Length	72900	0	0	0
Roughness	1402	0	0	0
IRI	2.04	0.00	0.00	0.00
Deflection	0.270	0.00	0.00	0.00
Cracking	0.05%	0.00%	0.00%	0.00%
Ravelling	2.14%	0.00%	0.00%	0.00%

RHS:	case-1	case-2	case-3	case-4
	<2000	>=2000 and <2500	>=2500 and <3000	>3000
Length	72900	0	0	0
Roughness	1398	0	0	0
IRI	2.04	0.00	0.00	0.00

RHS:	case-1	case-2	case-3	case-4
	<2000	>=2000 and <2500	>=2500 and <3000	>3000
Deflection	0.283	0.00	0.00	0.00
Cracking	0.14%	0.00%	0.00%	0.00%
Ravelling	1.21%	0.00%	0.00%	0.00%

#### 1.8.4 Options for O&M schedule

Based on the requirements of CA, various options have been considered to be used as responsive overlays triggered at specified level of roughness of 3000mm/km. Micro surfacing has also been considered to examine its feasibility for major maintenance.

Following options were considered in the analysis:

Base Case: MCS at Roughness of 3000mm/Km with regular maintenance

Opt-1: Responsive Overlay of 30mm BC whenever roughness is >3000mm/KM with regular maintenance

Opt-2: Responsive Overlay of 40mm BC whenever roughness is >3000mm/KM with regular maintenance

Opt-3: Scheduled Overlay for every 5 years with overlay of 30mm BC

#### 1.8.5 O&M schedule

*The Overlay requirement is not there from HDM Model till end of Concession Period; However, looking at the CA provisions i.e., Mandatory overlay in every 5<sup>th</sup> year from COD during the Concession Period, the following Overlay schedule is considered.*

- **30mm BC Overlay, partly in FY 2024 and partly in FY 2025**

## 1.9 COST

Cost Component for various items and activities have been worked out by considering the Best Industry practice and most appropriate methods. The gist of the cost components considered are presented below

- Immediate Repair's Cost
- Routine Maintenance Cost
  - Routine Maintenance of Road
  - Repair and Replacement of various road items
  - Tolling system and HTMS maintenance AMC cost
  - Incident management
  - Routine Maintenance for Structures
  - Electricity bill of lighting areas near cities, I/C and other areas & Fuel expenditure
- Periodic Maintenance Cost
  - Functional +Structural overlay
  - Overlay on Service Road
  - Major maintenance works for Structures
  - Replacement of Toll Hardware and software & HTMS at later date
- Toll Plaza Operation cost and Highway Patrolling and maintenance supervision staff cost
- Maintenance of utilities and public amenities
- Operation and management costs of rest areas and lay byes
- Safety audit and other inspection costs
- Insurance
- I.C for O&M period
- Grand Total Cost

**Table 20: Abstract of Cost Estimates (without escalation):**

S. No	FY	Immediate Repair's Cost + Routine and Operational Cost (Rs. Cr.)	Periodic Maintenance Cost (Rs. Cr.)	Total Cost (Rs. Cr)
1	2023	18.21	-	18.21
2	2024	18.21	37.47	55.69
3	2025	18.21	28.48	46.69
4	2026	18.21	-	18.21
5	2027	14.75	1.74	16.49
	<b>Total:</b>	<b>87.59</b>	<b>67.69</b>	<b>155.29</b>

**Table 21: Detailed Cost Summary (without escalation)**

S. No	FY	Routine Maintenance						Periodic Maintenance			Toll Plaza Operation cost	SPV Cost	Survey Costs	Insurance & Audit charges	IE Fee	Total Recurring cost
		Routine Maintenance	R&R of Road items	Toll and HTMS AMC cost	Incident management	R&R of Structures	Electricity bill of lighting	Functional +Structural overlay MCW+ S/R	Periodic Maintenance of of TMS & HTMS	Structure specified repairs						
1	2023	3.72	2.19	0.51	3.18	0.44	0.76	0.00		-	3.42	2.1	0.17	1.49	0.26	<b>18.21</b>
2	2024	3.72	2.19	0.51	3.18	0.44	0.76	37.47		-	3.42	2.1	0.17	1.49	0.26	<b>55.69</b>
3	2025	3.72	2.19	0.51	3.18	0.44	0.76	27.30		1.18	3.42	2.1	0.17	1.49	0.26	<b>46.69</b>
4	2026	3.72	2.19	0.51	3.18	0.44	0.76	0.00		-	3.42	2.1	0.17	1.49	0.26	<b>18.21</b>
5	2027	3.01	1.77	0.41	2.57	0.36	0.62	1.09	0.65	-	2.77	1.7	0.17	1.20	0.21	<b>16.49</b>
	<b>Total:</b>	<b>17.91</b>	<b>10.52</b>	<b>2.43</b>	<b>15.27</b>	<b>2.14</b>	<b>3.66</b>	<b>65.86</b>	<b>0.65</b>	<b>1.18</b>	<b>16.47</b>	<b>9.95</b>	<b>0.83</b>	<b>7.14</b>	<b>1.27</b>	<b>155.29</b>

**Notes:**

- The Base Cost Arrived for FY 2023
- All the material rates are Feb 2022 Rates
- All labour rates are taken from Central minimum wages (October'2021 cycle) and 2.5% escalation applied on the same to arrive FY2023 Rates
- All numbers are without any Escalation.
- Overlay thickness of 30mm BC considered in next MM (part length in FY24 and part length in FY 25)
- All the Cost presented in the above table are excluding Head Office (HQ) Expenses

### 1.10 COS Works Details

The following table presents the Work status of COS works as on Feb 2021.

S.No	Name of Project	NHAI Order Ref. No.	Approved Amount (Rs.)	Current Status (28.02.2021)
1	Installation of SSWIM, MSWIM and Static Weigh Bridge at toll plaza (6 SSWIM, 2 MSWIM and 2 SWB)	NHAI/11013/23/2009/RO Chennai/880 dated 03.03.2016	1.93 Cr.	Completed
2	Construction of 2 nos. toilet blocks near UEPL toll plaza	NHAI/PIU/VPM/SBM/2018/63 Dt.16.01.2018	0.60 Cr.	RHS side completed LHS side local issue
3	Construction, Operation & maintenance of Highway Nest (Mini) near toll plaza	NHAI/PIU/VPM/Highway Nest (Mini)/2018/125 Dt.28.01.2018	0.09 Cr.	Construction of one highway nest completed. Work of second highway nest is pending due to local issues.
4	Temporary Improvements	NHAI/PIU/VPM/Black Spot/2018/168 Dt.03.02.2018	0.36 Cr.	Completed
5	Medium / Interim remedial measures (TN-091-01, 02 & 04, TN-092-03&04, TN-093-01, 02 & 04, TN-096)	11016/NH-45/51/Vol-4/2018/PIU-VPM/1688 Dt.08.11.2018	3.141 Cr.	Completed
6	Permanent Remedial Measures (TN-098 Gingee Junction) Construction of vehicular under pass (VUP)	11016/NH-45/51/Vol-6/2018/PIU-VPM/469 Dt.19.02.2019	32.87 Cr.	Construction of VUP and approaches completed and open to traffic during December 2021
7	Permanent Remedial Measures (TN-091-03 Kooteripattu Junction))	11016/NH-45/52/Vol-1/2018/PIU-VPM/2357 Dt.25.10.2019	28.31 Cr.	Revised cost estimate submitted with SOR 2021-22
8	Permanent Remedial Measures (TN-092-01 Mundiampakkam Medical College Junction)	11016/NH-45/52/Vol-1/2018/PIU-VPM/2358 Dt.25.10.2019	26.62 Cr.	Descope requisition letter submitted to authority
9	Temporary Improvements and High mast lighting	11016/NH-45/12/Vol-1/2018/PIU-VPM/904 Dt.14.05.2020	1.91 Cr.	Completed

## 1.11 CONCLUSIONS

Foregoing discussions on various elements of project highway, following critical issues pertaining to project need careful attention for acquiring the same:

1. The Total Project length is 72.900 Km. The entire Project is having flexible pavement except at Toll Plaza location and at other two locations of each 50m where provision for ATCC was made.
2. The agreement was signed on 19.04.2006 and the Appointed date was taken on 16.10.2006.
3. The project achieved Provisional Completion Certificates on 23.07.2009 for entire project length with condition to complete the punch list items within 120 days of PCOD. The Commercial Operations started from 23.07.2009
4. the Effective date of Final Completion is 15.01.2010 for entire project length but the FCC was issued on 04.08.2016.
5. The Concession Period for the project is 20 years and as per the CA original Concession Period end date is 15.10.2026. Subsequently the Project got extension of 98 days during construction and 38 days during operation; With this the revised end of Concession is due on 28.02.2027.
6. The project road in general has good pavement condition except for minor surface related distresses such as minor surface cracking at isolated locations.
7. Patching is observed at few locations and the condition of the patch is good and importantly No Pot holes are seen along the project road.
8. There are no major undulations or depressions are observed along the corridor indicating good Subgrade quality.
9. For this project, a Project specific Manual is provided in Schedule-D. the allowable threshold value of roughness is 3000 mm/km as per Schedule-L.
10. Roughness surveys along corridor indicate that the maximum Roughness in LHS Carriageway is 1586 mm/Km and the maximum Roughness in RHS Carriageway is 1632 mm/Km whilst the allowable roughness as per CA is 3000 mm/Km. It can be concluded that, no immediate overlay is required for entire length of the Project Road from Roughness consideration.
11. Benkelman Beam Survey Data indicates that the characteristic deflection in LHS carriageway is the range of 0.311 to 0.693 mm and on RHS carriageway is 0.331 to 0.657 mm whilst the maximum allowable characteristic deflection as per CA is 1.2mm. it can be concluded that the, no immediate overlay is required for entire length from Pavement Deflection consideration.
12. Maintenance requirements stipulates that, the Surface shall not exceed 3000mm/Km during the service life of pavement at any time. A renewal coat of Bituminous concrete shall be laid every 5year after initial Construction or where the Roughness values reaches 3000mm/Km whichever is earlier to bring it to the initial value of 2000mm/Km. There is no mention regarding the minimum Overlay thickness.

13. Amendment was issues to IRC:81-1997 “Guidelines for Strengthening of Flexible Road Pavements, Using Benkelman Beam Deflection Technique” As per this Amendment (No. 1/IRC:81-1997/August, 2014 to IRC:81-1997), from structural considerations, the recommended minimum bituminous overlay thickness is 40 mm, however Clause 7.6 of IRC:81-1997 stipulates that, where structural deficiency is not indicated from deflection values, thin surfacing may be provided to improve the riding quality as required.
14. As per Clause 507.1 of MoRTH, Specifications for Roads and Bridge Works (Fifth Revision), Single layer of 30mm thick Bituminous Concrete (BC) can be laid on previously prepared bituminous bound surface
15. For the next Major maintenance which is due in FY 2024-25, overlay thickness of 30mm BC for Main Carriageway and Service Road is consider in Costing as this is the Renewal Coat Only (Not a Structural Overlay)
16. Concessionaire installed Solar System of capacity 1x60 KW in the recent past.
17. The Project road has One Toll plazas along the project road with rigid pavement. The Condition of the Rigid Pavement is Good
18. The concessionaire is maintaining the project facilities like truck lay byes, Toilets, Water supply, drinking water and power supply as per the agreement clauses and specifications which have been reviewed
19. Construction of Toilet Block under Swatch Bharat Mission is functional at Vikravandi Toll Plaza RHS. Due to local problem, the construction of toilet block in LHS at vikravandi Toll Plaza has been not started
20. Construction of Highway Nest (Mini) is completed and functioning at Vikravandi Toll Plaza RHS. Due to local problem, the construction of Nest (Mini) in LHS at vikravandi Toll Plaza has been not started.
21. Construction of VUP at Black Spot ID TN-98/TN-093-03 (Gingee Junction): Construction of VUP and approaches completed and open to traffic during December 2021.

**ANNEXURE III – TRAFFIC CONSULTANT’S REPORT**

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Intended for

# Virescent Infrastructure Investment Manager Private Limited (For the purpose of Highways Infrastructure Trust)

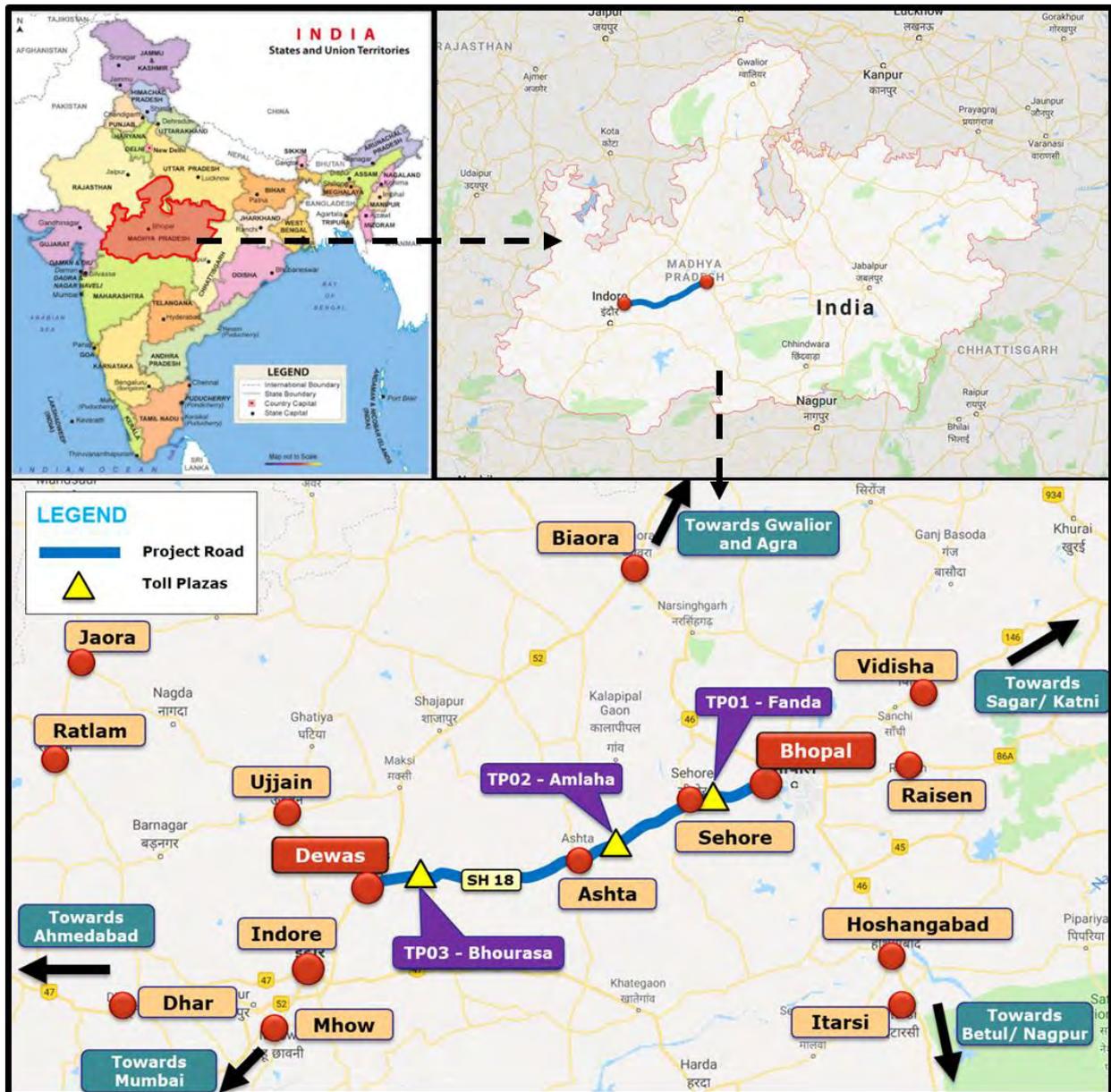
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Traffic Study Report

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February, 2022

## TRAFFIC STUDY FOR BHOPAL DEWAS SECTION OF SH-18 IN THE STATE OF MADHYA PRADESH



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Date 28/02/2022  
Made by Rahul/Harpreet  
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## ABBREVIATIONS

%	Percentage
2A	2 Axle Truck
2T	2 Ton Capacity
3A	3 Axle Truck
5T	5 Ton Capacity
AADT	Annual Average Daily Traffic
ADT	Average Daily Traffic
AR1	Alternate Route 1
BOT	Build, Operate & Transfer
CA	Concession Agreement
CAGR	Compounded Annual Growth Rate
CJV	Car/Jeep/Van
COVID	Corona Virus Disease
CSO	Central Statistical Organisation
DBCPL	Dewas Bhopal Corridor Pvt Ltd
EI	Economic Indicator
EMP	Environmental Management Plan
FMCG	Fast Moving Consumer Goods
FY	Financial Year
GDP	Gross Domestic Product
GSDP	Gross State Domestic Product
GST	Goods & Services Tax
GVW	Gross Vehicle Weight
IRC	Indian Roads Congress
IT	Information technology
LCV	Light Commercial Vehicle
LPG	Liquified Petroleum Gas
MAV	Multi Axle Vehicle
MPRDC	Madhya Pradesh Road Development Corporation
NH	National highway
NHAI	National Highway Authority of India
NHDP	National Highway Development Programme
OD	Origin & Destination
PCU	Passenger Car Unit
PIA	Project Influencing Area
PR	Project Road
SEZ	Special Economic Zone
SH	State Highway
SPV	Special Purpose Vehicle

TP	Toll Plaza
WPI	Wholesale Price Index
YOY	Year on Year

## DISCLAIMER

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***The traffic projections in this document represent Ramboll's best estimates based on the most credible information available on the date of this report. While these represent a reasonable expectation for the future, these are not precise forecasts.***

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## CONTENTS

1.	INTRODUCTION	2
1.1	General	2
1.2	Objective and Scope of Work	2
1.3	Structure of Report	3
2.	TRAFFIC SURVEYS AND ANALYSIS	4
2.1	General	4
2.2	Project Road Characteristics	4
2.3	Base Traffic Estimation	6
2.4	Travel Characteristics	9
3.	TRAFFIC GROWTH RATE AND PROJECTIONS	13
3.1	General	13
3.2	Project Road Traffic	13
3.3	Traffic Growth Rate Estimation	15
3.4	Past Economic Growth of PIA	17
3.5	India and PIA Outlook	19
3.6	Review of Past Traffic Data	22
3.7	Past and Future Transport Demand Elasticity	24
3.8	Projected Traffic Growth Rates	28
3.9	Traffic Projections	28
4.	TOLL REVENUE PROJECTIONS	30
4.1	Tolling Strategy	30
4.2	Schedule of User Fee	30
4.3	Tolling Streams	30
4.4	Toll Rates	32
4.5	Projected Tollable Traffic	33
4.6	Toll Revenue Estimates	34

## LIST OF TABLES

Table 2-1: AADT – FY22 at all the Toll Plaza Locations as per Tolling Categories.....	9
Table 2-2: Regional Distribution of Tollable Traffic (in %) on PR.....	10
Table 2-3: Commodity Distribution of Tollable Traffic (%) .....	11
Table 3-1: OD Shares for the Project Road .....	17
Table 3-2: Average Annual Growth Rates (%) of GSDP for PIA States.....	17
Table 3-3: Average Annual Growth Rates (%) of State Income for PIA States.....	18
Table 3-4: Future Outlook of India .....	21
Table 3-5: Future Outlook of PIA States.....	21
Table 3-6: Future Perspective of PIA Weighted Income .....	22
Table 3-7: Past Toll Data Traffic Comparison .....	24
Table 3-8: Actual Past Traffic Elasticity .....	25
Table 3-9: Recommended Elasticity for Project Road .....	28
Table 3-10: Projected Traffic Growth Rates for Project Road (%).....	28
Table 3-11: Projected Traffic in PCUs at Toll Plazas.....	29
Table 4-1: Tolling Distribution for the Project Road Including Exemptions and Violations (in %) .....	31
Table 4-2: Toll Paying Traffic, FY22 .....	31
Table 4-3: Tolling Distribution for the Project Road Excluding Barcode Journeys, Exemptions and Violations (in %) .....	32
Table 4-4: Monthly Pass Trip Rates.....	32
Table 4-5: Toll Rates in Rs/km for Different Vehicle Categories .....	33
Table 4-6: Toll Rates at the Three Toll Plazas (in Rs) .....	33
Table 4-7: Projected Toll Paying Traffic in PCUs at the Toll Plazas.....	34
Table 4-8: Toll Revenue (in Rs million) by Type of Concession for PR.....	35
Table 4-9: Toll Revenue (in Rs million) for Project Road by Mode .....	35

## LIST OF FIGURES

Figure 1-1: Alignment of SH-18 with Major Places along the Highway .....	2
Figure 2-1: Project Road and Toll Plaza Locations .....	4
Figure 2-2: Past Traffic on the Project Road at Fanda Toll Plaza .....	6
Figure 2-3: Past Traffic on the Project Road at Amlaha Toll Plaza .....	7
Figure 2-4: Past Traffic on the Project Road at Bhourasa Toll Plaza .....	7
Figure 2-5: MoM Traffic (FY22) at TP01-Fanda .....	8
Figure 2-6: MoM Traffic (FY22) at TP02-Amlaha .....	8
Figure 2-7: MoM Traffic (FY22) at TP03-Bhourasa .....	8
Figure 3-1: Route Alignment Map (Project Road and Alternate Route).....	14
Figure 3-2: Details of Upcoming Projects under Bharatmala in PIA .....	15
Figure 3-3: GSDP (in Rs Billion) for Influencing PIA States .....	19
Figure 3-4: GDP Growth in India .....	20

# 1. INTRODUCTION

## 1.1 General

The Madhya Pradesh Road Development Corporation (MPRDC) is responsible for development of highway network in the State of Madhya Pradesh and as a part of this endeavour, the department had decided to upgrade roads to meet with the growing traffic requirements. Considering this, SH-18 section from Bhopal to Dewas was upgraded to a four-lane configuration on BOT basis.

The project road section is a part of SH-18, starts at Bhopal (km 6.80) and ends at Dewas Bypass junction (km 151.60). The length of project road is 140.79 km. The asset is being run by SPV - M/s. Dewas Bhopal Corridor Pvt Ltd (DBCPL) for a concession period of 25 years and is operational since 10<sup>th</sup> February 2009.

SH-18 starts from Bhopal and ends at the border with Gujarat while passing through some of the important towns and cities of Madhya Pradesh. The importance of the highway arises from the fact that these cities have religious, tourism, agriculture and industrial significance such as Bhopal being the capital of Madhya Pradesh, Dewas having importance in terms of its industrial and agricultural output and Ujjain being one of the holy Hindu pilgrimage destinations. The highway essentially connects Indore and Bhopal, two of the largest cities of Madhya Pradesh, via NH-52 from Dewas. Additionally, the highway provides connectivity between Bhopal and state of Gujarat.

The location of the project road and the regions in and along the project influence area are shown in Figure 1-1.



Figure 1-1: Alignment of SH-18 with Major Places along the Highway

M/s. Ramboll India Private Ltd has been engaged as Traffic Consultant for Highways Infrastructure Trust to carry out a study for assessing the present traffic levels, travel pattern and revenue estimation duly considering the network characteristics, future economic perspective in the influence area of the project and the provisions in the Concession Agreement of the project for the balance concession period.

## 1.2 Objective and Scope of Work

The scope of services of this study is to prepare Traffic Due diligence Reports covering

- Analysis of recent toll/traffic data of April-December 2021 and its growth trends
- Estimation of the base AADT for FY22
- Traffic projections for the balance concession period
- Toll revenue estimates in view of changes, if any, in WPI forecasts and tolling ticket segmentation
- Scenario Analysis of toll revenue to cover diversion, if any, to/from the project road

### 1.3 Structure of Report

The report is divided into four chapters, including this introduction chapter. Chapter 2 contains details of project road characteristics and its analysis to understand the base year traffic and travel characteristics in the Project Influence Area (PIA). Chapter 3 contains the details on the derivation of traffic growth rates used for traffic forecasting and presents traffic projections till the end of the concession period. Chapter 4 presents the details regarding tolling strategy, toll rates and the revenue projections for the duration of the concession.

## 2. TRAFFIC SURVEYS AND ANALYSIS

### 2.1 General

This chapter presents the details of the project road characteristics, Annual Average Daily Traffic (AADT), travel characteristics on the project road. The results of the analysis will be utilized in assessing the traffic growth and estimation of traffic and revenue forecast on the project road for the remaining concession period.

### 2.2 Project Road Characteristics

The project road falls under the jurisdiction of Bhopal, Sehore and Dewas districts in the state of Madhya Pradesh. The project road section starts from km 6.800 at Bhopal and ends at the junction with Dewas Bypass at km 151.600 having a total length of 140.79 km. It connects Bhopal with Dewas while passing through the towns/cities of Sehore, Ashta and Sonkatch. There are three existing toll plazas at Fanda (TP01), Amlaha (TP02) and at Bhourasa (TP03).

The project road connects two major cities of Madhya Pradesh – Bhopal (political capital of Madhya Pradesh) and Indore (business and trading capital of Madhya Pradesh) via Dewas and serves the regional traffic demand. Additionally, the Project Road provides connectivity to the mobility requirements of smaller towns/cities along the project corridor such as Sehore, Ashta, Sonkatch, etc.

The alignment of the project road and its surrounding road network along with the three toll plaza locations is shown in Figure 2-1.



Figure 2-1: Project Road and Toll Plaza Locations

#### 2.2.1 Profile of Project Influence Area

The project road section lies entirely in the state of Madhya Pradesh. It passes through the districts of Bhopal, Sehore and Dewas. A brief description of the profile of these three

districts as well as Indore district which influences the traffic on the project road has been provided in this section.

### Bhopal District

Bhopal district, spanning over an area of about 2,772 square km, lies in the central part of the state of Madhya Pradesh. The district is bounded by Guna district on the north, Vidisha district on the northeast, Raisen district on the east and Sehore and Rajgarh district on the southwest and west, respectively. Bhopal city is the district as well as state head quarter. Bhopal is well connected with all parts of country by air, rail and roads. It lies on Delhi-Bhopal-Mumbai and Delhi-Bhopal-Chennai main railway line.

As per 2011 census, the population of Bhopal district is about 2.37 million with a density of 855 persons/sq.km and a decadal growth rate of 28.62 percent. The agricultural activity in Bhopal district is mainly dependent on the monsoon.

### Sehore District

Sehore district is primarily an agricultural district occupying the Chambal and Narmada basin valley. It is bound by the Rajgarh and Shajapur districts in the north-west, Bhopal and Raisen districts in the north-east and Hoshangabad, Harda and Dewas districts in the south. Agriculture is the main occupation of the people in the district.

The district has alluvial soil with fairly good fertility. Most part of the district has rich black cotton soil. Soybean and wheat are the two major crops produced in the district with other crops such as sugarcane, gram, maize, lentil, etc. are also sown. Sehore district is **known for the production of "Sharbati" wheat or the "Golden Grain" owing to the presence** of black and fertile alluvial soil in the region. About 400 sq.km. of area is cultivated resulting in over 100 kilo tonnes of annual production. Quartzite is the only major mineral found in the district.

Sehore district has a total population of about 1.31 million with a decadal growth of 21.5 percent.

### Dewas District

The Dewas district lies in the central part of the state and covers an area of 7,020.84 square km. Dewas lies north-east of Indore, south-east of Ujjain and southwest of Shajapur. Dewas is an industrial city of the state providing employment to thousands of industrial workers. These industrial areas are present along Indore Road and few pockets of industries on Ujjain Road. It is also Known for its Bank Note Press.

The chief agricultural products in the district are soyabean, wheat, sorghum, rice, cotton, etc. The district is known as the soyabean capital of India. Several industries with high tech manufacturing processes have been set up for extraction of soyabean oil.

The district has several centres of attraction which allures numerous travellers from different parts of country as well as world. Kavadia Hills, a group of seven hills with

various shapes are made up of stone pillars. These hills are the result of volcanic eruption, yet these seem to be minutely carved by humans. Other places include Khivni Sanctuary, Pawar Chattries, Gidya Khoh, etc.

Dewas district has a total population of about 1.56 million with a decadal growth of 19.5 percent as per census 2011.

Indore District

Indore district lies at the heart of Malwa region. Indore city is the district capital and is known as the commercial capital of Madhya Pradesh. Traditional agro industries as well as modern corporate and IT companies are present in the district.

Agriculture is the main source of economy due to the presence of immensely fertile soil of the Malwa region. The district has abundance of black cotton soil. The main crops grown are jowar, cotton, ground nut, wheat, gram, linseed, etc.

Indore is one of the premier textile centres of India. There are a number of textile mills in the region and a number of firms are involved in the export of textile. Besides, there are hosiery industry, cotton ginning and processing factories, oil mills, sugar mills, printing presses, etc. The metal industry is also an integral part of Indore which includes alloy, automobile and steel industries.

The district has an area of 3,898 sq.km with a population of 3.28 million and a decadal growth rate of 32.9 percent as per the census 2011.

2.3 Base Traffic Estimation

For the present study, the toll traffic data at the toll plaza location was provided by the client for the period April 2010 to December 2021. The year-on-year mode wise traffic for the project road is presented in Figure 2-2, Figure 2-3 and Figure 2-4.

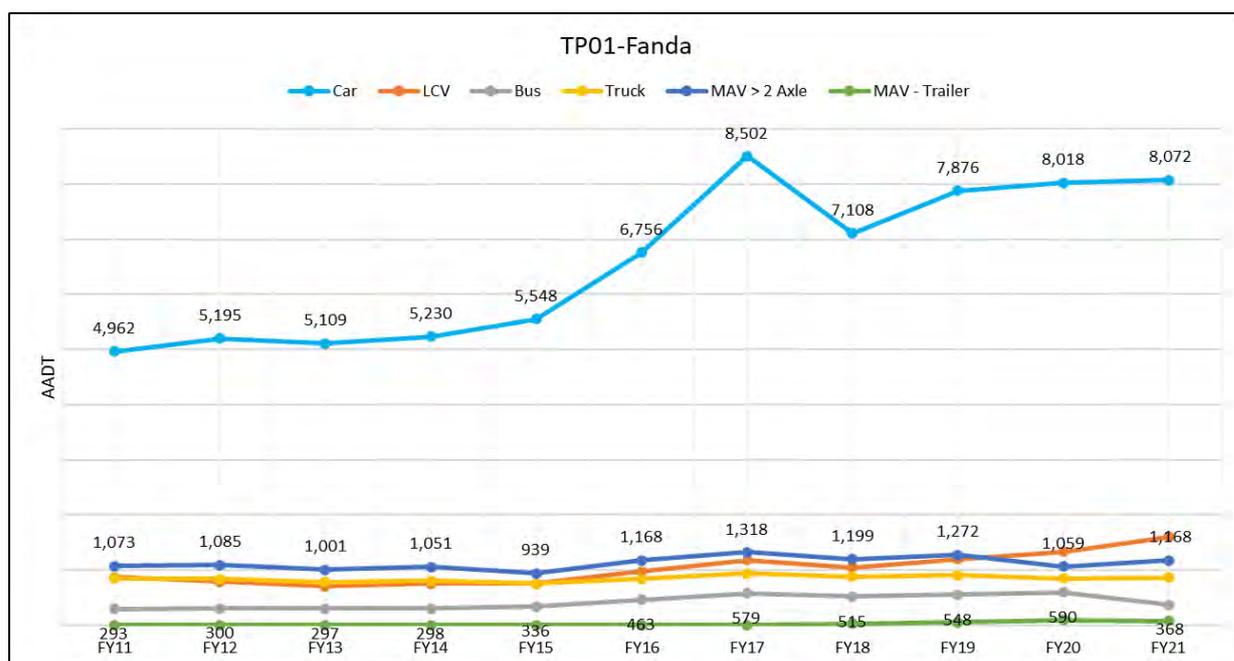


Figure 2-2: Past Traffic on the Project Road at Fanda Toll Plaza

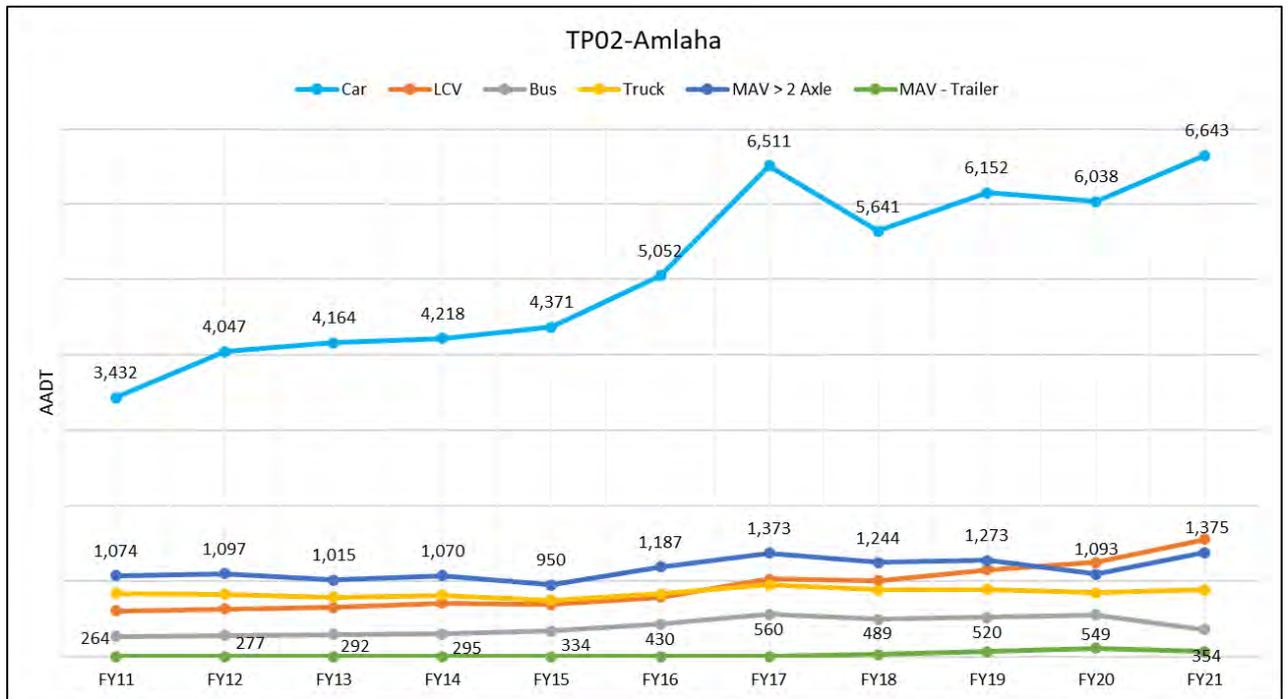


Figure 2-3: Past Traffic on the Project Road at Amlaha Toll Plaza

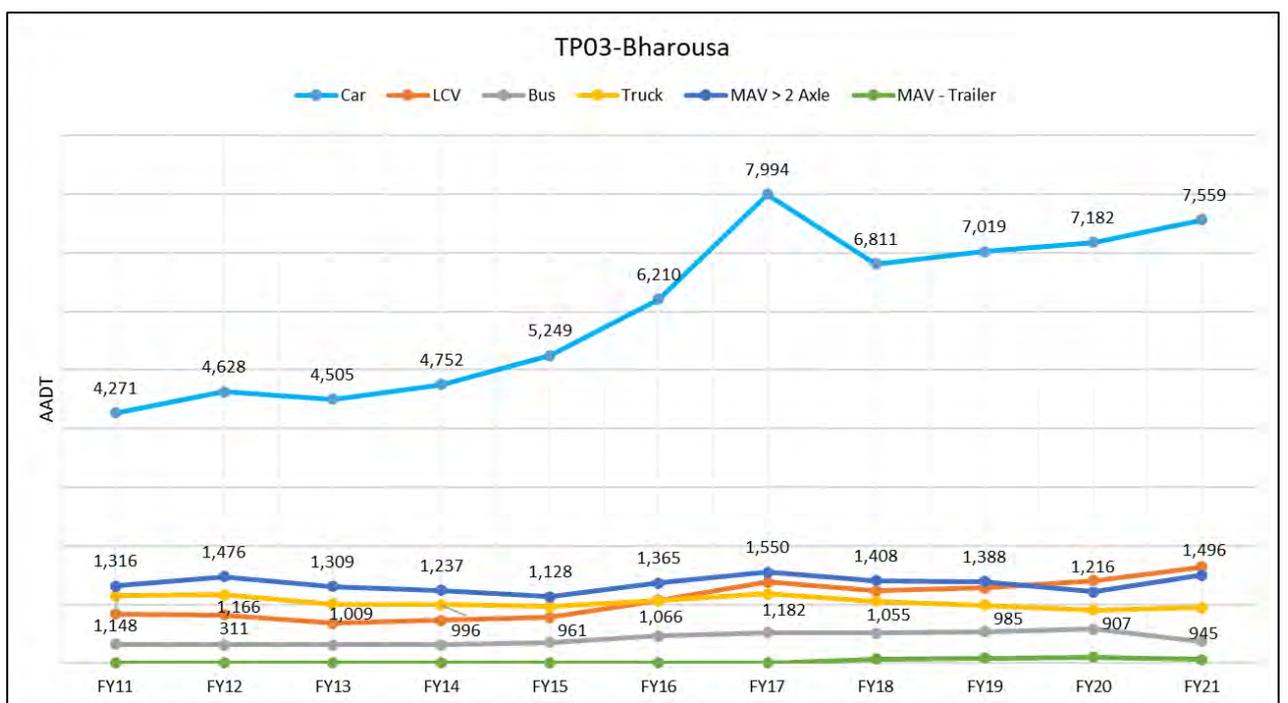


Figure 2-4: Past Traffic on the Project Road at Bharousa Toll Plaza

The traffic during FY21 was impacted by COVID-19 indicating a decline in first quarter traffic in almost all the modes due to a complete lockdown measure implemented by the Central government due to spread of COVID 19 virus throughout the country. The traffic showed recovery in second quarter of FY21 as the lockdowns were eased and economic activities slowly started to pick up. Next two quarters have shown a substantial pickup of traffic.

The onset of the second wave of Covid-19 and the lockdowns announced by the state government during April-May 2021 was a setback to the continuous recovery of traffic to

normal levels. With the opening of economic activities, the traffic has started to pick up and shows a recovery from June 2021 onwards. The month-on-month mode wise traffic for the FY22 (April-December) is presented Figure 2-5, Figure 2-6 and Figure 2-7.

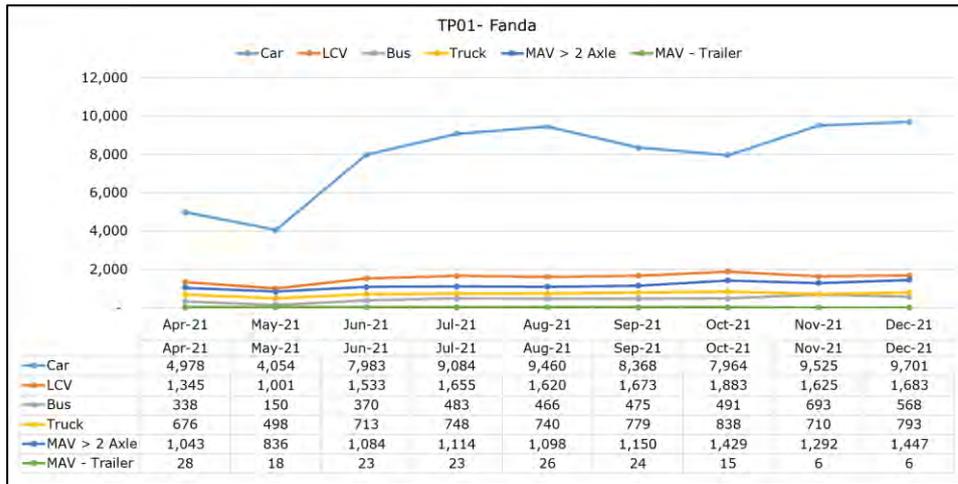


Figure 2-5: MoM Traffic (FY22) at TP01-Fanda

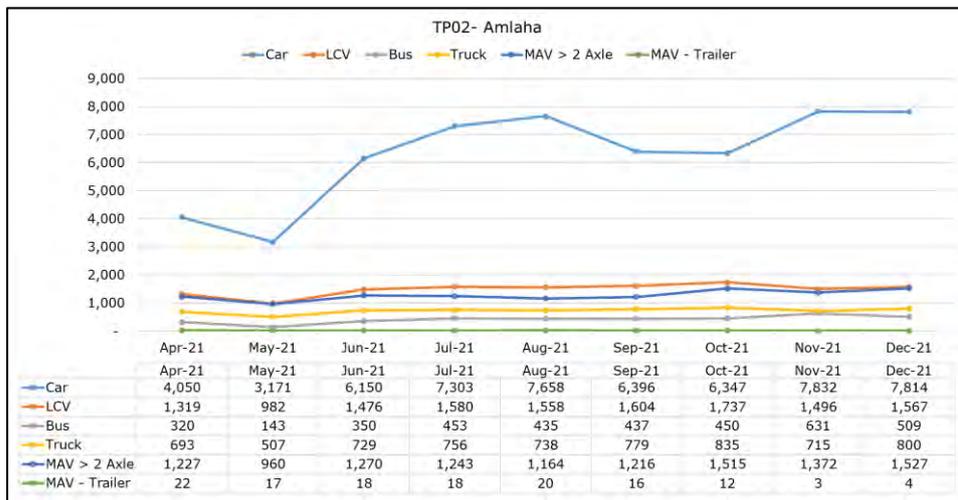


Figure 2-6: MoM Traffic (FY22) at TP02-Amlaha

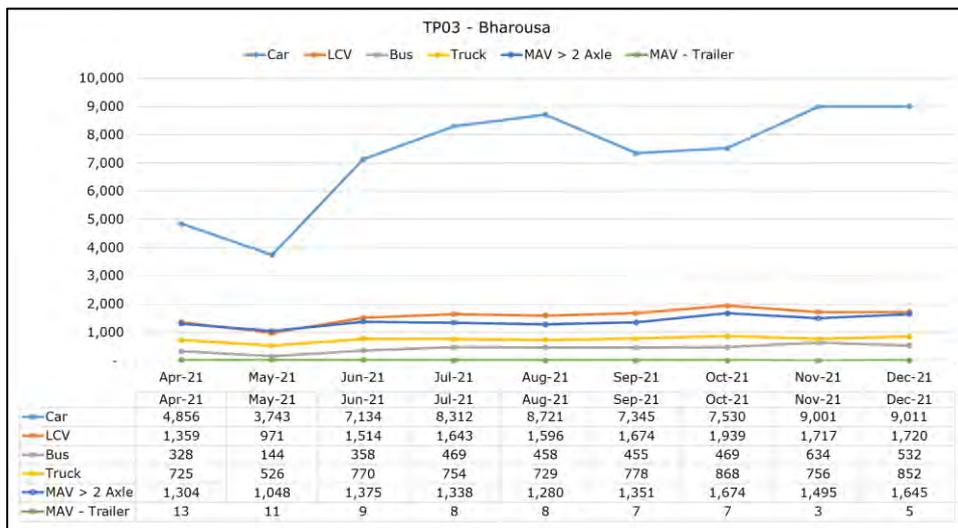


Figure 2-7: MoM Traffic (FY22) at TP03-Bhourasa

The estimation for FY22 AADT is done after annualising the behaviour of July-December traffic. For this purpose, a ratio/ factor of average of July-December to twelve-month average from FY19 was derived for all the modes except buses. As buses have not yet recovered from the impact of COVID 19 due to the social distancing norms being followed and resultant increased usage of cars, FY20 AADT of Buses has been adopted for corrected FY22 as well.

The AADT for FY22 derived from the toll traffic data along with 6 months to yearly factors in presented in Table 2-1.

Mode	Car	LCV	Bus	Truck	MAV	MAV-Trailer
<b>TP01-Fanda</b>						
ADT July-December (6months)	9,017	1,690	-	768	1,255	17
Six-to-twelve-month correction factor	1.07	1.00	-	0.99	1.03	0.99
<b>AADT</b>	<b>9,605</b>	<b>1,693</b>	<b>590</b>	<b>760</b>	<b>1,294</b>	<b>16</b>
<b>TP02-Amlaha</b>						
ADT July-December (6months)	7,225	1,590	-	770	1,339	12
Six-to-twelve-month correction factor	1.07	1.01	-	1.00	1.01	1.49
<b>AADT</b>	<b>7,766</b>	<b>1,600</b>	<b>549</b>	<b>772</b>	<b>1,354</b>	<b>18</b>
<b>TP03-Bhourasa</b>						
ADT July-December (6months)	8,320	1,715	-	790	1,464	6
Six-to-twelve-month correction factor	1.05	0.98	-	1.00	1.04	0.96
<b>AADT</b>	<b>8,738</b>	<b>1,678</b>	<b>580</b>	<b>789</b>	<b>1,516</b>	<b>6</b>

Table 2-1: AADT – FY22 at all the Toll Plaza Locations as per Tolling Categories

## 2.4 Travel Characteristics

### 2.4.1 Regional Distribution

Table 2-2 gives the distribution indicating the attraction and generation zones for the traffic on the project road.

States/ Modes	Cars	Bus	LCV	2A-Truck	3A-Truck	MAV
<b>TP01 - Fanda</b>						
Madhya Pradesh	97.8	93.2	89.9	87.4	83.6	72.3
Gujarat	1.1	5.0	3.2	6.4	7.4	13.3
Rajasthan	0.5	0.0	3.4	2.6	2.7	5.8
Maharashtra	0.2	0.0	0.7	0.7	4.3	1.9
Uttar Pradesh	0.2	1.9	0.8	1.3	0.3	1.5
Chhattisgarh	0.0	0.0	0.0	0.3	0.0	0.6
Rest of India	0.2	0.0	2.0	1.4	1.7	4.7
<b>Total</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>	<b>100</b>
<b>TP02 - Amlaha</b>						
Madhya Pradesh	98.8	99.1	95.8	90.6	89.8	82.4
Gujarat	0.3	0.5	1.2	3.8	5.6	10.1
Rajasthan	0.3	0.0	1.3	2.4	2.6	3.5
Maharashtra	0.1	0.0	0.8	0.3	0.3	0.8
Uttar Pradesh	0.2	0.5	0.1	1.3	0.3	1.2

States/ Modes	Cars	Bus	LCV	2A-Truck	3A-Truck	MAV
Chhattisgarh	0.0	0.0	0.1	0.5	0.3	0.3
Rest of India	0.2	0.0	0.6	1.3	1.3	1.8
Total	100	100	100	100	100	100
TPO3 - Bhourasa						
Madhya Pradesh	97.6	91.5	90.6	91.5	88.3	77.2
Gujarat	0.8	1.3	3.5	3.1	4.5	9.2
Rajasthan	0.7	4.9	2.9	2.7	3.6	6.6
Maharashtra	0.4	0.0	0.2	0.8	0.9	2.7
Uttar Pradesh	0.1	1.3	0.6	0.5	0.5	0.8
Chhattisgarh	0.1	0.3	0.0	0.0	0.0	0.1
Rest of India	0.4	0.8	2.3	1.4	2.2	3.5
Total	100	100	100	100	100	100

Table 2-2: Regional Distribution of Tollable Traffic (in %) on PR

Passenger traffic:

- Passenger traffic is primarily generated from Madhya Pradesh with about 98 percent of cars across all the toll plazas.
- In case of Buses also, Madhya Pradesh is the major traffic generator.
- The major passenger traffic generation points include the towns and cities of Bhopal, Vidisha, Raisen, Sagar, Sehore, Ashta, Dewas, Indore, Ujjain, etc.

Freight traffic:

- In case of freight traffic as well, Madhya Pradesh is the major contributor followed by Gujarat, Rajasthan and Maharashtra.
- In case of LCVs, Madhya Pradesh has a high share of about 90-96 percent followed by Gujarat and Rajasthan, each with about 1-4 percent contribution.
- In case of 2A-Trucks, about 87-92 percent is generated from Madhya Pradesh while Gujarat and Rajasthan together contribute about 6-9 percent.
- Madhya Pradesh contributes about 84-90 percent in 3A-Trucks and about 72-82 percent in MAVs. The majority of the long-distance traffic is from Gujarat with about 5-7 percent share in 3A-Trucks and 9-13 percent in MAVs. Rajasthan and Maharashtra each contribute about 1-4 percent in 3A-Trucks and 1-7 percent in MAVs.

#### 2.4.2 Travel Pattern

The major findings related to the travel pattern for passenger and freight traffic for the project road are as follows:

Passenger Traffic:

- Close to 40 percent of the total car traffic is through in nature, crossing all the toll plazas. The predominant interaction of this through traffic is between Bhopal/Raisen/Vidisha and Indore and surrounding areas.
- Local car traffic interaction at TP01 and TP03 (about 40 percent) are higher compared to TP02 (about 15 percent). The higher share of local car traffic can be attributed to

the two toll plazas being close to bigger cities of Bhopal and Dewas/Indore, respectively.

- In case of Buses, the share of traffic crossing all the TPs is higher (about 70 percent). Buses are primarily found to ply between Bhopal and Indore.

Freight Traffic:

- The local freight traffic interaction at TP01 is between Bhopal and Sehore while that at TP02 is between Sehore/Amlaha and Ashta/Sonkatch and at TP03 is between Ashta/Sonkatch and Dewas/Ujjain/Indore.
- Local traffic interaction is lower for TP02 (about 5 percent for all modes) in comparison to the other two toll plazas. At TP01, about 15-20 percent and at TP03 about 25-30 percent is local traffic. Indore and Dewas having higher industrial output in comparison to Bhopal, attract higher local freight traffic share at TP03 than at TP01.
- The share of through traffic is more than 60 percent across at all the locations. The major through traffic interaction is between Bhopal/Raisen/Vidisha and Indore and surroundings.

### 2.4.3 Commodity Distribution

The distribution of different commodities carried by freight traffic is summarised in Table 2-3.

Commodity Type	TP01	TP02	TP03
Empty	24.5	28.1	32.9
Minerals	0.4	1.2	1.0
Food Grains	5.8	5.4	8.4
Cash Crops	3.4	2.2	0.5
Perishable	6.3	3.8	4.5
Wood and Forest Products	3.8	1.1	1.6
Sand/ Powder	2.2	5.2	2.4
Iron/ Steel	2.9	4.4	4.7
Cement/ Fly Ash	2.3	4.4	3.1
Construction Materials	6.9	3.1	5.2
Natural Gas	5.4	6.4	5.6
Petrol Products	2.0	2.3	2.6
Parcel	7.6	11.0	5.8
Machinery	9.9	5.2	6.2
Paper	0.5	0.3	0.1
Chemicals/ Fertilizers	0.9	0.5	1.0
Grocery Items/ Consumer Goods	9.9	9.9	9.3
Textile	1.7	2.0	1.4
Others	3.7	3.5	3.2
Total	100.0	100.0	100.0

Table 2-3: Commodity Distribution of Tollable Traffic (%)

- The major commodities being transported include food grains and cash crops, perishable items, construction materials, natural gas, parcel, machinery and grocery items/ consumer goods.

- Food grains, cash crops and perishable items together constitute about 11-16 percent of total commodity being transported across all the toll plazas. Also, about 9-10 percent of total freight traffic carries grocery items/ consumer goods too. It is to be noted that Sehore, Vidisha and Ashta districts as well as some parts of Bhopal and Hoshangabad districts are famous for growing the Sharbati variety of wheat which has high market value among private FMCG companies such as ITC and Cargill. Also, Ujjain and Bhopal divisions are major soybean production regions.
- About 7-9 percent of total freight traffic carries natural gas and petrol products. Notably, Indian Oil, Bharat Petroleum as well as Reliance Industries have depots and bottling plants at Bhauri, near Bhopal, with rail siding facilities to each depot. Petroleum tankers as well as LPG cylinders are transported across the TPs primarily to Indore as well as to Sehore, Ashta, Dewas, etc.
- About 25-33 percent freight traffic plies as empty trucks.
- About 6-11 percent share of freight traffic carries parcel and almost equal share carries machineries across all the toll plaza locations. Also, about 14-17 percent share of freight traffic carries construction materials, cement/fly ash, iron/steel products and sand/powder.

## 3. TRAFFIC GROWTH RATE AND PROJECTIONS

### 3.1 General

As the project road has been executed on a BOT basis with a concession period of 25 years, an estimation of the traffic using the tolled highway and its future growth are **important elements to assess the project's economics as these are generally the main/sole source of revenue for the project**. This chapter details various aspects of the current traffic of the project road and its growth potential.

### 3.2 Project Road Traffic

The traffic that is likely to use the project road is estimated on the basis of the traffic and travel characteristics. The traffic on the project road would normally consist of the following components:

- Normal Traffic
- Diverted Traffic
- Induced/Developmental Traffic

#### 3.2.1 Normal Traffic

Normal traffic is the traffic, which is already plying on the project road in FY22, has been corrected for impact of COVID 19 and presented in Table 2.1. The corrected FY22 traffic is the total traffic including the exempted vehicles at the toll plaza location.

#### 3.2.2 Diverted Traffic

Diverted traffic is generally dictated by the presence of an alternative route at a lower generalised cost, which is in-turn defined by the road configuration and its condition, the type of vehicle and its operating costs, the average riding speed, the route distance and any tolling that may apply on a specific route.

In context of the project road, there are no routes in vicinity of toll plazas to avoid the project road. However, in the context of wider network assessment, the development of the proposed green-field Indore – Bhopal Expressway may impact the project road traffic.

#### Impact of Indore - Bhopal Expressway

Indore – Bhopal expressway is a proposed 4-lane access-controlled greenfield expressway connecting Bhopal (the state capital of Madhya Pradesh) to Indore (the commercial capital of Madhya Pradesh) via NH-47. The proposed highway is of 147.763 km starting from Khamkheda on NH-46 (Hoshangabad Road) and passes through Barjhiri, Ichhawar, Badodiya Gadri, Hatpipliya and joins NH-47 near Karnawad. As per limited information available in the public domain, the alignment of the expressway has been finalised and hiring of consultants for EMP preparation is underway. Going by the trend of similar projects being developed as green field facilities, it can be expected that the project (if implemented) will be only operational by 2029. There have been reports

of protest against the concept of new green field facility with involves land acquisition given that the 4-lane project road is under-utilised at present. The construction of this expressway will involve huge cost of land acquisition and construction. The implementation of this expressway will require the forest and environmental clearances (wildlife) as the greenfield alignment passes through the wildlife reserves.

Figure 3-1 presents the routes from Indore to Bhopal including the Alternate Route.



Figure 3-1: Route Alignment Map (Project Road and Alternate Route)

The route via PR is about 189.7 km long. The route via Indore – Bhopal Expressway (AR1) is 173.76 km long and is about 15.94 km shorter than through PR. The per km toll rates on the expressway will be significantly higher (1.5 times of the normal NHA per km toll rates accounting for 1.25 times for normal length of expressway and increase for the likely equivalent structure length) than the project road toll rates.

Since, it is cheaper to widen the existing highway to a six-lane facility and at present it is underutilised by traffic, it is highly unlikely that this expressway will get the required clearance and taken up for implementation.

### 3.2.3 Induced/ Developmental traffic

Developmental /new generated traffic is the one which would be generated, over and above normal growth, because of lowering of transport costs or new developments in the immediate influence area of the project road.

Bharatmala Pariyojana is the second largest highways construction project in the country since NHDP, under which almost 50,000 km or highway roads were targeted across the country. It will look to improve connectivity particularly on economic corridors, border areas and far-flung areas with an aim of quicker movement of cargo and boosting exports.

It will connect 550 district headquarters to minimum 4-lane highway by raising the number of corridors to 50 (from current 6) and move 80 percent freight traffic (currently

40 percent) to national highways by connecting 24 logistics parks and 7 north east multimodal waterway ports.

The Phase-I includes economic corridors of around 9,000 km; inter-corridor and feeder routes of around 6,000 km; 5,000 km roads under the National Corridors Efficiency Program, border and international connectivity roads of around 2,000 km; coastal and port connectivity roads of around 2,000 km; expressways of around 800 km and 10,000 km of NHDP roads. The total length in phase 1 comes to around 34,800 km.

In the context of the project influence area, the Kandla – Sagar economic corridor has been proposed to pass through Dewas and Bhopal while two more inter-corridor roads, Betul – Bhopal and Dewas – Ujjain – Ratlam, have also been proposed and are presented in Figure 3-2.

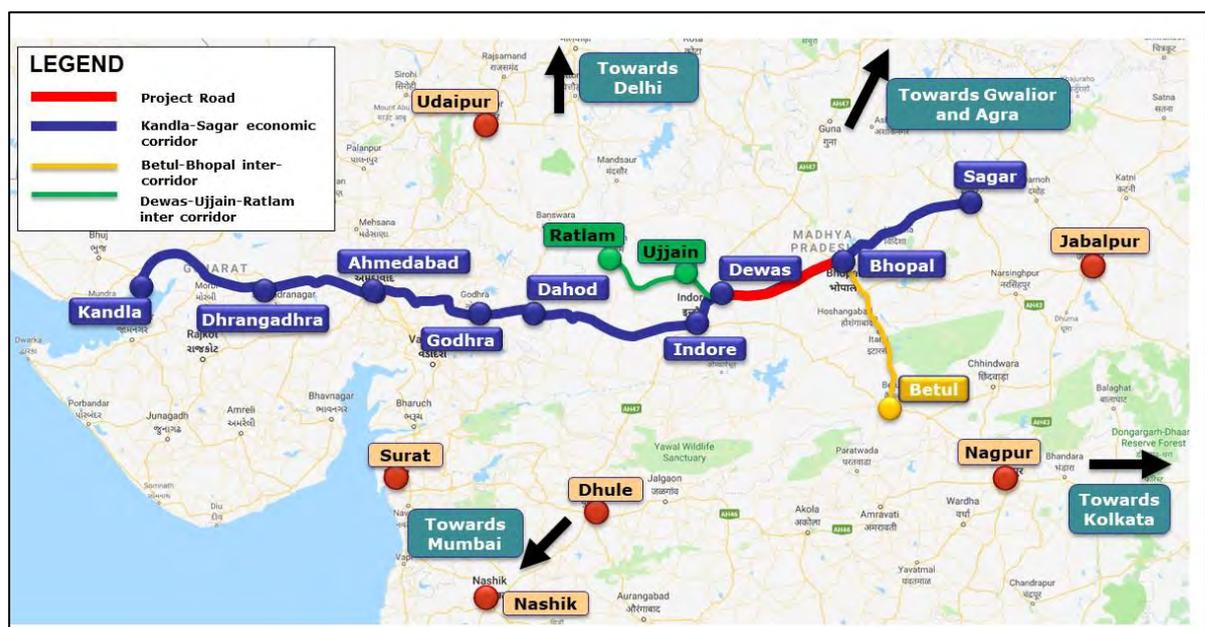


Figure 3-2: Details of Upcoming Projects under Bharatmala in PIA

As the project road is a part of the Kandla-Sagar economic corridor, it is likely to remain an important highway for the East/West movement and may see sustained growth in the future. This has been considered while setting out traffic growth rates for rest of the concession period.

### 3.3 Traffic Growth Rate Estimation

#### 3.3.1 Methodology

Traffic growth for both passenger and freight vehicles has been estimated using the econometric approach as described in IRC-108, 2015. For freight traffic, due consideration has been given to the total tonnage transported and the shift in types of vehicles used for moving goods.

The econometric model applied, relates traffic growth to changes in state (or district) domestic product via an elasticity factor. According to IRC guidelines, elasticity based econometric model for highway projects should be derived in the following form:

$\text{Log}_e (P) = A0 + A1 \text{Log}_e (EI)$ , where:

P = Traffic Volume

EI = Economic Indicator

A0 = Regression constant

A1 = Regression co-efficient (Elasticity Index).

In order to estimate traffic on the project road the methodology described below has been followed:

- Identify the influence area - From the analysis of travel patterns observed during the OD surveys, the project influencing states and districts, which are likely to impact the traffic growth on the project road, were identified.
- Review Past traffic Data – Based on data points available for the project corridor from different sources a review of past traffic and tonnage growth is carried out.
- Analysis of economic growth of the Project Influencing Area (PIA) - For each PIA state an economic profile describing past performance and future outlook was **prepared. This also considers India's past economic performance and its future outlook.**
- Estimation of traffic elasticity to income – in order to translate economic growth into traffic growth, an elasticity factor was estimated.
- Derivation of traffic growth rates – On the basis of the traffic weighted PIA outlook and related traffic elasticity, traffic growth rates were estimated.

The methodology thus adopted incorporates, as basic data inputs, the perspective growth envisaged in the influence area and the changes in transport demand elasticities over a period of time. The traffic growth rates by vehicle type for the project road have been determined in line with the concession period of 25 years up to financial year FY34 (till 1<sup>st</sup> December 2033 as extended from original end date of 19<sup>th</sup> March, 2033).

### 3.3.2 Traffic Pattern and Influence Area

The travel pattern as derived from origin and destination survey analysis reveals the predominance of Madhya Pradesh in both passenger and freight vehicles. Besides Madhya Pradesh, the states of Gujarat and Maharashtra do contribute to the project road traffic.

Cars and Buses are entirely generated from the state of Madhya Pradesh. In case of LCVs, about 92 percent is from Madhya Pradesh, Gujarat contributes for about 2.6 percent, Maharashtra contributes to a nominal share in the traffic.

In 2A trucks, Madhya Pradesh has a share of about 90 percent and Gujarat contributes about 2 percent. Maharashtra contributes to around 1 percent. In case of MAV trucks, a major percentage of 80 percent is from Madhya Pradesh followed by 9 percent from Gujarat and 2 percent from Maharashtra.

The normalised shares of all the influencing states for the combined locations are presented in Table 3-1.

Region / Modes	Car	LCV	Bus	Truck	MAV
Normalised OD shares					
Madhya Pradesh	100.0	96.6	100.0	94.7	88.0
Gujarat		2.8		4.6	10.0
Maharashtra		0.6		0.6	1.9
Total	100.0	100.0	100.0	100.0	100.0

Table 3-1: OD Shares for the Project Road

Looking at the predominance of Madhya Pradesh in cars, only the state of Madhya Pradesh has been considered as the PIA state for passenger vehicles. In case of freight vehicles, apart from Madhya Pradesh, the states of Gujarat and Maharashtra have also been considered as the PIA states.

### 3.4 Past Economic Growth of PIA

Growth of traffic on the project road depends on existing developments and future growth prospects of the connecting regions. A number of economic indicators for the PIA state, as published by Central Statistical Organisation (2011/12 prices), have been studied to assess their past performance. The year wise Gross State Domestic Product (GSDP) at 2011 – 2012 series and its growth is presented in Table 3-2.

Year	Madhya Pradesh	Gujarat	Maharashtra
GSDP in Billion			
2011-12	3,155.6	6,156.1	12,803.7
2012-13	3,516.8	6,826.5	13,579.4
2013-14	3,651.3	7,342.8	14,516.1
2014-15	3,839.4	8,114.3	15,431.6
2015-16	4,187.4	8,944.7	16,542.8
2016-17	4,706.7	9,813.4	18,070.5
2017-18	4,971.5	10,865.7	19,146.2
2018-19	5,294.2	11,830.2	20,333.1
2019-20	5,804.1	12,689.6	21,340.7
2020-21	5,608.5	#N/A	#N/A
YOY Growth in %			
FY12 to FY13	11.4	10.9	6.1
FY13 to FY14	3.8	7.6	6.9
FY14 to FY15	5.2	10.5	6.3
FY15 to FY16	9.1	10.2	7.2
FY16 to FY17	12.4	9.7	9.2
FY17 to FY18	5.6	10.7	6.0
FY18 to FY19	6.5	8.9	6.2
FY19 to FY20	9.6	7.3	5.0
FY20 to FY21	-3.4	#N/A	#N/A

#N/A- Not Available

Table 3-2: Average Annual Growth Rates (%) of GSDP for PIA States

- **Madhya Pradesh's** Gross State Domestic Product (GSDP) stood at Rs 5,804.1 billion in FY20 and has been growing at a compounded annual growth rate of 7.8 percent since FY12. The GSDP estimates for the year FY21 is Rs 5,608.5 billion. **The state's growth** has been growing between 5-13 percent since 2015-16. It has shown a growth of around 9.6 percent in FY20. The services sector is the largest contributor to GSDP (39.7 percent), agriculture allied activities sector at 34.6 percent and secondary sector at 25.7 percent of the GSDP in 2019-20.
- **Gujarat's** Gross State Domestic Product (GSDP) stood at Rs 12,689.6 billion in 2019-20 and has been growing at a compounded annual growth rate of 9.6 percent since 2011-12.
- Gross State Domestic Product (GSDP) of Maharashtra stood at Rs 21,340.6 billion in 2019-20 and has been growing at a compounded annual growth rate of 6.8 percent since 2011-12.
- The secondary sector is the largest contributor to GSDP of the PIA state of Gujarat, 46.3 percent whereas for the PIA state of Maharashtra, services sector is the largest contributor to GSDP with 57 percent.

The average annual growth rates as obtained using regression analysis till the last available year are presented in Table 3-3.

State/Particular	Madhya Pradesh	Gujarat	Maharashtra
	2011-12 to 2019-20		
GSDP	7.8	9.6	6.8
Primary	6.9	6.5	2.9
Secondary	7.3	10.9	6.3
Tertiary	7.3	8.6	7.8
Construction	4.4	3.7	3.2
Per Capita Income	6.1	8.2	5.7

Table 3-3: Average Annual Growth Rates (%) of State Income for PIA States

The GSDP over the years for the states of Madhya Pradesh, Gujarat and Maharashtra are presented in Figure 3-3.

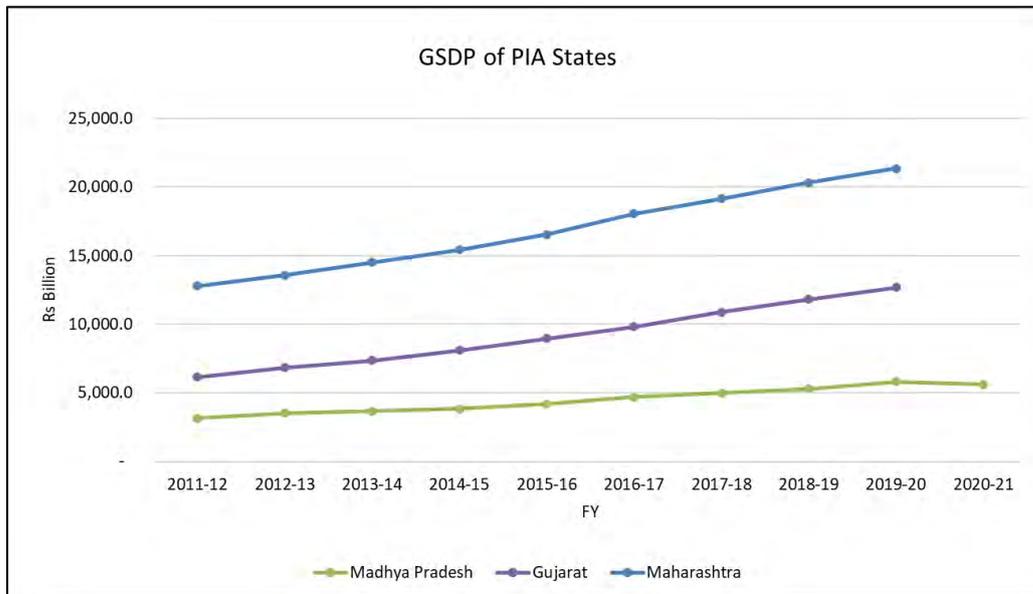


Figure 3-3: GSDP (in Rs Billion) for Influencing PIA States

Economy of Madhya Pradesh is highly dependent on agriculture, although services and industries play an increasingly significant role in the economy of the state. The construction sector is one of the main drivers of the industrial growth of Madhya Pradesh. The state is manufacturing base for a number of large and medium scale industries from diverse sectors such as automobile and auto-components, cement, agro-processing, consumer goods, pharmaceuticals, etc. The state has large mineral resources of coal, copper, limestone, and magnesium. The main industries are in the cement, minerals and textile sectors.

Bhopal, Indore, Gwalior and Jabalpur are the major locations where SEZs have been approved. These SEZs have been proposed for mineral-based, agro-based and multi-product industries. There is one operational multi-product SEZ in Indore.

The per capita income of Madhya Pradesh is Rs 70,014 in the year 2019-20 and has been growing at 6.1 percent during 2011-12 to 2019-20.

### 3.5 India and PIA Outlook

#### 3.5.1 India's past performance and outlook for future

India's growth trend during the recent years has been presented in Figure 3-4.

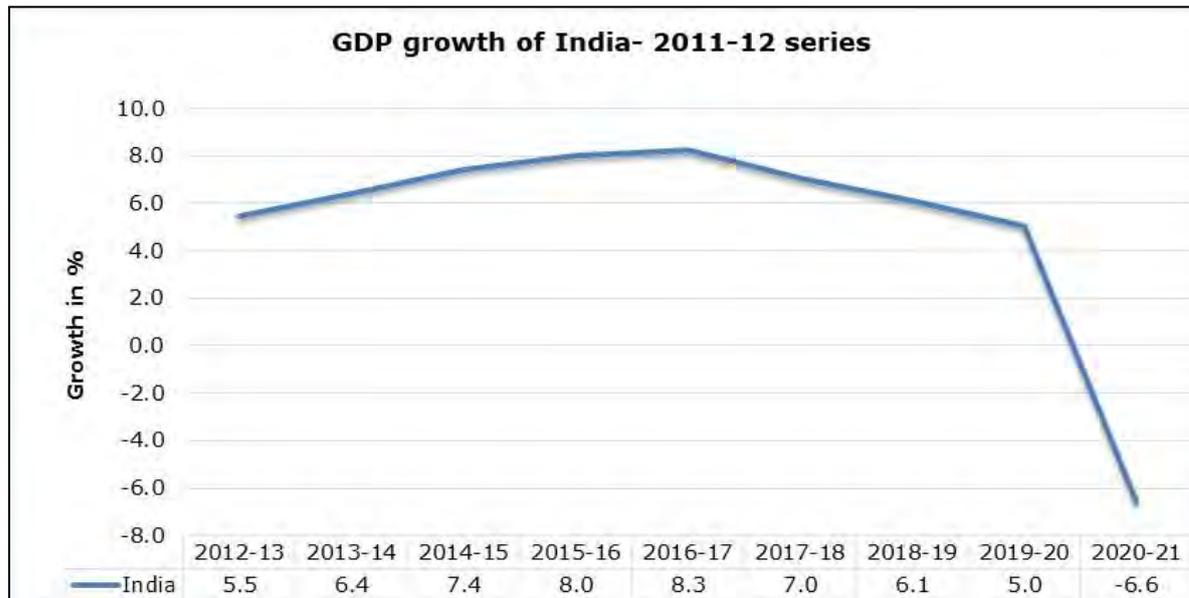


Figure 3-4: GDP Growth in India

Economic growth in India has been broadly on an accelerating path till FY18. It is likely to be the fastest growing major economy in the world in the medium-term. The growth in real GDP was 8.3 percent for FY17 and 7.0 percent in FY18, while the growth in FY19 was slightly lower at 6.1 percent. The long-term trend line growth of 7.2 percent has been achieved between FY12 to FY19. During FY20, growth has slowed down due to some structural issues and global headwinds resulting in an average GDP growth rate of 4.2 percent.

With the outbreak of COVID-19, global recession is likely to be witnessed across all the economies. The lockdown period announced by Indian government had an adverse impact on the economy. The first quarter estimated for FY21 has indicated a contraction of 23.9 percent, second quarter showed a rebound in growth by contracting 7.5 percent and third & fourth quarter grew by 0.5 percent and 1.6 percent respectively. The resultant contraction for FY21 is likely to be around 6.6 percent.

The Indian economy is likely to see the impact of global slowdown due to COVID-19 and hence, the GDP forecast for India by various international agencies has been revised for the next two years. As per the latest update by Central Statistical Organisation (CSO), GDP in Q2 of FY22 has grown by 8.4 percent (down from 20.1 percent in Q1) and is likely to achieve a yearly growth rate of 9.5 percent (with 6.6% in Q3 and 6% in Q4). Further on, the economy is likely to grow in the range of 6.5-7.0 percent in FY23 and over 7.0 percent thereafter as per the forecast by CSO. As per Economic Survey of India for FY22, the economy is predicted to have a growth rate of 9.2 percent for FY22 and 8.0-8.5 percent in FY23. With the vaccination programme having covered the bulk of the population, economic momentum building back and the likely long-term benefits of supply-side reforms in the pipeline, the Indian economy is in a good position to witness GDP growth of 8.0-8.5 per cent in 2022-23.

The year-on-year growth for Indian economy as provided by the Client is presented in Table 3-4.

FY End	India
2022	9.1
2023	7.8
2024	7.8
2025	7.9
2026	7.9
2027	7.9
2028	7.1
2029	7.1
2030	7.2
2031	7.2
2032	7.2
2033	6.6
2034	6.6

Table 3-4: Future Outlook of India

### 3.5.2 PIA states outlook

The outlook for PIA states as provided by the client has been presented in Table 3-5.

FY End /State	Madhya Pradesh	Gujarat	Maharashtra
2022	5.7	9.8	4.4
2023	7.6	8.3	7.0
2024	7.6	8.3	7.0
2025	7.7	8.3	7.0
2026	7.7	8.4	7.0
2027	7.7	8.4	7.0
2028	7.0	7.9	6.6
2029	7.0	7.9	6.6
2030	7.0	7.9	6.6
2031	7.0	7.9	6.6
2032	7.0	7.9	6.6
2033	6.5	7.8	6.5
2034	6.5	7.8	6.5

Table 3-5: Future Outlook of PIA States

Based on the OD shares of the toll plaza location and the outlooks adopted for PIA states, the future weighted income for different vehicle types is presented in Table 3-6.

FY End/Mode	Car	LCV	Bus	2A	MAV>2 Axle
2023	7.6	7.6	7.6	7.7	7.7
2024	7.6	7.6	7.6	7.7	7.7
2025	7.7	7.7	7.7	7.7	7.8
2026	7.7	7.7	7.7	7.8	7.8

FY End/Mode	Car	LCV	Bus	2A	MAV>2 Axle
2027	7.7	7.7	7.7	7.8	7.8
2028	7.0	7.0	7.0	7.1	7.1
2029	7.0	7.0	7.0	7.1	7.1
2030	7.0	7.0	7.0	7.1	7.1
2031	7.0	7.0	7.0	7.1	7.1
2032	7.0	7.0	7.0	7.1	7.1
2033	6.5	6.5	6.5	6.6	6.7
2034	6.5	6.5	6.5	6.6	6.7

Table 3-6: Future Perspective of PIA Weighted Income

### 3.6 Review of Past Traffic Data

The toll traffic data for the project road from the date of operation till December 21 was provided by the client. A time series analysis of the traffic data and comparison of the yearly averages with the current estimates of FY22 of the total traffic including exemptions and violations is presented in Table 3-7.

FY/Mode	CJV	LCV	Bus	2A	MAV> 2 Axle
TP01- Fanda					
FY11	4,962	872	293	844	1,073
FY12	5,195	783	300	836	1,085
FY13	5,109	702	297	778	1,001
FY14	5,230	749	298	801	1,051
FY15	5,548	749	336	750	939
FY16	6,756	972	463	839	1,168
FY17	8,502	1,182	579	939	1,318
FY18	7,108	1,044	515	880	1,219
FY19	7,876	1,196	548	901	1,317
FY20	8,018	1,333	590	844	1,148
FY21	8,072	1,599	368	860	1,241
FY22 (E)	9,605	1,693	590	760	1,310
YOY Growth in %					
FY12 vs FY11	4.7	-10.2	2.3	-1.0	1.1
FY13 vs FY12	-1.7	-10.3	-1.2	-7.0	-7.7
FY14 vs FY13	2.4	6.7	0.3	3.0	5.0
FY15 vs FY14	6.1	0.0	12.9	-6.4	-10.7
FY16 vs FY15	21.8	29.8	37.7	11.9	24.4
FY17 vs FY16	25.8	21.5	25.2	11.9	12.8
FY18 vs FY17	-16.4	-11.7	-11.1	-6.2	-7.5
FY19 vs FY18	10.8	14.6	6.4	2.4	8.0
FY20 vs FY19	1.8	11.5	7.6	-6.4	-12.8
FY21 vs FY20	0.7	19.9	-37.6	1.9	8.1
FY22 (E) vs FY21	19.0	5.9	60.4	-11.6	5.6
Trendline Growth in %					
FY20 vs FY13	7.6	10.0	11.8	2.1	3.6
FY20 vs FY15	6.3	10.1	9.6	2.1	3.7
FY21 vs FY14	6.3	10.9	5.7	1.5	3.0
TP02-Amlaha					

FY/Mode	CJV	LCV	Bus	2A	MAV> 2 Axle
FY11	3,432	601	264	834	1,074
FY12	4,047	627	277	826	1,097
FY13	4,164	645	292	787	1,015
FY14	4,218	704	295	808	1,070
FY15	4,371	687	334	742	950
FY16	5,052	783	430	830	1,187
FY17	6,511	1,023	560	945	1,373
FY18	5,641	1,003	489	882	1,265
FY19	6,152	1,149	520	886	1,337
FY20	6,038	1,246	549	841	1,197
FY21	6,643	1,552	354	884	1,439
FY22 (E)	7,766	1,600	549	772	1,372
YOY Growth in %					
FY12 vs FY11	17.9	4.3	5.0	-0.9	2.1
FY13 vs FY12	2.9	2.8	5.4	-4.7	-7.4
FY14 vs FY13	1.3	9.1	1.0	2.7	5.3
FY15 vs FY14	3.6	-2.4	13.3	-8.1	-11.2
FY16 vs FY15	15.6	14.0	28.7	11.8	24.9
FY17 vs FY16	28.9	30.7	30.3	13.9	15.7
FY18 vs FY17	-13.4	-1.9	-12.6	-6.7	-7.9
FY19 vs FY18	9.0	14.5	6.2	0.4	5.7
FY20 vs FY19	-1.9	8.4	5.6	-5.0	-10.4
FY21 vs FY20	10.0	24.5	-35.4	5.1	20.2
FY22 (E) vs FY21	16.9	3.1	54.9	-12.7	-4.6
Trendline Growth in %					
FY20 vs FY13	6.8	10.6	10.9	1.9	4.0
FY20 vs FY15	6.1	12.5	8.7	2.2	4.2
FY21 vs FY14	6.4	12.2	5.1	1.7	4.3
TP03- Bhourasa					
FY11	4,271	837	319	1,148	1,316
FY12	4,628	819	311	1,166	1,476
FY13	4,505	679	308	1,009	1,309
FY14	4,752	731	316	996	1,237
FY15	5,249	779	351	961	1,128
FY16	6,210	1,070	461	1,066	1,365
FY17	7,994	1,385	524	1,182	1,550
FY18	6,811	1,228	512	1,055	1,476
FY19	7,019	1,285	541	985	1,473
FY20	7,182	1,409	580	907	1,315
FY21	7,559	1,638	366	945	1,553
FY22 (E)	8,738	1,678	580	789	1,522
YOY Growth in %					
FY12 vs FY11	8.3	-2.2	-2.6	1.5	12.2
FY13 vs FY12	-2.6	-17.1	-0.8	-13.5	-11.3
FY14 vs FY13	5.5	7.7	2.4	-1.2	-5.5
FY15 vs FY14	10.5	6.6	11.3	-3.6	-8.8
FY16 vs FY15	18.3	37.4	31.2	10.9	21.0
FY17 vs FY16	28.7	29.4	13.6	10.9	13.5
FY18 vs FY17	-14.8	-11.4	-2.3	-10.8	-4.8

FY/Mode	CJV	LCV	Bus	2A	MAV> 2 Axle
FY19 vs FY18	3.0	4.7	5.6	-6.6	-0.2
FY20 vs FY19	2.3	9.6	7.3	-7.9	-10.7
FY21 vs FY20	5.3	16.3	-37.0	4.2	18.1
FY22 (E) vs FY21	15.6	2.4	58.6	-16.5	-2.0
Trendline Growth in %					
FY20 vs FY13	7.7	12.0	10.5	-0.5	2.2
FY20 vs FY15	5.2	10.2	8.8	-1.8	2.7
FY21 vs FY14	6.2	11.4	4.9	-1.2	3.1

Table 3-7: Past Toll Data Traffic Comparison

The comparison of past data across the toll plazas shows average trend line growth for car traffic of 5.2-7.7 percent between FY13 to FY20 across the three toll plazas. The slowdown in FY20 can be attributed to manufacturers deciding to reduce production of diesel cars in the near-future, technology disruption in the form of compliance to Bharat Stage VI norms, economic downturn and COVID 19.

LCV category has shown a 10-13 percent trendline growth from FY15 to FY20 across the three plazas. In 2A truck category, around 2.1 percent and 2.2 percent of trend line growth is seen between FY15 and FY20 at TP01 and TP02 respectively; TP03 has shown a negative growth of 1.8 percent. In case of MAV>2 Axle category, the trend line growth of around 3-5 percent is witnessed between FY15 and FY20 across the three toll plazas. Higher MAV growth has been observed in FY18 at TP03 due to damage of a bridge on the NH3 on adjoining Dewas-Shivpuri stretch (in March-April 2017) which possibly diverted some of the MAV traffic to TP03 of DBCPL stretch. The traffic has possibly diverted back to NH-3 in FY20.

The other main factors that might have impacted the traffic in the past include the impact of demonetisation in November 2016, GST in July 2017, all India **truckers' strike in July 2018**, revision of permissible Gross Vehicle Weights (GVW) for freight vehicle as per the new notification released by NHA1 on 18th July, 2018 and the impact of country wide/ state lockdowns starting from March 2020 and continuing in few months of FY21.

### 3.7 Past and Future Transport Demand Elasticity

The econometric model applied for the project, relates traffic growth to changes in state domestic product via an elasticity factor according to IRC guidelines.

The best measure of deriving traffic elasticity to income is time series data of traffic on the road. In case of the project road, past traffic data is available since the year of operation of the toll plaza. The YOY mode wise traffic elasticity has been derived using rate of growth in the traffic vis a vis the rate of growth in income (weighted income derived from weighted OD shares). The elasticity estimates for different time periods have been done using regression analysis with mode wise traffic as dependent variable and weighted income as independent variable. The rate of income growth of PIA states observed in FY12 to FY20 is assumed to continue for FY21 also. The year on year and trend line elasticity for different modes is presented in Table 3-8.

Period/Modes	CJV	LCV	Bus	2A	MAV> 2 Axle
<b>TPO1- Fanda</b>					
YOY Elasticity					
FY13 vs FY12	-0.1	-0.9	-0.1	-0.6	-0.7
FY14 vs FY13	0.6	1.6	0.1	0.7	1.1
FY15 vs FY14	1.2	0.0	2.5	-1.1	-1.7
FY16 vs FY15	2.4	3.3	4.2	1.3	2.7
FY17 vs FY16	2.1	1.8	2.0	1.0	1.1
FY18 vs FY17	-2.9	-2.0	-2.0	-1.0	-1.1
FY19 vs FY18	1.7	2.2	1.0	0.4	1.2
FY20 vs FY19	0.2	1.2	0.8	-0.7	-1.4
FY21 vs FY20	0.1	2.1	-3.9	0.2	0.9
Trend Line Elasticity					
FY20 vs FY13	1.0	1.3	1.5	0.3	0.5
FY20 vs FY15	0.8	1.2	1.2	0.3	0.5
FY21 vs FY14	0.8	1.3	0.7	0.2	0.4
<b>TPO2- Amlaha</b>					
YOY Elasticity					
FY13 vs FY12	0.3	0.2	0.5	-0.4	-0.7
FY14 vs FY13	0.3	2.2	0.3	0.6	1.1
FY15 vs FY14	0.7	-0.4	2.6	-1.4	-1.8
FY16 vs FY15	1.7	1.5	3.2	1.3	2.7
FY17 vs FY16	2.3	2.5	2.4	1.1	1.3
FY18 vs FY17	-2.4	-0.3	-2.2	-1.1	-1.2
FY19 vs FY18	1.4	2.2	1.0	0.1	0.8
FY20 vs FY19	-0.2	0.9	0.6	-0.5	-1.2
FY21 vs FY20	1.0	2.6	-3.7	0.5	2.3
Trend Line Elasticity					
FY20 vs FY13	0.9	1.4	1.4	0.3	0.5
FY20 vs FY15	0.8	1.5	1.1	0.3	0.5
FY21 vs FY14	0.8	1.4	0.6	0.2	0.5
<b>TPO3- Bhourasa</b>					
YOY Elasticity					
FY13 vs FY12	-0.2	-1.5	-0.1	-1.2	-1.0
FY14 vs FY13	1.4	1.9	0.6	-0.3	-1.2
FY15 vs FY14	2.0	1.2	2.2	-0.6	-1.4
FY16 vs FY15	2.0	4.1	3.4	1.2	2.3
FY17 vs FY16	2.3	2.4	1.1	0.9	1.2
FY18 vs FY17	-2.6	-1.9	-0.4	-1.8	-0.7
FY19 vs FY18	0.5	0.7	0.9	-1.0	0.0
FY20 vs FY19	0.2	1.0	0.8	-0.9	-1.2
FY21 vs FY20	0.5	1.7	-3.8	0.5	2.0
Trend Line Elasticity					
FY20 vs FY13	1.0	1.5	1.3	-0.1	0.3
FY20 vs FY15	0.7	1.3	1.1	-0.2	0.4
FY21 vs FY14	0.8	1.4	0.6	-0.1	0.4

Table 3-8: Actual Past Traffic Elasticity

## Cars

- The motorisation rate for cars (per 1000 population) in India has gone up from 6.6 in 2001 to 20 in 2015. Although India's car fleet has been growing at 10% for nearly 25

years, its motorization rate is low compared to other countries of similar wealth and much lower than developed countries with motorization rate of around 450. The low motorization rate suggests that there is room for continued growth for many years to come. The forecasts by different agencies indicate that number of cars will increase to 35 per thousand populations by 2025. With the continual increase in motorization rate and improved road network usage of cars for inter-urban travel is showing a rising trend.

- A regression between GSDP (as independent variable) and registered vehicles (as dependent variable) of PIA state was carried out and registered vehicle elasticity for the state of Madhya Pradesh in case of cars is 1.2.
- Actual trend line elasticity for the period FY13 to FY20 has been around 0.9-1.0 at all the toll plazas. Going into the future, an elasticity of 0.9 has been adopted for all the toll plazas till 2030.
- It is likely that this growth would slow down over time as the market becomes more mature and saturated, therefore elasticity to GSDP can be expected to decline over time. For the period beyond FY30, an elasticity of 0.8 is adopted for cars at the three plazas.

#### Bus

- **Over the years in India there has been a change in passenger's travel mode preferences with increasingly more people shifting from public transport systems towards personalised modes.** This has resulted, in general, in elasticity of bus traffic/demand to GSDP lower than unity in the recent years. Actual trend line elasticity for the period FY16 to FY20 has been around 0.6-0.7 at all the toll plaza locations.
- An elasticity of 0.7 has been adopted for all the toll plazas till the end of the concession period.
- In case of Buses, due to the impact of COVID and implementation of social distancing norms, the Bus service is yet to pick up on the highways. In view of this, Buses in FY20 are considered as corrected AADT for FY22 for all the toll plazas.

#### LCVs

- Predominance of Mini LCV in the LCV category for short haul traffic is being witnessed across many national highways. The LCV segments are also witnessing a smart uptick in demand in the goods carrier segment, where the 2T mini-truck and 2-3.5T pickups dominate with 90 percent share of the total LCV goods segment.
- At the same time Mini LCV have become more popular over LCVs for short distance traffic and more localised supply movements. Actual trend line elasticity for the period FY15 to FY20 has been more than 1.0 at all the toll plazas.

- An elasticity of 1.1 has been considered from FY23-FY25. Going into the future, an elasticity of 1.0 has been considered at all the plazas for the period up to FY30 and 0.9 beyond that.

#### Truck and MAV

- In India as a whole, the freight vehicle mix has been changing in the last decade favouring MAV to 2 Axle/ 3Axle vehicles for long-distance traffic, given the operational efficiencies achievable with larger vehicles. Considering the ongoing technical advancements in automobile industry, some of the standard 2 Axle/ 3 Axle trucks would gradually be replaced by MAVs. Mature National Highways with tolling in operation for few years, have already witnessed the shift in 2A/3A trucks to MAV for long distance movement and some of the 2A trucks are still being used for local movements.
- In case of trucks, registered vehicle elasticity is 1.7 for Madhya Pradesh, 0.77 for the state of Gujarat and 0.94 for the state of Maharashtra.
- In quite a few highways now, after a rapid decline over the years, 2A/3A trucks now with lower base have started showing growth trend due to their preference to cater to the local supplies of the region. In case of the project road, trendline elasticity of 0.3 has been observed at TP01 and TP2 for the period FY15 to FY20 while it has been negative at TP03.
- For the project road, an elasticity of 2A truck traffic to GSDP of 0.2 has been adopted till the end of concession period for all the toll plazas.
- In case of MAV category, for the period from FY15 to FY20, the trendline elasticity has been varying between 0.4 to 0.5 across the three toll plazas. For future years, an elasticity of 0.5 has been considered at all the toll plazas.

It has been assumed that transport demand elasticity, for both freight and passenger traffic, would gradually decline over time, despite growth in economy, as regions becomes more mature, self-sufficient and with alternative mode of transport available to users. Due consideration has been given to the tonnage shifts happening in the market with Mini LCV gaining importance for short distance movements over LCVs and MAVs being preferred over 2A/3A for long distance movements due to better operational efficiencies. Thus, in this study higher elasticity values for Mini LCV (being charged in LCV) and MAV have been considered as compared to LCV/2 Axle/ 3 Axle trucks.

While assigning elasticities to different toll plazas and modes, freight travel pattern and over all elasticity of cargo tonnage with respect to weighted GSDP has been an important consideration. The recommended elasticity values adopted for all vehicle types in line with the past traffic data and changes in freight traffic pattern observed on the project road are presented Table 3-9.

FY/Modes	Cars	LCV	Bus	Truck	MAV
2023-25	0.9	1.1	0.7	0.2	0.5
2025-2030	0.9	1.0	0.7	0.2	0.5
Beyond 2030	0.8	0.9	0.7	0.2	0.5

Table 3-9: Recommended Elasticity for Project Road

### 3.8 Projected Traffic Growth Rates

Based on the moderated perspective elasticity values and the projected growth rates of the income for PIA states, the future average annual compound traffic growth rates by vehicle type have been estimated for the project road by using the following relationship:

$$T_{gr} = (GSDP_{gr}) \times E$$

Where,

$T_{gr}$  – Traffic growth rate for mode

$GSDP_{gr}$  – Growth rate of GSDP

$E$  – Elasticity value for mode

The estimated traffic growth rates for the project road have been presented in Table 3-10.

FY End/Mode	Car	LCV	Bus	Truck	MAV > 2 Axle
2023	6.8	8.4	5.3	1.5	3.8
2024	6.8	8.4	5.3	1.5	3.8
2025	6.9	8.5	5.4	1.5	3.9
2026	6.9	7.7	5.4	1.6	3.9
2027	6.9	7.7	5.4	1.6	3.9
2028	6.3	7.0	4.9	1.4	3.6
2029	6.3	7.0	4.9	1.4	3.6
2030	6.3	7.0	4.9	1.4	3.6
2031	5.6	6.3	4.9	1.4	3.6
2032	5.6	6.3	4.9	1.4	3.6
2033	5.2	5.9	4.6	1.3	3.4
2034	5.2	5.9	4.6	1.3	3.4

Table 3-10: Projected Traffic Growth Rates for Project Road (%)

In derivation of above growth rates, the likely shift of buses to cars in case of passenger vehicles and the replacement/ tonnage shift of LCV/3A trucks by Mini LCV/2A truck for short distance and MAV for long distance in case of freight vehicles has been duly considered.

### 3.9 Traffic Projections

Table 3-11 presents the projections of the total traffic at the toll plazas on the project road using the above growth rates till the end of concession as assessed in this study.

FY Ending March /TP	TP01- Fanda	TP02- Amlaha	TP03- Bhourasa	Average
2022	21,502	19,704	21,503	20,903
2023	22,704	20,774	22,676	22,051
2024	23,983	21,910	23,923	23,272
2025	25,360	23,132	25,263	24,585
2026	26,801	24,409	26,665	25,958
2027	28,334	25,765	28,154	27,418
2028	29,818	27,077	29,595	28,830
2029	31,387	28,463	31,118	30,323
2030	33,048	29,929	32,727	31,902
2031	34,660	31,357	34,295	33,438
2032	36,357	32,860	35,944	35,054
2033	38,020	34,332	37,560	36,637
2034	39,765	35,875	39,254	38,298

Table 3-11: Projected Traffic in PCUs at Toll Plazas

The concession agreement for the project does not mention any guidelines related to design capacity and augmentation options for the project road. However, as per IRC guidelines the designed capacity for 4 lane road is 60,000 PCU. The traffic projections for the project road are not reaching 60,000 PCUs during the concession period.

## 4. TOLL REVENUE PROJECTIONS

### 4.1 Tolling Strategy

The project road has an "Open System" of toll collection which enables the concessionaire to collect tolls from through traffic as well as from short distance one.

As per the Concession Agreement, there are three operational toll plazas at Fanda, Amlaha and Bhourasa with tolling lengths of 31.6 km, 40.0 km and 69.19 km respectively. It is worth mentioning that the user can buy the ticket for all the plazas from any toll plaza and the users can show the barcoded ticket while crossing the other plazas.

### 4.2 Schedule of User Fee

As per Schedule of User Fee (Schedule C) of Concession Agreement for the project, the per km toll rates applicable from 2006/07 for normal tolling length on the rate revision basis and concessions are provided.

The concessions to traffic have been given in the form of rates as below:

#### Normal Ticket:

Traffic purchasing single journey ticket.

#### Monthly Pass

The rate of monthly pass shall be based on the toll charges for the single ticket on the same day and calculated for the month of consisting of 30 or 31 days.

#### Local Personal

Car Traffic from local areas around toll plazas is issued a local personal monthly.

Thus, the different categories of toll tickets are as follows:

- (i) Traffic paying normal toll rates (single trip)
- (ii) Traffic paying monthly pass rates
- (iii) Traffic paying local personal rates

### 4.3 Tolling Streams

In line with the above categories of toll payments, a segmentation of total traffic was done. The tolling stream distribution derived the latest year of FY22 (average of July to December) toll data for each of the toll plaza has been adopted for the present study and is presented in Table 4-1

Ticket Type/Modes	Car	LCV	Bus	Truck	MAV > 2 Axle	MAV - Trailer
TPO1-Fanda						
Single Traffic Fanda	80.1	80.5	83.9	95.0	98.2	97.2
Single Traffic Amlaha	0.9	1.5	1.6	0.7	0.1	0.3
Single Traffic Bhourasa	1.8	1.1	2.6	0.9	0.3	0.7

Ticket Type/Modes	Car	LCV	Bus	Truck	MAV > 2 Axle	MAV - Trailer
Barcode Journeys	2.6	2.7	4.4	2.2	0.4	0.9
Monthly Pass Journeys	2.2	6.7	2.7	0.4	0.6	0.0
Local Pass Journeys	0.0	0.0	0.0	0.0	0.0	0.0
Exemptions	12.4	7.5	4.8	0.7	0.3	0.8
Violations	0.1	0.0	0.0	0.0	0.0	0.1
Total	100.0	100.0	100.0	100.0	100.0	100.0
TPO2-Amlaha						
Single Traffic Amlaha	80.4	82.5	84.3	94.9	98.2	96.9
Single Traffic Fanda	1.2	1.6	1.9	0.7	0.1	0.4
Single Traffic Bhourasa	0.6	0.3	0.2	0.2	0.0	0.1
Barcode Journeys	5.7	4.3	7.6	3.2	0.9	2.4
Monthly Pass Journeys	0.5	3.3	1.1	0.0	0.0	0.0
Local Pass Journeys	0.0	0.0	0.0	0.0	0.0	0.0
Exemptions	11.6	8.0	4.9	1.0	0.8	0.1
Violations	0.0	0.0	0.0	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0
TPO3 -Bhourasa						
Single Traffic Bhourasa	72.4	76.8	87.7	93.2	97.1	93.7
Single Traffic Amlaha	0.3	0.3	0.0	0.1	0.0	0.0
Single Traffic Fanda	1.8	1.2	2.9	1.4	0.3	1.6
Barcode Journeys	2.4	1.4	3.0	1.1	0.3	2.3
Monthly Pass Journeys	0.2	3.6	0.4	0.0	0.0	0.0
Local Pass Journeys	0.0	0.0	0.0	0.0	0.0	0.0
Exemptions	22.9	12.0	4.3	2.0	1.0	2.2
Violations	0.0	4.8	1.7	2.3	1.1	0.2
Total	100.0	100.0	100.0	100.0	100.0	100.0

Table 4-1: Tolling Distribution for the Project Road I including Exemptions and Violations (in %)

The paying traffic for the year FY22 has been worked out by deducting the barcode journeys, toll exempt percentage (exemptions and violations) from total AADT and is presented in Table 4-2.

TP/Mode	Car	LCV	Bus	Truck	MAV > 2 Axle	MAV - Trailer
AADT						
TP1	9,605	1,693	590	760	1,294	16
TP2	7,766	1,600	549	772	1,354	18
TP3	8,738	1,678	580	789	1,516	6
Exemption and violation (%)						
TP1	15.0%	10.3%	9.2%	2.9%	0.7%	1.8%
TP2	17.3%	12.3%	12.5%	4.1%	1.7%	2.6%
TP3	25.3%	18.2%	9.0%	5.4%	2.5%	4.7%
Tollable traffic						
TP1	8,160	1,519	536	738	1,284	16
TP2	6,423	1,403	480	740	1,331	18
TP3	6,528	1,373	528	746	1,478	6

Table 4-2: Toll Paying Traffic, FY22

The tolling stream distribution excluding bar code journeys, exemptions and violations from paying traffic is presented in Table 4-3.

Ticket Type/Modes	Car	LCV	Bus	Truck	MAV > 2 Axle	MAV - Trailer
TPO1-Fanda						
Single Traffic Fanda	94.3	89.7	92.4	97.8	99.0	99.0
Single Traffic Amlaha	1.0	1.6	1.8	0.8	0.1	0.3
Single Traffic Bhourasa	2.1	1.2	2.9	1.0	0.3	0.7
Monthly Pass Journeys	2.6	7.4	2.9	0.4	0.6	0.0
Local Pass Journeys	0.0	0.0	0.0	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0
TPO2-Amlaha						
Single Traffic Amlaha	97.3	94.0	96.4	99.1	99.9	99.4
Single Traffic Fanda	1.4	1.8	2.1	0.8	0.1	0.5
Single Traffic Bhourasa	0.7	0.4	0.3	0.2	0.0	0.1
Monthly Pass Journeys	0.6	3.8	1.2	0.0	0.0	0.0
Local Pass Journeys	0.0	0.0	0.0	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0
TPO3 -Bhourasa						
Single Traffic Bhourasa	96.9	93.8	96.4	98.5	99.7	98.3
Single Traffic Amlaha	0.4	0.3	0.1	0.1	0.0	0.0
Single Traffic Fanda	2.4	1.5	3.2	1.5	0.3	1.7
Monthly Pass Journeys	0.3	4.4	0.4	0.0	0.0	0.0
Local Pass Journeys	0.0	0.0	0.0	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0

Table 4-3: Tolling Distribution for the Project Road Excluding Barcode Journeys, Exemptions and Violations (in %)

The normal toll paying traffic (purchasing for crossing only the corresponding toll plaza) for cars is around 94-98 percent at all the three toll plazas. In case of MAV>2 Axle, the same shares are around 98-99 percent at the three plazas. As mentioned earlier, the user can buy the ticket for all the plazas from any toll plaza and the users can show the barcoded ticket while crossing the other plazas.

The monthly pass trip rates as derived from the toll data are presented in Table 4-4.

Toll Plaza/Modes	Car	LCV	Bus	Truck	MAV > 2 Axle
Fanda	1.34	3.66	1.52	1.99	4.41
Amlaha	1.40	3.87	1.42	2.00	2.00
Bhourasa	1.32	4.08	0.43	2.00	2.00

Table 4-4: Monthly Pass Trip Rates

The trip rate derived from the toll data for car users availing monthly pass at TP01 is 1.34 while at TP02 it is 1.40 and at TP03, it is 1.32.

#### 4.4 Toll Rates

This section presents details on the toll rates that are likely to be imposed on the users of the project road during the concession period. The toll rates (Rs/km) for the base year 2006-07 for different vehicle categories as per concession agreement are presented in Table 4-5.

Mode	Base rate per km (in Rs) as per CA
Car, Jeep, Van	0.4
LCV	0.9
Bus	1.8
2 Axle Truck	2.1
MAV	4.2

Table 4-5: Toll Rates in Rs/km for Different Vehicle Categories

The CA states that the 2006 toll rates shall be increased by seven percent each year with effect from the 1st day of April 2008 and such increased rate shall be deemed to be the base rate for the subsequent years.

The stream of toll rates to be charged at the toll plazas for cardinal years is presented in Table 4-6. The toll fee has been rounded to nearest Rupees as per Schedule C of the concession agreement.

FY Ending March /Mode	Car	LCV	Bus	Truck	MAV > 2 Axle	MAV - Trailer
TPO1-Fanda						
2022	<b>29</b>	<b>69</b>	<b>143</b>	<b>172</b>	<b>343</b>	<b>343</b>
2025	35	84	175	210	420	420
2030	49	118	246	295	589	589
2034	65	155	322	387	772	772
TPO2-Amlaha						
2022	<b>36</b>	<b>87</b>	<b>181</b>	<b>217</b>	<b>434</b>	<b>434</b>
2025	45	107	222	266	531	531
2030	63	150	311	374	745	745
2034	82	196	408	490	977	977
TPO3 -Bhourasa						
2022	<b>63</b>	<b>151</b>	<b>313</b>	<b>376</b>	<b>750</b>	<b>750</b>
2025	77	185	384	461	919	919
2030	108	259	538	646	1,289	1,289
2034	142	340	705	847	1,690	1,690

Table 4-6: Toll Rates at the Three Toll Plazas (in Rs)

The users purchasing local commercial tickets will pay 50 percent of the above normal toll rates; the traffic opting for monthly passes will pay 30 times the normal traffic toll rates. All passes have been rounded to the nearest Rupees as per concession agreement.

#### 4.5 Projected Tollable Traffic

The projected toll paying traffic in PCUs (excluding exemptions and violations) based on the traffic growth rates till the end of concession as assessed in this study is presented in Table 4-7.

FY Ending March	Tollable Traffic in PCU			
	TP01-Fanda	TP02-Amlaha	TP03-Bhourasa	Average
2022	19,526	17,669	18,395	18,530
2023	20,597	18,606	19,363	19,522
2024	21,734	19,600	20,389	20,574
2025	22,959	20,668	21,491	21,706
2026	24,239	21,784	22,643	22,889
2027	25,600	22,968	23,864	24,144
2028	26,916	24,113	25,045	25,358
2029	28,308	25,321	26,291	26,640
2030	29,780	26,598	27,607	27,995
2031	31,212	27,846	28,894	29,317
2032	32,718	29,157	30,246	30,707
2033	34,195	30,441	31,571	32,069
2034	35,743	31,787	32,959	33,496

Table 4-7: Projected Toll Paying Traffic in PCUs at the Toll Plazas

#### 4.6 Toll Revenue Estimates

The concession period for the project road is 25 years from the appointed date (the date financial close is achieved). Toll revenue realised for FY21 is Rs 1,281.8 million. The revenue collected from April to December 2021 is Rs 1,092.3 million.

Toll revenue streams have been calculated assuming that:

- Toll would be collected for all 365 days in a year; for leap years, 366 days have been used
- Appointed date is March 2008
- Tolling would terminate on 1st December 2033 (original concession end date is 19<sup>th</sup> March 2033); as the concessionaire has received an extension of 195 days (on account of change of scope), 22.5 days (on account for demonetization) and 40 days for Covid 19; however, the revenues have been presented for full year of FY34.

The toll revenue for the total project road along with the concessions available is presented in Table 4-8

FY Ending March	Single Ticket	Monthly pass	Total
2022	1,607.7	6.0	1,613.7
2023	1,801.4	6.9	1,808.3
2024	2,026.0	7.9	2,033.9
2025	2,264.7	9.0	2,273.7
2026	2,542.7	10.3	2,553.1
2027	2,846.6	11.7	2,858.3
2028	3,194.7	13.3	3,208.0
2029	3,556.2	15.1	3,571.4

FY Ending March	Single Ticket	Monthly pass	Total
2030	3,978.4	17.2	3,995.6
2031	4,441.8	19.5	4,461.2
2032	4,973.7	22.0	4,995.7
2033	5,522.6	24.8	5,547.4
2034*	6,143.4	27.9	6,171.3

\*-presented for full year of FY34

Table 4-8: Toll Revenue (in Rs million) by Type of Concession for PR

For the project, vehicles paying normal tolls are around 99.6 per cent of total toll revenues for the project.

A mode wise breakdown of the revenue streams is also presented for the project in Table 4-9

FY Ending March	Car	LCV	Bus	Truck	MAV > 2 Axle	MAV - Trailer	Total
2022	333.4	157.3	126.0	211.4	779.2	6.4	1,613.7
2023	381.3	182.1	142.1	229.8	865.9	7.1	1,808.3
2024	438.1	212.3	160.4	250.5	964.6	7.9	2,033.9
2025	498.8	245.3	180.6	271.0	1,069.1	8.8	2,273.7
2026	574.4	282.5	203.3	294.6	1,188.5	9.8	2,553.1
2027	650.3	326.2	229.7	320.1	1,321.2	10.9	2,858.3
2028	747.3	373.6	258.6	348.2	1,468.3	12.1	3,208.0
2029	841.7	427.2	289.5	377.1	1,622.5	13.3	3,571.4
2030	959.9	488.6	324.7	409.1	1,798.4	14.8	3,995.6
2031	1,087.8	555.9	364.6	444.0	1,992.6	16.4	4,461.2
2032	1,235.0	634.5	410.0	483.2	2,214.7	18.2	4,995.7
2033	1,387.8	716.5	457.5	522.7	2,442.8	20.1	5,547.4
2034*	1,556.9	811.2	511.8	566.4	2,702.8	22.2	6,171.3

\*-presented for full year of FY34

Table 4-9: Toll Revenue (in Rs million) for Project Road by Mode

Cars are likely to generate around 23.7 percent share of the total revenue. In case of LCVs and buses around 12 and 8.1 percent respectively is likely to be generated. The revenue from MAV>2 Axle represents the highest share accounting for about 45.3 percent of the total revenue generated from the PR. Trucks are likely to generate about 10.5 and MAV-Trailers are likely to generate around 0.4 percent of total revenue.

The project road has a revenue CAGR of 11.8 percent during the tenure of concession.

Intended for

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(For the purpose of Highway Infrastructure Trust)

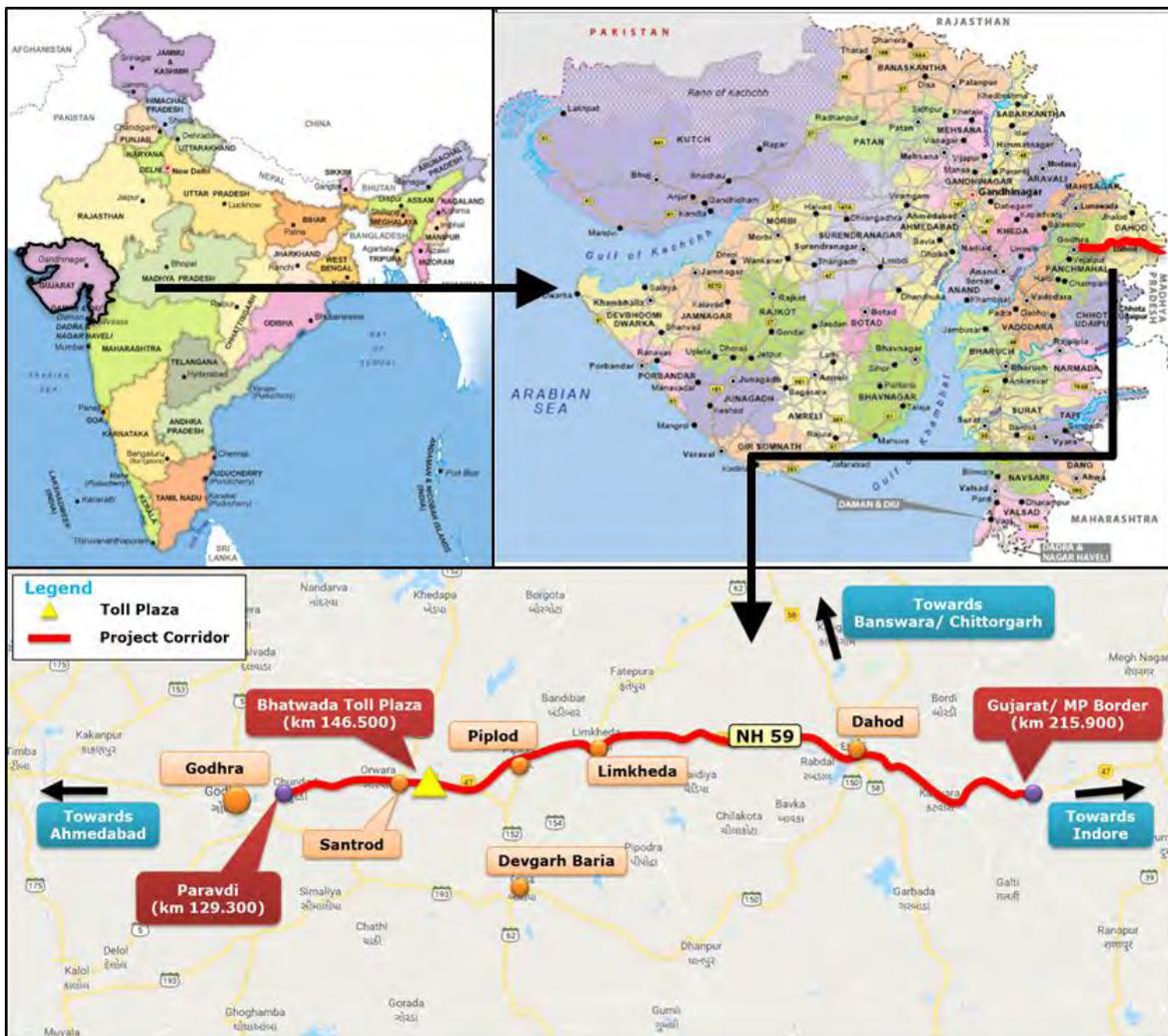
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## TRAFFIC STUDY FOR GODHRA-GUJ/MP BORDER SECTION OF NH-59 IN THE STATE OF GUJARAT



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## ABBREVIATIONS

%	Percentage
₹	Rupees
\$	US Dollar
2A	2 Axle truck
3A	3 Axle truck
AADT	Annual Average Daily Traffic
ADT	Average Daily Traffic
BOT	Build, Operate & Transfer
CA	Concession Agreement
CAGR	Compounded Annual Growth Rate
CJV	Car/Jeep/Van
COVID	Corona Virus Disease
CSO	Central Statistical Organisation
DBFOT	Design, Build, Finance, Operate & Transfer
DME	Delhi-Mumbai Expressway
DMIC	Delhi-Mumbai Industrial Corridor
DPR	Detailed Project Report
EI	Economic Indicator
EME	Earth Moving Equipment
FY	Financial Year
GDP	Gross Domestic Product
GSDP	Gross State Domestic Product
GST	Goods & Services Tax
GVW	Gross Vehicle Weight
HCM	Heavy Construction Machinery
IE	Industrial Estates
IRC	Indian Roads Congress
LCV	Light Commercial Vehicle
MAV	Multi Axle Vehicle
MLCV	Mini Light Commercial Vehicle
MP	Madhya Pradesh
MSME	Micro, Small & Medium Enterprises
MT	Metric Tonne
NH	National highway
NHAI	National Highway Authority of India
NHDP	National Highway Development Programme
OD	Origin & Destination
OSV	Oversized Vehicle
PCU	Passenger Car Unit

PIA	Project Influencing Area
PR	Project Road
RFP	Request For Proposal Document
ROB	Road Over Bridge
SEZ	Special Economic Zone
SPV	Special Purpose Vehicle
TP	Toll Plaza
US	United States of America
WPI	Wholesale Price Index
WPR	Work participation rate
YOY	Year on Year

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## CONTENTS

1.	INTRODUCTION	1
1.1	General	1
1.2	Objective and Scope of Services	1
1.3	Report Structure	2
2.	TRAFFIC ANALYSIS	3
2.1	General	3
2.2	Project Road Characteristics	3
2.3	Base Traffic Estimation	5
2.4	Travel Characteristics	7
3.	TRAFFIC GROWTH RATE AND PROJECTIONS	10
3.1	General	10
3.2	Project Road Traffic	10
3.3	Traffic Growth Rate Estimation	14
3.4	Past Economic Growth of PIA	16
3.5	India and PIA Outlook	18
3.6	Review of Past Traffic Data	22
3.7	Past and Future Transport Demand Elasticity	23
3.8	Projected Traffic Growth Rates	26
3.9	Modifications in Concession Period and Capacity Analysis	27
4.	TOLL REVENUE PROJECTIONS	28
4.1	Tolling Strategy	28
4.2	Schedule of User Fee	28
4.3	Tolling Streams	29
4.4	Toll Rates	30
4.5	Projected Tollable Traffic	32
4.6	Toll Revenue Estimates	33

## LIST OF TABLES

Table 2-1: AADT – FY22 at TP01 - Bhatwada Location as per Tolling Categories.....	6
Table 2-2: Regional Distribution of Tollable Traffic (in %) on Project Road.....	7
Table 2-3: Travel pattern on Project Road.....	8
Table 2-4: Commodity Distribution on Project Road.....	9
Table 3-1: Normalised OD Shares for the Project Road.....	16
Table 3-2: Average Annual Growth Rates (%) of GSDP for PIA States.....	17
Table 3-3: Average Annual Growth Rates (%) of State Income for PIA States.....	17
Table 3-4: Future Outlook of India.....	20
Table 3-5: Future Outlook of PIA States.....	21
Table 3-6: Future Perspective of PIA Weighted Income.....	21
Table 3-7: Past Growth and Trend Analysis.....	22
Table 3-8: Actual Past Traffic Elasticity.....	24
Table 3-9: Recommended Elasticity for Project Road.....	25
Table 3-10: Projected Traffic Growth Rates for the Project Road (%).....	26
Table 3-11: Projected Total Traffic at Toll Plaza.....	27
Table 4-1: Tolling Distribution for the Project Road Including Exemptions and Violations (in %).....	29
Table 4-2: Toll Paying Traffic, FY22.....	29
Table 4-3: Tolling Distribution for the Project Road Excluding Exemptions and Violations (in %).....	30
Table 4-4: Toll Rates in Rs/km for Different Vehicle Categories.....	30
Table 4-5: Toll Rates in Rs for Permanent Structure Exceeding 500 Million Rs Cost.....	31
Table 4-6: WPI Forecast for Toll Rate Indexation.....	32
Table 4-7: Toll Rates at the Toll Plaza (in Rs).....	32
Table 4-8: Projected Toll Paying Traffic in PCUs at the Toll Plaza.....	33
Table 4-9: Toll Revenue (in Rs million) by Type of Concession for PR.....	34
Table 4-10: Toll Revenue (in Rs million) for Project Road by Mode.....	34

## LIST OF FIGURES

Figure 1-1: Alignment Of NH-59 With Major Places.....	1
Figure 2-1: Project Road and Location of Toll Plaza.....	3
Figure 2-2: Past YoY Traffic on the Project Road.....	5
Figure 2-3: MoM Traffic (FY22) on the Project Road.....	6
Figure 3-1: Alignment of Under Construction Delhi – Mumbai Expressway.....	11
Figure 3-2: Alignment of Dahod-Indore Railway Line.....	13
Figure 3-3: Details of Upcoming Projects under Bharatmala in PIA.....	14
Figure 3-4: GSDP (in Rs Billion) for Influencing PIA States.....	18
Figure 3-5: GDP Growth in India.....	19

## 1. INTRODUCTION

### 1.1 General

The project road, Godhra - Gujarat/MP Border, is part of NH-59 which starts at Piravdi near Godhra (km 129.300) and ends at the border of Gujarat with Madhya Pradesh (km 215.900) with a length of about 87.102 km. The project road as part of the upgradation of National Highways in India under NHDP Phase III was upgraded from 2-lane to 4-lane highway. The project road has one toll plaza (Bhatwada TP) located at km 146.500 near Santrod where toll collection started from November 2013. The asset is being run by SPV – Godhra Expressway Pvt. Ltd. for a concession period of 27 years and tolling is operational since October 2013.

National Highway 59 connects Ahmedabad in Gujarat with Indore in Madhya Pradesh while passing through towns and cities such as Dhar, Dahod, Godhra, etc. It covers a distance of 350 km, of which 221 km is in Gujarat and 129 km is in Madhya Pradesh. NH-59 connects major economic centres like Ahmedabad, Vadodara, Kandla, Hazira, Rajkot etc. on the western side to places like Dahod, Pithampur, Indore, Bhopal etc. on the eastern side.

Figure 1-1 shows the alignment of NH-59 along with major places along the highway.

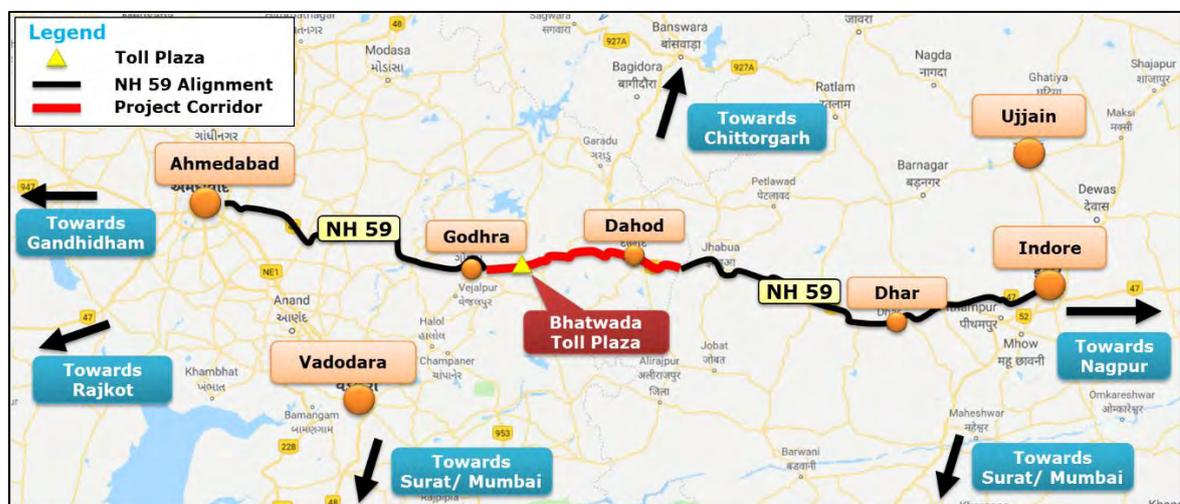


Figure 1-1: Alignment Of NH-59 With Major Places

M/s. Ramboll India Private Ltd has been engaged as Traffic Consultant for Highways Infrastructure Trust to carry out a study for assessing the present traffic levels, travel pattern and revenue estimation duly considering the network characteristics, future economic perspective in the influence area of the project and the provisions in the Concession Agreement of the project for the balance concession period.

### 1.2 Objective and Scope of Services

The scope of services of this study is to prepare Traffic Due diligence Reports covering

- Analysis of recent toll/traffic data of April-December 2021 and its growth trends

- Estimation of the base AADT for FY22
- Traffic projections for the balance concession period
- Toll revenue estimates in view of changes, if any, in WPI forecasts and tolling ticket segmentation
- Scenario Analysis of toll revenue to cover diversion, if any, to/from the project road

### 1.3 Report Structure

The report is divided into four chapters, including this introduction chapter. Chapter 2 contains details of project road characteristics and its analysis to understand the base year traffic and travel characteristics in the Project Influence Area (PIA). Chapter 3 contains the details on the derivation of traffic growth rates used for traffic forecasting and presents traffic projections till the end of the concession period. Chapter 4 presents the details regarding tolling strategy, toll rates and the revenue projections for the duration of the concession.

## 2. TRAFFIC ANALYSIS

### 2.1 General

This chapter presents the details of the project road characteristics, Annual Average Daily Traffic (AADT) and travel characteristics on the project road. The results of the analysis will be utilized in assessing the traffic growth and estimation of traffic and revenue forecast on the project road for the remaining concession period.

### 2.2 Project Road Characteristics

The project road, Godhra - Gujarat/MP Border, part of NH-59, starts at Piravdi near Godhra (km 129.300) and ends at the border of Gujarat with Madhya Pradesh (km 215.900) with a length of about 87.102 km. There is one existing toll plaza (Bhatwada TP) located at km 146.500 near Santrod as part of the concession and toll collection started from November 2013.

The project road section falls under jurisdiction of Panchmahal and Dahod Districts in the State of Gujarat passing through the villages, viz., Santrod, Piplod, Limkheda and Dahod. Panchmahal and Dahod are predominantly agriculture driven regions. The prime share of revenue in these districts comes from agriculture and agriculture-based products. Agro based industries and food processing industries constitute major part of the MSME manufacturing units along with mineral processing and fabrication units. In addition, Panchmahal district boasts of 97 percent of quartz in Gujarat and supplies to other districts and regions supporting ceramic, glass and cement industry. There are some stone crushers present along the corridor near Dahod; however, it does not have a significant impact on the project corridor as the crushers are fed with locally mined raw materials and the crushed stones are supplied locally.

The alignment of project road and toll plaza location is shown in Figure 2-1.

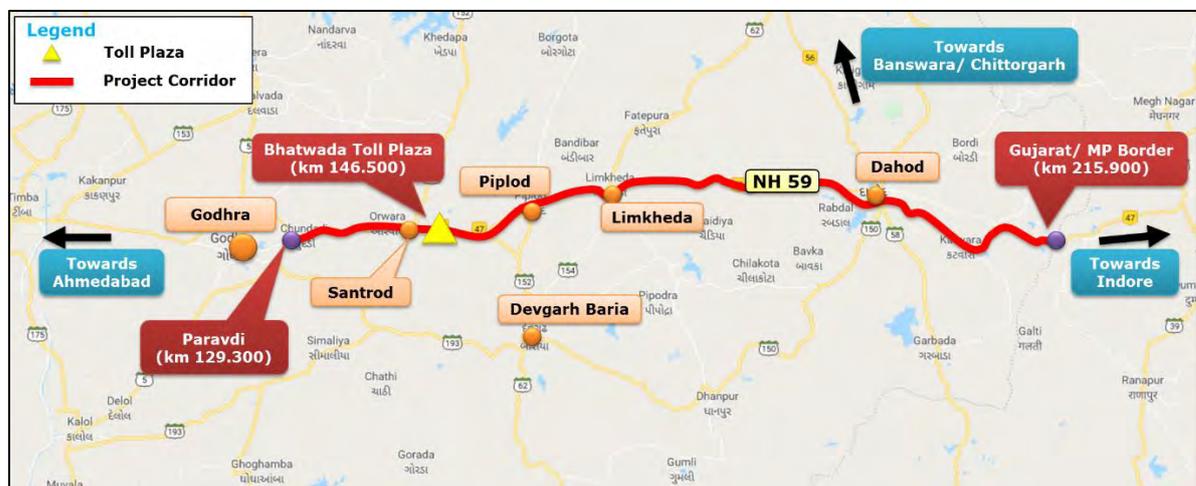


Figure 2-1: Project Road and Location of Toll Plaza

The project road, in wider context, serves the long-distance traffic which is majorly plying from Godhra and beyond to Madhya Pradesh and beyond. Apart from long distance traffic, it also serves the short distance traffic which is mainly generated between Godhra and Dahod and surroundings. Godhra, Devgadhi Baria, Dahod 1 and Dahod 2 (Kharedi) are Industrial Estates (IE) along the project road.

Gujarat, one of the leading industrialized states of India, is located on the western coast of India and has the longest coastline of 1,600 km among all states in the country. It is considered the petroleum capital of India due to the presence of large refining capacity set up by private and public-sector companies. **The state is the world's largest producer of processed diamonds, accounting for 72 per cent of the world's processed diamond share and 95 per cent of India's diamond exports. It is also** the largest manufacturer of denim in the country and the third largest in the world. There are 42 ports, 18 domestic airports and one international airport. The population of Gujarat State was 60.38 million according to 2011 census and the urban population accounts for around 42.6 percent.

### 2.2.1 Profile of Project Influence Area Districts

#### Dahod District

Dahod district is situated in the eastern part of Gujarat with an area of 3,943 sq.km. It is surrounded by the districts of Mahisagar, Panch Mahal and Chhota Udaipur in Gujarat and shares border with the states of Madhya Pradesh and Rajasthan. The city of Dahod is the administrative headquarters of Dahod district.

Dahod is predominantly an agricultural region, and the prime share of revenue comes from the agriculture and related products. Wheat and maize are the major crops produced. Home-based industries such as jute rope and bamboo weaving has grown due to the agriculture driven economy. The economy also thrives on the grain & pulse mills, food processing machinery, and cement & gypsum industries. Small scale industrial clusters are mostly located in Dahod and Devgadhi Baria talukas.

Quartz is the major mineral which is produced along with other minor minerals such as black trap, quartzite, murrum, ordinary sand and clay, etc. 4,000 MT of quartz is produced in the district and supports cement, glass and ceramic industries. Gujarat Fluoro Chemicals Limited in Goghamba taluka is a public sector unit involved in manufacturing of refrigerants. Dahod has been selected as one of the hundred Indian cities to be developed as a smart city under Smart Cities Mission. The Smart City development would help in providing better quality of life for the citizens of Dahod.

The district population as per Census 2011 is 2.13 million with a decadal growth rate of about 30 percent. The work participation rate (WPR) is about 47 percent.

### Panch Mahal District

Panch Mahal district is located on the eastern part of Gujarat with an area of 5,231 sq. km. It is spread over 7 talukas with Godhra as the district headquarter. The district is known for the world heritage site Champaner.

According to 2011 census, the district has a population of 2.39 million with decadal growth of about 18 percent. Agriculture and livestock are the mainstay of livelihood with about 76 percent of the population involved in agriculture. Agricultural produce include mango, banana, papaya, citrus, guava, brinjal, cabbage, cauliflower, cucurbits, onion, garlic, ginger etc. Wheat, maize and pulses are major crops produced in the district.

Major minerals produced include quartz, manganese ore and limestone with other minor minerals such as black trap, quartzite, murrum, etc. It is the largest producer of quartz (about 97 percent). The district is a manufacturing base for steel products, automobiles and cryogenic equipment. Glassware, ceramics and cement industries are gradually emerging due to the presence of quartz in the district. Small scale industry sectors such as food processing units, wooden products and machine tools are the supporting pillars of the economy with major industrial clusters being located at Kalol, Halol and Godhra.

### 2.3 Base Traffic Estimation

For the present study, the toll traffic data at the toll plaza location was provided by the client for the period November 2013 to December 2021. The year-on-year mode wise traffic for the project road is presented in Figure 2-2.

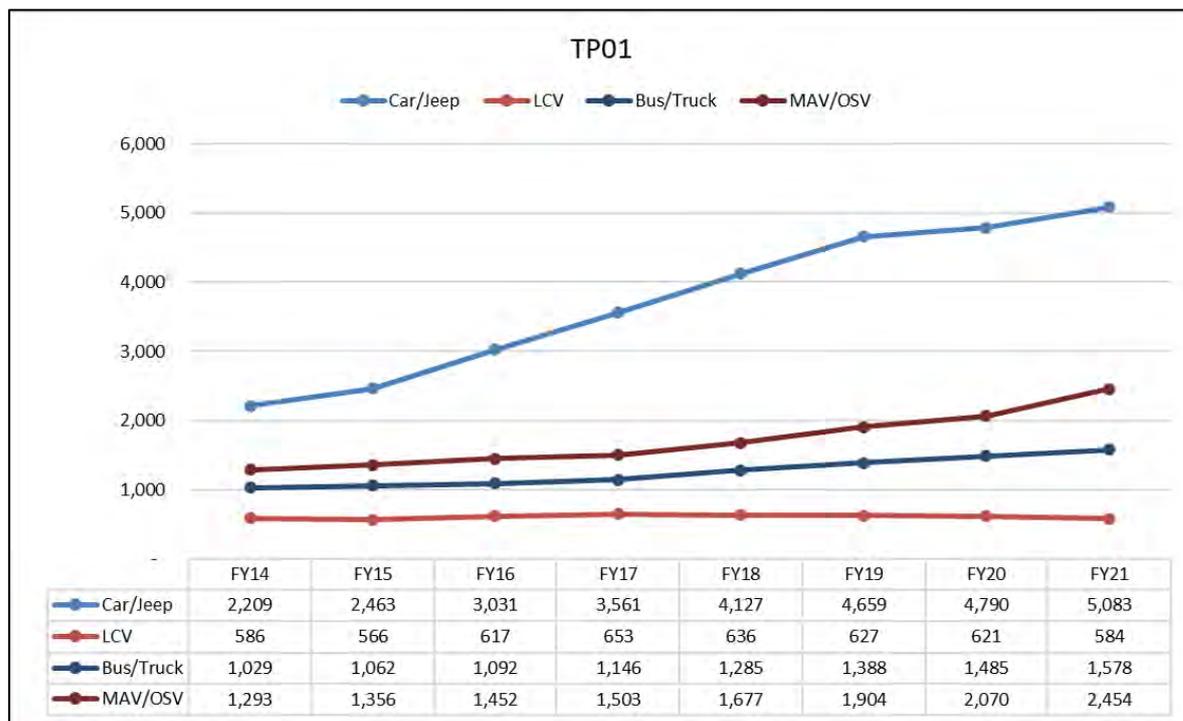


Figure 2-2: Past YoY Traffic on the Project Road

The traffic during FY21 was impacted by COVID-19 indicating a decline in first quarter traffic in almost all the modes due to complete lockdown measures implemented by the

Central government due to spread of COVID 19 virus throughout the country. The traffic showed recovery in second quarter of FY21 as the lockdowns were eased and economic activities slowly started to pick up. Next two quarters have shown a substantial pickup of traffic.

The onset of the second wave of Covid-19 and the lockdowns announced by the state government during April-May 2021 was a setback to the continuous recovery of traffic to normal levels. With the opening of economic activities, the traffic has started to pick up and shows a recovery from June 2021 onwards. The month-on-month mode wise traffic for the FY22 (April-December) is presented Figure 2-3

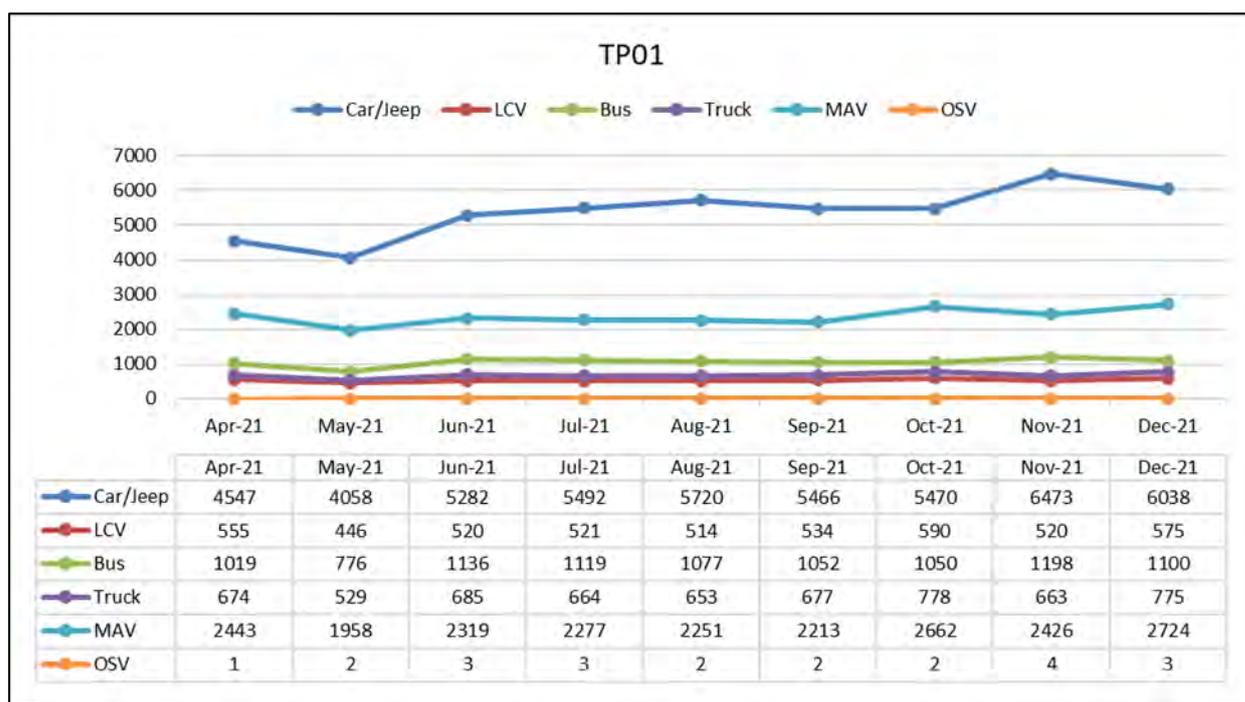


Figure 2-3: MoM Traffic (FY22) on the Project Road

With that in mind, estimation for FY22 AADT is done after annualising the behaviour of June-December traffic. For this purpose, a ratio/ factor of average of June-December to twelve-month average derived from FY19. FY22 AADT derived from the toll traffic data along with 7 months to yearly factors in presented in Table 2-1

Mode	Car	LCV	Bus	2A	MAV	OSV
ADT June-December (7 months)	5,706	539	1,105	699	2,410	3
Seven-to-twelve-month correction factor	1.03	1.05	1.01	1.05	1.05	1.13
AADT	5,868	569	1,117	732	2,540	3

Table 2-1: AADT – FY22 at TP01 - Bhatwada Location as per Tolling Categories

## 2.4 Travel Characteristics

### 2.4.1 Regional Distribution

Table 2-2 gives the distribution indicating the attraction and generation zones for the traffic on the project road.

Region/Modes	Car	Bus	LCV	2A	3A	MAV
Gujarat	84.7	90.6	74.1	75.1	72.8	59.7
Madhya Pradesh	12.8	6.9	22.2	22.2	20.7	24.8
Rajasthan	1.5	1.3	1.3	1.3	1.2	4.9
Uttar Pradesh	0.3	0.5	0.5	0.3	2.1	4.2
Maharashtra	0.4	0.5	0.5	0.3	0.6	1.5
Rest of India	0.5	0.3	0.3	1.9	2.5	4.9
Total	100.0	100.0	100.0	100.0	100.0	100.0

Table 2-2: Regional Distribution of Tollable Traffic (in %) on Project Road

Passenger Traffic:

- Car traffic at the toll plaza location is mostly from within Gujarat state (84.7 percent) followed by Madhya Pradesh (12.8 percent) and around 1.8 percent is from Rajasthan and Uttar Pradesh together.
- In case of bus traffic major share is of Gujarat State (90.6 percent) followed by Madhya Pradesh accounting for 6.9 percent.

Freight Traffic:

- Around 74.1 % of the LCV traffic is from the state of Gujarat, followed by Madhya Pradesh and Rajasthan accounting for 22.2 percent and 1.3 percent respectively.
- In 2A trucks around 75.1 percent is from Gujarat followed by Madhya Pradesh with 22.2 percent.
- In case of large freight vehicles (3A and MAV), Gujarat accounts for a share of about 72.8 percent and 59.7 percent respectively followed Madhya Pradesh with 20.7 percent and 24.8 percent respectively.

### 2.4.2 Travel Pattern

The major travel pattern movements in for passenger and freight traffic as available from an earlier study by consultants are presented in Table 2-3

S. No	Traffic Streams	Car	Bus	LCV	2A	3A	MAV
1	Godhra & Surroundings to Dahod & Surroundings	61.9%	51.0%	42.0%	18.5%	13.2%	11.9%
2	Godhra & Surroundings to Beyond Dahod	3.5%	2.7%	7.6%	9.6%	8.6%	13.7%
3	Ahmedabad/Vadodara & Surroundings to Dahod & Surroundings	21.6%	33.3%	21.0%	17.3%	20.0%	11.7%
4	Ahmedabad/Vadodara & Surroundings to Beyond Dahod	6.4%	6.2%	19.3%	34.2%	43.1%	51.8%

S. No	Traffic Streams	Car	Bus	LCV	2A	3A	MAV
5	Beyond Ahmedabad/Vadodara & Surroundings to Dahod & Surroundings	5.2%	6.0%	8.1%	6.8%	4.0%	1.7%
6	Beyond Ahmedabad/Vadodara & Surroundings to Beyond Dahod	1.4%	0.8%	1.9%	13.6%	11.0%	9.2%
Total		100%	100%	100%	100%	100%	100%

Table 2-3: Travel pattern on Project Road

- It is observed that there is a significant interaction of car and bus trips are between Ahmedabad/Vadodara – Dahod & surroundings.
- The highest freight interaction is between Ahmedabad/Vadodara & surroundings to Beyond Dahod, followed by Ahmedabad/Vadodara & surroundings to Dahod & surroundings.
- Around 62.0 percent of car trips and 51.0 percent of bus trips originate and terminate within Godhra and Dahod/ Project Road zones (stream 1).
- Around 52 percent of MAV trips and 43 percent of 3A trips are found to be traveling between Ahmedabad/Vadodara & surroundings to Beyond Dahod (stream 4).
- It is observed that 12 percent of MAV trips and 13 percent of 3A trips originate and terminate within the Project Road zones i.e., between Godhra & surroundings to Dahod & Surroundings (stream 1).

#### 2.4.3 Commodity Distribution

Commodity distribution for the total freight vehicles is presented at Table 2-4 .

Commodity Type	% Share
Empty	29.9
Minerals	3.0
Food grains	4.5
Cash crops	2.7
Perishables	8.7
Wood and Forest products	0.8
Sand/Powder	3.6
Stone/Marble	0.8
Iron/Steel	2.0
Cement/Fly ash	5.1
Construction materials	4.1
Natural gas	4.1
Petroleum products	7.1
Parcel	2.9
Machinery	5.0

Commodity Type	% Share
Container	0.0
Paper	0.2
Chemical/Fertilizers	1.1
Grocery/Consumer goods	8.7
Textile	1.9
Others	3.8
Total	100.0

Table 2-4: Commodity Distribution on Project Road

- Petroleum Products, Chemicals and Gas movement is one of the noticeable commodities moved. It accounts for around 7.1 percent and 4.1 percent respectively.
- The movement of petroleum products is also found between Dahod – Ahmedabad/Vadodara which is mainly of distributive nature for general distribution of petroleum at or near Dahod and areas on the eastern side.
- Significant volume of Consumer goods is being transported by the freight vehicles accounting for about 8.7 percent.
- The movement of empty vehicles observed at the toll plaza was about 29.9 percent. It may be noted that the movement of empty vehicles is mainly from Dahod/Indore to Ahmedabad/Vadodara going empty after the distribution of commodities including petroleum, industrial products etc.
- Freight vehicles for industrial products are found to be from Ahmedabad/Rajkot/Jamnagar/Surat Hazira to Indore/Dahod. This can be related to presence to big size industries of Reliance, Essar, L&T etc. located in Western Gujarat. In addition, some local interaction between Dahod and Godhra is also found, as the area around Godhra/Dahod has some units of MSME industries producing industrial products.
- Majority of the food grain movement have been found destined to Dahod from different parts of Gujarat namely Ahmedabad, Vadodara, Surat/Hazira.

## 3. TRAFFIC GROWTH RATE AND PROJECTIONS

### 3.1 General

As the project road has been executed on a DBFOT basis with a concession period of 27 years, an estimation of the traffic using the tolled highway and its future growth are **important elements to assess the project's economics as they are generally the main/sole source of revenue for the project.** This chapter details various aspects of the current traffic of the project road and its growth potential.

### 3.2 Project Road Traffic

The traffic that is likely to use the project road is estimated on the basis of the traffic and travel characteristics. The traffic on the project road would normally consist of the following components:

- Normal Traffic
- Diverted Traffic
- Induced/Developmental Traffic

#### 3.2.1 Normal Traffic

Normal traffic is the traffic, which is already plying on the project road in FY22, has been corrected for impact of COVID 19. The corrected FY22 traffic is the total traffic including the exempted vehicles which do not pay toll at the toll plaza location.

#### 3.2.2 Diverted Traffic

Diverted traffic is generally dictated by the presence of an alternative route at a lower generalised cost, which is in-turn defined by the road configuration and its condition, the type of vehicle and its operating costs, the average riding speed, the route distance and any tolling that may apply on a specific route. A detailed road network assessment along with site reconnaissance survey was conducted on the project road and vicinity to identify alternate routes. In case of the project road, the tolling has been at place since 2013, the travel pattern is well established. No alternate route has been found from/to where the traffic may divert.

However, two major developments that could impact the project road traffic are:

- Proposed Delhi-Mumbai Expressway (DME)
- Construction of Indore-Dahod new rail link

#### Delhi – Mumbai Expressway

Major development in case of the project road which could impact the project road traffic is Delhi – Mumbai Expressway. Delhi–Mumbai Expressway is an under-construction 1,250 km long controlled-access highway connecting the national capital Delhi with India's commercial capital Mumbai. It will be the longest expressway in the country and. The



The proposed Delhi – Mumbai expressway is having an alignment parallel to the PR. In the alignment details available as of now, a spur is proposed around 7-8 km north of Godhra town. Once completed, some of the freight vehicles currently using the project road travelling between west side of the project road (Vadodara/Surat/Hazira/south-eastern Gujarat/western Rajasthan/Mumbai/Nashik/Pune) and areas north of the project road (Jhabua/Megh Nagar/Ratlam/eastern Rajasthan/ Delhi & beyond), may find Delhi Mumbai expressway attractive and may divert from the project road traffic.

**The OD analysis presented in the Vendor's report for this aspect indicates a low potential** traffic of around 3-4 percent in Cars and 3A/MAV trucks on the project road. In light of the toll rates likely to be as 1.5 times of the normal NHAI per km toll rates (accounting for 1.25 times for normal length of expressway and increase for the likely equivalent structure length). In view of this, there could be minimal impact on the PR traffic.

Also, as DME alignment is closer to the project road, with a likely interchange near Godhra, there could also be an upside to the project road traffic. Some of the traffic from/to Mumbai to/from Indore and other eastern parts of MP may use the greenfield expressway till Godhra and then use the project road to go towards Indore and rest of MP. However, it is difficult to quantify the impact at this stage of analysis.

As the impact of expected loss and gain of traffic to the project road may balance out, hence, no impact of DME is envisaged on PR traffic.

#### Indore –Dahod New Rail line

At present, there is a railway line under Western Railway connecting Ahmedabad and Ratlam via Dahod running parallel to the project road. The Ahmedabad-Indore connectivity is via the broad gauge Ratlam/Barnagar line, making it longer by rail as compared by road. A direct single line rail link from Dahod and Indore is being constructed which is likely to reduce the travel distance.

The 201 km railway link from Dahod to Indore being constructed is of utmost importance to the region as it will connect south-western part of Madhya Pradesh. Out of this 201 km, only 20 km is in Gujarat and remaining 180 km falls in Madhya Pradesh. The alignment of the railway line is given in Figure 3-2.



Figure 3-2: Alignment of Dahod-Indore Railway Line

The project was sanctioned in 2008 and was supposed to complete by 2011, but due to land acquisition issues and realignment for the construction of tunnel between Dhar and Pithampur the project is further delayed. However, information collected at site and through public domain indicates that work for the project is on and is likely to complete by 2028.

The commodities which are being transported via rail are already using existing route via Ratlam where Indian Railways has a railway siding for containers which comprises of fertilisers, food grains, cement for inward movement and for Soya DE-oil cake, food grains for outward movement. It is worth mentioning that the Indian Railways transports the commodities only for which it has a storage facility at that station.

With the presence of the already existing rail links around the corridor, the mode choice of freight traffic on the corridor is well established. The proposed rail link from Dahod to Indore though will lead to reduction in travel distance for the railway movement but being a single line, will have high turn-around time which may not be cost effective alternative for a further shift from road to rail. In view of this, there is less probability of further inter modal shifts on the corridor.

### 3.2.3 Induced/ Development Traffic

Developmental /new generated traffic is the one which would be generated, over and above normal growth, because of lowering of transport costs or new developments in the immediate influence area of the project road.

Bharatmala Pariyojana is the second largest highways construction project in the country since NHDP, under which almost 50,000 km or highway roads were targeted across the country. It will look to improve connectivity particularly on economic corridors, border areas and far-flung areas with an aim of quicker movement of cargo and boosting exports.

It will connect 550 district headquarters to minimum 4-lane highway by raising the number of corridors to 50 (from current 6) and move 80 percent freight traffic (currently 40 percent) to national highways by connecting 24 logistics parks and 7 north east multimodal waterway ports.

The Phase-I includes economic corridors of around 9,000 km; inter-corridor and feeder routes of around 6,000 km; 5,000 km roads under the National Corridors Efficiency Program, border and international connectivity roads of around 2,000 km; coastal and port connectivity roads of around 2,000 km; expressways of around 800 km and 10,000 km of NHDP roads. The total length in phase 1 comes to around 34,800 km.

In the context of the project influence area, there are two economic corridors, one inter-corridor and one feeder road which are identified under this project as presented in Figure 3-3.



Figure 3-3: Details of Upcoming Projects under Bharatmala in PIA

As the project road is a main connecting link of the Kandla-Sagar economic corridor, it is likely to remain an important highway for the East/West movement and may see sustained growth in the future. This has been considered while setting out traffic growth rates for rest of the concession period.

### 3.3 Traffic Growth Rate Estimation

#### 3.3.1 Methodology

Traffic growth for both passenger and freight vehicles has been estimated using the econometric approach as described in IRC-108, 2015. For freight traffic, due consideration has been given to the total tonnage transported and the shift in types of vehicles used for moving goods.

The econometric model applied, relates traffic growth to changes in state (or district) domestic product via an elasticity factor. According to IRC guidelines, elasticity based econometric model for highway projects should be derived in the following form:

$$\text{Log } e (P) = A0 + A1 \text{ Log } e (EI)$$

Where:

- P = Traffic Volume  
 EI = Economic Indicator  
 A0 = Regression constant  
 A1 = Regression co-efficient (Elasticity Index).

In order to estimate traffic on the project road the methodology described below has been followed:

- Identify the influence area - From the analysis of travel patterns observed from the OD survey data, the influencing states and districts, which are likely to impact the traffic growth on the project road, were identified.
- Review Past Traffic Data – Based on data points available for the project corridor from different sources a review of past traffic and tonnage growth is carried out.
- Analysis of economic growth of the Project Influencing Area (PIA) - For each PIA state an economic profile describing past performance and future outlook **was prepared. This also considers India's past economic performance and its future outlook.**
- Estimation of traffic elasticity to income – in order to translate economic growth into traffic growth, an elasticity factor was estimated.
- Derivation of traffic growth rates – On the basis of the traffic weighted PIA outlook and related traffic elasticity, traffic growth rates were estimated.

The methodology thus adopted incorporates, as basic data inputs, the perspective growth envisaged in the influence area and the changes in transport demand elasticities over a period of time. The traffic growth rates by vehicle type for the project road have been determined in line with the concession period of 27 years up to FY38 and likely to be extended till FY44 (23<sup>rd</sup> July 2043) in view of actual traffic being lower than the target traffic.

### 3.3.2 Traffic Pattern and Influence Area

The travel pattern as derived from origin and destination survey analysis reveals the predominance of Gujarat in passenger and freight vehicles. Besides Gujarat, the state of Madhya Pradesh also contributes a considerable percentage to the project road freight and passenger traffic.

The travel pattern observed at the toll plaza location reveals that 86.9 percent of the CJV traffic and 92.9 percent of the Bus traffic are from the state of Gujarat indicating outright dominance of Gujarat in passenger vehicle category. Madhya Pradesh also has a considerable share of 13 percent in cars and 23 percent in buses.

The share of freight traffic from Gujarat for LCVs, 2A-trucks and MAVs are 76.9 percent, 79.4 percent and 72.3 percent, respectively, indicating heavy influence of Gujarat in this category as well. In addition, Madhya Pradesh contributes around 23.1 percent in LCV, 20.6 percent in 2A-trucks and 27.7 percent in MAV category.

The normalised shares of the two influencing states derived from the OD survey data analysis of the toll plaza location are presented in Table 3-1.

States/Mode	Car	LCV	Bus	Truck	MAV
Gujarat	86.9	76.9	92.9	79.4	72.3
Madhya Pradesh	13.1	23.1	7.1	20.6	27.7
Total	100.0	100.0	100.0	100.0	100.0

Table 3-1: Normalised OD Shares for the Project Road

Looking at the predominance of Gujarat and Madhya Pradesh in both passenger and freight traffic (CJV & buses), these two have been considered as the PIA states for both passenger and freight vehicles.

### 3.4 Past Economic Growth of PIA

Growth of traffic on the project road depends on existing development and future growth prospects of the connecting regions. A number of economic indicators for the PIA state, as published by Central Statistical Organisation (2011/12 prices), have been studied to assess their past performance.

The year wise Gross State Domestic Product (GSDP) at 2011 – 2012 series and its growth is presented in Table 3-2.

Year	Gujarat	Madhya Pradesh
GSDP in Billion		
2011-12	6,156.1	3,155.6
2012-13	6,826.5	3,516.8
2013-14	7,342.8	3,651.3
2014-15	8,114.3	3,839.4
2015-16	8,944.7	4,187.4
2016-17	9,813.4	4,706.7
2017-18	10,865.7	4,971.5
2018-19	11,830.2	5,294.2
2019-20	12,689.6	5,804.1
2020-21	#N/A	5,608.5
YOY Growth in %		
FY12 to FY13	10.9	11.4
FY13 to FY14	7.6	3.8
FY14 to FY15	10.5	5.2
FY15 to FY16	10.2	9.1
FY16 to FY17	9.7	12.4
FY17 to FY18	10.7	5.6

Year	Gujarat	Madhya Pradesh
FY18 to FY19	8.9	6.5
FY19 to FY20	7.3	9.6
FY20 to FY21	#N/A	-3.4

#N/A – Not Available

**Table 3-2: Average Annual Growth Rates (%) of GSDP for PIA States**

- **Gujarat's** Gross State Domestic Product (GSDP) stood at Rs 12,689.6 billion in 2019-20 and has been growing at a compounded annual growth rate of 9.6 percent since 2011-12. **The state's growth had been between 7-11 percent** since 2015-16. It has shown a growth of around 7.3 percent in FY20. The secondary sector is the largest contributor to GSDP (46.3 percent), agriculture allied activities sector at 17.3 percent and services sector at 36.4 percent of the GSDP in 2019-20.
- **Madhya Pradesh's Gross State Domestic Product (GSDP) stood at Rs 5,804.1 billion** in 2019-20 and has been growing at a compounded annual growth rate of 7.8 percent since 2011-12. The services sector is the largest contributor to GSDP (39.7 percent) followed by agriculture allied activities sector at 34.6 percent and secondary sector at 25.7 percent of the GSDP in 2019-20. The GSDP for the year 2020-2021 is Rs 5,608.5 billion.

The average annual growth rates as obtained using regression analysis till the last available year are presented in Table 3-3.

State/Particular	Gujarat	Madhya Pradesh
	2011-12 to 2019-20	
GSDP	9.6	7.8
Primary	6.5	6.9
Secondary	10.9	7.3
Tertiary	8.6	7.3
Construction	3.7	4.4
Per Capita Income	8.2	6.1

**Table 3-3: Average Annual Growth Rates (%) of State Income for PIA States**

The GSDP over the years for the states of Gujarat and Madhya Pradesh are presented in Figure 3-4.

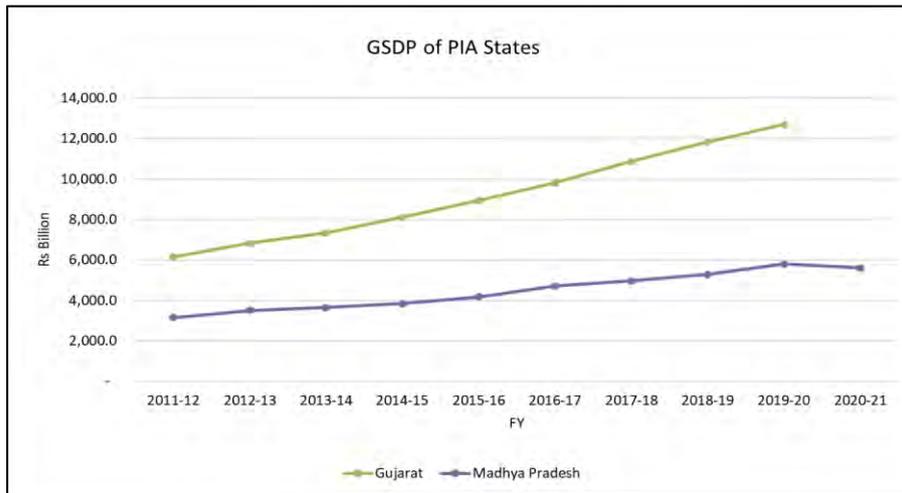


Figure 3-4: GSDP (in Rs Billion) for Influencing PIA States

Being one of India's most industrialized states, Gujarat maintains a variety of industries, the principal ones being general and electrical engineering and the manufacture of textiles, vegetable oils, chemicals, soda ash, cement and also production of fertilizers and petrochemicals.

Gujarat is considered the petroleum capital of India due to presence of large refining capacity set up by private and public sector companies. The state is the world's largest producer of processed diamonds, accounting for 72 per cent of the world's processed diamond share and 80 per cent of India's diamond exports.

The state has one of the strongest port infrastructures in India. It is the first state in India to take up port privatisation. Gujarat has 45 ports along a 1,600 km coastline, including one major port at Kandla and 44 minor ports. There are 106 product clusters and 60 notified special economic zones (SEZs). Large scale investment is expected in Gujarat as part of the US\$ 90 billion Delhi-Mumbai Industrial Corridor (DMIC).

### 3.5 India and PIA Outlook

#### 3.5.1 India's past performance and outlook for future

India's growth trend during the recent years has been presented in Figure 3-5.

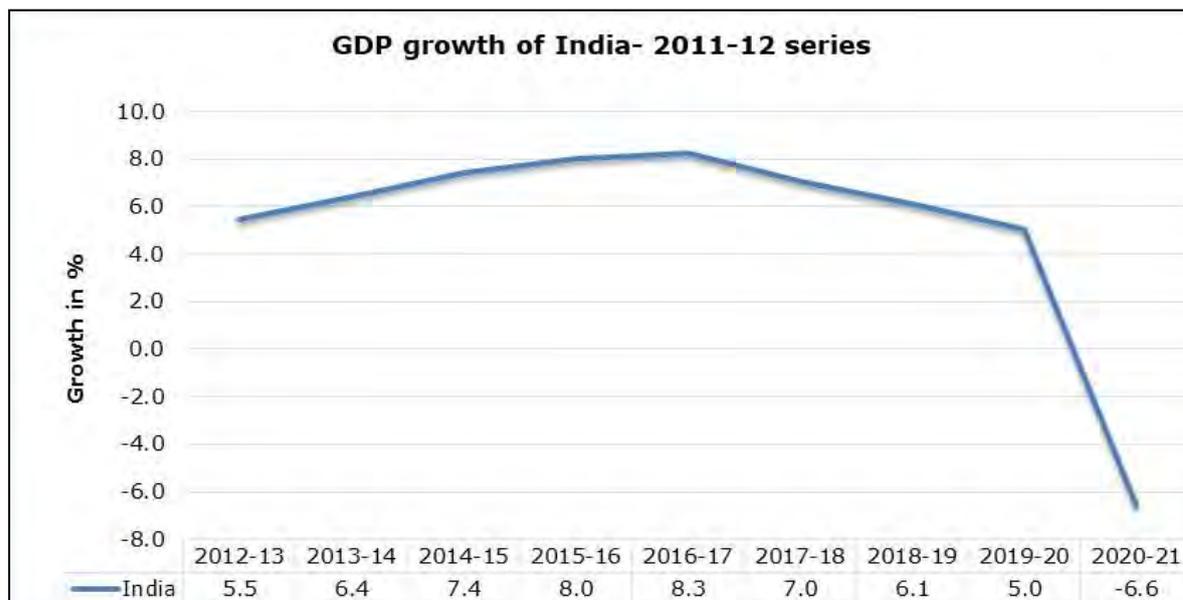


Figure 3-5: GDP Growth in India

Economic growth in India has been broadly on an accelerating path till FY18. It is likely to be the fastest growing major economy in the world in the medium-term. The growth in real GDP was 8.3 percent for FY17 and 7.0 percent in FY18, while the growth in FY19 was slightly lower at 6.1 percent. The long-term trend line growth of 7.2 percent has been achieved between FY12 to FY19. During FY20, growth has slowed down due to some structural issues and global headwinds resulting in an average GDP growth rate of 4.2 percent.

With the outbreak of COVID-19, global recession is likely to be witnessed across all the economies. The lockdown period announced by Indian government had an adverse impact on the economy. The first quarter estimated for FY21 has indicated a contraction of 23.9 percent, second quarter showed a rebound in growth by contracting 7.5 percent and third & fourth quarter grew by 0.5 percent and 1.6 percent respectively. The resultant contraction for FY21 is likely to be around 6.6 percent.

The Indian economy is likely to see the impact of global slowdown due to COVID-19 and hence, the GDP forecast for India by various international agencies has been revised for the next two years. As per the latest update by Central Statistical Organisation (CSO), GDP in Q2 of FY22 has grown by 8.4 percent (down from 20.1 percent in Q1) and is likely to achieve a yearly growth rate of 9.5 percent (with 6.6% in Q3 and 6% in Q4). Further on, the economy is likely to grow in the range of 6.5-7.0 percent in FY23 and over 7.0 percent thereafter as per the forecast by CSO. As per Economic Survey of India for FY22, the economy is predicted to have a growth rate of 9.2 percent for FY22 and 8.0-8.5 percent in FY23. With the vaccination programme having covered the bulk of the population, economic momentum building back and the likely long-term benefits of supply-side reforms in the pipeline, the Indian economy is in a good position to witness GDP growth of 8.0-8.5 per cent in 2022-23.

The year-on-year growth for Indian economy as provided by the Client is presented in Table 3-4.

FY Ending March/State	India
2023	7.8
2024	7.8
2025	7.9
2026	7.9
2027	7.9
2028	7.1
2029	7.1
2030	7.2
2031	7.2
2032	7.2
2033	6.6
2034	6.6
2035	6.6
2036	6.7
2037	6.7
2038	6.1
2039	6.2
2040	6.2
2041	6.2
2042	6.2
2043	6.5
2044	6.5
2045	6.5

Table 3-4: Future Outlook of India

### 3.5.2 PIA states outlook

The outlook for PIA states as provided by the client has been presented in Table 3-5.

FY Ending March/State	Gujarat	Madhya Pradesh
2023	8.3	7.6
2024	8.3	7.6
2025	8.3	7.7
2026	8.4	7.7
2027	8.4	7.7
2028	7.9	7.0
2029	7.9	7.0
2030	7.9	7.0
2031	7.9	7.0
2032	7.9	7.0
2033	7.8	6.5
2034	7.8	6.5

FY Ending March/State	Gujarat	Madhya Pradesh
2035	7.8	6.5
2036	7.9	6.5
2037	7.9	6.5
2038	7.4	5.9
2039	7.4	5.9
2040	7.4	5.9
2041	7.4	5.9
2042	7.4	5.9
2043	6.6	5.9
2044	6.6	5.9
2045	6.6	5.9

Table 3-5: Future Outlook of PIA States

Based on the OD shares of the toll plaza location and the outlooks adopted for PIA states, the future weighted income for different vehicle types is presented in Table 3-6.

FY Ending March /Mode	Car	LCV	Bus	Truck	MAV
2023	8.3	8.2	8.3	8.2	8.2
2024	8.3	8.2	8.3	8.2	8.2
2025	8.3	8.2	8.3	8.2	8.2
2026	8.4	8.3	8.4	8.3	8.3
2027	8.4	8.3	8.4	8.3	8.3
2028	7.8	7.8	7.9	7.8	7.8
2029	7.8	7.8	7.9	7.8	7.8
2030	7.8	7.8	7.9	7.8	7.8
2031	7.8	7.8	7.9	7.8	7.8
2032	7.8	7.8	7.9	7.8	7.8
2033	7.7	7.6	7.8	7.7	7.6
2034	7.7	7.6	7.8	7.7	7.6
2035	7.7	7.6	7.8	7.7	7.6
2036	7.8	7.7	7.9	7.8	7.7
2037	7.8	7.7	7.9	7.8	7.7
2038	7.3	7.2	7.3	7.2	7.2
2039	7.3	7.2	7.3	7.2	7.2
2040	7.3	7.2	7.3	7.2	7.2
2041	7.3	7.2	7.3	7.2	7.2
2042	7.3	7.2	7.3	7.2	7.2
2043	6.6	6.5	6.6	6.5	6.5
2044	6.6	6.5	6.6	6.5	6.5
2045	6.6	6.5	6.6	6.5	6.5

Table 3-6: Future Perspective of PIA Weighted Income

### 3.6 Review of Past Traffic Data

The toll plaza traffic data for the project road from the date of operation till December 2021 was provided by the client. A time series analysis of the traffic data and a comparison of the yearly averages with the current estimates of FY22 of the total traffic including exemptions and violations is presented in Table 3-7.

FY Ending March \Mode	Car / Jeep	LCV	Bus	Truck	MAV
2014	2,209	586	1,029		1,292
2015	2,463	566	1,062		1,355
2016	3,031	617	1,092		1,449
2017	3,561	653	1,146		1,499
2018	4,127	636	836	449	1,674
2019	4,659	627	879	508	1,902
2020	4,790	621	926	560	2,066
2021	5,083	584	921	657	2,450
FY22 (E)	5,868	569	1,117	732	2,540
YOY Growth in %					
FY15 vs FY14	11.5	-3.4	3.3		4.8
FY16 vs FY15	23.1	9.1	2.8		7.0
FY17 vs FY16	17.5	5.8	5.0		3.4
FY18 vs FY17	15.9	-2.6	12.1		11.7
FY19 vs FY18	12.9	-1.4	5.1	13.2	13.6
FY20 vs FY19	2.8	-0.8	5.3	10.1	8.7
FY21 vs FY20	6.1	-6.1	-0.5	17.4	18.6
FY22 (E) vs FY21	15.4	-2.6	21.4	11.5	3.7
Trend Line Growth in %					
FY20 vs FY15	14.6	1.4	7.4		9.1
FY20 vs FY17	10.6	-1.6	8.9		11.5
FY21 vs FY17	9.0	-2.4	8.2		12.7

**Table 3-7: Past Growth and Trend Analysis**

The comparison of the past toll data shows robust traffic growth in almost all the modes. High growth was observed in case of MAV in FY17 to FY20. The plausible reason for such high growth could be attributed to the opening of adjoining section from Gujarat/MP border to Indore after completion of upgradation to a four-lane facility. The Bus and Truck segregation is available from FY18. Buses have shown a growth of around 5.0 percent till FY20 after which a decline is observed due to Covid impact. FY22 actual bus traffic is also showing a pick-up in growth of around 21 percent. 2A trucks have a low base and have shown a double-digit growth in all the years. The combined trend line growth of 7.0 percent.

The car traffic growth for FY20 was observed to be about 2.8 percent with respect to FY19. However, the car growth was in the range of 11-24 percent for the previous years until FY19. The slowdown in FY20 can be attributed to manufacturers deciding to reduce production of diesel cars in the near-future, technology disruption in the form of

compliance to Bharat Stage VI norms, economic downturn and COVID 19. The growth in FY21 and FY22 has been 15 percent which is partly due to low base in FY21.

In case of LCVs, negative growth is observed in the recent years between FY17 and FY20. On a general note, LCVs are showing negative growth in recent years which could be attributed to the tonnage shifts happening across all highways between the LCV category from LCV to Mini LCV or could be a classification issue between LCVs and 2A trucks.

On a broad level, the events which could have impacted the traffic growth on the PR is the completion of significant works on adjacent IVRCL stretch (Gujarat/MP border to Indore) in June 2016 and hence there was an increase in the traffic on the project road stretch. Also, upgradation works were carried out at Dahod-Banswara Road which is a feeder road to the project road to and from Rajasthan.

The other main factors that might have impacted the traffic in the past include the impact of demonetisation in November 2016, **GST in July 2017, all India truckers' strike in July 2018**, revision of permissible Gross Vehicle Weights (GVW) for freight vehicle as per the new notification released by NHAI on 18th July, 2018 and the impact of country wide/ state lockdowns starting from March 2020, FY21 and continuing in few months of FY22.

### 3.7 Past and Future Transport Demand Elasticity

The econometric model applied for the project, relates traffic growth to changes in state domestic product via an elasticity factor according to IRC guidelines. The elasticity by vehicle types have been estimated based on the regression analysis of weighted income of PIA states with registered vehicles of PIA and actual traffic data.

The best measure of deriving traffic elasticity to income is time series data of traffic on the road. In case of the project road, past traffic data is available since the year of operation of the toll plaza. The YOY mode wise traffic elasticity has been derived using rate of growth in the traffic vis a vis the rate of growth in income (weighted income derived from weighted OD shares). The elasticity estimates for different time periods have been done using regression analysis with mode wise traffic as dependent variable and weighted income as independent variable. The rate of income growth of PIA states observed in FY12 to FY20 is assumed to continue for FY21 also. The point to point and trend line actual elasticity between GSDP and traffic is presented in Table 3-8.

Period\Modes	Car / Jeep	LCV	Bus	Truck	MAV
Point to Point Elasticity					
FY15 vs FY14	1.1	-0.4	0.3		0.5
FY16 vs FY15	2.3	0.9	0.3		0.7
FY17 vs FY16	1.8	0.6	-0.1		0.3
FY18 vs FY17	1.5	-0.3	-2.2		1.2
FY19 vs FY18	1.5	-0.2	0.6	1.5	1.6
FY20 vs FY19	0.4	-0.1	0.7	1.3	1.1
FY21 vs FY20	0.8	-0.8	-0.1	2.3	2.4
Trend Line Elasticity					

Period\Modes	Car / Jeep	LCV	Bus	Truck	MAV
FY15-FY20	1.5	0.2	0.8		1.0
FY17-FY20	1.2	-0.2	1.0		1.3
FY17-FY21	1.1	-0.3	1.0		1.5

Table 3-8: Actual Past Traffic Elasticity

## CJV

- The motorisation rate for cars (per 1000 population) in India has gone up from 6.6 in 2001 to 20 in 2015. Although India's car fleet has been growing at 10% for nearly 25 years, its motorization rate is low compared to other countries of similar wealth and much lower than developed countries with motorization rate of around 450. The low motorization rate suggests that there is room for continued growth for many years to come. The forecasts by different agencies indicate that number of cars will increase to 35 per thousand populations by 2025. With the continual increase in motorization rate and improved road network usage of cars for inter-urban travel is showing a growing trend.
- A regression between GSDP (as independent variable) and registered vehicles (as dependant variable) of PIA state of Gujarat was carried out and registered vehicle elasticity in case of cars is 1.2 during the period between FY12 and FY17.
- Actual trend line elasticity in the recent years between FY17 and FY20 has been 1.2.
- It is likely that this growth would slow down over time as the market becomes more mature and saturated, therefore elasticity to GSDP can be expected to decline over time. Giving due consideration to the traffic and travel characteristics for the project road, Car elasticity has been considered as 1.0 for the period FY23 to FY25 and tapered in subsequent slabs.

## Bus/Truck

- Over the years in India there has been a change in passenger's travel mode preferences with increasingly more people shifting from public transport systems towards personalised modes. This has resulted, in general, elasticity of bus traffic/demand to GSDP being lower than unity.
- 2A trucks have also been showing some growth in the recent years on national highways indicating its use for local supplies.
- In the past, bus/truck have shown an elasticity of 0.8 in FY15 to FY20 comparison. For the project road, an elasticity of Bus traffic to GSDP of 0.7 has been adopted between FY23 and FY25. For 2A trucks, an elasticity of 0.8 has been adopted for the initial slab and tapered thereafter.

## Trucks

- In India as a whole, the freight vehicle mix has been changing in the last decade favouring MAV to 2 Axle/ 3Axle vehicles for long-distance traffic, given the operational efficiencies achievable with larger vehicles. Considering the ongoing technical advancements in automobile industry, some of the standard 2 Axle/ 3 Axle trucks would gradually be replaced by MAVs. Mature National Highways with tolling in operation for few years, have already witnessed the shift in 2A/3A trucks to MAV for long distance movement and the limited number of 2A trucks are being used for local movements.
- At the same time Mini LCV have become more popular over LCVs for short distance traffic and more localised supply movements. The trend line elasticity between FY15 and FY20 is 0.2 for LCV. An elasticity of 0.2 to GSDP for LCV has been adopted till end of concession.
- Considering the ongoing technical advancements in automobile industry, some of the standard 2 Axle/ 3 Axle trucks would gradually be replaced by MAVs. 3A/MAV combined category has shown an elasticity of 1.0 for the period FY15 to FY20. An elasticity of 0.9 for MAV has been adopted for the period up FY23-FY25 and tapering thereafter.

It has been assumed that transport demand elasticity, for both freight and passenger traffic, would gradually decline over time, despite growth in per capita income, as regions becomes more mature, self-sufficient and with alternative mode of transport available to users. Due consideration has been given to the tonnage shifts happening in the market with Mini LCV gaining importance for short distance movements over LCVs and MAVs being preferred over 2A/3A for long distance movements due to better operational efficiencies. Thus, in this study higher elasticity values for Mini LCV and MAV have been considered as compared to LCV/2 Axle/ 3 Axle trucks.

Giving due consideration to the growth momentum being witnessed in the immediate past, higher elasticity values have been considered for the slab up to FY25 and further tapering has been done in the next slab. The recommended elasticity values adopted for all vehicle types in line with the past traffic data, future perspective and changes in freight traffic pattern observed on the project road are presented in Table 3-9.

Period \ Modes	Car	LCV	Bus	Truck	MAV/3A
2023-2025	1.0	0.2	0.7	0.8	0.9
2025-2030	0.9	0.2	0.6	0.7	0.8
2030-2035	0.8	0.2	0.5	0.6	0.7
Beyond 2035	0.7	0.2	0.5	0.5	0.6

Table 3-9: Recommended Elasticity for Project Road

The above recommended elasticity values have been used to arrive at traffic growth rates.

### 3.8 Projected Traffic Growth Rates

Based on the moderated perspective elasticity values and the projected growth rates of the income for PIA states, the future average annual compound traffic growth rates by vehicle type have been estimated for the project road by using the following relationship:

$$T_{gr} = (GSDP_{gr}) \times E$$

Where,

$T_{gr}$  – Traffic growth rate for mode

$GSDP_{gr}$  – Growth rate of GSDP

E – Elasticity value for mode

The estimated traffic growth rates for the project road have been presented in Table 3-10.

FY Ending March/ Modes	Car	LCV	Bus	Truck	MAV
2023	8.3	1.6	5.8	6.6	7.4
2024	8.3	1.6	5.8	6.6	7.4
2025	8.3	1.6	5.8	6.6	7.4
2026	7.5	1.7	5.0	5.8	6.6
2027	7.5	1.7	5.0	5.8	6.6
2028	7.1	1.6	4.7	5.5	6.2
2029	7.1	1.6	4.7	5.5	6.2
2030	7.1	1.6	4.7	5.5	6.2
2031	6.3	1.6	3.9	4.7	5.4
2032	6.3	1.6	3.9	4.7	5.4
2033	6.2	1.5	3.9	4.6	5.3
2034	6.2	1.5	3.9	4.6	5.3
2035	6.2	1.5	3.9	4.6	5.3
2036	5.5	1.5	3.9	3.9	4.6
2037	5.5	1.5	3.9	3.9	4.6
2038	5.1	1.4	3.7	3.6	4.3
2039	5.1	1.4	3.7	3.6	4.3
2040	5.1	1.4	3.7	3.6	4.3
2041	5.1	1.4	3.7	3.6	4.3
2042	5.1	1.4	3.7	3.6	4.3
2043	4.6	1.3	3.3	3.3	3.9
2044	4.6	1.3	3.3	3.3	3.9

Table 3-10: Projected Traffic Growth Rates for the Project Road (%)

In derivation of above growth rates, the likely shift of buses to cars in case of passenger vehicles and the replacement/ tonnage shift of LCV/3A trucks by Mini LCV/2A truck for short distance and MAV for long distance in case of freight vehicles has been duly considered.

### 3.9 Modifications in Concession Period and Capacity Analysis

Table 3-11 presents the projections of the total traffic at the toll plaza on the project road using the above traffic growth rates till the end of concession as assessed in this study.

FY Ending March	Projected PCUs
2022	22,950
2023	24,575
2024	26,319
2025	28,193
2026	30,000
2027	31,927
2028	33,852
2029	35,898
2030	38,070
2031	40,089
2032	42,218
2033	44,423
2034	46,746
2035	49,195
2036	51,480
2037	53,874
2038	56,217
2039	58,665
2040	61,221
2041	63,891
2042	66,680
2043	69,306
2044	72,037

Table 3-11: Projected Total Traffic at Toll Plaza

The target traffic as per Concession Agreement is deemed to be 26,839 PCUs as on 1<sup>st</sup> October 2019. The traffic volume counts reported as per the surveys conducted in September 2018, September 2019 and September 2020 are 17,017 PCUs, 17,891 PCUs and 21,525 PCUs respectively. The traffic estimated on the project road as an average of these surveys is 18,881 PCUs which is 30 percent lower than the target traffic.

Based on the CA (clause 29.2.1), if the traffic in PCUs at target date is lower than the target traffic, then for every 1 percent decrease, the concession period shall be increased by 1.5 percent, and not more than 20 per cent of the base concession period.

As per information provided by the Concessionaire, IE and NHAI PIU has already recommended for extension of concession period by 5.4 years.

The projected traffic on the section will reach the designed capacity of 60,000 PCU during FY40 wherein the DPR preparation for capacity augmentation to six laning may get initiated by NHAI.

## 4. TOLL REVENUE PROJECTIONS

### 4.1 Tolling Strategy

**The project road has an “Open System” of toll collection which** enables the concessionaire to collect tolls from through traffic as well as from short distance one.

As mentioned earlier, there is one operational toll plaza at km 146.500 (Bhatwada Toll Plaza) where toll collection started from November 2013 for a normal tolling length of 78.477 km. In addition, Limkheda bypass and a ROB at km 144 are being charged at structure rate with cost of Rs 60.60 crore and Rs 55 crore respectively.

### 4.2 Schedule of User Fee

As per Schedule of User Fee (Schedule R) of Concession Agreement for the project, the per km toll rates applicable from 2007/08 for normal tolling length and permanent structures, the revision basis and concessions are provided.

The concessions to traffic have been given in the form of rates as below:

#### Local traffic

Car / Jeep / Vans - includes local users owning a vehicle registered for non-commercial purposes, residing within a distance of 20 km from the toll plaza and crossing the same for commuting purposes. The discounted fee for these users shall be a monthly pass of Rs. 150.00.

#### Daily Pass

When the vehicle has to cross the tolled section more than once in a day, the user shall have the option to pay one and half times (1.5 times) of the fee for a single entry; this pass shall be valid for 2 entries within 24 hours of purchase.

#### Monthly Pass

A user, who makes use of the project road frequently during a month, may opt to purchase a monthly pass upon payment of a charge equal to two-thirds of the fee payable for 50 single journeys; this pass can be used for a maximum 50 one-way journeys over the month of validity.

Thus, the different categories of toll tickets are as follows:

- (i) Traffic paying normal toll rates (single trip)
- (ii) Traffic paying return journey rates
- (iii) Traffic paying monthly pass rates
- (iv) Traffic paying local personal rates

### 4.3 Tolling Streams

The toll data giving the bifurcation of normal paying traffic and the traffic opting for concessions has been provided since the time of operation. In line with the categories of toll payments, a segmentation of total paying traffic was analysed from the toll data for all the past years. The tolling stream distribution over the years has been similar.

The tolling stream distribution has been derived from the toll data for the toll plaza by taking the average from June to December 2021 has been adopted for the present study and is presented in Table 4-1.

Category/Modes	Car/ MLCV	LCV/ Mini Bus	Bus	Truck	3A/MAV	OSV
Normal Toll Paying Traffic	41.4	54.4	13.0	70.2	90.7	100.0
Daily Pass Traffic	35.2	40.2	86.9	28.8	9.0	
Monthly Pass Traffic	0.0	1.5	0.0	0.2	0.0	
Local Pass Traffic	15.2	0.0	0.0	0.0	0.0	
Exemption and violation	8.3	3.9	0.0	0.8	0.3	
Total	100.0	100.0	100.0	100.0	100.0	100.0

Table 4-1: Tolling Distribution for the Project Road Including Exemptions and Violations (in %)

As observed from the tolling stream distribution, the non-paying traffic (exemptions and violations) in case of cars is around 8.3 percent and around 3.9 percent is observed in LCV/M Bus category. It is minimal in case of other categories.

The tolling distribution presented in Table 4-1 is of the total traffic captured on road including the exempted vehicles which do not pay toll at the toll plaza location. The paying traffic for the year FY22 has been worked out by deducting the toll exempt percentage (exemptions, FY22) from total AADT and is presented in Table 4-2.

Toll Plaza/Modes	Car/ MLCV	LCV/ Mini Bus	Bus	Truck	3A/MAV	OSV
Base AADT including exemptions and violations	5,868	569	1,117	732	2,540	3
% of Exemptions and violations	8.3%	3.9%	0.0%	0.8%	0.3%	0.0%
Paying Traffic	5,382	547	1,117	726	2,533	3

Table 4-2: Toll Paying Traffic, FY22

The normalised tolling stream distribution for the toll plaza excluding the exempt vehicles for the FY22 is presented in Table 4-3.

Category/Modes	Car/ MLCV	LCV/ Mini Bus	Bus	Truck	3A/MAV	OSV
Normal Toll	45.1	56.6	13.0	70.8	91.0	100.0
Daily Pass	38.3	41.8	87.0	29.0	9.0	0.0
Monthly Pass	0.0	1.6	0.0	0.2	0.0	0.0
Local Pass Traffic	16.5	0.0	0.0	0.0	0.0	0.0

Category/Modes	Car/ MLCV	LCV/ Mini Bus	Bus	Truck	3A/MAV	OSV
Total	100.0	100.0	100.0	100.0	100.0	100.0

Table 4-3: Tolling Distribution for the Project Road Excluding Exemptions and Violations (in %)

The normal toll paying traffic for cars is around 45.1 percent at the toll plaza while around 38.3 percent are likely to opt for daily pass. The monthly pass opting traffic is very nominal.

In case of 3A-Truck/MAV, normal toll paying traffic is about 91 percent which are majorly long-distance traffic. Around 87 percent of Bus and 9 percent 3A-Truck/MAV traffic is likely to opt for daily passes.

For monthly passes, given the Schedule of User Fee cap on multiple entries with a single pass, a trip rate of 1.67 trips per day has been assumed for all vehicle types. For daily pass, based on the toll data a trip rate of 2 has been used for the various toll categories of vehicles.

#### 4.4 Toll Rates

This section presents details on the toll rates that are likely to be imposed on the users of the project road during the concession period. The toll rates (Rs/km) for the base year 2007-08 for different vehicle categories as per concession agreement are presented in Table 4-4.

Mode	Base rate per km (in Rs)
Car/MLCV	0.7
LCV/Mini Bus	1.1
Bus/Truck	2.2
3-axle Truck/MAV	3.5
OSV	4.2
Local Passenger Traffic	150

Table 4-4: Toll Rates in Rs/km for Different Vehicle Categories

The CA states that the 2007 toll rates shall be increased without compounding by three per cent each year with effect from the 1st day of April 2008 and such increased rate shall be deemed to be the base rate for the subsequent years.

In addition to this, the rate of fee for use of bypass forming part of a section of a National Highway constructed with a cost of Rs 10 crore or more, for the base year 2007, shall be one and a half times of the per km base rates specified above and the length of such bypass shall be excluded from the length of such section of National Highway.

Additionally, when permanent structures such as bridges, tunnels or flyovers are part of the project road and their construction cost exceeds 500 million Rs (50 Crore), then the length of such structures shall be deducted from the tolling length and the structure tolled according to the rates presented in Table 4-5.

Cost of Structure (Rupees in crore)	Car, Jeep, Van or Light Motor Vehicle	LCV, Light Goods Vehicle or Mini-Bus	Truck or Bus	HCM, EME, 3A or MAV	Over size Vehicle
10 to 15	5	7.5	15	22	30
For every additional rupees five crore or part thereof, exceeding rupees fifteen crore and up to rupees one hundred crore.	1	1.5	3	4.5	6
For every additional rupees five crore or part thereof, exceeding rupees one hundred crore and up to rupees two hundred crore.	0.8	1.2	2.3	3.4	4.5
For every additional rupees five crore or part thereof, exceeding rupees two hundred crore.	0.5	0.8	1.5	2.3	3

Table 4-5: Toll Rates in Rs for Permanent Structure Exceeding 500 Million Rs Cost

In case of the project road, Limakheda bypass with a cost of Rs 60.6 crore and a ROB at km 144.000 with structure cost of Rs 55.0 crore is being charged at the toll plaza along with base highway section.

The applicable base rates shall be revised annually with effect from April 1 each year to reflect the increase in wholesale price index for the month of December of the immediate preceding year in which sub revision is undertaken but such revision shall be restricted for 40 per cent of the increase in wholesale price index.

Actual WPI information for December 2021 of 142.4 under 2011-12 series converted into 1993-94 series (437.7) has been used. The forecast for WPI as provided by the client has been used for the period till the end of concession period (extended) and is presented in Table 4-6.

December in FY End	Applicable for FY	WPI Forecast
2023	2024	3.7
2024	2025	4.4
2025	2026	4.8
2026	2027	5.0
2027	2028	5.0
2028	2029	5.3
2029	2030	5.4
2030	2031	5.4
2031	2032	5.3
2032	2033	5.2
2033	2034	5.0
2034	2035	4.9
2035	2036	4.7
2036	2037	4.6
2037	2038	4.3
2038	2039	4.1
2039	2040	3.8
2040	2041	3.7

December in FY End	Applicable for FY	WPI Forecast
2041	2042	3.7
2042	2043	3.7
2043	2044	3.7

Table 4-6: WPI Forecast for Toll Rate Indexation

The stream of toll rates to be charged at the toll plazas for cardinal years is presented in Table 4-7. The toll fee has been rounded to nearest 5 Rupees as per Schedule R of the concession agreement.

FY Ending March	Car/ MLCV	LCV/ Mini Bus	Bus/ Truck	3A-Truck/ MAV	OSV	Local monthly pass for Cars
2021	145	230	475	730	915	275
2022	150	235	490	490	750	945
2025	180	285	585	585	900	1,135
2030	230	365	750	750	1,160	1,455
2035	300	470	975	975	1,500	1,890
2038	345	545	1,125	1,125	1,735	2,180
2044	450	710	1,460	1,460	2,250	2,830

Table 4-7: Toll Rates at the Toll Plaza (in Rs)

The users purchasing return journey tickets will pay 1.5 times the above toll rates; the traffic opting for monthly passes will pay 33.3 times (two-thirds of 50 single journeys) the normal traffic toll rates. Local commercial vehicles registered in the district of toll plaza will pay 50 percent of a single journey ticket. All passes have been rounded to the nearest 5 Rupees as per concession agreement.

#### 4.5 Projected Tollable Traffic

The projected toll paying traffic in PCUs (excluding exemptions and violations) based on the traffic growth rates till the end of concession as assessed in this study is presented in Table 4-8.

FY Ending March	Tollable Traffic in PCU
2022	22,383
2023	23,964
2024	25,660
2025	27,483
2026	29,239
2027	31,111
2028	32,982
2029	34,969
2030	37,079
2031	39,038
2032	41,103
2033	43,242
2034	45,496
2035	47,870
2036	50,086

FY Ending March	Tollable Traffic in PCU
2037	52,406
2038	54,677
2039	57,048
2040	59,525
2041	62,111
2042	64,813
2043	67,355
2044	70,000

Table 4-8: Projected Toll Paying Traffic in PCUs at the Toll Plaza

#### 4.6 Toll Revenue Estimates

The concession period for the project road is 27 years from the appointed date (the date financial close is achieved). Toll revenue realised for FY21 is Rs 1,053.1 million. The revenue collected from April to December 2021 is Rs 852.8 million.

Toll revenue streams have been calculated assuming that:

- Toll would be collected for all 365 days in a year; however, for leap year, 366 days have been used
- Tolling started in November 2013
- Tolling would terminate on 23<sup>rd</sup> July 2043 (original concession end date is 28<sup>th</sup> February 2038) in view of the extension of concession period for 5.4 years due to target traffic provisions. However, revenues have been presented for full year of FY44.

The toll revenue for the total project road along with the concessions available is presented in Table 4-9.

FY Ending March	Normal Toll	Monthly Passes	Return Passes	Local Concessions	Total
2022	909.2	304.2	0.7	4.6	1,218.7
2023	1,071.4	356.0	0.8	5.5	1,433.7
2024	1,199.2	397.5	0.8	6.2	1,603.8
2025	1,344.6	441.8	0.9	7.0	1,794.3
2026	1,504.8	492.7	1.0	8.0	2,006.4
2027	1,686.9	545.6	1.0	8.9	2,242.4
2028	1,885.0	610.1	1.1	10.1	2,506.3
2029	2,099.8	676.4	1.2	11.3	2,788.8
2030	2,345.7	749.9	1.3	12.9	3,109.7
2031	2,605.6	831.6	1.4	14.4	3,453.1
2032	2,895.8	920.8	1.6	16.2	3,834.4
2033	3,207.7	1,015.2	1.7	18.0	4,242.7
2034	3,554.3	1,119.5	1.8	20.1	4,695.6
2035	3,939.5	1,236.6	2.0	22.5	5,200.6
2036	4,340.2	1,358.9	2.1	25.0	5,726.3
2037	4,754.9	1,487.6	2.3	27.7	6,272.6
2038	5,196.6	1,624.6	2.5	30.2	6,853.8

FY Ending March	Normal Toll	Monthly Passes	Return Passes	Local Concessions	Total
2039	5,667.6	1,773.6	2.6	33.5	7,477.3
2040	6,203.5	1,937.4	2.8	36.7	8,180.5
2041	6,737.4	2,101.6	3.0	40.2	8,882.2
2042	7,325.2	2,285.3	3.2	44.2	9,658.0
2043	7,951.6	2,473.9	3.4	48.0	10,477.0
2044*	8,653.1	2,689.1	3.7	52.7	11,398.5

\*-presented for full year of FY44

Table 4-9: Toll Revenue (in Rs million) by Type of Concession for PR

For the project, almost entire share of revenue is likely to be generated from normal toll and return passes contributing about 75.5 percent and 24 percent, respectively. The monthly pass and local concession category are likely to generate 0.4 percent of revenue of the project road.

A mode wise breakdown of the revenue streams is also presented for the project road in Table 4-10

FY Ending March	Car/MLCV	LCV/ Mini Bus	Bus	Truck	3A-Truck/ MAV	OSV	Total
2022	222.3	41.9	155.4	120.2	677.9	1.0	1,218.7
2023	263.7	47.0	181.0	140.2	800.5	1.2	1,433.7
2024	298.3	49.7	199.5	156.5	898.4	1.4	1,603.8
2025	338.4	53.1	220.4	173.9	1,006.9	1.5	1,794.3
2026	384.1	56.1	243.4	193.5	1,127.5	1.7	2,006.4
2027	431.9	60.0	268.1	214.8	1,265.7	1.9	2,242.4
2028	489.9	64.6	295.9	238.0	1,415.8	2.2	2,506.3
2029	548.0	68.7	326.0	264.9	1,578.7	2.4	2,788.8
2030	613.6	73.6	358.8	293.2	1,767.9	2.7	3,109.7
2031	692.7	78.9	394.2	323.6	1,960.8	3.0	3,453.1
2032	772.3	84.5	432.0	358.5	2,183.7	3.3	3,834.4
2033	863.7	90.0	472.4	394.3	2,418.6	3.7	4,242.7
2034	965.6	96.7	516.6	433.7	2,679.0	4.1	4,695.6
2035	1,081.7	102.8	564.0	477.7	2,969.9	4.5	5,200.6
2036	1,198.7	110.0	618.0	523.1	3,271.5	5.0	5,726.3
2037	1,323.6	116.9	671.7	568.4	3,586.5	5.5	6,272.6
2038	1,457.0	124.5	728.9	616.3	3,921.2	6.0	6,853.8
2039	1,601.1	131.9	791.1	667.5	4,279.2	6.5	7,477.3
2040	1,774.5	140.2	859.9	725.8	4,672.9	7.1	8,180.5
2041	1,936.9	147.9	927.9	783.3	5,078.6	7.7	8,882.2
2042	2,116.7	157.0	1,004.2	846.7	5,525.0	8.4	9,658.0
2043	2,314.1	166.1	1,083.7	913.4	5,990.5	9.1	10,477.0
2044*	2,539.8	176.2	1,170.5	986.3	6,515.8	9.9	11,398.5

\*-presented for full year of FY44

Table 4-10: Toll Revenue (in Rs million) for Project Road by Mode

Majority of the revenue is expected to come from 3A/MAV with about 56.8 percent of the total revenue. Amongst other categories, Car/MLCV represent a share of around 20.3 per

cent of total revenue followed by Bus/2A Truck at 20.6 percent. LCV/Mini-Bus category is likely to generated about 2.2 percent revenue.

The project road has a revenue CAGR of 10.7 percent during the tenure of concession.

Intended for

# Virescent Infrastructure Investment Manager Private Limited (For the purpose of Highways Infrastructure Trust)

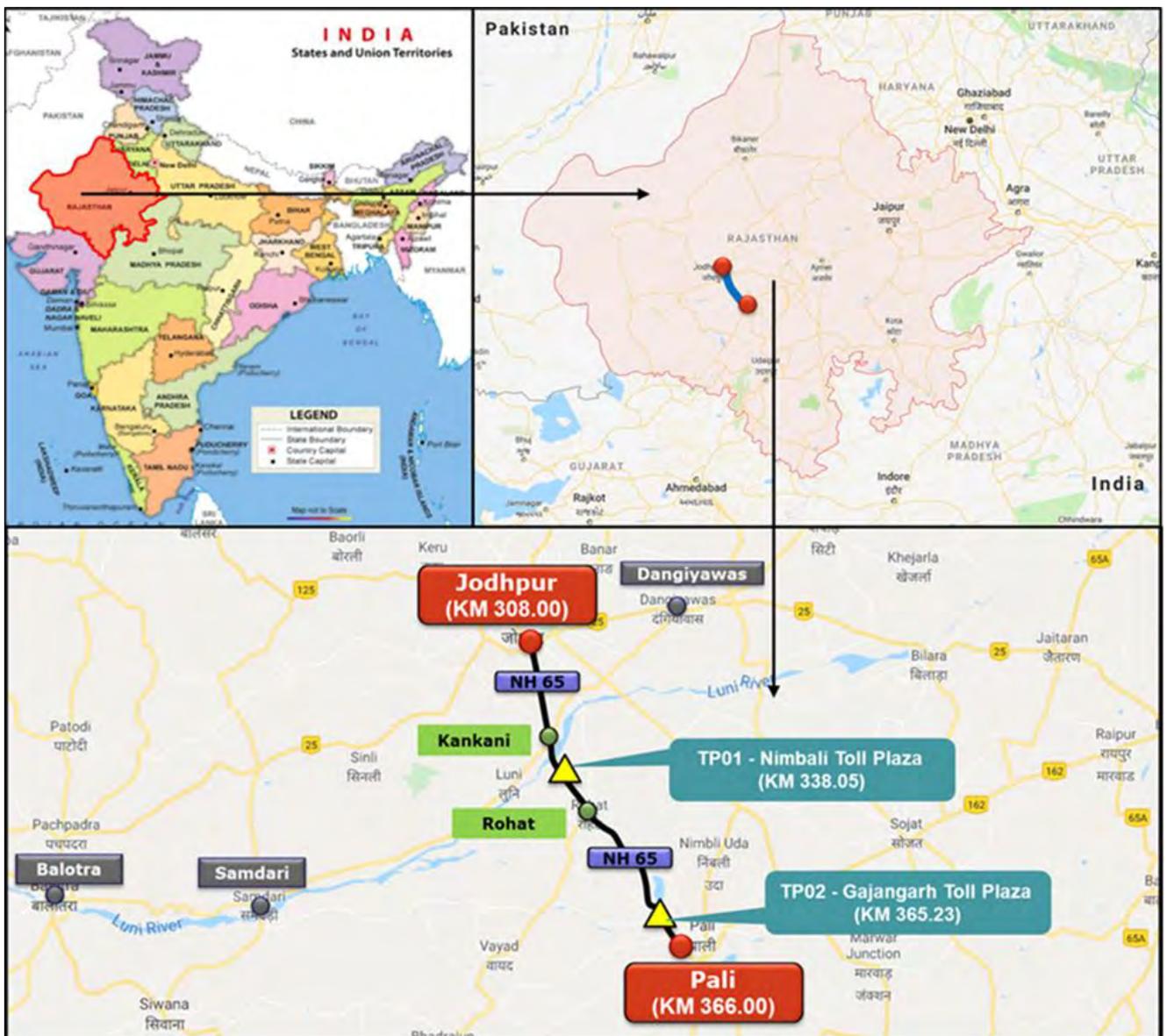
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## TRAFFIC STUDY FOR JODHPUR – PALI SECTION OF NH-65 IN THE STATE OF RAJASTHAN



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## ABBREVIATIONS

%	Percentage
2A	2 Axle Truck
3A	3 Axle Truck
AADT	Annual Average Daily Traffic
ACSR	Aluminium Conductors Steel Reinforced
ADT	Average Daily Traffic
AR	Alternate Route
BOT	Build, Operate & Transfer
CA	Concession Agreement
CAGR	Compounded Annual Growth Rate
CJV	Car/Jeep/Van
COVID	Corona Virus Disease
CSO	Central Statistical Organisation
DFC	Dedicated Freight Corridor
DMIC	Delhi Mumbai Industrial Corridor
EI	Economic Indicator
EME	Earth Moving Equipment
FY	Financial Year
GDP	Gross Domestic Product
GIP	Global Infra Partners
GJ	Gujarat
GSDP	Gross State Domestic Product
GST	Goods & Services Tax
GVW	Gross Vehicle Weight
HCM	Heavy Construction Machinery
IA	Industrial Area
IR	Investment Region
IRC	Indian Roads Congress
IT	Information Technology
ITES	Information Technology Enabled Services
JPM	Jodhpur-Pali-Marwar
JPMIA	Jodhpur-Pali-Marwar Industrial Area
LCV	Light Commercial Vehicle
LMV	Light Motor Vehicle
MAV	Multi Axle Vehicle
MDR	Major District Road
MH	Maharashtra
MLCV	Mini Light Commercial Vehicle
MTPA	Million Tonnes Per Annum

NH	National highway
NHAI	National Highway Authority of India
NHDP	National Highway Development Programme
OD	Origin & Destination
OSV	Oversized Vehicle
PB	Punjab
PCU	Passenger Car Unit
PIA	Project Influence Area
PMGSY	Pradhan Mantri Gram Sadak Yojana
PR	Project Road
RFP	Request For Proposal Document
RJ	Rajasthan
SEZ	Special Economic Zone
SH	State Highway
SMS	Steel Melting-Shop
SPV	Special Purpose Vehicle
TP	Toll Plaza
WPI	Wholesale Price Index
YOY	Year on Year

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*In preparing this report, Ramboll India Private Limited relied, in whole or in part, on data and information provided by the SPV – Jodhpur-Pali Expressway Private Limited, which information has not been independently verified by Ramboll and which Ramboll has assumed to be accurate, complete, reliable, and current. Therefore, while Ramboll has utilized its best efforts in preparing this Report, Ramboll does not warrant or guarantee the conclusions set forth in this Report which are dependent or based upon data, information, or statements supplied by third parties or the client.*

***The traffic projections in this document represent Ramboll’s best estimates based on the most credible information available on the date of this report. While these represent a reasonable expectation for the future, these are not precise forecasts.***

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## CONTENTS

1.	INTRODUCTION	7
1.1	General	7
1.2	Objective and Scope of Services	8
1.3	Structure of Report	8
2.	TRAFFIC SURVEYS AND ANALYSIS	9
2.1	General	9
2.2	Project Road Characteristics	9
2.3	Base Traffic Estimation	11
2.4	Travel Characteristics	13
3.	TRAFFIC GROWTH RATE AND PROJECTIONS	16
3.1	General	16
3.2	Project Road Traffic	16
3.3	Traffic Growth Rate Estimation	26
3.4	Past Economic Growth of PIA	27
3.5	India and PIA Outlook	30
3.6	Review of Past Traffic Data	33
3.7	Present and Future Transport Demand Elasticity	35
3.8	Projected Traffic Growth Rates	37
3.9	Projected Total Traffic	38
4.	TOLL REVENUE PROJECTIONS	40
4.1	Tolling Strategy	40
4.2	Schedule of User Fee	40
4.3	Tolling Streams	41
4.4	Toll Rates	42
4.5	Projected Tollable Traffic	45
4.6	Toll Revenue Estimates	45

## LIST OF TABLES

Table 2-1: AADT – FY22 at Both Toll Plazas as per Tolling Categories .....	13
Table 2-2: Regional Distribution of Tollable Traffic (in %) at TP01 And TP02.....	13
Table 2-3: Travel pattern on Project Road.....	14
Table 2-4: Commodity Distribution at Toll Plazas (%).....	15
Table 3-1: Vehicle generation from DMIC to the Project Road (per day).....	25
Table 3-2: Normalised OD Shares for the Project Road.....	27
Table 3-3: Average Annual Growth Rates (%) of GSDP for PIA States .....	28
Table 3-4: Average Annual Growth Rates (%) of State Income for PIA states.....	29
Table 3-5: Future Outlook of India .....	31
Table 3-6: Future Outlook of PIA States.....	32
Table 3-7: Future Perspective of PIA Weighted Income.....	33
Table 3-8: Past Growth and Trend Analysis .....	34
Table 3-9: Actual Past Traffic Elasticity .....	35
Table 3-10: Recommended Elasticity for Project Road .....	37
Table 3-11: Projected Traffic Growth Rates for PIA (%) .....	38
Table 3-12: Total Traffic Projections in PCUs at the Toll Plazas .....	39
Table 4-1: Tolling Distribution for the Project Road Including Exemptions and Violations (in %) ..	41
Table 4-2: Toll Paying Traffic, FY22 .....	42
Table 4-3: Tolling Distribution for the Project Road Excluding Exemptions and Violations (in %) ..	42
Table 4-4: Toll Rates in Rs/km for Different Vehicle Categories.....	43
Table 4-5: Toll Rates in Rs for Permanent Structure Exceeding 500 million Rs Cost .....	43
Table 4-6: WPI Forecast for Toll Rate Indexation .....	44
Table 4-7: Toll Rates at The Toll Plazas (in Rs) .....	44
Table 4-8: Projected Toll Paying Traffic in PCUs at the Toll Plazas .....	45
Table 4-9: Toll Revenue (in Rs million) by Type of Concession for PR .....	46
Table 4-10: Toll Revenue (in Rs million) for Project Road by Mode .....	47

## LIST OF FIGURES

Figure 1-1: Map Showing The Alignment Of NH65 Connecting Ambala & Pali .....	7
Figure 2-1: Project Road and Toll Plaza Locations .....	9
Figure 2-2: Past Traffic at TP01 Nimbali.....	11
Figure 2-3: Past Traffic at TP02 Gajangarh.....	11
Figure 2-4: MoM Traffic (FY22) on the Project Road at TP01-Nimbali .....	12
Figure 2-5: MoM Traffic (FY22) on the Project Road at TP02-Gajangarh .....	12
Figure 3-1: Different Alternate Routes along the Project Corridor.....	17
Figure 3-2: Alignment of Alternate Route-01 .....	18
Figure 3-3: Alignment Map of Alternate Route-02 .....	19
Figure 3-4: Alignment Map of Alternate Route-03 .....	20
Figure 3-5: Alignment Map of Alternate Route-04 .....	21
Figure 3-6: Alignment of the Economic Corridors and Feeder Roads .....	22
Figure 3-7: Proposed DMIC Node of JPMIA .....	24
Figure 3-8: Proposed DFC Alignment.....	25
Figure 3-9 : GSDP (in Rs Billion) for Influencing PIA States.....	29
Figure 3-10 : GDP Growth in India .....	30

## 1. INTRODUCTION

### 1.1 General

The Public Works Department, Government of Rajasthan on behalf of Ministry of Road Transport and Highways, Government of India has identified important corridors in the state under the core road network. The Jodhpur-Pali section of NH-65 is one of many such corridors that have been four laned considering the future capacity constraints.

The National Highway-65 with a length of 690 km connects Ambala in Haryana to Pali in Rajasthan. The highway passes through Haryana and Rajasthan states. The major cities located along this highway are Ambala, Kaithal, Hisar, Churu, Fatehpur, Nagaur, Jodhpur and Pali. Alignment of the NH-65 is shown in Figure 1-1.

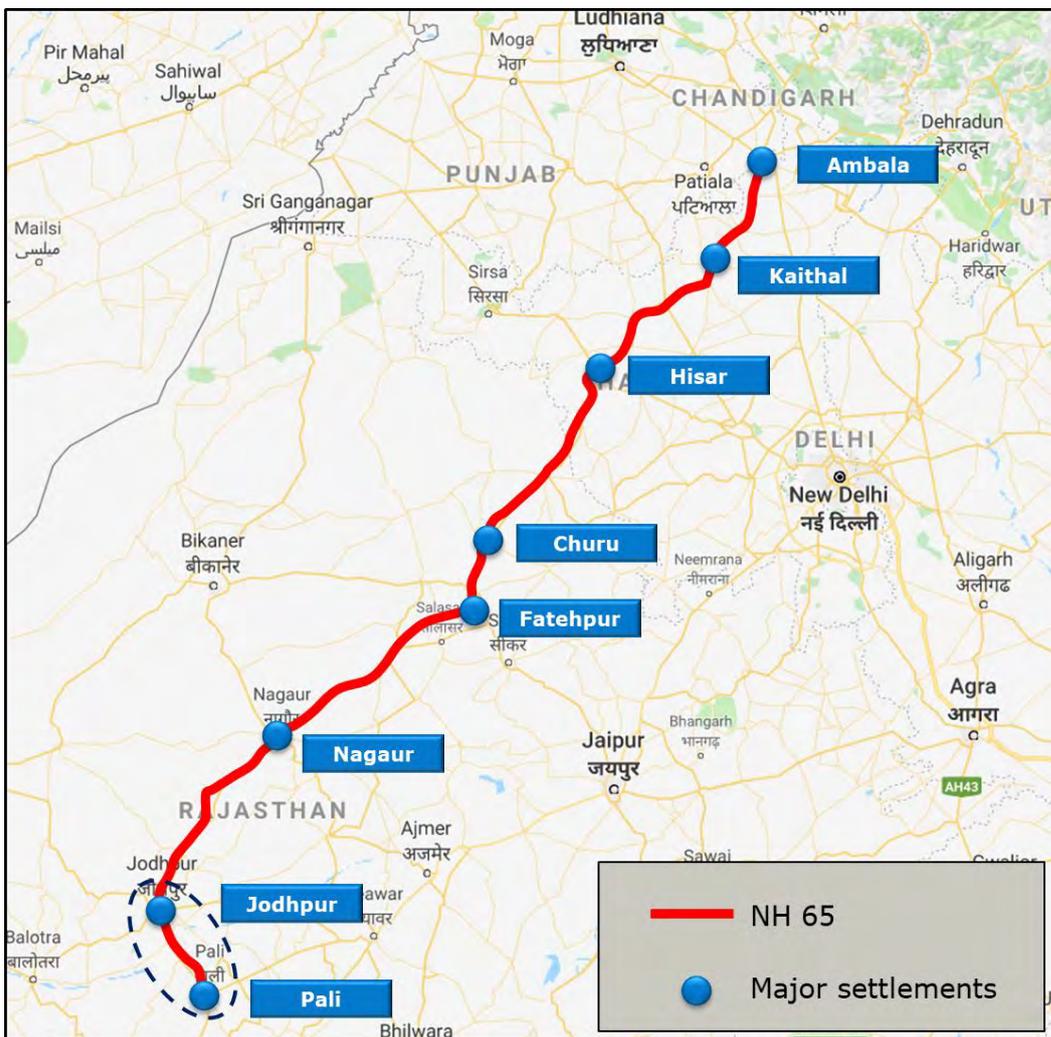


Figure 1-1: Map Showing The Alignment Of NH65 Connecting Ambala & Pali

The project road section of Jodhpur-Pali of NH-65 starts at Jodhpur (km 308) to km 366 & includes bypass to Pali starting from km 366 of NH-65, connecting NH-14 at km 114 in the state of Rajasthan. The project road has a length of about 71.535 km. The asset is being run by SPV – Jodhpur-Pali Expressway Private Limited for a concession period of 25 years and is operational since 31<sup>st</sup> October 2014.

M/s. Ramboll India Private Ltd has been engaged as Traffic Consultant for Highways Infrastructure Trust to carry out a study for assessing the present traffic levels, travel pattern and revenue estimation for the project duly considering the network characteristics, future economic perspective in the influence area of the project and the provisions in the Concession Agreement of the project for the balance concession period.

## 1.2 Objective and Scope of Services

The scope of services of this study is to prepare Traffic Due diligence Reports covering

- Analysis of recent toll/traffic data of April-December 2021 and its growth trends
- Estimation of the base AADT for FY22
- Traffic projections for the balance concession period
- Toll revenue estimates in view of changes, if any, in WPI forecasts and tolling ticket segmentation
- Scenario Analysis of toll revenue to cover diversion, if any, to/from the project road

## 1.3 Structure of Report

The report is divided into four chapters, including this introduction chapter. Chapter 2 contains details of project road characteristics and its analysis to understand the base year traffic and travel characteristics in the Project Influence Area (PIA). Chapter 3 contains the details on the derivation of traffic growth rates used for traffic forecasting and presents traffic projections till the end of the concession period. Chapter 4 presents the details regarding tolling strategy, toll rates and the revenue projections for the duration of the concession.

## 2. TRAFFIC SURVEYS AND ANALYSIS

### 2.1 General

This chapter presents the details of the project road characteristics, Annual Average Daily Traffic (AADT) and travel characteristics on the project road. The results of the analysis will be utilized in assessing the traffic growth and estimation of traffic and revenue forecast on the project road for the remaining concession period.

### 2.2 Project Road Characteristics

The project road falls under the jurisdiction of two districts (Jodhpur and Pali). The project road, in wider context, serves the long-distance traffic which is majorly plying between Punjab/Rajasthan areas and Gujarat/Maharashtra part of India. Apart from long distance traffic, it also serves the short distance traffic which is mainly generated between Jodhpur and Pali areas. The settlements of Rohat, Nimbali, Gajangarh and Kharda lie along the project corridor. The alignment of project road and toll plaza locations are shown in Figure 2-1.



Figure 2-1: Project Road and Toll Plaza Locations

There are two toll plazas present on the project road, one near Nimbali (km 338.05) and second one at Gajangarh (km 365.23). Both toll plazas are located in Pali district.

#### 2.2.1 Profile of project influence area

The project road section lies entirely in the state of Rajasthan. It passes through the districts of Jodhpur and Pali. The districts of Jodhpur and Pali fall under the DMIC region identified along the Western DFC corridor running from Delhi to Mumbai. The DMIC corridor is proposed to include 24 industrial nodes: 13 investment regions of ~ 200 sq.km

area and 11 Industrial areas of ~100 sq.km area. The Jodhpur-Pali-Marwar Industrial Area (JPM IA) is proposed in Jodhpur Division of Rajasthan. The key industries currently present in Jodhpur include handicrafts and textile products. Also, an Integrated Multimodal Logistics Hub has been proposed near Rohat Railway Station as per the JPM IA Master Plan (2016).

A brief description of the profile of these two districts is presented below.

### Jodhpur District

Jodhpur district, situated in central Rajasthan, spreads in 22,850 sq. km and accommodates a population of 3.687 million (as per 2011 census). It is the divisional **headquarters of state's largest administrative division covering** western districts of Rajasthan i.e., Barmer, Jaisalmer, Jalore, Jodhpur, Pali and Sirohi.

Almost 60 percent of land area is under agricultural or related use. Maize, bajra, moth, chanwala, guar, till, moong, groundnut, cotton, barley, chilli and wheat are the major crops cultivated within the district. Minerals are playing important role in development of Jodhpur district. District is rich in non-metallic minerals like sandstone, rhyolite, dolomite, jasper, granite and clay.

Handicraft is the major industry in the district. Jodhpur is famous for its solid wooden furniture market. Some big furniture manufactures and sellers like Induscraft, Urban Ladder, Pepperfry, Home glamour and Fabfurnish are located in the district. Tourism and related sectors are the next major economic activities in district. Jodhpur city which is also **known as 'blue city' and 'sun city' is famous for its historical monuments, forts and museums.** Textiles, cement, mineral based, plastic, chemicals, electrical and electronics are the other major industries in the district.

### Pali District

Pali district, situated in central Rajasthan, spreads in 12,387 sq. km and accommodates a population of 2.038 million (as per 2011 census). Chemical grade limestone, quartz, feldspar and calcite produced in the district are famous for its quality. Asbestos, soap stone, magnesite, gypsum, marble and barytes are the other major minerals found in the district. Agriculture is the major economic activity in the district. Millet, cotton, wheat, mustard, beans and barley are the major crops cultivated in the district.

Medicines, pesticides and steel furniture are the major industrial sectors found in the district. Industrial units of textile dyeing and printing, umbrellas and wire netting, cotton ginning and medium and small sized manufacturing units of mehandi, ACSR conductors, agricultural equipment, conduct pipes are also found within district boundaries.

### 2.3 Base Traffic Estimation

For the present study, the toll traffic data at the toll plaza location was provided by the client for the period November 2014 to December 2021. The year-on-year mode wise traffic for the project road is presented in Figure 2-2 and Figure 2-3.

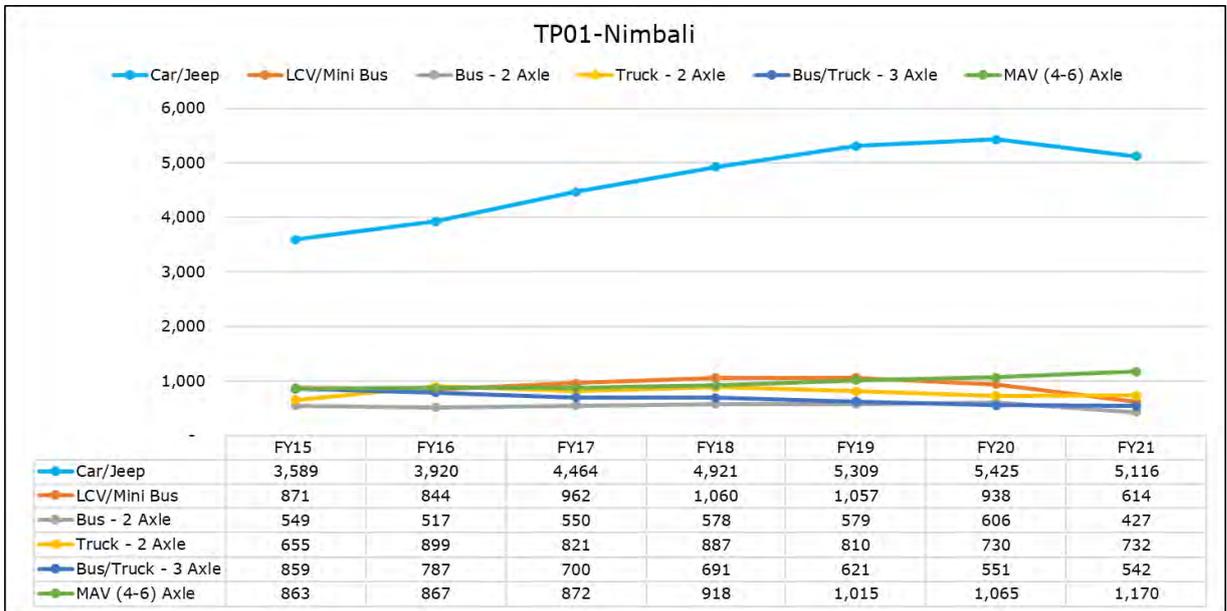


Figure 2-2: Past Traffic at TP01 Nimbali

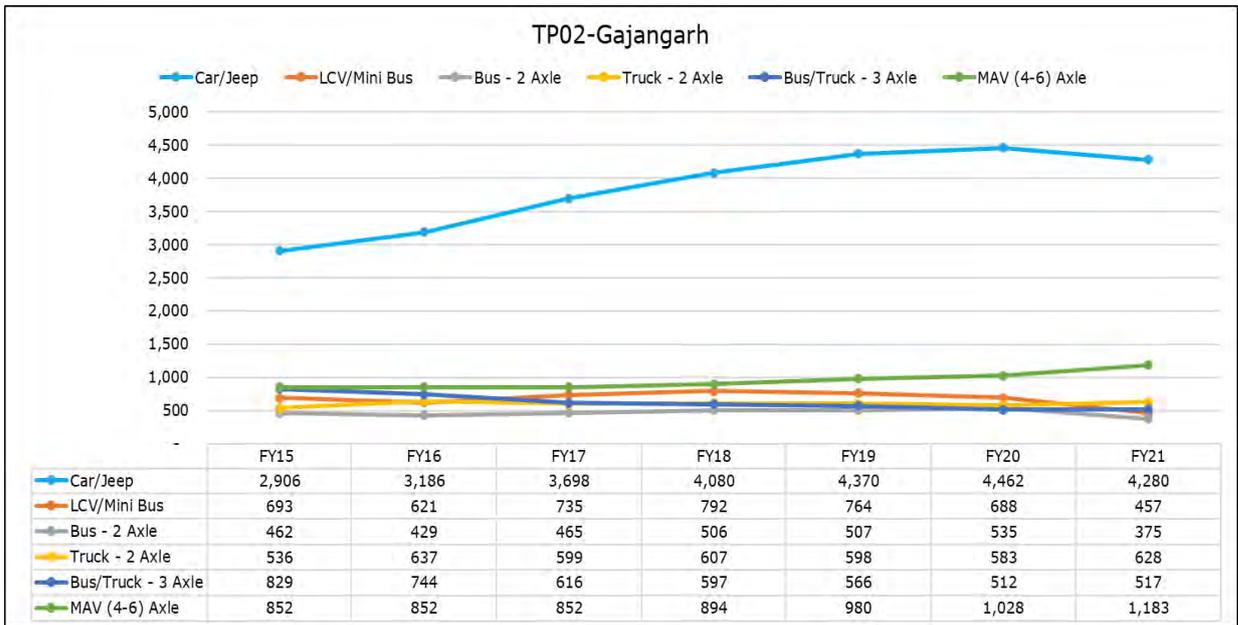


Figure 2-3: Past Traffic at TP02 Gajargarh

The traffic during FY21 was impacted by COVID-19 indicating a decline in first quarter traffic in almost all the modes due to complete lockdown measures implemented by the Central government due to spread of COVID 19 virus throughout the country. The traffic showed recovery in second quarter of FY21 as the lockdowns were eased and economic activities slowly started to pick up. Next two quarters have shown a substantial pickup of traffic.

The onset of the second wave of Covid-19 and the lockdowns announced by the state government during April-May 2021 was a setback to the continuous recovery of traffic to

normal levels. With the opening of economic activities, the traffic has started to pick up and shows a recovery from June 2021 onwards. The month-on-month mode wise traffic for the FY22 (April-December) for both the toll plazas is presented Figure 2-4 and Figure 2-5.

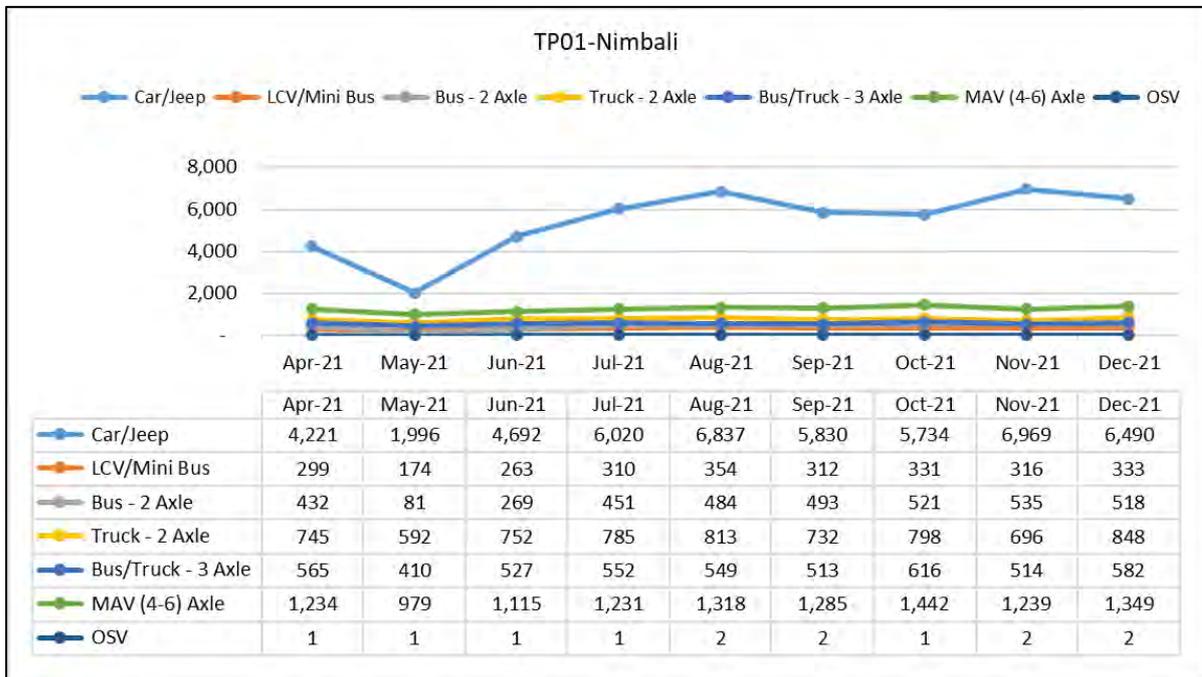


Figure 2-4: MoM Traffic (FY22) on the Project Road at TP01-Nimbali

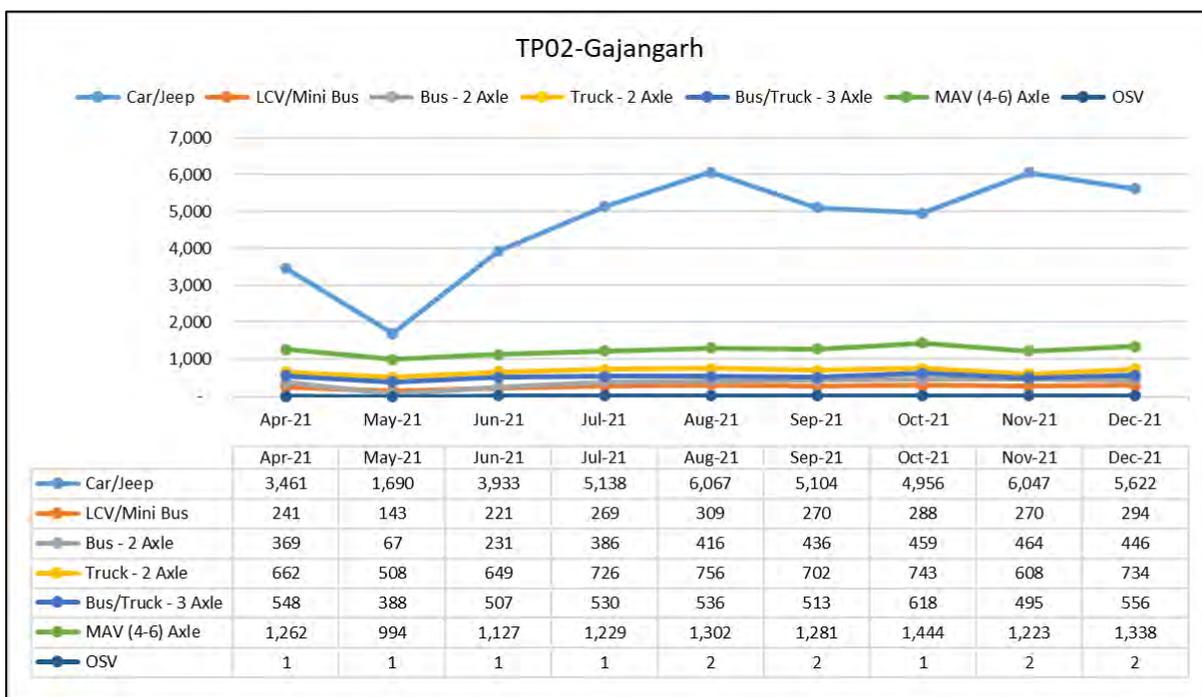


Figure 2-5: MoM Traffic (FY22) on the Project Road at TP02-Gajangarh

With that in mind, estimation for FY22 AADT is done after annualising the behaviour of June-December traffic. For this purpose, a ratio/ factor of average of July-December to twelve-month average derived from FY19. As buses have not yet recovered from the impact of COVID 19 due to the social distancing norms being followed and resultant increased usage of cars, FY20 AADT of Buses has been adopted for corrected FY22 as well.

The AADT for FY22 derived from the toll traffic data along with 6 months to yearly factors in presented in Table 2-1.

Mode/TP	Car/Jeep	LCV/ Minibus	Bus	2A Truck	3A Truck	MAV (4-6A)	OSV
TPO1-Nimbali							
ADT-July- December (6 months)	6,313	326	-	778	554	1,311	2
Six-to-twelve- month correction factor	0.99	1.00	-	1.04	1.01	1.04	1.01
AADT	6,279	326	606	811	559	1,369	2
TPO2-Gajangarh							
ADT-July- December (6 months)	5,489	283	-	712	541	1,303	2
Six-to-twelve- month correction factor	0.98	1.00	-	1.03	1.01	1.04	1.01
AADT	5,381	280	535	731	546	1,360	2

Table 2-1: AADT – FY22 at Both Toll Plazas as per Tolling Categories

## 2.4 Travel Characteristics

### 2.4.1 Regional Distribution

Table 2-2 presents the distribution indicating the attraction and generation zones for the traffic on the project road for TP01 and TP02.

Region/ Modes	LMV	Mini Bus	Bus	LCV	2A	3A	MAV
TPO1-Nimbali							
Rajasthan	90.0	79.4	85.7	90.8	76.6	59.0	43.3
Gujarat	8.1	2.9	10.3	5.2	13.9	21.8	28.4
Punjab	0.3	5.8	0.5	1.6	4.1	8.7	12.2
Haryana	0.1	0.0	0.0	0.5	1.5	3.8	6.7
Maharashtra	0.3	8.8	1.4	0.8	2.1	3.9	4.7
Madhya Pradesh	0.6	2.9	0.5	0.1	0.3	0.1	0.2
Rest of India	0.3	0.0	1.1	0.7	1.3	2.5	4.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
TPO2-Gajangarh							
Rajasthan	89.9	82.1	76.7	86.8	72.5	55.9	44.1
Gujarat	6.5	7.1	14.2	6.7	15.5	22.6	27.1
Punjab	0.6	3.5	0.9	2.2	5.4	8.5	11.8
Haryana	0.5	0.0	1.3	1.1	2.0	3.5	6.2
Maharashtra	0.8	3.5	3.6	1.2	1.5	4.8	4.8
Madhya Pradesh	0.3	3.5	0.9	0.1	0.2	0.0	0.2
Rest of India	1.0	0.0	2.1	1.6	2.6	4.4	5.5
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 2-2: Regional Distribution of Tollable Traffic (in %) at TP01 And TP02

Passenger traffic:

- In case of car traffic, Rajasthan contributes about 90.0 percent at TP01 and TP02. However, Gujarat and Punjab contribute about 7-8 percent and 0.3-0.6 percent at both the toll plazas.

- In case of Bus traffic, Rajasthan contributes about 85.7 percent and 76.7 percent at TP01 and TP02 respectively, followed by Gujarat accounting for 5-6 percent at both toll plazas.

Freight traffic:

- In case of LCV traffic, Rajasthan contributes about 90.8 and 86.8 percent at TP01 and TP02 respectively, followed by Gujarat accounting for 5-6 percent at TP01 & TP02 respectively.
- In case of MAVs, share of Rajasthan state at TP01 and TP02 is about 43.3 and 44.1 percent respectively. Gujarat contributes around 27-28 percent at both the toll plaza locations. Punjab contributes 12.2 percent at TP01 and 11.8 percent at TP02. Haryana and Maharashtra also have a reasonable share at TP01, about 6.7 percent and 4.7 percent, while at TP02 it is about 6.2 percent and 4.8 percent.

#### 2.4.2 Travel Pattern

The major travel pattern for the project road from an earlier study available with the consultant is presented in Table 2-3.

S. No	Traffic Streams	Car	MiniBus	Bus	MLCV	LCV	2A	3A	MAV
<b>TP01-Nimbali</b>									
1	Jodhpur & beyond - Zones between TP01 & TP02	27.0%	42.8%	14.4%	34.6%	20.0%	30.5%	11.6%	5.1%
2	Jodhpur & surroundings - Pali & beyond	66.4%	49.5%	75.8%	62.3%	62.8%	58.2%	55.3%	48.4%
3	Jaisalmer/Bikaner/Nagar & surroundings - Pali & beyond	5.7%	7.8%	9.5%	2.1%	10.6%	5.0%	14.0%	13.7%
4	Haryana/Delhi/Punjab & beyond -Pali & beyond	0.9%	0.0%	0.3%	1.0%	6.7%	6.2%	19.1%	32.8%
Total		100%	100%	100%	100%	100%	100%	100%	100%
<b>TP02- Gajangarh</b>									
1	Zones between TP01 & TP02 - Pali & beyond	13.5%	4.4%	3.6%	17.9%	6.9%	7.8%	5.0%	2.4%
2	Jodhpur & surroundings - Pali & beyond	72.6%	88.6%	88.8%	76.8%	83.0%	70.1%	58.7%	58.8%
3	Jaisalmer/Bikaner/Nagar & surroundings - Pali & beyond	11.3%	7.0%	6.2%	3.2%	3.7%	8.9%	14.3%	13.8%
4	Haryana/Delhi/Punjab & beyond -Pali & beyond	2.6%	0.0%	1.4%	2.2%	6.5%	13.2%	22.0%	24.9%
Total		100%	100%	100%	100%	100%	100%	100%	100%

Table 2-3: Travel pattern on Project Road

- In case of large axle truck traffic (2A, 3A, MAV) at TP01 & TP02, the major travel pattern is from/to Jodhpur and surroundings to/from Pali and beyond.
- About 66-72 percent of car traffic at both the toll plazas is found to be travelling between Jodhpur & surroundings to Pali & beyond (stream 2).
- About 25-32 percent of MAV traffic at both locations are found to be travelling between Haryana/Delhi/Punjab & beyond to Pali & beyond (stream 4). It may be noted that

majority of this traffic is from/to Ahmedabad/Vadodara/Surat to/from Delhi/Haryana /Punjab.

### 2.4.3 Commodity Distribution

Commodity distribution for the total freight vehicle is presented at Table 2-4.

Commodity Type	% Share - TP01	% Share- TP02
Empty	13.5	14.0
Minerals	0.8	0.2
Food grains	3.5	2.7
Cash crops	1.2	1.6
Perishables	16.7	22.2
Wood and Forest products	2.2	2.3
Sand/Powder	1.8	2.8
Stone/Marble	10.5	6.8
Iron/Steel	1.0	1.5
Cement/Fly ash	6.2	5.9
Construction materials	2.8	2.6
Natural gas	1.4	2.8
Petroleum products	5.8	3.5
Parcel	3.1	4.0
Machinery	0.8	1.5
Paper	0.5	0.3
Chemical/Fertilizers	3.3	4.0
Grocery/Consumer goods	15.5	11.3
Textile	7.6	7.0
Others	2.0	2.7
Total	100.0	100.0

Table 2-4: Commodity Distribution at Toll Plazas (%)

- About 6.2 percent of total truck traffic at TP01 and 5.9 percent of total truck traffic at TP02 are found to carry cement/ fly ash. Major travel pattern of such vehicles was observed to be between Jodhpur and Rohat/Pali/Sirohi.
- Fruits and vegetables (perishables) are the other major commodities transported across toll plaza locations, it accounts for 16.7 percent of freight traffic at TP01 and 22.2 percent at TP02. Major travel pattern is observed between Jodhpur/ Punjab and Pali/ Ahmedabad/ Vadodara/ Surat.
- Around 13.5 percent at TP01 and about 14.0 percent at TP02 of freight vehicles are found to be plying empty, after unloading of goods to nearby destination points such as Sirohi, Pali etc.

## 3. TRAFFIC GROWTH RATE AND PROJECTIONS

### 3.1 General

As the project road has been executed on a BOT basis with a concession period of 25 years, an estimation of the traffic using the tolled highway and its future growth are **important elements to assess the project's economics** as these are generally the main/sole source of revenue for the project. This chapter details various aspects of the current traffic of the project road and its growth potential.

### 3.2 Project Road Traffic

The traffic that is likely to use the project road is estimated on the basis of the traffic and travel characteristics. The traffic on the project road would normally consist of the following components:

- Normal Traffic
- Diverted Traffic
- Induced/Developmental Traffic

#### 3.2.1 Normal Traffic

Normal traffic is the traffic, which is already plying on the project road in FY22, has been corrected for impact of COVID 19. The corrected FY22 traffic is the total traffic including the exempted vehicles which do not pay toll at the toll plaza location.

#### 3.2.2 Diverted Traffic

Diverted traffic is generally dictated by the presence of an alternative route at a lower generalised cost, which is in-turn defined by the road configuration and its condition, the type of vehicle and its operating costs, the average riding speed, the route distance and any tolling that may apply on a specific route.

Some alternate routes in the vicinity of the project road have been identified which possibly could be used to bypass the toll plazas and are presented in Figure 3-1.



Figure 3-1: Different Alternate Routes along the Project Corridor

The description and analysis of the different alternate routes are discussed in the following sections:

Alternate Route-01:

The Alternate Route-01 starts at Jodhpur bypass, connecting MDR-101 and ends near to Rohat. It is an MDR road maintained under the PMGSY program, with a lane configuration of 3.5 to 4.5m. Village traffic going to Lalki and Rajpuriya are using this route. This road is not a properly paved road while crossing the village settlements. Only the local traffic which is destined to Lalki and beyond is using this route and is not likely to be a threat to the project corridor traffic. The alternate route crosses few water bodies and Luni River with a temporary road only. There was no bridge in place to cross the river, which itself shows that vehicles cannot cross the river when the water level is high. The alternate route is 3 km longer than the project road. The alignment of the Alternate Route-1 is presented in Figure 3-2.



Figure 3-2: Alignment of Alternate Route-01

As Alternate Route-01 is longer than project road by 3 km and has poor geometry, it may not be preferred by vehicles to bypass the project road. Since the alternate route is a village road, its upgradation to a level of competing facility to the project road is not envisaged and thus, any diversion is not likely to happen.

Alternate Route-02:

The identified Alternate Route-02 was assessed through the site reconnaissance to figure its potential in acting as an alternate route. AR02 starts near Kharda and crossing the railway line near Kairla station and connected with the Jodhpur road (which is going to Pali) below the Pali – Jodhpur bypass flyover. AR2 (8 km) is a village road maintained under PMGSY Program and has a lane configuration of 3.5 m with poor road geometry. There is no direct connectivity between AR02 and the project road and the route also has a railway crossing. This route is 1.5 km longer than the project road. The alignment of the Alternate Route-2 is presented in Figure 3-3.



Figure 3-3: Alignment Map of Alternate Route-02

As Alternate Route-02 has poor geometry and has a railway crossing with no direct connectivity to project road, it is not likely that this route will act as a potential threat to the project road traffic. Since the alternate route is a village road, its upgradation to a level of competing facility to the project road is not envisaged and thus, diversion is not likely to happen.

Alternate Route-03:

Alternate Route-03, connecting Kharda and Pali is a village road with a lane configuration of 3.5 to 4.0 m. The condition of the road is very poor, and it has very minimal local traffic at the time of survey. AR03 has a railway crossing at the beginning of section near Pali railway station. The alternate route has to cross few water bodies in order to get connected to the other end of the road. There was no bridge in place to cross the river which acts as a deterrent for the vehicles to use this road. The alignment of the Alternate Route-03 is presented in Figure 3-4.

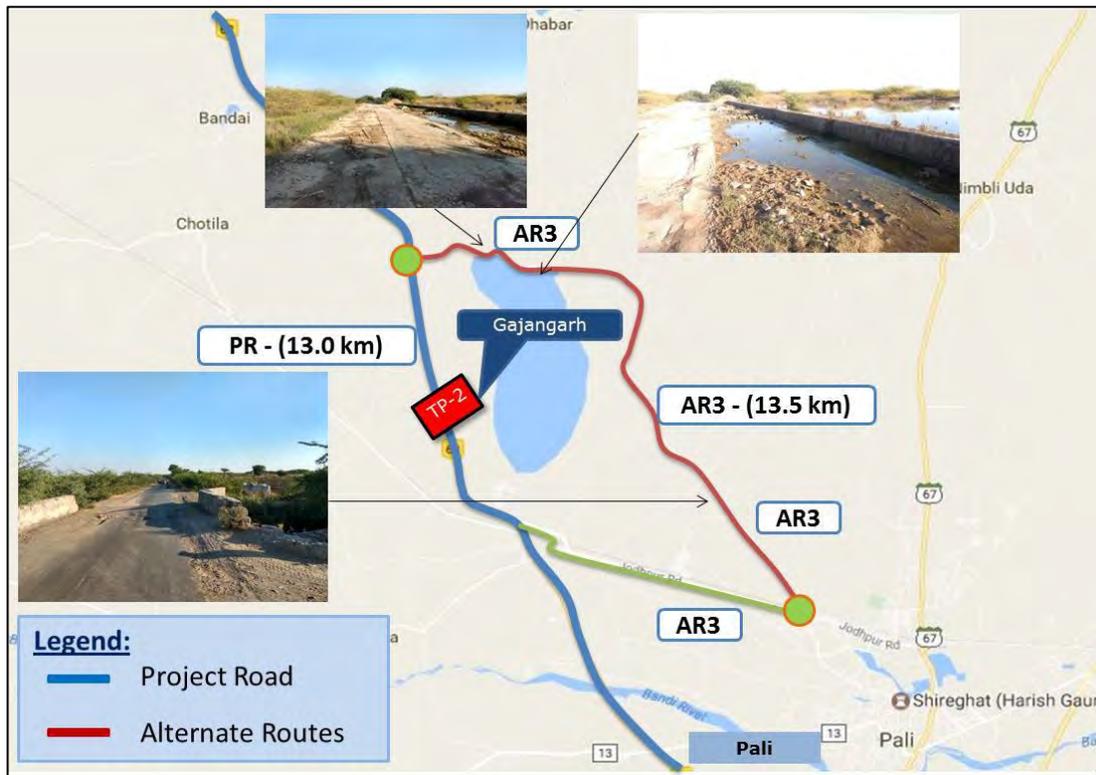


Figure 3-4: Alignment Map of Alternate Route-03

Alternate Route-03 is 0.5 km longer than project road and has poor geometry with a railway crossing in place. In light of this, it would not be preferred by vehicles to bypass the project road. Since the alternate route is a village road, its upgradation to a level of competing facility to the project road is not envisaged and thus, diversion is not likely to happen.

Alternate Route-04:

Alternate Route-04, connecting Jodhpur and Pali via Sardar Samand was identified. The alternate road is around 80 km and 8 km longer than the project road. It is a recently upgraded 2 lane road upto Jadan with two toll plazas- one between Jodhpur and Sardar Samand, another toll plaza between Sardar Samand and Jadan but not yet operational. The vehicles using this alternate route to reach Pali will have to pay toll at the toll plaza between Jodhpur and Sardar Samand and pass through the densely populated area of Pali. As per the **vendor's study and site visit undertaken by us in an earlier study**, it is observed that local traffic movement is predominant on this route, with majority of the traffic going to the local areas along the route and further to Jadan. Thus, there would not be any diversion from project road in future. The alignment of the Alternate Route-04 is presented in Figure 3-5.

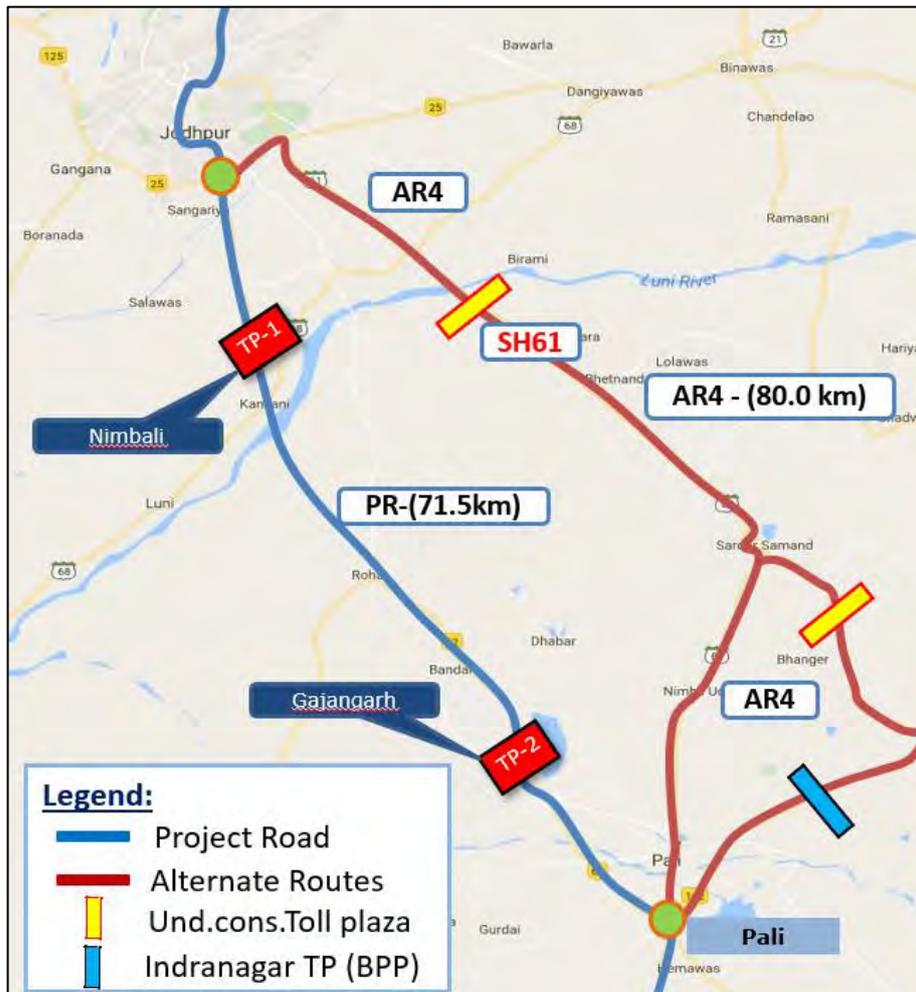


Figure 3-5: Alignment Map of Alternate Route-04

### 3.2.3 Induced/ Development Traffic

Developmental /new generated traffic is the one which would be generated, over and above normal growth, because of lowering of transport costs or new developments in the immediate influence area of the project road.

Bharatmala Pariyojana is the second largest highways construction project in the country since NHDP, under which almost 50,000 km or highway roads were targeted across the country. It will look to improve connectivity particularly on economic corridors, border areas and far-flung areas with an aim of quicker movement of cargo and boosting exports.

It will connect 550 district headquarters to minimum 4-lane highway by raising the number of corridors to 50 (from current 6) and move 80 percent freight traffic (currently 40 percent) to national highways by connecting 24 logistics parks and 7 north east multimodal waterway ports.

The Phase-I includes economic corridors of around 9,000 km; inter-corridor and feeder routes of around 6,000 km; 5,000 km roads under the National Corridors Efficiency Program, border and international connectivity roads of around 2,000 km; coastal and port connectivity roads of around 2,000 km; expressways of around 800 km and 10,000 km of NHDP roads. The total length in phase 1 comes to around 34,800 km.

In the context of the project influence area, project road is a part of Amritsar-Jamnagar economic corridor which passes through Faridkot – Bhatinda – Abohar – Sri Ganganagar – Bikaner – Nagaur – Jodhpur – Radhanpur – Samakhiali – Jamnagar and is likely to improve connectivity with an aim to provide quicker movement of cargo. Figure 3-6 presents the details of the upcoming projects under Bharatmala in the project influence area in the context of the project section.

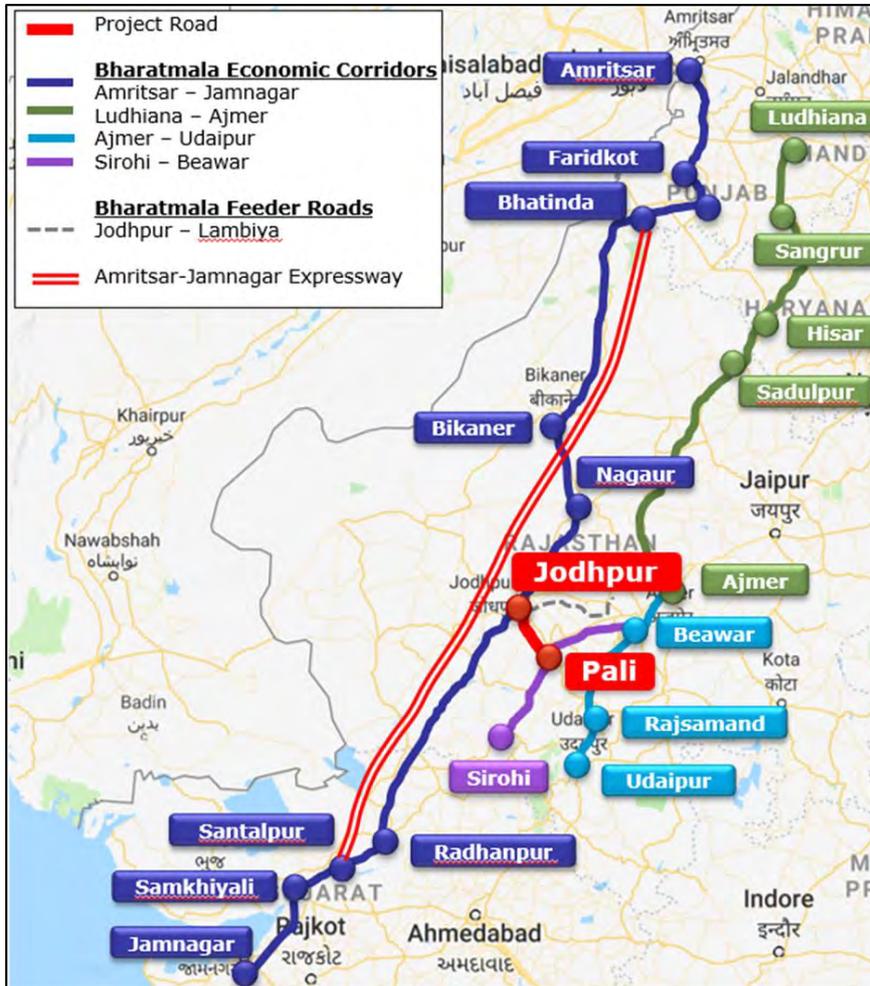


Figure 3-6: Alignment of the Economic Corridors and Feeder Roads

In the context of upcoming Amritsar-Jamnagar expressway, the project road does not have the potential traffic from/to Punjab & beyond to/from Saurashtra region in Gujarat. Hence, this expressway will not take away any traffic from the project road.

As the project road is a connecting link to these economic corridors and feeder roads, it is likely to remain an important state highway for the North-South movement and may see sustained growth in the future. This has been considered while setting out traffic growth rates for rest of the concession period.

Two major developments of DMIC node (Jodhpur-Pali) and operation of western DFC may have an impact on the PR traffic. The following sections provide an assessment of the impact.

### Impact of DMIC

Along the alignment of the **Delhi-Mumbai Freight Corridor, "Delhi Mumbai Industrial Corridor (DMIC)"** is being set up in a strip of 150-200 km. The proposed alignment of dedicated freight corridor passes through the region that already has well-developed industrial base. However, to optimize on the alignment of DFC and feeder transport infrastructure for freight distribution, influence region for development of high impact economic regions with quality infrastructure is considered to be extended up to 150-200 km on both sides of the alignment of the DFC.

Project influence area (PIA) for DMIC comprises 436,486 sq km and constitutes 29.2% of the total area of DMIC states (1,492,557 sq km) and 13.8% of overall India. The influence area states for DMIC include Delhi, Haryana, Rajasthan, Gujarat, Maharashtra, Union Territories of Diu & Daman and Dadra & Nagar Haveli along with parts of Western Uttar Pradesh, Uttaranchal and Madhya Pradesh.

Under DMIC, high impact/ market driven nodes- integrated Investment Region (IRs) and Industrial Areas (IAs) have been identified within the corridor to provide transparent and investment friendly facility regimes.

An Investment Region (IR) would be a specifically delineated industrial region with a minimum area of over 200 square km (20,000 hectares), while an Industrial Area (IA) would be developed with a minimum area of over 100 square km (10,000 hectares). 24 such nodes - 11 IRs and 13 IAs spanning across six states have been identified after wide consultations with the stakeholders i.e., the State Governments and the concerned Central Ministries. It is proposed that 6 IR and 6 IAs would be taken up for implementation in the Phase 1. Phase I development is very much delayed and now is likely to be completed by 2020-21. The revised deadlines for phase 2 and 3 are 2027 and 2037, respectively.

In case of the project road, DMIC node for Jodhpur-Pali-Marwar (JPM) is proposed to be developed as an Industrial Area in Phase II with an area of 154 sq. km. Proposed DMIC investment region of JPM along with the alignment of the project road is presented in Figure 3-7.



Figure 3-7: Proposed DMI C Node of JPMIA

As per the draft master plan of this IA, Jodhpur-Pali-Marwar industrial area is proposed to be developed in three phases. The first phase (2014-22) will kick in with the Multi-Modal Logistic hub which is anticipated to be the main catalyst of growth in the initial phases. Four basic industry groups are expected to be attracted to the IA and consolidated as regional economic drivers i.e., agro food, apparel and textile, building materials and handicrafts.

In the draft master plan of Jodhpur-Pali-Marwar Industrial Area (IA), regional network analysis of IA has been done. It mentions, under existing conditions, NH-65, SH-64 and SH-61 are major highways linking the IA to the outside region. To better serve the freight transport of IA area, it is recommended to add two highways in the future. One proposed new highway construction is to extend SH-64 to SH-61 to facilitate truck access to Jodhpur Airport and to DFC at Marwar Junction. The other highway project is to connect the IA with SH-64 and SH-68. Also, a feeder road link is planned from Rohat on NH65 to SH61.

Passenger trips from the JPM IA to outside are expected to be relatively low because most people will work and reside within the IA. As per the draft master plan, the passenger vehicle generation from this IA is expected to be around 19,000 car/taxi and 134 buses per day by 2042. The draft master plan states that the total cargo generated by IA is likely to be 0.32 million ton in 2022, 1.76 million ton in 2032 and 7.18 million ton in 2042. Of all the cargo, average 30% will use rail and 70% use the road to transport. Using the rail-road split for different commodity types, the total road cargo tonnage is expected to be 0.24 MTPA in 2022, 1.27 MTPA in 2032 and 5.14 MTPA in 2042.

The assessment of the likely generation by different types of trucks from this industrial area to use the project road of Jodhpur-Pali was based on likely composition of freight traffic, average load carried by different type of freight vehicles and likely percentage of total traffic which would have desire pattern towards the project road. The vehicles likely to be generated per day for the project road are presented in Table 3-1.

FY ending March/Mode	Vehicles per day					
	Car	LCV	Bus	2-Axle	3-Axle	MAV
2027	803	6	5	2	3	3
2037	2,006	14	28	10	17	14
2047	3,810	27	113	42	70	55

Table 3-1: Vehicle generation from DMIC to the Project Road (per day)

Given the delays and uncertainties in the implementation of such large-scale projects and considering the development of Phase 1 is much delayed beyond the revised deadlines, the impact of this development has not been considered for further analysis. However, the main impact could be an upside on the car traffic, for which the growth rates have been set out considering this development in the future.

Impact of DFC

The Ministry of Railways has embarked upon the Dedicated Freight Corridor (DFC) project which would provide a quantum leap in the railways transportation capacity which will be enough to meet the transportation demands generated by the rapidly growing economy and industrial production for the next four to five decades.

Two Dedicated Freight Corridors (DFC) i.e., between Mumbai-Delhi (Western DFC) and Delhi- Kolkata (Eastern DFC) legs of the golden quadrilateral are proposed under Phase 1 for a total length of 2,792 km.

The distribution of length of dedicated freight corridor indicates that Rajasthan and Gujarat together constitute 77% of total length of the alignment of freight corridor between Delhi and Mumbai. The envisaged alignment of freight corridor is shown in Figure 3-8.

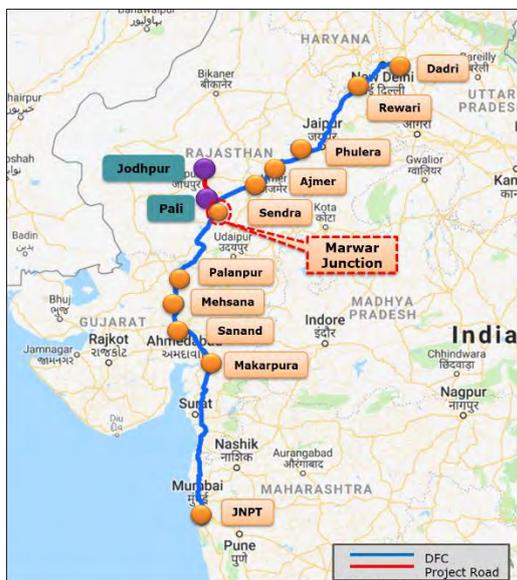


Figure 3-8: Proposed DFC Alignment

The proposed Western DFC is on the eastern side of the project road. Marwar station is the nearest DFC junction to the project road and is around 40 kms east of Pali. With the operation of DFC as a complete link from Delhi to Mumbai, may result in an upside with distributive traffic from railway node to surrounding areas along the project road. Therefore, LCV and MAV are likely to witness a higher growth in the initial years of

operation of DFC as these vehicles are more likely to be used for distributive purpose which has been considered while setting the future growth rates.

### 3.3 Traffic Growth Rate Estimation

#### 3.3.1 Methodology

Traffic growth for both passenger and freight vehicles has been estimated using the econometric approach as described in IRC-108, 2015. For freight traffic, due consideration has been given to the total tonnage transported and the shift in types of vehicles used for moving goods.

The econometric model applied, relates traffic growth to changes in state (or district) domestic product via an elasticity factor. According to IRC guidelines, elasticity based econometric model for highway projects should be derived in the following form:

$$\text{Log } e (P) = A_0 + A_1 \text{ Log } e (EI)$$

Where:

P = Traffic Volume

EI = Economic Indicator

A<sub>0</sub> = Regression constant

A<sub>1</sub> = Regression co-efficient (Elasticity Index).

In order to estimate traffic on the project road the methodology described below has been followed:

- Identify the influence area - From the analysis of travel patterns observed during the OD surveys, the influencing states and districts, which are likely to impact the traffic growth on the project road, were identified.
- Review Past traffic Data – Based on data points available for the project corridor from different sources a review of past traffic and tonnage growth is carried out.
- Analysis of economic growth of the Project Influencing Area (PIA) - For each PIA state an economic profile describing past performance and future outlook was **prepared. This also considers India's past economic performance and its future outlook.**
- Estimation of traffic elasticity to income – in order to translate economic growth into traffic growth, an elasticity factor was estimated.
- Derivation of traffic growth rates – On the basis of the traffic weighted PIA outlook and related traffic elasticity, traffic growth rates were estimated.

The methodology thus adopted incorporates, as basic data inputs, the perspective growth envisaged in the influence area and the changes in transport demand elasticities over a period of time. The traffic growth rates by vehicle type for the project road have been

determined in line with the concession period of 25 years up to FY39 and likely maximum extension of 5 years till FY44 based on target traffic provisions mentioned in Article 29 of the Concession Agreement.

### 3.3.2 Traffic Pattern and Influence Area

The travel pattern observed on the project road reveals that total passenger traffic (CJV/Buses) is contributed by Rajasthan and Gujarat. In case of LCVs, about 89 percent is from Rajasthan, Gujarat contributes for about 6 percent, Punjab contributes for about 2 percent and Maharashtra contributes to a nominal share in the traffic.

In 2A trucks, Rajasthan has a share of about 77.8 percent and Gujarat contributes about 15.3 percent. States of Punjab and Maharashtra contribute to around 5 and 15.3 percent respectively. Coming to the MAV trucks, a major percentage of 49.4 percent is from Rajasthan followed by 31.6 percent from Gujarat and 13.6 percent from Punjab. Also, around 5.4 percent share of traffic is from Maharashtra.

The normalised shares of all the influencing states derived from the OD survey analysis for the project road (combined for both toll plazas) are presented in Table 3-2.

States/Mode	CJV	LCV	Bus	2A	3A	MAV
Rajasthan	92.4	90.6	87.0	77.8	62.0	49.4
Punjab	0.0	2.1	0.0	5.0	9.3	13.6
Gujarat	7.6	6.0	13.0	15.3	24.0	31.6
Maharashtra	0.0	1.3	0.0	1.9	4.8	5.4
Total	100.0	100.0	100.0	100.0	100.0	100.0

Table 3-2: Normalised OD Shares for the Project Road

With the passenger traffic being entirely from Rajasthan and Gujarat, these two states have been considered as the PIA states. For freight traffic, besides the major contribution from Rajasthan, states of Gujarat, Punjab and Maharashtra also contribute a notable share. Thus, in addition to Rajasthan, these states of Gujarat, Punjab and Maharashtra have been considered as the PIA states for freight vehicles.

### 3.4 Past Economic Growth of PIA

Growth of traffic on the project road depends on existing developments and future growth prospects of the connecting regions. A number of economic indicators for the PIA state, as published by Central Statistical Organisation (2011/12 prices), have been studied to assess their past performance. The year wise Gross State Domestic Product (GSDP) at 2011 – 2012 series and its growth is presented in Table 3-3.

Year	Rajasthan	Punjab	Gujarat	Maharashtra
GSDP in Billion				
2011-12	4,348.4	2,666.3	6,156.1	12,803.7
2012-13	4,545.6	2,808.2	6,826.5	13,579.4
2013-14	4,862.3	2,994.5	7,342.8	14,516.1
2014-15	5,215.1	3,121.3	8,114.3	15,431.6

Year	Rajasthan	Punjab	Gujarat	Maharashtra
2015-16	5,633.4	3,300.5	8,944.7	16,542.8
2016-17	5,967.5	3,527.2	9,813.4	18,070.5
2017-18	6,248.3	3,754.1	10,865.7	19,146.2
2018-19	6,557.1	3,976.0	11,830.2	20,333.1
2019-20	6,887.1	4,135.8	12,689.6	21,341
2020-21	6,432.2	3,861.7	#N/A	#N/A
YOY Growth in %				
FY12 to FY13	4.5	5.3	10.9	6.1
FY13 to FY14	7.0	6.6	7.6	6.9
FY14 to FY15	7.3	4.2	10.5	6.3
FY15 to FY16	8.0	5.7	10.2	7.2
FY16 to FY17	5.9	6.9	9.7	9.2
FY17 to FY18	4.7	6.4	10.7	6.0
FY18 to FY19	4.9	5.9	8.9	6.2
FY19 to FY20	5.0	4.0	7.3	5.0
FY20 to FY21	-6.6	-6.6	#N/A	#N/A

#NA-Not Available

Table 3-3: Average Annual Growth Rates (%) of GSDP for PIA States

- **Rajasthan's** Gross State Domestic Product (GSDP) stood at Rs 6,887.1 billion in 2019-20 and has been growing at a compounded annual growth rate of 6.1 percent since 2011-12. The **state's growth had been between** 5-8 percent since 2015-16. It has shown a growth of around 5 percent in FY20. The services sector is the largest contributor to GSDP (44.7 percent), agriculture allied activities sector at 33.1 percent and secondary sector at 22.2 percent of the GSDP in 2019-20. The GSDP for the year 2021-22 is Rs 6432.2 billion.
- Gross State Domestic Product (GSDP) of Punjab stood at Rs 4,135.8 billion in 2019-20 and has been growing at a compounded annual growth rate of 5.8 percent since 2011-12. The GSDP for the year 2021-22 is Rs 3861.7 billion.
- **Gujarat's** Gross State Domestic Product (GSDP) stood at Rs 12,689.6 billion in 2019-20 and has been growing at a compounded annual growth rate of 9.6 percent since 2011-12.
- Gross State Domestic Product (GSDP) of Maharashtra stood at Rs 21,341 billion in 2019-20 and has been growing at a compounded annual growth rate of 6.8 percent since 2011-12.
- The services sector is the largest contributor to GSDP of the PIA states, 50.8 percent in Punjab and 57 percent in Maharashtra whereas Secondary sector is the largest contributor to GSDP of the PIA state of Gujarat (46.3 percent).

The average annual growth rates as obtained using regression analysis till the last available year are presented in Table 3-4.

State/Particular	Rajasthan	Punjab	Gujarat	Maharashtra
	2011-12 to 2019-20			
GSDP	6.1	5.8	9.6	6.8
Primary	5.2	2.3	6.5	2.9
Secondary	3.9	5.1	10.9	6.3
Tertiary	7.3	7.0	8.6	7.8
Construction	2.3	3.0	3.7	3.2
Per Capita Income	4.5	4.4	8.2	5.7

Table 3-4: Average Annual Growth Rates (%) of State Income for PIA states

The GSDP over the years for the states of Rajasthan, Gujarat, Punjab and Maharashtra are presented in Figure 3-9 .

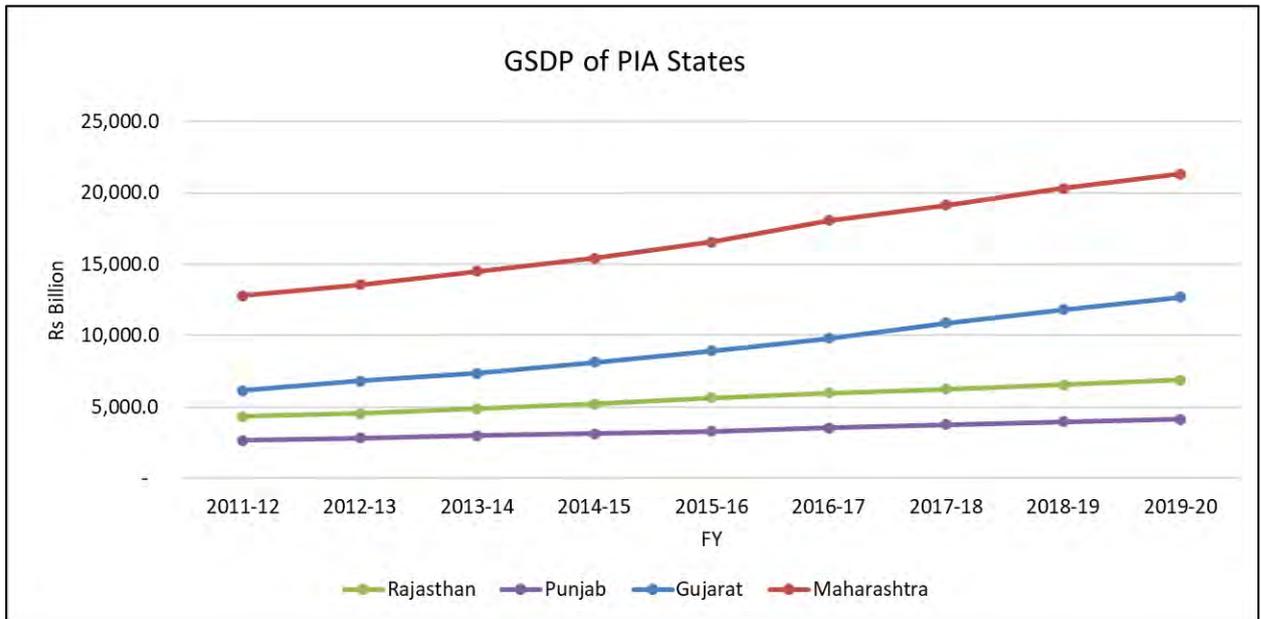


Figure 3-9 : GSDP (In Rs Billion) for Influencing PIA States

Rajasthan is known for its textile industry and the state is the fourth largest producer of spun yarn in India. The main industries of Rajasthan include textile, rugs, woollen goods, vegetable oil and dyes. Heavy industries consist of copper and zinc smelting and the manufacture of railway rolling stock. The other industries related to private sector include steel, cement, ceramics and glass wares, electronic, leather and footwear, stone and other chemical industries.

Rajasthan has huge reserves of cement-grade and Steel Melting-Shop (SMS) grade limestone. SMS-grade limestone from Jaisalmer is supplied to various steel plants in the country. Rajasthan has 21 major cement plants, having a total capacity of 55 million tonnes per annum (MTPA). It is the largest cement-producing state in India. The state has about 17 per cent share in cement grade limestone reserves of India. Given the availability of huge cement grade limestone reserves, more than 10 cement plants would be installed in the state in near future, particularly in Chittorgarh, Jaipur, Jhunjhunu, Nagaur and Pali.

The state is a leading producer of major minerals such as lead-zinc, calcite, gypsum, rock phosphate, ochre, silver as well as minor minerals such as marble, sandstone, serpentine (green marble), etc. which contribute a major percentage to national production.

The state is developing sector specific infrastructure, such as special purpose industrial parks and special economic zones (SEZs) for exports of handicrafts, IT and electronic goods. Eight SEZs have got formal approval and eight have been notified. The primary industries for these SEZs are IT/ITES, Handicrafts, Gems and Jewellery, Engineering and related services.

### 3.5 India and PIA Outlook

#### 3.5.1 India's past performance and outlook for future

India's growth trend during the recent years has been presented in Figure 3-10.

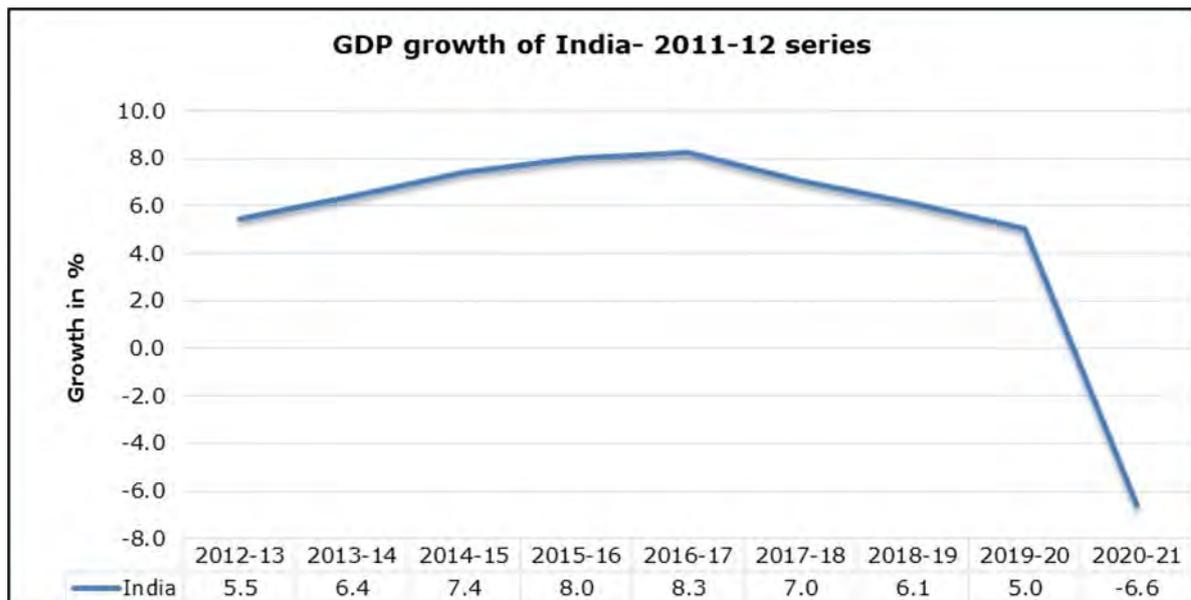


Figure 3-10 : GDP Growth in India

Economic growth in India has been broadly on an accelerating path till FY18. It is likely to be the fastest growing major economy in the world in the medium-term. The growth in real GDP was 8.3 percent for FY17 and 7.0 percent in FY18, while the growth in FY19 was slightly lower at 6.1 percent. The long-term trend line growth of 7.2 percent has been achieved between FY12 to FY19. During FY20, growth has slowed down due to some structural issues and global headwinds resulting in an average GDP growth rate of 4.2 percent.

With the outbreak of COVID-19, global recession is likely to be witnessed across all the economies. The lockdown period announced by Indian government had an adverse impact on the economy. The first quarter estimated for FY21 has indicated a contraction of 23.9 percent, second quarter showed a rebound in growth by contracting 7.5 percent and third & fourth quarter grew by 0.5 percent and 1.6 percent respectively. The resultant contraction for FY21 is likely to be around 6.6 percent.

The Indian economy is likely to see the impact of global slowdown due to COVID-19 and hence, the GDP forecast for India by various international agencies has been revised for the next two years. As per the latest update by Central Statistical Organisation (CSO), GDP in Q2 of FY22 has grown by 8.4 percent (down from 20.1 percent in Q1) and is likely

to achieve a yearly growth rate of 9.5 percent (with 6.6% in Q3 and 6% in Q4). Further on, the economy is likely to grow in the range of 6.5-7.0 percent in FY23 and over 7.0 percent thereafter as per the forecast by CSO. As per Economic Survey of India for FY22, the economy is predicted to have a growth rate of 9.2 percent for FY22 and 8.0-8.5 percent in FY23. With the vaccination programme having covered the bulk of the population, economic momentum building back and the likely long-term benefits of supply-side reforms in the pipeline, the Indian economy is in a good position to witness GDP growth of 8.0-8.5 per cent in 2022-23.

The year-on-year growth for Indian economy as provided by the Client is presented in Table 3-5.

FY End /State	India
2022	9.1
2023	7.8
2024	7.8
2025	7.9
2026	7.9
2027	7.9
2028	7.1
2029	7.1
2030	7.2
2031	7.2
2032	7.2
2033	6.6
2034	6.6
2035	6.6
2036	6.7
2037	6.7
2038	6.1
2039	6.2
2040	6.2
2041	6.2
2042	6.2
2043	6.5
2044	6.5

Table 3-5: Future Outlook of India

### 3.5.2 PIA states outlook

The outlook for PIA states has been presented in Table 3-6.

FY End /State	RJ	PB	GJ	MH
2022	5.7	6.5	9.8	4.4
2023	6.0	6.5	8.3	7.0
2024	6.0	6.5	8.3	7.0

FY End /State	RJ	PB	GJ	MH
2025	6.1	6.5	8.3	7.0
2026	6.1	6.5	8.4	7.0
2027	6.2	6.5	8.4	7.0
2028	6.0	5.8	7.9	6.6
2029	6.0	5.8	7.9	6.6
2030	6.0	5.8	7.9	6.6
2031	6.1	5.8	7.9	6.6
2032	6.1	5.8	7.9	6.6
2033	5.2	5.1	7.8	6.5
2034	5.2	5.1	7.8	6.5
2035	5.2	5.1	7.8	6.5
2036	5.2	5.1	7.9	6.5
2037	5.2	5.1	7.9	6.5
2038	4.7	4.6	7.4	6.4
2039	4.7	4.6	7.4	6.4
2040	4.7	4.6	7.4	6.4
2041	4.7	4.6	7.4	6.4
2042	4.7	4.6	7.4	6.4
2043	4.7	4.6	6.6	6.1
2044	4.7	4.6	6.6	6.1

Table 3-6: Future Outlook of PIA States

Based on the OD shares of the toll plaza location and the outlooks adopted for PIA states, the future weighted income for different vehicle types is presented in Table 3-7.

FY End/Mode	CJV	LCV	Bus	2A	3A	MAV
2023	6.3	6.3	6.5	6.6	6.9	7.2
2024	6.3	6.3	6.5	6.6	6.9	7.2
2025	6.4	6.3	6.6	6.7	7.0	7.2
2026	6.4	6.4	6.6	6.7	7.0	7.2
2027	6.5	6.4	6.7	6.8	7.1	7.3
2028	6.2	6.2	6.4	6.5	6.7	6.9
2029	6.2	6.2	6.4	6.5	6.7	6.9
2030	6.2	6.2	6.4	6.5	6.7	6.9
2031	6.3	6.3	6.5	6.6	6.8	6.9
2032	6.3	6.3	6.5	6.6	6.8	6.9
2033	5.5	5.5	5.8	5.9	6.3	6.5
2034	5.5	5.5	5.8	5.9	6.3	6.5
2035	5.5	5.5	5.8	5.9	6.3	6.5
2036	5.6	5.5	5.8	5.9	6.3	6.5
2037	5.6	5.5	5.8	5.9	6.3	6.5
2038	5.1	5.0	5.3	5.4	5.8	6.1
2039	5.1	5.0	5.3	5.4	5.8	6.1
2040	5.1	5.0	5.3	5.4	5.8	6.1
2041	5.1	5.0	5.3	5.4	5.8	6.1
2042	5.1	5.0	5.3	5.4	5.8	6.1

FY End/Mode	CJV	LCV	Bus	2A	3A	MAV
2043	4.9	4.9	5.1	5.2	5.5	5.7
2044	4.9	4.9	5.1	5.2	5.5	5.7

Table 3-7: Future Perspective of PIA Weighted Income

### 3.6 Review of Past Traffic Data

The toll traffic data for the project road from the date of operation till December 21 was provided by the client. A time series analysis of the traffic data and comparison of the yearly averages with the current estimates of FY22 of the total traffic including exemptions and violations is presented in Table 3-8.

Period/Modes	Car/Jeep	LCV/Minibus	Bus - 2 Axle	Truck - 2 Axle	Bus/Truck - 3 Axle	MAV (4-6) Axle
TPO1-Nimbali						
FY15	3,589	871	549	655	859	863
FY16	3,920	844	517	899	787	867
FY17	4,464	962	550	821	700	872
FY18	4,921	1,060	578	887	691	918
FY19	5,309	1,057	579	810	621	1,015
FY20	5,425	938	606	730	551	1,065
FY21	5,116	614	427	732	542	1,170
FY22(E)	6,279	326	606	811	559	1,369
YOY Growth in %						
FY16 vs FY15	9.2	-3.1	-5.9	37.3	-8.3	0.4
FY17 vs FY16	13.9	14.0	6.5	-8.7	-11.1	0.6
FY18 vs FY17	10.3	10.2	5.1	8.1	-1.2	5.3
FY19 vs FY18	7.9	-0.3	0.1	-8.7	-10.1	10.5
FY20 vs FY19	2.2	-11.3	4.7	-9.9	-11.3	4.9
FY21 vs FY20	-5.7	-34.5	-29.5	0.3	-1.6	9.9
FY22 (E) vs FY21	22.7	-46.9	41.9	10.8	3.1	17.0
Trendline Growth in %						
FY21 vs FY15	7.0	-2.6	-1.3	-0.3	-7.6	5.4
FY20 vs FY17	6.8	-0.8	3.0	-4.3	-7.9	7.2
FY20 vs FY18	5.0	-5.9	2.4	-9.3	-10.7	7.7
TPO2- Gajangarh						
FY15	2,906	693	462	536	829	852
FY16	3,186	621	429	637	744	852
FY17	3,698	735	465	599	616	852
FY18	4,080	792	506	607	597	894
FY19	4,370	764	507	598	566	980
FY20	4,462	688	535	583	512	1,028
FY21	4,280	457	375	628	517	1,183
FY22 (E)	5,381	280	535	731	546	1,360
YOY Growth in %						
FY16 vs FY15	9.6	-10.5	-7.2	18.7	-10.2	0.0
FY17 vs FY16	16.1	18.5	8.5	-6.0	-17.3	0.1
FY18 vs FY17	10.3	7.7	8.7	1.4	-3.0	4.8
FY19 vs FY18	7.1	-3.5	0.3	-1.4	-5.2	9.6
FY20 vs FY19	2.1	-9.9	5.6	-2.5	-9.5	4.9
FY21 vs FY20	-4.1	-33.6	-29.9	7.6	1.0	15.1

Period/Modes	Car/Jeep	LCV/Minibus	Bus - 2 Axle	Truck - 2 Axle	Bus/Truck - 3 Axle	MAV (4-6) Axle
FY22 (E) vs FY21	25.7	-38.7	42.5	16.4	5.4	15.0
Trendline Growth in %						
FY21 vs FY15	7.4	-3.5	-0.3	1.1	-7.7	5.5
FY20 vs FY17	6.5	-2.3	4.3	-0.9	-5.9	6.7
FY20 vs FY18	4.6	-6.8	2.9	-2.0	-7.4	7.2

**Table 3-8: Past Growth and Trend Analysis**

The comparison of the past data shows a 7-7.5 percent growth in cars at the both the toll plazas between FY15 and FY21. The YOY growth has been positive except for FY20 vs FY21. The slowdown in FY20 can be attributed to manufacturers deciding to reduce production of diesel cars in the near-future, technology disruption in the form of compliance to Bharat Stage VI norms, economic downturn and COVID 19.

The trend-based comparison of year-on-year counts indicates a decline in traffic growth of LCV (since FY18). 2A trucks have been showing a negative growth between FY18 and FY20 at both the plazas. The growth in 2A truck in FY21 vs actual FY22 comparison has been positive at 2.6 percent at TP01 and 7.8 percent at TP02.

A trendline growth of 2-3 percent is observed in case of Buses during FY18 and FY20. In case of MAV, the recent period of FY15 and FY21 has shown a growth rate of about 5-5.5 percent each at both the toll plazas. The trend line growth between FY17 and FY20 is observed around 6-8 percent at the two toll plazas in MAVs.

At both toll plaza locations, a clear trend of decline/ minimal growth is witnessed 3A trucks and high growth in MAV substantiating the tonnage shifts happening towards MAV from 2A/3A across all highways in India. It has been observed in some of the mature National Highways that 3A trucks have stabilized after reaching a base level of 500-600 trucks and show a low growth after that.

On a broad level, the corridor has seen a good level of growth in the recent years. The first two years of operation could have faced some initial hiccups after tolling became operational on the corridor. During FY17, the earlier operator, GR Infra was allowing some of their trucks (plying for construction of a nearby stretch) to pass through plaza without payment of toll. The reason impacting the corridor growth in FY18 could be due to proper capture of traffic in the first year post takeover by India Infrastructure Fund II. The traffic in Jul – Aug 2016 was impacted by heavy rainfall in Gujarat and Rajasthan. The annual Ramdev Yatra (conducted in Aug-Sep every year) wherein devotees come from all states to visit Baba Ramdev temple in Jaisalmer contributes to higher passenger traffic movement on the corridor in these months. This was also disrupted due to heavy rain during 2016. One more event which impacted the freight traffic is the truckers strike for 8 days (20th to 27th July 2018). In addition to the above, FY20 was impacted by a general economic downturn witnessed in Indian economy wherein the GDP growth was subdued and recorded below 5 percent. FY21 was impacted by COVID 19 in the initial months but the traffic showed a strong recovery post opening of lockdown restrictions.

The other main factors that might have impacted the traffic in the past include the impact of demonetisation in November 2016, **GST in July 2017, all India truckers' strike in July 2018**, revision of permissible Gross Vehicle Weights (GVW) for freight vehicle as per the new notification released by NHA1 on 18th July, 2018 and the impact of country wide/ state lockdowns starting from March 2020 and continuing in few months of FY21.

### 3.7 Present and Future Transport Demand Elasticity

The econometric model applied for the project, relates traffic growth to changes in state domestic product via an elasticity factor according to IRC guidelines. The elasticity by vehicle types have been estimated based on the regression analysis of weighted income of PIA states with the actual traffic data.

The best measure of deriving traffic elasticity to income is time series data of traffic on the road. In case of the project road, past traffic data is available since the year of operation of the toll plaza. The YOY mode wise traffic elasticity has been derived using rate of growth in the traffic vis a vis the rate of growth in income (weighted income derived from weighted OD shares). The elasticity estimates for different time periods have been done using regression analysis with mode wise traffic as dependent variable and weighted income as independent variable. The rate of income growth of PIA states observed in FY12 to FY20 is assumed to continue for FY21 also. The point to point and trend line actual elasticity between GSDP and traffic is presented in Table 3-9.

Period/Modes	Car/Jeep	LCV/Minibus	Bus - 2 Axle	Truck - 2 Axle	Bus/Truck - 3 Axle	MAV (4-6) Axle
<b>TP01-Nimbali</b>						
YOY Elasticity						
FY16 vs FY15	1.1	-0.4	-0.7	4.4	-1.0	0.0
FY17 vs FY16	2.2	2.2	1.0	-1.3	-1.5	0.1
FY18 vs FY17	1.9	1.9	0.9	1.3	-0.2	0.7
FY19 vs FY18	1.4	-0.1	0.0	-1.5	-1.6	1.5
FY20 vs FY19	0.4	-2.1	0.9	-1.8	-2.0	0.8
FY21 vs FY20	-1.1	-6.6	-5.4	0.0	-0.3	1.7
Trend Line Elasticity						
FY17 to FY20	1.3	-0.1	0.5	-0.8	-1.3	1.1
FY18 to FY20	0.9	-1.2	0.4	-1.7	-1.9	1.2
FY21 vs FY15	1.2	-0.4	-0.2	0.0	-1.2	0.7
<b>TP02- Gajargarh</b>						
YOY Elasticity						
FY16 vs FY15	1.2	-1.3	-0.8	2.2	-1.2	0.0
FY17 vs FY16	2.5	2.9	1.3	-0.9	-2.3	0.0
FY18 vs FY17	1.9	1.4	1.5	0.2	-0.4	0.6
FY19 vs FY18	1.3	-0.7	0.1	-0.2	-0.8	1.4
FY20 vs FY19	0.4	-1.9	1.0	-0.5	-1.6	0.8
FY21 vs FY20	-0.8	-6.4	-5.4	1.4	0.2	2.5
Trend Line Elasticity						
FY17 to FY20	1.2	-0.5	0.8	-0.2	-1.0	1.0
FY18 to FY20	0.9	-1.4	0.5	-0.4	-1.3	1.1
FY21 vs FY15	1.3	-0.6	0.0	0.2	-1.2	0.8

Table 3-9: Actual Past Traffic Elasticity

## CJV

- The motorisation rate for cars (per 1000 population) in India has gone up from 6.6 in **2001 to 20 in 2015. Although India's car fleet has been growing at 10% for nearly 25** years, its motorization rate is low compared to other countries of similar wealth and much lower than developed countries with motorization rate of around 450. The low motorization rate suggests that there is room for continued growth for many years to come. The forecasts by different agencies indicate that number of cars will increase to 35 per thousand populations by 2025. With the continual increase in motorization rate and improved road network usage of cars for inter-urban travel is showing a growing trend.
- A regression between GSDP (as independent variable) and registered vehicles (as dependant variable) of PIA states was carried out for the state of Rajasthan which showed an elasticity of 1.6 during the period between FY12 and FY17.
- Actual trend line elasticity for the period FY15 to FY21 has been between 1.2 to 1.3 in the past across all the toll plazas.
- It is likely that this growth would slow down over time as the market becomes more mature and saturated, therefore elasticity to GSDP can be expected to decline over time. CJV elasticity has been considered as 1.2 for the two toll plazas up to FY25 and tapered in subsequent years.

## Bus

- **Over the years in India there has been a change in passenger's travel mode** preferences with increasingly more people shifting from public transport systems towards personalised modes. This has resulted in elasticity of bus traffic/demand to GSDP majorly varying between 0.4 and 0.8 during different time periods across different highways.
- For the project road, an elasticity of Bus traffic to GSDP of 0.4 for both the toll plazas.

## Trucks

- In India as a whole the freight vehicle mix has been changing in the last decade favouring MAV to 2 Axle/ 3Axle vehicles for long-distance traffic, given the operational efficiencies achievable with larger vehicles.
- At the same time Mini LCV have become more popular over LCVs for short distance traffic and more localised supply movements. Actual trend line elasticity for LCV in FY15 to FY21 has been negative at both toll plazas. The volume of LCV is low at both the plazas. For future, 0.2 has been adopted for all the toll plazas till the end of concession period.
- Considering the ongoing technical advancements in automobile industry, some of the standard 2 Axle/ 3 Axle trucks are gradually being replaced by MAVs. In quite a few

highways now, after a rapid decline over the years, 2A/3A trucks now with lower base have started showing growth trend due to their preference to cater to the local supplies of the region. At both the toll plazas, 2 Axle trucks have shown negative elasticity in the past. In light of these changing freight composition in the automobile industry and giving due consideration to the freight mix on the PR, an elasticity of 0.3 for 2A trucks has been adopted for both the toll plazas.

- 3A trucks show a negative elasticity in the past over all the years. The elasticity values adopted for 3A trucks are 0.2 for both the toll plazas due to their low base and likely slow growth in the future due to replacements with MAVs
- The elasticity values achieved in the past for MAV at TP01 is 1.07 between FY17 and FY20; however, FY17 vs FY20 has shown a 1.0 elasticity for MAVs at TP02. In case of MAV, an elasticity of 1.0 has been adopted for both the plazas between FY23-FY25 and further on it has been tapered till the end of concession.

It has been assumed that transport demand elasticity, for both freight and passenger traffic, would gradually decline over time, despite growth in per capita income, as regions becomes more mature, self-sufficient and with alternative mode of transport available to users. Due consideration has been given to the tonnage shifts happening in the market with Mini LCV gaining importance for short distance movements over LCVs and MAVs being preferred over 2A/3A for long distance movements due to better operational efficiencies. Thus, in this study higher elasticity values for Mini LCV (being charged in CJV) and MAV have been considered as compared to LCV/2 Axle/ 3 Axle trucks.

Giving due consideration to the growth momentum being witnessed in the immediate past, higher elasticity values have been considered for the slab up to FY25 and further tapering has been done in the next slab. The recommended elasticity values adopted for all vehicle types in line with the past traffic data and changes in freight traffic pattern observed on the project road are presented in Table 3-10.

Period/ Modes	CJV	Minibus/ LCV	Bus	2A	3A	MAV
TP01 and TP02						
2023-2025	1.2	0.2	0.4	0.3	0.2	1.0
2025-2030	1.1	0.2	0.4	0.3	0.2	0.9
2030-2035	1.0	0.2	0.4	0.3	0.2	0.8
Beyond 2035	1.0	0.2	0.4	0.3	0.2	0.7

Table 3-10: Recommended Elasticity for Project Road

### 3.8 Projected Traffic Growth Rates

Based on the perspective elasticity values and the projected growth rates of the income for PIA states, the future average annual compound traffic growth rates by vehicle type have been estimated for the project road by using the following relationship:

$$Tgr = (GSDPgr) \times E$$

Where,

Tgr – Traffic growth rate for mode

GSDPgr – Growth rate of GSDP

E – Elasticity value for mode

The estimated traffic growth rates for the project road have been presented in Table 3-11.

FY Ending March /Mode	CJV	Minibus/LCV	Bus	2A	3A	MAV
TP01 and TP02						
2023	7.6	1.3	2.6	2.0	1.4	7.2
2024	7.6	1.3	2.6	2.0	1.4	7.2
2025	7.7	1.3	2.6	2.0	1.4	7.2
2026	7.0	1.3	2.6	2.0	1.4	6.5
2027	7.1	1.3	2.7	2.0	1.4	6.6
2028	6.9	1.2	2.6	1.9	1.3	6.2
2029	6.9	1.2	2.6	1.9	1.3	6.2
2030	6.9	1.2	2.6	1.9	1.3	6.2
2031	6.3	1.3	2.6	2.0	1.4	5.5
2032	6.3	1.3	2.6	2.0	1.4	5.5
2033	5.5	1.1	2.3	1.8	1.3	5.2
2034	5.5	1.1	2.3	1.8	1.3	5.2
2035	5.5	1.1	2.3	1.8	1.3	5.2
2036	5.6	1.1	2.3	1.8	1.3	4.6
2037	5.6	1.1	2.3	1.8	1.3	4.6
2038	5.1	1.0	2.1	1.6	1.2	4.3
2039	5.1	1.0	2.1	1.6	1.2	4.3
2040	5.1	1.0	2.1	1.6	1.2	4.3
2041	5.1	1.0	2.1	1.6	1.2	4.3
2042	5.1	1.0	2.1	1.6	1.2	4.3
2043	4.9	1.0	2.0	1.6	1.1	4.0
2044	4.9	1.0	2.0	1.6	1.1	4.0

Table 3-11: Projected Traffic Growth Rates for PIA (%)

In derivation of above growth rates, the likely shift of buses to cars in case of passenger vehicles and the replacement/ tonnage shift of LCV/2A/3A trucks by Mini LCV for short distance and MAV for long distance in case of freight vehicles has been duly considered.

### 3.9 Projected Total Traffic

The projected total traffic for the two toll plazas based on the above traffic growth rates is presented in Table 3-12.

FY Ending March	TP01	TP02	Average
2022	18,866	17,366	18,116
2023	19,908	18,326	19,117
2024	21,020	19,350	20,185
2025	22,219	20,453	21,336
2026	23,400	21,540	22,470
2027	24,668	22,705	23,686

FY Ending March	TP01	TP02	Average
2028	25,956	23,889	24,922
2029	27,322	25,144	26,233
2030	28,772	26,476	27,624
2031	30,185	27,772	28,978
2032	31,677	29,140	30,409
2033	33,098	30,446	31,772
2034	34,591	31,819	33,205
2035	36,160	33,260	34,710
2036	37,727	34,694	36,210
2037	39,370	36,197	37,783
2038	40,953	37,645	39,299
2039	42,607	39,158	40,883
2040	44,335	40,738	42,536
2041	46,139	42,389	44,264
2042	48,025	44,112	46,068
2043	49,918	45,840	47,879
2044	51,893	47,642	49,768

Table 3-12: Total Traffic Projections in PCUs at the Toll Plazas

The target traffic as per RFP is deemed to be 35,938 PCUs as on 1<sup>st</sup> Jan 2030. Based on the forecast detailed above, the traffic estimated on the project road considering the average of both TPs and the average of the traffic for the three consecutive accounting years (FY29 to FY31) is estimated to be 27,612 PCUs which is 23.2 percent lower than the target traffic.

As per clause 29.2.2 of CA, if the Actual Average Traffic shall have fallen short of or exceeded the target traffic by more than 2.5 percent, then there will be an increase or reduction in concession period.

Based on the CA (clause 29.2.2), if the traffic in PCUs at target date is lower than the target traffic, then for every 1 percent decrease, the concession period shall be increased by 1.5 percent, and no more than 20 per cent of the base concession period.

The concession period may, therefore, be subject to an increase by 5 years to 30 years.

The project road traffic is not likely to reach the designed capacity of 60,000 PCUs during the stipulated as well as extended concession period.

## 4. TOLL REVENUE PROJECTIONS

### 4.1 Tolling Strategy

The project road has an “Open System” of toll collection which enables the concessionaire to collect tolls from through traffic as well as from short distance one.

As mentioned earlier, two toll plazas are operational on the project road with a tolling length of 39.29 km at TP01 and 19.5 km at TP02. Additionally, Pali bypass with a total length of 12.3 km is being charged at TP02 at bypass rate of 1.5 times the normal rate.

### 4.2 Schedule of User Fee

As per Schedule of User Fee (Schedule R) of Concession Agreement for the project, the per km toll rates applicable from 2007/08 for normal tolling length and permanent structures, the revision basis and concessions are provided.

The concessions to traffic have been given in the form of rates as below:

#### Local traffic

Car / Jeep / Vans - includes local users owning a vehicle registered for non-commercial purposes, residing within a distance of 20 km from the toll plaza and crossing the same for commuting purposes. The discounted fee for these users shall be a monthly pass of Rs. 150.00

Commercial vehicles - includes local users owning a commercial vehicle (excluding vehicles under National Permit), registered with address on the Registration Certificate of a particular district and uses such vehicle for commuting on a section of National Highway, permanent bridge, tunnel or bypass, as the case may be, which is located within that district, shall be levied user fee on all toll plazas which are located within that district at the rate of fifty per cent of the prescribed rate of fee. No such concession shall be provided, if a service road or alternative road is available for use by such commercial vehicles. Thus, local commercial traffic has to pay only 50 percent of the normal ticket.

#### Daily Pass

When the vehicle has to cross the tolled section more than once in a day, the user shall have the option to pay one and half times (1.5 times) of the fee for a single entry; this pass shall be valid for 2 entries within 24 hours of purchase.

#### Monthly Pass

A user, who makes use of the project road frequently during a month, may opt to purchase a monthly pass upon payment of a charge equal to two-thirds of the fee payable for 50 single journeys; this pass can be used for a maximum 50 one-way journeys over the month of validity.

Thus, the different categories of toll tickets are as follows:

- (i) Traffic paying normal toll rates (single trip)
- (ii) Traffic paying return journey rates
- (iii) Traffic paying monthly pass rates
- (iv) Traffic paying local personal rates
- (v) Traffic paying local commercial rates

#### 4.3 Tolling Streams

The tolling stream distribution has been derived from the toll data for the toll plazas and distribution from July–December 2021 adopted for the present study is presented in Table 4-1.

Ticket Type/Modes	Car	LCV	Bus	2A	3A	MAV	OSV
TPO1							
Single	44.3	45.8	14.7	55.2	78.6	92.3	100.0
Return	49.9	39.5	71.6	38.9	20.6	7.6	0.0
Monthly	0.8	0.0	0.0	0.0	0.0	0.0	0.0
Local personal	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Local commercial	0.6	9.4	13.0	4.8	0.6	0.0	0.0
Exempt	4.4	5.2	0.7	1.0	0.2	0.1	0.0
Violation	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
TPO2							
Single	45.6	44.1	14.6	57.5	78.8	91.8	100.0
Return	48.1	40.6	67.7	34.8	18.8	8.1	0.0
Monthly	1.1	0.0	0.0	0.0	0.0	0.0	0.0
Local personal	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Local commercial	0.5	10.0	16.8	6.6	2.2	0.0	0.0
Exempt	4.8	5.2	0.9	1.1	0.2	0.1	0.0
Violation	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 4-1: Tolling Distribution for the Project Road Including Exemptions and Violations (in %)

The paying traffic for the year FY22 has been worked out by deducting the toll exempt percentage (exemptions and violations, FY22) from total AADT and is presented in Table 4-2.

Toll Plaza/Mode	Car	LCV	Bus	2A	3A	MAV	OSV
TPO1 – Nimbali							
Base AADT including toll exempted vehicles	6,279	326	606	811	559	1,369	2
% of Exemptions/ Violations	4.4%	5.2%	0.7%	1.0%	0.2%	0.1%	0.0%
Paying Traffic	6,001	309	602	803	558	1,367	2
TPO2 – Gajangarh							
Base AADT including toll exempted vehicles	5,381	280	535	731	546	1,360	2
% of Exemptions/ Violations	4.8%	5.2%	0.9%	1.1%	0.2%	0.2%	0.0%
Paying Traffic	5,124	265	530	723	545	1,358	2

Table 4-2: Toll Paying Traffic, FY22

The tolling stream distribution excluding exemptions and violations from paying traffic is presented in Table 4-3.

Ticket Type/ Modes	Car	LCV	Bus	2A	3A	MAV	OSV
TP01							
Single	46.4	48.4	14.8	55.8	78.8	92.4	100.0
Return	52.2	41.7	72.1	39.3	20.6	7.6	0.0
Monthly	0.8	0.0	0.0	0.0	0.0	0.0	0.0
Local personal	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Local commercial	0.6	9.9	13.1	4.9	0.6	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0
TP02							
Single	47.9	46.6	14.7	58.2	78.9	91.9	100.0
Return	50.5	42.8	68.4	35.2	18.8	8.1	0.0
Monthly	1.1	0.1	0.0	0.0	0.0	0.0	0.0
Local personal	0.0	0.0	0.0	0.0	0.0	0.0	0.0
Local commercial	0.5	10.6	16.9	6.7	2.2	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0	100.0	100.0

Table 4-3: Tolling Distribution for the Project Road Excluding Exemptions and Violations (in %)

At TP01, the normal toll paying traffic for cars is around 46.4 percent and around 52.2 percent are opting for return category. At TP02 also similar travel pattern is visible where the percentages are 47.9 and 50.5 percent for normal and return categories respectively.

In case of Buses also, majority of the traffic (around 68-72 percent) is falling in the return category for both the toll plazas. Around 13-17 percent of the bus traffic may opt for local commercial discount.

For LCV category, around 46-48 percent of this category is buying normal ticket across the two toll plaza locations and remaining traffic is opting for return pass and local commercial pass. For 3A/MAV category, at both the toll plazas, majority (78-92 percent) of the traffic is opting for normal ticket as they have a long lead of travel and are less likely to return in the same day.

The trip rate of 2 for daily pass and 1.67 for monthly pass been considered. For local personal cars a trip rate of 1 has been adopted.

#### 4.4 Toll Rates

This section presents details on the toll rates that are likely to be imposed on the users of the project road during the concession period. The toll rates (Rs/km) for the base year 2007-08 for different vehicle categories as per concession agreement are presented in Table 4-4.

Mode	Base rate per km (in Rs)
Car, Jeep, Van, LMV	0.65
LCV /Mini Bus	1.05
Bus/ 2 Axle Truck	2.2

Mode	Base rate per km (in Rs)
3 Axle	2.2
MAV	2.4
Oversized	3.45

Table 4-4: Toll Rates in Rs/km for Different Vehicle Categories

The CA states that the 2007 toll rates shall be increased without compounding by three per cent each year with effect from the 1st day of April 2008 and such increased rate shall be deemed to be the base rate for the subsequent years.

In addition to this, the rate of fee for use of bypass forming part of a section of a National Highway constructed with a cost of Rs 10 crore or more, for the base year 2007, shall be one and a half times of the per km base rates specified above and the length of such bypass shall be excluded from the length of such section of National Highway.

Additionally, when permanent structures such as bridges, tunnels or flyovers are part of the project road and their construction cost exceeds 500 million Rs (50 Crore), then the length of such structures shall be deducted from the tolling length and the structure tolled according to the rates presented in Table 4-5. The toll fee has been rounded to nearest 5 Rupee as per Schedule R of the concession agreement.

Cost of Structure (rupees in crore)	Car, Jeep, Van or Light Motor Vehicle	LCV, Light Goods Vehicle or Mini Bus	Truck or Bus	HCM, EME, 3A or MAV	Over size Vehicle
10 to 15	5	7.5	15	22	30
For every additional rupees five crore or part thereof, exceeding rupees fifteen crore and up to rupees one hundred crore.	1	1.5	3	4.5	6
For every additional rupees five crore or part thereof, exceeding rupees one hundred crore and upto rupees two hundred crore.	0.8	1.2	2.3	3.4	4.5
For every additional rupees five crore or part thereof, exceeding rupees two hundred crore.	0.5	0.8	1.5	2.3	3

Table 4-5: Toll Rates in Rs for Permanent Structure Exceeding 500 million Rs Cost

In case of project road, Pali bypass is being charged with a total length of 12.3 km at TP02 at bypass rate of 1.5 times the normal rate.

The applicable base rates shall be revised annually with effect from April 1 each year to reflect the increase in wholesale price index for the month of December of the immediate preceding year in which sub revision is undertaken but such revision shall be restricted for 40 per cent of the increase in wholesale price index.

Actual WPI information for December 2021 of 142.4 under 2011-12 series converted into 1993-94 series (437.7) has been used. The forecast for WPI as provided by the client has been used for the period till the end of concession period (extended) and is presented in Table 4-6.

December in FY End	Applicable for FY	WPI
2023	2024	3.66
2024	2025	4.40
2025	2026	4.77
2026	2027	4.95
2027	2028	5.04
2028	2029	5.26
2029	2030	5.37
2030	2031	5.43
2031	2032	5.28
2032	2033	5.21
2033	2034	5.00
2034	2035	4.90
2035	2036	4.67
2036	2037	4.56
2037	2038	4.25
2038	2039	4.09
2039	2040	3.84
2040	2041	3.72
2041	2042	3.72
2042	2043	3.72
2043	2044	3.72

Table 4-6: WPI Forecast for Toll Rate Indexation

The stream of toll rates to be charged at the toll plazas for cardinal years is presented in Table 4-7. The toll fee has been rounded to nearest 5 Rupees as per Schedule R of the concession agreement.

FY Ending March	Car	LCV	Bus/2 A	3A	MAV	OSV	Car Local
TP01							
2021	50	75	160	175	250	305	275
2022	50	80	165	180	260	315	285
2025	60	95	200	215	310	380	340
2030	75	120	255	280	400	490	440
2035	100	160	330	360	520	635	570
2039	120	190	400	440	630	765	690
2044	145	235	495	545	780	950	855
TP02							
2021	45	75	155	170	240	295	275
2022	45	75	160	175	250	305	285
2025	55	90	190	205	300	365	340
2030	70	115	245	265	385	465	440
2035	95	150	315	345	495	605	570
2039	115	185	385	420	600	730	690
2044	140	225	475	520	745	905	855

Table 4-7: Toll Rates at The Toll Plazas (in Rs)

The users purchasing return journey tickets will pay 1.5 times the above toll rates; the traffic opting for monthly passes will pay 33.3 times (two-thirds of 50 single journeys) the

normal traffic toll rates. All passes have been rounded to the nearest 5 Rupees as per concession agreement.

#### 4.5 Projected Tollable Traffic

The projected toll paying traffic in PCUs (excluding exemptions and violations) based on the traffic growth rates till the end of concession as assessed in this study is presented in Table 4-8.

FY Ending March	Tollable Traffic in PCU		
	TPO1	TPO2	Average
2022	18,512	17,035	17,773
2023	19,531	17,974	18,752
2024	20,619	18,975	19,797
2025	21,791	20,054	20,922
2026	22,946	21,116	22,031
2027	24,185	22,255	23,220
2028	25,444	23,411	24,427
2029	26,779	24,637	25,708
2030	28,195	25,938	27,066
2031	29,575	27,203	28,389
2032	31,032	28,539	29,786
2033	32,421	29,815	31,118
2034	33,880	31,155	32,518
2035	35,412	32,563	33,988
2036	36,942	33,962	35,452
2037	38,545	35,427	36,986
2038	40,090	36,840	38,465
2039	41,703	38,316	40,009
2040	43,388	39,856	41,622
2041	45,149	41,465	43,307
2042	46,988	43,146	45,067
2043	48,833	44,829	46,831
2044	50,758	46,584	48,671

Table 4-8: Projected Toll Paying Traffic in PCUs at the Toll Plazas

#### 4.6 Toll Revenue Estimates

The concession period for the project road is 25 years from the appointed date (the date financial close is achieved). Toll revenue realised for FY21 is Rs 492.9 million. The revenue collected from April to December 2021 is Rs 420.4 million.

Toll revenue streams have been calculated assuming that:

- Toll would be collected for all 365 days in a year; for leap years, 366 days have been used
- Tolling would terminate on 15th September 2038. On account of target traffic provisions, the concession period is likely to be extended by 5 years till 15<sup>th</sup> September 2043; however, revenues have been presented till FY44

The toll revenue for the project road along with the concessions available is presented in Table 4-9

FY Ending March	Normal Toll	Monthly Passes	Return Passes	Local Concessions	Total
2022	450.9	1.2	167.8	9.6	629.4
2023	523.7	1.4	190.8	10.4	726.4
2024	579.8	1.6	211.0	11.4	803.8
2025	639.8	1.8	234.0	12.3	887.9
2026	711.5	2.0	258.8	13.2	985.5
2027	785.5	2.3	282.0	14.1	1,083.9
2028	872.9	2.6	311.7	15.4	1,202.5
2029	964.7	2.9	348.1	16.4	1,332.1
2030	1,066.9	3.2	383.4	17.9	1,471.4
2031	1,187.1	3.6	421.0	19.4	1,631.1
2032	1,314.6	4.1	463.1	20.7	1,802.5
2033	1,449.4	4.5	510.6	22.6	1,987.1
2034	1,595.3	5.0	561.0	24.3	2,185.5
2035	1,754.9	5.6	610.6	26.2	2,397.2
2036	1,929.4	6.2	672.3	28.1	2,636.0
2037	2,112.4	6.8	732.8	30.3	2,882.4
2038	2,297.7	7.5	798.4	32.2	3,135.9
2039	2,500.2	8.3	875.2	34.3	3,418.0
2040	2,714.9	9.1	945.0	36.9	3,705.9
2041	2,942.8	10.0	1,029.5	39.5	4,021.7
2042	3,194.3	10.9	1,114.8	42.2	4,362.2
2043	3,454.7	12.0	1,205.5	44.6	4,716.8
2044*	3,751.2	13.1	1,315.2	47.8	5,127.3

\*-presented for full year of FY44

Table 4-9: Toll Revenue (in Rs million) by Type of Concession for PR

For the project, the normal toll revenue is likely to be about 72.9 percent of total toll revenues for the project road whereas about 25.7 percent of the toll revenue may be generated from daily pass category.

A mode wise breakdown of the revenue streams is also presented for the project in Table 4-10

FY Ending March	Car	LCV	Bus	2A	3A	MAV	OSV	Total
2022	168.8	13.8	50.6	79.7	67.3	248.7	0.5	629.4
2023	197.6	15.2	56.6	88.7	75.1	292.6	0.5	726.4
2024	224.5	16.0	60.6	94.5	79.2	328.4	0.6	803.8
2025	254.0	17.1	65.3	101.3	83.3	366.2	0.7	887.9
2026	285.0	18.2	70.5	108.6	90.1	412.3	0.7	985.5
2027	316.0	19.2	75.9	116.2	95.7	460.0	0.8	1,083.9
2028	361.6	20.7	81.7	124.3	101.4	511.9	0.9	1,202.5
2029	406.1	21.8	88.3	133.5	108.6	572.6	1.0	1,332.1
2030	452.2	23.2	95.2	143.2	115.6	640.8	1.2	1,471.4
2031	508.6	25.2	103.1	154.5	123.4	715.1	1.3	1,631.1

FY Ending March	Car	LCV	Bus	2A	3A	MAV	OSV	Total
2032	571.7	26.8	111.2	165.5	132.1	793.7	1.5	1,802.5
2033	638.8	28.4	120.3	177.5	140.1	880.3	1.6	1,987.1
2034	712.2	30.2	129.4	189.9	150.6	971.5	1.8	2,185.5
2035	786.4	32.0	139.3	203.0	159.5	1,075.0	2.0	2,397.2
2036	876.0	34.2	150.5	219.2	170.8	1,183.0	2.2	2,636.0
2037	966.9	36.0	161.0	232.7	180.7	1,302.6	2.4	2,882.4
2038	1,064.1	38.3	172.1	247.8	192.1	1,418.8	2.6	3,135.9
2039	1,175.5	40.4	183.5	263.4	203.7	1,548.7	2.8	3,418.0
2040	1,283.2	42.7	196.7	280.7	214.2	1,685.3	3.1	3,705.9
2041	1,408.0	45.2	208.7	296.4	225.8	1,834.2	3.3	4,021.7
2042	1,536.4	47.6	222.8	314.3	239.3	1,998.1	3.6	4,362.2
2043	1,674.4	49.7	236.8	333.1	252.0	2,166.9	4.0	4,716.8
2044*	1,836.0	52.6	252.7	353.8	267.8	2,360.1	4.3	5,127.3

\*-presented for full year of FY44

**Table 4-10: Toll Revenue (in Rs million) for Project Road by Mode**

Cars represent around 31.9 percent share in total revenue with Buses having a share of 6.1 percent only. Amongst the freight vehicles category, MAVs represent the highest share of around 44 percent of total revenue. 2Axle trucks have a share of 9.1 percent.

The project road has a revenue CAGR of 10.0 percent during the tenure of concession till FY44.

Intended for

Virescent Infrastructure Investment Manager Private Limited  
(For the purpose of Highways Infrastructure Trust)

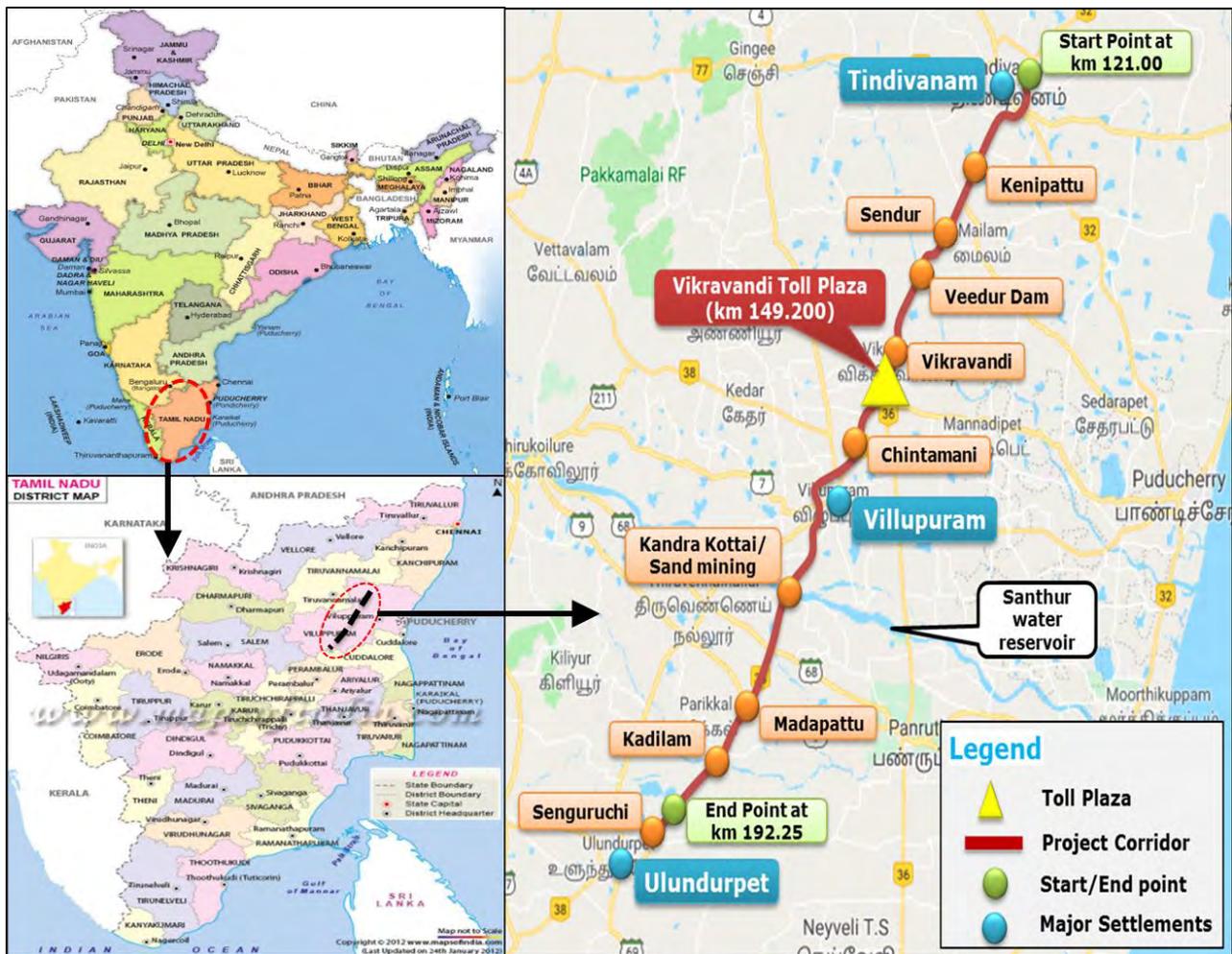
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Traffic Study Report

Date

February 2022

# TRAFFIC STUDY FOR TINDIVANAM-ULUNDURPET SECTION OF NH-45 IN THE STATE OF TAMIL NADU



Revision 00  
Date 28/02/2022  
Made by Nitin/Harpreet  
Checked by Meenakshi Asija  
Approved by Srinivas Chekuri  
Description Traffic Study Report

Ramboll  
The Epitome  
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## ABBREVIATIONS

%	Percentage
2A	2 Axle Truck
3A	3 Axle Truck
AADT	Annual Average Daily Traffic
ADB	Asian Development Bank
ADT	Average Daily Traffic
BOT	Build, Operate & Transfer
CA	Concession Agreement
CAGR	Compounded Annual Growth Rate
CJV	Car/Jeep/Van
CNG	Compressed Natural Gas
COVID	Corona Virus Disease
CPCL	Chennai Petroleum Corporation Ltd
CSO	Central Statistical Organisation
ECEC	East Coast Economic Corridor
EI	Economic Indicator
EPIP	Export Promotion Industrial Park
FY	Financial Year
GDP	Gross Domestic Product
GSDP	Gross State Domestic Product
GST	Goods & Services Tax
GVW	Gross Vehicle Weight
IOCL	Indian Oil Corporation Ltd
IRC	Indian Roads Congress
LCV	Light Commercial Vehicle
LMV	Light Motor Vehicle
LPG	Liquified Petroleum Gas
MAV	Multi Axle Vehicle
NH	National highway
NHAI	National Highway Authority of India
NHDP	National Highway Development Programme
OD	Origin & Destination
PCU	Passenger Car Unit
PIA	Project Influence Area
PNG	Piped Natural Gas
PR	Project Road
SEZ	Special Economic Zone
SH	State Highway
SIPCOT	State Industries Promotion Corporation of Tamil Nadu Ltd

SPV	Special Purpose Vehicle
TN	Tamil Nadu
TP	Toll Plaza
UEPL	Ulundurpet Expressway Private Limited
WPI	Wholesale Price Index

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## CONTENTS

1.	INTRODUCTION	7
1.1	General	7
1.2	Objective and Scope of Work	8
1.3	Report Structure	8
2.	TRAFFIC ANALYSIS	9
2.1	General	9
2.2	Project Road Characteristics	9
2.3	Base Traffic Estimation	10
2.4	Travel Characteristics	12
3.	TRAFFIC GROWTH RATE AND PROJECTIONS	16
3.1	General	16
3.2	Project Road Traffic	16
3.3	Traffic Growth Rate Estimation	18
3.4	Past Economic Growth of PIA	19
3.5	India and PIA Outlook	21
3.6	Review of Past Traffic Data	22
3.7	Present and Future Transport Demand Elasticity	24
3.8	Projected Traffic Growth Rates	26
3.9	Projected Total Traffic	27
4.	TOLL REVENUE PROJECTIONS	28
4.1	Tolling Strategy	28
4.2	Schedule of User Fee	28
4.3	Tolling Streams	29
4.4	Toll Rates	30
4.5	Projected Tollable Traffic	31
4.6	Toll Revenue Estimates	32

## LIST OF TABLES

Table 2-1: AADT – FY22 at TP01 - Vikravandi TP Location as per Tolling Categories.....	12
Table 2-2: Regional Distribution of Tollable Traffic (in %) on Project Road.....	13
Table 2-3: Traffic Streams on Project Road.....	13
Table 2-4: Commodity Distribution (%) .....	14
Table 3-1: Average Annual Growth Rates (%) of GSDP for PIA State .....	20
Table 3-2: Average Annual Growth Rates (%) of State Income for PIA state.....	21
Table 3-3: Future Outlook of India .....	22
Table 3-4: Future Outlook of PIA State .....	22
Table 3-5: Past Growth and Trend Analysis .....	23
Table 3-6: Actual Past Traffic Elasticity .....	24
Table 3-7: Recommended Elasticity for Project Road .....	26
Table 3-8: Projected Traffic Growth Rates for PIA (%) .....	27
Table 3-9: Total Traffic Projections in PCUs at the Toll Plaza .....	27
Table 4-1: Tolling Distribution for the Project Road Including Exemptions and Violations (in %) .....	29
Table 4-2: Toll Paying Traffic, FY22 .....	29
Table 4-3: Tolling Distribution for the Project Road Excluding Exemptions and Violations (in %) .....	30
Table 4-4: Toll Rates in Rs/km for Different Vehicle Categories .....	30
Table 4-5: WPI Forecast for Toll Rate Indexation.....	31
Table 4-6: Toll Rates at Toll Plaza (in Rs) .....	31
Table 4-7: Projected Toll Paying Traffic in PCUs at the Toll Plaza .....	31
Table 4-8: Toll Revenue (in Rs million) by Type of Concession for PR.....	32
Table 4-9: Toll Revenue (in Rs million) for Project Road by Mode .....	32

## LIST OF FIGURES

Figure 1-1: Alignment of National Highway No.45(NH45) .....	7
Figure 2-1 : Project Road Alignment and Surrounding Area .....	9
Figure 2-2: Past Traffic at Vikravandi Toll Plaza.....	11
Figure 2-3: MoM Traffic (FY22) on the Project Road.....	12
Figure 3-1: Alignment of the Economic Corridor Along With PR .....	17
Figure 3-2: GSDP (in Rs Billion) for Influencing PIA State of TN .....	20

# 1. INTRODUCTION

## 1.1 General

The project road Tindivanam-Ulundurpet, is part of 472 km long National Highway No.45 (NH-45) or Great Southern Trunk Road (GST Road) which starts from Kathipara junction in Guindy area (Chennai City) and extends up to Theni (headquarters of Theni District). It acts as one of the primary life-line corridor in the state of Tamil Nadu connecting the State Capital (Chennai city) with various industrial towns and tourist places in the southern, eastern, western parts of Tamil Nadu. The important towns which en-route the NH45 are Tambaram, Tindivanam, Viluppuram, Perambalur, Tiruchirapalli, Dindigul and Theni. The alignment of NH-45 is depicted in Figure 1-1.



Figure 1-1: Alignment of National Highway No.45(NH45)

The project road section starts at Tindivanam (km 121.000) and ends at just north of Sengurchi (km 192.250). Along the project road, there are several local roads, state highways and national highways branching out from NH45 i.e SH-203 towards Puducherry, NH-36 towards Kumbakonam, NH-38 towards Tiruvannamalai, Vellore and SH-68 towards Cuddalore. The tolling length of project road is 72.90 km. The asset awarded on BOT basis is being run by SPV – Ulundurpet Expressway Private Limited (UEPL) for a concession period of 20 years and tolling is operational since July 2009.

M/s. Ramboll India Private Ltd has been engaged as Traffic Consultant for Highways Infrastructure Trust to carry out a study for assessing the present traffic levels, travel

pattern and revenue estimation duly considering the network characteristics, future economic perspective in the influence area of the project and the provisions in the Concession Agreement of the project for the balance concession period.

## 1.2 Objective and Scope of Work

The scope of services of this study is to prepare Traffic Due diligence Reports covering

- Analysis of recent toll/traffic data of April-December 2021 and its growth trends
- Estimation of the base AADT for FY22
- Traffic projections for the balance concession period
- Toll revenue estimates in view of changes, if any, in WPI forecasts and tolling ticket segmentation
- Scenario Analysis of toll revenue to cover diversion, if any, to/from the project road

## 1.3 Report Structure

The report is divided into four chapters, including this introduction chapter. Chapter 2 contains details of project road characteristics and its analysis to understand the base year traffic and travel characteristics in the Project Influence Area (PIA). Chapter 3 contains the details on the derivation of traffic growth rates used for traffic forecasting and presents traffic projections till the end of the concession period. Chapter 4 presents the details regarding tolling strategy, toll rates and the revenue projections for the duration of the concession.

## 2. TRAFFIC ANALYSIS

### 2.1 General

This chapter presents the details of the project road characteristics, Annual Average Daily Traffic (AADT), travel characteristics on the project road. The results of the analysis will be utilized in assessing the traffic growth and estimation of traffic and revenue forecast on the project road for the remaining concession period.

### 2.2 Project Road Characteristics

As mentioned earlier, the project road section of Tindivanam-Ulundurpet, is a part of NH 45 (GST Road) in the state of Tamil Nadu which starts at km 121.00 near Tindivanam and ends at km 192.25 near Sengurchi.

The entire section of project road falls under the jurisdiction of Villupuram district in the state of Tamil Nadu. The project road in wider context serves long-distance distance traffic which is majorly plying between Tindivanam/North of Tindivanam (Chengalpattu/Chennai) and Eastern/Southern & Western Tamil Nadu districts (Trichy/Madurai/Cuddalore/Salem/Thanjavur etc). Apart from long distance traffic, it also serves the short distance traffic which is mainly generated between Tindivanam and Villupuram/Madapattu/ Kadilam areas. At present, one toll plaza is located on the project road just south of Vikravandi town at km 149.2 between Vikravandi and Villupuram section of NH45.

The schematic representation of project road alignment indicating the existing toll plaza and the major town/villages are depicted in Figure 2-1.

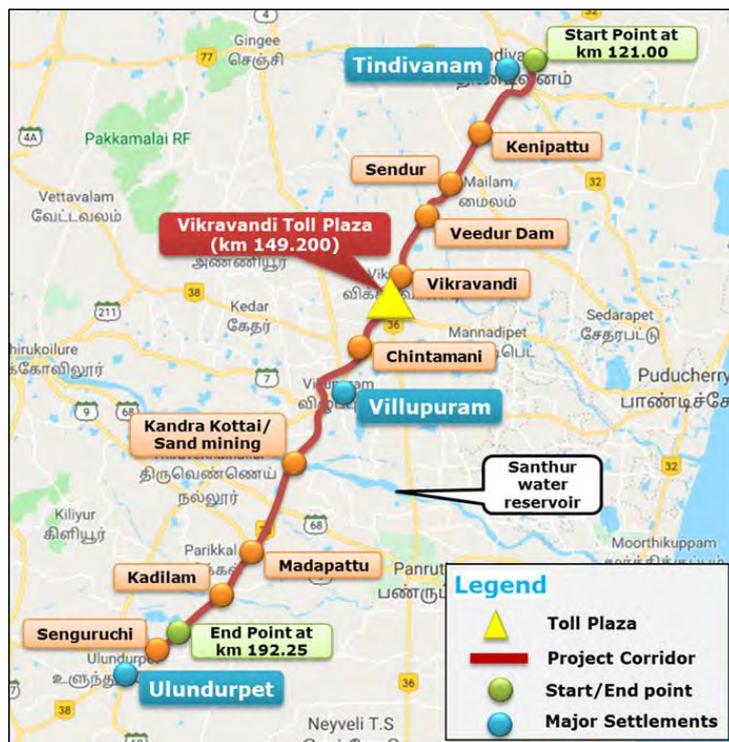


Figure 2-1 : Project Road Alignment and Surrounding Area

### 2.2.1 Profile of Project Influence Area Districts - Villupuram district

Project road falls under the jurisdiction of Villupuram district. The district has been bifurcated from the erstwhile composite South Arcot district.

Villupuram district, with headquarters at Villupuram, is the largest district in Tamil Nadu state. The district is situated in the northern part of Tamil Nadu and close to the state capital of Chennai in a distance of about 100 kms from its north border.

It is one of the predominant agricultural districts in which 75 percent of population is engaged in agriculture and allied activities for their livelihood. Agriculture continues to be the predominant sector of the districts economy. Paddy is the principal crop extensively cultivated which accounts to 40 percent of the total cropped area in the district. About 1,120 acres of land is under mulberry cultivation in the district.

The sugar industry is the major industry in the district. The district is also known as the sugar bowl of Tamil Nadu. Villupuram contributes more than 10 percent of the **state's** food production every year. Sugar mills such as Rajashree Sugars, CCSM Sugar Factory, EID Parry Sugar Mills and Madras Sugars Limited are located near to the project road corridor.

Silica sand, river sand, black granite, blue metal and gravel are the mineral resources under production in the district. The district has tourist spot of more than 500 years old Gingee fort.

There are about 26 cement industries/units in the state of which some of them are near the project corridor in Ariyalur district. Some of the biggest players situated near the project corridor are The Ramco Cements Limited, Ultratech Cement Limited, The India Cements Limited and Chettinadu Cements Limited.

There are many other industries in the project influence area of the project road. Rice mills are present near Tindivanam and Vikravandi; sand mines in Nemili and Tindivanam; industries such as Sun pharma, MRF Tyres, Marico Ltd are present in Puducherry; Neyveli mines for fossil fuel mining and thermal power generation in Neyveli; Indian Oil storage in Asanur and industries in Trichy.

### 2.3 Base Traffic Estimation

For the present study, the toll traffic data at the toll plaza location was provided by the client for the period from April 2011 to December 2021. The year-on-year mode wise traffic for the project road is presented in Figure 2-2.

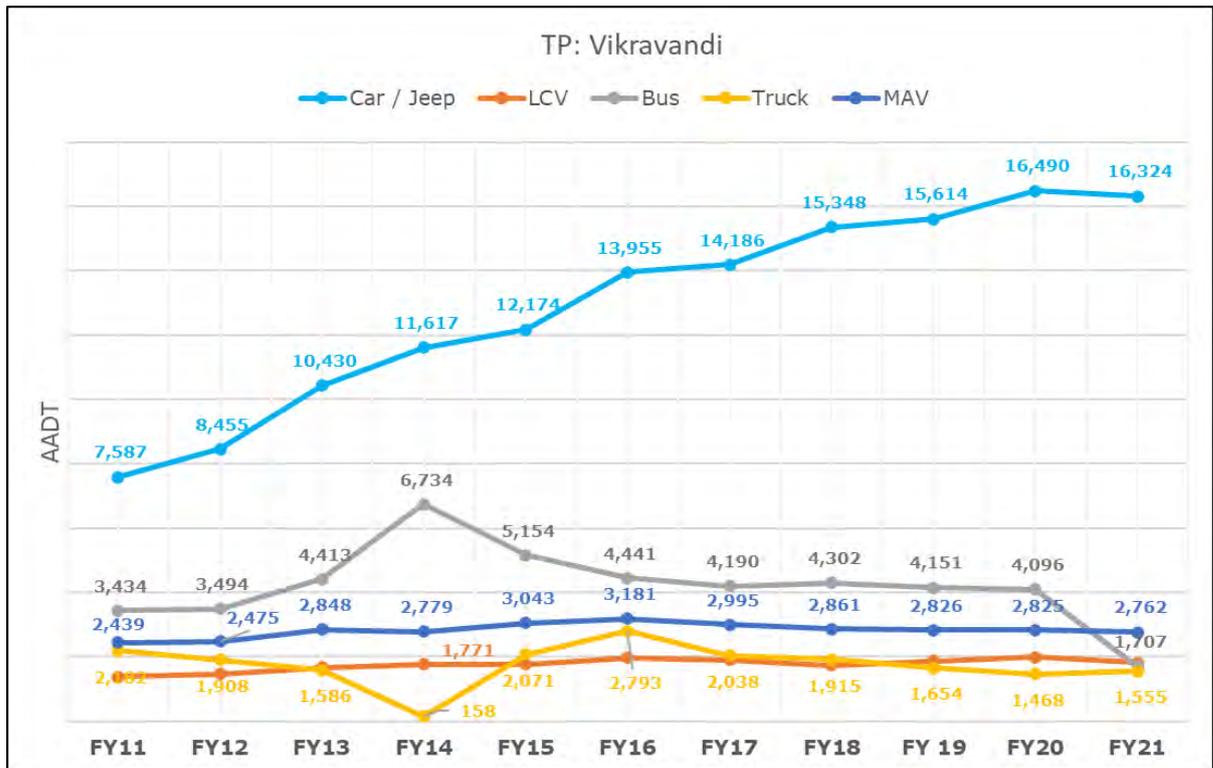


Figure 2-2: Past Traffic at Vikravandi Toll Plaza

The traffic during FY21 was impacted by COVID-19 indicating a decline in first quarter traffic in almost all the modes due to complete lockdown measures implemented by the Central government due to spread of COVID 19 virus throughout the country. The traffic showed recovery in second quarter of FY21 as the lockdowns were eased and economic activities slowly started to pick up. Next two quarters have shown a substantial pickup of traffic.

The onset of the second wave of Covid-19 and the lockdowns announced by the state government during April-June 2021 was a setback to the continuous recovery of traffic to normal levels. With the opening of economic activities, the traffic has started to pick up and shows a recovery from July 2021 onwards. The month-on-month mode wise traffic for the FY22 (April-December) is presented in Table 2-1.

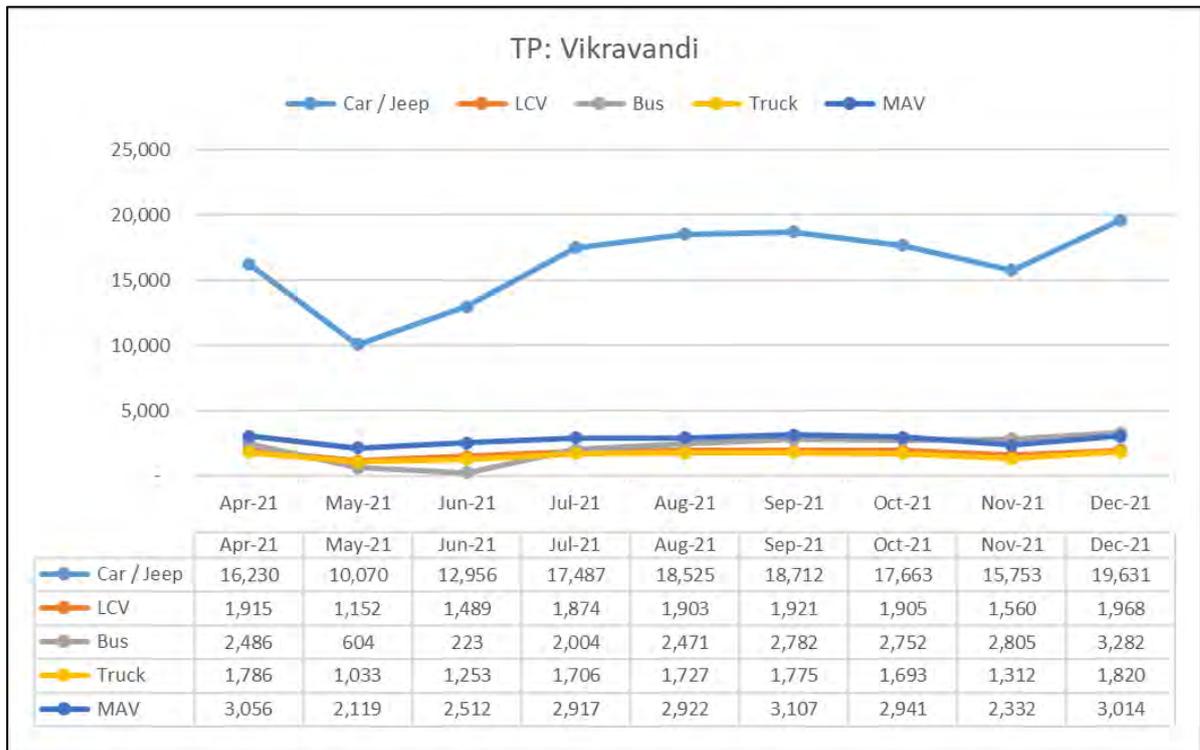


Figure 2-3: MoM Traffic (FY22) on the Project Road

With that in mind, estimation for FY22 AADT is done after annualising the behaviour of July-December traffic. For this purpose, a ratio/ factor of average of July-December to twelve-month average is derived from FY20 toll data. As buses have not yet recovered from the impact of COVID 19 due to the social distancing norms being followed and resultant increased usage of cars, FY20 AADT of Buses has been adopted for corrected FY22 as well.

The AADT for FY22 derived from the toll traffic data along with 6 months to yearly factors in presented in Table 2-1.

Description	Car	LCV	Bus	Truck	MAV
TP01 – Vikravandi TP					
ADT July-December (6 months)	17,962	1,855		1,672	2,872
Six-to-twelve-month correction factor	1.02	1.02		1.08	1.04
AADT FY22	18,387	1,891	4,096	1,810	2,986

Table 2-1: AADT – FY22 at TP01 - Vikravandi TP Location as per Tolling Categories

2.4 Travel Characteristics

2.4.1 Regional Distribution

Table 2-2 gives the distribution indicating the attraction and generation zones for the traffic on the project road.

Region/Modes	Passenger Traffic	Freight Traffic
Tamil Nadu	98.12	93.8
Puducherry	1.19	1.3
Kerala	0.41	2.8
Andhra Pradesh	0.22	1.4
West Bengal		0.3
Telangana		0.2
Rest of India	0.06	0.2
Total	100.0	100.0

Table 2-2: Regional Distribution of Tollable Traffic (in %) on Project Road

- The majority of the passenger/freight traffic on the project road at Vikravandi toll plaza location is only from the state of Tamil Nadu.
- Kerala and Andhra Pradesh states have a minor share of 2.8 percent and 1.4 percent respectively in case of total freight traffic
- Within the state of Tamil Nadu, the major passenger traffic generation and attraction points on the project road are from Chennai, Tindivanam, Villupuram, Trichy, Salem and Madurai places.
- In case of total freight traffic, the major generation and attraction points in Tamil Nadu state are from Chennai, Tindivanam, Villupuram, Trichy, Coimbatore and Madurai places.

#### 2.4.2 Travel Pattern

The list of popular streams of traffic plying on the project road from the earlier study available with the consultant is presented in Table 2-3.

S.No.	Traffic Stream	Car	LCV	Bus	Truck	MAV
1	Tindivanam & Surroundings to Villupuram & Surroundings	13.2%	12.6%	7.4%	19.6%	10.3%
2	Tindivanam & Surroundings to Beyond Villupuram/Kerala	6.9%	9.0%	2.2%	15.2%	9.0%
3	Chennai/Kanchipuram/Vellore to Villupuram & Surroundings	22.7%	20.8%	21.5%	18.8%	11.6%
4	Chennai/Kanchipuram/Vellore to Beyond Villupuram/Kerala	56.4%	56.8%	68.2%	44.7%	64.8%
5	Beyond Chennai to Villupuram & beyond	0.8%	0.9%	0.7%	1.7%	4.3%
Total		100.0%	100.0%	100.0%	100.0%	100.0%

Table 2-3: Traffic Streams on Project Road

- In cars, about 79 percent of the vehicles are primarily observed between Chennai/Kanchipuram/Vellore and Villupuram/south of Villupuram/Kerala (streams 3 & 4)
- Around 13 percent of car traffic is observed between Tindivanam & surroundings and Villupuram & surrounding areas (stream 1).

- The major chunk of bus traffic movement is found between Chennai/Kanchipuram/Vellore and Villupuram/south of Villupuram/Kerala (streams 3 & 4)
- In LCVs, about 77 percent of the vehicles are primarily observed between Chennai/Kanchipuram/Vellore and Villupuram/south of Villupuram/Kerala (streams 3 & 4)
- LCVs are mostly travelling within TN with about 97-100 percent of total traffic which are dominantly interacting between the regions of Chennai/Tindivanam/Vikravandi and Villupuram/Trichy/Salem.
- Around 36 per cent of 2 axle trucks are from generated/attracted between Tindivanam & surroundings and Villupuram & beyond (streams 1 & 2).
- In case of larger trucks (MAVs), about 95 per cent of total traffic originates from (or is destined to) Chennai/Tindivanam and Villupuram/Trichy/Coimbatore and beyond (streams 1,2,3 & 4).
- Major OD pairs for the freight traffic are primarily observed between Chennai & surroundings and Madurai, Villupuram, Tiruchirappalli, Coimbatore, Salem, Villupuram.

### 2.4.3 Commodity Distribution

Various commodities observed to be plying on the project road is presented in Table 2-4.

Commodity Type	Vikravandi Toll Plaza
Agricultural Products, Vegetables and Animals	18.0
Packaged and Processed Food	6.5
Consumer Product	4.4
Construction and Building Materials	12.4
Chemicals and Fertilizers	4.0
Vehicles and Vehicle Spare Parts	2.6
Plastics & Rubber	0.8
Textiles and Clothing Materials	0.4
Coal & Petroleum Products	9.9
Parcels and Letters	9.7
Containers	0.3
Medicines	1.0
Electronic Goods and Heavy Machinery	2.4
Metals and Alloys	5.4
Empty	21.4
Scrap and Other Materials	0.9
Total	100.0

Table 2-4: Commodity Distribution (%)

- Major movement of agricultural products is observed in freight vehicles along the project corridor which is about 18 percent of the total commodity transported.

This commodity movement is found primarily travelling between Chennai/ Tindivanam/ Vikravandi and Villupuram/ Trichy/ Coimbatore/ Madurai.

- Construction and building materials are found carrying a considerable share of around 13 percent from Chennai/Tindivanam to Villupuram/Panruti/Salem/Trichy.
- A considerable number of coal & petroleum products (around 10 percent) is being carried primarily found between Chennai and Villupuram/Trichy/Coimbatore.
- Parcels also have a considerable share of about 10 percent travelling along the project corridor.
- Empty goods vehicles contribute about 21 percent along the project corridor.
- Major commodities carried from Tindivanam to Villupuram direction were petroleum products, fly-ash, steel, fish and LPG. Fishes were majorly carried on 2 Axle trucks whereas the other commodities are majorly carried via 3A/MAV trucks.
- Major commodities carried from Villupuram to Tindivanam direction were cement, parcels, fruits, milk, petroleum products and vegetables. Cement, petroleum products and milk were majorly carried on 3A/MAV trucks whereas fruits and vegetables are majorly carried through LCVs.

## 3. TRAFFIC GROWTH RATE AND PROJECTIONS

### 3.1 General

As the project road has been executed on a BOT basis with a concession period of 20 years, an estimation of the traffic using the tolled highway and its future growth are **important elements to assess the project's economics as these** are generally the main/sole source of revenue for the project. This chapter details various aspects of the current traffic of the project road and its growth potential.

### 3.2 Project Road Traffic

The traffic that is likely to use the project road is estimated on the basis of the traffic and travel characteristics. The traffic on the project road would normally consist of the following components:

- Normal Traffic
- Diverted Traffic
- Induced/Developmental Traffic

#### 3.2.1 Normal Traffic

Normal traffic is the traffic, which is already plying on the project road in FY22, has been corrected for impact of COVID 19 and presented in Table 2.1. The corrected FY22 traffic is the total traffic including the exempted vehicles at the toll plaza location.

#### 3.2.2 Diverted Traffic

Diverted traffic is generally dictated by the presence of an alternative route at a lower generalised cost, which is in-turn defined by the road configuration and its condition, the type of vehicle and its operating costs, the average riding speed, the route distance and any tolling that may apply on a specific route. In case of the project road, there is no alternate route available in the vicinity of the project road.

#### 3.2.3 Induced/ Development Traffic

Developmental /new generated traffic is the one which would be generated, over and above normal growth, because of lowering of transport costs or new developments in the immediate influence area of the project road. In case of the project road, no new major development is known to be developed in the vicinity which could impact the project road traffic.

Bharatmala Pariyojana is the second largest highways construction project in the country since NHDP, under which almost 50,000 km or highway roads were targeted across the country. It will look to improve connectivity particularly on economic corridors, border areas and far-flung areas with an aim of quicker movement of cargo and boosting exports.

It will connect 550 district headquarters to minimum 4-lane highway by raising the number of corridors to 50 (from current 6) and move 80 percent freight traffic (currently 40 percent) to national highways by connecting 24 logistics parks and 7 north east multimodal waterway ports.

The Phase-I includes economic corridors of around 9,000 km; inter-corridor and feeder routes of around 6,000 km; 5,000 km roads under the National Corridors Efficiency Program, border and international connectivity roads of around 2,000 km; coastal and port connectivity roads of around 2,000 km; expressways of around 800 km and 10,000 km of NHDP roads. The total length in phase 1 comes to around 34,800 km.

### East Coast Economic Corridor (ECEC)

As per Bharatmala Pariyojana, the **East Coast Economic Corridor (ECEC)** is India's first coastal economic corridor covering 2,500 km of India's coastline, to be developed with the help of the Asian Development Bank (ADB). ECEC will be implemented in three phases.

- Phase-1 includes Vizag-Chennai Industrial corridor, which covers Andhra Pradesh
- Phase II covers Chennai-Kanyakumari Industrial Corridor and
- Phase III covers Odisha and West Bengal.

Chennai – Madurai/Kanyakumari section is identified as one of the economic corridors and project road is a part of this section and is depicted in Figure 3-1.

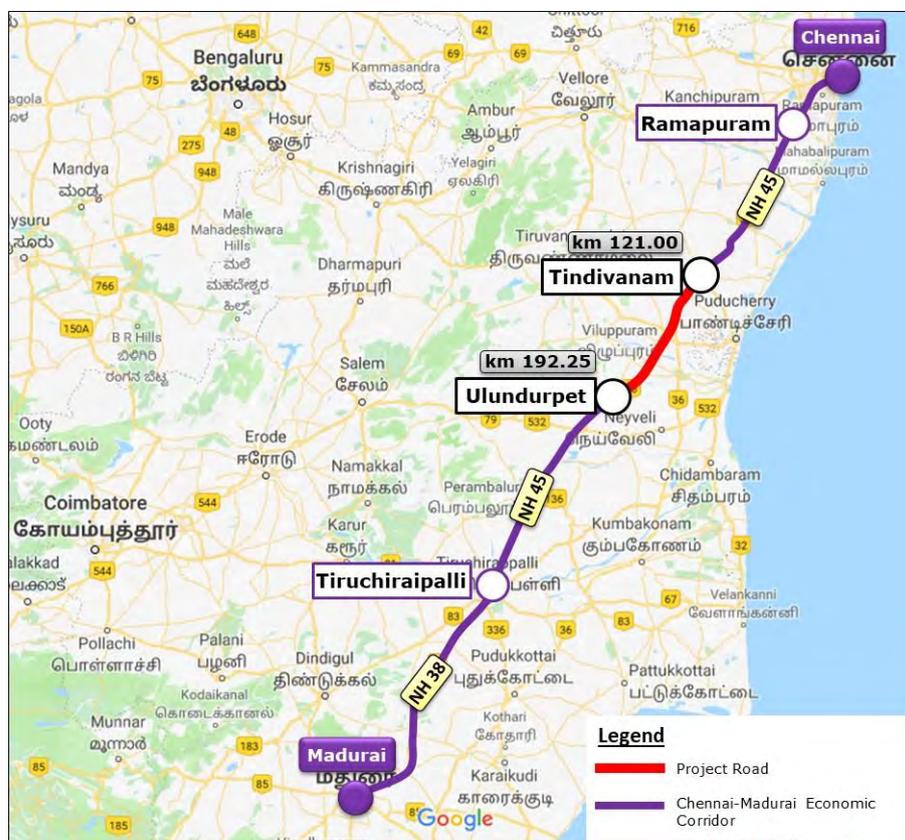


Figure 3-1: Alignment of the Economic Corridor Along With PR

The two identified industrial nodes include Madurai-Dindigul-Virudhunagar Theni (8,232 acres) and Thoothukudi-Tirunelveli corridor (11,248 acres), the master planning of these two will be funded by ADB. The completion of development of East Coast corridor is to take 10-15 years which is beyond the end of the concession period of the project road. As the project road is a connecting link in this economic corridor, it is likely to remain an important national highway for the Chennai-Madurai movement.

### Indian Oil LPG Pipeline Proposal

IOCL/ CPCL has two refineries with a combined refining capacity of 11.5 million tonnes per year. The Manali Refinery in Chennai has a capacity of 10.5 million tonnes per year and is one of the most complex refineries in India with fuel, lube, wax and petrochemical feedstocks production facilities. CPCL's second refinery is Nagapattinam Refinery located at Cauvery basin at Nagapattinam in Panagudi.

Indian Oil is targeting to lay 3,900 inch kms of pipeline, provide 12.5 lakh PNG connections and set up 430 CNG stations in 8 years in Coimbatore and Salem Districts at a total cost of Rs.42,000 million. This terminal with its linkages through pipelines and spur lines to Tuticorin and Bengaluru would bring in the cheaper and cleaner natural gas to the industries, auto fuel stations and households. The proposed LPG pipelines which would run across the state would sharply reduce dependence on the road transportation of bulk LPG to the bottling plants once the construction is completed.

As per the data available in the public domain, the Chennai-Trichy-Madurai pipeline construction is still ongoing and is expected that the pipeline laying may take another 5 to 6 years especially due to court cases. In view of this, the pipeline may not be a potential threat to the project road during the concession period.

## 3.3 Traffic Growth Rate Estimation

### 3.3.1 Methodology

Traffic growth for both passenger and freight vehicles has been estimated using the econometric approach as described in IRC-108, 2015. For freight traffic, due consideration has been given to the total tonnage transported and the shift in types of vehicles used for moving goods.

The econometric model applied, relates traffic growth to changes in state (or district) domestic product via an elasticity factor. According to IRC guidelines, elasticity based econometric model for highway projects should be derived in the following form:

$$\text{Log } e (P) = A_0 + A_1 \text{ Log } e (EI)$$

Where:

P = Traffic Volume

EI = Economic Indicator

A0 = Regression constant

A1 = Regression co-efficient (Elasticity Index).

In order to estimate traffic on the project road the methodology described below has been followed:

- Identify the influence area - From the analysis of travel patterns observed during the OD surveys, the influencing states and districts, which are likely to impact the traffic growth on the project road, were identified.
- Review Past traffic Data – Based on data points available for the project corridor from different sources a review of past traffic and tonnage growth is carried out.
- Analysis of economic growth of the Project Influencing Area (PIA) - For each PIA state an economic profile describing past performance and future outlook **was prepared. This also considers India's past economic performance and its future outlook.**
- Estimation of traffic elasticity to income – in order to translate economic growth into traffic growth, an elasticity factor was estimated.
- Derivation of traffic growth rates – On the basis of the traffic weighted PIA outlook and related traffic elasticity, traffic growth rates were estimated.

The methodology thus adopted incorporates, as basic data inputs, the perspective growth envisaged in the influence area and the changes in transport demand elasticities over a period of time. The traffic growth rates by vehicle type for the project road have been determined in line with the concession period up to FY27 (till 28<sup>th</sup> February 2027 as extended from original end date of 15<sup>th</sup> October, 2026).

### 3.3.2 Traffic Pattern and Influence Area

The travel pattern observed on the project road reveals that total passenger traffic (CJV/Buses) is contributed by Tamil Nadu. In case of LCVs, about 98 percent is from Tamil Nadu and Kerala contributes a nominal share of about 2 percent in the traffic.

In 2A trucks, Tamil Nadu has a share of about 98 percent and Kerala contributes about 1 percent. In case of MAV trucks, a major percentage (95 percent) is contributed by Tamil Nadu followed by 3 percent from Kerala.

With the passenger and freight traffic being majorly from Tamil Nadu, it has been considered as the PIA state.

### 3.4 Past Economic Growth of PIA

Growth of traffic on the project road depends on existing developments and future growth prospects of the connecting regions. A number of economic indicators for the PIA state, as published by Central Statistical Organisation (2011/12 prices), have been studied to

assess its past performance. The year wise Gross State Domestic Product (GSDP) at 2011 – 2012 series and its growth is presented in Table 3-1.

Year	Tamil Nadu	
	GSDP in Billion	YOY Growth in %
2011-12	7,514.9	
2012-13	7,918.2	5.4
2013-14	8,519.8	7.6
2014-15	8,939.2	4.9
2015-16	9,675.6	8.2
2016-17	10,367.6	7.2
2017-18	11,257.9	8.6
2018-19	12,046.7	7.0
2019-20	12,785.6	6.1
2020-21	12,966.6	1.4

Table 3-1: Average Annual Growth Rates (%) of GSDP for PIA State

Tamil Nadu's Gross State Domestic Product (GSDP) stood at Rs 12,785.6 billion in 2019-20 and has been growing at a compounded annual growth rate of 7.1 percent since 2011-12. **The state's growth had been between 6-9 percent since 2015-16.** It has shown a growth of around 6.1 percent in FY20. The service sector is the largest contributor to GSDP (50.9 percent), secondary sector at 37.7 percent and agriculture allied activities at 11.5 percent of the GSDP in 2019-20. The GSDP for the year 2020-21 is Rs 12,966.6 billion. The GSDP over the years for the state of Tamil Nadu is presented in Figure 3-2.

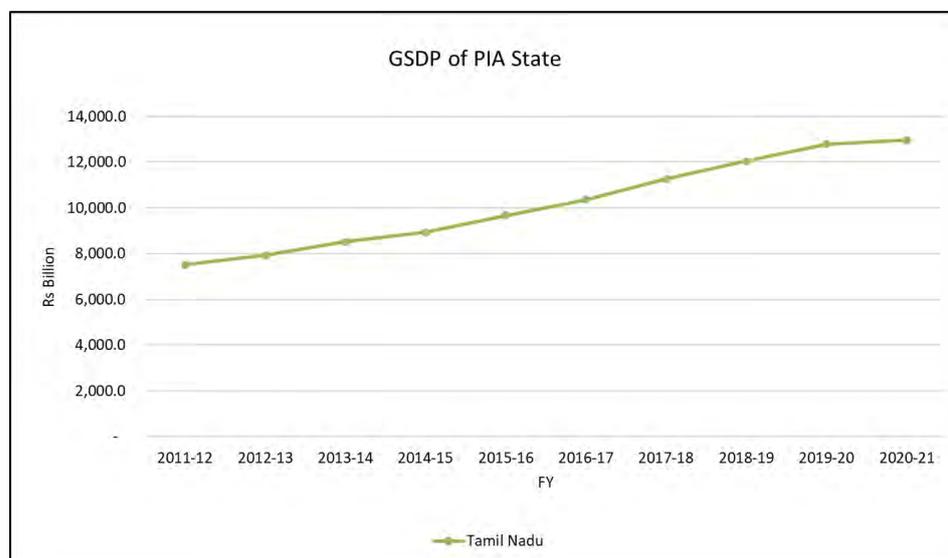


Figure 3-2: GSDP (in Rs Billion) for Influencing PIA State of TN

The average annual growth rates as obtained using regression analysis till the last available year are presented in Table 3-2.

State/Particular	Tamil Nadu
	FY12 to FY20
GSDP	7.1
Primary	5.4
Secondary	7.3
Tertiary	6.5
Construction	4.6
Per Capita Income	6.4

Table 3-2: Average Annual Growth Rates (%) of State Income for PIA state

Tamil Nadu has a diversified manufacturing sector and features among the leading states in several industries like automobile & components, engineering, pharma, garments & textile products, leather products and chemicals & plastics. It has well developed infrastructure with an excellent road and rail network, three major ports, 23 minor ports, and seven airports across the state providing excellent connectivity.

The State Industries Promotion Corporation of Tamil Nadu Limited (SIPCOT) Export Promotion Industrial Park (EPIP) is spread over 224 acres at Gummidipoondi in the Thiruvallur district. An industrial park has been set up at Irungattukottai for the automotive, electronics, food processing, general engineering and other non-polluting industries. The hi-tech SEZs in the Sriperumbudur Industrial Park and Oragadam Industrial Growth Centre (both in Kanchipuram district), are spread over 570.92 acres and 347.66 acres, respectively. These house manufacturing units for electronics, telecom hardware and support services.

### 3.5 India and PIA Outlook

#### 3.5.1 India's past performance and outlook for future

Economic growth in India has been broadly on an accelerating path till FY18. It is likely to be the fastest growing major economy in the world in the medium-term. The growth in real GDP was 8.3 percent for FY17 and 7.0 percent in FY18, while the growth in FY19 was slightly lower at 6.1 percent. The long-term trend line growth of 7.2 percent has been achieved between FY12 to FY19. During FY20, growth has slowed down due to some structural issues and global headwinds resulting in an average GDP growth rate of 4.2 percent.

With the outbreak of COVID-19, global recession is likely to be witnessed across all the economies. The lockdown period announced by Indian government had an adverse impact on the economy. The first quarter estimated for FY21 has indicated a contraction of 23.9 percent, second quarter showed a rebound in growth by contracting 7.5 percent and third & fourth quarter grew by 0.5 percent and 1.6 percent respectively. The resultant contraction for FY21 is around 6.6 percent.

The Indian economy is likely to see the impact of global slowdown due to COVID-19 and hence, the GDP forecast for India by various international agencies has been revised for the next two years. As per the latest update by Central Statistical Organisation (CSO), GDP in Q2 of FY22 has grown by 8.4 percent (down from 20.1 percent in Q1) and is likely

to achieve a yearly growth rate of 9.5 percent (with 6.6% in Q3 and 6% in Q4). Further on, the economy is likely to grow in the range of 6.5-7.0 percent in FY23 and over 7.0 percent thereafter as per the forecast by CSO. As per Economic Survey of India for FY22, the economy is predicted to have a growth rate of 9.2 percent for FY22 and 8.0-8.5 percent in FY23. With the vaccination programme having covered the bulk of the population, economic momentum building back and the likely long-term benefits of supply-side reforms in the pipeline, the Indian economy is in a good position to witness GDP growth of 8.0-8.5 per cent in 2022-23.

The year-on-year forecast of India GDP has been provided by the client and is presented in Table 3-3.

FY End	India
2022	9.1
2023	7.8
2024	7.8
2025	7.9
2026	7.9
2027	7.9

Table 3-3: Future Outlook of India

### 3.5.2 PIA states outlook

The outlook for PIA states as provided by the client has been presented in Table 3-4.

FY End /State	Tamil Nadu
2022	6.8
2023	7.5
2024	7.5
2025	7.5
2026	7.5
2027	7.6

Table 3-4: Future Outlook of PIA State

### 3.6 Review of Past Traffic Data

The toll traffic data for the project road from the date of operation till December 21 was provided by the client. A time series analysis of the traffic data and comparison of the yearly averages with the current estimates of FY22 of the total traffic including exemptions and violations is presented in Table 3-5.

FY/Mode	Cars	LCV	Bus	2A	MAV
TPO1-Vikravandi					
FY11	7,587	1,383	3,434	2,182	2,439
FY12	8,455	1,458	3,494	1,908	2,475
FY13	10,430	1,667	4,413	1,586	2,848
FY14	11,617	1,771	6,734	158	2,779
FY15	12,174	1,774	5,154	2,071	3,043

FY/Mode	Cars	LCV	Bus	2A	MAV
FY16	13,955	1,971	4,441	2,793	3,181
FY17	14,186	1,897	4,190	2,038	2,995
FY18	15,348	1,729	4,302	1,915	2,861
FY19	15,614	1,865	4,151	1,654	2,826
FY20	16,490	1,990	4,096	1,468	2,825
FY21	16,324	1,812	1,707	1,555	2,762
FY22 (E)	18,387	1,891	4,096	1,810	2,986
YOY Growth in %					
FY12 vs FY11	11.4	5.4	1.7	-12.5	1.5
FY13 vs FY12	23.4	14.4	26.3	-16.9	15.1
FY14 vs FY13	11.4	6.2	52.6	-90.0	-2.4
FY15 vs FY14	4.8	0.1	-23.5	1211.0	9.5
FY16 vs FY15	14.6	11.1	-13.8	34.9	4.5
FY17 vs FY16	1.7	-3.8	-5.6	-27.0	-5.8
FY18 vs FY17	8.2	-8.9	2.7	-6.0	-4.5
FY19 vs FY18	1.7	7.9	-3.5	-13.6	-1.2
FY20 vs FY19	5.6	6.7	-1.3	-11.2	0.0
FY21 vs FY20	-1.0	-9.0	-58.3	5.9	-2.2
FY22 (E) vs FY21	12.6	4.4	140.0	16.4	8.1
Trendline Growth in %					
FY20 vs FY15	5.7	0.9	-3.7	-9.1	-2.2
FY20 vs FY17	4.8	2.2	-1.0	-10.7	-1.9
FY21 vs FY17	3.6	0.5	-16.9	-7.7	-1.7

Table 3-5: Past Growth and Trend Analysis

The comparison of past toll data from the toll plaza shows a fluctuating growth across all modes. In car/jeep traffic, growth was positive across all years except the covid impact seen in FY21. The trend line growth for the period FY15 to FY20 has been 5.7 percent, however, the recent years of FY17 and FY20 show a growth of 4.8 percent.

LCV/Minibus category has shown YOY variations and in the recent year comparison between FY17 and FY20 around 2.2 percent growth was observed.

Bus have shown a negative trend in the past, FY19 and FY20 with -3.5 percent and -1.3 percent respectively. There seems to be a cross classification issue between Bus and Truck category in FY14 which has led to exorbitant growth in FY15 vs FY14 comparison.

In 2A truck category, a decline was observed in the traffic in most of the years. The recent years of FY19 and FY20 has shown a negative growth of -13.6 percent and -11.2 percent respectively.

In the previous years, between FY17 to FY20 the growth of MAV trucks (3A/MAV) has been negative. This corridor has been impacted intermittently by the ban on sand mining since FY17. This is one of the reasons for stagnant growth in trucks since FY18 to FY20. The MAVs are likely to show a growth of 8.1 percent in FY22 estimate vs actual FY21. The MAV trucks have shown a pick-up in month-on-month number for the July-December period of FY22 as compared to same six months of FY20 traffic indicating a growth of

around 2.8 percent per annum. This could partly be the result of the legalised sand mining regulations imposed by the Tamil Nadu Government.

All the political parties in Tamil Nadu did an agitation in the month of April-2018 due to Cauvery water issue leading to a tensed situation in TN and Karnataka border due to which the commercial traffic was reduced.

The other main factors that might have impacted the traffic in the past include the impact of demonetisation in November 2016, **GST in July 2017, all India truckers' strike in July 2018**, revision of permissible Gross Vehicle Weights (GVW) for freight vehicle as per the new notification released by NHA1 on 18th July,2018 and the impact of country wide/ state lockdowns starting from March 2020 and continuing in few months of FY21.

### 3.7 Present and Future Transport Demand Elasticity

The econometric model applied for the project, relates traffic growth to changes in state domestic product via an elasticity factor according to IRC guidelines. The elasticity by vehicle types have been estimated based on the regression analysis of weighted income of PIA states with the actual traffic data.

The best measure of deriving traffic elasticity to income is time series data of traffic on the road. In case of the project road, past traffic data is available since the year of operation of the toll plaza. The YOY mode wise traffic elasticity has been derived using rate of growth in the traffic vis a vis the rate of growth in income. The elasticity estimates for different time periods have been done using regression analysis with mode wise traffic as dependent variable and weighted income as independent variable. The point to point and trend line actual elasticity between GSDP and traffic is presented in Table 3-6.

Period/Modes	Cars	LCV	Bus	2A	MAV
<b>TPO1-Vikravandi</b>					
YOY Elasticity					
FY13 vs FY12	4.4	2.7	4.9	-3.1	2.8
FY14 vs FY13	1.5	0.8	6.9	-11.9	-0.3
FY15 vs FY14	1.0	0.0	-4.8	246.0	1.9
FY16 vs FY15	1.8	1.4	-1.7	4.2	0.6
FY17 vs FY16	0.2	-0.5	-0.8	-3.8	-0.8
FY18 vs FY17	1.0	-1.0	0.3	-0.7	-0.5
FY19 vs FY18	0.2	1.1	-0.5	-1.9	-0.2
FY20 vs FY19	0.9	1.1	-0.2	-1.8	0.0
FY21 vs FY20	-0.2	-1.5	-9.5	1.0	-0.4
Trend Line Elasticity					
FY20 vs FY12	0.8	0.1	-0.5	-1.3	-0.3
FY20 vs FY15	0.7	0.0	-0.2	-2.1	-0.4
FY21 vs FY17	0.5	0.1	-2.6	-1.2	-0.3

Table 3-6: Actual Past Traffic Elasticity

## CJV

- The motorisation rate for cars (per 1000 population) in India has gone up from 6.6 in **2001 to 20 in 2015. Although India's car fleet has been growing at 10% for nearly 25** years, its motorization rate is low compared to other countries of similar wealth and much lower than developed countries with motorization rate of around 450. The low motorization rate suggests that there is room for continued growth for many years to come. The forecasts by different agencies indicate that number of cars will increase to 35 per thousand populations by 2025. With the continual increase in motorization rate and improved road network usage of cars for inter-urban travel is showing a growing trend.
- A regression between GSDP (as independent variable) and registered vehicles (as dependant variable) of PIA states was carried out for the state of Tamil Nadu which showed an elasticity of 1.2 during the period between FY12 and FY17.
- The past elasticity of 0.7 is observed for the period FY17 to FY20 and 0.8 between FY15 and FY20. In view of the slowdown in car growth observed between FY15 and FY20, car elasticity has been considered as 0.6 for the duration between FY23 and FY25.
- It is likely that this growth would slow down over time as the market becomes more mature and saturated, therefore elasticity to GSDP can be expected to decline over a long period of time. Elasticity value has been considered as 0.5 for the period beyond 2025 for cars.

## Bus

- **Over the years in India there has been a change in passenger's travel mode** preferences with increasingly more people shifting from public transport systems towards personalised modes. This has resulted, in general, in elasticity of bus traffic/demand to GSDP lower than unity.
- Past trend line elasticity has been negative in the past but in the comparison between FY17 to FY18, 0.3 elasticity has been observed. For the project road, an elasticity of Bus traffic to GSDP of 0.3 has been adopted throughout the concession period.
- In case of Buses, due to the impact of COVID and implementation of social distancing norms, the Bus service is yet to pick up on the highways. In view of this, Buses in FY20 are considered as corrected AADT for FY22 and elasticity approach has not been adopted for FY23.

## Trucks

- In India as a whole, the freight vehicle mix has been changing in the last decade favouring MAV to 2 Axle/ 3Axle vehicles for long-distance traffic, given the operational efficiencies achievable with larger vehicles. Considering the ongoing technical

advancements in automobile industry, some of the standard 2 Axle/ 3 Axle trucks would gradually be replaced by MAVs. Mature National Highways with tolling in operation for few years, have already witnessed the shift in 2A/3A trucks to MAV for long distance movement and the limited number of 2A trucks are being used for local movements.

- The past YoY elasticity on the project road for 2A category has been negative with trend line elasticity for the period FY15 to FY20 being -1.3. With the replacement of 2A still happening, an elasticity of -0.5 has been considered for the project road.
- MAV category has been widely fluctuating with trend line values being 0.6 for the period FY13 to FY16 for the toll plaza. As mentioned earlier, this corridor has been impacted intermittently by the ban on sand mining since FY17. However, the MAV trucks have shown a pick-up in month-on-month number for the July-December period of FY22 as compared to same six months of FY20 traffic. In view of 3 Axle trucks still being replaced by MAV and momentum to be gained for long distance corridor providing access between Chennai/ Chennai Port/Ennore Port and southern part of the State, an elasticity of 0.3 has been adopted throughout the concession period for MAV category.

It has been assumed that transport demand elasticity, for both freight and passenger traffic, would gradually decline over time, despite growth in per capita income, as regions becomes more mature, self-sufficient and with alternative mode of transport available to users. Due consideration has been given to the tonnage shifts happening in the market with Mini LCV gaining importance for short distance movements over LCVs and MAVs being preferred over 2A/3A for long distance movements due to better operational efficiencies. Thus, in this study higher elasticity values for Mini LCV (being charged in CJV) and MAV have been considered as compared to LCV/2 Axle trucks.

Giving due consideration to the growth momentum being witnessed in the immediate past, higher elasticity values have been considered for the slab up to FY25 and further tapering has been done in the next slab. The recommended elasticity values adopted for all vehicle types in line with the past traffic data and changes in freight traffic pattern observed on the project road are presented in Table 3-7.

Period/ Modes	Car	LCV	Bus	2A	3A/MAV
2023-2025	0.6	0.2	0.3	-0.5	0.3
Beyond 2025	0.5	0.2	0.3	-0.5	0.3

Table 3-7: Recommended Elasticity for Project Road

### 3.8 Projected Traffic Growth Rates

Based on the perspective elasticity values and the projected growth rates of the income for PIA states, the future average annual compound traffic growth rates by vehicle type have been estimated for the project road by using the following relationship:

$$Tgr = (GSDPgr) \times E$$

where,

Tgr – Traffic growth rate for mode

GSDPgr – Growth rate of GSDP

E – Elasticity value for mode

The estimated traffic growth rates for the project road have been presented in Table 3-8.

FY End/Mode	Car	LCV	Bus	2A	MAV /3A
TPO1					
2023	4.5	1.5		-3.8	2.3
2024	4.5	1.5	2.3	-3.8	2.3
2025	4.5	1.5	2.3	-3.8	2.3
2026	3.8	1.5	2.3	-3.8	2.3
2027	3.8	1.5	2.3	-3.8	2.3

Table 3-8: Projected Traffic Growth Rates for PIA (%)

In derivation of above growth rates, the likely shift of buses to cars in case of passenger vehicles and the replacement/ tonnage shift of LCV/2A/3A trucks by Mini LCV for short distance and MAV for long distance in case of freight vehicles has been duly considered.

Since corrected base traffic of FY22 for buses has been used for FY23, the elasticity approach has not been adopted for FY23 implying a zero growth for buses in FY23.

### 3.9 Projected Total Traffic

Table 3-9 presents the projections of the tollable vehicles at the toll plaza on the project road using the above traffic growth rates till the end of concession as assessed in this study.

FY Ending March	TPO1
2022	50,389
2023	51,313
2024	52,565
2025	53,875
2026	55,089
2027	56,370

Table 3-9: Total Traffic Projections in PCUs at the Toll Plaza

The concession agreement for the project does not mention any guidelines related to design capacity and augmentation options for the project road. However, as per IRC guidelines the designed capacity for 4 lane road is 60,000 PCU. In terms of the designed capacity of the project road, the traffic projections are not reaching 60,000 PCUs in the concession period.

## 4. TOLL REVENUE PROJECTIONS

### 4.1 Tolling Strategy

The project road has an "Open System" of toll collection which enables the concessionaire to collect tolls from through traffic as well as from short distance one.

As per the Schedule R of the Concession Agreement, there is one operational toll plaza at km 149.200 (TP01) with tolling length of 72.90 km.

### 4.2 Schedule of User Fee

As per Schedule of User Fee (Schedule R) of Concession Agreement for the project, the per km toll rates applicable from 2007/08 for normal tolling length and permanent structures, the revision basis and concessions are provided.

The concessions to traffic have been given in the form of rates as below:

#### Local traffic - Car

Car / Jeep / Vans - includes local users owning a vehicle registered for non-commercial purposes, residing within a distance of 10 km from the toll plaza and crossing the same for commuting purposes. The discounted fee for these users shall be a monthly pass of Rs. 150.00. The local users who are residing within a radius of more than 10 km but upto 20 km of the toll plaza location, the discounted fee for these users shall be a monthly pass of Rs.300.

#### Local Traffic - LCV/Trucks (Local Transport Operators) -

Concessional fee shall be from local transport operators on production of proof for plying within 20 km i.e., good challan for origin and destination clearly specifying the return details of the vehicle. The fee for such transport shall be Rs.25 for trucks for each entry and Rs.15 for LCV for each entry. No such concession shall be provided, if a service road or alternative road is available for use by such commercial vehicles.

#### Local traffic - School bus

Monthly passes for school buses for school students crossing toll plaza for commuting purpose. The discounted fee for these users shall be a monthly pass of Rs.1,000.

#### Daily Pass

When the vehicle has to cross the tolled section more than once in a day, the user shall have the option to pay one and half times (1.5 times) of the fee for a single entry; this pass shall be valid for 2 entries within 24 hours of purchase.

#### Monthly Pass

A user, who makes use of the project road frequently during a month, may opt to purchase a monthly pass upon payment of a charge equal to two-thirds of the fee payable

for 30 single journeys; this pass can be used for a maximum 30 one-way journeys over the month of validity.

Thus, the different categories of toll tickets are as follows:

- (i) Traffic paying normal toll rates (single trip)
- (ii) Traffic paying return journey rates
- (iii) Traffic paying monthly pass rates
- (iv) Traffic paying local personal rates
- (v) Traffic paying local commercial rates

#### 4.3 Tolling Streams

The tolling stream distribution has been derived from the toll data for the toll plaza and the average of the distribution from July to December 2021 adopted for the present study is presented in Table 4-1.

Ticket Type/Modes	Car	LCV/Mini-Bus	Bus	Truck	MAV
TP01					
Normal Toll	57.7	58.8	8.5	44.5	75.9
Daily Pass	33.2	39.2	53.7	54.3	23.9
Monthly Pass	0.0	1.0	37.7	0.8	0.0
Local Concessions/SC bus					
Car 10 km	4.0				
Car 20 km	0.0				
Exempt	5.1	1.0	0.1	0.5	0.2
Total	100.0	100.0	100.0	100.0	100.0

Table 4-1: Tolling Distribution for the Project Road Including Exemptions and Violations (in %)

The paying traffic for the year FY22 has been worked out by deducting the toll exempt percentage from total AADT and is presented in Table 4-2.

Toll Plaza/Mode	Car	LCV/Mini-Bus	Bus	Truck	MAV
AADT	18,387	1,891	4,096	1,810	2,986
Percentage of exemptions and violations	5.1%	1.0%	0.1%	0.5%	0.2%
Paying traffic	17,444	1,873	4,092	1,801	2,981

Table 4-2: Toll Paying Traffic, FY22

The tolling stream distribution excluding exemptions and violations from paying traffic in presented in Table 4-3.

Ticket Type/Modes	Car	LCV/Mini-Bus	Bus	Truck	MAV
TPO1					
Normal Toll	60.8	59.4	8.5	44.7	76.0
Daily Pass	35.0	39.6	53.7	54.5	24.0
Monthly Pass	0.0	1.0	37.8	0.8	0.0
Local Concessions/ SC bus	0.0	0.0	0.0	0.0	0.0
Car 10 km	4.2	0.0	0.0	0.0	0.0
Car 20 km	0.0	0.0	0.0	0.0	0.0
Total	100.0	100.0	100.0	100.0	100.0

**Table 4-3: Tolling Distribution for the Project Road Excluding Exemptions and Violations (in %)**

The normal toll paying traffic for cars is about 60.8 percent at the toll plaza location. Daily pass is in double digits in all the modes. Almost 53.7 percent of the Bus category is opting for daily pass.

Normal toll paying percentage is high in MAV (3A/MAV) especially larger axle vehicles which are more likely to ply on long distances. Around 24 percent of 3A/MAV trucks may fall in daily pass category at the toll plaza location. The long-distance OD pairs in 3A/MAV are Chennai to Ulundurpet/ Trichy and beyond.

Given the Schedule of User Fee cap on multiple entries with a single monthly pass, a trip rate of 1.64 - 3.54 trips per day as derived from toll plaza data for all vehicle types has been considered at the toll plaza location. For daily pass with multiple entries in a day, a trip rate of around 2.05 - 2.43 has been considered as derived from the toll data.

#### 4.4 Toll Rates

This section presents details on the toll rates that are likely to be imposed on the users of the project road during the concession period. The toll rates (Rs/km) for the base year 1997 for different vehicle categories as per concession agreement are presented in Table 4-4.

Mode	Base rate per km (in Rs)
Car, Jeep, Van, LMV	0.4
Light Commercial Vehicle (LCV)	0.7
Bus, Truck	1.4
MAV (>2 Axle)	2.3

**Table 4-4: Toll Rates in Rs/km for Different Vehicle Categories**

The CA states that the applicable base rates shall be revised annually with effect from September 1 each year to reflect the increase in wholesale price index for the month of March of the immediately preceding year in which sub revision is undertaken.

Actual WPI information for March 2021 of 129.9 under 2011/12 series converted into 1993-94 series (399.260) has been used. The forecast for WPI as provided by the client

has been used for the period till the end of concession period and is presented in Table 4-5.

March in FY	Applicable for Sept in FY	WPI Forecast
2022	2023	10.5
2023	2024	3.7
2024	2025	4.4
2025	2026	4.8
2026	2027	5.0

Table 4-5: WPI Forecast for Toll Rate Indexation

The stream of toll rates to be charged at the toll plaza is presented in Table 4-6. The toll fee has been rounded to nearest 5 Rupees as per Schedule R of the concession agreement.

September in FY Ending March	Car / Jeep	LCV	Bus/Truck	MAV
2022	90	155	310	495
2023	95	170	340	550
2024	100	175	355	570
2025	105	185	370	595
2026	110	195	385	620
2027	115	205	405	650

Table 4-6: Toll Rates at Toll Plaza (in Rs)

The users purchasing return journey tickets will pay 1.5 times the above toll rates; the traffic opting for monthly passes will pay 33.3 times (two-thirds of 30 single journeys) the normal traffic toll rates. All monthly passes have been rounded to the nearest 5 Rupees as per concession agreement; however, all the rates of local passes (car, LCV and school buses) have been kept constant in line with the current practice.

#### 4.5 Projected Tollable Traffic

The projected toll paying traffic in PCUs (excluding exemptions and violations) based on traffic growth rates till the end of concession as assessed in this study is presented in Table 4-7.

FY Ending March	Tollable Traffic in PCU
2022	49,362
2023	50,243
2024	51,450
2025	52,714
2026	53,888
2027	55,126

Table 4-7: Projected Toll Paying Traffic in PCUs at the Toll Plaza

#### 4.6 Toll Revenue Estimates

The concession period for the project road is 20 years from the appointed date (the date financial close is achieved). Toll revenue realised for FY21 is Rs 1,086.1 million. The revenue collected from April to December 2021 is Rs 924.6 million.

Toll revenue streams have been calculated assuming that:

- Toll would be collected for all 365 days in a year; however, for leap years, 366 days have been used
- Appointed date is October 2006
- As per the revised concession end date, tolling will terminate on 28<sup>th</sup> February 2027 (original concession end date is 15<sup>th</sup> October 2026). However, toll revenues have presented for full year of FY27.

The toll revenue for the total project road for the base case along with the concessions available is presented in Table 4-8.

FY Ending March	Normal Toll	Return Passes	Monthly Passes	Local Concessions	Total
2022	919.0	475.7	103.0	2.3	1,499.9
2023	1,037.6	524.9	112.7	2.4	1,677.7
2024	1,125.9	569.4	122.5	2.5	1,820.3
2025	1,192.4	605.7	130.3	2.7	1,931.1
2026	1,278.3	646.0	139.4	2.8	2,066.4
2027*	1,372.0	690.8	149.5	2.9	2,215.2

\*-presented for full year of FY27

**Table 4-8: Toll Revenue (in Rs million) by Type of Concession for PR**

For the project, vehicles paying normal tolls are around 61.8 per cent of total toll revenues for the project road and around 31.3 percent of the traffic may opt for daily pass category. Remaining 6.9 percent may fall in monthly pass and local concession category.

A mode wise breakdown of the revenue streams is also presented for the project in Table 4-9.

FY Ending March	Car / Jeep	LCV	Bus	School Bus	Truck	MAV	Total
2022	476.6	91.5	288.8	0.00	156.0	487.0	1,499.9
2023	549.8	100.9	316.8	0.00	165.2	544.9	1,677.7
2024	602.3	109.8	345.5	0.00	169.6	593.1	1,820.3
2025	650.4	115.9	366.3	0.00	168.8	629.7	1,931.1
2026	706.8	122.8	392.2	0.00	170.4	674.3	2,066.4
2027*	768.0	130.9	420.6	0.00	172.1	723.6	2,215.2

\*-presented for full year of FY27

**Table 4-9: Toll Revenue (in Rs million) for Project Road by Mode**

Cars represent a share of around 33.5 percent in total revenue. LCV/Mini-bus and bus have a share of 6 percent and 19 percent respectively. Amongst the freight vehicles category, MAVs represent the highest share of around 32.6 percent of total revenue. 2A trucks have a share of 8.9 percent.

The project road has a revenue CAGR of 8.1 percent during the tenure of concession.