MMK TOLL ROAD PVT. LTD.
(Part of IRB Group)
CIN : U45200MH2002PTC135512

IRB Infrastructure Trust

May 14, 2026

To,
National Stock Exchange of India Limited
Exchange Plaza
Plot no. C/1, G Block
Bandra-Kurla Complex, Bandra (East)
Mumbai 400051

Dear Sir,

Ref.: NSE Symbol: IRBIT / Series: IV

Subject: Valuation Report as on March 31, 2026 & Traffic Reports

Please find enclosed the Valuation Report dated May 14, 2026, issued by M/s. KPMG Valuation Services LLP [IBBI Reg. No. IBBI/RV-E/06/2020/115], as on March 31, 2026, for IRB Infrastructure Trust (the "**Trust**"), along with the Traffic Reports issued by M/s. GMD Consultants, for Project SPVs.

The Net Asset Value pursuant to Regulation 10 of SEBI (Infrastructure Investment Trusts) Regulations, 2014 based on the Valuation Report issued by the Valuer is as follows:

Particulars	**(Rs. in Crore)**
A. Assets	74,582
B. Liabilities (at book value)	37,107
C. Net Assets [A-B]	37,475
D. Outstanding Units (in Crore)	117.21
E. NAV at Fair Value (Rupees/per Unit) [C/D]	**319.73**

You are requested to note the same.

For MMK Toll Road Private Limited
(in its capacity as Investment Manager to IRB Infrastructure Trust)

Kaustubh Purushottam Shevade
Digitally signed by Kaustubh Purushottam Shevade
Date: 2026.05.14 23:47:51 +05'30'

Kaustubh Shevade
Company Secretary & Compliance Officer

Encl.: As above.

IRB Infrastructure Trust

Valuation of IRB Infrastructure Trust and its SPVs

Valuation Report

—

May 2026

KPMG Valuation Services LLP
2nd Floor, Block T2 (B Wing),
Lodha Excelus
Apollo Mills Compound
N.M. Joshi Marg, Mahalakshmi
Mumbai – 400 011, India
Telephone: +91 22 3989 6000

Strictly private and confidential

14 May 2026

IRB Infrastructure Trust
(IDBI Trusteeship Services Limited acting on behalf of IRB Infrastructure Trust)

1101, Hiranandani Knowledge Park,
Technology Street, Hill Side Avenue,
Powai, Mumbai – 400 076

MMK Toll Road Private Limited
("Investment Manager")

Office No-11th Floor, 1101
Hiranandani Knowledge Park, Technology Street
Hill Side Avenue, Powai, Mumbai 400 076

Dear Sir,

Valuation Report ("Valuation Report")

This is in accordance with the terms of reference set out in our Letter of Engagement dated 17 July 2025 wherein KPMG Valuation Services LLP (hereinafter referred to as "KVSL " or "us" or "we" or "Valuer") has been appointed by IRB Infrastructure Trust ("IRBI Trust/Trust" or "the Company"), MMK Toll Road Private Limited ("Investment Manager") and IDBI Trusteeship Services Limited ("Trustee") (together referred as "Clients" or "You") in relation to carrying out Enterprise Valuation of 15 Special Purpose Vehicles ("SPVs" or "Trust Assets") of IRBI Trust and Equity Valuation of IRBI Trust (jointly referred as "Targets") as on the agreed date of the valuation. Our engagement is in accordance with Regulation 21 of the Securities Exchange Board of India (Infrastructure Investment Trusts) Regulations, 2014 ("SEBI InvIT Regulations") where valuation is required to be conducted by a registered valuer (as defined under section 247 of the Companies Act, 2013) and such valuation report ("Report") is required to be in compliance with the SEBI InvIT Regulations ("Engagement").

The date for the valuation is 31 March 2026 ("Valuation Date").

We hereby enclose our Valuation Report dated 14 May 2026. This is our deliverable and sets out KVSL's conclusions on the valuation of the Targets and has been prepared in accordance with the LoE as of Valuation Date.

The report is based on the information provided to KVSL by the management of the Targets ("Management"). In arriving at our conclusion, KVSL has applied generally accepted valuation methodologies as on the Valuation Date. As detailed in the enclosed Valuation Report, the NAV at fair value per unit of IRBI Trust is **INR 319.73 per unit** as on 31 March 2026.

The Valuation Report is confidential to the Clients and will be used by the Clients only for the purpose, as indicated in this Report, for which we have been appointed. The results of our valuation analysis and our Report cannot be used or relied by the Clients for any other purpose or by any other party for any other purpose whatsoever.

The Valuation Report is issued by us on the express understanding that it shall not be copied, disclosed or circulated or referred to in correspondence or in discussion with any third party or used for any other purpose without KVSL's prior written consent. We are aware that the Report may have to be shared with certain regulatory authorities and stock exchanges in India and therefore Report may enter the public domain and hereby provide our consent to such sharing. It is clarified that reference to this Valuation Report in any document and/ or filing with aforementioned regulatory authorities/ stock exchanges in India, shall not be deemed to be an acceptance by the Valuer of any responsibility or liability to any person/ party other than the Clients.

We will not, pursuant to the LoE, perform any management functions for You, nor make any decisions. You are responsible for making management decisions, including accepting responsibility for the results. Additionally, the Clients are responsible for designating a management-level individual or individuals responsible for overseeing the services provided, evaluating the adequacy of the services provided, evaluating any findings or recommendations, establishing and maintaining internal controls, and monitoring ongoing activities.

The Valuation Report does not constitute an offer or invitation to any section of the public to subscribe for or purchase any securities in, or the other business or assets or liabilities of the Targets or Clients. This letter forms an integral part of the Valuation Report and should be read in conjunction with the Valuation Report enclosed herein.

The Valuation Report has been prepared by KVSL solely for the purpose as stated above. The Valuation Report forms an integral whole and cannot be split into parts. The outcome of the valuation can only lead to proper conclusions if the Valuation Report as a whole is taken into account.

Yours faithfully
For KPMG Valuation Services LLP
LLP Identification Number – AAP-2732
Registered Valuer Entity under Companies (Registered Valuers and Valuation) Rules, 2017
IBBI Registration No. IBBI/RV-E//06/2020/115
Asset Class : Securities or Financial Assets

Amit Jain, Partner
IBBI Registration No. IBBI/RV/06/2018/10501

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Glossary

%	Percentage
AETL	AE Tollway Limited
Bn	Billion
CAGR	Compounded Annual Growth Rate
Capex	Capital Expenditure
CGTL	CG Tollway Limited
Clients	IRB Infrastructure Trust, MMK Toll Road Private Limited and IDBI Trusteeship Services Limited
Coco	Comparable Companies
COD	Commercial operation date
CoTrans	Comparable Transactions
Cr	Crore
CWIP	Capital Work In Progress
DBFOT	Design, Build, Finance, Operate and Transfer
DCF	Discounted Cash Flow
EBIT	Earnings Before Interest and Tax
EBITDA	Earnings Before Interest, Tax, Depreciation and Amortization
EV	Enterprise Value
FCFF	Free Cash Flows to Firm
FV	Fair Value
FY	Financial Year
IDBI Trusteeship Services Ltd	Trustee
IBEF	India Brand Equity Foundation
IGEPL	IRB Golconda Expressway Private Limited
IKTPL	IRB Kota Tollway Private Limited
ILTPL	IRB Lalitpur Tollway Private Limited
IMF	International Monetary Fund
INR	Indian Rupee
InvIT	Investment Trust
IRBI Trust	IRB Infrastructure Trust
IRBIDL	IRB Infrastructure Developers Limited
IWTL	IRB Westcoast Tollway Limited
K	Thousands
Kd	Cost of Debt
Ke	Cost of Equity
Km	Kilometer
KVSL	KPMG Valuation Services LLP
LoE	Letter of Engagement
Management	Management of IRBI Trust and its 15 SPVs
MAT	Minimum Alternate Tax
MBEL	Meerut Budaun Expressway Limited
MMK Toll Road Private Limited	Investment Manager
Mn	Million
MoRTH	The Ministry of Road Transport and Highways
NAV	Net Asset Value
NHAI	National Highways Authority of India
IGTPL	IRB Gwalior Tollway Private Limited
IHCPL	IRB Harihara Corridors Private Limited
CBTPL	IRB Chandibhadra Tollway Private Limited
NHIDCL	National Highway and Infrastructure Development Corporation Limited
NIP	National Infrastructure Pipeline
NWC	Net Working Capital
O&M	Operation and Maintenance
PAT	Profit After Tax
PBT	Profit Before Tax
PDTPL	Palsit Dankuni Private Tollway Limited
PIB	Press Information Bureau
PV	Present Value
R(f)	Risk free rate of Return
R(m)	Market rate of Return
Rf	Risk-free Rate
SEBI	Securities and Exchange Board of India
Sponsor	IRB Infrastructure Developers Limited
SPV	Special Purpose Vehicle
STPL	Samakhiyali Tollway Private Limited
SYTL	Solapur Yedeshi Tollway Limited
t	Trillion
TOT	Toll operate transfer
UPEIDA	Uttar Pradesh Expressways Industrial Development Authority
UTL	Udaipur Tollway Limited
Valuation Date	31 March 2026
WACC	Weighted Average Cost of Capital
WPI	Wholesale Price Index
YATL	Yedeshi Aurangabad Tollway Limited

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1.

Executive Summary

Overview

Terms of the Engagement

- We have been appointed by IRBI Trust, Investment Manager and Trustee to undertake Enterprise Valuation of 15 Special Purpose Vehicles of IRBI Trust and Equity Valuation of IRBI Trust in accordance with Regulation 21 of the SEBI InvIT Regulations where valuation is required to be conducted by a registered valuer and such valuation report is required to be in compliance with the SEBI InvIT Regulations.
- As per the LoE, the valuation is to be carried out as on 31 March 2026. This report has been prepared by KVSL pursuant to terms of LoE.
- As on 31 March 2026 IRBI Trust assets comprised of the following 15 SPVs.
  - IRB Westcoast Tollway Limited (“IWTL”)
  - Solapur Yedeshi Tollway Limited (“SYTL”)
  - Yedeshi Aurangabad Tollway Limited (“YATL”)
  - AE Tollway Limited (“AETL”)
  - Udaipur Tollway Limited (“UTL”)
  - Chittorgarh Gulabpura Tollway Limited (“CGTL”)
  - Palsit Dankuni Tollway Private Limited (“PDTPL”)
  - IRB Golconda Expressway Private Limited (“IGEPL”)
  - Samakhiyali Tollway Private Limited (“STPL”)
  - IRB Kota Tollway Private Limited (“IKTPL”)
  - IRB Lalitpur Tollway Private Limited (“ILTPL”)
  - IRB Gwalior Tollway Private Limited (“IGTPL”)
  - Meerut Budaun Expressway Limited (“MBEL”)
  - IRB Harihara Corridor Private Limited (“IHCPL”)
  - IRB Chandibhadra Tollway Private Limited (“CBTPL”)

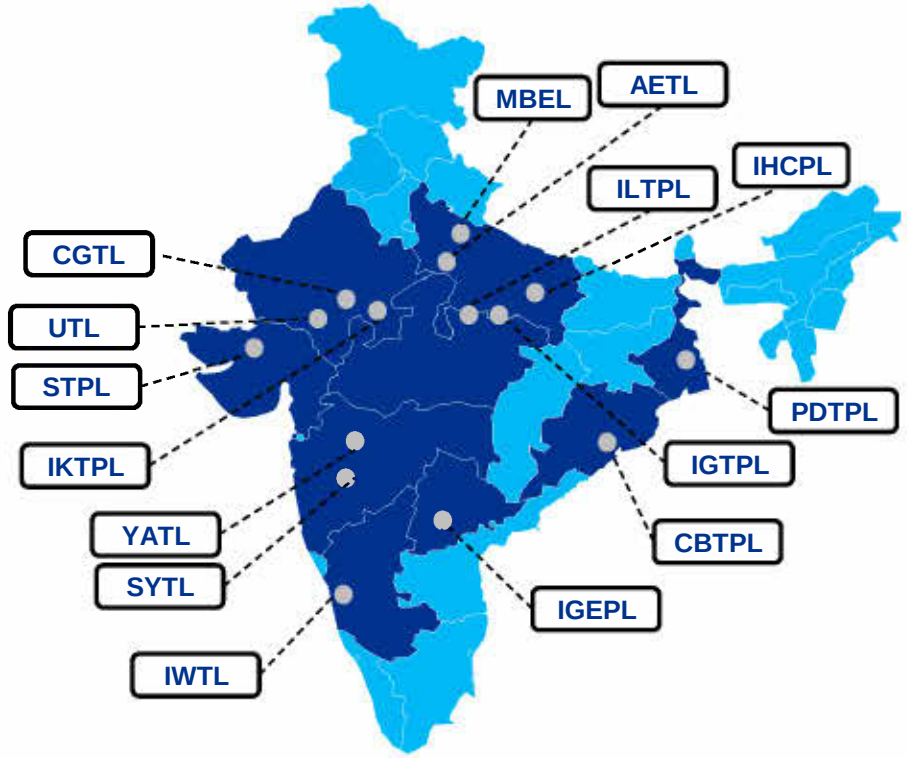
Valuation Approach and Methodology

Approach	Method
Income Approach	Discounted Cash Flow Method (DCF)

Source(s): Management information, KVSL analysis

SPV Overview

IRBI Trust through its SPVs operates 9 DBFOT assets and 6 TOT asset in the states of Maharashtra, Gujarat, Rajasthan, Goa, Karnataka, Madhya Pradesh, Uttar Pradesh, Telangana and West Bengal, Odisha which are being managed in pursuant to concessions granted by the National Highways Authority of India (“NHAI”) / Hyderabad Metropolitan Development Authority / Uttar Pradesh Expressways Industrial Development Authority (“UPEIDA”). The map below represents the locations of the SPVs.



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Valuation Conclusion

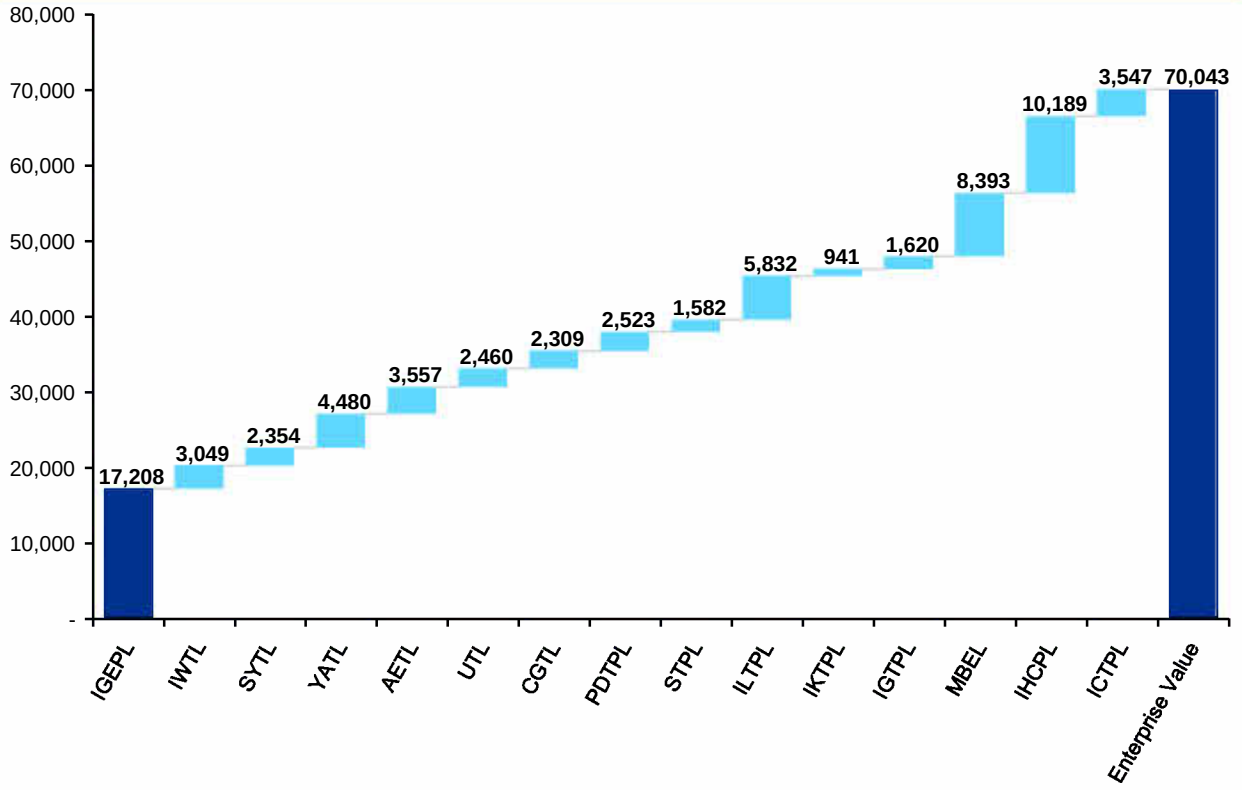
Valuation Conclusion (INR Crs)

Valuation Conclusion 31 March 2026	INR Crore
IRB Golconda Expressway Private Limited	17,208
IRB Westcoast Tollway Limited	3,049
Solapur Yedeshi Tollway Limited	2,354
Yedeshi Aurangabad Tollway Limited	4,480
AE Tollway Limited	3,557
Udaipur Tollway Limited	2,460
CG Tollway Limited	2,309
Palsit Dankuni Tollway Private Limited	2,523
Samakhiyali Tollway Private Limited	1,582
Lalitpur Tollway Private Limited	5,832
IRB Kota Tollway Private Limited	941
IRB Gwalior Tollway Private Limited	1,620
Meerut Buadun Expressway Limited	8,393
IRB Harihara Corridors Private Limited	10,189
IRB Chandibhadra Tollway Private Limited	3,547
Enterprise Value of the SPVs	**70,043**
Cash and cash equivalents	170
Surplus Assets	637
Debt and debt like items	(31,150)
PV of standalone expenses of IRBI Trust	(492)
Capital Creditors	(599)
Non-controlling interest	(1,134)
Equity value of IRBI Trust	**37,475**

NAV at fair value per unit as on 31 March 2026	
Equity Value of IRBI Trust (INR Cr)	37,475
Units outstanding (No.)	1,172,093,265
NAV at fair value per unit (INR)	**319.73**

Source(s): Management information, KVSL analysis

Enterprise Value of SPVs (in INR Crore)



Note: *SPVs are individually referred as "Target", "Business", "Company", "SPV" or the "Asset" Collectively referred as SPVs or Assets*

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2.

IRBI Trust Overview

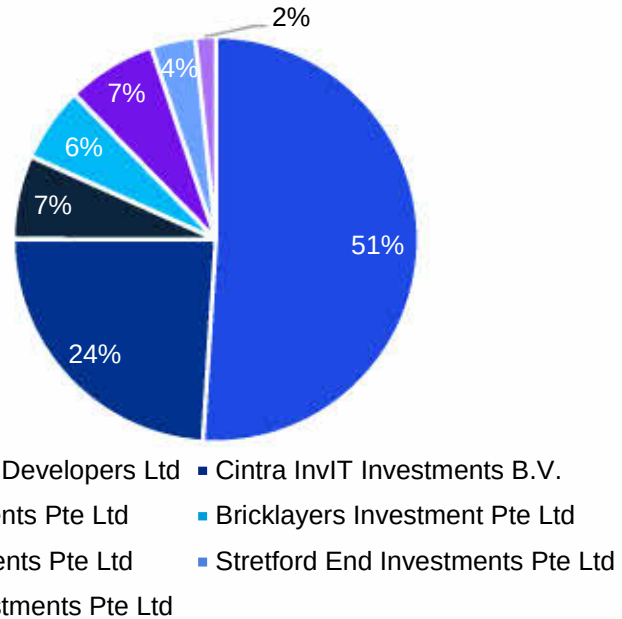
IRBI Trust Overview

IRBI Trust - Overview

- IRB Infrastructure Developers Limited ("IRBIDL" or "Sponsor") is one of the largest infrastructure development and construction companies in India in the roads and highways sector. It was incorporated on 27 July 1998 and is based in Mumbai, India.
- IRBI Trust has been settled by the Sponsor as an irrevocable trust under the provisions of the Trusts Act in New Delhi, India pursuant to the Indenture of Trust dated August 27, 2019, as amended. The Indenture of Trust is registered under the Registration Act. IRBI Trust is registered with the SEBI as an infrastructure investment trust under the InvIT regulations.
- The object and purpose of IRBI Trust is to carry on the activity of an infrastructure investment trust under the InvIT regulations. Investment by IRBI Trust shall only be in holding companies, SPVs, infrastructure projects, securities in India or other permitted investments in accordance with the InvIT regulations, the investment strategy and IRBI Trust documents.
- As on 31 March 2026 IRBI Trust assets comprised of 15 SPVs. IRBI Trust has acquired 9 DBFOT road assets and 6 TOT road assets. All SPVs of IRBI Trust except MBEL are revenue generating. Refer subsequent slides for more details.
- IRBI trust is held by IRBIDL as Sponsor with 51% stake, Cintra InvIT Investments B.V. with 24% stake and remaining 25% stake is held by GIC through its affiliates.
- In June 2024 Cintra InvIT Investments B.V has acquired ~24 per cent of the Units i.e. 26.72 Cr units of IRBI Trust from GIC Affiliates.
- In December 2024, IRBI Trust raised INR 1,714.9 Cr by way of right issue for acquisition of 80.4 per cent stake in MBEL from Sponsor and Anahera Investments Pte limited in a related party transaction.
- IRBI Trust transferred three highway assets, IHMTL, KGTL and KTL at an enterprise value of INR 8,436 Crore to IRB InvIT Fund, on 6 November 2025 in a related party transaction.
- We understand that IRBI Trust received the Letter of Award (LoA) for the IHCPL on 14 November 2025 and for CBTPL on 6 January 2026. Subsequently, IRBI Trust incorporated IHCPL and CBTPL for undertaking respective projects. The IRBI Trust has paid INR 9,270 Cr for IHCPL and INR 3,087 Cr to NHAI as an upfront bid concession fee.

Source(s): Management information, IRBI Trust website, Provisional Consolidated Trust Financials March 2026

Shareholding Pattern of IRBI Trust as on 31 March 2026



Key related parties of IRBI Trust

Role	Entity Name
Sponsor	IRB Infrastructure Developers Limited
Investment Manager	MMK Toll Road Private Limited
Trustee	IDBI Trusteeship Services Limited

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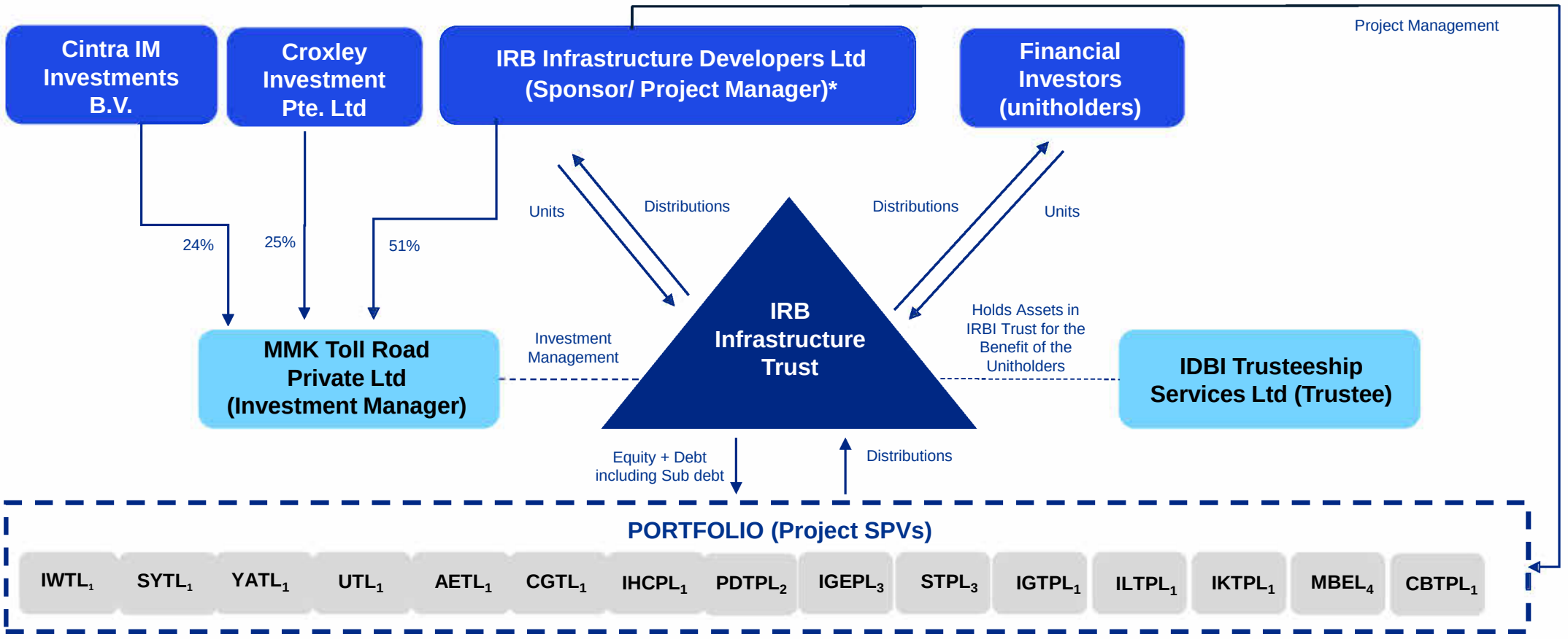
Structure of the IRBI Trust



[1] *100% of each project SPV held by the IRBI Trust, together with nominee shareholders.*
[2] *99.96% held by the IRBI Trust, with the Sponsor and Sponsor's nominee shareholders holding the remaining 0.04%.*
[3] *99.99% of IGEPL held by the IRBI Trust, with the Sponsor and Sponsor's nominee shareholders holding the remaining 0.01%.*
[4] *80.4% of MBEL held by the IRBI Trust, 10% by IRBI Developers and 9.6% by Anahera Investment Pte. Ltd.*

Source(s): IRBI Trust Corporate Presentation, Management

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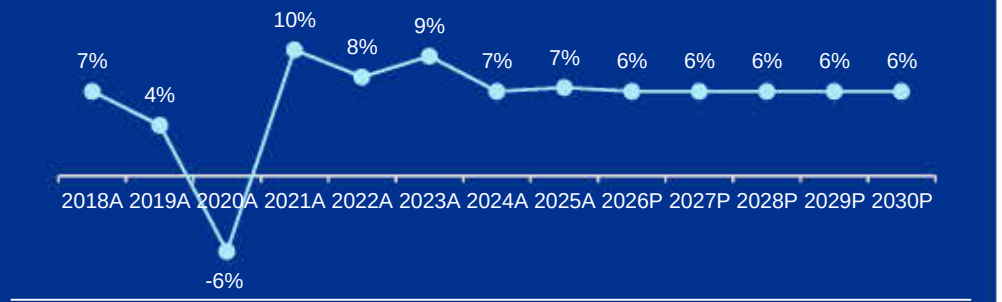
3.

Industry Overview

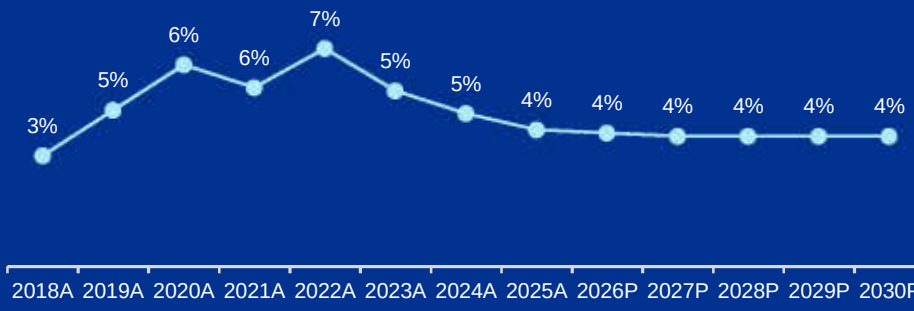
Indian Economy Outlook

The IMF, in its January 2026 World Economic Outlook Update, has projected that India's economy will grow at 6.4% each in 2026-27 and 2027-28. With this, India will remain the fastest-growing economy, and based on the calendar year, the IMF sees India's economy growing at 6.3% in 2026 and 6.5% in 2027.

Real GDP growth rate (%)



Annual percentage changes of average consumer prices (%)



Infra Sector

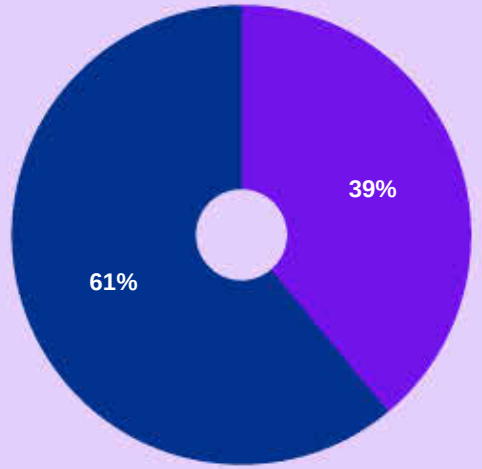
Infrastructure is a key enabler in helping India become a USD 26 trillion economy by 2047.

Capital investment outlay for infrastructure has been increased to Rs. 12.21 trillion in the FY2027 budget estimate (BE), compared to Rs 11.21 trillion in the FY2026 revised estimate (RE), marking a 10.0 per cent year-on-year growth; which would be 3.1% of the GDP.

India Infrastructure market (USD billion)

Infrastructure Segmentation

(2025)



Source(s): International Monetary Fund ("IMF"), India Brand Equity Foundation ("IBEF"), Mordor intelligence

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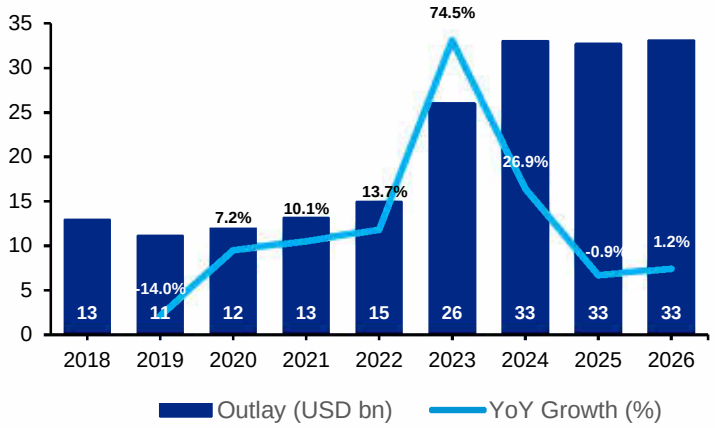
Road Transport and Highways

Road Transport and Highways sector

- The Ministry of Road Transport and Highways (“MoRTH”) formulates and administers policies for road transport, national highways and transport research. It is also involved with the construction and maintenance of the National Highways (“NHs”) through the National Highways Authority of India (“NHAI”), and the National Highway and Infrastructure Development Corporation Limited (“NHIDCL”). NHAI is an agency of MoRTH which is also responsible for the toll collection on several highways.
- Under Budget 2026-27, capital investment outlay for infrastructure has been increased to Rs 12.22 trillion, which is 4.4% of GDP.

Outlay for Roads under the Union Budget (USD billion)

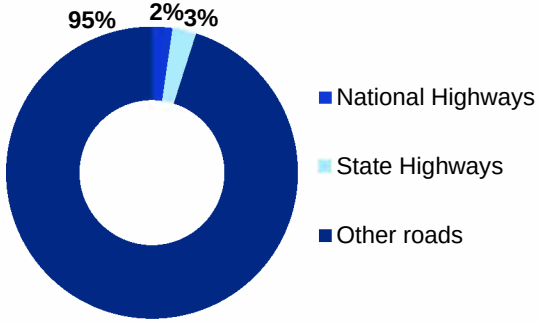


Source(s): MoRTH, IBEF, Invest India

2nd

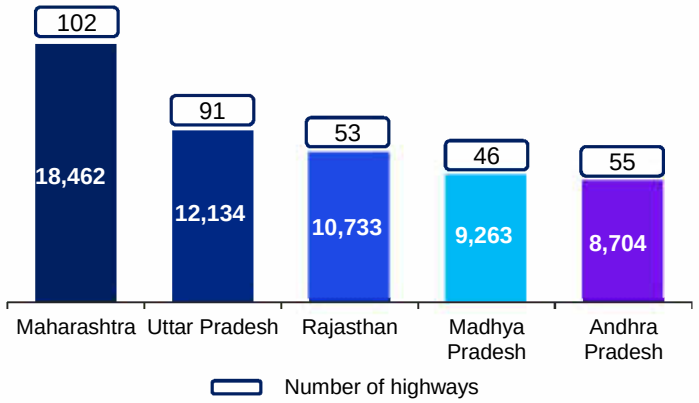
India has the second largest road network in the world of about 63 lakh km. This comprises National Highways, Expressways, State Highways, District Roads, Other District Roads and Village Roads.

Road & Highway – classification breakup



As per the data from Ministry of Road Transport and Highways, National Highways (NHs) make up for about 2.2 per cent (1,46,145 km) of the total road network of India (66,71,083 km).

Top 5 states by length of NHs in India (Km)



National Highways carry over 40 per cent of the total traffic across the length and breadth of the country. Maharashtra has the largest network of National Highways with 18,462 km (12.6%). As of December 31, 2025, 102 National Highway and road projects have been evaluated.

(*State-wise split is as per December 2025)*

4.9%

The roads and highways market size has grown steadily in recent years. It will grow from $732.88 billion in 2026 to $886.97 billion in 2030 at a compounded annual growth rate (CAGR) of 4.9%. The growth in the forecast period can be attributed to smart transportation solutions, sustainable and green infrastructure, emphasis on safety measures and adoption of advanced materials.

KPMG

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Key drivers of the sector

Pace of length of highways awarded and constructed (in kms)

The awarding of projects has picked up pace after the sanction of ambitious Bharatmala program. The Government of India has allocated INR 2.9 lakh crore under the National Infrastructure Pipeline for 2026. The government also aims to construct 10,000 Km of new roads in 2026.

* 2026 data is as of November 2025

9% 2015-2025
CAGR - Length of highways constructed per day

1.3 2030
Estimated toll collection (in INR lakh crore)

10k 2026
Road construction target (in km)

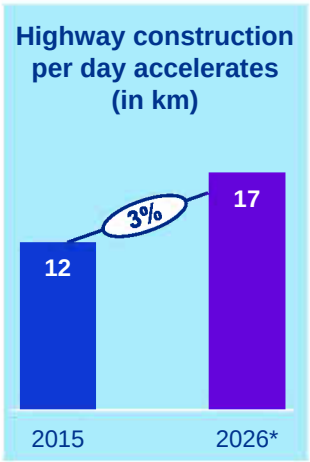
27 km FY 2027
Estimated highways constructed per day to be achieved

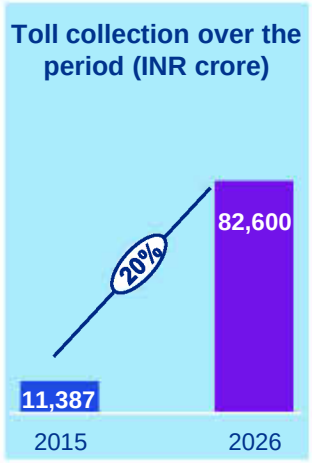
Source(s): MoRTH, Press Information Bureau ("PIB"), Money control

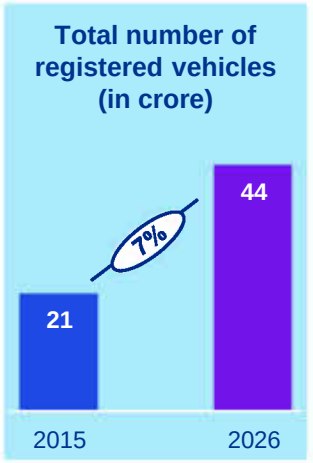
Toll operations efficiency increased due to adoption and growth of FASTag

11.9 Cr As of 31st January 2026, banks have issued over 11.9 crore FASTags.

232 Cr The average daily collection via FASTag on NH fee plaza is INR 232 crore thereby increasing efficiency in toll operations.







2026 data is as of November 2025*
2026 data is as of March 2026
- CAGR

Government has implemented multiple initiatives in the last 9 years to augment the capacity of the National Highway infrastructure in the country. The pace of National Highways construction has increased consistently due to the systematic push through corridor-based National Highway development approach.

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Financing in road infrastructure

Financing infrastructure

Investment in road infrastructure is long-term and returns are seen several years after construction. Roads and highways are financed through Government and private sources. Funding from Government sources includes budgetary allocations.

Private financing

Under private financing, the private developer builds a road, and in return has the right to collect toll for a specified period of time. The developer is responsible for the maintenance of roads during this period.

Public financing

Funding from government sources includes budgetary allocations, which are financed from taxes, cesses, or dedicated road funds. Publicly funded projects are usually given to contractors under various contract models such as the Engineering Procurement Construction (EPC).

Financing in road sector & MoRTH, NHAI budget

The Ministry is estimated to spend INR 3,09,692 crore in 2026-27. This is 7.9% higher than the revised estimates for 2025-26 (INR 2,86,963 crore). Major allocations are towards NHAI and expenditure on roads and bridges as show:

Sub-Head	Actuals FY 2024-25	RE FY 2025-26	BE FY 2026-27	% Change BE over RE
NHAI	168,602.0	170,266.0	187,293.0	10.0%
Roads & Bridges (MoRTH)	130,965.0	116,337.0	121,999.0	5.0%
Road Transport & Safety	254.0	360.0	400.0	11.0%
Total	**299,821.0**	**286,963.0**	**309,692.0**	7.9%

Note: BE – Budget Estimate, RE – Revised Estimate; "Total" includes recoveries which have not been shown in the table; "Others" covers establishment expenditure of the central government and allocations towards road transport and safety.

Allocation to Roads and Bridges

In 2026-27, the government has allocated INR 1,21,999 crore towards the development and maintenance of roads and bridges. This marks a 5% increase over the revised estimates for 2025 - 26. Expenditure under this allocation includes:

- Projects related to expressways
- Expansion and development of national highways
- Increase number of lanes under various projects
- Development of road connectivity in left-wing extremism affected areas

Investment Opportunities in Roads & Highways

33.9 Bn
Road InvIT Assets (USD)

14,563
Projects under NIP

2,613.7
Total Project Cost (USD billion)

50 Bn
Monetization Pipeline 2.0 Budget FY26 – FY30

Types of projects awarded by NHAI

a. Engineering Procurement & Construction

Under the EPC model, Government pays private players to lay roads. The private player has no role in the road's ownership, toll collection or maintenance.

b. Build Operate Transfer ("BOT")

Private players build, operate and maintain the road for a specified period before transferring the asset back to the Government. The private player arranges all the finances for the project, while collecting toll revenue/ annuity fee from the Government.

c. Hybrid Annuity Model ("HAM")

HAM is a hybrid model, a mix of the EPC and BOT (build, operate, transfer) models. HAM combines EPC (40 per cent) and BOT-Annuity (60 per cent). On behalf of the government, NHAI releases 40 per cent of the total project cost. The balance 60 per cent is arranged by the developer.

Source(s): PRS Legislative research, IBEF, CRISIL, MoRTH, Invest India

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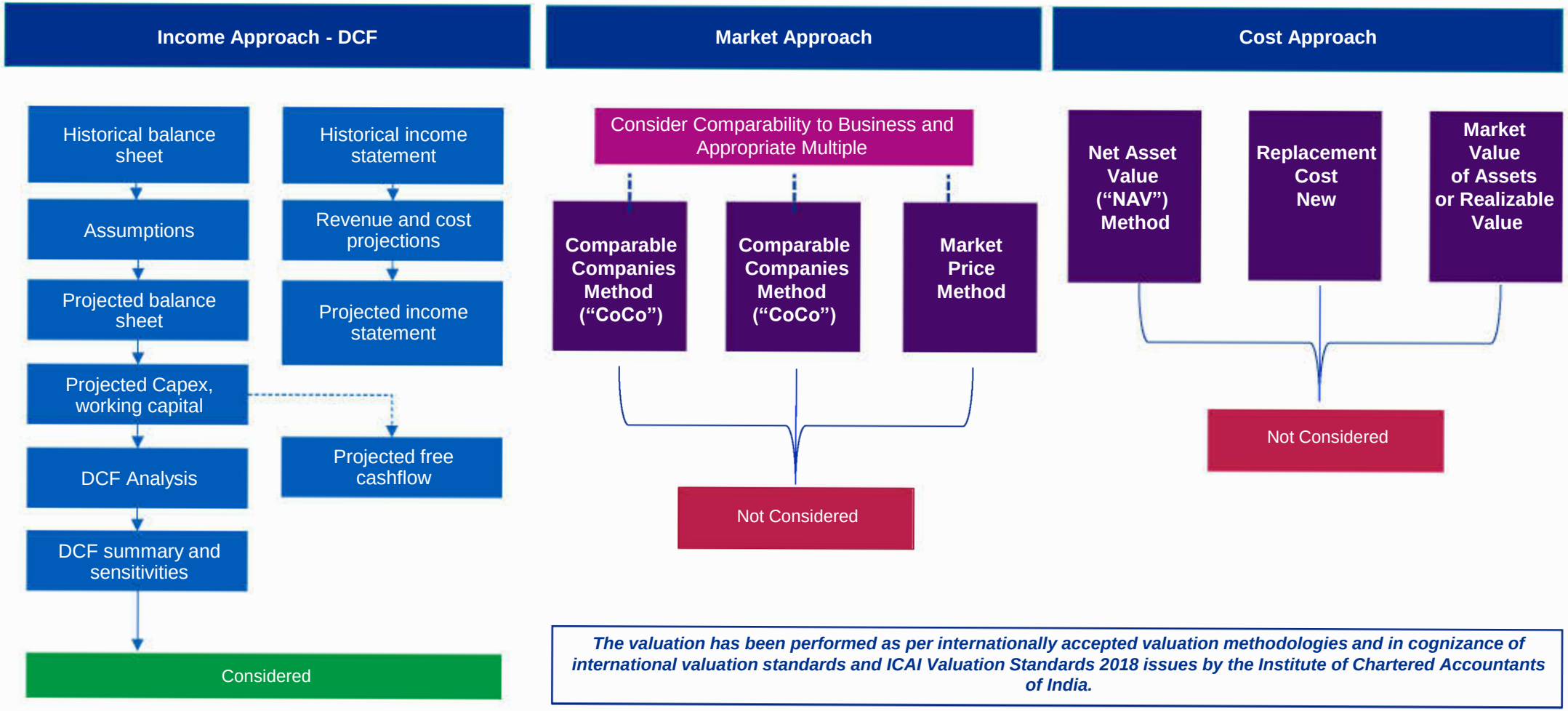
4.

Valuation Methodology and Approach

Valuation Methodology and Approach

Methodology and Approach



The valuation has been performed as per internationally accepted valuation methodologies and in cognizance of international valuation standards and ICAI Valuation Standards 2018 issues by the Institute of Chartered Accountants of India.

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Valuation Methodologies - Income Approach

Discounted Cash Flows ("DCF")

- Under a DCF approach, forecast cash flows are discounted back to the present date, generating a net present value for the cash flow stream of the business. A terminal value at the end of the explicit forecast period is then determined and that value is also discounted back to the valuation date to give an overall value for the business.
- A discounted cash flow methodology typically requires the forecast period to be of such a length to enable the business to achieve a stabilized level of earnings, or to be reflective of an entire operation cycle for more cyclical industries.
- The rate at which the future cash flows are discounted ("the discount rate") should reflect not only the time value of money, but also the risk associated with the business' future operations. The discount rate most generally employed is weighted average cost of capital ("WACC"), reflecting an optimal as opposed to actual financing structure.
- In calculating the terminal value, regard must be had to the business' potential for further growth beyond the explicit forecast period. The "constant growth model", which applies an expected constant level of growth to the cash flow forecast in the last year of the forecast period and assumes such growth is achieved in perpetuity, is a common method. These results would be cross-checked, however, for reasonability to implied exit multiples.
- Due to the finite life of the concession period of the SPVs, we have not computed a terminal value for the valuation of the SPVs.
- The rate at which future cash flows are discounted should reflect not only the time value of the cash flows but also the risk associated with the business' future operations. This means that in order for a DCF to produce a sensible valuation figure, the importance of the quality of the underlying cash flow forecasts is fundamental.
- The DCF approach has been applied in the valuation of the SPVs.

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Valuation Methodologies - Market Approach

Comparable Companies ("CoCo")

- Under comparable companies method, the value of shares / business of a company is determined based on market multiples of publicly traded comparable companies. Although no two companies are entirely alike, the companies selected as comparable companies should be engaged in the same or a similar line of business as the subject company.
- The appropriate multiple is generally based on the performance of listed companies with similar business models and size.
- The CoCo methodology has been not been applied in the valuation of IRBI Trust and SPVs.
- The list of companies in the road segment have mix of assets which are at different stages of operation / development / revenue mix/ leasing period. Therefore, comparable companies' method is not considered.

Comparable Transactions ("CoTrans")

- Under comparable transactions method, the value of shares / business of a company is determined based on market multiples of publicly disclosed transactions in the similar space as that of the subject company. Due to different purposes of investments, transaction rationale and synergy benefits, different control premiums and minority discounts are embedded in the transaction values.
- Multiples are generally based on data from recent transactions in a comparable sector, but with appropriate adjustment after consideration has been given to the specific characteristics of the business being valued.
- The list of transactions in the road segment have mix of assets which are at different stages of operation / development / revenue mix/ leasing period. Therefore, Therefore, comparable transactions method has not been considered for the valuation of IRBI Trust and SPVs.

Market Price Method

- Under this approach, the value of the business is arrived at considering the market price of the company based on the daily moving averages of the last six-month volume traded weighted average of closing price on the stock exchange where the company's shares are most frequently traded.
- The market price methodology has not been considered in the valuation of IRBI Trust and SPVs as it is not publicly listed or traded on any stock exchange.

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Valuation Methodologies – Cost Approach

Net Asset Value ("NAV") Method

- Under the net asset value approach, total value is based on the sum of net asset value as recorded on the balance sheet.
- A net asset methodology is most applicable for businesses where the value lies in the underlying assets and not the ongoing operations of the business.
- The net assets methodology has not been considered for the valuation of IRBI Trust and SPVs as the Targets are operational and the financials are made on a going concern basis.

Replacement Cost New

- The replacement cost of a business is the cost of acquiring similar assets employed in the business and/or reaching a similar level of development. A purchaser, faced with a build versus buy scenario, may be prepared to pay significantly over and above this cost to obtain advantages including time saved in developing a similar business, and risk of failure.
- The replacement cost method quantifies the cost and risk to reach the present stage of development.
- This approach is often used for start-up/non-mature technology or biotech businesses.
- Hence, the replacement cost method has not been considered.

Market Value of Assets or Realizable Value

- Under the market value methodology, total value is based on the sum of market value of asset value less market value of liabilities plus, the value of intangible assets not recorded on the balance sheet.
- This methodology is most applicable for businesses where the value lies in the underlying assets and not the ongoing operations of the business.
- Hence, the market value method has not been considered.

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Procedures adopted

Procedures adopted

We have carried out the Enterprise Valuation of the SPVs, in accordance with valuation standards as specified / applicable as per SEBI InvIT Regulations, to the extent applicable.

In connection with this analysis, we have adopted the following procedures to carry out the valuation analysis:

- Requested and received financial and qualitative information relating to the SPVs.
- Considered the key terms of concession agreements;
- Analysis of the Management Business Plan;
- Considered the Traffic Study Reports from the independent consultant;
- Discussed with the Management on: background of the SPVs– business and fundamental factors that affect its earning-generating capacity and historical and expected financial performance;
- Analysis of the key economic and industry factors which may affect the valuation of the SPVs;
- Analysis of the information available in public domain/ subscribed databases in respect of the comparable companies/ comparable transactions, as considered relevant by us;
- Conducted site visits of SPVs in December 2025 to April 2026 to assess the operating condition of the projects under the SPVs as per the requirements of SEBI (InvIT Regulations) 2014; SEBI (InvIT Regulations) 2014 requires the valuer to conduct site visit once a year.
- Selection of valuation approach and valuation methodology, in accordance with SEBI (InvIT Regulations), as considered appropriate and relevant by us;
- Analysis of other publicly available information, as considered relevant by us; and
- Determination of Enterprise Value of the SPVs and equity value of IRBI Trust as on the Valuation Date.

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WACC Analysis

Discount Rate and Terminal Value

Discount rate

In order to determine the discount rate, we have used the WACC methodology as set out below:

WACC = Ke * (E/(D + E)) + Kd * (1-T) * (D/(D + E))

Where:	Ke	=	cost of equity
	E	=	market value of equity
	Kd	=	cost of debt
	D	=	market value of debt
	T	=	corporate taxation rate

The cost of equity is derived using the Capital Asset Pricing Model ("CAPM") as follows:

	Ke	=	Rf + ß * (Rm – Rf) + α
Where:	Rf	=	the current return on risk-free assets
	Rm market	=	the expected average return of the
	(Rm – Rf)	=	the average risk premium above the risk - free rate that a "market" portfolio of assets is earning
	ß	=	the beta factor, being the measure of the systematic risk of a particular asset relative to the risk of a portfolio of all risky assets
	α	=	company specific risk factor (alpha)

Terminal Value

- Due to the finite life of the concession period of the SPVs, we have not computed a terminal value for the valuation of the SPVs.

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WACC Parameters

a. Risk free rate (Rf)

- Risk free rate forms the basis for any discount rate estimation using the build up methodology. As the name implies, this rate should not take into account any risk factors and should only include two general components – time value of money and inflation.
- Since there are no investments that are truly risk free, the risk free rate is commonly approximated by reference to yield on long-term debt instruments issued by government of India.
- For our analysis, the nominal risk-free rate is based 10 year benchmark government of India securities yield as well as analysis of the consensus forecast yield which stands at 6.8%.

b. Market risk premium

- Market risk premium is the difference between the expected return on the market as a whole and the risk-free rate (like the return on government bonds). This premium compensates investors for taking on the higher risk associated with investing in the stock market
- The ERP is not directly observable in the market and therefore must be estimated. There are various approaches for estimating ERP which can be categorized as (i) Historical ERP approach (ii) Surveys and (iii) implied ERP approach. Historical ERP is most commonly used approach, and we have used the same. Under this method the ERP is estimated as the difference between broad based equity market index returns and government debt returns over a selected sample period. Different assumptions considered in this approach include – selection of Time period for measurement, stock market benchmark and the risk free rate.
- The historical ERP can be estimated using any historical period; however, it is frequently calculated using a long back period. When calculated over a long period, the historical ERP is found to be relatively consistent with lower standard of error. We have considered long term returns on BSE Sensex index for our estimation of ERP over long period of time.
- Rf is subtracted from stock index returns for estimating ERP. The difference between Rf and market returns is averaged over the period to estimate the range.
- Based on our calculations, while Equity risk premium varies per period, it converges around 7.0 per cent. We have considered ERP of 7.0 per cent in our estimation of WACC.

c. Beta

- Beta is a measure of the risk of the shares of a company. ß is the co-variance between the return on sample stock and the return on the market. In order to determine the appropriate beta factor for the Company, consideration must be given either to the market beta of the Company or betas of comparable quoted companies.
- We have screened for companies in the road operating industry and infrastructure investment trusts. We have also included InvIT in the transmission sector that are based on a BOT model. We have considered companies operating in India.
- Betas are low in this industry due to the stable nature of the road operating industry and low level of cash flow volatility due to the relatively steady usage of roads. We have arrived at a levered adjusted beta of 0.82. This includes the additional risk due to debt financing of the comparable companies.

  *Adjusted beta = (0.67 * Raw Beta) + (0.33*1)*

- We have then unlevered and then relevered this beta using the optimal capital structure and tax rate applicable to the each SPV to reflect difference in operating leverage across comparable companies.

  Unlevered beta = Beta / [1 + (1-tax rate) Debt to Equity ratio}*

  *Relevered beta = Unlevered Beta * [1 + (1-tax rate)* Debt to Equity ratio}*

- We have considered Median of re-levered beta of comparable companies for our WACC estimation of SPVs.

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WACC Parameters

d. Alpha

- The Alpha factor incorporates company specific risk factor to reflect different stages of maturity and levels of uncertainty that are not already reflected in the projected cash flows.
- Since project under STPL is currently under construction, We have considered 1 per cent additional Alpha for STPL. Further, for project under MBEL we understand that ~99% physical progress has already been achieved and CoD is expected to be received in May 2026. Therefore, we have not considered any Alpha for MBEL.

e. Cost of Debt

- As per discussions with Management, we understand that the actual cost of debt for SPVs (excluding CBTPL and IHCPL) currently ranges between 8.60% and 8.75%. Management has approached lenders to revise the interest rate benchmark from the 1-year MCLR to the 1-month MCLR, proposing a rate of 7.95%. This proposal is yet to be approved by the lenders; however, Management is of the view that the revision is in line with prevailing market rates for other AAA-rated InvITs and expects a favorable outcome. Further, we understand that IRB Infrastructure Trust has recently raised debt to finance the upfront concession fee of IHCTL and CBTPL at a rate of 1-month MCLR plus a spread of 0.05%, resulting in an effective interest rate of approximately 7.95% and 7.75% respectively. Considering the above and based on discussions with Management, we have adopted a pre-tax cost of debt of 7.95% for the purpose of our valuation analysis.

f. Tax

- Basis discussion with the Management, We understand that eventually all the SPVs will transition to the new tax, hence we have considered tax rate of 25.17 per cent for the WACC.
- The Finance Bill, 2026 (presented on 1 February 2026) reduces the MAT rate from 15% to 14% and disallows any further MAT credit accrual under both regimes. Under the old regime, MAT paid will be treated as final tax with no additional credit accumulation. Under the new regime, however, unutilized MAT credit carried forward from the old regime can still be utilized. Such set-off is restricted to a maximum of 25% of the tax liability for the relevant year.

g. Capital structure

- To estimate an appropriate capital structure for the SPVs we have considered capital structure of comparable companies, IRBI Trust actual capital structure and discussion with Management on long term view on normalized capital structure.
- The debt capitalization (based on market values) of publicly traded companies operating in a similar industry as the IRBI Trust ranged from 11.4 per cent to 72.2 per cent of total capital with median of 50.2 per cent. Please refer to the next slide in this regard.
- The actual debt to capital for IRBI Trust as on valuation date (based on concluded enterprise value) stood at 44.6 per cent.
- However, given that comparable companies have assets portfolio which is mix of operational and under-construction assets, we have also considered status of IRBI Trust's asset portfolio and borrowing capacity when determining where within the Industry debt level ranges to select. All projects under SPVs of IRBI Trust other than MBEL are operational and have a significant remaining useful life. Considering remaining concession life of BOT assets in IRBI Trust's portfolio and discussion with the Management on their long term view on normalized capital structure including refinancing capacity, we have estimated a normalized capital structure of 60 per cent debt and 40 per cent equity.

h. WACC Indication

- Based on selected rate of return on equity, cost of debt and capital structure discussed above, we have calculated WACC for SPVs to be in the range of 9.31 per cent to 9.71 per cent. Refer subsequent slides for Beta and SPV wise WACC computation.

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Beta Computation

Beta computation 31 March 2026	Market Capitalization	Total Debt	Debt / Equity	Debt / Total Capital	Beta	Tax Rate	Unlevered Beta	Target's Debt Equity	Target's Tax Rate	Re Levered Beta
IRB Infrastructure Developers Limited	252,339	208,516	82.6%	45.2%	0.95	25.17%	59%	150.0%	25.17%	1.25
PNC Infratech Limited	53,107	50,688	95.4%	48.8%	0.99	25.17%	58%	150.0%	25.17%	1.23
Dilip Buildcon Limited	71,546	103,749	145.0%	59.2%	1.10	25.17%	53%	150.0%	25.17%	1.12
Bharat Road Network Limited	1,671	4,343	259.9%	72.2%	0.89	25.17%	30%	150.0%	25.17%	0.64
National Highways Infra Trust	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
India Infrastructure Trust	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Indus Infra Trust	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Anantam Highways Trust	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
Capital Infra Trust	22,547	37,376	165.8%	62.4%	0.49	25.17%	22%	150.0%	25.17%	0.46
Indigrid Infrastructure Trust	157,201	220,359	140.2%	58.4%	0.41	25.17%	20%	150.0%	25.17%	0.43
Powergrid Infrastructure Investment Trust	83,187	10,661	12.8%	11.4%	0.56	25.17%	51%	150.0%	25.17%	1.08
IRB InvIT Fund	78,763	79,300	100.7%	50.2%	0.51	25.17%	29%	150.0%	25.17%	0.62
G R Infraprojects Limited	85,993	55,922	65.0%	39.4%	0.82	25.17%	55%	150.0%	25.17%	1.17
Median										**1.08**

Note:

a) Market capitalization of comparable companies has been considered based on volume weighted average share prices till 31 March 2026.
b) Beta has been computed based on analysis of adjusted beta over 1-year, 3-year, 5-year, daily/weekly/monthly data.
c) Market beta is unlevered using each companies tax rate and capital structure (Beta/ 1+(1-tax rate)*Debt/Equity).
d) We have considered re-levered beta to give impact to the SPVs' capital structure and applicable tax rate. Debt/equity ratio used to re-lever beta is based on the normalized capital structure of the SPV i.e. 150% (Unlevered beta * (1+(1-Re-levered beta)*Target's Debt Equity)).
e) Although, National Highways Infra Trust, India Infrastructure Trust and Indus Infra Trust are a part of our comparable companies set, they have been excluded while calculating the beta due to low trading.
f) Capital Infra Trust was listed in January 2025 and has completed more than twelve months of trading. Considering its comparability and relevance to sector in which IRBI Trust is operating, it has been included in the peer set for Beta computation.
g) Anantam Highways Trust was listed in October 2025 and has completed less than 6 months of trading. Therefore, we have excluded the company from the peer set for Beta computation.
h) Refer Annexure 5 for business description of comparable companies.

Source: KVSL analysis based on data sourced from S&P Capital IQ

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Summary - WACC

WACC calculation															
Name of SPV	**IWTL**	**SYTL**	**YATL**	**AETL**	**UTL**	**CGTL**	**PDTPL**	**IGEPL**	**STPL**	**ILTPL**	**IKTPL**	**IGTPL**	**MBEL**	**IHCPL**	**CBTPL**
Risk free rate of return	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%	6.8%
India risk premium	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%
Beta	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08	1.08
Alpha	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%	1.00%	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Cost of Equity	**14.34%**	**14.34%**	**14.34%**	**14.34%**	**14.34%**	**14.34%**	**14.34%**	**14.34%**	**15.34%**	**14.34%**	**14.34%**	**14.34%**	**14.34%**	**14.34%**	**14.34%**
Cost of Debt	7.95%	7.95%	7.95%	7.95%	7.95%	7.95%	7.95%	7.95%	7.95%	7.95%	7.95%	7.95%	7.95%	7.95%	7.95%
Tax Rate	25.2%	25.2%	25.2%	25.2%	25.2%	25.2%	25.2%	25.2%	25.2%	25.2%	25.2%	25.2%	25.2%	25.2%	25.2%
After Tax Cost of Debt	**5.9%**	**5.9%**	**5.9%**	**5.9%**	**5.9%**	**5.9%**	**5.9%**	**5.9%**	**5.9%**	**5.9%**	**5.9%**	**5.9%**	**5.9%**	**5.9%**	**5.9%**
Debt to Capital %	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%
Equity to Capital %	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%
Weighted Average Cost of Capital	**9.31%**	**9.31%**	**9.31%**	**9.31%**	**9.31%**	**9.31%**	**9.31%**	**9.31%**	**9.71%**	**9.31%**	**9.31%**	**9.31%**	**9.31%**	**9.31%**	**9.31%**

Source: KVSL analysis

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WACC – Comparison between current and previous valuation (1/3)

WACC calculation												
Name of SPV	**IWTL**		**SYTL**		**YATL**		**AETL**		**UTL**		**CGTL**	
Valuation Date	**31-Mar-26**	**31-Dec-25**	**31-Mar-26**	**31-Dec-25**	**31-Mar-26**	**31-Dec-25**	**31-Mar-26**	**31-Dec-25**	**31-Mar-26**	**31-Dec-25**	**31-Mar-26**	**31-Dec-25**
Risk free rate of return	6.8%	6.6%	6.8%	6.6%	6.8%	6.6%	6.8%	6.6%	6.8%	6.6%	6.8%	6.6%
India risk premium	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%
Beta	1.08	1.05	1.08	1.05	1.08	1.05	1.08	1.05	1.08	1.05	1.08	1.05
Alpha	-	0.3%	-	1%	-	1%	-	0%	-	0%	-	0%
Cost of Equity	**14.3%**	**14.2%**	**14.3%**	**15.0%**	**14.3%**	**15.0%**	**14.3%**	**14.2%**	**14.3%**	**14.2%**	**14.3%**	**14.2%**
Cost of Debt	7.95%	7.95%	7.95%	8.60%	7.95%	8.60%	7.95%	7.95%	7.95%	7.95%	7.95%	7.95%
Tax Rate	25.2%	25.2%	25.2%	25.2%	25.2%	25.2%	25.2%	25.2%	25.2%	25.2%	25.2%	25.2%
After Tax Cost of Debt	**5.9%**	**5.9%**	**5.9%**	**6.4%**	**5.9%**	**6.4%**	**5.9%**	**5.9%**	**5.9%**	**5.9%**	**5.9%**	**5.9%**
Debt to Capital %	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%
Equity to Capital %	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%
Weighted Average Cost of Capital	**9.31%**	**9.25%**	**9.31%**	**9.84%**	**9.31%**	**9.84%**	**9.31%**	**9.25%**	**9.31%**	**9.25%**	**9.31%**	**9.25%**

Rf	Yield on government of India securities has increased leading to the change in Rf presented above
Rm	Equity risk premium has remained the same. However, there is an increase in Beta on account of changes in the market.
Debt to capital	The debt to capital structure has remained unchanged.
Cost of Debt	As per discussion with the Management, the cost of debt has reduced from 9 per cent in June 2025 to 8.6 per cent in December 2025 and Management further envisages the same to come down to 7.95 per cent in Q1 FY2027. Basis discussion with Management, We have considered pre-tax cost of debt to be 7.95 per.
WACC	For all the SPVs, the cost of capital has increased by 0.05% except for SYTL and YATL which has gone down by 0.54%
Alpha	In December 2025, we have considered 0.25% alpha on account of uncertainty in refinancing at lower interest rate. We understand from the Management that IRB Infrastructure Trust has raised debt to finance upfront concession fee of IHCTL and CBTPL at 1 month MCLR + 0.05% spread which translated to 7.95 per cent and 7.75 per cent respectively. Hence, we have removed the alpha for this uncertainty.

Source: KVSL analysis, Management Information and S&P Capital IQ

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WACC – Comparison between current and previous valuation (2/3)

WACC calculation												
Name of SPV	**PDTPL**		**IGEPL**		**STPL**		**ILTPL**		**IKTPL**		**IGTPL**	
Valuation Date	**31-Mar-26**	**31-Dec-25**	**31-Mar-26**	**31-Dec-25**	**31-Mar-26**	**31-Dec-25**	**31-Mar-26**	**31-Dec-25**	**31-Mar-26**	**31-Dec-25**	**31-Mar-26**	**31-Dec-25**
Risk free rate of return	6.8%	6.6%	6.8%	6.6%	6.8%	6.6%	6.8%	6.6%	6.8%	6.6%	6.8%	6.6%
India risk premium	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%	7.0%
Beta	1.08	1.05	1.08	1.05	1.08	1.05	1.08	1.05	1.08	1.05	1.08	1.05
Alpha	-	0.3%	-	0.3%	1.0%	1.3%	-	0.3%	-	0.3%	-	0.3%
Cost of Equity	**14.3%**	**14.2%**	**14.3%**	**14.2%**	**15.3%**	**15.2%**	**14.3%**	**14.2%**	**14.3%**	**14.2%**	**14.3%**	**14.2%**
Cost of Debt	7.95%	7.95%	7.95%	7.95%	7.95%	7.95%	7.95%	7.95%	7.95%	7.95%	7.95%	7.95%
Tax Rate	25.2%	25.2%	25.2%	25.2%	25.2%	25.2%	25.2%	25.2%	25.2%	25.2%	25.2%	25.2%
After Tax Cost of Debt	**5.9%**	**5.9%**	**5.9%**	**5.9%**	**5.9%**	**5.9%**	**5.9%**	**5.9%**	**5.9%**	**5.9%**	**5.9%**	**5.9%**
Debt to Capital %	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%	60.0%
Equity to Capital %	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%	40.0%
Weighted Average Cost of Capital	**9.31%**	**9.25%**	**9.31%**	**9.25%**	**9.71%**	**9.65%**	**9.31%**	**9.25%**	**9.31%**	**9.25%**	**9.31%**	**9.25%**

Rf	Yield on government of India securities has increased leading to the change in Rf presented above
Rm	Equity risk premium has remained the same. However, there is an increase in Beta on account of changes in the market.
Debt to capital	The debt to capital structure has remained unchanged.
Cost of Debt	As per discussion with the Management, the cost of debt has reduced from 9 per cent in June 2025 to 8.6 per cent in December 2025 and Management further envisages the same to come down to 7.95 per cent in Q1 FY2027. Basis discussion with Management, We have considered pre-tax cost of debt to be 7.95 per.
WACC	For all the SPVs, the cost of capital has increased by 0.05% except for SYTL and YATL which has gone down by 0.54%
Alpha	In December 2025, we have considered 0.25% alpha on account of uncertainty in refinancing at lower interest rate. We understand from the Management that IRB Infrastructure Trust has raised debt to finance upfront concession fee of IHCTL and CBTPL at 1 month MCLR + 0.05% spread which translated to 7.95 per cent and 7.75 per cent respectively. Hence, we have removed the alpha for this uncertainty.

Source: KVSL analysis, Management Information and S&P Capital IQ

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WACC – Comparison between current and previous valuation (3/3)

WACC calculation						
Name of SPV	**MBEL**		**IHCPL**		**CBTPL**	
Valuation Date	**31-Mar-26**	**31-Dec-25**	**31-Mar-26**	**31-Dec-25**	**31-Mar-26**	**31-Dec-25**
Risk free rate of return	6.8%	6.6%	6.8%	-	6.8%	-
India risk premium	7.0%	7.0%	7.0%	-	7.0%	-
Beta	1.08	1.05	1.08	-	1.08	-
Alpha	-	0.3%	-	-	-	-
Cost of Equity	**14.3%**	**14.2%**	**14.3%**	**-**	**14.3%**	**-**
Cost of Debt	7.95%	7.95%	7.95%	-	7.95%	-
Tax Rate	25.2%	25.2%	25.2%	-	25.2%	-
After Tax Cost of Debt	**5.9%**	**5.9%**	**5.9%**	**-**	**5.9%**	**-**
Debt to Capital %	60.0%	60.0%	60.0%	-	60.0%	-
Equity to Capital %	40.0%	40.0%	40.0%	-	40.0%	-
Weighted Average Cost of Capital	**9.31%**	**9.25%**	**9.31%**	**-**	**9.31%**	**-**

Rf	Yield on government of India securities has increased leading to the change in Rf presented above
Rm	Equity risk premium has remained the same. However, there is an increase in Beta on account of changes in the market.
Debt to capital	The debt to capital structure has remained unchanged.
Cost of Debt	As per discussion with the Management, the cost of debt has reduced from 9 per cent in June 2025 to 8.6 per cent in December 2025 and Management further envisages the same to come down to 7.95 per cent in Q1 FY2027. Basis discussion with Management, We have considered pre-tax cost of debt to be 7.95 per.
WACC	For all the SPVs, the cost of capital has increased by 0.05% except for SYTL and YATL which has gone down by 0.54%
Alpha	For MBEL, the cost of capital has increased by 0.05%. IHCPL and CBTPL are being valued for first time and hence comparison for the same is not available.

Source: KVSL analysis, Management Information and S&P Capital IQ

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5.

Valuation of Individual SPVs

IRB Westcoast Tollway Limited

Overview

Project details

IWTL was engaged for four laning the existing two lane highway on DBFOT basis The project stretch is 187.28 kms long involving the Goa/ Karnataka border to Kundapur Section of NH-17 from 93.7 kms to 283.3 kms in Karnataka with 3 toll plazas.

Concession period

IWTL is required to construct, operate and maintain and modify, repair or otherwise make improvements to the project highway in accordance with the concession agreement for a period of 28 years commencing from the appointed date.
Probable extension of concession period is estimated according to article 29 of concession agreement which comes to about 5.6 years.

Premium

There is no premium clause in the concession agreement.

Source(s): Management information

Highlights

Particulars	Details
Project location	Goa/Karnataka border to Kundapur
Concessionaire	IWTL
State	Karnataka
Tollable length (kms)	187.28
No. of toll plazas	3
Concession agreement date	25-Mar-13
Appointed date	3-Mar-14
Four laning completion certificate date	19-Mar-23
Scheduled end date	2-Mar-42
New scheduled end date	7-Feb-48

Interest held by Trust as at 31 March 2026

Particulars	Stake %
Equity stake	100%
Debt held by InvIT in IWTL	INR 2,994 Cr

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Key Assumptions

a. Modification in concession period

- As per Clause 29.2 of the concession agreement between NHAI and IWTL, *"In the event actual average traffic shall have fallen short of the target traffic, then for every 1% shortfall as compared to the target traffic, the concession period shall, subject to payment of concession fee in accordance with this agreement, be increased by 1.5% thereof; provided such increase in concession period shall not in any case exceed 20% of the concession period"*.
- Thus, the concession period is increased as per the above clause as follows:

Particulars	
Shortfall in traffic (Management estimate)	39%
1.5% increase for every 1% decrease	59%
Maximum increase in concession period	20%
Increase in concession period (years)	5.6
Original concession period	28.0
Revised concession period	33.6
Scheduled end date	2-Mar-42
New scheduled end date	**7-Feb-48**

- Besides the extension mentioned in the agreement, Management represented that the concession period will be increased by further 124 days on account of covid-19. (included above)
- The Management has confirmed to us to consider revised concession period till 7 February 2048. Thus, the explicit period for the current valuation analysis exercise has been considered from 1 April 2026 to 7 February 2048.

Source(s): Management information, External traffic Study

b. Revenue

- Revenue for IWTL is derived from Toll collections for the concession period. Management has provided Traffic volume, toll rates and toll revenue for the forecast period based on the traffic report prepared by independent consultant in May 2026.
- As per the NHAI Circular No. 17.7.12/2025 dated 17 October 2025, the Ministry of Road Transport & Highways (MoRTH), vide Gazette Notification No. 388 (E) dated 17 June 2025, has inserted sub-section (3B) in Rule 9 of the National Highways Fee (Determination of Rates and Collection) Rules, 2008, thereby introducing the concept of an Annual Pass with effect from 15 August 2025. MoRTH vide Circular No. H-25011/05/2025-Toll (E-245443) dated 1 September 2025 has notified a fair compensation framework for addressing revenue losses arising out of the Annual Pass in InvIT Projects.
- The impact of Annual Pass has been considered by the traffic consultant in the traffic study while estimating toll revenue for the forecast period.
- As stated in the Traffic Study Report of IWTL, elasticity model of growth projection has been considered for traffic forecast. While estimating traffic volume, consultant has considered factors such as GDP growth rate of India, developments along the project road, elasticity value of different vehicle type for computing the traffic growth rate.
- Traffic growth is driven by the west coast's deeper waters, along with the expansion of JNPT that is expected to increase cargo movement from surrounding regions. In addition to that three SEZs has been developed with major IT investments from companies like TCS, Wipro, and Lotus which further strengthen the higher traffic on the project road.
- Basis above factors, Traffic is forecast to increase by 5-7 per cent annually in the forecast period.
- Annual revision of toll rate for the forecast period shall be in accordance with National Highway Fee (Determination of Rates and Collection) Rules, 2008 and amendment thereto.
- Additionally, the applicable base rate shall be revised annually on April 1 to reflect 3% fixed increase plus the increase in wholesale price index ("WPI") but such revision shall be restricted to 40% of the increase in WPI on overall basis during the concession period. As given in the traffic report, average inflation in WPI from FY2021-25 is 4.74%, reflecting inflationary cycles across both high and low year. Hence, an annual escalation factor of 4.5% has been considered for the remaining concession period.

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Key Assumptions

- Toll revenue has been considered basis the pessimistic scenario from the traffic report prepared by an independent consultant appointed by the Management. Please refer to traffic report for detailed study on forecast traffic growth rates, toll rates and toll revenue.
- Refer Annexure 2c for a detailed breakup of Revenue.

c. Periodic maintenance & routine maintenance costs

- Operational expenditure includes base operating expenditure, admin expenses, insurance, project management fees and various other expenses. These are broadly categorized as routine maintenance expenses.
- Periodic maintenance expense, also referred to as major maintenance expenses are incurred to restore the road asset to its original condition or to maintain its current operating standard.
- Upto FY2030, IWTL has entered into a fixed price Project Implementation Agreement ("PIA") for periodic and routine maintenance with IRB Infrastructure Developers Limited ("Project Manager").
- For the forecast period post FY2030 periodic and routine maintenance cost have been considered based on technical assessment done by the Management. Routine maintenance has been increased by 2% to 5% y-o-y in forecast period post FY2030.

d. Depreciation & amortization

- Forecasted depreciation on assets has been provided by the Management. Management has forecasted depreciation to increase in line with the increase in revenue.

e. Tax

- The Finance Bill, 2026 (presented on 1 February 2026) reduces the MAT rate from 15% to 14% and disallows any further MAT credit accrual under both regimes. Under the old regime, MAT paid will be treated as final tax with no additional credit accumulation. Under the new regime, however, unutilized MAT credit carried forward from the old regime can still be utilized. Such set-off is restricted to a maximum of 25% of the tax liability for the relevant year.
- Management represented that IWTL has 80IA benefit from FY2026 to FY2033. However, from an FCFF perspective, the new tax regime may appear to result in a lower effective tax outflow over the projection period and hence we have used the same in our valuation analysis. However, Management is still evaluating the option to migrate to the new tax regime at this stage and therefore timing of the transition to new tax regime will remain Managements option.

f. Working capital

- The change in WC each year is not material. Therefore, we have only considered the impact of release of working capital at the end of the concession period.

g. Capex

- Capex towards reconstruction of Kali bridge would be incurred to the tune of INR 150 crores (Excl. GST). The said expenses would be incurred by Trust. Trust would be lodging claim towards the same with NHAI. Since the said expense would be a pass through for the Trust, hence the same has not been factored in Valuation.

h. Changes in assumption from previous valuation

- Material changes from previous valuation include change in revenue forecasts due to the following factors
    - Impact on toll rates due to change in WPI growth forecast from 4.75% to 4.5%.
    - Change in tollable traffic volume growth rates forecast considered by Traffic consultant

Source(s): Management information, External traffic Study

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Discounted Cash Flows (1/3)

Discounted Cash Flow								
INR crores		FY2027 12 months	FY2028 12 months	FY2029 12 months	FY2030 12 months	FY2031 12 months	FY2032 12 months	FY2033 12 months
Revenue		166	185	206	231	257	285	315
y-o-y growth		*10%*	*12%*	*12%*	*12%*	*11%*	*11%*	*10%*
Routine maintenance		29	30	31	32	33	34	35
y-o-y growth		*n/a*	*4%*	*3%*	*3%*	*3%*	*3%*	*3%*
Major maintenance expense		1	-	111	41	-	-	2
Other expenses		-	-	-	-	-	-	-
EBITDA	**[A]**	**136**	**155**	**65**	**159**	**224**	**251**	**278**
EBITDA margin		*81.8%*	*83.8%*	*31.4%*	*68.7%*	*87.2%*	*88.1%*	*88.4%*
Depreciation		(37)	(38)	(42)	(45)	(46)	(51)	(57)
EBIT		**99**	**117**	**22**	**114**	**178**	**200**	**221**
EBIT margin		*59.7%*	*63.2%*	*10.9%*	*49.4%*	*69.3%*	*70.2%*	*70.4%*
Less: Tax on EBIT	[B]	-	-	-	-	-	-	-
Change in working capital	[C]	0	-	-	-	-	-	-
Less: Capex		-	-	-	-	-	-	-
Free cash flows to the firm	**E = [A+B+C+D]**	**136**	**155**	**65**	**159**	**224**	**251**	**278**
Discounting period		0.500	1.500	2.500	3.500	4.500	5.500	6.500
Discount factor	[F]	0.956	0.875	0.801	0.732	0.670	0.613	0.561
Present value of cash flows	**[E*F]**	**130**	**136**	**52**	**116**	**150**	**154**	**156**

Source(s): Management information, KVSL analysis

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Discounted Cash Flows (2/3)

Discounted Cash Flow									
INR crores		FY2034 12 months	FY2035 12 months	FY2036 12 months	FY2037 12 months	FY2038 12 months	FY2039 12 months	FY2040 12 months	FY2041 12 months
Revenue		349	387	429	475	525	581	646	714
y-o-y growth		*11%*	*11%*	*11%*	*11%*	*10%*	*11%*	*11%*	*11%*
Routine maintenance		36	37	38	39	40	41	42	44
y-o-y growth		*3%*	*3%*	*3%*	*2%*	*2%*	*3%*	*3%*	*5%*
Major maintenance expense		12	166	2	-	-	148	53	-
Other expenses		-	-	-	-	-	-	-	-
EBITDA	**[A]**	**302**	**184**	**389**	**436**	**485**	**392**	**551**	**670**
EBITDA margin		*86.3%*	*47.4%*	*90.7%*	*91.8%*	*92.4%*	*67.4%*	*85.2%*	*93.8%*
Depreciation		(63)	(70)	(78)	(86)	(95)	(106)	(118)	(131)
EBIT		**239**	**114**	**312**	**350**	**390**	**286**	**433**	**539**
EBIT margin		*68.3%*	*29.4%*	*72.6%*	*73.7%*	*74.2%*	*49.2%*	*67.0%*	*75.5%*
Less: Tax on EBIT	[B]	-	-	-	-	(15)	(63)	(103)	(133)
Change in working capital	[C]	-	-	-	-	-	-	-	-
Less: Capex		-	-	-	-	-	-	-	-
Free cash flows to the firm	**E = [A+B+C+D]**	**302**	**184**	**389**	**436**	**470**	**329**	**448**	**537**
Discounting period		7.500	8.500	9.500	10.500	11.500	12.500	13.500	14.500
Discount factor	[F]	0.513	0.469	0.429	0.393	0.359	0.329	0.301	0.275
Present value of cash flows	**[E*F]**	**155**	**86**	**167**	**171**	**169**	**108**	**135**	**148**

Source(s): Management information, KVSL analysis

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Discounted Cash Flows (3/3)

Discounted Cash Flow								
INR crores		FY2042 12 months	FY2043 12 months	FY2044 12 months	FY2045 12 months	FY2046 12 months	FY2047 12 months	FY2048 10 months
Revenue		793	878	978	1,082	1,197	1,326	1,254
y-o-y growth		*11%*	*11%*	*11%*	*11%*	*11%*	*11%*	*-5%*
Routine maintenance		46	49	51	54	56	59	53
y-o-y growth		*5%*	*5%*	*5%*	*5%*	*5%*	*5%*	*-10%*
Major maintenance expense		-	-	-	-	-	-	-
Other expenses		-	-	-	-	-	-	-
EBITDA	**[A]**	**747**	**829**	**926**	**1,028**	**1,140**	**1,266**	**1,201**
EBITDA margin		*94.2%*	*94.5%*	*94.8%*	*95.0%*	*95.3%*	*95.5%*	*95.7%*
Depreciation		(145)	(161)	(180)	(200)	(222)	(246)	(234)
EBIT		**602**	**668**	**746**	**829**	**919**	**1,021**	**967**
EBIT margin		*75.8%*	*76.1%*	*76.3%*	*76.6%*	*76.8%*	*77.0%*	*77.1%*
Less: Tax on EBIT	[B]	(160)	(209)	(233)	(259)	(287)	(319)	(302)
Change in working capital	[C]	-	-	-	-	-	-	-
Less: Capex		-	-	-	-	-	-	-
Free cash flows to the firm	**E = [A+B+C+D]**	**587**	**620**	**693**	**770**	**853**	**948**	**899**
Discounting period		15.500	16.500	17.500	18.500	19.500	20.500	21.426
Discount factor	[F]	0.252	0.230	0.211	0.193	0.176	0.161	0.149
Present value of cash flows	**[E*F]**	**148**	**143**	**146**	**148**	**151**	**153**	**134**

Valuation conclusion	
INR Crore	
Present value of cash flows	3,055
Present value of release of working capital	(6)
Enterprise Valuation	**3,049**

WACC	**9.31%**

Present value of release in working capital represent negative working capital of INR 43.12 Cr released at the end of the concession period.

Please refer WACC Summary for WACC breakup.

Basis the above and using a WACC of 9.31%, the Enterprise Value of IWTL, as on 31 March 2026 is INR 3,049 crore.

Source(s): Management information, KVSL analysis

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Solapur Yedeshi Tollway Limited

Overview

Project details

SYTL was engaged for four laning the existing two lane highway on DBFOT basis the project stretch is 98.7 kms long involving the Solapur to Yedeshi section of NH-211 from 0.00 kms to 100 kms in Maharashtra with 2 toll plazas.

Concession period

SYTL is required to construct; operate and maintain and modify, repair or otherwise make improvements to the project highway in accordance with the concession agreement for a period of 29 years commencing from the appointed date.
Extension of concession period by 318 days is estimated according to article 29 of concession agreement. Refer next slide for details.

Premium

There is no premium clause in the concession agreement.

Source(s): Management information

Highlights

Particulars	Details
Project location	Solapur Yedeshi
Concessionaire	SYTL
State	Maharashtra
Tollable length (kms)	98.7
No. of toll plazas	2
Concession agreement date	3-Mar-14
Appointed date	21-Jan-15
Four laning completion certificate date	15-Oct-19
Scheduled end date	21-Jan-44
New scheduled end date	27-March-45

Interest held by Trust as at 31 March 2026

Particulars	Stake %
Equity stake	100%
Debt held by InvIT in SYTL	INR 685 Cr

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Key Assumptions

a. Modification in concession period

- As per Clause 29.1, of the concession agreement between NHAI and SYTL, *"In the event that the actual average traffic shall have fallen short of or exceeded the target traffic by more than 2.5%, the concession period shall be modified in accordance with Clause 29.2."*
- As per Clause 29.2 of the concession agreement between NHAI and SYTL, *"In the event actual average traffic shall have fallen short of the target traffic, then for every 1% shortfall as compared to the target traffic, the concession period shall, subject to payment of concession fee in accordance with this agreement, be increased by 1.5% thereof; provided such increase in concession period shall not in any case exceed 20% of the concession period"*.
- Thus, the concession period is increased as per the above clause as follows:

Particulars	
Shortfall in traffic (As per Independent Engineer appointed by NHAI)	-2.6%
1.5% increase for every 1% decrease. Subject to Maximum increase in concession period capped at 20%.	3.93%
As per illustration CA CL 29.2.1, it is considered	3.0%
Original concession period	29.0
Revised concession period	29.9
Scheduled end date as per concession	21-Jan-44
Scheduled end date as per last calculation	13-May-44
New scheduled end date (Post current estimates)	**27-Mar-45**

- The Management has confirmed to us to consider revised concession period till 27 March 2045. Thus, the explicit period for the current valuation analysis exercise has been considered from 1 April 2026 to 27 March 2045.
- Besides the extension mentioned in the agreement, Management represented that the concession period will be increased by further 115 days on account of covid-19. (included above).

Source(s): Management information, External traffic Study

b. Revenue

- Revenue for SYTL is derived from Toll collections for the concession period. Management has provided Traffic volume, toll rates and toll revenue for the forecast period based on the traffic report prepared by independent consultant in May 2026.
- As per the NHAI Circular No. 17.7.12/2025 dated 17 October 2025, the Ministry of Road Transport & Highways (MoRTH), vide Gazette Notification No. 388 (E) dated 17 June 2025, has inserted sub-section (3B) in Rule 9 of the National Highways Fee (Determination of Rates and Collection) Rules, 2008, thereby introducing the concept of an Annual Pass with effect from 15 August 2025. MoRTH vide Circular No. H-25011/05/2025-Toll (E-245443) dated 1 September 2025 has notified a fair compensation framework for addressing revenue losses arising out of the Annual Pass in InvIT Projects.
- The impact of Annual Pass has been considered by the traffic consultant in the traffic study while estimating toll revenue for the forecast period.
- As stated in the Traffic Study Report of SYTL, elasticity model of growth projection has been considered for traffic forecast. While estimating traffic volume, consultant has considered factors such as GDP growth rate of India, developments along the project road, elasticity value of different vehicle type for computing the traffic growth rate.
- Further, while estimating growth, traffic consultant has also taken into consideration the project corridor passes highest number of sugar factories in India and multiple MIDC clusters which indicates strong and sustained traffic growth along the project corridor.
- Further, we have been given to understand that a PIL was filed at Hon'ble Bombay High Court (Aurangabad bench) to augment the Autram Ghat section (between Chalisgaon and Aurangabad). The Hon'ble High Court has passed an interim order in August 2023 directing NHAI to submit a plan for augmentation of the road, and till then movement of commercial vehicles is restricted on corresponding section of the road. It has negatively impacted on traffic on SYTL and YATL. However, the matter is expected to be resolved during FY27, basis which it is anticipated that the diverted traffic would progressively come back on project stretch between FY27 and FY28.
- Basis above factors, Traffic is forecast to increase by 16 per cent in FY27 and 5-3 per cent annually thereafter.

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Key Assumptions

- Annual revision of toll rate for the forecast period shall be in accordance with National Highway Fee (Determination of Rates and Collection) Rules, 2008 and amendment thereto.
- Additionally, the applicable base rate shall be revised annually on April 1 to reflect 3% fixed increase plus increase in wholesale price index ("WPI") but such revision shall be restricted to 40% of the increase in WPI on overall basis during the concession period. As given in the traffic report, average inflation in WPI from FY2021-25 is 4.74%, reflecting inflationary cycles across both high and low year. Hence, an annual escalation factor of 4.5% has been considered for the remaining concession period.
- Toll revenue has been considered basis the pessimistic scenario from the traffic report prepared by an independent consultant appointed by the Management. Please refer to traffic report for detailed study on forecast traffic growth rates, toll rates and toll revenue.
- Refer Annexure 2c for a detailed breakup of Revenue.

c. Periodic maintenance & routine maintenance costs

- Operational expenditure includes base operating expenditure, admin expenses, insurance, project management fees and various other expenses. These are broadly categorized as routine maintenance expenses and other operating expenses.
- Periodic maintenance expense, also referred to as major maintenance expenses are incurred to restore the road asset to its original condition or to maintain its current operating standard.
- Upto FY2030, SYTL has entered into a fixed price Project Implementation Agreement ("PIA") for periodic and routine maintenance with IRB Infrastructure Developers Limited ("Project Manager").
- For the forecast period post FY2030 periodic and routine maintenance cost have been considered based on technical assessment done by the Management. Routine maintenance has been increased by 4% to 5% y-o-y in forecast period post FY2030.

d. Depreciation & amortization

- Forecasted depreciation on assets has been provided by the Management. Management has forecasted depreciation to increase in line with the increase in revenue.

e. Tax

- The Finance Bill, 2026 (presented on 1 February 2026) reduces the MAT rate from 15% to 14% and disallows any further MAT credit accrual under both regimes. Under the old regime, MAT paid will be treated as final tax with no additional credit accumulation. Under the new regime, however, unutilized MAT credit carried forward from the old regime can still be utilized. Such set-off is restricted to a maximum of 25% of the tax liability for the relevant year.
- Management represented that SYTL has 80IA benefit from FY2026 to FY2034. However, from an FCFF perspective, the new tax regime may appear to result in a lower effective tax outflow over the projection period and hence we have used the same in our valuation analysis. However, Management is still evaluating the option to migrate to the new tax regime at this stage and therefore timing of the transition to new tax regime will remain Managements option.

f. Working capital

- The change in WC in FY27 pertains to release in DSRA on refinancing / repayment of SPV debt. The change in WC each year is not material. Therefore, we have only considered the impact of release of working capital at the end of the concession period.

g. Capex

- Since the SPV is already operational, there is no capex to be incurred in the remainder of the concession period.

h. Changes in assumption from previous valuation

- Material changes from previous valuation include change in revenue forecasts due to the following factors
    - Impact on toll rates due to change in WPI growth forecast from 4.75% to 4.5%.
    - Change in tollable traffic volume growth rates forecast considered by Traffic consultant

Source(s): Management information, External traffic Study

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Discounted Cash Flows (1/2)

Discounted Cash Flow										
INR crores		FY2027 12 months	FY2028 12 months	FY2029 12 months	FY2030 12 months	FY2031 12 months	FY2032 12 months	FY2033 12 months	FY2034 12 months	FY2035 12 months
Revenue		180	196	212	231	253	278	304	332	362
y-o-y growth			*9%*	*8%*	*9%*	*10%*	*10%*	*9%*	*9%*	*9%*
Routine maintenance		21	22	23	24	25	26	28	29	30
y-o-y growth		*n/a*	*5%*	*5%*	*5%*	*5%*	*5%*	*4%*	*5%*	*5%*
Major maintenance expense		20	-	-	-	-	-	61	64	67
Other expenses		-	-	-	-	-	-	-	-	-
EBITDA	**[A]**	**139**	**175**	**189**	**208**	**228**	**252**	**215**	**239**	**264**
EBITDA margin		*77.2%*	*89.0%*	*89.3%*	*89.7%*	*90.1%*	*90.5%*	*70.8%*	*71.9%*	*73.0%*
Depreciation		(23)	(27)	(30)	(34)	(37)	(42)	(46)	(51)	(57)
EBIT		**116**	**148**	**159**	**174**	**191**	**210**	**169**	**187**	**207**
EBIT margin		*64.6%*	*75.2%*	*75.1%*	*75.2%*	*75.4%*	*75.6%*	*55.6%*	*56.4%*	*57.2%*
Less: Tax on EBIT	[B]	-	-	-	-	-	(28)	(41)	(47)	(53)
Change in working capital	[C]	14	-	-	-	-	-	-	-	-
Less: Capex		-	-	-	-	-	-	-	-	-
Free cash flows to the firm	**E = [A+B+C+D]**	**153**	**175**	**189**	**208**	**228**	**224**	**174**	**192**	**211**
Discounting period		0.500	1.500	2.500	3.500	4.500	5.500	6.500	7.500	8.500
Discount factor	[F]	0.956	0.875	0.801	0.732	0.670	0.613	0.561	0.513	0.469
Present value of cash flows	**[E*F]**	**146**	**153**	**152**	**152**	**153**	**137**	**98**	**99**	**99**

Source(s): Management information, KVSL analysis

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Discounted Cash Flows (2/2)

Discounted Cash Flow											
INR crores		FY2036 12 months	FY2037 12 months	FY2038 12 months	FY2039 12 months	FY2040 12 months	FY2041 12 months	FY2042 12 months	FY2043 12 months	FY2044 12 months	FY2045 12 months
Revenue		394	429	467	512	559	606	661	716	786	841
y-o-y growth		*9%*	*9%*	*9%*	*10%*	*9%*	*8%*	*9%*	*8%*	*10%*	*7%*
Routine maintenance		32	33	35	37	39	41	43	45	47	49
y-o-y growth		*5%*	*5%*	*5%*	*5%*	*5%*	*5%*	*5%*	*5%*	*5%*	*4%*
Major maintenance expense		-	-	-	-	-	-	42	44	46	-
Other expenses		-	1	2	4	5	6	7	9	10	11
EBITDA	**[A]**	**362**	**394**	**430**	**472**	**516**	**559**	**569**	**619**	**682**	**781**
EBITDA margin		*91.9%*	*92.0%*	*92.0%*	*92.1%*	*92.2%*	*92.3%*	*86.0%*	*86.4%*	*86.8%*	*92.8%*
Depreciation		(64)	(70)	(78)	(87)	(97)	(107)	(119)	(132)	(147)	(20)
EBIT		**299**	**324**	**351**	**385**	**419**	**452**	**449**	**487**	**536**	**761**
EBIT margin		*75.8%*	*75.6%*	*75.2%*	*75.1%*	*74.9%*	*74.6%*	*68.0%*	*68.0%*	*68.1%*	*90.5%*
Less: Tax on EBIT	[B]	(78)	(86)	(95)	(105)	(116)	(127)	(130)	(142)	(161)	(197)
Change in working capital	[C]	-	-	-	-	-	-	-	-	-	-
Less: Capex		-	-	-	-	-	-	-	-	-	-
Free cash flows to the firm	**E = [A+B+C+D]**	**285**	**309**	**335**	**366**	**399**	**432**	**439**	**477**	**521**	**584**
Discounting period		9.500	10.500	11.500	12.500	13.500	14.500	15.500	16.500	17.500	18.496
Discount factor	[F]	0.429	0.393	0.359	0.329	0.301	0.275	0.252	0.230	0.211	0.193
Present value of cash flows	**[E*F]**	**122**	**121**	**120**	**120**	**120**	**119**	**111**	**110**	**110**	**113**

Valuation conclusion	
INR Crore	
Present value of cash flows	2,355
Present value of release of working capital	(1)
Enterprise Valuation	**2,354**
WACC	**9.31%**

Present value of release in working capital represent negative working capital of INR 5.81 Cr released at the end of the concession period.

Please refer WACC Summary for WACC breakup.

Basis the above and using a WACC of 9.31%, the Enterprise Value of SYTL, as on 31 March 2026 is INR 2,354 crore.

Source(s): Management information, KVSL analysis

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Yedeshi Aurangabad Tollway Limited

Overview

Project details

YATL was engaged for four laning the existing two lane highway on DBFOT basis The project stretch is 189.1 kms long involving the Yedeshi Aurangabad section of NH-211 from 100.0 kms to 290.2 kms in Maharashtra with 3 toll plazas.

Concession period

YATL is required to construct; operate and maintain and modify, repair or otherwise make improvements to the project highway in accordance with the concession agreement for a period of 26 years commencing from the appointed date.
Probable extension of concession period is estimated according to article 29 of concession agreement which comes to about 4.5 years.

Premium

There is no premium clause in the concession agreement.

Source(s): Management information

Highlights

Particulars	Details
Project location	Yedeshi Aurangabad
Concessionaire	YATL
State	Maharashtra
Tollable length (kms)	189.1
No. of toll plazas	3
Concession agreement date	30-May-14
Appointed date	1-Jul-15
Four laning completion certificate date	24-Sep-20
Scheduled end date	1-July-41
New scheduled end date	16-May-46

Interest held by Trust as at 31 March 2026

Particulars	Stake %
Equity stake	100%
Debt held by InvIT in YATL	INR 1,860 Cr

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Key Assumptions

a. Modification in concession period

- As per Clause 29.2 of the concession agreement between NHAI and YATL, *"In the event actual average traffic shall have fallen short of the target traffic, then for every 1% shortfall as compared to the target traffic, the concession period shall, subject to payment of concession fee in accordance with this agreement, be increased by 1.5% thereof; provided such increase in concession period shall not in any case exceed 20% of the concession period"*.
- Thus, the concession period is increased as per the above clause as follows:

Particulars	
Shortfall in traffic (Management estimate)	11%
1.5% increase for every 1% decrease	17%
Maximum increase in concession period	20%
Increase in concession period (years)	4.5
Original concession period	26.0
Revised concession period	30.5
Scheduled end date	1-Jul-41
New scheduled end date	**16-May-46**

- Besides the extension mentioned in the agreement, Management represented that the concession period will be increased by further 151 days on account of covid-19 and Kannad ghat crisis. (included above)
- The Management has confirmed to us to consider revised concession period till 16 May 2046. Thus, the explicit period for the current valuation analysis exercise has been considered from 1 April 2026 to 16 May 2046.

b. Revenue

- Revenue for YATL is derived from Toll collections for the concession period. Management has provided Traffic volume, toll rates and toll revenue for the forecast period based on the traffic report prepared by independent consultant in May 2026.
- As per the NHAI Circular No. 17.7.12/2025 dated 17 October 2025, the Ministry of Road Transport & Highways (MoRTH), vide Gazette Notification No. 388 (E) dated 17 June 2025, has inserted sub-section (3B) in Rule 9 of the National Highways Fee (Determination of Rates and Collection) Rules, 2008, thereby introducing the concept of an Annual Pass with effect from 15 August 2025. MoRTH vide Circular No. H-25011/05/2025-Toll (E-245443) dated 1 September 2025 has notified a fair compensation framework for addressing revenue losses arising out of the Annual Pass in InvIT Projects.
- The impact of Annual Pass has been considered by the traffic consultant in the traffic study while estimating toll revenue for the forecast period.
- As stated in the Traffic Study Report of YATL, elasticity model of growth projection has been considered for traffic forecast. While estimating traffic volume, consultant has considered factors such as GDP growth rate of India, developments along the project road, elasticity value of different vehicle type for computing the traffic growth rate.
- Further, we have been given to understand that a PIL was filed at Hon'ble Bombay High Court (Aurangabad bench) to augment the Autram Ghat section (between Chalisgaon and Aurangabad). The Hon'ble High Court has passed an interim order in August 2023 directing NHAI to submit a plan for augmentation of the road, and till then movement of commercial vehicles is restricted on corresponding section of the road. It has negatively impacted on traffic on SYTL and YATL. However, the matter is expected to be resolved during FY27, basis which it is anticipated that the diverted traffic would progressively come back on project stretch between FY27 and FY28.
- Basis above factors, a higher growth in traffic rate of ~13 per cent has been considered in FY27 and in range of 2-4 per cent annually thereafter.

Source(s): Management information, External traffic Study

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Key Assumptions

- Annual revision of toll rate for the forecast period shall be in accordance with National Highway Fee (Determination of Rates and Collection) Rules, 2008 and amendment thereto.
- Additionally, the applicable base rate shall be revised annually on April 1 to reflect 3% fixed increase plus increase in wholesale price index ("WPI") but such revision shall be restricted to 40% of the increase in WPI on overall basis during the concession period. As given in the traffic report, average inflation in WPI from FY2021-25 is 4.74%, reflecting inflationary cycles across both high and low year. Hence, an annual escalation factor of 4.5% has been considered for the remaining concession period.
- Toll revenue has been considered basis the pessimistic scenario from the traffic report prepared by an independent consultant appointed by the Management. Please refer to traffic report for detailed study on forecast traffic growth rates, toll rates and toll revenue.
- Refer Annexure 2c for a detailed breakup of Revenue.

c. Periodic maintenance & routine maintenance costs

- Operational expenditure includes base operating expenditure, admin expenses, insurance, project management fees and various other expenses. These are broadly categorized as routine maintenance expenses and other operating expenses.
- Periodic maintenance expense, also referred to as major maintenance expenses are incurred to restore the road asset to its original condition or to maintain its current operating standard.
- Upto FY2030, YATL has entered into a fixed price Project Implementation Agreement ("PIA") for periodic and routine maintenance with IRB Infrastructure Developers Limited ("Project Manager").
- For the forecast period post FY2030 periodic and routine maintenance cost have been considered based on technical assessment done by the Management. Routine maintenance has been increased by 4% to 5% y-o-y in forecast period post FY2030.

d. Depreciation & amortization

- Forecasted depreciation on assets has been provided by the Management. Management has forecasted depreciation to increase in line with the increase in revenue.

e. Tax

- The Finance Bill, 2026 (presented on 1 February 2026) reduces the MAT rate from 15% to 14% and disallows any further MAT credit accrual under both regimes. Under the old regime, MAT paid will be treated as final tax with no additional credit accumulation. Under the new regime, however, unutilized MAT credit carried forward from the old regime can still be utilized. Such set-off is restricted to a maximum of 25% of the tax liability for the relevant year.
- Management represented that YATL has 80IA benefit from FY2026 to FY2035. However, From an FCFF perspective, the new tax regime may appear to result in a lower effective tax outflow over the projection period and hence we have used the same in our valuation analysis. However, Management is still evaluating the option to migrate to the new tax regime at this stage and therefore timing of the transition to new tax regime will remain Managements option.

f. Working capital

- The change in WC in FY27-FY28 pertains to release in DSRA on refinancing / repayment of SPV debt. The change in WC each year is not material. Therefore, we have only considered the impact of release of working capital at the end of the concession period.

g. Capex

- Since the SPV is already operational, there is no capex to be incurred in the remainder of the concession period.

h. Changes in assumption from previous valuation

- Material changes from previous valuation include change in revenue forecasts due to the following factors
    - Impact on toll rates due to change in WPI growth forecast from 4.75% to 4.5%.
    - Change in tollable traffic volume growth rates forecast considered by Traffic consultant

Source(s): Management information, External traffic Study

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Discounted Cash Flows [1/3]

Discounted Cash Flow								
INR crores		FY2027 12 months	FY2028 12 months	FY2029 12 months	FY2030 12 months	FY2031 12 months	FY2032 12 months	FY2033 12 months
Revenue		332	361	391	423	458	496	534
y-o-y growth			*9%*	*8%*	*8%*	*8%*	*8%*	*8%*
Routine maintenance		29	30	31	33	35	37	38
y-o-y growth		*n/a*	*5%*	*5%*	*5%*	*5%*	*5%*	*4%*
Major maintenance expense		32	-	-	-	-	-	110
Other expenses		-	-	-	-	-	-	-
EBITDA	**[A]**	**271**	**331**	**359**	**390**	**423**	**460**	**386**
EBITDA margin		*81.8%*	*91.7%*	*92.0%*	*92.2%*	*92.4%*	*92.6%*	*72.3%*
Depreciation		(47)	(51)	(56)	(62)	(68)	(74)	(81)
EBIT		**224**	**280**	**303**	**328**	**356**	**386**	**305**
EBIT margin		*67.6%*	*77.5%*	*77.6%*	*77.6%*	*77.7%*	*77.7%*	*57.2%*
Less: Tax on EBIT	[B]	-	-	-	-	-	-	(14)
Change in working capital	[C]	9	19	-	-	-	-	-
Less: Capex		-	-	-	-	-	-	-
Free cash flows to the firm	**E = [A+B+C+D]**	**281**	**350**	**359**	**390**	**423**	**460**	**372**
Discounting period		0.500	1.500	2.500	3.500	4.500	5.500	6.500
Discount factor	[F]	0.956	0.875	0.801	0.732	0.670	0.613	0.561
Present value of cash flows	**[E*F]**	**268**	**307**	**288**	**286**	**284**	**282**	**209**

Source(s): Management information, KVSL analysis

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Discounted Cash Flows [2/3]

Discounted Cash Flow									
INR crores		FY2034 12 months	FY2035 12 months	FY2036 12 months	FY2037 12 months	FY2038 12 months	FY2039 12 months	FY2040 12 months	FY2041 12 months
Revenue		578	626	677	726	784	848	918	990
y-o-y growth		*8%*	*8%*	*8%*	*7%*	*8%*	*8%*	*8%*	*8%*
Routine maintenance		40	42	44	46	49	51	54	56
y-o-y growth		*5%*	*5%*	*5%*	*5%*	*5%*	*5%*	*5%*	*5%*
Major maintenance expense		115	121	-	-	-	-	60	63
Other expenses		-	-	-	-	-	-	-	-
EBITDA	**[A]**	**422**	**463**	**633**	**680**	**736**	**797**	**804**	**870**
EBITDA margin		*73.1%*	*74.0%*	*93.5%*	*93.6%*	*93.8%*	*94.0%*	*87.6%*	*87.9%*
Depreciation		(88)	(97)	(106)	(115)	(126)	(137)	(151)	(164)
EBIT		**334**	**366**	**527**	**565**	**610**	**660**	**654**	**706**
EBIT margin		*57.8%*	*58.5%*	*77.8%*	*77.8%*	*77.8%*	*77.8%*	*71.2%*	*71.4%*
Less: Tax on EBIT	[B]	(65)	(75)	(118)	(129)	(143)	(159)	(161)	(177)
Change in working capital	[C]	-	-	-	-	-	-	-	-
Less: Capex		-	-	-	-	-	-	-	-
Free cash flows to the firm	**E = [A+B+C+D]**	**358**	**388**	**515**	**551**	**592**	**638**	**644**	**693**
Discounting period		7.500	8.500	9.500	10.500	11.500	12.500	13.500	14.500
Discount factor	[F]	0.513	0.469	0.429	0.393	0.359	0.329	0.301	0.275
Present value of cash flows	**[E*F]**	**184**	**182**	**221**	**216**	**213**	**210**	**194**	**191**

Source(s): Management information, KVSL analysis

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Discounted Cash Flows [3/3]

Discounted Cash Flow							
INR crores		FY2042 12 months	FY2043 12 months	FY2044 12 months	FY2045 12 months	FY2046 12 months	FY2047 2 months
Revenue		1,068	1,155	1,253	1,351	1,456	198
y-o-y growth		*8%*	*8%*	*8%*	*8%*	*8%*	*-86%*
Routine maintenance		59	62	65	68	72	10
y-o-y growth		*5%*	*5%*	*5%*	*5%*	*5%*	*-87%*
Major maintenance expense		66	-	-	-	-	-
Other expenses		-	-	-	-	-	-
EBITDA	**[A]**	**942**	**1,093**	**1,187**	**1,283**	**1,384**	**189**
EBITDA margin		*88.2%*	*94.6%*	*94.8%*	*94.9%*	*95.1%*	*95.1%*
Depreciation		(180)	(197)	(216)	(235)	(257)	(36)
EBIT		**763**	**896**	**972**	**1,047**	**1,127**	**153**
EBIT margin		*71.4%*	*77.6%*	*77.6%*	*77.5%*	*77.4%*	*76.9%*
Less: Tax on EBIT	[B]	(228)	(275)	(299)	(323)	(348)	(47)
Change in working capital	[C]	-	-	-	-		-
Less: Capex		-	-	-	-	-	-
Free cash flows to the firm	**E = [A+B+C+D]**	**714**	**818**	**888**	**960**	**1,036**	**141**
Discounting period		15.500	16.500	17.500	18.500	19.500	20.064
Discount factor	[F]	0.252	0.230	0.211	0.193	0.176	0.168
Present value of cash flows	**[E*F]**	**180**	**188**	**187**	**185**	**183**	**24**

Valuation conclusion	
INR Crore	
Present value of cash flows	4,480
Present value of release of working capital	(0)
Enterprise Valuation	**4,480**
WACC	**9.31%**

Present value of release in working capital represent negative working capital of INR 0.21 Cr released at the end of the concession period.

Please refer WACC Summary for WACC breakup.

Basis the above and using a WACC of 9.31%, the Enterprise Value of YATL, as on 31 March 2026 is INR 4,480 crore.

Source(s): Management information, KVSL analysis

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AE Tollway Limited

Overview

Project details

AETL was engaged to expand the Agra to Etawah bypass section of NH-2 from 199.66 Km to 323.52 Km in the state of Uttar Pradesh from four to six lanes under National Highway Development Program Phase V on a DBFOT basis.

Concession period

AETL is required to construct; operate and maintain and modify, repair or otherwise make improvements to the project highway in accordance with the concession agreement for a period of 24 years commencing from the appointed date.
Probable extension of concession period is estimated according to article 29 of concession agreement which comes to about 4.8 years.

Premium

AETL was engaged on payment of premium of INR 81 Crs to NHAI in the remaining period of the year of appointed date and for each subsequent year the premium shall increase by an additional 5% as compared to the previous year.

Source(s): Management information

Highlights

Particulars	Details
Project location	Agra Etawah
Concessionaire	AETL
State	Uttar Pradesh
Tollable length (kms)	124.52
No. of toll plazas	2
Concession agreement date	01-Sep-15
Appointed date	01-Aug-16
Six laning completion certificate date	24-Nov-20
Scheduled end date	31-Jul-40
New scheduled end date	29-Oct-45

Interest held by Trust as at 31 March 2026

Particulars	Stake %
Equity stake	100%
Debt held by InvIT in AETL	INR 3,676 Cr

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Key Assumptions

a. Modification in concession period

- As per Clause 29.2 of the concession agreement between NHAI and AETL, *"In the event actual average traffic shall have fallen short of the target traffic, then for every 1% shortfall as compared to the target traffic, the concession period shall, subject to payment of concession fee in accordance with this agreement, be increased by 1.5% thereof; provided such increase in concession period shall not in any case exceed 20% of the concession period"*.
- Thus, the concession period is increased as per the above clause as follows:

Particulars	
Shortfall in traffic (Management estimate)	37%
1.5% increase for every 1% decrease	55%
Maximum increase in concession period	20%
Increase in concession period (years)	4.8
Original concession period	24.0
Revised concession period	28.8
Scheduled end date	31-Jul-40
New scheduled end date	**29-Oct-45**

- Besides the extension mentioned in the agreement, Management represented that the concession period will be increased by further 163 days on account of covid-19 and demonetization (included above).
- The Management has confirmed to us to consider revised concession period till 29 October 2045. Thus, the explicit period for the current valuation analysis exercise has been considered from 1 April 2026 to 29 October 2045.

b. Revenue

- Revenue for AETL is derived from Toll collections for the concession period. Management has provided Traffic volume, toll rates and toll revenue for the forecast period based on the traffic report prepared by independent consultant in May 2026.
- As per the NHAI Circular No. 17.7.12/2025 dated 17 October 2025, the Ministry of Road Transport & Highways (MoRTH), vide Gazette Notification No. 388 (E) dated 17 June 2025, has inserted sub-section (3B) in Rule 9 of the National Highways Fee (Determination of Rates and Collection) Rules, 2008, thereby introducing the concept of an Annual Pass with effect from 15 August 2025. MoRTH vide Circular No. H-25011/05/2025-Toll (E-245443) dated 1 September 2025 has notified a fair compensation framework for addressing revenue losses arising out of the Annual Pass in InvIT Projects.
- The impact of Annual Pass has been considered by the traffic consultant in the traffic study while estimating toll revenue for the forecast period.
- As stated in the Traffic Study Report of AETL, elasticity model of growth projection has been considered for traffic forecast. While estimating traffic volume, consultant has considered factors such as GDP growth rate of India, developments along the project road, elasticity value of different vehicle type for computing the traffic growth rate.
- While estimating the traffic growth, the consultant has also considered the impact of industrial units such as Export Promotion Industrial Park, Glass Industries etc developed around the corridor.
- Basis above factors, Traffic is forecast to increase in range of 4-7 per cent annually in the forecast period. .
- Additionally, the applicable base rate shall be revised annually on April 1 to reflect 3% fixed increase plus increase in wholesale price index ("WPI") but such revision shall be restricted to 40% of the increase in WPI on overall basis during the concession period. As given in the traffic report, average inflation in WPI from FY2021-25 is 4.74%, reflecting inflationary cycles across both high and low year. Hence, an annual escalation factor of 4.5% has been considered for the remaining concession period.

Source(s): Management information, External traffic study

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Key Assumptions

- Annual revision of toll rate for the forecast period shall be in accordance with National Highway Fee (Determination of Rates and Collection) Rules, 2008 and amendment thereto
- Toll revenue has been considered basis the pessimistic scenario from the traffic report prepared by an independent consultant appointed by the Management. Please refer to traffic report for detailed study on forecast traffic growth rates, toll rates and toll revenue.
- Refer Annexure 2c for a detailed breakup of Revenue.

c. Premium payable

- The premium payable to NHAI is considered and corroborated from the concession agreement as given by the Management.

d. Periodic maintenance & routine maintenance costs

- Operational expenditure includes base operating expenditure, admin expenses, insurance, project management fees and various other expenses. These are broadly categorized as routine maintenance expenses and other operating expenses.
- Periodic maintenance expense, also referred to as major maintenance expenses are incurred to restore the road asset to its original condition or to maintain its current operating standard.
- Upto FY2030, AETL has entered into a fixed price Project Implementation Agreement (“PIA”) for periodic and routine maintenance with IRB Infrastructure Developers Limited (“Project Manager”).
- For the forecast period post FY2030 periodic and routine maintenance cost have been considered based on technical assessment done by the Management. Routine maintenance has been increased by 4% to 5% y-o-y in forecast period post FY2030

e. Depreciation & Amortization

- Forecasted depreciation on assets has been provided by the Management. Management has forecasted depreciation to increase in line with the increase in revenue.

f. Tax

- The Finance Bill, 2026 (presented on 1 February 2026) reduces the MAT rate from 15% to 14% and disallows any further MAT credit accrual under both regimes. Under the old regime, MAT paid will be treated as final tax with no additional credit accumulation. Under the new regime, however, unutilized MAT credit carried forward from the old regime can still be utilized. Such set-off is restricted to a maximum of 25% of the tax liability for the relevant year.
- Management represented that AETL has 80IA benefit from FY2027 to FY2036. However, from an FCFF perspective, the new tax regime may appear to result in a lower effective tax outflow over the projection period and hence we have used the same in our valuation analysis. However, Management is still evaluating the option to migrate to the new tax regime at this stage and therefore timing of the transition to new tax regime will remain Managements option.

g. Working capital

- The change in WC each year is not material. Therefore, we have only considered the impact of release of working capital at the end of the concession period.

h. Capex

- Since the SPV is already operational, there is no capex to be incurred in the remainder of the concession period.

i. Changes in assumption from previous valuation

- Material changes from previous valuation include change in revenue forecasts due to the following factors
    - Impact on toll rates due to change in WPI growth forecast from 4.75% to 4.5%.
    - Change in tollable traffic volume growth rates forecast considered by Traffic consultant

Source(s): Management information, External traffic study

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Discounted Cash Flows [1/3]

Discounted Cash Flow								
INR crores		FY2027 12 months	FY2028 12 months	FY2029 12 months	FY2030 12 months	FY2031 12 months	FY2032 12 months	FY2033 12 months
Revenue		182	212	243	280	321	369	421
y-o-y growth			*16%*	*15%*	*15%*	*15%*	*15%*	*14%*
Routine maintenance		43	46	48	50	53	56	58
y-o-y growth		*n/a*	*5%*	*5%*	*5%*	*5%*	*5%*	*4%*
Major maintenance expense		-	-	-	-	123	130	135
Other expenses		-	-	-	-	-	-	-
EBITDA	**[A]**	**138**	**166**	**195**	**230**	**145**	**184**	**228**
EBITDA margin		*76.1%*	*78.4%*	*80.3%*	*82.1%*	*45.1%*	*49.9%*	*54.1%*
Depreciation		(47)	(53)	(59)	(66)	(73)	(82)	(91)
EBIT		**92**	**113**	**136**	**164**	**71**	**102**	**136**
EBIT margin		*50.4%*	*53.4%*	*56.0%*	*58.6%*	*22.3%*	*27.6%*	*32.4%*
Less: Tax on EBIT	[B]	-	-	-	-	-	-	-
Change in working capital	[C]	-	-	-	-	-	-	-
Less: Capex		-	-	-	-	-	-	-
Free cash flows to the firm	**E = [A+B+C+D]**	**138**	**166**	**195**	**230**	**145**	**184**	**228**
Discounting period		0.500	1.500	2.500	3.500	4.500	5.500	6.500
Discount factor	[F]	0.956	0.875	0.801	0.732	0.670	0.613	0.561
Present value of cash flows	**[E*F]**	**132**	**145**	**156**	**168**	**97**	**113**	**128**

Source(s): Management information, KVSL analysis

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Discounted Cash Flows [2/3]

Discounted Cash Flow								
INR crores		FY2034 12 months	FY2035 12 months	FY2036 12 months	FY2037 12 months	FY2038 12 months	FY2039 12 months	FY2040 12 months
Revenue		480	548	616	687	772	863	970
y-o-y growth		*14%*	*14%*	*13%*	*11%*	*12%*	*12%*	*12%*
Routine maintenance		61	64	67	70	74	78	82
y-o-y growth		*5%*	*5%*	*5%*	*5%*	*5%*	*5%*	*5%*
Major maintenance expense		-	-	-	-	73	77	81
Other expenses		-	-	-	-	-	-	-
EBITDA	**[A]**	**419**	**484**	**549**	**617**	**625**	**708**	**807**
EBITDA margin		*87.3%*	*88.3%*	*89.1%*	*89.8%*	*80.9%*	*82.1%*	*83.2%*
Depreciation		(102)	(114)	(125)	(118)	(121)	(134)	(149)
EBIT		**317**	**370**	**424**	**499**	**504**	**574**	**658**
EBIT margin		*66.1%*	*67.6%*	*68.8%*	*72.6%*	*65.3%*	*66.5%*	*67.9%*
Less: Tax on EBIT	[B]	-	-	-	(56)	(123)	(144)	(169)
Change in working capital	[C]	-	-	-	-	-	-	-
Less: Capex		-	-	-	-	-	-	-
Free cash flows to the firm	**E = [A+B+C+D]**	**419**	**484**	**549**	**560**	**502**	**564**	**638**
Discounting period		7.500	8.500	9.500	10.500	11.500	12.500	13.500
Discount factor	[F]	0.513	0.469	0.429	0.393	0.359	0.329	0.301
Present value of cash flows	**[E*F]**	**215**	**227**	**236**	**220**	**180**	**186**	**192**

Source(s): Management information, KVSL analysis

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Discounted Cash Flows [3/3]

Discounted Cash Flow							
INR crores		FY2041 12 months	FY2042 12 months	FY2043 12 months	FY2044 12 months	FY2045 12 months	FY2046 7 months
Revenue		1,070	1,182	1,302	1,449	1,594	1,015
y-o-y growth		*10%*	*10%*	*10%*	*11%*	*10%*	*-36%*
Routine maintenance		86	90	94	99	104	64
y-o-y growth		*5%*	*5%*	*5%*	*5%*	*5%*	*-39%*
Major maintenance expense		-	-	-	-	-	-
Other expenses		-	-	-	-	-	-
EBITDA	**[A]**	**984**	**1,092**	**1,208**	**1,349**	**1,490**	**951**
EBITDA margin		*92.0%*	*92.4%*	*92.8%*	*93.1%*	*93.5%*	*93.7%*
Depreciation		(162)	(178)	(195)	(215)	(236)	(149)
EBIT		**822**	**914**	**1,012**	**1,134**	**1,254**	**802**
EBIT margin		*76.8%*	*77.3%*	*77.7%*	*78.3%*	*78.7%*	*79.1%*
Less: Tax on EBIT	[B]	(237)	(275)	(304)	(340)	(375)	(239)
Change in working capital	[C]	-	-	-	-	-	-
Less: Capex		-	-	-	-	-	-
Free cash flows to the firm	**E = [A+B+C+D]**	**747**	**817**	**904**	**1,010**	**1,115**	**712**
Discounting period		14.500	15.500	16.500	17.500	18.500	19.290
Discount factor	[F]	0.275	0.252	0.230	0.211	0.193	0.180
Present value of cash flows	**[E*F]**	**206**	**206**	**208**	**213**	**215**	**128**

Valuation conclusion	
INR Crore	
Present value of cash flows	3,571
Present value of release of working capital	(14)
Enterprise Valuation	**3,557**
WACC	**9.31%**

Present value of release in working capital represent negative working capital of INR 79.53 Cr released at the end of the concession period.

Please refer WACC Summary for WACC breakup.

Basis the above and using a WACC of 9.31%, the Enterprise Value of AETL, as on 31 March 2026 is INR 3,557 crore.

Source(s): Management information, KVSL analysis

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Udaipur Tollway Limited

Overview

Project details

UTL was engaged to expand the Udaipur bypass (287.40 Km) to the Rajasthan/Gujarat border (401.20 Km) section of NH-8 in the states of Rajasthan & Gujarat (approx. length 113.80 Km) from four to six lanes under National Highway Development Program Phase V on a DBFOT basis.

Concession period

UTL is required to construct; operate and maintain and modify, repair or otherwise make improvements to the project highway in accordance with the concession agreement for a period of 21 years commencing from the appointed date.
Probable extension of concession period is estimated according to article 29 of concession agreement which comes to about 4.2 years.

Premium

UTL was engaged on payment of premium of INR 163.8 Crs to NHAI immediately after the 3rd anniversary year of COD and for each subsequent year till the 9th anniversary of COD, the premium shall increase by an additional 3% as compared to the previous year. From the 9th anniversary of COD until the end of the concession period, the premium shall increase by an additional 8% each year as compared to the previous year. UTL has filed Writ petition with Rajasthan High Court with prayer to commence payment of premium to NHAI, six months post actual completion of the project construction work. The High Court prima facie agreed with the contention and have provided interim relief from payment of premium. The matter is currently under arbitration.

Source(s): Management information

Highlights

Particulars	Details
Project location	Udaipur Gujarat border
Concessionaire	UTL
State	Rajasthan/ Gujarat
Tollable length (kms)	113.8
No. of toll plazas	1
Concession agreement date	09-Dec-16
Appointed date	03-Sep-17
Six laning completion certificate date	01-Jun-21
Scheduled end date	02-Sep-38
New scheduled end date	28-Feb-43

Interest held by Trust as at 31 March 2026

Particulars	Stake %
Equity stake	100%
Debt held by InvIT in UTL	INR 1,353 Cr

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Key Assumptions

a. Modification in concession period

- As per Clause 29.2 of the concession agreement between NHAI and UTL, *"In the event actual average traffic shall have fallen short of the target traffic, then for every 1% shortfall as compared to the target traffic, the concession period shall, subject to payment of concession fee in accordance with this agreement, be increased by 1.5% thereof; provided such increase in concession period shall not in any case exceed 20% of the concession period"*.
- Thus, the concession period is increased as per the above clause as follows:

Particulars	
Shortfall in traffic (Management estimate)	22%
1.5% increase for every 1% decrease	33%
Maximum increase in concession period	20%
Increase in concession period (years)	4.2
Original concession period	21.0
Revised concession period	25.2
Scheduled end date	2-Sep-38
New scheduled end date	**28-Feb-43**

- Besides the extension mentioned in the agreement, Management represented that the concession period will be increased by further 106 days on account of covid-19. (included above)
- The Management has confirmed to us to consider revised concession period till 28 February 2043. Thus, the explicit period for the current valuation analysis exercise has been considered from 1 April 2026 to 28 February 2043.

b. Revenue

- Revenue for UTL is derived from Toll collections for the concession period. Management has provided Traffic volume, toll rates and toll revenue for the forecast period based on the traffic report prepared by independent consultant in May 2026.
- As per the NHAI Circular No. 17.7.12/2025 dated 17 October 2025, the Ministry of Road Transport & Highways (MoRTH), vide Gazette Notification No. 388 (E) dated 17 June 2025, has inserted sub-section (3B) in Rule 9 of the National Highways Fee (Determination of Rates and Collection) Rules, 2008, thereby introducing the concept of an Annual Pass with effect from 15 August 2025. MoRTH vide Circular No. H-25011/05/2025-Toll (E-245443) dated 1 September 2025 has notified a fair compensation framework for addressing revenue losses arising out of the Annual Pass in InvIT Projects.
- The impact of Annual Pass has been considered by the traffic consultant in the traffic study while estimating toll revenue for the forecast period.
- As stated in the Traffic Study Report of UTL, elasticity model of growth projection has been considered for traffic forecast. While estimating traffic volume, consultant has considered factors such as GDP growth rate of India, developments along the project road, elasticity value of different vehicle type for computing the traffic growth rate.
- Further, while estimating growth, traffic consultant considered impact strong tourism, mining, and agricultural activity, supported by industries like Hindustan Zinc along with large marble and limestone clusters,
- There are ROBs which are under construction in Ahmedabad – Shamlaji section. Due to this some traffic is temporarily diverted to alternate roads. It is expected that construction of these ROBs have been completed in 2025 and stretch is open for seamless traffic flow subsequently. The said diverted traffic is expected to come back on project stretch considering from Financial Year 2027.
- Basis above factors, Traffic is forecast to increase by 4-6 per cent annually in the forecast period.
- Annual revision of toll rate for the forecast period shall be in accordance with National Highway Fee (Determination of Rates and Collection) Rules, 2008 and amendment thereto

Source(s): Management information, External traffic study

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Key Assumptions

- Additionally, the applicable base rate shall be revised annually on April 1 to reflect 3% fixed increase plus increase in wholesale price index ("WPI") but such revision shall be restricted to 40% of the increase in WPI on overall basis during the concession period. As given in the traffic report, average inflation in WPI from FY2021-25 is 4.74%, reflecting inflationary cycles across both high and low year. Hence, an annual escalation factor of 4.5% has been considered for the remaining concession period.
- Toll revenue has been considered basis the pessimistic scenario from the traffic report prepared by an independent consultant appointed by the Management. Please refer to traffic report for detailed study on forecast traffic growth rates, toll rates and toll revenue.
- Refer Annexure 2c for a detailed breakup of Revenue.

c. Premium payable

- The premium payable to NHAI is considered and corroborated from the concession agreement as given by the Management.

d. Periodic maintenance & routine maintenance costs

- Operational expenditure includes base operating expenditure, admin expenses, insurance, project management fees and various other expenses. These are broadly categorized as routine maintenance expenses and other operating expenses.
- Periodic maintenance expense, also referred to as major maintenance expenses are incurred to restore the road asset to its original condition or to maintain its current operating standard.
- Upto FY2030, UTL has entered into a fixed price Project Implementation Agreement ("PIA") for periodic and routine maintenance with IRB Infrastructure Developers Limited ("Project Manager").
- For the forecast period post FY2030 periodic and routine maintenance cost have been considered based on technical assessment done by the Management. Routine maintenance has been increased by 2% to 5% y-o-y in forecast period post FY2030.

e. Depreciation & Amortization

- Forecasted depreciation on assets has been provided by the Management. Management has forecasted depreciation to increase in line with the increase in revenue.

f. Tax

- The Finance Bill, 2026 (presented on 1 February 2026) reduces the MAT rate from 15% to 14% and disallows any further MAT credit accrual under both regimes. Under the old regime, MAT paid will be treated as final tax with no additional credit accumulation. Under the new regime, however, unutilized MAT credit carried forward from the old regime can still be utilized. Such set-off is restricted to a maximum of 25% of the tax liability for the relevant year.
- Management represented that UTL has 35AD benefit for income tax. From an FCFF perspective, the new tax regime appear to result in a lower effective tax over the projection period once the unabsorbed depreciation and business losses are utilized in the old tax regime and hence, we have used the approach in our valuation analysis. However, Management is still evaluating the impact at this stage and therefore timing of the transition to new tax regime will remain Managements option.

g. Working capital

- The change in WC in FY28 pertains to release in DSRA on refinancing / repayment of SPV debt. The change in WC each year is not material. Therefore, we have only considered the impact of release of working capital at the end of the concession period.

h. Capex

- Since the SPV is already operational, there is no capex to be incurred in the remainder of the concession period.

i. Changes in assumption from previous valuation

- Material changes from previous valuation include change in revenue forecasts due to the following factors
    - Impact on toll rates due to change in WPI growth forecast from 4.75% to 4.5%.
    - Change in tollable traffic volume growth rates forecast considered by Traffic consultant

Source(s): Management information, External traffic study

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Discounted Cash Flows [1/2]

Discounted Cash Flow									
INR crores		FY2027 12 months	FY2028 12 months	FY2029 12 months	FY2030 12 months	FY2031 12 months	FY2032 12 months	FY2033 12 months	FY2034 12 months
Revenue		182	214	238	268	298	331	370	412
y-o-y growth			*18%*	*11%*	*12%*	*11%*	*11%*	*12%*	*11%*
Routine maintenance		24	24	25	26	27	28	29	29
y-o-y growth		*n/a*	*4%*	*3%*	*3%*	*3%*	*3%*	*3%*	*3%*
Major maintenance expense		4	-	120	125	127	5	-	86
Other expenses		-	-	-	-	-	-	-	-
EBITDA	**[A]**	**154**	**190**	**93**	**116**	**144**	**299**	**341**	**296**
EBITDA margin		*84.8%*	*88.6%*	*39.2%*	*43.5%*	*48.3%*	*90.1%*	*92.3%*	*72.0%*
Depreciation		(55)	(60)	(66)	(73)	(81)	(89)	(97)	(107)
EBIT		**100**	**130**	**27**	**43**	**63**	**210**	**244**	**189**
EBIT margin		*54.8%*	*60.5%*	*11.4%*	*16.1%*	*21.3%*	*63.4%*	*66.0%*	*46.0%*
Less: Tax on EBIT	[B]	(16)	(21)	(4)	(7)	(10)	(34)	(40)	(31)
Change in working capital	[C]	-	39	-	-	-	-	-	-
Less: Capex		-	-	-	-	-	-	-	-
Free cash flows to the firm	**E = [A+B+C+D]**	**138**	**207**	**89**	**109**	**134**	**264**	**301**	**265**
Discounting period		0.500	1.500	2.500	3.500	4.500	5.500	6.500	7.500
Discount factor	[F]	0.956	0.875	0.801	0.732	0.670	0.613	0.561	0.513
Present value of cash flows	**[E*F]**	**132**	**182**	**71**	**80**	**90**	**162**	**169**	**136**

Source(s): Management information, KVSL analysis

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Discounted Cash Flows [2/2]

Discounted Cash Flow										
INR crores		FY2035 12 months	FY2036 12 months	FY2037 12 months	FY2038 12 months	FY2039 12 months	FY2040 12 months	FY2041 12 months	FY2042 12 months	FY2043 11 months
Revenue		456	507	558	615	680	752	822	900	904
y-o-y growth		*11%*	*11%*	*10%*	*10%*	*11%*	*11%*	*9%*	*10%*	*0%*
Routine maintenance		30	31	32	33	33	35	37	39	37
y-o-y growth		*3%*	*3%*	*2%*	*3%*	*2%*	*5%*	*5%*	*5%*	*-4%*
Major maintenance expense		91	119	-	-	-	-	-	-	-
Other expenses		-	-	-	-	-	-	-	-	-
EBITDA	**[A]**	**335**	**356**	**526**	**583**	**647**	**717**	**785**	**862**	867
EBITDA margin		*73.4%*	*70.3%*	*94.3%*	*94.7%*	*95.1%*	*95.3%*	*95.5%*	*95.7%*	*95.9%*
Depreciation		(118)	(129)	(125)	(105)	(116)	(127)	(138)	(151)	(151)
EBIT		**217**	**227**	**400**	**477**	**531**	**590**	**647**	**711**	**716**
EBIT margin		*47.6%*	*44.8%*	*71.8%*	*77.5%*	*78.1%*	*78.5%*	*78.7%*	*79.0%*	*79.2%*
Less: Tax on EBIT	[B]	(35)	(37)	-	(127)	(163)	(181)	(198)	(217)	(218)
Change in working capital	[C]	-	-	-	-	-	-	-	-	-
Less: Capex		-	-	-	-	-	-	-	-	-
Free cash flows to the firm	**E = [A+B+C+D]**	**300**	**319**	**526**	**456**	**484**	**537**	**587**	**645**	**649**
Discounting period		8.500	9.500	10.500	11.500	12.500	13.500	14.500	15.500	16.456
Discount factor	[F]	0.469	0.429	0.393	0.359	0.329	0.301	0.275	0.252	0.231
Present value of cash flows	**[E*F]**	**141**	**137**	**206**	**164**	**159**	**162**	**162**	**162**	**150**

Valuation conclusion	
INR Crore	
Present value of cash flows	2,464
Present value of release of working capital	(4)
Enterprise Valuation	**2,460**

WACC	**9.31%**

Present value of release in working capital represent negative working capital of INR 18 Cr released at the end of the concession period.

Basis the above and using a WACC of 9.31%, the Enterprise Value of UTL, as on 31 March 2026 is INR 2,460 crore.

Please refer WACC Summary for WACC breakup.

Source(s): Management information, KVSL analysis

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Chittorgarh Gulabpura Tollway Limited

Overview

Project details

CGTL was engaged for six laning the existing four lane highway on DBFOT basis The project stretch is 124.87 kms long involving the Kishangarh Udaipur Ahmedabad section from 90 kms (near Gulabpara) to 214.87 kms (end of Chittorgarh Bypass) of NH-79 in Rajasthan with 2 toll plazas.

Concession period

CGTL is required to construct; operate and maintain and modify, repair or otherwise make improvements to the project highway in accordance with the concession agreement for a period of 20 years commencing from the appointed date.
Probable extension of concession period is estimated according to article 29 of concession agreement which comes to about 4 years.

Premium

CGTL was engaged on payment of premium of INR 228.6 Crs to NHAI immediately after the 3rd anniversary year of COD and for each subsequent year till the 9th anniversary of COD, the premium shall increase by an additional 3% as compared to the previous year. From the 9th anniversary of COD until the end of the concession period, the premium shall increase by an additional 8% each year as compared to the previous year. CGTL has filed Writ petition with Rajasthan High Court with prayer to commence payment of premium to NHAI, six months post actual completion of the project construction work. The High Court prima facie agreed with the contention and have provided interim relief from payment of premium. The matter is currently under arbitration.

Source(s): Management information

Highlights

Particulars	Details
Project location	Gulabpura Chittorgarh
Concessionaire	CGTL
State	Rajasthan
Tollable length (kms)	124.87
No. of toll plazas	2
Concession agreement date	9-Dec-16
Appointed date	4-Nov-17
Six laning completion certificate date	14-Aug-21
Scheduled end date	3-Nov-37
New scheduled end date	27-Feb-42

Interest held by Trust as at 31 March 2026

Particulars	Stake %
Equity stake	100%
Debt held by InvIT in CGTL	INR 626 Cr

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Key Assumptions

a. Modification in concession period

- As per Clause 29.2 of the concession Agreement between NHAI and CGTL, *"In the event actual average traffic shall have fallen short of the target traffic, then for every 1% shortfall as compared to the target traffic, the concession period shall, subject to payment of concession fee in accordance with this agreement, be increased by 1.5% thereof; provided such increase in concession period shall not in any case exceed 20% of the concession period"*.
- Thus, the concession period is increased as per the above clause as follows:

Particulars	
Shortfall in traffic (Management estimate)	30%
1.5% increase for every 1% decrease	45%
Maximum increase in concession period	20%
Increase in concession period (years)	4.0
Original concession period	20.0
Revised concession period	24.0
Scheduled end date	3-Nov-37
New scheduled end date	**27-Feb-42**

- Besides the extension mentioned in the agreement, Management represented that the concession period will be increased by further 117 days on account of covid-19. (included above)
- The Management has confirmed to us to consider revised concession period till 27 February 2042. Thus, the explicit period for the current valuation analysis exercise has been considered from 1 April 2026 to 27 February 2042.

b. Revenue

- Revenue for CGTL is derived from Toll collections for the concession period. Management has provided Traffic volume, toll rates and toll revenue for the forecast period based on the traffic report prepared by independent consultant in May 2026
- As per the NHAI Circular No. 17.7.12/2025 dated 17 October 2025, the Ministry of Road Transport & Highways (MoRTH), vide Gazette Notification No. 388 (E) dated 17 June 2025, has inserted sub-section (3B) in Rule 9 of the National Highways Fee (Determination of Rates and Collection) Rules, 2008, thereby introducing the concept of an Annual Pass with effect from 15 August 2025. MoRTH vide Circular No. H-25011/05/2025-Toll (E-245443) dated 1 September 2025 has notified a fair compensation framework for addressing revenue losses arising out of the Annual Pass in InvIT Projects.
- The impact of Annual Pass has been considered by the traffic consultant in the traffic study while estimating toll revenue for the forecast period.
- As stated in the Traffic Study Report of CGTL, elasticity model of growth projection has been considered for traffic forecast. While estimating traffic volume, consultant has considered factors such as GDP growth rate of India, developments along the project road, elasticity value of different vehicle type for computing the traffic growth rate.
- Further, while estimating the growth, consultant has considered that the project corridor is supported by textile units, marble and granite industries, and the strong tourism and consumption base of Udaipur and major freight volumes through large cement plants in Chanderiya and Nimbahera, along with the Chanderiya lead-zinc smelter in Chittorgarh.
- Basis above factors, Traffic is forecast to increase in range of 4-6 per cent annually in the forecast period.
- Additionally, the applicable base rate shall be revised annually on April 1 to reflect 3% fixed increase plus increase in wholesale price index ("WPI") but such revision shall be restricted to 40% of the increase in WPI on overall basis during the concession period. As given in the traffic report, average inflation in WPI from FY2021-25 is 4.74%, reflecting inflationary cycles across both high and low year. Hence, an annual escalation factor of 4.5% has been considered for the remaining concession period.

Source(s): Management information, External traffic study

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Key Assumptions

- Annual revision of toll rate for the forecast period shall be in accordance with National Highway Fee (Determination of Rates and Collection) Rules, 2008 and amendment thereto
- Toll revenue has been considered basis the pessimistic scenario from the traffic report prepared by an independent consultant appointed by the Management. Please refer to traffic report for detailed study on forecast traffic growth rates, toll rates and toll revenue.
- Refer Annexure 2c for a detailed breakup of Revenue.

c. Premium payable

- The premium payable to NHAI is considered and corroborated from the concession agreement as given by the Management.

d. Periodic maintenance & routine maintenance costs

- Operational expenditure includes base operating expenditure, admin expenses, insurance, project management fees and various other expenses. These are broadly categorized as routine maintenance expenses and other operating expenses.
- Periodic maintenance expense, also referred to as major maintenance expenses are incurred to restore the road asset to its original condition or to maintain its current operating standard.
- Upto FY2030, CGTL has entered into a fixed price Project Implementation Agreement (“PIA”) for periodic and routine maintenance with IRB Infrastructure Developers Limited (“Project Manager”).
- For the forecast period post FY2030 periodic and routine maintenance cost have been considered based on technical assessment done by the Management. Routine maintenance has been increased by 4% to 5% y-o-y in forecast period post FY2030.

e. Depreciation & Amortization

- Forecasted depreciation on assets has been provided by the Management. Management has forecasted depreciation to increase in line with the increase in revenue.

f. Tax

- The Finance Bill, 2026 (presented on 1 February 2026) reduces the MAT rate from 15% to 14% and disallows any further MAT credit accrual under both regimes. Under the old regime, MAT paid will be treated as final tax with no additional credit accumulation. Under the new regime, however, unutilized MAT credit carried forward from the old regime can still be utilized. Such set-off is restricted to a maximum of 25% of the tax liability for the relevant year.
- Management represented that CGTL has 35AD benefit for income tax. From an FCFF perspective, the new tax regime may appear to result in a lower effective tax outflow over the projection period once the unabsorbed depreciation and business losses are utilized in the old tax regime and hence, we have used the approach in our valuation analysis. However, Management is still evaluating the impact at this stage and therefore timing of the transition to new tax regime will remain Managements option.

g. Working capital

- The change in WC in FY28 pertains to release in DSRA on refinancing / repayment of SPV debt. The change in WC each year is not material. Therefore, we have only considered the impact of release of working capital at the end of the concession period.

h. Capex

- Since the SPV is already operational, there is no capex to be incurred in the remainder of the concession period.

i. Changes in assumption from previous valuation

- Material changes from previous valuation include change in revenue forecasts due to the following factors
    - Impact on toll rates due to change in WPI growth forecast from 4.75% to 4.5%.
    - Change in tollable traffic volume growth rates forecast considered by Traffic consultant

Source(s): Management information, External traffic study

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Discounted Cash Flows [1/2]

Discounted Cash Flow									
INR crores		FY2027 12 months	FY2028 12 months	FY2029 12 months	FY2030 12 months	FY2031 12 months	FY2032 12 months	FY2033 12 months	FY2034 12 months
Revenue		198	236	260	291	321	356	395	435
y-o-y growth			*19%*	*10%*	*12%*	*10%*	*11%*	*11%*	*10%*
Routine maintenance		40	42	44	46	48	51	53	56
y-o-y growth		*n/a*	*5%*	*5%*	*5%*	*5%*	*5%*	*4%*	*5%*
Major maintenance expense		30	-	-	-	86	91	95	-
Other expenses		-	-	-	-	-	-	-	-
EBITDA	**[A]**	**129**	**195**	**217**	**245**	**186**	**215**	**247**	**379**
EBITDA margin		*65.0%*	*82.4%*	*83.3%*	*84.3%*	*58.2%*	*60.3%*	*62.6%*	*87.2%*
Depreciation		(49)	(55)	(61)	(68)	(74)	(82)	(89)	(98)
EBIT		**80**	**140**	**156**	**177**	**112**	**133**	**158**	**282**
EBIT margin		*40.2%*	*59.1%*	*59.8%*	*60.9%*	*34.9%*	*37.4%*	*40.0%*	*64.7%*
Less: Tax on EBIT	[B]	(13)	(23)	(25)	(29)	(18)	(22)	(26)	(46)
Change in working capital	[C]	-	50	-	-	-	-	-	-
Less: Capex		-	-	-	-	-	-	-	-
Free cash flows to the firm	**E = [A+B+C+D]**	**116**	**222**	**192**	**216**	**168**	**193**	**222**	**334**
Discounting period		0.500	1.500	2.500	3.500	4.500	5.500	6.500	7.500
Discount factor	[F]	0.956	0.875	0.801	0.732	0.670	0.613	0.561	0.513
Present value of cash flows	**[E*F]**	**111**	**194**	**153**	**158**	**113**	**118**	**124**	**171**

Source(s): Management information, KVSL analysis

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Discounted Cash Flows [2/2]

Discounted Cash Flow									
INR crores		FY2035 12 months	FY2036 12 months	FY2037 12 months	FY2038 12 months	FY2039 12 months	FY2040 12 months	FY2041 12 months	FY2042 11 months
Revenue		480	529	579	633	697	767	781	779
y-o-y growth		*10%*	*10%*	*9%*	*9%*	*10%*	*10%*	*2%*	*0%*
Routine maintenance		58	61	64	67	71	74	78	75
y-o-y growth		*5%*	*5%*	*5%*	*5%*	*5%*	*5%*	*5%*	*-4%*
Major maintenance expense		9	46	48	51	-	-	-	-
Other expenses		-	1	3	4	5	7	9	11
EBITDA	**[A]**	**413**	**420**	**463**	**511**	**621**	**686**	**694**	**693**
EBITDA margin		*86.0%*	*79.4%*	*80.1%*	*80.7%*	*89.2%*	*89.4%*	*88.9%*	*89.0%*
Depreciation		(107)	(118)	(128)	(141)	(153)	(168)	(179)	(179)
EBIT		**305**	**302**	**335**	**371**	**468**	**518**	**515**	**514**
EBIT margin		*63.6%*	*57.1%*	*57.9%*	*58.6%*	*67.1%*	*67.5%*	*65.9%*	*66.0%*
Less: Tax on EBIT	[B]	(50)	(126)	(87)	(120)	(156)	(173)	(175)	(174)
Change in working capital	[C]	-	-	-	-	-	-	-	-
Less: Capex		-	-	-	-	-	-	-	-
Free cash flows to the firm	**E = [A+B+C+D]**	**363**	**294**	**376**	**391**	**465**	**513**	**520**	**519**
Discounting period		8.500	9.500	10.500	11.500	12.500	13.500	14.500	15.454
Discount factor	[F]	0.469	0.429	0.393	0.359	0.329	0.301	0.275	0.253
Present value of cash flows	**[E*F]**	**170**	**126**	**148**	**141**	**153**	**154**	**143**	**131**

Valuation conclusion	
INR Crore	
Present value of cash flows	2,310
Present value of release of working capital	(1)
Enterprise Valuation	**2,309**

Present value of release in working capital represent negative working capital of INR 3.53 Cr released at the end of the concession period.

WACC **9.31%**

Basis the above and using a WACC of 9.31%, the Enterprise Value of CGTL, as on 31 March 2026 is INR 2,309 crore.

Please refer WACC Summary for WACC breakup.

Source(s): Management information, KVSL analysis

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Palsit Dankuni Tollway Private Limited

Overview

Project details

PDTPL was engaged for six laning the existing four lane highway on DBFOT basis The project stretch is 74.72 kms long involving the Palsit to Dankuni (up to NH-6 Connector) section from 588.87 kms to 652.7 kms (total design length - 63.83 kms) of NH-19 in West Bengal with 1 toll plaza.

Concession period

PDTPL is required to construct; operate and maintain and modify, repair or otherwise make improvements to the project highway in accordance with the concession agreement for a period of 17 years commencing from the appointed date.

Probable reduction of concession period is estimated according to article 29 of concession agreement which comes to about 1 year.

Premium

PDTPL has to pay premium after the 1st anniversary of project completion date for every year of the remaining concession period, calculated on total realizable fee. For the 2nd year after project completion date premium shall equal to 10.8% of the total realizable fee during that year. For all subsequent years, the premium shall be determined on the total realizable fee by increasing the percentage of premium by an additional 1% as compared to the immediately preceding year.

Source(s): Management information

Highlights

Particulars	Details
Project	Dankuni to Palsit
Concessionaire	PDTPL
State	West Bengal
Tollable length (kms)	63.83
No. of toll plazas	1
Concession agreement date	14-Jun-21
Appointed date	1-Apr-22
Completion certificate date	14-Jul-25
Scheduled end date	1-Apr-39
New scheduled end date	1-Apr-38

Interest held by Trust as at 31 March 2026

Particulars	Stake %
Equity stake	99.96%
Debt held by InvIT in PDTPL	INR 371 Cr

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Key Assumptions

a. Modification in concession period

- As per Clause 29.2.2 of the concession agreement between NHAI and PDTPL, *"In the event actual average traffic shall have exceeded the target traffic by more than 5%, then for every 1% increase as compared to the target traffic, the remaining concession period shall, be reduced by 1% thereof; provided that such reduction in concession period shall not exceed 20% of the concession period."*
- Thus, the concession period is increased as per the above clause as follows:

Particulars	
Increase in traffic (Management estimate)	10%
1% decrease for every 1% increase	0%
Maximum increase in concession period	20%
Decrease in concession period (years)	(1.0)
Original concession period	17.0
Revised concession period	16.0
Scheduled end date	01-Apr-39
New scheduled end date	**01-Apr-38**

- The Management has confirmed to us to consider revised concession period till 01 April 2038. Thus, the explicit period for the current valuation analysis exercise has been considered from 1 April 2026 to 01 April 2038.

b. Revenue

- Revenue for PDTPL is derived from Toll collections for the concession period. Management has provided Traffic volume, toll rates and toll revenue for the forecast period based on the traffic report prepared by independent consultant in May 2026
- As per the NHAI Circular No. 17.7.12/2025 dated 17 October 2025, the Ministry of Road Transport & Highways (MoRTH), vide Gazette Notification No. 388 (E) dated 17 June 2025, has inserted sub-section (3B) in Rule 9 of the National Highways Fee (Determination of Rates and Collection) Rules, 2008, thereby introducing the concept of an Annual Pass with effect from 15 August 2025. MoRTH vide Circular No. H-25011/05/2025-Toll (E-245443) dated 1 September 2025 has notified a fair compensation framework for addressing revenue losses arising out of the Annual Pass in InvIT Projects.
- The impact of Annual Pass has been considered by the traffic consultant in the traffic study while estimating toll revenue for the forecast period.
- As stated in the Traffic Study Report of PDTPL, elasticity model of growth projection has been considered for traffic forecast. While estimating traffic volume, consultant has considered factors such as GDP growth rate of India, developments along the project road, elasticity value of different vehicle type for computing the traffic growth rate.
- Further, while estimating growth, traffic consultant has considered that the project corridor is supported by major engineering and manufacturing hub with large establishments like Chittaranjan Locomotives and IISCO.
- PDTPL has received completion certificate and is fit for commercial operations from 14 July 2025. Hence, increase in revenue is expected in FY27 and FY28. Traffic is forecast to increase 2-5 per cent annually thereafter.
- Additionally, the applicable base rate shall be revised annually on April 1 to reflect 3% fixed increase plus increase in wholesale price index ("WPI") but such revision shall be restricted to 40% of the increase in WPI on overall basis during the concession period. As given in the traffic report, average inflation in WPI from FY2021-25 is 4.74%, reflecting inflationary cycles across both high and low year. Hence, an annual escalation factor of 4.5% has been considered for the remaining concession period.

Source(s): Management information, External traffic study

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Key Assumptions

- Annual revision of toll rate for the forecast period shall be in accordance with National Highway Fee (Determination of Rates and Collection) Rules, 2008 and amendment thereto.
- Toll revenue has been considered basis the pessimistic scenario from the traffic report prepared by an independent consultant appointed by the Management. Please refer to traffic report for detailed study on forecast traffic growth rates, toll rates and toll revenue.
- Refer Annexure 2c for a detailed breakup of Revenue.

c. Premium payable

- The premium payable to NHAI is considered and corroborated from the concession agreement as given by the Management.

d. Periodic maintenance & routine maintenance costs

- Operational expenditure includes base operating expenditure, admin expenses, insurance, project management fees and various other expenses. These are broadly categorized as routine maintenance expenses and other operating expenses.
- Periodic maintenance expense, also referred to as major maintenance expenses are incurred to restore the road asset to its original condition or to maintain its current operating standard.
- Upto FY2032, PDTPL has entered into a fixed price Project implementation (“PIA”) for periodic and routine maintenance with IRB Infrastructure Developers Limited (“Project Manager”).
- For the forecast period post FY2032 (i) routine maintenance has been increased by ~5% in forecast years. For FY36-FY38, routine maintenance is lower on account of periodic maintenance activity (ii) periodic maintenance has been considered based on the technical feasibility study conducted by the Management.

e. Depreciation & amortization

- Forecasted depreciation on assets has been provided by the Management. Management has forecasted depreciation to increase in line with the increase in revenue and capex being incurred in the forecast period.

f. Tax

- The Finance Bill, 2026 (presented on 1 February 2026) reduces the MAT rate from 15% to 14% and disallows any further MAT credit accrual under both regimes. Under the old regime, MAT paid will be treated as final tax with no additional credit accumulation. Under the new regime, however, unutilized MAT credit carried forward from the old regime can still be utilized. Such set-off is restricted to a maximum of 25% of the tax liability for the relevant year.
- Management represented that the SPV has adopted the new tax regime. Thus, tax outflows for the forecast have been calculated based on the new regime of income tax. Carried forward business loss and unabsorbed depreciation if any has been considered while calculating tax outflows.

g. Capex

- Capex has been forecasted to be INR 3 Cr in FY2027 based on Management estimates for the remaining construction work. Management has provided statement of expenses/work in progress pertaining to capex as on 31 March 2026.

h. Working capital

- The change in WC in FY27 pertains to creation / release in DSRA on completion of project and refinancing / repayment of SPV debt. Apart from this, the change in WC each year is not material. Therefore, we have only considered the impact of release of working capital at the end of the concession period.

i. Changes in assumption from previous valuation

- Material changes from previous valuation include change in revenue forecasts due to the following factors
    - Impact on toll rates due to change in WPI growth forecast from 4.75% to 4.5%.
    - Change in tollable traffic volume growth rates forecast considered by Traffic consultant

Source(s): Management information, External traffic study

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Valuation of Individual SPVs — Palsit Dankuni Tollway Private Limited

Discounted Cash Flows [1/2]

Discounted Cash Flow								
INR crores		FY2027 12 months	FY2028 12 months	FY2029 12 months	FY2030 12 months	FY2031 12 months	FY2032 12 months	FY2033 12 months
Revenue		310	349	379	413	446	483	517
y-o-y growth			*12%*	*9%*	*9%*	*8%*	*8%*	*7%*
Routine maintenance		47	50	30	32	35	62	65
y-o-y growth		*n/a*	*6%*	*-41%*	*10%*	*9%*	*75%*	*5%*
Major maintenance expense		-	-	55	61	57	-	-
Other expenses		-	-	-	-	-	0	1
EBITDA	**[A]**	**263**	**299**	**294**	**319**	**354**	**421**	**451**
EBITDA margin		*84.8%*	*85.7%*	*77.7%*	*77.4%*	*79.2%*	*87.2%*	*87.2%*
Depreciation		(101)	(115)	(126)	(139)	(152)	(166)	(180)
EBIT		**162**	**184**	**168**	**181**	**202**	**255**	**271**
EBIT margin		*52.2%*	*52.8%*	*44.4%*	*43.8%*	*45.2%*	*52.7%*	*52.4%*
Less: Tax on EBIT	[B]	-	-	(34)	(41)	(49)	(66)	(74)
Change in working capital	[C]	7	-	-	-	-	-	-
Less: Capex		(3.06)	-	-	-	-	-	-
Free cash flows to the firm	**E = [A+B+C+D]**	**267**	**299**	**260**	**279**	**304**	**355**	**377**
Discounting period		0.500	1.500	2.500	3.500	4.500	5.500	6.500
Discount factor	[F]	0.956	0.875	0.801	0.732	0.670	0.613	0.561
Present value of cash flows	**[E*F]**	**256**	**262**	**208**	**204**	**204**	**217**	**212**

Source(s): Management information, KVSL analysis

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Discounted Cash Flows [2/2]

Discounted Cash Flow							
INR crores		FY2034 12 months	FY2035 12 months	FY2036 12 months	FY2037 12 months	FY2038 12 months	FY2039 0 months
Revenue		558	604	645	689	738	17
y-o-y growth		*8%*	*8%*	*7%*	*7%*	*7%*	*-98%*
Routine maintenance		68	72	40	44	48	2
y-o-y growth		*5%*	*5%*	*-44%*	*10%*	*10%*	*-96%*
Major maintenance expense		-	-	80	71	80	-
Other expenses		2	4	5	-	-	-
EBITDA	**[A]**	**488**	**528**	**520**	**574**	**609**	**16**
EBITDA margin		*87.4%*	*87.5%*	*80.6%*	*83.3%*	*82.6%*	*90.1%*
Depreciation		(197)	(215)	(233)	(252)	(273)	(6)
EBIT		**291**	**313**	**287**	**322**	**336**	**10**
EBIT margin		*52.1%*	*51.8%*	*44.4%*	*46.7%*	*45.5%*	*57.2%*
Less: Tax on EBIT	[B]	(83)	(93)	(91)	(105)	(113)	(3)
Change in working capital	[C]	-	-	-	-	-	-
Less: Capex		-	-	-	-	-	-
Free cash flows to the firm	**E = [A+B+C+D]**	**405**	**435**	**429**	**469**	**496**	**12**
Discounting period		7.500	8.500	9.500	10.500	11.500	12.010
Discount factor	[F]	0.513	0.469	0.429	0.393	0.359	0.343
Present value of cash flows	**[E*F]**	**208**	**204**	**184**	**184**	**178**	**4**

Valuation conclusion	
INR Crore	
Present value of cash flows	2,526
Present value of release of working capital	(3)
Enterprise Valuation	**2,523**
WACC	**9.31%**

Present value of release in working capital represent negative working capital of INR 8.93 Cr released at the end of the concession period.

Basis the above and using a WACC of 9.31%, the Enterprise Value of PDTPL, as on 31 March 2026 is INR 2,523 crore.

Please refer WACC Summary for WACC breakup.

Source(s): Management information, KVSL analysis

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IRB Golconda Expressway Private Limited

Overview

Project details

IGEPL is engaged to carry out the operation and maintenance of Nehru Outer Ring Road project in accordance with the concession agreement on TOT basis. The project stretch is 158 kms, 8 lane ring road encircling Hyderabad. with 22 toll plazas.

Concession period

IGEPL is required to operate and maintain and modify, repair or otherwise make improvements to the project highway in accordance with the concession agreement for a period of 30 years commencing from the appointed date. Article 24 of the concession agreement stipulates increase or decrease in the concession period on the basis of toll collection in April 2033 (Target point 1) and April 2043 (Target point2). As per the traffic report, no shortening or extension of concession period is estimated.

Upfront Concession fee

As per the concession agreement, IGEPL has paid INR 7,380 crores as upfront concession fee to Hyderabad Metropolitan Development Authority.

Highlights

Particulars	Details
Project	Nehru Outer Ring Road, Hyderabad
Concessionaire	IGEPL
State	Telangana
Tollable length (kms)	158
No. of toll plazas	22
Concession agreement date	26-Mar-23
Appointed date	12-Aug-23
Completion certificate date	NA
Scheduled end date	11-Aug-53
New scheduled end date	NA

Interest held by Trust as at 31 March 2026

Particulars	Stake %
Equity stake	99.99%
Debt held by InvIT in IGEPL	INR 2,150 Cr

Source(s): Management information, External traffic study

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Key Assumptions

a. Modification in concession period

- Article 24 of the concession agreement of IGEPL provides for modification of the concession period.
- As per Article 24.5.1, “In the event actual fee 1 shall have fallen short of or exceeded the target fee 1 by more than 20%, then for every 1% shortfall or increase as compared to the target fee 1, the concession period, subject to fulfillment of terms of this agreement, shall be increased by 1.5% or decreased by 0.75% thereof. In the event of a shortfall or increase by 30% in target fee 1, the concession period shall be increased by 15% or decreased by 7.5% thereof.”
- As per Article 24.5.2, “In the event actual fee 2 shall have fallen short of or exceeded the target fee 2 by more than 30%, then for every 1% shortfall or increase as compared to the target fee 2, the concession period, subject to fulfillment of terms of this agreement, shall be increased by 1.5% or decreased by 0.75% thereof. In the event of a shortfall or increase by 40% in target fee 2, the concession period shall be increased by 15% or decreased by 7.5% thereof.”
- As per the traffic report, revenue variance is estimated to be lower than the caps mentioned above. Thus, there shall be no modification to the concession period in line with the above articles of the concession agreement.
- The Management has confirmed to us to consider concession period to end on 11 August 2053. Thus, the explicit period for the current valuation analysis exercise has been considered from 1 April 2026 to 11 August 2053.

b. Revenue

- Revenue for IGEPL is derived from Toll collections for the concession period. Management has provided Traffic volume, toll rates and toll revenue for the forecast period based on the traffic report prepared by independent consultant in May 2026
- As stated in the Traffic Study Report of IGEPL, elasticity model of growth projection has been considered for traffic forecast. While estimating traffic volume, consultant has considered factors such as GDP growth rate of India, developments along the project road, elasticity value of different vehicle type for computing the traffic growth rate.
- Further, while estimating growth, traffic consultant has considered the impact of developments around the corridor relating to developments of IT incubation centers in Telengana and the city being the leading contributor in Pharma Industry’s exports.
- Basis above factors, Traffic is forecast to increase in range of 6-8 per cent in FY27 and FY28 and 3-5 per cent annually thereafter.
- Annual revision of toll rate for the forecast period shall be in accordance with National Highway Fee (Determination of Rates and Collection) Rules, 2008 and amendment thereto.
- Additionally, the applicable base rate shall be revised annually on April 1 to reflect 3% fixed increase plus increase in wholesale price index (“WPI”) but such revision shall be restricted to 40% of the increase in WPI on overall basis during the concession period. As given in the traffic report, average inflation in WPI from FY2021-25 is 4.74%, reflecting inflationary cycles across both high and low year. Hence, an annual escalation factor of 4.5% has been considered for the remaining concession period.
- Toll revenue has been considered basis the pessimistic scenario from the traffic report prepared by an independent consultant appointed by the Management. Please refer to traffic report for detailed study on forecast traffic growth rates, toll rates and toll revenue.
- Refer Annexure 2c for a detailed breakup of Revenue.

Source(s): Management information, External traffic study

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Key Assumptions

c. Periodic maintenance & routine maintenance costs

- Operational expenditure includes base operating expenditure, admin expenses, insurance, project management fees and various other expenses. These are broadly categorized as routine maintenance expenses and other operating expenses.
- Periodic maintenance expense, also referred to as major maintenance expenses are incurred to restore the road asset to its original condition or to maintain its current operating standard.
- Upto FY2033, IGEPL has entered into a fixed price Project Implementation Agreement (“PIA”) for periodic and routine maintenance with IRB Infrastructure Developers Limited (“Project Manager”).
- For the forecast period post FY2033, routine maintenance has been increased by 2% to 4% and (ii) periodic maintenance has been considered based on the technical feasibility study conducted by the Management.

d. Fast tag charges

- Fast tag charges have been considered at 1.7 per cent (including GST) of toll revenue in the forecast period (including GST). We understand from the Management that the fast tag charges have been renegotiated with the vendor.

e. Depreciation & amortization

- Forecasted depreciation on assets has been provided by the Management. Management has forecasted depreciation to increase in line with the increase in revenue in the forecast period.

f. Tax

- The Finance Bill, 2026 (presented on 1 February 2026) reduces the MAT rate from 15% to 14% and disallows any further MAT credit accrual under both regimes. Under the old regime, MAT paid will be treated as final tax with no additional credit accumulation. Under the new regime, however, unutilized MAT credit carried forward from the old regime can still be utilized. Such set-off is restricted to a maximum of 25% of the tax liability for the relevant year.
- Management represented that the SPV has adopted the new tax regime. Thus, tax outflows for the forecast have been calculated based on the new regime of income tax. Carried forward business loss and unabsorbed depreciation if any has been considered while calculating tax outflows.

g. Working capital

- The change in WC in FY28 and FY29 pertains to release in DSRA on refinancing of SPV debt. Apart from that the change in WC each year is not material. Therefore, we have only considered the impact of release of working capital at the end of the concession period.

h. Capex

- Since the SPV is already operational, there is no capex to be incurred in the remainder of the concession period.

i. Changes in assumption from previous valuation

- Material changes from previous valuation include change in revenue forecasts due to the following factors
    - Impact on toll rates due to change in WPI growth forecast from 4.75% to 4.5%.
    - Change in tollable traffic volume growth rates forecast considered by Traffic consultant

Source(s): Management information, External traffic study

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Discounted Cash Flows [1/3]

Discounted Cash Flow										
INR crores		FY2027 12 months	FY2028 12 months	FY2029 12 months	FY2030 12 months	FY2031 12 months	FY2032 12 months	FY2033 12 months	FY2034 12 months	FY2035 12 months
Revenue		1,008	1,120	1,230	1,360	1,499	1,657	1,833	1,988	2,179
y-o-y growth			*11%*	*10%*	*11%*	*10%*	*11%*	*11%*	*8%*	*10%*
Routine maintenance		224	233	242	250	259	269	277	286	295
y-o-y growth		*n/a*	*4%*	*4%*	*4%*	*4%*	*4%*	*3%*	*3%*	*3%*
Major maintenance expense		-	-	161	161	161	161	-	-	386
Fastag Expense		17	19	21	23	26	28	31	34	37
EBITDA	**[A]**	**767**	**867**	**806**	**925**	**1,053**	**1,199**	**1,524**	**1,668**	**1,461**
EBITDA margin		*76.1%*	*77.5%*	*65.6%*	*68.0%*	*70.3%*	*72.3%*	*83.2%*	*83.9%*	*67.1%*
Depreciation		(70)	(78)	(86)	(95)	(104)	(116)	(128)	(139)	(152)
EBIT		**697**	**789**	**720**	**831**	**948**	**1,083**	**1,397**	**1,529**	**1,309**
EBIT margin		*69.1%*	*70.4%*	*58.6%*	*61.1%*	*63.3%*	*65.3%*	*76.2%*	*76.9%*	*60.1%*
Less: Tax on EBIT	[B]	-	(25)	(135)	(165)	(197)	(234)	(316)	(352)	(300)
Change in working capital	[C]	-	139	32	-	-	-	-	-	-
Less: Capex		-	-	-	-	-	-	-	-	-
Free cash flows to the firm	**E = [A+B+C+D]**	**767**	**981**	**703**	**760**	**856**	**965**	**1,209**	**1,316**	**1,162**
Discounting period		0.500	1.500	2.500	3.500	4.500	5.500	6.500	7.500	8.500
Discount factor	[F]	0.956	0.875	0.801	0.732	0.670	0.613	0.561	0.513	0.469
Present value of cash flows	**[E*F]**	**734**	**859**	**563**	**557**	**574**	**592**	**678**	**675**	**545**

Source(s): Management information, KVSL analysis

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Discounted Cash Flows [2/3]

Discounted Cash Flow										
INR crores		FY2036 12 months	FY2037 12 months	FY2038 12 months	FY2039 12 months	FY2040 12 months	FY2041 12 months	FY2042 12 months	FY2043 12 months	FY2044 12 months	FY2045 12 months
Revenue		2,374	2,594	2,840	3,066	3,347	3,627	3,946	4,286	4,645	5,017
y-o-y growth		*9%*	*9%*	*10%*	*8%*	*9%*	*8%*	*9%*	*9%*	*8%*	*8%*
Routine maintenance		304	312	321	330	340	348	357	366	376	384
y-o-y growth		*3%*	*3%*	*3%*	*3%*	*3%*	*2%*	*3%*	*2%*	*3%*	*2%*
Major maintenance expense		387	386	386	-	-	235	235	235	236	-
Fastag Expense		41	44	48	52	57	62	67	73	79	86
EBITDA	**[A]**	**1,643**	**1,851**	**2,084**	**2,683**	**2,950**	**2,982**	**3,286**	**3,612**	**3,955**	**4,548**
EBITDA margin		*69.2%*	*71.4%*	*73.4%*	*87.5%*	*88.1%*	*82.2%*	*83.3%*	*84.3%*	*85.1%*	*90.6%*
Depreciation		(166)	(181)	(198)	(216)	(235)	(253)	(277)	(301)	(326)	(353)
EBIT		**1,476**	**1,670**	**1,886**	**2,468**	**2,715**	**2,729**	**3,010**	**3,311**	**3,628**	**4,195**
EBIT margin		*62.2%*	*64.4%*	*66.4%*	*80.5%*	*81.1%*	*75.2%*	*76.3%*	*77.2%*	*78.1%*	*83.6%*
Less: Tax on EBIT	[B]	(346)	(398)	(457)	(607)	(675)	(683)	(759)	(841)	(927)	(1,077)
Change in working capital	[C]	-	-	-	-	-	-	-	-	-	-
Less: Capex		-	-	-	-	-	-	-	-	-	-
Free cash flows to the firm	**E = [A+B+C+D]**	**1,297**	**1,453**	**1,628**	**2,076**	**2,275**	**2,299**	**2,527**	**2,771**	**3,027**	**3,471**
Discounting period		9.500	10.500	11.500	12.500	13.500	14.500	15.500	16.500	17.500	18.500
Discount factor	[F]	0.429	0.393	0.359	0.329	0.301	0.275	0.252	0.230	0.211	0.193
Present value of cash flows	**[E*F]**	**557**	**571**	**585**	**683**	**684**	**633**	**636**	**638**	**638**	**669**

Source(s): Management information, KVSL analysis

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Discounted Cash Flows [3/3]

Discounted Cash Flow										
INR crores		FY2046 12 months	FY2047 12 months	FY2048 12 months	FY2049 12 months	FY2050 12 months	FY2051 12 months	FY2052 12 months	FY2053 12 months	FY2054 4 months
Revenue		5,430	5,893	6,399	6,875	7,432	8,007	8,675	9,328	3,675
y-o-y growth		*8%*	*9%*	*9%*	*7%*	*8%*	*8%*	*8%*	*8%*	*-61%*
Routine maintenance		392	401	411	419	428	437	447	455	169
y-o-y growth		*2%*	*2%*	*2%*	*2%*	*2%*	*2%*	*2%*	*2%*	*-63%*
Major maintenance expense		-	531	532	531	531	-	-	404	150
Fastag Expense		93	101	109	117	127	137	148	159	63
EBITDA	**[A]**	**4,945**	**4,861**	**5,346**	**5,808**	**6,346**	**7,433**	**8,080**	**8,309**	**3,293**
EBITDA margin		*91.1%*	*82.5%*	*83.5%*	*84.5%*	*85.4%*	*92.8%*	*93.1%*	*89.1%*	*89.6%*
Depreciation		(383)	(415)	(451)	(487)	(525)	(567)	(614)	(663)	(261)
EBIT		**4,561**	**4,446**	**4,895**	**5,321**	**5,822**	**6,867**	**7,465**	**7,647**	**3,032**
EBIT margin		*84.0%*	*75.4%*	*76.5%*	*77.4%*	*78.3%*	*85.8%*	*86.1%*	*82.0%*	*82.5%*
Less: Tax on EBIT	[B]	(1,177)	(1,155)	(1,278)	(1,394)	(1,529)	(1,803)	(1,966)	(2,023)	(829)
Change in working capital	[C]	-	-	-	-	-	-	-	-	-
Less: Capex		-	-	-	-	-	-	-	-	-
Free cash flows to the firm	**E = [A+B+C+D]**	**3,768**	**3,705**	**4,068**	**4,414**	**4,817**	**5,631**	**6,114**	**6,286**	**2,464**
Discounting period		19.500	20.500	21.500	22.500	23.500	24.500	25.500	26.500	27.182
Discount factor	[F]	0.176	0.161	0.148	0.135	0.124	0.113	0.103	0.095	0.089
Present value of cash flows	**[E*F]**	**665**	**598**	**601**	**596**	**595**	**637**	**632**	**595**	**219**

Valuation conclusion	
INR Crores	
Present value of cash flows	17,208
Present value of release of working capital	(0)
Enterprise Valuation	**17,208**

Present value of release in working capital represents negative working capital of INR 1.68 Cr released at the end of the concession period.

WACC	**9.31%**

Basis the above and using a WACC of 9.31%, the Enterprise Value of IGEPL, as on 31 March 2026 is INR 17,208 crore.

Please refer WACC Summary for WACC breakup.

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Samakhiyali Tollway Private Limited

Overview

Project details

STPL is engaged in six laning the existing four lane highway on DBFOT basis. The project stretch is 90.90 kms long involving the Samakhiyali to Santalpur section of NH-27 in Gujarat.

Concession period

STPL is required to construct, obtain and maintain the project highway in accordance with the concession agreement for a period of 20 years commencing from the appointed date.

Probable extension of the remaining concession period is estimated according to article 29 of concession agreement which comes to about ~1.3 years.

Premium

STPL has agreed to pay to NHAI immediately after the 1st anniversary of project completion date, a premium in the form of additional concession fee for every year of the remaining concession period, to be calculated on total realizable fee. The premium to be paid for the 2nd year after project completion date shall equal to 42.84% of the total realizable fee. For all subsequent years, premium shall be determined by increasing percentage of premium by additional 1% as compared to immediately preceding year.

Source(s): Management information

Highlights

Particulars	Details
Project location	Samakhiyali to Santalpur
Concessionaire	STPL
State	Gujarat
Tollable length (kms)	90.90
No. of toll plazas	1
Concession agreement date	12-May-23
Appointed date	28-Dec-23
Six laning completion certificate date	Under construction
Scheduled end date	27-Dec-43
New scheduled end date	03-Apr-45

Interest held by Trust as at 31 March 2026

Particulars	Stake %
Equity stake	99.96%
Debt held by InvIT in STPL	INR 127 Cr

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Key Assumptions

a. Modification in concession period

- As per Clause 29.2 of the concession agreement between NHAI and STPL, *"In the event actual average traffic shall have fallen short of the target traffic by more than 5%, then for every 1% shortfall as compared to the target traffic, the remaining concession period shall, subject to payment of concession and additional concession fee in accordance with this agreement, be increased by 1% thereof; provided such increase in concession period shall not in any case exceed 20% of the concession period".*
- Thus, the concession period is increased as per the above clause as follows:

Particulars	
Shortfall in traffic (Management estimate)	13%
1% increase for every 1% increase beyond 5%	8%
Increase in remaining concession period (years)	1.3
Original concession period	20.0
Revised concession period	21.3
Scheduled end date	27-Dec-43
New scheduled end date	**03-Apr-45**

- The Management has confirmed to us to consider revised concession period till 03 April 2045. Thus, the explicit period for the current valuation analysis exercise has been considered from 1 April 2026 to 03 April 2045.

b. Revenue

- Revenue for STPL is derived from Toll collections for the concession period. Management has provided Traffic volume, toll rates and toll revenue for the forecast period based on the traffic report prepared by independent consultant in May 2026.
- As per the NHAI Circular No. 17.7.12/2025 dated 17 October 2025, the Ministry of Road Transport & Highways (MoRTH), vide Gazette Notification No. 388 (E) dated 17 June 2025, has inserted sub-section (3B) in Rule 9 of the National Highways Fee (Determination of Rates and Collection) Rules, 2008, thereby introducing the concept of an Annual Pass with effect from 15 August 2025. MoRTH vide Circular No. H-25011/05/2025-Toll (E-245443) dated 1 September 2025 has notified a fair compensation framework for addressing revenue losses arising out of the Annual Pass in InvIT Projects.
- The impact of Annual Pass has been considered by the traffic consultant in the traffic study while estimating toll revenue for the forecast period.
- As stated in the Traffic Study Report of STPL, elasticity model of growth projection has been considered for traffic forecast. While estimating traffic volume, consultant has considered factors such as GDP growth rate of India, developments along the project road, elasticity value of different vehicle type for computing the traffic growth rate.
- STPL is expected to complete construction in FY 2027 and hence, revenue is expected to increase significantly on the project stretch in FY27-FY28. Traffic is forecast to increase in the range of 4-7 per cent annually thereafter.
- Annual revision of toll rate for the forecast period shall be in accordance with National Highway Fee (Determination of Rates and Collection) Rules, 2008 and amendment thereto.
- Additionally, the applicable base rate shall be revised annually on April 1 to reflect 3% fixed increase plus increase in wholesale price index ("WPI") but such revision shall be restricted to 40% of the increase in WPI on overall basis during the concession period. As given in the traffic report, average inflation in WPI from FY2021-25 is 4.74%, reflecting inflationary cycles across both high and low year. Hence, an annual escalation factor of 4.5% has been considered for the remaining concession period.

Source(s): Management information, External traffic study

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Key Assumptions

- Toll revenue has been considered basis the pessimistic scenario from the traffic report prepared by an independent consultant appointed by the Management. Please refer to traffic report for detailed study on forecast traffic growth rates, toll rates and toll revenue.
- Refer Annexure 2c for a detailed breakup of Revenue.

c. Premium payable

- The premium payable to NHAI is considered and corroborated from the concession agreement as given by the Management.

d. Periodic maintenance & routine maintenance costs

- Operational expenditure includes base operating expenditure, admin expenses, insurance, project management fees and various other expenses. These are broadly categorized as routine maintenance expenses and other operating expenses.
- Periodic maintenance expense, also referred to as major maintenance expenses are incurred to restore the road asset to its original condition or to maintain its current operating standard.
- Upto FY2033, STPL has entered into a fixed price Project Implementation Agreement (“PIA”) for periodic and routine maintenance with IRB Infrastructure Developers Limited (“Project Manager”).
- For the forecast period post FY2033 (i) routine maintenance has been increased by 2% to 3% till concession end and (ii) periodic maintenance has been considered based on the technical feasibility study conducted by the Management.

e. Depreciation & Amortization

- Forecasted depreciation on assets has been provided by the Management. Management has forecasted depreciation to increase in line with the increase in revenue and capex being incurred in the forecast period.

f. Tax

- The Finance Bill, 2026 (presented on 1 February 2026) reduces the MAT rate from 15% to 14% and disallows any further MAT credit accrual under both regimes. Under the old regime, MAT paid will be treated as final tax with no additional credit accumulation. Under the new regime, however, unutilized MAT credit carried forward from the old regime can still be utilized. Such set-off is restricted to a maximum of 25% of the tax liability for the relevant year.
- Management represented that the SPV has adopted the new tax regime. Thus, tax outflows for the forecast have been calculated based on the new regime of income tax. Carried forward business loss and unabsorbed depreciation if any has been considered while calculating tax outflows.

g. Capex

- Capex has been forecasted to be INR 455 Cr for FY 2027 based on Management estimates. Management have provided statement of expenses/work in progress pertaining to capex as on 31 March 2026. Management expects to complete construction in FY2027.

h. Working capital

- The change in WC in FY27 and FY28 pertains to creation / release in DSRA on completion of project and refinancing / repayment of SPV debt. Apart from this, the change in WC each year is not material. Therefore, we have only considered the impact of release of working capital at the end of the concession period.

i. Changes in assumption from previous valuation

- Material changes from previous valuation include change in revenue forecasts due to the following factors
  - Impact on toll rates due to change in WPI growth forecast from 4.75% to 4.5%.
  - Change in tollable traffic volume growth rates forecast considered by Traffic consultant

Source(s): Management information, External traffic study

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Discounted Cash Flows [1/3]

Discounted Cash Flow								
INR crores		FY2027 12 months	FY2028 12 months	FY2029 12 months	FY2030 12 months	FY2031 12 months	FY2032 12 months	FY2033 12 months
Revenue		195	178	194	213	232	255	277
y-o-y growth			*-9%*	*9%*	*9%*	*9%*	*10%*	*9%*
Routine maintenance		24	25	25	26	27	27	28
y-o-y growth		*n/a*	*3%*	*2%*	*3%*	*2%*	*3%*	*2%*
Major maintenance expense		0	-	-	-	-	36	37
Other expenses		-	-	-	-	-	-	-
EBITDA	**[A]**	**171**	**153**	**169**	**187**	**206**	**191**	**212**
EBITDA margin		*87.6%*	*86.1%*	*87.0%*	*87.8%*	*88.6%*	*75.0%*	*76.6%*
Depreciation		(22)	(33)	(37)	(41)	(46)	(52)	(58)
EBIT		**149**	**120**	**132**	**145**	**159**	**139**	**155**
EBIT margin		*76.2%*	*67.3%*	*67.9%*	*68.3%*	*68.7%*	*54.7%*	*55.8%*
Less: Tax on EBIT	[B]	(21)	(13)	(17)	(21)	(26)	(22)	(28)
Change in working capital	[C]	(100)	100	-	-	-	-	-
Less: Capex		(455)	-	-	-	-	-	-
Free cash flows to the firm	**E = [A+B+C+D]**	**(405)**	**240**	**152**	**165**	**180**	**169**	**185**
Discounting period		0.500	1.500	2.500	3.500	4.500	5.500	6.500
Discount factor	[F]	0.955	0.870	0.793	0.723	0.659	0.601	0.548
Present value of cash flows	**[E*F]**	**(387)**	**209**	**121**	**120**	**118**	**101**	**101**

Source(s): Management information, KVSL analysis

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Discounted Cash Flows [2/3]

Discounted Cash Flow								
INR crores		FY2034 12 months	FY2035 12 months	FY2036 12 months	FY2037 12 months	FY2038 12 months	FY2039 12 months	FY2040 12 months
Revenue		300	324	353	380	412	443	478
y-o-y growth		*8%*	*8%*	*9%*	*8%*	*8%*	*8%*	*8%*
Routine maintenance		28	29	30	31	31	32	33
y-o-y growth		*2%*	*3%*	*2%*	*2%*	*2%*	*2%*	*2%*
Major maintenance expense		38	-	-	-	-	-	43
Other expenses		-	-	-	-	-	-	-
EBITDA	**[A]**	**233**	**295**	**323**	**350**	**381**	**411**	**402**
EBITDA margin		*77.8%*	*91.0%*	*91.5%*	*92.0%*	*92.4%*	*92.8%*	*84.1%*
Depreciation		(64)	(70)	(77)	(85)	(93)	(103)	(114)
EBIT		**170**	**225**	**245**	**265**	**287**	**308**	**288**
EBIT margin		*56.6%*	*69.4%*	*69.6%*	*69.6%*	*69.8%*	*69.5%*	*60.3%*
Less: Tax on EBIT	[B]	(33)	(49)	(55)	(62)	(70)	(78)	(75)
Change in working capital	[C]	-	-	-	-	-	-	-
Less: Capex		-	-	-	-	-	-	-
Free cash flows to the firm	**E = [A+B+C+D]**	**200**	**247**	**267**	**287**	**311**	**333**	**327**
Discounting period		7.500	8.500	9.500	10.500	11.500	12.500	13.500
Discount factor	[F]	0.499	0.455	0.415	0.378	0.345	0.314	0.286
Present value of cash flows	**[E*F]**	**100**	**112**	**111**	**109**	**107**	**105**	**94**

Source(s): Management information, KVSL analysis

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Discounted Cash Flows [3/3]

Discounted Cash Flow							
INR crores		FY2041 12 months	FY2042 12 months	FY2043 12 months	FY2044 12 months	FY2045 12 months	FY2046 0 months
Revenue		513	551	592	637	698	9
y-o-y growth		*7%*	*7%*	*7%*	*8%*	*10%*	*-99%*
Routine maintenance		33	34	34	35	36	30
y-o-y growth		*2%*	*2%*	*2%*	*2%*	*1%*	*-16%*
Major maintenance expense		44	45	-	-	-	-
Other expenses		-	-	-	-	-	-
EBITDA	**[A]**	**436**	**472**	**557**	**602**	**662**	**(21)**
EBITDA margin		*85.0%*	*85.7%*	*94.2%*	*94.5%*	*94.9%*	*-230.9%*
Depreciation		(125)	(138)	(152)	(168)	(185)	(204)
EBIT		**311**	**334**	**405**	**434**	**477**	**(225)**
EBIT margin		*60.6%*	*60.6%*	*68.4%*	*68.1%*	*68.4%*	*-2497.0%*
Less: Tax on EBIT	[B]	(84)	(93)	(115)	(126)	(141)	-
Change in working capital	[C]	-	-	-	-	-	-
Less: Capex		-	-	-	-	-	-
Free cash flows to the firm	**E = [A+B+C+D]**	**352**	**379**	**443**	**476**	**521**	**(21)**
Discounting period		14.500	15.500	16.500	17.500	18.500	19.004
Discount factor	[F]	0.261	0.238	0.217	0.198	0.180	0.172
Present value of cash flows	**[E*F]**	**92**	**90**	**96**	**94**	**94**	**(4)**

Valuation conclusion	
INR Crores	
Present value of cash flows	1,583
Present value of release of working capital	(1)
Enterprise Valuation	**1,582**
WACC	**9.71%**

Present value of release in working capital represents negative working capital of INR 3.86 Cr released at the end of the concession period.

Basis the above and using a WACC of 9.71%, the Enterprise Value of STPL, as on 31 March 2026 is INR 1,582 crore.

Please refer WACC Summary for WACC breakup.

Source(s): Management information, KVSL analysis

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IRB Gwalior Tollway Private Limited

Overview

Project details

IGTPL is engaged to carry out the operation and maintenance of the Gwalior – Jhansi section on the NH75 in accordance with the concession agreement on a TOT basis. The project stretch is 82.5 kms, 4 lane road stretching between Gwalior and Jhansi.

Concession period

IGTPL is required to operate, manage and maintain, repair or otherwise make improvements to the project highway in accordance with the concession agreement for a period of 20 years commencing from the appointed date. The concession agreement also stipulates that the concession period shall not be reduced by more than 5 years or increased by more than 10 years whatsoever. As per the traffic report, no shortening or extension of concession period is estimated.

Upfront Concession Fee

As per the concession agreement, IGTPL is required to pay INR 1,161 crores as upfront concession fee to NHAI which has been paid in March 2024.

Highlights

Particulars	Details
Project location	Gwalior-Jhansi stretch on NH75
Concessionaire	IGTPL
State	Madhya Pradesh and Uttar Pradesh
Tollable length (kms)	82.5
Concession agreement date	12-Jan-24
Appointed date	1-Apr-24
Completion certificate date	NA
Scheduled end date	31-Mar-44

Interest held by Trust as at 31 March 2026

Particulars	Stake %
Equity stake	100%
Debt held by InvIT in IGTPL	INR 310 Cr

Source(s): Management information, External traffic study

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Key Assumptions

a. Modification in concession period

- Article 24 of the concession agreement of IGTPL provides for modification of the concession period.
- As per Article 24.5.1, “in the event Actual Fee I shall have fallen short of or exceeded the Target Fee 1 by more than 20% (twenty percent), then for every 1% (one percent) shortfall or increase as compared to the Target Fee 1, the Concession Period, subject to fulfilment of terms of this Agreement, shall be increased by 1.5% (one and a half percent) or decreased by 0.75% (point seven five percent) thereof; provided that such increase or decrease in concession period shall not in any case exceed not more than limits specified in Clause 3.1.”
- As per Article 24.5.2, “in the event Actual Fee 2 shall have fallen short of or exceeded the Target Fee 2 by more than 30% (thirty percent), then for every 1% (one percent) shortfall or increase as compared to the Target Fee 2, the concession period, subject to fulfilment of terms of this Agreement, shall be increased by 1.5% (one and a half percent) or decreased by 0.75% (point seven five percent) thereof; provided that such increase or decrease in Concession Period shall not in any case exceed not more than limits specified in Clause 3.1.”
- As per the traffic report, revenue variance is estimated to be lower than the caps mentioned above. Thus, there shall be no modification to the concession period in line with the above articles of the concession agreement.
- The Management have paid the upfront fee and confirmed to us to consider concession appointment date as 01 April 2024.
- Thus, the explicit period for the current valuation analysis exercise has been considered from 1 April 2026 to 31 March 2044.

b. Revenue

- Revenue for IGTPL is derived from Toll collections for the concession period. Management has provided Traffic volume, toll rates and toll revenue for the forecast period based on the traffic report prepared by independent consultant in May 2026
- As per the NHAI Circular No. 17.7.12/2025 dated 17 October 2025, the Ministry of Road Transport & Highways (MoRTH), vide Gazette Notification No. 388 (E) dated 17 June 2025, has inserted sub-section (3B) in Rule 9 of the National Highways Fee (Determination of Rates and Collection) Rules, 2008, thereby introducing the concept of an Annual Pass with effect from 15 August 2025. MoRTH vide Circular No. H-25011/05/2025-Toll (E-245443) dated 1 September 2025 has notified a fair compensation framework for addressing revenue losses arising out of the Annual Pass in InvIT Projects.
- The impact of Annual Pass has been considered by the traffic consultant in the traffic study while estimating toll revenue for the forecast period.
- As stated in the Traffic Study Report of IGTPL, elasticity model of growth projection has been considered for traffic forecast. While estimating traffic volume, consultant has considered factors such as GDP growth rate of India, developments along the project road, elasticity value of different vehicle type for computing the traffic growth rate.
- Further, while estimating growth, the traffic consultant has considered the presence of major economic and industrial centres along the corridor in Datia; and major industries in Jhansi such as BHEL Jhansi, Heidelberg Cement and Parichha Thermal Power Plant.
- Basis above factors, traffic is forecast to increase 5-6 per cent in FY27-FY28 and in range of 2-4 per cent annually thereafter.
- Annual revision of toll rate for the forecast period shall be in accordance with National Highway Fee (Determination of Rates and Collection) Rules, 2008 and amendment thereto.
- Additionally, the applicable base rate shall be revised annually on April 1 to reflect 3% fixed increase plus increase in wholesale price index (“WPI”) but such revision shall be restricted to 40% of the increase in WPI on overall basis during the concession period. As given in the traffic report, average inflation in WPI from FY2021-25 is 4.74%, reflecting inflationary cycles across both high and low year. Hence, an annual escalation factor of 4.5% has been considered for the remaining concession period.

Source(s): Management information, External traffic study

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Key Assumptions

- Toll revenue has been considered basis the pessimistic scenario from the traffic report prepared by an independent consultant appointed by the Management. Please refer to traffic report for detailed study on forecast traffic growth rates, toll rates and toll revenue.
- Refer Annexure 2c for a detailed breakup of Revenue.

c. Periodic maintenance & routine maintenance costs

- Operational expenditure includes base operating expenditure, admin expenses, insurance, project management fees and various other expenses. These are broadly categorized as routine maintenance expenses and other operating expenses.
- Periodic maintenance expense, also referred to as major maintenance expenses are incurred to restore the road asset to its original condition or to maintain its current operating standard.
- Upto FY2034, IGTPL has entered into an agreement for periodic and routine maintenance with IRB Infrastructure Developers Limited (“Project Manager”). Routine maintenance has been increased by ~3-4 per cent in forecast period. For the forecast period from FY34-FY36 and FY41-FY43, routine maintenance expense is estimated to be lower on account of periodic maintenance cost.
- Periodic Maintenance cost have been considered based on technical assessment done by the Management.

d. Depreciation & amortization

- Forecasted depreciation on assets has been provided by the Management. Management has forecasted depreciation to increase in line with the increase in revenue and capex being incurred in the forecast period.

e. Tax

- The Finance Bill, 2026 (presented on 1 February 2026) reduces the MAT rate from 15% to 14% and disallows any further MAT credit accrual under both regimes. Under the old regime, MAT paid will be treated as final tax with no additional credit accumulation. Under the new regime, however, unutilized MAT credit carried forward from the old regime can still be utilized. Such set-off is restricted to a maximum of 25% of the tax liability for the relevant year.
- Management represented that the SPV has adopted the new tax regime. Thus, tax outflows for the forecast have been calculated based on the new regime of income tax. Carried forward business loss and unabsorbed depreciation if any has been considered while calculating tax outflows.

f. Working capital

- The change in WC in FY27 and FY28 pertains to release in DSRA on refinancing / repayment of SPV debt. Apart from this, the change in WC each year is not material. Therefore, we have only considered the impact of release of working capital at the end of the concession period.

g. Capex

- Since the SPV is already operational, there is no capex to be incurred in the remainder of the concession period.

h. Changes in assumption from previous valuation

- Material changes from previous valuation include change in revenue forecasts due to the following factors
    - Impact on toll rates due to change in WPI growth forecast from 4.75% to 4.5%.
    - Change in tollable traffic volume growth rates forecast considered by Traffic consultant

Source(s): Management information, External traffic study

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Discounted Cash Flows (1/3)

Discounted Cash Flow								
INR crores		FY2027 12 months	FY2028 12 months	FY2029 12 months	FY2030 12 months	FY2031 12 months	FY2032 12 months	FY2033 12 months
Revenue		149	165	178	195	212	231	250
y-o-y growth			*10%*	*8%*	*9%*	*9%*	*9%*	*8%*
Routine maintenance		17	31	35	36	37	39	40
y-o-y growth		*n/a*	*76%*	*13%*	*4%*	*4%*	*4%*	*3%*
Major maintenance expense		11	22	23	36	52	-	-
Other expenses		-	-	-	-	-	-	-
EBITDA	**[A]**	**121**	**113**	**121**	**123**	**123**	**192**	**210**
EBITDA margin		*80.7%*	*68.4%*	*67.7%*	*63.1%*	*58.0%*	*83.2%*	*84.0%*
Depreciation		(29)	(33)	(36)	(39)	(42)	(46)	(50)
EBIT		**91**	**80**	**85**	**84**	**80**	**146**	**160**
EBIT margin		*61.2%*	*48.7%*	*47.8%*	*43.2%*	*37.9%*	*63.1%*	*63.8%*
Less: Tax on EBIT	[B]	-	-	(9)	(15)	(15)	(33)	(37)
Change in working capital	[C]	10	43	-	-	-	-	-
Less: Capex		-	-	-	-	-	-	-
Free cash flows to the firm	**E = [A+B+C+D]**	**131**	**156**	**112**	**107**	**107**	**159**	**173**
Discounting period		0.500	1.500	2.500	3.500	4.500	5.500	6.500
Discount factor	[F]	0.956	0.875	0.801	0.732	0.670	0.613	0.561
Present value of cash flows	**[E*F]**	**125**	**136**	**89**	**79**	**72**	**98**	**97**

Source(s): Management information, KVSL analysis

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Discounted Cash Flows (2/3)

Discounted Cash Flow								
INR crores		FY2034 12 months	FY2035 12 months	FY2036 12 months	FY2037 12 months	FY2038 12 months	FY2039 12 months	FY2040 12 months
Revenue		273	293	317	341	366	394	425
y-o-y growth		*9%*	*7%*	*8%*	*8%*	*8%*	*8%*	*8%*
Routine maintenance		39	40	42	45	47	48	50
y-o-y growth		*-3%*	*3%*	*3%*	*9%*	*3%*	*3%*	*3%*
Major maintenance expense		11	21	22	35	50	-	-
Other expenses		-	-	-	-	-	-	-
EBITDA	**[A]**	**223**	**232**	**253**	**260**	**269**	**346**	**375**
EBITDA margin		*81.6%*	*79.1%*	*79.8%*	*76.4%*	*73.5%*	*87.8%*	*88.3%*
Depreciation		(55)	(59)	(64)	(69)	(74)	(80)	(87)
EBIT		**168**	**172**	**189**	**191**	**195**	**266**	**288**
EBIT margin		*61.5%*	*58.9%*	*59.6%*	*56.2%*	*53.2%*	*67.4%*	*67.9%*
Less: Tax on EBIT	[B]	(41)	(43)	(48)	(50)	(52)	(72)	(79)
Change in working capital	[C]	-	-	-	-	-	-	-
Less: Capex		-	-	-	-	-	-	-
Free cash flows to the firm	**E = [A+B+C+D]**	**182**	**189**	**205**	**210**	**217**	**275**	**296**
Discounting period		7.500	8.500	9.500	10.500	11.500	12.500	13.500
Discount factor	[F]	0.513	0.469	0.429	0.393	0.359	0.329	0.301
Present value of cash flows	**[E*F]**	**94**	**89**	**88**	**83**	**78**	**90**	**89**

Source(s): Management information, KVSL analysis

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Discounted Cash Flows (3/3)

Discounted Cash Flow					
INR crores		FY2041 12 months	FY2042 12 months	FY2043 12 months	FY2044 12 months
Revenue		456	489	526	568
y-o-y growth		*7%*	*7%*	*8%*	*8%*
Routine maintenance		48	49	50	55
y-o-y growth		*-4%*	*3%*	*3%*	*9%*
Major maintenance expense		26	38	49	61
Other expenses		-	-	-	-
EBITDA	**[A]**	**382**	**401**	**427**	**452**
EBITDA margin		*83.8%*	*82.1%*	*81.2%*	*79.6%*
Depreciation		(93)	(100)	(108)	(117)
EBIT		**288**	**301**	**319**	**335**
EBIT margin		*63.3%*	*61.6%*	*60.6%*	*59.0%*
Less: Tax on EBIT	[B]	(81)	(85)	(92)	(98)
Change in working capital	[C]	-	-	-	-
Less: Capex		-	-	-	-
Free cash flows to the firm	**E = [A+B+C+D]**	**301**	**316**	**335**	**354**
Discounting period		14.500	15.500	16.500	17.500
Discount factor	[F]	0.275	0.252	0.230	0.211
Present value of cash flows	**[E*F]**	**83**	**79**	**77**	**75**

Valuation conclusion	
INR Crores	
Present value of cash flows	1,620
Present value of release of working capital	-
Enterprise Valuation	**1,620**
WACC	**9.31%**

Present value of release in working capital represent working capital of INR 0 Cr released at the end of the concession period.

Basis the above and using a WACC of 9.31%, the Enterprise Value of IGTPL on 31 March 2026 is INR 1,620 crore.

Please refer WACC Summary for WACC breakup.

Source(s): Management information, KVSL analysis

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IRB Lalitpur Tollway Private Limited

Overview

Project details

ILTPL is engaged to carry out the operation and maintenance of the Lalitpur – Sagar – Lakhnadon stretch on NH26 in accordance with the concession agreement on a TOT basis. The project stretch is 316 kms, 4 lane road stretching through Uttar Pradesh and Madhya Pradesh.

Concession period

ILTPL is required to operate, manage and maintain, repair or otherwise make improvements to the project highway in accordance with the concession agreement for a period of 20 years commencing from the appointed date. The concession agreement also stipulates that the concession period shall not be reduced by more than 5 years or increased by more than 10 years whatsoever. As per the traffic report, no shortening or extension of concession period is estimated.

Upfront Concession Fee

As per the concession agreement, ILTPL is required to pay INR 4,428 crores as upfront concession fee to NHAI which the Management has paid in March 2024.

Highlights

Particulars	Details
Project location	Lalitpur-Sagar-Lakhnadon stretch on NH26
Concessionaire	ILTPL
State	Uttar Pradesh and Madhya Pradesh
Tollable length (kms)	316.1
Concession agreement date	24-Nov-23
Appointed date	1-Apr-24
Completion certificate date	NA
Scheduled end date	31-Mar-44

Interest held by Trust as at 31 March 2026

Particulars	Stake %
Equity stake	100%
Debt held by InvIT in ILTPL	INR 1,262 Cr

Source(s): Management information

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Key Assumptions

a. Modification in concession period

- Article 24 of the concession agreement of ILTPL provides for modification of the concession period.
- As per Article 24.5.1, “in the event Actual Fee I shall have fallen short of or exceeded the Target Fee 1 by more than 20% (twenty percent), then for every 1% (one percent) shortfall or increase as compared to the Target Fee 1, the concession period, subject to fulfilment of terms of this agreement, shall be increased by 1.5% (one and a half percent) or decreased by 0.75% (point seven five percent) thereof; provided that such increase or decrease in concession period shall not in any case exceed not more than limits specified in Clause 3.1.”
- As per Article 24.5.2, “in the event Actual Fee 2 shall have fallen short of or exceeded the Target Fee 2 by more than 30% (thirty percent), then for every 1% (one percent) shortfall or increase as compared to the Target Fee 2, the concession period, subject to fulfilment of terms of this Agreement, shall be increased by 1.5% (one and a half percent) or decreased by 0.75% (point seven five percent) thereof; provided that such increase or decrease in Concession Period shall not in any case exceed not more than limits specified in Clause 3.1.”
- As per the traffic report, revenue variance is estimated to be lower than the caps mentioned above. Thus, there shall be no modification to the concession period in line with the above articles of the concession agreement.
- The Management have paid the upfront fee and confirmed to us to consider concession appointment date as 01 April 2024.
- Thus, the explicit period for the current valuation analysis exercise has been considered from 1 April 2026 to 31 March 2044.

b. Revenue

- Revenue for ILTPL is derived from Toll collections for the concession period. Management has provided Traffic volume, toll rates and toll revenue for the forecast period based on the traffic report prepared by independent consultant in May 2026
- As per the NHAI Circular No. 17.7.12/2025 dated 17 October 2025, the Ministry of Road Transport & Highways (MoRTH), vide Gazette Notification No. 388 (E) dated 17 June 2025, has inserted sub-section (3B) in Rule 9 of the National Highways Fee (Determination of Rates and Collection) Rules, 2008, thereby introducing the concept of an Annual Pass with effect from 15 August 2025. MoRTH vide Circular No. H-25011/05/2025-Toll (E-245443) dated 1 September 2025 has notified a fair compensation framework for addressing revenue losses arising out of the Annual Pass in InvIT Projects.
- The impact of Annual Pass has been considered by the traffic consultant in the traffic study while estimating toll revenue for the forecast period.
- As stated in the Traffic Study Report of ILTPL, elasticity model of growth projection has been considered for traffic forecast. While estimating traffic volume, consultant has considered factors such as GDP growth rate of India, developments along the project road, elasticity value of different vehicle type for computing the traffic growth rate.
- Further, while estimating growth, the traffic consultant has considered the strong economic base of Madhya Pradesh and Uttar Pradesh, supported by extensive transport infrastructure, and emerging logistics hubs which collectively enhance the traffic potential.
- Basis above factors, Traffic is forecast to increase by 3-5 per cent annually in the forecast period.
- Additionally, the applicable base rate shall be revised annually on April 1 to reflect 3% fixed increase plus increase in wholesale price index (“WPI”) but such revision shall be restricted to 40% of the increase in WPI on overall basis during the concession period. As given in the traffic report, average inflation in WPI from FY2021-25 is 4.74%, reflecting inflationary cycles across both high and low year. Hence, an annual escalation factor of 4.5% has been considered for the remaining concession period.

Source(s): Management information, External traffic study

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Key Assumptions

- Annual revision of toll rate for the forecast period shall be in accordance with National Highway Fee (Determination of Rates and Collection) Rules, 2008 and amendment thereto.
- Toll revenue has been considered basis the pessimistic scenario from the traffic report prepared by an independent consultant appointed by the Management. Please refer to traffic report for detailed study on forecast traffic growth rates, toll rates and toll revenue.
- Refer Annexure 2c for a detailed breakup of Revenue.

c. Periodic maintenance & routine maintenance costs

- Operational expenditure includes base operating expenditure, admin expenses, insurance, project management fees and various other expenses. These are broadly categorized as routine maintenance expenses and other operating expenses.
- Periodic maintenance expense, also referred to as major maintenance expenses are incurred to restore the road asset to its original condition or to maintain its current operating standard.
- Upto FY2034, ILTPL has entered into fixed price Project Implementation Agreement for periodic and routine maintenance with IRB Infrastructure Developers Limited (“Project Manager”).
- For the forecast period post FY2034 periodic and routine maintenance cost have been considered based on technical assessment done by the Management. Routine maintenance has been increased by 2% to 3% y-o-y in forecast period post FY2034.

d. Depreciation & amortization

- Forecasted depreciation on assets has been provided by the Management. Management has forecasted depreciation to increase in line with the increase in revenue and capex being incurred in the forecast period.

e. Tax

- The Finance Bill, 2026 (presented on 1 February 2026) reduces the MAT rate from 15% to 14% and disallows any further MAT credit accrual under both regimes. Under the old regime, MAT paid will be treated as final tax with no additional credit accumulation. Under the new regime, however, unutilized MAT credit carried forward from the old regime can still be utilized. Such set-off is restricted to a maximum of 25% of the tax liability for the relevant year.
- Management represented that the SPV has adopted the new tax regime. Thus, tax outflows for the forecast have been calculated based on the new regime of income tax. Carried forward business loss and unabsorbed depreciation if any has been considered while calculating tax outflows.

f. Working capital

- The change in WC in FY28 pertains to release in DSRA on refinancing / repayment of SPV debt. Apart from this, the change in WC each year is not material. Therefore, we have only considered the impact of release of working capital at the end of the concession period.

g. Capex

- Since the SPV is already operational, there is no capex to be incurred in the remainder of the concession period.

h. Changes in assumption from previous valuation

- Material changes from previous valuation include change in revenue forecasts due to the following factors
    - Impact on toll rates due to change in WPI growth forecast from 4.75% to 4.5%.
    - Change in tollable traffic volume growth rates forecast considered by Traffic consultant

Source(s): Management information, External traffic study

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Discounted Cash Flows (1/2)

Discounted Cash Flow										
INR crores		FY2027 12 months	FY2028 12 months	FY2029 12 months	FY2030 12 months	FY2031 12 months	FY2032 12 months	FY2033 12 months	FY2034 12 months	FY2035 12 months
Revenue		499	546	586	638	695	761	826	900	969
y-o-y growth			*9%*	*7%*	*9%*	*9%*	*9%*	*9%*	*9%*	*8%*
Routine maintenance		70	73	76	78	81	85	87	90	93
y-o-y growth		*n/a*	*4%*	*4%*	*4%*	*4%*	*4%*	*3%*	*3%*	*3%*
Major maintenance expense		-	-	66	69	72	75	78	-	-
Other expenses		-	-	-	-	-	-	-	-	-
EBITDA	**[A]**	**429**	**473**	**444**	**490**	**542**	**601**	**661**	**810**	**876**
EBITDA margin		*86.0%*	*86.6%*	*75.8%*	*76.9%*	*77.9%*	*79.0%*	*80.1%*	*90.0%*	*90.4%*
Depreciation		(118)	(131)	(143)	(156)	(171)	(187)	(203)	(222)	(240)
EBIT		**311**	**342**	**301**	**334**	**372**	**414**	**458**	**588**	**637**
EBIT margin		*62.3%*	*62.6%*	*51.3%*	*52.4%*	*53.4%*	*54.5%*	*55.4%*	*65.3%*	*65.7%*
Less: Tax on EBIT	[B]	-	-	(2)	(61)	(74)	(88)	(104)	(141)	(158)
Change in working capital	[C]	-	174	-	-	-	-	-	-	-
Less: Capex		-	-	-	-	-	-	-	-	-
Free cash flows to the firm	**E = [A+B+C+D]**	**429**	**647**	**442**	**430**	**468**	**513**	**558**	**669**	**718**
Discounting period		0.500	1.500	2.500	3.500	4.500	5.500	6.500	7.500	8.500
Discount factor	[F]	0.956	0.875	0.801	0.732	0.670	0.613	0.561	0.513	0.469
Present value of cash flows	**[E*F]**	**411**	**566**	**354**	**315**	**314**	**314**	**313**	**343**	**337**

Source(s): Management information, KVSL analysis

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Discounted Cash Flows (2/2)

Discounted Cash Flow										
INR crores		FY2036 12 months	FY2037 12 months	FY2038 12 months	FY2039 12 months	FY2040 12 months	FY2041 12 months	FY2042 12 months	FY2043 12 months	FY2044 12 months
Revenue		1,047	1,126	1,213	1,307	1,406	1,506	1,616	1,734	1,869
y-o-y growth		*8%*	*7%*	*8%*	*8%*	*8%*	*7%*	*7%*	*7%*	*8%*
Routine maintenance		96	99	102	105	108	111	113	116	120
y-o-y growth		*3%*	*3%*	*3%*	*3%*	*3%*	*2%*	*3%*	*3%*	*3%*
Major maintenance expense		117	121	124	128	132	-	-	185	185
Other expenses		-	-	-	-	-	-	-	-	-
EBITDA	**[A]**	**834**	**906**	**987**	**1,074**	**1,165**	**1,395**	**1,503**	**1,433**	**1,564**
EBITDA margin		*79.6%*	*80.5%*	*81.4%*	*82.2%*	*82.9%*	*92.7%*	*93.0%*	*82.6%*	*83.7%*
Depreciation		(260)	(280)	(302)	(326)	(352)	(378)	(407)	(437)	(472)
EBIT		**574**	**627**	**685**	**748**	**814**	**1,017**	**1,096**	**996**	**1,092**
EBIT margin		*54.8%*	*55.7%*	*56.5%*	*57.2%*	*57.9%*	*67.6%*	*67.8%*	*57.4%*	*58.4%*
Less: Tax on EBIT	[B]	(147)	(165)	(186)	(208)	(230)	(288)	(316)	(298)	(331)
Change in working capital	[C]	-	-	-	-	-	-	-	-	-
Less: Capex		-	-	-	-	-	-	-	-	-
Free cash flows to the firm	**E = [A+B+C+D]**	**687**	**741**	**802**	**867**	**935**	**1,107**	**1,187**	**1,135**	**1,233**
Discounting period		9.500	10.500	11.500	12.500	13.500	14.500	15.500	16.500	17.500
Discount factor	[F]	0.429	0.393	0.359	0.329	0.301	0.275	0.252	0.230	0.211
Present value of cash flows	**[E*F]**	**295**	**291**	**288**	**285**	**281**	**305**	**299**	**262**	**260**

Valuation conclusion	
INR Crores	
Present value of cash flows	5,832
Present value of release of working capital	0
Enterprise Valuation	**5,832**

WACC	**9.31%**

Present value of release in working capital represent positive working capital of INR 0.03 Cr released at the end of the concession period.

Basis the above and using a WACC of 9.31%, the Enterprise Value of ILTPL on 31 March 2026 is INR 5,832 crore.

Please refer WACC Summary for WACC breakup.

Source(s): Management information, KVSL analysis

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IRB Kota Tollway Private Limited

Overview

Project details

IKTPL is engaged to carry out the operation and maintenance of the Kota bypass and cable stay bridge on NH76 in accordance with the concession agreement on a TOT basis. The project stretch is 27.8 kms, 4 lane road near Kota, Rajasthan.

Concession period

IKTPL is required to operate, manage and maintain, repair or otherwise make improvements to the project highway in accordance with the concession agreement for a period of 20 years commencing from the appointed date. The concession agreement also stipulates that the concession period shall not be reduced by more than 5 years or increased by more than 10 years whatsoever. As per the traffic report, no shortening or extension of concession period is estimated.

Upfront Concession Fee

As per the concession agreement, IKTPL is required to pay INR 522 crores as upfront concession fee to NHAI which the Management has paid in March 2024.

Highlights

Particulars	Details
Project location	Kota Bypass and Cable Stay Bridge
Concessionaire	IKTPL
State	Rajasthan
Tollable length (kms)	27.8
Concession agreement date	12-Jan-24
Appointed date	1-Apr-24
Completion certificate date	NA
Scheduled end date	31-Mar-44
New scheduled end date	31-Mar-44

Interest held by Trust as at 31 March 2026

Particulars	Stake %
Equity stake	100%
Debt held by InvIT in IKTPL	INR 118 Cr

Source(s): Management information

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Key Assumptions

a. Modification in concession period

- Article 24 of the concession agreement of IKTPL provides for modification of the concession period.
- As per Article 24.5.1, “in the event Actual Fee I shall have fallen short of or exceeded the Target Fee 1 by more than 20% (twenty percent), then for every 1% (one percent) shortfall or increase as compared to the Target Fee 1, the Concession Period, subject to fulfilment of terms of this Agreement, shall be increased by 1.5% (one and a half percent) or decreased by 0.75% (point seven five percent) thereof; provided that such increase or decrease in concession period shall not in any case exceed not more than limits specified in Clause 3.1.”
- As per Article 24.5.2, “in the event Actual Fee 2 shall have fallen short of or exceeded the Target Fee 2 by more than 30% (thirty percent), then for every 1% (one percent) shortfall or increase as compared to the Target Fee 2, the concession period, subject to fulfilment of terms of this Agreement, shall be increased by 1.5% (one and a half percent) or decreased by 0.75% (point seven five percent) thereof; provided that such increase or decrease in Concession Period shall not in any case exceed not more than limits specified in Clause 3.1.”
- As per the traffic report, revenue variance is estimated to be lower than the caps mentioned above. Thus, there shall be no modification to the concession period in line with the above articles of the concession agreement.
- The Management have paid the upfront fee and confirmed to us to consider concession appointment date as 01 April 2024.
- Thus, the explicit period for the current valuation analysis exercise has been considered from a 1 April 2026 to 31 March 2044.

b. Revenue

- Revenue for IKTPL is derived from Toll collections for the concession period. Management has provided Traffic volume, toll rates and toll revenue for the forecast period based on the traffic report prepared by independent consultant in May 2026.
- As per the NHAI Circular No. 17.7.12/2025 dated 17 October 2025, the Ministry of Road Transport & Highways (MoRTH), vide Gazette Notification No. 388 (E) dated 17 June 2025, has inserted sub-section (3B) in Rule 9 of the National Highways Fee (Determination of Rates and Collection) Rules, 2008, thereby introducing the concept of an Annual Pass with effect from 15 August 2025. MoRTH vide Circular No. H-25011/05/2025-Toll (E-245443) dated 1 September 2025 has notified a fair compensation framework for addressing revenue losses arising out of the Annual Pass in InvIT Projects.
- The impact of Annual Pass has been considered by the traffic consultant in the traffic study while estimating toll revenue for the forecast period.
- As stated in the Traffic Study Report of IKTPL, elasticity model of growth projection has been considered for traffic forecast. While estimating traffic volume, consultant has considered factors such as GDP growth rate of India, developments along the project road, elasticity value of different vehicle type for computing the traffic growth rate.
- Basis above factors, Traffic is forecast to increase in range of 5-7 per cent in FY27-FY29 and in range of 2-4 per cent annually thereafter.
- Additionally, the applicable base rate shall be revised annually on April 1 to reflect 3% fixed increase plus increase in wholesale price index (“WPI”) but such revision shall be restricted to 40% of the increase in WPI on overall basis during the concession period. As given in the traffic report, average inflation in WPI from FY2021-25 is 4.74%, reflecting inflationary cycles across both high and low year. Hence, an annual escalation factor of 4.5% has been considered for the remaining concession period.

Source(s): Management information, External traffic study

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Key Assumptions

- Annual revision of toll rate for the forecast period shall be in accordance with National Highway Fee (Determination of Rates and Collection) Rules, 2008 and amendment thereto.
- Toll revenue has been considered basis the pessimistic scenario from the traffic report prepared by an independent consultant appointed by the Management. Please refer to traffic report for detailed study on forecast traffic growth rates, toll rates and toll revenue.
- Refer Annexure 2c for a detailed breakup of Revenue.

c. Periodic maintenance & routine maintenance costs

- Operational expenditure includes base operating expenditure, admin expenses, insurance, project management fees and various other expenses. These are broadly categorized as routine maintenance expenses and other operating expenses.
- Periodic maintenance expense, also referred to as major maintenance expenses are incurred to restore the road asset to its original condition or to maintain its current operating standard.
- Upto FY2034, IKTPL has entered into a fixed price Project Implementation Agreement for periodic and routine maintenance with IRB Infrastructure Developers Limited (“Project Manager”).
- For the forecast period post FY2034 periodic and routine maintenance cost have been considered based on technical assessment done by the Management. Routine maintenance has been increased by 3% to 4% y-o-y in forecast period post FY2034.

d. Depreciation & amortization

- Forecasted depreciation on assets has been provided by the Management. Management has forecasted depreciation to increase in line with the increase in revenue and capex being incurred in the forecast period.

e. Tax

- The Finance Bill, 2026 (presented on 1 February 2026) reduces the MAT rate from 15% to 14% and disallows any further MAT credit accrual under both regimes. Under the old regime, MAT paid will be treated as final tax with no additional credit accumulation. Under the new regime, however, unutilized MAT credit carried forward from the old regime can still be utilized. Such set-off is restricted to a maximum of 25% of the tax liability for the relevant year.
- Management represented that the SPV has adopted the new tax regime. Thus, tax outflows for the forecast have been calculated based on the new regime of income tax. Carried forward business loss and unabsorbed depreciation if any has been considered while calculating tax outflows.

f. Working capital

- The change in WC in FY28 pertains to release in DSRA on refinancing / repayment of SPV debt. Apart from this, the change in WC each year is not material. Therefore, we have only considered the impact of release of working capital at the end of the concession period.

g. Capex

- Since the SPV is already operational, there is no capex to be incurred in the remainder of the concession period.

h. Changes in assumption from previous valuation

- Material changes from previous valuation include change in revenue forecasts due to the following factors
    - Impact on toll rates due to change in WPI growth forecast from 4.75% to 4.5%.
    - Change in tollable traffic volume growth rates forecast considered by Traffic consultant

Source(s): Management information, External traffic study

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Discounted Cash Flows (1/2)

Discounted Cash Flow									
INR crores		FY2027 12 months	FY2028 12 months	FY2029 12 months	FY2030 12 months	FY2031 12 months	FY2032 12 months	FY2033 12 months	FY2034 12 months
Revenue		86	96	104	112	123	134	145	158
y-o-y growth			*11%*	*8%*	*8%*	*9%*	*9%*	*8%*	*9%*
Routine maintenance		22	23	23	24	25	26	27	28
y-o-y growth		*n/a*	*5%*	*4%*	*4%*	*4%*	*4%*	*3%*	*3%*
Major maintenance expense		-	-	8	8	-	-	-	19
Other expenses		-	-	-	-	-	-	-	-
EBITDA	**[A]**	**65**	**73**	**72**	**80**	**97**	**107**	**117**	**111**
EBITDA margin		*75.0%*	*76.4%*	*69.5%*	*71.1%*	*79.3%*	*80.3%*	*81.1%*	*70.2%*
Depreciation		(13)	(15)	(16)	(18)	(20)	(21)	(23)	(25)
EBIT		**51**	**58**	**56**	**62**	**78**	**86**	**94**	**85**
EBIT margin		*59.5%*	*60.8%*	*53.7%*	*55.1%*	*63.3%*	*64.3%*	*65.1%*	*54.1%*
Less: Tax on EBIT	[B]	-	(6)	(11)	(13)	(17)	(20)	(22)	(21)
Change in working capital	[C]	-	22	-	-	-	-	-	-
Less: Capex		-	-	-	-	-	-	-	-
Free cash flows to the firm	**E = [A+B+C+D]**	**65**	**90**	**61**	**67**	**80**	**88**	**95**	**90**
Discounting period		0.500	1.500	2.500	3.500	4.500	5.500	6.500	7.500
Discount factor	[F]	0.956	0.875	0.801	0.732	0.670	0.613	0.561	0.513
Present value of cash flows	**[E*F]**	**62**	**78**	**49**	**49**	**54**	**54**	**53**	**46**

Source(s): Management information, KVSL analysis

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Discounted Cash Flows (2/2)

Discounted Cash Flow											
INR crores		FY2035 12 months	FY2036 12 months	FY2037 12 months	FY2038 12 months	FY2039 12 months	FY2040 12 months	FY2041 12 months	FY2042 12 months	FY2043 12 months	FY2044 12 months
Revenue		170	185	199	214	233	251	269	290	314	337
y-o-y growth		*8%*	*9%*	*8%*	*8%*	*9%*	*8%*	*7%*	*8%*	*8%*	*7%*
Routine maintenance		29	30	31	32	33	34	35	36	37	38
y-o-y growth		*3%*	*4%*	*3%*	*3%*	*3%*	*3%*	*3%*	*3%*	*3%*	*3%*
Major maintenance expense		19	-	-	-	11	12	-	-	-	23
Other expenses		-	-	-	-	-	-	-	-	-	-
EBITDA	**[A]**	**122**	**155**	**168**	**182**	**189**	**205**	**234**	**255**	**277**	**276**
EBITDA margin		*71.8%*	*83.7%*	*84.4%*	*85.1%*	*81.0%*	*81.9%*	*87.0%*	*87.7%*	*88.3%*	*81.9%*
Depreciation		(27)	(30)	(32)	(35)	(38)	(41)	(44)	(47)	(51)	(56)
EBIT		**95**	**125**	**136**	**148**	**151**	**164**	**190**	**207**	**226**	**220**
EBIT margin		*55.8%*	*67.6%*	*68.3%*	*68.9%*	*64.8%*	*65.5%*	*70.7%*	*71.3%*	*72.0%*	*65.4%*
Less: Tax on EBIT	[B]	(24)	(32)	(35)	(39)	(40)	(44)	(52)	(57)	(63)	(62)
Change in working capital	[C]	-	-	-	-	-	-	-	-	-	-
Less: Capex		-	-	-	-	-	-	-	-	-	-
Free cash flows to the firm	**E = [A+B+C+D]**	**99**	**123**	**133**	**144**	**149**	**161**	**182**	**198**	**215**	**214**
Discounting period		8.500	9.500	10.500	11.500	12.500	13.500	14.500	15.500	16.500	17.500
Discount factor	[F]	0.469	0.429	0.393	0.359	0.329	0.301	0.275	0.252	0.230	0.211
Present value of cash flows	**[E*F]**	**46**	**53**	**52**	**52**	**49**	**48**	**50**	**50**	**49**	**45**

Valuation conclusion	
INR Crores	
Present value of cash flows	941
Present value of release of working capital	0
Enterprise Valuation	**941**
WACC	**9.31%**

Present value of release in working capital represent positive working capital of INR 0.05 Cr released at the end of the concession period.

Basis the above and using a WACC of 9.31%, the Enterprise Value of IKTPL on 31 March 2026 is INR 941 crore.

Please refer WACC Summary for WACC breakup.

Source(s): Management information, KVSL analysis

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Meerut Budaun Expressway Limited

Overview

Project details

MBEL has entered into concession agreement with UPEIDA for development, maintenance and management of Ganga expressway for section from km 7.9 to km 137.6 (Meerut - Budaun section) on the NH334 on a DBFOT basis. The project stretch is 129.7 kms, 6 lane road stretching between Meerut and Budaun.
The project is currently under construction and tolling is expected to commence from October 2025.

Concession period

The term of the concession agreement is for a period of 30 years commencing from the appointed date.
Probable extension of concession period is estimated according to article 29 of concession agreement which comes to about 6 years.

Project Cost and Grant

Total project cost is appraised to be INR 6,538 cr. As per concession agreement MBEL will receive a grant of INR 1,746 crore from UPEIDA as equity support for towards construction cost. The Grant received till 31 March 2026 is INR 1,658.3 crore.
Remaining project cost of INR 4,792 Cr is proposed to be financed in 55:45 ratio of debt and equity. 100 per cent equity contribution in project cost amounting to INR 2,133 Cr has already infused by shareholders in form of equity shares and NCDs.

Highlights

Particulars	Details
Project location	Meerut-Budaun stretch on NH334
Concessionaire	MBEL
State	Uttar Pradesh
Tollable length (kms)	129.7
Concession agreement date	06-Jan-2022
Appointed date	12-Oct-2022
Estimate completion date	May-2026
Concession Period	30 years from Appointed Date
Scheduled Concession end date	10-Oct-52
Expected Concession end date	10-Oct-58

Interest held by Trust as at 31 March 2026

Particulars	Stake %
Equity stake	80.4%
Debt held by InvIT in MBEL	135 Crore

Source(s): Management information, financial statements of Target

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Key Assumptions

a. Modification in concession period

- As per Clause 29.2 of the concession agreement between UPEIDA and MBEL, *"In the event actual average traffic shall have fallen short of the target traffic by more than 5%, then for every 1% shortfall as compared to the target traffic, the concession period shall, subject to payment of concession fee and additional concession fees in accordance with this agreement, be increased by 1% thereof; provided such increase in concession period shall not in any case exceed 20% of the concession period"*.
- Forecast traffic is estimated to be lower than target traffic by more than 20 per cent in all target traffic dates. Hence, Management has considered maximum possible extension in the concession period, 6 years and revised concession period till 10 October 2058 in the forecast. Thus, the explicit period for the current valuation analysis exercise has been considered from 1 April 2026 to 10 October 2058.
- Calculation of 20 per cent extension in the concession period as per the above explanation as follows:

Particulars						
Target traffic year	**2025-26**	**2030-31**	**2035-36**	**2040-41**	**2045-46**	**2050-51**
Weighted Average daily traffic forecast	5,649	8,042	10,998	14,654	18,267	22,420
Target average daily traffic	25,719	40,759	61,199	87,256	118,274	148,644
Revised target traffic		32,607	48,959	69,805	94,619	118,915
Percent difference from target traffic	-78%	-60%	-78%	-79%	-81%	-81%
Percent difference exceeding 5%	-73%	-55%	-73%	-74%	-76%	-76%
Percent difference exceeding 5% upto 20%	-20%	-20%	-20%	-20%	-20%	-20%

b. Revenue

- Revenue for MBEL is derived from Toll collections for the concession period. Management has provided Traffic volume, toll rates and toll revenue for the forecast period based on the traffic report prepared by independent consultant in May 2026
- As per the NHAI Circular No. 17.7.12/2025 dated 17 October 2025, the Ministry of Road Transport & Highways (MoRTH), vide Gazette Notification No. 388 (E) dated 17 June 2025, has inserted sub-section (3B) in Rule 9 of the National Highways Fee (Determination of Rates and Collection) Rules, 2008, thereby introducing the concept of an Annual Pass with effect from 15 August 2025. MoRTH vide Circular No. H-25011/05/2025-Toll (E-245443) dated 1 September 2025 has notified a fair compensation framework for addressing revenue losses arising out of the Annual Pass in InvIT Projects.
- The impact of Annual Pass has been considered by the traffic consultant in the traffic study while estimating toll revenue for the forecast period.
- As stated in the Traffic Study Report of MBEL, transport demand elasticity method has been considered for traffic forecast. While estimating traffic volume, consultant has considered factors such as GDP growth rate, developments along the project road, elasticity value of different vehicle type for computing the traffic growth rate.
- MBEL is expected to commence toll collection in FY2027 and hence, revenue is expected to increase significantly on the project stretch in FY28-FY29. Traffic is forecast to increase in the range of 2-5 per cent annually thereafter.
- Annual revision of toll rate for the forecast period shall be in accordance with National Highway Fee (Determination of Rates and Collection) Rules, 2008 and amendment thereto.
- Additionally, the applicable base rate shall be revised annually on April 1 to reflect the increase in wholesale price index ("WPI") but such revision shall be restricted to 40% of the increase in WPI on overall basis during the concession period. Toll rates are forecast to increase by CAGR of 2.5 per cent in the forecast period. As given in the traffic report, average inflation in WPI from FY2021-25 is 4.74%, reflecting inflationary cycles across both high and low year. Hence, an annual escalation factor of 4.5% has been considered for the remaining concession period.

Source(s): Management information, External traffic study

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Key Assumptions

- Toll revenue has been considered basis the pessimistic scenario from the traffic report prepared by an independent consultant appointed by the Management. Please refer Traffic report for detailed study on traffic growth, toll rates and toll revenue.
- Refer Annexure 2c for a detailed breakup of Revenue.

c. Periodic maintenance & routine maintenance costs

- Operational expenditure includes base operating expenditure, admin expenses, insurance, project management fees and various other expenses. These are broadly categorized as routine maintenance expenses and other operating expenses.
- Periodic maintenance expense, also referred to as major maintenance expenses are incurred to restore the road asset to its original condition or to maintain its current operating standard.
- Upto FY2032, MBEL has entered into an fixed price Project Implementation Agreement for periodic and routine maintenance with IRB Infrastructure Developers Limited (“Project Manager”).
- For the forecast period post FY2032 periodic and routine maintenance cost have been considered based on technical assessment done by the Management. Routine maintenance has been increased by 2% to 6% y-o-y in forecast period post FY2032.

d. Depreciation & amortization

- Management has forecast project cost net of grant to be depreciated in proportion to forecast revenue.

e. Tax

- The Finance Bill, 2026 (presented on 1 February 2026) reduces the MAT rate from 15% to 14% and disallows any further MAT credit accrual under both regimes. Under the old regime, MAT paid will be treated as final tax with no additional credit accumulation. Under the new regime, however, unutilized MAT credit carried forward from the old regime can still be utilized. Such set-off is restricted to a maximum of 25% of the tax liability for the relevant year.
- Management represented that the MBEL has adopted the new tax regime. Thus, tax outflows for the forecast have been calculated based on the new regime of income tax. Carried forward business loss and unabsorbed depreciation if any has been considered while calculating tax outflows.

f. Capex

- MBEL has entered into fixed price EPC contract for construction of the expressway with the sponsor. EPC cost for the project is agreed at INR 5,912 Cr excluding GST. As at Valuation Date, INR 177 Cr (including EPC Cost and EPC payables; excluding contingencies and pre operative expenses) of project cost are pending to be incurred of which INR 87 Cr is to funded from grant to be received from UPEIDA. Balance capex of INR 30 Cr is forecast to be incurred in FY27 between Valuation Date to construction completion date which is expected to be on 16 May 2026.

g. Working capital

- The change in WC in FY27 and FY28 pertains to creation and release in DSRA on refinancing / repayment of SPV debt. Apart from this, the change in WC each year is not material. Therefore, we have only considered the impact of release of working capital at the end of the concession period.

h. Changes in assumption from previous valuation

- Material changes from previous valuation include change in revenue forecasts due to the following factors
    - Impact on toll rates due to change in WPI growth forecast from 4.75% to 4.5%.
    - Change in tollable traffic volume growth rates forecast considered by Traffic consultant

Source(s): Management information, External traffic study

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Discounted Cash Flows (1/4)

Discounted Cash Flow									
INR crores		FY2027 12 months	FY2028 12 months	FY2029 12 months	FY2030 12 months	FY2031 12 months	FY2032 12 months	FY2033 12 months	FY2034 12 months
Revenue		295	356	512	561	608	664	725	792
y-o-y growth			*21%*	*44%*	*10%*	*8%*	*9%*	*9%*	*9%*
Routine maintenance		63	76	78	81	84	88	90	93
y-o-y growth		*n/a*	*19%*	*3%*	*4%*	*3%*	*4%*	*3%*	*4%*
Major maintenance expense		-	-	-	-	85	88	91	-
Other expenses		2	2	2	2	2	2	3	3
EBITDA	**[A]**	**230**	**279**	**432**	**477**	**437**	**486**	**541**	**696**
EBITDA margin		*78%*	*78%*	*84%*	*85%*	*72%*	*73%*	*75%*	*88%*
Depreciation		(43)	(47)	(51)	(56)	(61)	(66)	(72)	(78)
EBIT		**187**	**232**	**381**	**422**	**376**	**419**	**469**	**619**
EBIT margin		*63%*	*65%*	*74%*	*75%*	*62%*	*63%*	*65%*	*78%*
Less: Tax on EBIT	[B]	(24)	(33)	(72)	(83)	(73)	(85)	(99)	(138)
Change in working capital	[C]	(33)	130	-	-	-	-	-	-
Less: Capex/ (Grant Receivable)		(30)	-	-	-	-	-	-	-
Free cash flows to the firm	**E = [A+B+C+D]**	**143**	**376**	**360**	**394**	**364**	**401**	**442**	**558**
Discounting period		0.500	1.500	2.500	3.500	4.500	5.500	6.500	7.500
Discount factor	[F]	0.956	0.875	0.801	0.732	0.670	0.613	0.561	0.513
Present value of cash flows	**[E*F]**	**137**	**329**	**288**	**289**	**244**	**246**	**248**	**286**

Source(s): Management information, KVSL analysis

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Discounted Cash Flows (2/4)

Discounted Cash Flow										
INR crores		FY2035 12 months	FY2036 12 months	FY2037 12 months	FY2038 12 months	FY2039 12 months	FY2040 12 months	FY2041 12 months	FY2042 12 months	FY2043 12 months
Revenue		870	954	1,041	1,138	1,243	1,364	1,473	1,596	1,721
y-o-y growth		*10%*	*10%*	*9%*	*9%*	*9%*	*10%*	*8%*	*8%*	*8%*
Routine maintenance		96	100	102	105	108	112	114	117	120
y-o-y growth		*3%*	*4%*	*2%*	*3%*	*3%*	*3%*	*2%*	*3%*	*3%*
Major maintenance expense		-	-	-	-	109	112	115	-	-
Other expenses		3	3	4	4	4	5	5	6	6
EBITDA	**[A]**	**771**	**850**	**934**	**1,028**	**1,022**	**1,135**	**1,238**	**1,473**	**1,594**
EBITDA margin		*89%*	*89%*	*90%*	*90%*	*82%*	*83%*	*84%*	*92%*	*93%*
Depreciation		(84)	(92)	(99)	(107)	(116)	(126)	(135)	(144)	(154)
EBIT		**687**	**759**	**835**	**921**	**905**	**1,009**	**1,104**	**1,329**	**1,440**
EBIT margin		*79%*	*80%*	*80%*	*81%*	*73%*	*74%*	*75%*	*83%*	*84%*
Less: Tax on EBIT	[B]	(157)	(177)	(198)	(222)	(220)	(248)	(275)	(334)	(364)
Change in working capital	[C]	-	-	-	-	-	-	-	-	-
Less: Capex/ (Grant Receivable)		-	-	-	-	-	-	-	-	-
Free cash flows to the firm	**E = [A+B+C+D]**	**614**	**674**	**736**	**806**	**801**	**886**	**964**	**1,140**	**1,230**
Discounting period		8.500	9.500	10.500	11.500	12.500	13.500	14.500	15.500	16.500
Discount factor	[F]	0.469	0.429	0.393	0.359	0.329	0.301	0.275	0.252	0.230
Present value of cash flows	**[E*F]**	**288**	**289**	**289**	**290**	**264**	**267**	**265**	**287**	**283**

Source(s): Management information, KVSL analysis

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Discounted Cash Flows (3/4)

Discounted Cash Flow									
INR crores		FY2044 12 months	FY2045 12 months	FY2046 12 months	FY2047 12 months	FY2048 12 months	FY2049 12 months	FY2050 12 months	FY2051 12 months
Revenue		1,861	2,004	2,152	2,310	2,490	2,669	2,867	3,078
y-o-y growth		*8%*	*8%*	*7%*	*7%*	*8%*	*7%*	*7%*	*7%*
Routine maintenance		124	126	129	132	136	138	141	144
y-o-y growth		*3%*	*2%*	*2%*	*2%*	*3%*	*2%*	*2%*	*2%*
Major maintenance expense		-	-	-	133	137	139	-	-
Other expenses		7	7	8	8	9	9	10	11
EBITDA	**[A]**	**1,730**	**1,870**	**2,015**	**2,037**	**2,209**	**2,382**	**2,716**	**2,922**
EBITDA margin		*93%*	*93%*	*94%*	*88%*	*89%*	*89%*	*95%*	*95%*
Depreciation		(165)	(176)	(189)	(202)	(217)	(231)	(246)	(264)
EBIT		**1,565**	**1,694**	**1,826**	**1,835**	**1,992**	**2,151**	**2,470**	**2,659**
EBIT margin		*84%*	*85%*	*85%*	*79%*	*80%*	*81%*	*86%*	*86%*
Less: Tax on EBIT	[B]	(398)	(434)	(470)	(476)	(519)	(562)	(646)	(698)
Change in working capital	[C]	-	-	-	-	-	-	-	-
Less: Capex/ (Grant Receivable)		-	-	-	-	-	-	-	-
Free cash flows to the firm	**E = [A+B+C+D]**	**1,332**	**1,436**	**1,545**	**1,561**	**1,690**	**1,820**	**2,069**	**2,224**
Discounting period		17.500	18.500	19.500	20.500	21.500	22.500	23.500	24.500
Discount factor	[F]	0.211	0.193	0.176	0.161	0.148	0.135	0.124	0.113
Present value of cash flows	**[E*F]**	**281**	**277**	**273**	**252**	**250**	**246**	**256**	**251**

Source(s): Management information, KVSL analysis

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Discounted Cash Flows (4/4)

Discounted Cash Flow									
INR crores		FY2052 12 months	FY2053 12 months	FY2054 12 months	FY2055 12 months	FY2056 12 months	FY2057 12 months	FY2058 12 months	FY2059 6 months
Revenue		3,307	3,540	3,800	4,072	4,376	4,676	5,010	2,841
y-o-y growth		*7%*	*7%*	*7%*	*7%*	*7%*	*7%*	*7%*	*-43%*
Routine maintenance		148	155	163	171	180	188	198	110
y-o-y growth		*3%*	*4%*	*5%*	*5%*	*6%*	*4%*	*5%*	*-44%*
Major maintenance expense		-	-	-	197	202	206	-	-
Other expenses		12	13	13	14	15	17	18	10
EBITDA	**[A]**	**3,147**	**3,373**	**3,624**	**3,690**	**3,979**	**4,265**	**4,795**	**2,721**
EBITDA margin		*95%*	*95%*	*95%*	*91%*	*91%*	*91%*	*96%*	*96%*
Depreciation		(282)	(300)	(321)	(343)	(367)	(391)	(417)	(236)
EBIT		**2,865**	**3,073**	**3,303**	**3,347**	**3,612**	**3,875**	**4,378**	**2,485**
EBIT margin		*87%*	*87%*	*87%*	*82%*	*83%*	*83%*	*87%*	*87%*
Less: Tax on EBIT	[B]	(755)	(812)	(875)	(892)	(964)	(1,036)	(1,170)	(665)
Change in working capital	[C]	-	-	-	-	-	-	-	-
Less: Capex/ (Grant Receivable)		-	-	-	-	-	-	-	-
Free cash flows to the firm	**E = [A+B+C+D]**	**2,392**	**2,561**	**2,749**	**2,798**	**3,014**	**3,229**	**3,625**	**2,056**
Discounting period		25.500	26.500	27.500	28.500	29.500	30.500	31.500	32.264
Discount factor	[F]	0.103	0.095	0.087	0.079	0.072	0.066	0.061	0.057
Present value of cash flows	**[E*F]**	**247**	**242**	**238**	**222**	**218**	**214**	**220**	**116**

Valuation conclusion	
INR Crore	
Present value of cash flows	8,392
Present value of release of working capital	1
Enterprise Valuation	**8,393**
WACC	**9.31%**

Present value of release in working capital represent positive working capital of INR 10.26 Cr released at the end of the concession period.

Basis the above and using a WACC of 9.31%, the Enterprise Value of MBEL on 31 March 2026 is INR 8,393 crore.

Please refer WACC Summary for WACC breakup.

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IRB Harihara Corridors Private Limited

Overview

Project details

IHCPL is engaged to carry out the operation and maintenance of Lucknow–Ayodhya–Gorakhpur stretch on NH-27 and the Lucknow–Sultanpur stretch on NH-731 in the state of Uttar Pradesh in accordance with the concession agreement on a TOT basis. The project stretch is 366 kms, 4 lane road in Uttar Pradesh.

Concession period

The Concession Agreement is for a period of 20 years from the appointed date, in line with the Toll-Operate-Transfer (TOT) model awarded by NHAI. The concession agreement also stipulates that the concession period shall not be reduced by more than 5 years or increased by more than 10 years whatsoever.

Probable extension of concession period is estimated according to article 24 of concession agreement which comes to about ~0.1 years.

Project Cost and Grant

As per the concession agreement, IHCPL is required to pay INR 9,208 crores as upfront concession fee to NHAI which the Management has paid in January 2026.

Highlights

Particulars	Details
Project location	Lucknow – Varanasi- Gorakhpur section of NH-27 and Lucknow – Sultanpur section
Concessionaire	IHCPL
State	Uttar Pradesh
Tollable length (kms)	366
Concession agreement date	12-Dec-25
Appointed date	23-Jan-26
Estimated completion date	Mar-28
Concession Period	20 years from Appointed Date
Scheduled Concession end date	22-Jan-46
Expected Concession end date	15-May-46

Interest held by Trust as at 31 March 2026

Particulars	Stake %
Equity stake	100%
Debt held by InvIT in IHCPL	8,714 Crore

Source(s): Management information, financial statements of Target

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Key Assumptions

a. Modification in concession period

- As per Article 24.5.1, *"in the event Actual Fee shall have fallen short of or exceeded the Target Fee by more than 5% (five percent), then for every 1% (one percent) shortfall or increase as compared to the Target Fee, the concession period, subject to fulfilment of terms of this agreement, shall be increased by 1% (one percent) thereof; provided that such increase or decrease in concession period shall not in any case exceed not more than limits specified in Clause 3.1."*
- As per Article 24.5.2, *"in the event Actual Fee shall have fallen short of or exceeded the Target Fee by more than 5% (five percent), then for every 1% (one percent) shortfall or increase as compared to the Target Fee, the concession period, subject to fulfilment of terms of this Agreement, shall be increased by 1% (one percent); provided that such increase or decrease in Concession Period shall not in any case exceed not more than limits specified in Clause 3.1."*
- Thus, the concession period is increased as per the above clause as follows:

Particulars	CA 1	CA 2
Increase/(decrease) in traffic (Management estimate)	8%	-7%
1% increase/(decrease) for every 1% increase/(decrease) beyond 5%	-3%	2%
Maximum increase/(decrease) in concession period	As specified above	
Increase/(decrease) in concession period (years)	(0.2)	0.3
Net Increase/(decrease) in concession period (years)		**0.1**

Particulars	
Original concession period	20.0
Revised concession period	20.1
Scheduled end date	22-Jan-46
New scheduled end date	**15-May-46**

**CA 1 is Lucknow-Ayodhya Section & CA -2 is Ayodhya-Gorakhpur Section of the IHCPL.*

- The Management has confirmed to us to consider revised concession period till 15 May 2046. Thus, the explicit period for the current valuation analysis exercise has been considered from 1 April 2026 to 15 May 2046.

Source(s): Management information, External traffic study

b. Revenue

- Revenue for IHCPL is derived from Toll collections for the concession period. Management has provided Traffic volume, toll rates and toll revenue for the forecast period based on the traffic report prepared by independent consultant in May 2026.
- As per the NHAI Circular No. 17.7.12/2025 dated 17 October 2025, the Ministry of Road Transport & Highways (MoRTH), vide Gazette Notification No. 388 (E) dated 17 June 2025, has inserted sub-section (3B) in Rule 9 of the National Highways Fee (Determination of Rates and Collection) Rules, 2008, thereby introducing the concept of an Annual Pass with effect from 15 August 2025. MoRTH vide Circular No. H-25011/05/2025-Toll (E-245443) dated 1 September 2025 has notified a fair compensation framework for addressing revenue losses arising out of the Annual Pass in InvIT Projects.
- The impact of Annual Pass has been considered by the traffic consultant in the traffic study while estimating toll revenue for the forecast period.
- As stated in the Traffic Study Report of IHCPL, transport demand elasticity method has been considered for traffic forecast. While estimating traffic volume, consultant has considered factors such as GDP growth rate, developments along the project road, elasticity value of different vehicle type for computing the traffic growth rate.
- Basis above factors, Traffic is forecast to increase by 3-5 per cent annually in the forecast period.
- Annual revision of toll rate for the forecast period shall be in accordance with National Highway Fee (Determination of Rates and Collection) Rules, 2008 and amendment thereto.
- Additionally, the applicable base rate shall be revised annually on April 1 to reflect 3% fixed increase plus increase in wholesale price index ("WPI") but such revision shall be restricted to 40% of the increase in WPI on overall basis during the concession period. As given in the traffic report, average inflation in WPI from FY2021-25 is 4.74%, reflecting inflationary cycles across both high and low year. Hence, an annual escalation factor of 4.5% has been considered for the remaining concession period.

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Key Assumptions

- Toll revenue has been considered basis the pessimistic scenario from the traffic report prepared by an independent consultant appointed by the Management. Please refer Traffic report for detailed study on traffic growth, toll rates and toll revenue.
- Refer Annexure 2c for a detailed breakup of Revenue.

c. Periodic maintenance & routine maintenance costs

- Operational expenditure includes base operating expenditure, admin expenses, insurance, project management fees and various other expenses. These are broadly categorized as routine maintenance expenses and other operating expenses.
- Periodic maintenance expense, also referred to as major maintenance expenses are incurred to restore the road asset to its original condition or to maintain its current operating standard.
- IHCPL has entered into a fixed price Project Implementation Agreement for periodic and routine maintenance with IRB Infrastructure Developers Limited (“Project Manager”).

d. Depreciation & amortization

- Management has forecast project cost net of grant to be depreciated in proportion to forecast revenue.

Source(s): Management information, External traffic study

e. Tax

- The Finance Bill, 2026 (presented on 1 February 2026) reduces the MAT rate from 15% to 14% and disallows any further MAT credit accrual under both regimes. Under the old regime, MAT paid will be treated as final tax with no additional credit accumulation. Under the new regime, however, unutilized MAT credit carried forward from the old regime can still be utilized. Such set-off is restricted to a maximum of 25% of the tax liability for the relevant year.
- Management represented that the SPV has adopted the new tax regime. Thus, tax outflows for the forecast have been calculated based on the new regime of income tax. Carried forward business loss and unabsorbed depreciation if any has been considered while calculating tax outflows.

f. Capex

- Capex has been forecasted to be INR 381 Cr for FY27 and FY28 based on Management estimates for the remaining construction work. Management has provided statement of expenses/work in progress pertaining to capex as on 31 March 2026.

g. Working capital

- The change in WC in FY27 and FY28 pertains to release of the mobilization advances provided earlier to the suppliers as part of ongoing construction activities. Apart from this, the change in WC each year is not material. Therefore, we have only considered the impact of release of working capital at the end of the concession period.

h. Changes in assumption from previous valuation

- This section is not applicable given that IHCPL is being valued for the first time.

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Valuation of Individual SPVs — IRB Harihara Corridors Private Limited

Discounted Cash Flows (1/3)

Discounted Cash Flow								
INR crores		FY2027 12 months	FY2028 12 months	FY2029 12 months	FY2030 12 months	FY2031 12 months	FY2032 12 months	FY2033 12 months
Revenue		743	819	895	987	1,088	1,199	1,314
y-o-y growth			*10%*	*9%*	*10%*	*10%*	*10%*	*10%*
Routine maintenance		89.59	106	107	112	144	150	156
y-o-y growth			*19%*	*0%*	*6%*	*28%*	*4%*	*4%*
Major maintenance expense		-	-	-	-	151	245.63	118
Other expenses		-	-	-	-	-	-	-
EBITDA	**[A]**	**653**	**712**	**789**	**875**	**793**	**803**	**1,040**
EBITDA margin		*88%*	*87%*	*88%*	*89%*	*73%*	*67%*	*79%*
Depreciation		(176)	(200)	(220)	(243)	(267)	(295)	(323)
EBIT		**477**	**513**	**569**	**632**	**525**	**508**	**717**
EBIT margin		*64%*	*63%*	*64%*	*64%*	*48%*	*42%*	*55%*
Less: Tax on EBIT	[B]	(9)	(53)	(71)	(93)	(72)	(75)	(134)
Change in working capital	[C]	81	13	-	-	-	-	-
Less: Capex/ (Grant Receivable)		(292)	(89)	-	-	-	-	-
Free cash flows to the firm	**E = [A+B+C+D]**	**433**	**584**	**718**	**782**	**721**	**728**	**906**
Discounting period		0.500	1.500	2.500	3.500	4.500	5.500	6.500
Discount factor	[F]	0.956	0.875	0.801	0.732	0.670	0.613	0.561
Present value of cash flows	**[E*F]**	**414**	**511**	**575**	**573**	**483**	**447**	**508**

Source(s): Management information, KVSL analysis

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Discounted Cash Flows (2/3)

Discounted Cash Flow									
INR crores		FY2034 12 months	FY2035 12 months	FY2036 12 months	FY2037 12 months	FY2038 12 months	FY2039 12 months	FY2040 12 months	FY2041 12 months
Revenue		1,449	1,591	1,744	1,909	2,087	2,289	2,512	2,730
y-o-y growth		*10%*	*10%*	*10%*	*10%*	*9%*	*10%*	*10%*	*9%*
Routine maintenance		164	210	233	233	242	251	260	269
y-o-y growth		*5%*	*28%*	*11%*	*0%*	*4%*	*4%*	*4%*	*4%*
Major maintenance expense		-	84	52	149	282	133	-	9
Other expenses		-	-	-	-	-	-	-	-
EBITDA	**[A]**	**1,285**	**1,298**	**1,459**	**1,528**	**1,563**	**1,906**	**2,252**	**2,452**
EBITDA margin		*89%*	*82%*	*84%*	*80%*	*75%*	*83%*	*90%*	*90%*
Depreciation		(356)	(391)	(429)	(469)	(513)	(563)	(618)	(671)
EBIT		**929**	**906**	**1,030**	**1,059**	**1,050**	**1,343**	**1,635**	**1,781**
EBIT margin		*64%*	*57%*	*59%*	*55%*	*50%*	*59%*	*65%*	*65%*
Less: Tax on EBIT	[B]	(196)	(199)	(240)	(257)	(266)	(352)	(439)	(490)
Change in working capital	[C]	-	-	-	-	-	-	-	-
Less: Capex/ (Grant Receivable)		-	-	-	-	-	-	-	-
Free cash flows to the firm	**E = [A+B+C+D]**	**1,089**	**1,099**	**1,219**	**1,271**	**1,297**	**1,553**	**1,813**	**1,962**
Discounting period		7.500	8.500	9.500	10.500	11.500	12.500	13.500	14.500
Discount factor	[F]	0.513	0.469	0.429	0.393	0.359	0.329	0.301	0.275
Present value of cash flows	**[E*F]**	**559**	**516**	**524**	**499**	**466**	**511**	**545**	**540**

Source(s): Management information, KVSL analysis

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Discounted Cash Flows (3/3)

Discounted Cash Flow							
		FY2042	FY2043	FY2044	FY2045	FY2046	FY2047
INR crores		**12 months**	**12 months**	**12 months**	**12 months**	**12 months**	**2 months**
Revenue		2,975	3,248	3,548	3,865	3,422	286
y-o-y growth		*9%*	*9%*	*9%*	*9%*	*-11%*	*-92%*
Routine maintenance		278	288	298	308	281	28
y-o-y growth		*3%*	*4%*	*3%*	*3%*	*-9%*	*-90%*
Major maintenance expense		-	177	335	157	-	1
Other expenses		-	-	-	-	-	-
EBITDA	**[A]**	**2,696**	**2,782**	**2,915**	**3,400**	**3,141**	**256**
EBITDA margin		*91%*	*86%*	*82%*	*88%*	*92%*	*90%*
Depreciation		(731)	(799)	(872)	(950)	(841)	(96)
EBIT		**1,965**	**1,984**	**2,043**	**2,449**	**2,300**	**161**
EBIT margin		*66%*	*61%*	*58%*	*63%*	*67%*	*56%*
Less: Tax on EBIT	[B]	(551)	(573)	(606)	(728)	(694)	(40)
Change in working capital	[C]	-	-	-	-	-	-
Less: Capex/ (Grant Receivable)		-	-	-	-	-	-
Free cash flows to the firm	**E = [A+B+C+D]**	**2,145**	**2,210**	**2,309**	**2,672**	**2,447**	**216**
Discounting period		15.500	16.500	17.500	18.500	19.500	20.063
Discount factor	[F]	0.252	0.230	0.211	0.193	0.176	0.168
Present value of cash flows	**[E*F]**	**540**	**509**	**487**	**515**	**432**	**36**

Valuation conclusion	
INR Crore	
Present value of cash flows	10,189
Present value of release of working capital	-
Enterprise Valuation	**10,189**
WACC	**9.31%**

Present value of release in working capital represent working capital of INR 0 Cr released at the end of the concession period.

Basis the above and using a WACC of 9.31%, the Enterprise Value of IHCPL on 31 March 2026 is INR 10,189 crore.

Please refer WACC Summary for WACC breakup.

Source(s): Management information, KVSL analysis

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IRB Chandibhadra Tollway Private Limited

Overview

Project details

CBTPL is engaged to carry out the operation and maintenance of Chandikhole - Bhadrak Section of NH- 16 in the State of Odisha in accordance with the concession agreement on a TOT basis. The project stretch is 74 kms, 6 lane road in Odisha.

Concession period

The term of the concession agreement is for a period of 20 years commencing from the appointed date. The concession agreement also stipulates that the concession period shall not be reduced by more than 5 years or increased by more than 10 years whatsoever.

Probable reduction of concession period is estimated according to article 24 of concession agreement which comes to about ~0.9 years.

Project Cost and Grant

As per the concession agreement, CBTPL is required to pay INR 3,087 crores as upfront concession fee to NHAI which the Management has paid in March 2026.

Highlights

Particulars	Details
Project location	Chandikhole - Bhadrak Section of NH- 16
Concessionaire	CBTPL
State	Odisha
Tollable length (kms)	74.5
Concession agreement date	04-Feb-26
Appointed date	01-April-26
Estimate completion date	Mar-27
Concession Period	20 years from Appointed Date
Scheduled Concession end date	31-Mar-46
Expected Concession end date	07-May-45

Interest held by Trust as at 31 March 2026

Particulars	Stake %
Equity stake	100%
Debt held by InvIT in CBTPL	3,040 Crore

Source(s): Management information, financial statements of Target

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Key Assumptions

a. Modification in concession period

- As per Article 24.5.1, *"in the event Actual Fee shall have fallen short of or exceeded the Target Fee by more than 5% (five percent), then for every 1% (one percent) shortfall or increase as compared to the Target Fee, the concession period, subject to fulfilment of terms of this agreement, shall be increased by 1% (one percent) thereof; provided that such increase or decrease in concession period shall not in any case exceed not more than limits specified in Clause 3.1."*
- As per Article 24.5.2, *"in the event Actual Fee shall have fallen short of or exceeded the Target Fee by more than 5% (five percent), then for every 1% (one percent) shortfall or increase as compared to the Target Fee, the concession period, subject to fulfilment of terms of this Agreement, shall be increased by 1% (one percent); provided that such increase or decrease in Concession Period shall not in any case exceed not more than limits specified in Clause 3.1."*
- Thus, the concession period is increased as per the above clause as follows:

Particulars	Target 1	Target 2	Target 3
Increase in traffic (Management estimate)	5%	10%	13%
1% decrease for every 1% increase	0%	-5%	-8%
Maximum increase in concession period	As specified above		
Decrease in concession period (years)	(0.0)	(0.5)	(0.3)
Net Increase/(decrease) in concession period (years)			**(0.9)**

Particulars	
Original concession period	20.0
Revised concession period	19.1
Scheduled end date	31-Mar-46
New scheduled end date	**07-May-45**

- The Management has confirmed to us to consider revised concession period till 07 May 2045. Thus, the explicit period for the current valuation analysis exercise has been considered from 1 April 2026 to 07 May 2045.

Source(s): Management information, External traffic study

b. Revenue

- Revenue for CBTPL is derived from Toll collections for the concession period. Management has provided Traffic volume, toll rates and toll revenue for the forecast period based on the traffic report prepared by independent consultant in May 2026.
- As per the NHAI Circular No. 17.7.12/2025 dated 17 October 2025, the Ministry of Road Transport & Highways (MoRTH), vide Gazette Notification No. 388 (E) dated 17 June 2025, has inserted sub-section (3B) in Rule 9 of the National Highways Fee (Determination of Rates and Collection) Rules, 2008, thereby introducing the concept of an Annual Pass with effect from 15 August 2025. MoRTH vide Circular No. H-25011/05/2025-Toll (E-245443) dated 1 September 2025 has notified a fair compensation framework for addressing revenue losses arising out of the Annual Pass in InvIT Projects.
- The impact of Annual Pass has been considered by the traffic consultant in the traffic study while estimating toll revenue for the forecast period.
- As stated in the Traffic Study Report of CBTPL, transport demand elasticity method has been considered for traffic forecast. While estimating traffic volume, consultant has considered factors such as GDP growth rate, developments along the project road, elasticity value of different vehicle type for computing the traffic growth rate.
- Basis above factors, Traffic is forecast to increase by 4-6 per cent annually in the forecast period.
- Annual revision of toll rate for the forecast period shall be in accordance with National Highway Fee (Determination of Rates and Collection) Rules, 2008 and amendment thereto.
- Additionally, the applicable base rate shall be revised annually on April 1 to reflect 3% fixed increase plus increase in wholesale price index ("WPI") but such revision shall be restricted to 40% of the increase in WPI on overall basis during the concession period. As given in the traffic report, average inflation in WPI from FY2021-25 is 4.74%, reflecting inflationary cycles across both high and low year. Hence, an annual escalation factor of 4.5% has been considered for the remaining concession period.

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Key Assumptions

- Toll revenue has been considered basis the pessimistic scenario from the traffic report prepared by an independent consultant appointed by the Management. Please refer Traffic report for detailed study on traffic growth, toll rates and toll revenue.
- Refer Annexure 2c for a detailed breakup of Revenue.

c. Periodic maintenance & routine maintenance costs

- Operational expenditure includes base operating expenditure, admin expenses, insurance, project management fees and various other expenses. These are broadly categorized as routine maintenance expenses and other operating expenses.
- Periodic maintenance expense, also referred to as major maintenance expenses are incurred to restore the road asset to its original condition or to maintain its current operating standard.
- CBTPL has entered into a fixed price Project Implementation Agreement for periodic and routine maintenance with IRB Infrastructure Developers Limited (“Project Manager”).

d. Depreciation & amortization

- Management has forecast project cost net of grant to be depreciated in proportion to forecast revenue.

e. Tax

- Management represented that the SPV has adopted the new tax regime. Thus, tax outflows for the forecast have been calculated based on the new regime of income tax. Carried forward business loss and unabsorbed depreciation if any has been considered while calculating tax outflows.

f. Capex

- Capex has been forecasted to be INR 199 Cr for FY27 based on Management estimates for the remaining construction work. Management has provided statement of expenses/work in progress pertaining to capex as on 31 March 2026.

g. Working capital

- The change in WC in FY27 pertains to release of the mobilization advances provided earlier to the suppliers as part of ongoing construction activities. Apart from this, the change in WC each year is not material. Therefore, we have only considered the impact of release of working capital at the end of the concession period.

h. Changes in assumption from previous valuation

- This section is not applicable given that CBTPL is being valued for the first time.

Source(s): Management information, External traffic study

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Discounted Cash Flows (1/3)

Discounted Cash Flow								
INR crores		FY2027 12 months	FY2028 12 months	FY2029 12 months	FY2030 12 months	FY2031 12 months	FY2032 12 months	FY2033 12 months
Revenue		279	306	322	353	387	426	464
y-o-y growth			*10%*	*5%*	*10%*	*10%*	*10%*	*9%*
Routine maintenance		19	20	21	20	21	22	23
y-o-y growth		*n/a*	*8%*	*2%*	*-2%*	*5%*	*4%*	*4%*
Major maintenance expense		0	-	-	-	-	-	0
Other expenses		-	-	-	-	-	-	-
EBITDA	**[A]**	**260**	**286**	**301**	**333**	**366**	**404**	**440**
EBITDA margin		*93%*	*93%*	*94%*	*94%*	*94%*	*95%*	*95%*
Depreciation		(69)	(76)	(81)	(89)	(98)	(108)	(117)
EBIT		**191**	**210**	**219**	**243**	**268**	**296**	**323**
EBIT margin		*68%*	*69%*	*68%*	*69%*	*69%*	*69%*	*70%*
Less: Tax on EBIT	[B]	(26)	(30)	(34)	(42)	(50)	(60)	(69)
Change in working capital	[C]	28	-	-	-	-	-	-
Less: Capex/ (Grant Receivable)		(199)	-	-	-	-	-	-
Free cash flows to the firm	**E = [A+B+C+D]**	**63**	**255**	**267**	**291**	**315**	**344**	**371**
Discounting period		0.500	1.500	2.500	3.500	4.500	5.500	6.500
Discount factor	[F]	0.956	0.875	0.801	0.732	0.670	0.613	0.561
Present value of cash flows	**[E*F]**	**60**	**224**	**214**	**213**	**211**	**211**	**208**

Source(s): Management information, KVSL analysis

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Discounted Cash Flows (2/3)

Discounted Cash Flow								
INR crores		FY2034 12 months	FY2035 12 months	FY2036 12 months	FY2037 12 months	FY2038 12 months	FY2039 12 months	FY2040 12 months
Revenue		508	557	611	665	726	795	869
y-o-y growth		*9%*	*10%*	*10%*	*9%*	*9%*	*9%*	*9%*
Routine maintenance		24	25	26	29	99	74	76
y-o-y growth		*4%*	*4%*	*4%*	*11%*	*235%*	*-25%*	*3%*
Major maintenance expense		-	-	-	-	167	167	167
Other expenses		-	-	-	-	-	-	-
EBITDA	**[A]**	**483**	**531**	**585**	**636**	**461**	**554**	**626**
EBITDA margin		*95%*	*95%*	*96%*	*96%*	*63%*	*70%*	*72%*
Depreciation		(129)	(141)	(155)	(168)	(184)	(201)	(220)
EBIT		**355**	**390**	**430**	**467**	**277**	**352**	**406**
EBIT margin		*70%*	*70%*	*70%*	*70%*	*38%*	*44%*	*47%*
Less: Tax on EBIT	[B]	(80)	(92)	(105)	(118)	(74)	(98)	(116)
Change in working capital	[C]	-	-	-	-	-	-	-
Less: Capex/ (Grant Receivable)		-	-	-	-	-	-	-
Free cash flows to the firm	**E = [A+B+C+D]**	**403**	**439**	**479**	**517**	**387**	**456**	**510**
Discounting period		7.500	8.500	9.500	10.500	11.500	12.500	13.500
Discount factor	[F]	0.513	0.469	0.429	0.393	0.359	0.329	0.301
Present value of cash flows	**[E*F]**	**207**	**206**	**206**	**203**	**139**	**150**	**154**

Source(s): Management information, KVSL analysis

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Discounted Cash Flows (3/3)

Discounted Cash Flow							
INR crores		FY2041 12 months	FY2042 12 months	FY2043 12 months	FY2044 12 months	FY2045 12 months	FY2046 1 months
Revenue		948	1,030	1,120	1,221	1,328	150
y-o-y growth		*9%*	*9%*	*9%*	*9%*	*9%*	*-89%*
Routine maintenance		79	81	84	87	89	10
y-o-y growth		*3%*	*3%*	*3%*	*3%*	*3%*	*-89%*
Major maintenance expense		-	-	-	83	85	-
Other expenses		-	-	-	-	-	-
EBITDA	**[A]**	**869**	**949**	**1,036**	**1,052**	**1,154**	**140**
EBITDA margin		*92%*	*92%*	*93%*	*86%*	*87%*	*94%*
Depreciation		(240)	(261)	(284)	(309)	(336)	(38)
EBIT		**629**	**688**	**752**	**742**	**818**	**102**
EBIT margin		*66%*	*67%*	*67%*	*61%*	*62%*	*68%*
Less: Tax on EBIT	[B]	(177)	(197)	(219)	(223)	(249)	-
Change in working capital	[C]	-	-	-	-	-	-
Less: Capex/ (Grant Receivable)		-	-	-	-	-	-
Free cash flows to the firm	**E = [A+B+C+D]**	**692**	**752**	**817**	**829**	**905**	**140**
Discounting period		14.500	15.500	16.500	17.500	18.500	19.051
Discount factor	[F]	0.275	0.252	0.230	0.211	0.193	0.184
Present value of cash flows	**[E*F]**	**190**	**189**	**188**	**175**	**175**	**26**

Valuation conclusion	
INR Crore	
Present value of cash flows	3,548
Present value of release of working capital	(1)
Enterprise Valuation	**3,547**
WACC	**9.31%**

Present value of release in working capital represent negative working capital of INR 3.7 Cr released at the end of the concession period.

Basis the above and using a WACC of 9.31%, the Enterprise Value of ICTPL on 31 March 2026 is INR 3,547 crore.

Please refer WACC Summary for WACC breakup.

Source(s): Management information, KVSL analysis

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6.

Valuation Conclusion

Valuation Conclusion (1/2)

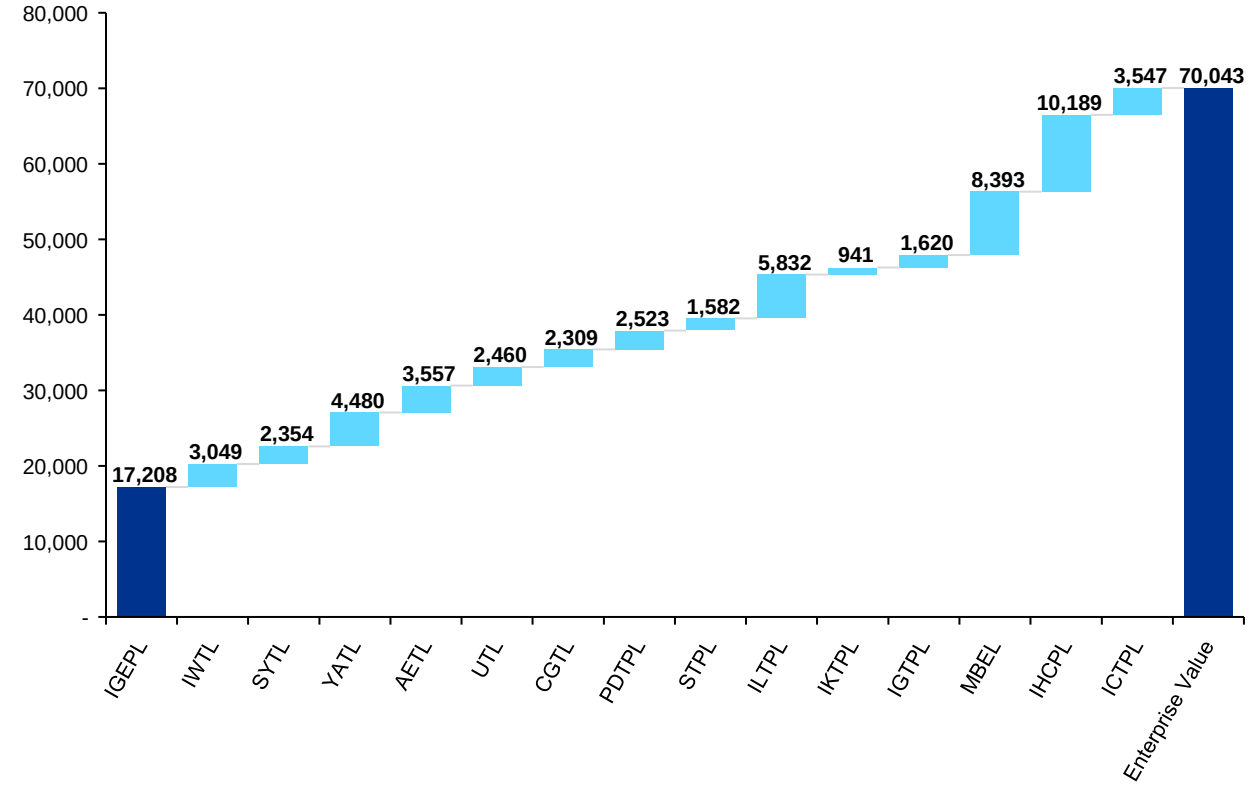
Valuation Conclusion (INR Crs)

IRB Golconda Expressway Private Limited	17,208
IRB Westcoast Tollway Limited	3,049
Solapur Yedeshi Tollway Limited	2,354
Yedeshi Aurangabad Tollway Limited	4,480
AE Tollway Limited	3,557
Udaipur Tollway Limited	2,460
CG Tollway Limited	2,309
Palsit Dankuni Tollway Private Limited	2,523
Samakhiyali Tollway Private Limited	1,582
Lalitpur Tollway Private Limited	5,832
IRB Kota Tollway Private Limited	941
IRB Gwalior Tollway Private Limited	1,620
Meerut Buadun Expressway Limited	8,393
IRB Harihara Corridors Private Limited	10,189
IRB Chandibhadra Tollway Private Limited	3,547
Enterprise Value of the SPVs	**70,043**
Cash and cash equivalents	170
Surplus Assets	637
Debt and debt like items	(31,150)
PV of standalone expenses of IRBI Trust	(492)
Capital Creditors	(599)
Non-controlling interest	(1,134)
Equity value of IRBI Trust	**37,475**

Equity Value of IRBI Trust (INR Cr)	37,475
Units outstanding (No.)	1,172,093,265
NAV at fair value per unit (INR)	**319.73**

Source(s): Management information, KVSL analysis

Enterprise Value of SPVs



Note: *SPVs are individually referred as "Target", "Business", "Company", "SPV" or the "Asset" Collectively referred as SPVs or Assets*

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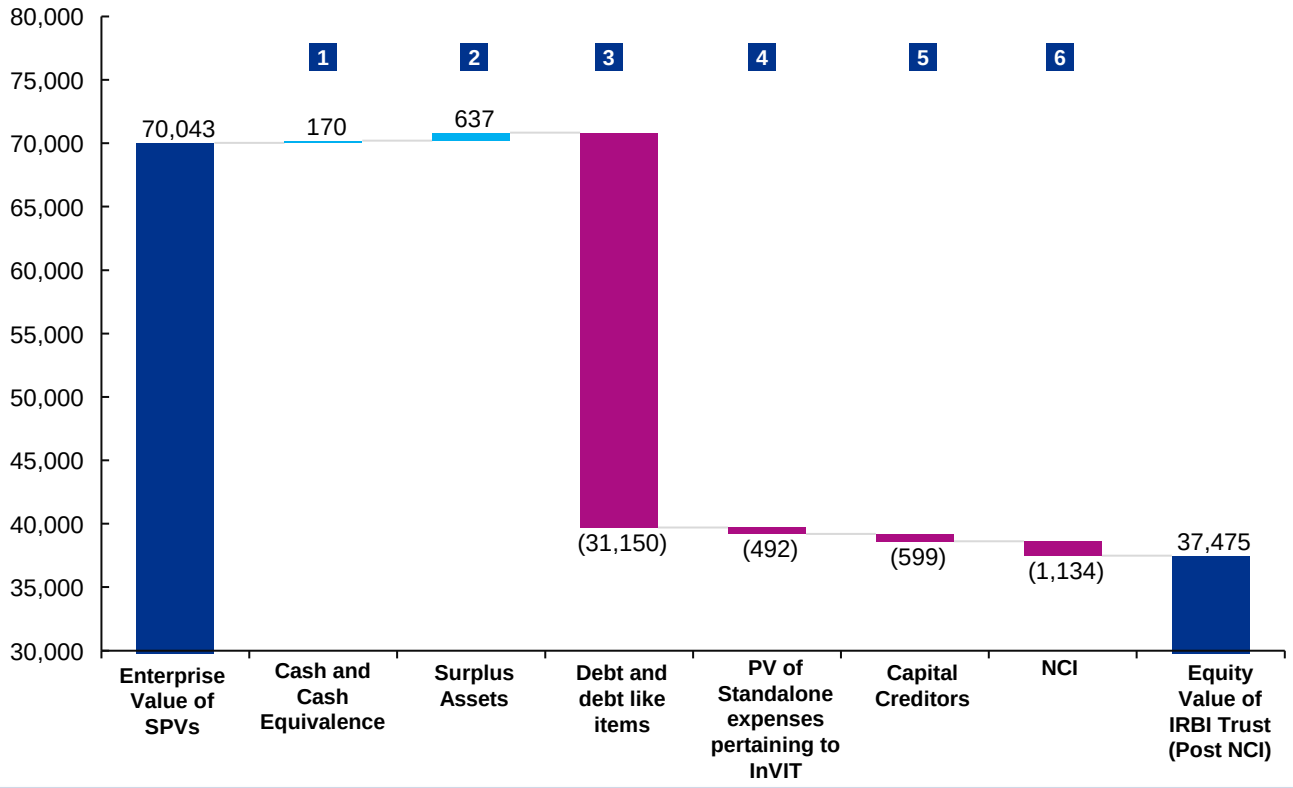
Valuation Conclusion (2/2)

Calculation of Equity Value of IRBI Trust from Enterprise Value of the SPVs



1	Cash and cash equivalents comprise balance and deposits with banks (excluding balance held towards DSRA) as on 31 March 2026
2	Surplus assets primarily comprise of investment in mutual funds as on 31 March 2026, further adjusted for net working capital of IRB trust at standalone level.
3	Debt and debt like items primarily represents loan from banks and financial institutions of INR 31,150 Cr as on 31 March 2026. This amount has been adjusted by INR 277 Cr, which represents the present value of the release of DSRA as on 31 March 2026. The release schedule of the DSRA along with applicable interest earned on the DSRA balance has been provided by the Management.
4	Present value of standalone expenses of the IRBI Trust represent the present value of the investment manager fee in the books of IRBI Trust.
5	Capital creditors of INR 599 Cr have been considered debt like in nature and adjusted from the Enterprise Value to arrive at the Equity Value of IRBI Trust. Management represented that they do not consider these liabilities as part of the working capital and thus they have not been considered as part of the forecast working capital
6	The Non controlling interest (“NCI”) represents value of minority interest in PDTPL, STPL, MBEL and IGEPL.

The Enterprise Value of the SPVs is INR 70,043 Cr and the Equity Value attributable to the IRB Infrastructure Trust is INR 37,475 Cr as on 31 March 2026. The NAV at fair value per unit of IRBI Trust as on 31 March 2026 is INR 319.73 per unit.

Source(s): Management information, KVSL analysis

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7.
Annexures

Annexure 1: Sources of Information and Other Key Assumptions (1/3)

This Report is prepared based on the below sources of information as provided to us by the Management:

The following information provided to KVSL by Management was used in preparation of the Valuation Report:

- Provisional financial statements for the period ended 31 March 2026 of all the SPVs
- Standalone provisional financial statements for the period ended 31 March 2026 of the Trust.
- Consolidated provisional financial statements for the period ended 31 March 2026 of the Trust.
- Financial projections of SPVs from 1 April 2026 till the end of the concession period of the respective SPVs
- Financial projections for Investment management expenses
- Other data for all the SPVs which is as follows –
    - Concession Agreements
    - Completion Certificates and Provisional Completion Certificates
    - Traffic Reports prepared by GMD consultants for all the SPVs
    - Toll Rate Notifications
    - Extracts of O&M agreement with IRBIDL
- Since STPL and MBEL are still under construction, the Management has provided statement of expenses/work in progress pertaining to capex as on 31 March 2026.
- List of approvals, permits, licenses and litigations for the SPVs as on 31 March 2026.
- Management has provided traffic consultant reports prepared by GMD Consultants for all SPVs dated February 2026. Management has confirmed that the traffic studies shared are the most recent studies available. Forecast revenue has been considered from the aforesaid traffic study reports for each of the SPVs. We have compared the revenue considered in the forecast model with the revenue forecasted in the traffic study reports and noted that the Management has considered the pessimistic revenue scenario in their forecast.
- Management has informed that O&M for the SPVs projects would be done by IRBIDL, project manager, based on fixed price project implementation agreement. O&M payments are fixed for the contract period of 10 years (till FY2032 for PDTPL & MBEL, FY2033 for IGEPL and STPL, FY2034 for ILTPL, IGTPL and IKTPL and till FY2030 for other SPVs other than MBEL) after which terms of the contract may get renegotiated upon renewal. Management has shared extract of the contract and we have validated forecasted periodic and routine maintenance expense for contract period from the same. For the forecast period post the contract period (i) routine maintenance has been increased by 2% to 5% annually for inflation and (ii) periodic maintenance has been considered based on the technical assessment of the Management. While the inflation considered is in line with long term inflation forecast for India, we have gone ahead with Management assumption on periodic maintenance. Given the technical nature of this study, review of the same is not part of our scope of work.

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Annexure 1: Sources of Information and Other Key Assumptions (2/3)

- We understand that CGTL and UTL have filed Writ petition with Hon'ble Rajasthan High Court with prayer to commence payment of premium to NHAI, six months post actual completion of the project construction work. The Hon'ble High Court prima facie agreed with the contention of the SPVs and have provided interim relief from payment of premium. The matter is currently under arbitration. Forecast provided is based on assumption that said relief will be granted to respective SPVs.
- The investment management fees is computed assuming 10% markup on the cost incurred by investment manager. The said expenses are projected to increase by 10% annually which is in line with agreement between the Trust and Investment Manager.
- Management represented that due to covid 19 the concession period end dates across all SPVs (besides PDTPL, IGEPL, STPL, ILTPL, IKTPL and IGTPL) increased by 90-139 days pursuant to notification no F.184/2020-PPD dated 13th May 2020 and Notification no. Covid-19/Roadmap/JS(H)/2020 dated 26th August 2021. Apart from this, concession period is increased for AETL due to demonetization and for SYTL and YATL due to Kannad Ghat crisis. Based on this representation from Management, we have considered extended concession period in our analysis.
- We understand that due to High Court Order, movement of commercial vehicles on certain sections of SYTL and YATL project roads have been restricted. Management expects the matter to be resolved in 2026 basis which it is anticipated that the diverted traffic would progressively come back on project stretch between FY27 and FY28.
- IHMTL, KGTL and KTL were transferred to IRB InvIT Fund, an infrastructure investment trust for which IRB is acting as Sponsor and the Project Manager, by the Trust on 6 November 2025 for a consideration and terms as agreed under the share purchase agreement dated 2 October 2025.
- We noted that other financial liabilities of INR 4,142.4 Cr and sub-debt of INR 1,188.67 Cr is outstanding in the consolidated financials of IRBI Trust, payable to IRBIDL as on 31 March 2026, which has not been considered as debt like in nature for the purpose of valuation analysis. We have been given to understand that SPVs have ongoing claims and litigations with NHAI for respective projects. IRBI Trust and its SPVs have entered into a debt novation agreement with IRBIDL pursuant to which any amount received by SPVs or Trust towards these NHAI claims will be paid to IRBIDL. Management has also confirmed that these claims and liabilities have no financial impact on the SPVs or the IRBI Trust and the claim amounts from NHAI are significantly higher than the liabilities recognized by the IRBI Trust. Based on the above, we have not considered any impact of these liabilities in our valuation analysis.
- Given the nature of the liability, capital creditors of INR 599 Cr outstanding in the books of the SPVs have been considered debt like in nature and adjusted from the Enterprise Value to arrive at the Equity Value of IRBI Trust.
- The Finance Bill, 2026 (presented on 1 February 2026) reduces the MAT rate from 15% to 14% and disallows any further MAT credit accrual under both regimes. Under the old regime, MAT paid will be treated as final tax with no additional credit accumulation. Under the new regime, however, unutilized MAT credit carried forward from the old regime can still be utilized. Such set-off is restricted to a maximum of 25% of the tax liability for the relevant year. Given different stages of operations and respective tax benefit availability, Management is still evaluating the option to migrate to the new tax regime for the SPVs at this stage and therefore timing of the transition to new tax regime will remain Managements option.
- For SYTL, the Independent Engineer appointed by NHAI, through its letter dated 14 January 2026, has recommended an extension of the concession period by 318 days in accordance with the traffic variation clause of the concession agreement.
- We understand that IRBI Trust received the Letter of Award (LoA) for the IHCPL on 14 November 2025 and for CBTPL on 6 January 2026. Subsequently, IRBI Trust incorporated IHCPL and CBTPL for undertaking respective projects. The IRBI Trust has paid INR 9,270 Cr for IHCPL and INR 3,087 Cr to NHAI as an upfront bid concession fee.

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Annexure 1: Sources of Information and Other Key Assumptions (3/3)

- Management of IRBI Trust is in discussion with lenders to reduce interest rate on borrowings from current 8.75 per cent to 7.95 per cent which is in line with rate offered to a similar AAA rated Infrastructure investment trust. Management expects to receive revision in interest rate during Q1FY27.
- Besides the above, there may be other information provided by the Management which may not have been perused by us in any detail, if not considered relevant for our defined scope.
- In addition to the above, we have also obtained such other information and explanations from the Management, either verbally or in written form, as were considered relevant for the purpose of the valuation. We had discussions with the key members of the Management, including Mr. Tushar Kawedia and Ms. Shilpa Todankar;
- The following external sources were used in the preparation of the report:
  - External databases such as Capital IQ etc.
  - Relevant information made available to us by Management at our request.
  - Publicly available information and secondary information.

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Annexure 2a: Non-Controlling Interest (NCI)

INR Crores	PDTPL	STPL	IGEPL	MBEL
Enterprise Value of the SPV	**2,523**	**1,582**	**17,208**	**8,393**
Add: Cash and cash equivalents	6	2	13	1
Add: Surplus Assets	61	12	30	-
Less: Debt & debt like items	(2,018)	(895)	(8,003)	(2,605)
Less: Sub debt	-	(127)	-	(7)
Less: Capital creditors	(29)	(315)	-	-
Equity Value of the SPV	**543**	**259**	**9,248**	**5,782**
No. of shares held by IRB/Anahera	50,000	50,000	50,000	104,517,000
Total shares	121,250,000	116,250,000	715,500,000	533,250,000
NCI	**0.2**	**0.1**	**0.6**	**1,133.2**

Basis above the value of Non –Controlling Interest is 1,134.2 Crore

Source(s): Management information, KVSL analysis

Source(s): Management information, KVSL analysis

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Annexure 2b: Investment Management Expenses

Present value of stand alone expenses pertaining to InvIT											
INR crores	FY2027 12 months	FY2028 12 months	FY2029 12 months	FY2030 12 months	FY2031 12 months	FY2032 12 months	FY2033 12 months	FY2034 12 months	FY2035 12 months	FY2036 12 months	FY2037 12 months
Trust expenses	14.3	15.7	17.3	19.0	20.9	23.0	25.3	27.8	30.6	33.7	37.0
Discounting period	0.500	1.500	2.500	3.500	4.500	5.500	6.500	7.500	8.500	9.500	10.500
Discount factor	0.956	0.875	0.801	0.732	0.670	0.613	0.561	0.513	0.469	0.429	0.393
Present value of cash flows	**13.7**	**13.7**	**13.8**	**13.9**	**14.0**	**14.1**	**14.2**	**14.3**	**14.4**	**14.5**	**14.6**

Present value of stand alone expenses pertaining to InvIT												
INR crores	FY2038 12 months	FY 2039 12 months	FY2040 12 months	FY2041 12 months	FY2042 12 months	FY2043 12 months	FY2044 12 months	FY2045 12 months	FY2046 12 months	FY2047 12 months	FY2048 12 months	FY2049 12 months
Trust expenses	40.7	44.8	49.3	54.2	59.7	65.6	72.2	79.4	87.3	96.1	105.7	116.2
Discounting period	11.500	12.500	13.500	14.500	15.500	16.500	17.500	18.500	19.500	20.500	21.500	22.500
Discount factor	0.359	0.329	0.301	0.275	0.252	0.230	0.211	0.193	0.176	0.161	0.148	0.135
Present value of cash flows	**14.6**	**14.7**	**14.8**	**14.9**	**15.0**	**15.1**	**15.2**	**15.3**	**15.4**	**15.5**	**15.6**	**15.7**

Present value of stand alone expenses pertaining to InvIT										
INR crores	FY2050 12 months	FY2051 12 months	FY2052 12 months	FY2053 12 months	FY2054 12 months	FY2055 12 months	FY2056 12 months	FY2057 12 months	FY2058 12 months	FY2059 6 months
Trust expenses	127.9	140.7	154.7	170.2	187.2	205.9	226.5	249.2	274.1	159.1
Discounting period	23.500	24.500	25.500	26.500	27.500	28.500	29.500	30.500	31.500	32.264
Discount factor	0.124	0.113	0.103	0.095	0.087	0.079	0.072	0.066	0.061	0.057
Present value of cash flows	**15.8**	**15.9**	**16.0**	**16.1**	**16.2**	**16.3**	**16.4**	**16.5**	**16.6**	**9.0**

Valuation conclusion	
Present value of cash flows (INR Crores)	492
WACC	***9.31%***

The investment management fees have been forecasted to increase by 10% each year. Management represented that the fees is computed as cost incurred by investment manager +10% markup. We have relied on Management representation for the same.

Source(s): Management information, KVSL analysis

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Annexure 2c: Revenue - IWTL

Revenue Breakup												
INR crores	FY2027 12 months	FY2028 12 months	FY2029 12 months	FY2030 12 months	FY2031 12 months	FY2032 12 months	FY2033 12 months	FY2034 12 months	FY2035 12 months	FY2036 12 months	FY2037 12 months	FY2038 12 months
Toll Revenue	165	184	206	231	256	285	314	349	386	429	474	524
Less: premium payment to NHAI	-	-	-	-	-	-	-	-	-	-	-	-
Other operating income	0	0	0	1	1	1	1	1	1	1	1	1
Total revenue	**166**	**185**	**206**	**231**	**257**	**285**	**315**	**349**	**387**	**429**	**475**	**525**

Revenue Breakup										
INR crores	FY2039 12 months	FY2040 12 months	FY2041 12 months	FY2042 12 months	FY2043 12 months	FY2044 12 months	FY2045 12 months	FY2046 12 months	FY2047 12 months	FY2048 10 months
Toll Revenue	580	645	713	791	876	975	1,079	1,194	1,323	1,251
Less: premium payment to NHAI	-	-	-	-	-	-	-	-	-	-
Other operating income	1	1	2	2	2	2	3	3	3	3
Total revenue	**581**	**646**	**714**	**793**	**878**	**978**	**1,082**	**1,197**	**1,326**	**1,254**

Source(s): Management information

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Annexure 2c: Revenue - SYTL

Revenue Breakup												
INR crores	FY2027 12 months	FY2028 12 months	FY2029 12 months	FY2030 12 months	FY2031 12 months	FY2032 12 months	FY2033 12 months	FY2034 12 months	FY2035 12 months	FY2036 12 months	FY2037 12 months	FY2038 12 months
Toll Revenue	179	196	211	231	253	278	303	331	361	393	428	466
Less: premium payment to NHAI	-	-	-	-	-	-	-	-	-	-	-	-
Other operating income	1	0	1	1	1	1	1	1	1	1	1	1
Total revenue	**180**	**196**	**212**	**231**	**253**	**278**	**304**	**332**	**362**	**394**	**429**	**467**

Revenue Breakup							
INR crores	FY2039 12 months	FY2040 12 months	FY2041 12 months	FY2042 12 months	FY2043 12 months	FY2044 12 months	FY2045 12 months
Toll Revenue	511	557	604	659	714	783	841
Less: premium payment to NHAI	-	-	-	-	-	-	-
Other operating income	2	2	2	2	2	3	0
Total revenue	**512**	**559**	**606**	**661**	**716**	**786**	**841**

Source(s): Management information

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Annexure 2c: Revenue - YATL

Revenue Breakup												
INR crores	FY2027 12 months	FY2028 12 months	FY2029 12 months	FY2030 12 months	FY2031 12 months	FY2032 12 months	FY2033 12 months	FY2034 12 months	FY2035 12 months	FY2036 12 months	FY2037 12 months	FY2038 12 months
Toll Revenue	329	359	390	422	457	495	532	576	624	675	724	782
Less: premium payment to NHAI	-	-	-	-	-	-	-	-	-	-	-	-
Other operating income	3	2	1	1	1	1	2	2	2	2	2	2
Total revenue	**332**	**361**	**391**	**423**	**458**	**496**	**534**	**578**	**626**	**677**	**726**	**784**

Revenue Breakup									
INR crores	FY2039 12 months	FY2040 12 months	FY2041 12 months	FY2042 12 months	FY2043 12 months	FY2044 12 months	FY2045 12 months	FY2046 12 months	FY2047 2 months
Toll Revenue	846	916	987	1,065	1,152	1,249	1,347	1,451	198
Less: premium payment to NHAI	-	-	-	-	-	-	-	-	-
Other operating income	3	3	3	3	4	4	4	5	1
Total revenue	**848**	**918**	**990**	**1,068**	**1,155**	**1,253**	**1,351**	**1,456**	**198**

Source(s): Management information

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Annexure 2c: Revenue - AETL

Revenue Breakup												
INR crores	FY2027 12 months	FY2028 12 months	FY2029 12 months	FY2030 12 months	FY2031 12 months	FY2032 12 months	FY2033 12 months	FY2034 12 months	FY2035 12 months	FY2036 12 months	FY2037 12 months	FY2038 12 months
Toll Revenue	313	350	387	432	480	537	597	665	741	820	900	996
Less: premium payment to NHAI	(132)	(139)	(145)	(153)	(160)	(169)	(177)	(186)	(195)	(205)	(215)	(226)
Other operating income	1	1	1	1	1	1	1	1	2	2	2	2
Total revenue	**182**	**212**	**243**	**280**	**321**	**369**	**421**	**480**	**548**	**616**	**687**	**772**

Revenue Breakup								
INR crores	FY2039 12 months	FY2040 12 months	FY2041 12 months	FY2042 12 months	FY2043 12 months	FY2044 12 months	FY2045 12 months	FY2046 7 months
Toll Revenue	1,098	1,216	1,328	1,453	1,586	1,748	1,907	1,206
Less: premium payment to NHAI	(237)	(249)	(261)	(274)	(288)	(303)	(317)	(194)
Other operating income	2	3	3	3	3	4	4	3
Total revenue	**863**	**970**	**1,070**	**1,182**	**1,302**	**1,449**	**1,594**	**1,015**

Source(s): Management information

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Annexure 2c: Revenue - UTL

Revenue Breakup												
INR crores	FY2027 12 months	FY2028 12 months	FY2029 12 months	FY2030 12 months	FY2031 12 months	FY2032 12 months	FY2033 12 months	FY2034 12 months	FY2035 12 months	FY2036 12 months	FY2037 12 months	FY2038 12 months
Toll Revenue	369	407	448	495	543	597	655	720	790	867	946	1,035
Less: premium payment to NHAI	(190)	(196)	(211)	(228)	(246)	(267)	(287)	(310)	(335)	(363)	(391)	(422)
Other operating income	3	3	1	1	1	1	1	2	2	2	2	2
Total revenue	**182**	**214**	**238**	**268**	**298**	**331**	**370**	**412**	**456**	**507**	**558**	**615**

Revenue Breakup					
INR crores	FY2039 12 months	FY2040 12 months	FY2041 12 months	FY2042 12 months	FY2043 11 months
Toll Revenue	1,133	1,243	1,350	1,471	1,469
Less: premium payment to NHAI	(456)	(494)	(532)	(574)	(568)
Other operating income	3	3	3	3	3
Total revenue	**680**	**752**	**822**	**900**	**904**

Source(s): Management information

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Annexure 2c: Revenue - CGTL

Revenue Breakup												
INR crores	FY2027 12 months	FY2028 12 months	FY2029 12 months	FY2030 12 months	FY2031 12 months	FY2032 12 months	FY2033 12 months	FY2034 12 months	FY2035 12 months	FY2036 12 months	FY2037 12 months	FY2038 12 months
Toll Revenue	460	506	554	607	663	727	794	866	945	1,033	1,122	1,219
Less: premium payment to NHAI	(265)	(274)	(295)	(318)	(344)	(372)	(401)	(433)	(467)	(506)	(545)	(589)
Other operating income	3	4	1	1	1	2	2	2	2	2	3	3
Total revenue	**198**	**236**	**260**	**291**	**321**	**356**	**395**	**435**	**480**	**529**	**579**	**633**

Revenue Breakup				
INR crores	FY2039 12 months	FY2040 12 months	FY2041 12 months	FY2042 11 months
Toll Revenue	1,330	1,452	1,519	1,508
Less: premium payment to NHAI	(636)	(689)	(742)	(733)
Other operating income	3	3	4	4
Total revenue	**697**	**767**	**781**	**779**

Source(s): Management information

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Annexure 2c: Revenue - PDTL

Revenue Breakup													
INR crores	FY2027 12 months	FY2028 12 months	FY2029 12 months	FY2030 12 months	FY2031 12 months	FY2032 12 months	FY2033 12 months	FY2034 12 months	FY2035 12 months	FY2036 12 months	FY2037 12 months	FY2038 12 months	FY2039 0 months
Toll Revenue	347	393	432	476	521	570	618	675	739	799	866	938	20
Less: premium payment to NHAI	(38)	(45)	(54)	(65)	(76)	(89)	(102)	(119)	(137)	(156)	(178)	(202)	(4)
Other operating income	1	1	1	1	1	1	1	1	1	2	2	2	2
Total revenue	**310**	**349**	**379**	**413**	**446**	**483**	**517**	**558**	**604**	**645**	**689**	**738**	**17**

Source(s): Management information

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Annexure 2c: Revenue - IGEPL

Revenue Breakup												
INR crores	FY2027 12 months	FY2028 12 months	FY2029 12 months	FY2030 12 months	FY2031 12 months	FY2032 12 months	FY2033 12 months	FY2034 12 months	FY2035 12 months	FY2036 12 months	FY2037 12 months	FY2038 12 months
Toll Revenue	1,006	1,118	1,227	1,357	1,496	1,654	1,829	1,984	2,175	2,369	2,588	2,834
Less: premium payment to NHAI	-	-	-	-	-	-	-	-	-	-	-	-
Other operating income	2	2	3	3	3	3	4	4	5	5	5	6
Total revenue	**1,008**	**1,120**	**1,230**	**1,360**	**1,499**	**1,657**	**1,833**	**1,988**	**2,179**	**2,374**	**2,594**	**2,840**

Revenue Breakup												
INR crores	FY2039 12 months	FY2040 12 months	FY2041 12 months	FY2042 12 months	FY2043 12 months	FY2044 12 months	FY2045 12 months	FY2046 12 months	FY2047 12 months	FY2048 12 months	FY2049 12 months	FY2050 12 months
Toll Revenue	3,060	3,340	3,620	3,937	4,277	4,636	5,006	5,418	5,881	6,385	6,861	7,416
Less: premium payment to NHAI	-	-	-	-	-	-	-	-	-	-	-	-
Other operating income	6	7	8	8	9	10	10	11	12	13	14	15
Total revenue	**3,066**	**3,347**	**3,627**	**3,946**	**4,286**	**4,645**	**5,017**	**5,430**	**5,893**	**6,399**	**6,875**	**7,432**

Revenue Breakup				
INR crores	FY2051 12 months	FY2052 12 months	FY2053 12 months	FY2054 4 months
Toll Revenue	7,990	8,657	9,308	3,667
Less: premium payment to NHAI	-	-	-	-
Other operating income	17	18	19	8
Total revenue	**8,007**	**8,675**	**9,328**	**3,675**

Source(s): Management information

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Annexure 2c: Revenue - STPL

Revenue Breakup												
INR crores	FY2027 12 months	FY2028 12 months	FY2029 12 months	FY2030 12 months	FY2031 12 months	FY2032 12 months	FY2033 12 months	FY2034 12 months	FY2035 12 months	FY2036 12 months	FY2037 12 months	FY2038 12 months
Toll Revenue	195	310	345	384	427	477	530	583	644	714	787	870
Less: premium payment to NHAI	-	(133)	(151)	(172)	(196)	(223)	(253)	(285)	(321)	(363)	(408)	(460)
Other operating income	0	1	1	1	1	1	1	1	1	1	2	2
Total revenue	**195**	**178**	**194**	**213**	**232**	**255**	**277**	**300**	**324**	**353**	**380**	**412**

Revenue Breakup								
INR crores	FY2039 12 months	FY2040 12 months	FY2041 12 months	FY2042 12 months	FY2043 12 months	FY2044 12 months	FY2045 12 months	FY2046 0 months
Toll Revenue	956	1,053	1,157	1,270	1,397	1,541	1,688	15
Less: premium payment to NHAI	(514)	(578)	(646)	(722)	(808)	(907)	(993)	(9)
Other operating income	2	2	2	2	3	3	3	3
Total revenue	**443**	**478**	**513**	**551**	**592**	**637**	**698**	**9**

Source(s): Management information

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Annexure 2c: Revenue - GJTL

Revenue Breakup												
INR crores	FY2027 12 months	FY2028 12 months	FY2029 12 months	FY2030 12 months	FY2031 12 months	FY2032 12 months	FY2033 12 months	FY2034 12 months	FY2035 12 months	FY2036 12 months	FY2037 12 months	FY2038 12 months
Toll Revenue	147	163	178	194	211	230	250	272	292	316	340	366
Less: premium payment to NHAI	-	-	-	-	-	-	-	-	-	-	-	-
Other operating income	2	2	0	0	0	1	1	1	1	1	1	1
Total revenue	**149**	**165**	**178**	**195**	**212**	**231**	**250**	**273**	**293**	**317**	**341**	**366**

Revenue Breakup						
INR crores	FY2039 12 months	FY2040 12 months	FY2041 12 months	FY2042 12 months	FY2043 12 months	FY2044 12 months
Toll Revenue	394	424	455	487	525	566
Less: premium payment to NHAI	-	-	-	-	-	-
Other operating income	1	1	1	1	1	1
Total revenue	**394**	**425**	**456**	**489**	**526**	**568**

Source(s): Management information

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Annexure 2c: Revenue - ILTPL

Revenue Breakup												
INR crores	FY2027 12 months	FY2028 12 months	FY2029 12 months	FY2030 12 months	FY2031 12 months	FY2032 12 months	FY2033 12 months	FY2034 12 months	FY2035 12 months	FY2036 12 months	FY2037 12 months	FY2038 12 months
Toll Revenue	490	537	585	637	694	759	824	898	967	1,045	1,123	1,211
Less: premium payment to NHAI	-	-	-	-	-	-	-	-	-	-	-	-
Other operating income	9	9	1	1	2	2	2	2	2	2	3	3
Total revenue	**499**	**546**	**586**	**638**	**695**	**761**	**826**	**900**	**969**	**1,047**	**1,126**	**1,213**

Revenue Breakup						
INR crores	FY2039 12 months	FY2040 12 months	FY2041 12 months	FY2042 12 months	FY2043 12 months	FY2044 12 months
Toll Revenue	1,304	1,402	1,502	1,612	1,730	1,865
Less: premium payment to NHAI	-	-	-	-	-	-
Other operating income	3	3	3	4	4	4
Total revenue	**1,307**	**1,406**	**1,506**	**1,616**	**1,734**	**1,869**

Source(s): Management information

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Annexure 2c: Revenue - KBTL

Revenue Breakup												
INR crores	FY2027 12 months	FY2028 12 months	FY2029 12 months	FY2030 12 months	FY2031 12 months	FY2032 12 months	FY2033 12 months	FY2034 12 months	FY2035 12 months	FY2036 12 months	FY2037 12 months	FY2038 12 months
Toll Revenue	85	94	103	112	122	133	144	158	170	185	199	214
Less: premium payment to NHAI	-	-	-	-	-	-	-	-	-	-	-	-
Other operating income	1	1	0	0	0	0	0	0	0	0	0	1
Total revenue	**86**	**96**	**104**	**112**	**123**	**134**	**145**	**158**	**170**	**185**	**199**	**214**

Revenue Breakup						
INR crores	FY2039 12 months	FY2040 12 months	FY2041 12 months	FY2042 12 months	FY2043 12 months	FY2044 12 months
Toll Revenue	233	250	268	290	313	336
Less: premium payment to NHAI	-	-	-	-	-	-
Other operating income	1	1	1	1	1	0
Total revenue	**233**	**251**	**269**	**290**	**314**	**337**

Source(s): Management information

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Annexure 2c: Revenue - MBEL

Revenue Breakup												
INR crores	FY2027 12 months	FY2028 12 months	FY2029 12 months	FY2030 12 months	FY2031 12 months	FY2032 12 months	FY2033 12 months	FY2034 12 months	FY2035 12 months	FY2036 12 months	FY2037 12 months	FY2038 12 months
Toll Revenue	288	350	511	560	607	663	724	791	869	952	1,039	1,136
Less: premium payment to NHAI	-	-	-	-	-	-	-	-	-	-	-	-
Other operating income	7	6	1	1	1	1	1	1	1	1	2	2
Total revenue	**295**	**356**	**512**	**561**	**608**	**664**	**725**	**792**	**870**	**954**	**1,041**	**1,138**

Revenue Breakup												
INR crores	FY2039 12 months	FY2040 12 months	FY2041 12 months	FY2042 12 months	FY2043 12 months	FY2044 12 months	FY2045 12 months	FY2046 12 months	FY2047 12 months	FY2048 12 months	FY2049 12 months	FY2050 12 months
Toll Revenue	1,241	1,362	1,471	1,594	1,718	1,858	2,001	2,149	2,307	2,487	2,665	2,864
Less: premium payment to NHAI	-	-	-	-	-	-	-	-	-	-	-	-
Other operating income	2	2	2	2	2	3	3	3	3	3	4	4
Total revenue	**1,243**	**1,364**	**1,473**	**1,596**	**1,721**	**1,861**	**2,004**	**2,152**	**2,310**	**2,490**	**2,669**	**2,867**

Revenue Breakup									
INR crores	FY2051 12 months	FY2052 12 months	FY2053 12 months	FY2054 12 months	FY2055 12 months	FY2056 12 months	FY2057 12 months	FY2058 12 months	FY2059 6 months
Toll Revenue	3,074	3,303	3,536	3,795	4,066	4,370	4,670	5,004	2,837
Less: premium payment to NHAI	-	-	-	-	-	-	-	-	-
Other operating income	4	4	5	5	5	6	6	6	4
Total revenue	**3,078**	**3,307**	**3,540**	**3,800**	**4,072**	**4,376**	**4,676**	**5,010**	**2,841**

Source(s): Management information

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Annexure 2c: Revenue - IHCPL

Revenue Breakup												
INR crores	FY2027 12 months	FY2028 12 months	FY2029 12 months	FY2030 12 months	FY2031 12 months	FY2032 12 months	FY2033 12 months	FY2034 12 months	FY2035 12 months	FY2036 12 months	FY2037 12 months	FY2038 12 months
Toll Revenue	735	811	895	987	1,087	1,198	1,313	1,447	1,590	1,742	1,908	2,085
Less: premium payment to NHAI	-	-	-	-	-	-	-	-	-	-	-	-
Other operating income	7	7	1	1	1	1	1	1	1	1	2	2
Total revenue	**743**	**819**	**895**	**987**	**1,088**	**1,199**	**1,314**	**1,449**	**1,591**	**1,744**	**1,909**	**2,087**

Revenue Breakup									
INR crores	FY2039 12 months	FY2040 12 months	FY2041 12 months	FY2042 12 months	FY2043 12 months	FY2044 12 months	FY2045 12 months	FY2046 12 months	FY2047 12 months
Toll Revenue	2,287	2,510	2,728	2,972	3,246	3,546	3,862	3,419	286
Less: premium payment to NHAI	-	-	-	-	-	-	-	-	-
Other operating income	2	2	2	2	2	3	3	3	-
Total revenue	**2,289**	**2,512**	**2,730**	**2,975**	**3,248**	**3,548**	**3,865**	**3,422**	**286**

Source(s): Management information

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Annexure 2c: Revenue - CBTPL

Revenue Breakup												
INR crores	FY2027 12 months	FY2028 12 months	FY2029 12 months	FY2030 12 months	FY2031 12 months	FY2032 12 months	FY2033 12 months	FY2034 12 months	FY2035 12 months	FY2036 12 months	FY2037 12 months	FY2038 12 months
Toll Revenue	272	299	321	352	386	425	463	507	555	610	664	725
Less: premium payment to NHAI	-	-	-	-	-	-	-	-	-	-	-	-
Other operating income	7	7	1	1	1	1	1	1	1	1	2	2
Total revenue	**279**	**306**	**322**	**353**	**387**	**426**	**464**	**508**	**557**	**611**	**665**	**726**

Revenue Breakup								
INR crores	FY2039 12 months	FY2040 12 months	FY2041 12 months	FY2042 12 months	FY2043 12 months	FY2044 12 months	FY2045 12 months	FY2046 12 months
Toll Revenue	793	868	946	1,028	1,117	1,219	1,325	150
Less: premium payment to NHAI	-	-	-	-	-	-	-	-
Other operating income	2	2	2	2	2	3	3	-
Total revenue	**795**	**869**	**948**	**1,030**	**1,120**	**1,221**	**1,328**	**150**

Source(s): Management information

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Annexure 3: Other disclosures as required under SEBI InvIT Regulations

The following disclosures are as on 31 March 2026 for the SPVs

1. **Valuation of the project in the previous 3 years:** Refer annexure 4a for the aforementioned information.
2. **List of one-time sanctions/approvals which are obtained or pending/ List of up to date/overdue periodic clearances:** Refer annexure 4b for the aforementioned information.
3. **Estimates of already carried as well as proposed major repairs and improvements along with estimated time of completion:** Refer annexure 4c for the aforementioned information.
4. **Purchase price of the project by the InvIT:** Refer annexure 4d for the aforementioned information.
5. **On-going and closed material litigations including tax disputes in relation to the assets, if any:** Management represented that there are no on-going and closed material litigations in PDTPL, STPL, IKTPL, IGTPL, MBEL, IHCPL and CBTPL and ILTPL. Refer annexure 4e for the aforementioned information for other SPVs.
6. **Statement of assets**: Refer annexure 4f for the aforementioned information.
7. **Revenue pendencies including local authority taxes associated with InvIT asset and compounding charges, if any:** Management represented that there are no revenue pendencies including local authority taxes and compounding charges with respect to the 15 SPVs.
8. **Vulnerability to natural or induced hazards that may not have been covered in town planning/ building control:** Management represented that there are no such natural or induced hazards which have been not considered in town planning/building control with respect to the 15 SPVs.
9. **Latest pictures of the SPVs:** Refer annexure 4g for the aforementioned information
10. **Date of site inspection**: During the month of December 2025 to April 2026.
11. **In term of the SEBI InvIT Regulations, we hereby confirm that:**

- We are competent to undertake the valuation.
- We are independent and have prepared this Report on fair and unbiased basis.
- The Valuation has been performed as per internationally accepted valuation methodologies and in cognizance of international valuation standards and ICAI Valuation Standards 2018 issued by the Institute of Chartered Accountants of India.
- KVSL is not affiliated to the Client in any manner whatsoever. Further KVSL does not have a prospective interest in the Targets which is the subject of this Valuation and KVSL's fee is not contingent on an action or event resulting from the analysis, opinions or conclusions in the Valuation.

12. **Valuer profile:** Refer annexure 4h valuer profile

KVSL has not independently verified the documents related to disclosures mentioned in the annexures other than annexure 4h and have relied on Management representation for the same.

Source(s): Management information, KVSL analysis

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Annexure 4a: Valuation of the projects in the previous 3 years

Valuation Conclusion - Enterprise Value											
INR Crore											
Name of the SPV	Mar-26	Dec-25	Sep-25	Jun-25	Mar-25	Dec-24	Sep-24	Mar-24	Dec-23/ Jan-24	Sep-23	Mar-23
IRB Westcoast Tollway Limited	3,049	3,002	2,993	3,072	3,037	3,034	3,255	3,435	3,392	3,741	3,640
Solapur Yedeshi Tollway Limited	2,354	2,940	2,760	3,009	2,969	2,992	2,884	2,610	2,652	2,403	2,373
Yedeshi Aurangabad Tollway Limited	4,480	5,362	5,293	5,852	5,766	5,726	5,289	4,396	4,411	4,216	4,177
AE Tollway Limited	3,557	3,489	3,453	3,597	3,549	3,374	3,441	3,552	3,509	3,259	3,183
Udaipur Tollway Limited	2,460	2,788	2,716	3,009	2,961	2,852	2,650	2,647	2,663	2,673	2,607
CG Tollway Limited	2,309	2,788	2,732	2,713	2,671	2,693	2,750	2,827	2,854	2,803	2,744
Palsit Dankuni Tollway Private Limited	2,523	2,630	2,576	2,384	2,274	2,028	2,003	1,795	1,662	1,576	1,095
IRB Golconda Expressway Private Limited	17,208	17,577	17,297	16,010	15,857	16,178	15,803	14,428	14,025	12,682	NA
Samakhiyali Tollway Private Limited	1,582	1,402	916	960	694	669	715	497	365	NA	NA
Lalitpur Tollway Private Limited	5,832	5,796	5,748	6,096	6,114	5,976	5,874	4,988	222	NA	NA
IRB Kota Tollway Private Limited	941	938	929	995	985	971	926	719	149	NA	NA
IRB Gwalior Tollway Private Limited	1,620	1,661	1,651	1,662	1,657	1,658	1,537	1,342	90	NA	NA
Meerut Buadun Expressway Limited	8,393	6,007	5,580	4,808	4,686	4,454	3,955	NA	NA	NA	NA
IRB Harihara Corridors Private Limited	10,189	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA
IRB Chandibhadra Tollway Private Limited	3,547	NA	NA	NA	NA	NA	NA	NA	NA	NA	NA

Note: Enterprise Valuation of SPVs has been presented in the above table
Source(s): Company website and Management Information

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Annexure 4b: One-time sanctions and approvals and overdue periodic clearances (1/5)

Sr. No.	Description	Remarks
IRB Westcoast Tollway Limited		
A	Permission of State government for extraction of boulders from quarry.	Received
B	Permission of Village Panchayat & Pollution control board for installation of crushers	Received
C	License for use of explosives.	Received
D	Permission of state government for drawing water from Rivers & reservoir	Not Applicable
E	License from Inspector of factories or competent authorities for setting up Batching Plant.	Received
F	Clearance from Pollution control board for Setting up Batching Plant	Received
G	Permission of Village Panchayat & Pollution control board for Asphalt Plant	Received
H	Permission of Village Panchayat & State government for Borrow earth	Received
I	Permission of State Government for Cutting of trees	Received
J	Any other permits or clearance required under applicable Laws	Labour License taken

Sr. No.	Description	Remarks
Palsit Dankuni Private Tollway Limited		
A	Permission of the State Government for extraction of boulder from quarry.	Applied
B	Permission of Village Panchayat and Pollution Control Board for installation of crusher;	Applied
C	License for use of explosives	Applied
D	Permission of state government for drawing water from river/reservoir	Not Applicable
E	License from the inspector of factories or other competent authority for setting up Batching plant.	Received
F	Clearance of Pollution Control Board for setting up Batching Plant;	Received
G	Clearance of Village Panchayats and Pollution Control Board for Asphalt Plant	Received
H	Permission of Village Panchayat and State Government for borrow areas	Received
I	Permission of State Government for cutting of trees	Received
J	Any other permits or clearances required under Applicable Laws	Labour License taken.

Source(s): Management information

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Annexure 4b: One-time sanctions and approvals and overdue periodic clearances (2/5)

Sr. No.	Description	Remarks
Samakhiyali Tollway Private Limited		
A	Permission of the State Government for extraction of boulder from quarry.	Received
B	Permission of Village Panchayat and Pollution Control Board for installation of crusher;	Received
C	License for use of explosives	Received
D	Permission of state government for drawing water from river/reservoir	Not Applicable
E	License from the inspector of factories or other competent authority for setting up Batching plant.	Received
F	Clearance of Pollution Control Board for setting up Batching Plant;	Received
G	Clearance of Village Panchayats and Pollution Control Board for Asphalt Plant	Received
H	Permission of Village Panchayat and State Government for borrow areas	Received
I	Permission of State Government for cutting of trees	Received
J	Any other permits or clearances required under Applicable Laws	Labour License taken.

Sr. No.	Description	Remarks
IRB Gwalior Tollway Private Limited		
A	Permission of the State Government for extraction of boulder from quarry.	Not Applicable
B	Permission of Village Panchayat and Pollution Control Board for installation of crusher;	Not Applicable
C	License for use of explosives	Not Required
D	Permission of state government for drawing water from river/reservoir	The SPV is in process of identifying land for plant set-up and borrow areas. Once identified, Applicable permits and Clearances shall be obtained.
E	License from the inspector of factories or other competent authority for setting up Batching plant.	
F	Clearance of Pollution Control Board for setting up Batching Plant;	
G	Clearance of Village Panchayats and Pollution Control Board for Asphalt Plant	
H	Permission of Village Panchayat and State Government for borrow areas	
I	Permission of State Government for cutting of trees	Not Required
J	Any other permits or clearances required under Applicable Laws	Not Applicable

Source(s): Management information

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Annexure 4b: One-time sanctions and approvals and overdue periodic clearances (3/5)

Sr. No.	Description	Remarks
IRB Lalitpur Tollway Private Limited		
A	Permission of the State Government for extraction of boulder from quarry.	Not Applicable
B	Permission of Village Panchayat and Pollution Control Board for installation of crusher;	Not Applicable
C	License for use of explosives	Not Required
D	Permission of state government for drawing water from river/reservoir	The SPV is in process of identifying land for plant set-up and borrow areas. Once identified, Applicable permits and Clearances shall be obtained.
E	License from the inspector of factories or other competent authority for setting up Batching plant.	
F	Clearance of Pollution Control Board for setting up Batching Plant;	
G	Clearance of Village Panchayats and Pollution Control Board for Asphalt Plant	
H	Permission of Village Panchayat and State Government for borrow areas	
I	Permission of State Government for cutting of trees	Not Required
J	Any other permits or clearances required under Applicable Laws	Not Applicable

Sr. No.	Description	Remarks
IRB Kota Tollway Private Limited		
A	Permission of the State Government for extraction of boulder from quarry.	Not Applicable
B	Permission of Village Panchayat and Pollution Control Board for installation of crusher;	Not Applicable
C	License for use of explosives	Not Required
D	Permission of state government for drawing water from river/reservoir	The SPV is in process of identifying land for plant set-up and borrow areas. Once identified, Applicable permits and Clearances shall be obtained.
E	License from the inspector of factories or other competent authority for setting up Batching plant.	
F	Clearance of Pollution Control Board for setting up Batching Plant;	
G	Clearance of Village Panchayats and Pollution Control Board for Asphalt Plant	
H	Permission of Village Panchayat and State Government for borrow areas	
I	Permission of State Government for cutting of trees	Not Required
J	Any other permits or clearances required under Applicable Laws	Not Applicable

Source(s): Management information

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Annexure 4b: One-time sanctions and approvals and overdue periodic clearances (4/5)

Sr. No.	Description	Remarks
Meerut Budaun Expressway Limited		
A	Permission of the State Government for extraction of boulder from quarry.	Received
B	Permission of Village Panchayat and Pollution Control Board for installation of crusher;	Received
C	License for use of explosives	Received
D	Permission of state government for drawing water from river/reservoir	Not Applicable
E	License from the inspector of factories or other competent authority for setting up Batching plant.	Received
F	Clearance of Pollution Control Board for setting up Batching Plant;	Received
G	Clearance of Village Panchayats and Pollution Control Board for Asphalt Plant	Received
H	Permission of Village Panchayat and State Government for borrow earth	Received
I	Permission of State Government for cutting of trees	Received
J	Any other permits or clearances required under Applicable Laws	Received

Sr. No.	Description	Remarks
IRB Harihara Corridors Private Limited		
A	Permission of the State Government for extraction of boulder from quarry.	Not Applicable
B	Permission of Village Panchayat and Pollution Control Board for installation of crusher;	Not Applicable
C	License for use of explosives	Not Applicable
D	Permission of state government for drawing water from river/ reservoir	Not Applicable
E	License from the inspector of factories or other competent authority for setting up Batching plant.	Not Applicable
F	Clearance of Pollution Control Board for setting up Batching Plant;	Not Applicable
G	Clearance of Village Panchayats and Pollution Control Board for Asphalt Plant	Not Applicable
H	Permission of Village Panchayat and State Government for borrow areas	Not Applicable
I	Permission of State Government for cutting of trees	Under process
J	Any other permits or clearances required under Applicable Laws	Labour License taken.

Source(s): Management information

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Annexure 4b: One-time sanctions and approvals and overdue periodic clearances (5/5)

Sr. No.	Description	Remarks
IRB Chandibhadra Tollway Private Limited		
A	Permission of the State Government for extraction of boulder from quarry.	Not Applicable
B	Permission of Village Panchayat and Pollution Control Board for installation of crusher;	Not Applicable
C	License for use of explosives	Not Applicable
D	Permission of state government for drawing water from river/reservoir	Not Applicable
E	License from the inspector of factories or other competent authority for setting up Batching plant.	Not Applicable
F	Clearance of Pollution Control Board for setting up Batching Plant;	Not Applicable
G	Clearance of Village Panchayats and Pollution Control Board for Asphalt Plant	Not Applicable
H	Permission of Village Panchayat and State Government for borrow areas	Not Applicable
I	Permission of State Government for cutting of trees	Not Applicable
J	Any other permits or clearances required under Applicable Laws	Labour License Applied

The information has been represented by the Management. The above disclosure is not required in case of SYTL, YATL, AETL, UTL, CGTL, and IGEPL since the projects have received COD.

Source(s): Management information

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Annexure 4c: Estimates of already carried as well as proposed major repairs and improvements (1/4)

Estimates of already carried out as well as proposed major repairs and improvements									
INR Crore									
Name of the SPV	**FY 2023**	**FY 2024**	**FY 2025**	**FY 2026**	**FY 2027**	**FY 2028**	**FY 2029**	**FY 2030**	**FY 2031**
IRB Westcoast Tollway Limited	40	41	42	-	1	-	111	41	-
Solapur Yedeshi Tollway Limited	-	-	18	19	20	-	-	-	-
Yedeshi Aurangabad Tollway Limited	-	-	29	31	32	-	-	-	-
AE Tollway Limited	-	37	39	41	-	-	-	-	123
Udaipur Tollway Limited	-	57	69	76	4	-	120	125	127
CG Tollway Limited	-	-	27	28	30	-	-	-	86
Palsit Dankuni Private Tollway Limited	-	-	-	-	-	-	55	61	57
IRB Golconda Expressway Private Limited	-	-	-	-	-	-	161	161	161
Samakhiyali Tollway Private Limited	-	-	-	-	0.2	-	-	-	-
IRB Lalitpur Tollway Private Limited	-	-	-	-	-	-	66	69	72
IRB Kota Tollway Private Limited	-	-	2	-	-	-	8	8	-
IRB Gwalior Tollway Private Limited	-	-	0.3	-	11	22	23	36	52
Meerut Budaun Expressway Limited	-	-	-	0.2	-	-	-	-	85
IRB Harihara Corridors Private Limited	-	-	-	-	-	-	-	-	151
IRB Chandibhadra Tollway Private Limited	-	-	-	-	0.2	-	-	-	-

Source(s): Management information

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Annexure 4c: Estimates of already carried as well as proposed major repairs and improvements (2/4)

Estimates of already carried out as well as proposed major repairs and improvements									
INR Crore									
Name of the SPV	**FY 2032**	**FY 2033**	**FY 2034**	**FY 2035**	**FY 2036**	**FY 2037**	**FY 2038**	**FY 2039**	**FY 2040**
IRB Westcoast Tollway Limited	-	2	12	166	2	-	-	148	53
Solapur Yedeshi Tollway Limited	-	61	64	67	-	-	-	-	-
Yedeshi Aurangabad Tollway Limited	-	110	115	121	-	-	-	-	60
AE Tollway Limited	130	135	-	-	-	-	73	77	81
Udaipur Tollway Limited	5	-	86	91	119	-	-	-	-
CG Tollway Limited	91	95	-	9	46	48	51	-	-
Palsit Dankuni Private Tollway Limited	-	-	-	-	80	71	80	-	-
IRB Golconda Expressway Private Limited	161	-	-	386	387	386	386	-	-
Samakhiyali Tollway Private Limited	36	37	38	-	-	-	-	-	43
IRB Lalitpur Tollway Private Limited	75	78	-	-	117	121	124	128	132
IRB Kota Tollway Private Limited	-	-	19	19	-	-	-	11	12
IRB Gwalior Tollway Private Limited	-	-	11	21	22	35	50	-	-
Meerut Budaun Expressway Limited	88	91	-	-	-	-	-	109	112
IRB Harihara Corridors Private Limited	246	118	-	84	52	149	282	133	-
IRB Chandibhadra Tollway Private Limited	-	0.3	-	-	-	-	167	167	167

Source(s): Management information

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Annexure 4c: Estimates of already carried as well as proposed major repairs and improvements (3/4)

Estimates of already carried out as well as proposed major repairs and improvements									
INR Crore									
Name of the SPV	**FY 2041**	**FY 2042**	**FY 2043**	**FY 2044**	**FY 2045**	**FY 2046**	**FY 2047**	**FY 2048**	**FY 2049**
IRB Westcoast Tollway Limited	-	-	-	-	-	-	-	-	-
Solapur Yedeshi Tollway Limited	-	42	44	46	-	-	-	-	-
Yedeshi Aurangabad Tollway Limited	63	66	-	-	-	-	-	-	-
AE Tollway Limited	-	-	-	-	-	-	-	-	-
Udaipur Tollway Limited	-	-	-	-	-	-	-	-	-
CG Tollway Limited	-	-	-	-	-	-	-	-	-
Palsit Dankuni Private Tollway Limited	-	-	-	-	-	-	-	-	-
IRB Golconda Expressway Private Limited	235	235	235	236	-	-	531	532	531
Samakhiyali Tollway Private Limited	44	45	-	-	-	-		-	-
IRB Lalitpur Tollway Private Limited	-	-	185	185	-	-	-	-	-
IRB Kota Tollway Private Limited	-	-	-	6	-	-	-	-	-
IRB Gwalior Tollway Private Limited	26	38	49	61	-	-	-	-	-
Meerut Budaun Expressway Limited	115	-	-	-	-	-	133	137	139
IRB Harihara Corridors Private Limited	9	-	177	335	157	-	1	-	-
IRB Chandibhadra Tollway Private Limited	-	-	-	83	85	-	-	-	-

Source(s): Management information

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Annexure 4c: Estimates of already carried as well as proposed major repairs and improvements (4/4)

Estimates of already carried out as well as proposed major repairs and improvements										
INR Crore										
Name of the SPV	**FY 2050**	**FY 2051**	**FY 2052**	**FY 2053**	**FY 2054**	**FY 2055**	**FY 2056**	**FY 2057**	**FY 2058**	**FY 2059**
IRB Westcoast Tollway Limited	-	-	-	-	-	-	-	-	-	-
Solapur Yedeshi Tollway Limited	-	-	-	-	-	-	-	-	-	-
Yedeshi Aurangabad Tollway Limited	-	-	-	-	-	-	-	-	-	-
AE Tollway Limited	-	-	-	-	-	-	-	-	-	-
Udaipur Tollway Limited	-	-	-	-	-	-	-	-	-	-
CG Tollway Limited	-	-	-	-	-	-	-	-	-	-
Palsit Dankuni Private Tollway Limited	-	-	-	-	-	-	-	-	-	-
IRB Golconda Expressway Private Limited	531	-	-	404	150	-	-	-	-	-
Samakhiyali Tollway Private Limited	-	-	-	-	-	-	-	-	-	-
IRB Lalitpur Tollway Private Limited	-	-	-	-	-	-	-	-	-	-
IRB Kota Tollway Private Limited	-	-	-	-	-	-	-	-	-	-
IRB Gwalior Tollway Private Limited	-	-	-	-	-	-	-	-	-	-
Meerut Budaun Expressway Limited	-	-	-	-	-	197	202	206	-	-
IRB Harihara Corridors Private Limited	-	-	-	-	-	-	-	-	-	-
IRB Chandibhadra Tollway Private Limited	-	-	-	-	-	-	-	-	-	-

Source(s): Management information

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Annexure 4d : Purchase price of the SPVs by the InvIT

Purchase Price of SPV's			
Name of SPV	No. of equity shares transferred to Trust	No. of units of trust issued to sponsor	% stake in SPV
IRB Westcoast Tollway Limited	174,194,303	17,419,000	100.00%
Solapur Yedeshi Tollway Limited	98,250,000	9,825,000	100.00%
Yedeshi Aurangabad Tollway Limited	215,757,001	21,576,000	100.00%
AE Tollway Limited	436,500,000	43,650,000	100.00%
Udaipur Tollway Limited	116,800,000	11,680,000	100.00%
CG Tollway Limited	203,500,000	20,350,000	100.00%

The table above presents the number of equity shares transferred to the Trust and the number of units issued by the Trust to the Sponsor to acquire 100% of the equity stake in the aforementioned SPVs. The transfer is as per the share purchase agreement between the Trust and Sponsor dated 19 February 2020. Aforesaid transaction is a related party transaction.

- **PDTPL**

IRBI Trust acquired 99.96% stake in PDTPL by acquiring 121,200,000 equity shares in PDTPL through an equity infusion of INR 121.2 Cr in April 2022.

- **IGEPL**

IRBI Trust issued and allotted 142,400,000 units to the eligible unitholders of the Trust for cash at an Issue price of INR 200.98 per unit, aggregating to approximately INR 2,861.95 Cr. The Sponsor of the Trust, has been allotted 72,800,000 units of the Trust while GIC Affiliates have been allotted 69,600,000 units. Proceeds from the issue were used for acquisition of IGEPL through subscription to the equity shares of IGEPL pursuant to the IGEPL share subscription agreement for a consideration of INR 715.45 Cr.

- **STPL**

IRBI Trust acquired 99.96% stake in STPL by acquiring 116,200,000 equity shares in STPL through an equity infusion of INR 116.2 Cr on 04 January 2024.

- **IGTPL, IKTPL and ILTPL**

IRBI Trust acquired 100% stake in IGTPL, IKTPL and ILTPL by acquiring 103,285,000; 39,347,500 and 50,000 equity shares in the 3 entities through an equity infusion of INR 103.2, INR 39.3 and INR 420.5 Cr in March 2024.

- **Meerut Budaun Expressway Limited**

IRBI Trust issued and allotted 58,400,000 units to the eligible unitholders of the Trust for cash aggregating to approximately INR 1,714.92 Cr. Proceeds from the issue were used for acquisition of 80.4 per cent of the equity share capital and debentures of MBEL for an aggregate purchase consideration of INR 1714.92 Cr. The transaction was a related party transaction.

- **IHCPL**

IHCPL was incorporated in FY26 with share capital of INR 792.5 crores against which 792,500,000 shares of face value INR 10 each were issued to IRBI Trust.

- **CBTPL**

CBTPL was incorporated in FY26 with share capital of INR 94 crores against which 94,000,000 shares of face value INR 10 each were issued to IRBI Trust.

Source(s): Management information

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Annexure 4e: Pending litigations – IWTL (1/3)

Sr. No.	Complainant/Applicant /Plaintiff	Respondents	Name & Address of the Court and case number	Brief Description of Case	Status as on 31 March 2026	Financial implications
1	Mr. Sachhidananda Shetty.	The Chief General Manager, Modern Road Makers Pvt. Ltd.	Judicial Magistrate First Class Court, Kundapura.	The plaintiff has filed this suit praying that stay should be given for the stoppage work of NH-66 to set right certain anomalies in the tree cutting tender awarded to him by the NHAI in Kundapur forest division in respect of cutting of reserved categories of trees like teak, Bethonne, Matti, Sandalwood & seasom.	The plaintiff has withdrawn the suit. The matter is disposed by the court. This matter is now closed.	Land acquisition and related cost, cutting the necessary trees for road widening work, and related cost, etc are the sole responsibilities of NHAI. Further the concessionaire is not a party in the tender awarded to the plaintiff for cutting of the trees. Hence, there are no financial implications in this matter.
2	Laxman Neelakanth Desai, Goangeri, Majali, Karwar	IRB West Coast Tollway Pvt Ltd,	Civil Judge & JMFC II Court, Karwar	The plaintiff has filed the suit to restrain the defendants from undertaking the blasting of the rocks/hill in unscientific manner as it has caused loss to the plaintiff.	There are no Adverse orders against the company. The matter is pending	The company and plaintiff had mediated the dispute partly and the company has paid a sum of Rs. 175000/- to the plaintiff in the interest of the project. The matter is pending for final determination. As the company has complied with all the necessary provisions and undertaken the work with all safety precautions, the company feels that there are no financial implications in this matter.
3	Venkatramana S	Chief General Manager (IRB), Kumta	JMFC at Bhatkal (O.S. No. 103/2018)	The plaintiff has filed this suit challenging the land acquisition and has prayed that the respondents should be restrained from doing the work against the provisions of the land acquisition act.	The matter is dosposed by the court.	The responsibility of the entire process of land acquisition and payment of compensation is of NHAI. Hence, that there are no financial implications in this matter.
4	Mr. Vithobha Ganesh Naik	IRB West Coast Tollway Pvt Ltd,	Principal Judge, Karwar	The complainant is alleging that IRB WTL is encroaching upon the Petitioner's land to construct the highway	There are no Adverse orders against the company. The matter is pending	

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Annexure 4e: Pending litigations – IWTL (2/3)

Sr. No.	Complainant/Applicant /Plaintiff	Respondents	Name & Address of the Court and case number	Brief Description of Case	Status as on 31 March 2026	Financial implications
5	IRB Westcoast Tollway Ltd	NHAI	Arbitration	IWTL, IRB Infrastructure Trust and IRB Infrastructure Developers Ltd are the Claimants. 1.Claim for compensation (Rs 3107.82 Cr) and corresponding extension of Concession Period (1482.86 days) in terms of Article 35.2 & 35.3 respectively on account of material default/ breach of NHAI 2.COS claims recommended by IE vide letter dated 03.05.2025 (Rs 47.17 Cr) 3.Relating to Kali bridge (including compensation of cost incurred towards demolition, etc. ~ Rs 23.8 Crore) and construction of new bridge under Change of Scope (Article 16) ~ Rs 128. 03 Crore (estimated) with the help of financial funding from the Promoters (earlier/ current) (Claimants have craved leave to submit the actual cost for construction upon completion) 4.Relating to landslide and rescue operations at Shiroor (compensation of cost incurred towards studies and amount paid towards rescue operations ~ Rs 1.89 Crore) and remedial measures at landslide prone locations to be considered under COS (Article 16)	Section 17 order pronounced in favour of the Claimants which is challenged by NHAI before the Delhi High Court. The previous Arbitral Tribunal has recused itself from further proceedings, citing NHAI's non-acceptance of the proposed arbitral fees.The consitution of a fresh Tribunal is in progress.	Rs 3349.13 Cr + interest 1482.86 Days (under Cl 35.3) 5.6 Years (under Cl 29)

Source(s): Management information

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Annexure 4e: Pending litigations – IWTL (2/3)

Sr. No.	Complainant/Applicant /Plaintiff	Respondents	Name & Address of the Court and case number	Brief Description of Case	Status as on 31 March 2026	Financial implications
				5.Compensation of Rs. 3.94 Crore towards construction of damaged bridge @ 130 ~ Rs 3.94 Cr under COS (Article 16) (Claimants have craved leave to submit the actual cost for construction upon completion) 6.Construction of dilapidated bridges (6 minor + 2 major) under COS with the help of financial funding from the Promoters (earlier/ current) amounting to Rs 1.2 Cr + Rs 35.28 Cr (Claimants have craved leave to submit the actual cost for construction upon completion) 7.Deemed modification of extension of Concession Period by 5.6 years under Article 29		

Source(s): Management information

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Annexure 4e: Pending litigations – SYTL (1/2)

Sr. No.	Complainant/Applicant /Plaintiff	Respondents	Name & Address of the Court and case number	Brief Description of Case	Status as on 31 March 2026	Financial implications
1	Raosaheb Chadre	Modern Road Makers Pvt. Ltd.	Civil Judge, Senior Division, Osmanabad(Special suit number 73/2018)	The plaintiffs have prayed that due to mining work by the defendant, the levelling of the ground has been disturbed and there have been huge holes in the ground which should be filled by the defendants and that the plaintiffs should pay Rs. 82,41,800/- towards the extraction cost.	The matter is pending	The company had undertaken the work with the consent of the plaintiff after obtaining necessary permissions. The claim of the plaintiff is false. The company has denied all the allegations. Considering the merits of the matter, there are no financial implications in this matter.
2	Bhagwan Rambhau Jadhwar	Solapur Yedeshi Tollway Pvt. Ltd. and others	Civil Judge, Junior Division, Kallam (regular civil suit number 1139/2018)	The plaintiff has filed suit claiming that due to the negligence of the defendants, in construction of drainage adjoining the road, the water from the drainage had entered in field of the plaintiff and has caused loss to the tune of Rs. 2,00,000/-, which should be made good by the respondents.	The matter is pending	The company has taken all the necessary safety measures while construction of the road and denied any negligence on its part. Considering the merits of the matter, there are no financial implications in this matter.

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Annexure 4e: Pending litigations – SYTL (2/2)

Sr. No.	Complainant/Applicant /Plaintiff	Respondents	Name & Address of the Court and case number	Brief Description of Case	Status as on 31 March 2026	Financial implications
3	Solapur Yedeshi Tollway Ltd.	NHAI	Arbitration	SYTL (Claimant) had submitted claims to NHAI for compensation as per Clause 35.2 and Clause 35.3 of the Concession Agreement on account of delays attributable to NHAI. The claim for cost stands at Rs. 571.36 Crore in terms of Clause 35.2 and extension of Concession Period for 539.20 days in terms of Clause 35.3 of the Concession Agreement. Since there was no response received from NHAI, SYTL crystallised the matter as contractual dispute on 09.03.2022 and requested for amicable settlement through Conciliation as per Clause 44.2 of the Concession Agreement.	Arbitration proceedings are in progress. Next hearing is on 15.07.2026	Rs. 790.54 Cr + interest & extension of extension of 647.43 days

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Annexure 4e: Pending litigations - YATL (1/2)

Sr. No.	Complainant/Applicant /Plaintiff	Respondents	Name & Address of the Court and case number	Brief Description of Case	Status as on 31 March 2026	Financial implications
1	Shaikh Rafiq and others	IRB Infrastructure Developers Limited and others	Bombay High Court Aurangabad Bench	This matter is pertaining to Yedeshi Aurangabad Project.	The matter is pending.	The responsibility of the entire process of land acquisition and payment of compensation is of NHAI. Hence, there are no financial implications on the company.
			Writ Petition 5410/2015	The petitioner is aggrieved by the award wherein his land is acquired by NHAI, for construction of highway. Hence, the petitioners have prayed not to change the existing alignment of the proposed road widening of NH 211 passing through petitioners village and to restrain respondents from proceeding further with any change in the existing alignment		
2	Panditrao Chausalkar and others	IRB Infrastructure Developers Limited And Others	Bombay High Court Aurangabad Bench	This matter is pertaining to Yedeshi Aurangabad Project.	the matter is withdrawan by the petitioner. Hence, this matter is closed.	The responsibility of the entire process of land acquisition and payment of compensation is of NHAI. Hence, there are no financial implications on the company.
			Writ Petition 92/2017	The petitioner is aggrieved by the award wherein his land is acquired by NHAI, for construction of highway. Hence, the petitioners have prayed that the land acquisition should be set aside, the respondents should be restrained from acquiring the land belonging to the petitioners, etc..		

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Annexure 4e: Pending litigations - YATL (2/2)

Sr. No.	Complainant/Applicant /Plaintiff	Respondents	Name & Address of the Court and case number	Brief Description of Case	Status as on 31 March 2026	Financial implications
3	Pruthviraj shahane	IRB Infrastructure Developers Limited and others	Civil Judge senior division, Beed.	This matter is pertaining to Yedeshi Aurangabad Project.	The matter is pending.	The responsibility of the entire process of land acquisition and payment of compensation is of NHAI. Utility shifting is being done on the land provided by NHAI Hence, there are no financial implications on the company.
			Civil suit number 10/2016	The Plaintiff claims that the electricity poles & DP coming within road alignment / area have been replaced but erected & installed within his private land which has not been acquired.		
4	Yedeshi Aurangabad Tollway Ltd	NHAI	Arbitration	YATL (Claimant) had submitted claims to NHAI for compensation as per Clause 35.2 and Clause 35.3 of the Concession Agreement on account of delays attributable to NHAI. The claim for cost stands at Rs. 1,501.84 Crore in terms of Clause 35.2 and extension of Concession Period for 831.08 days in terms of Clause 35.3 of the Concession Agreement. YATL had proposed to NHAI for amicable settlement through CCIE. Since no written settlement reached between the Parties, YATL invoked arbitration on 09.03.2022 in terms of Clause 44.3 of the Concession Agreement.	Arbitral Triubunal pronounced Award in favour of YATL granting comepnsation of Rs 1719.48 Cr (as on 27.01.2024) along with applicable interest till realisation of payment and extension to Concession Period by 689 days. NHAI filed section 34 in the Delhi High Court challenging the Award and YATL filed application for enforcement of Award. The court had directed NHAI to deposit the arbitral amount with the registry of the Court. NHAI filed SLP challenging the enforcement judgment which is dimissed with a direction to deposit 50% of the Award amount. The matters are pending	Rs 1719.48 Cr (as on 27.01.2024) along with applicable interest till realisation of payment and extension to Concession Period by 689 days.

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Annexure 4e: Pending litigations – AETL

Sr. No.	Complainant/Applicant /Plaintiff	Respondents	Name & Address of the Court and case number	Brief Description of Case	Status as on 31 March 2026	Financial implications
1	AE Tollway Limited	NHAI	Arbitration	Arbitraion is invoked. AETL filed Statement of Claim account of delay in completion of construction and other Force Majeure claims such as Covid 19 etc. along with claim for loss of revenue during the delayed period..Upon successful completion of arbitration in AETL vs NHAI, with the award in favour of the Company and after receipt of the amount from NHAI, a part of such amount received would have to be paid to the sub-contractor in terms of their sub-contract agreement	Arbitration proceedings are currently in progress, and the next hearing date is yet to be issued.	Rs. 1317.98 Cr + interest & Extension to Concession Period by 351.41 days
2	Hakim Singh Yadav and others	AE Tollway Private Limited	High Court of Allahabad	The petitiiner filed a writ petition before the High Court of Allahabad against the Sponsor and others (the “Respondents”) in relation to the drainage system for the road asset operated by AETL. AETL had crystallised dispute and requested NHAI to take up the matter of payment of premium with proportionate reduction of revenue losses (the figures under dispute are excess payment of Premium of Rs. 12.84 Cr and outstanding payment of Premium including interest of Rs.55.34 Cr as on June 07, 2021) on account of Covid and delay in completion of construction as a dispute and for amicable settlement though Conciliation. Since no written settlement reached between the Parties, the AETL on 14.03.2022 invoked arbitration as per Clause 44.3 of the Concession Agreement. The matter is pending.	the matter is pending.	

Source(s): Management information

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Annexure 4e: Pending litigations – UTL

Sr. No.	Complainant/Applicant /Plaintiff	Respondents	Name & Address of the Court and case number	Brief Description of Case	Status as on 31 March 2026	Financial implications
1	Hiteshkumar Ramanlal Gandhi (Shift Incharge Khandiobri Toll)	Bhairulal Salvi (Bus Driver) Dist - Bhilwada.	FIR number 0299 dated 18/11/2017, Kherwada Police Station Tah – Kherwara, Dist – Udaipur State – Rajasthan	Bus driver Mr. Bhairulal Salvi has damaged the toll booths by pelting the stone & created violence in smooth tolling operations at Khandiobri Toll.	The matter is being investigated by the police.	The FIR is filed against the Bus driver, by the employee of the company. The FIR is filed by the employee of the company against the bus driver. There are no proceedings against the company.
2	Udaipur Tollway Ltd	NHAI	Arbitration	Claimants filed Statement of Claim including the claim on account of compensation of Force Majeure Cost and extension in Concession Period on account of COVID 19) , Claim for compensation under Clause 35.2 & 35.3 along with a prayer that Premium is applicable after 6 months of Actual completion	Arbitration proceedings are in progress.In view of the demise of Sri Justice V.K. Gupta, the NHAI has substituted Sri B.S. Bhullar, Retired IAS as their arbitrator. The Section 16 order of the Tribunal has been challenged by NHAI before the Hon'ble Delhi High Court, and the matter is currently pending adjudication.	Commencement of Premium after 6 months of actual completion Claim Rs. 906.08 Cr + interest & extension of 214.99 days

Source(s): Management information

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Annexure 4e: Pending litigations – CGTL

Sr. No.	Complainant/Applicant /Plaintiff	Respondents	Name & Address of the Court and case number	Brief Description of Case	Status as on 31 March 2026	Financial implications
1	Shri Azad Sharma & Other	NHAI and others (The Manager, IRB is respondent number 7)	Lok Adalat, Bhilwara	The plaintiff has filed case challenging the collection of toll without completion of six lane. Plaintiff /Petitioners have prayed that collection of toll shall be stopped until works of six lanes are completed and toll collected in the name of six laning shall be returned with interest.	The matter is disposed by the court. Hence, this matetr is clsoed.	The company is collecting the toll as per the toll notification and concession agreement with NHAI. Since, the project consists from 4 laining to 6 laining, hence, during the construction period, the company collects only 75% of the prescribed toll amount as per the toll fee notification. These toll rates are fixed for construction period. The company has good case on merits. The company has not violated any of the concession agreement provisions and hence, there are no financial implications in the matter.
2	CGTollway Ltd	NHAI	Arbitration	Claimants filed Statement of Claim including the claim on account of compensation of Force Majeure Cost and extension in Concession Period on account of COVID 19) , Claim for compensation under Clause 35.2 & 35.3 along with a prayer that Premium is applicable after 6 months of Actual completion	Arbitration proceedings are in progress.In view of the demise of Sri Justice V.K. Gupta, the NHAI has substituted Sri B.S. Bhullar, Retired IAS as their arbitrator. The Section 16 order of the Tribunal has been challenged by NHAI before the Hon'ble Delhi High Court, and the matter is currently pending adjudication.	Commencement of Premium after 6 months of actual completion Claim: Rs. 502.12 + + interest & extension of 241.37 days

Source(s): Management information

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Annexure 4e: Pending litigations - IGEPL

Sr. No.	Complainant/Applicant /Plaintiff	Respondents	Name & Address of the Court and case number	Brief Description of Case	Status as on 31 March 2026	Financial implications
1	Kanugula Mahesh Kumar (Petitioner)	1.State of Telangana, 2. Hyderabad Metropolitan Development Authority (HMDA), 3. Hyderabad Growth Corridor Ltd (HGCL), 4. IRB Golconda Expressway Pvt Ltd (IRB GEPL) and 5. IRB Infrastructure Developers Ltd. (IRB)	High Court of State of Telangana	The Petitioner filed a public interest litigation before the High Court of Telangana against Respondents, praying, inter alia, to set aside the award of the Toll, Operate and Transfer ("TOT") tender for the Nehru Outer Ring Road project to the IRB and IRB GEPL by entering into a concession agreement for a period of 30 years by not disclosing the initial estimated concession value for the project and seeking to illegally and unlawfully divert the funds from. The Petitioner has also sought quashing or setting aside of the concession agreement and all other agreements entered into by State of Telangana, HMDA and HGCL with IRB and IRB GEPL in relation to the Project. The Petitioner has also prayed, inter alia, to pass an order directing the IRB and IRB GEPL to not transfer the bid concession fee of ₹7,380 Crores to the HMDA or alternatively, not to transfer any funds from the bid concession fee of ₹7,380 Crores to the State of Telangana.	The matter is pending	Nil

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Annexure 4e: Pending litigations – PDTPL

Sr. No.	Complainant/Applicant /Plaintiff	Respondents	Name & Address of the Court and case number	Brief Description of Case	Status as on 31 March 2026	Financial implications
1	NHAI	Palsit Dankuni Tollway Pvt Ltd	Arbitration	DRB pronounced decision directing NHAI to refrain from demanding DUF from PDTPL in Jan 2024. The decision was challenged by NHAI and the arbitration was invoked. NHAI filed claim demanding payment of Rs 1.87 Cr (DUF for July 2023 to Dec 2024) + interest and direction to pay DUF till the end of Concession Period PDTPL filed counter claim for 1.Refund of DUF already remitted amounting to Rs 1.78 Cr 2.Way Side Amenity (Rs 15.71 Cr) and +ve COS (Rs 4.78 Cr) aggregating to about Rs. 22.27 Cr + interest	Arbitration proceedings are in progress	NHAI claim: Rs 1.78 Cr + Interest (direction seeking payment of DUF till the end of Concession Period) PDTPL filed claim for an amount of Rs 22.27 Cr +interest

Source(s): Management information

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Annexure 4f: Statement of assets as on 31 March 2026

Statement of Assets					
INR Crore					
Name of the SPV	Net tangible assets	Intangible assets	Other non current assets	Non current assets	Current assets
IRB Westcoast Tollway Limited	-	3,035.8	0.0	3,035.8	36.2
Solapur Yedeshi Tollway Limited	-	1,268.1	0.1	1,268.1	24.7
Yedeshi Aurangabad Tollway Limited	-	3,332.0	0.2	3,332.1	58.7
AE Tollway Limited	0.0	2,911.1	0.0	2,911.1	35.7
Udaipur Tollway Limited	-	2,458.7	-	2,458.7	95.4
CG Tollway Limited	0.2	1,970.9	18.3	1,989.5	87.3
Palsit Dankuni Tollway Private Limited	-	2,209.1	1.1	2,210.2	137.9
IRB Golconda Expressway Private Limited	-	7,853.4	0.1	7,853.4	317.9
Samakhiyali Tollway Private Limited	-	1,656.2	0.0	1,656.2	16.5
Lalitpur Tollway Private Limited	-	4,784.6	-	4,784.6	244.9
IRB Kota Tollway Private Limited	-	560.7	0.0	560.7	26.7
IRB Gwalior Tollway Private Limited	-	1,188.6	-	1,188.6	58.1
Meerut Buadun Expressway Limited	-	5,510.4	-	5,510.4	262.4
IRB Harihara Corridor Private Limited	-	9,531.9	94.9	9,626.8	78.9
IRB Chandibhadra Tollway Private Limited	-	3,088.2	-	3,088.2	29.2

Source(s): Provisional financials Mar-26, Management information

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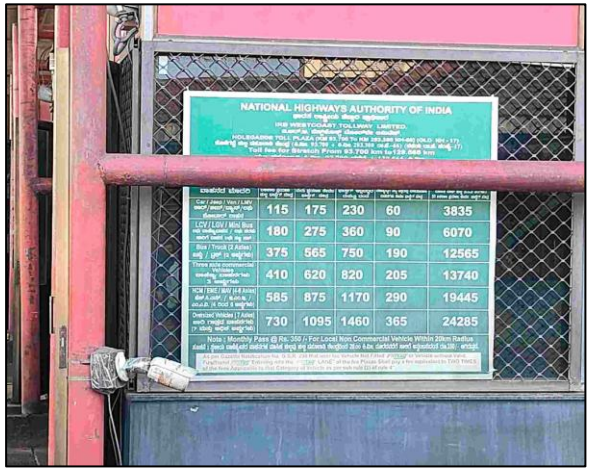
Annexure 4g: Site pictures - IWTL



Source(s): Site visits conducted in December 2025 – April 2026.

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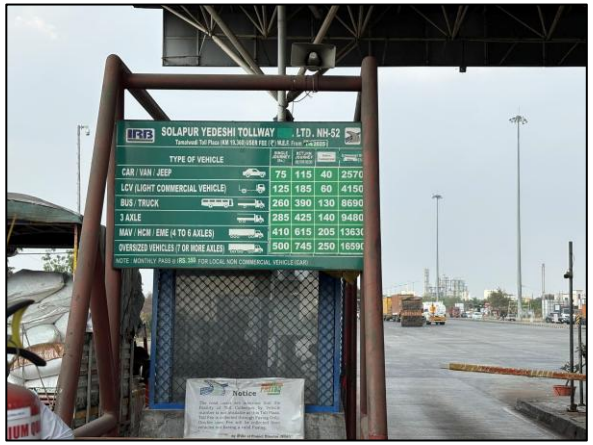
Annexure 4g: Site pictures - SYTL



Source(s): Site visits conducted in December 2025 – April 2026.

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Annexure 4g: Site pictures - YATL

Source(s): Site visits conducted in December 2025 – April 2026.

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Annexure 4g: Site pictures - AETL

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Annexure 4g: Site pictures - UTPL

Source(s): Site visits conducted in December 2025 – April 2026.

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Annexure 4g: Site pictures - CGTL

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Annexure 4g: Site pictures - PDTPL

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Annexure 4g: Site pictures - IGEPL

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Annexure 4g: Site pictures - IGTPL

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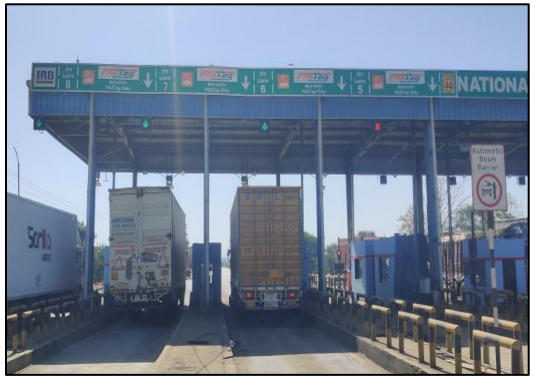
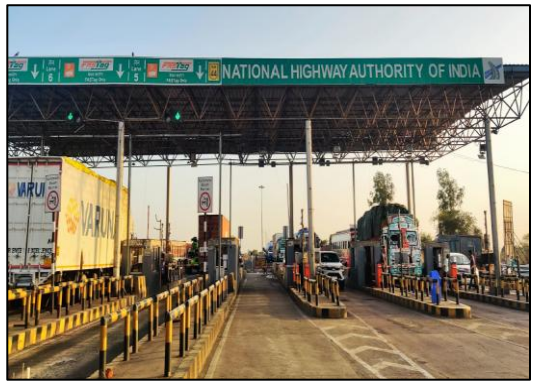
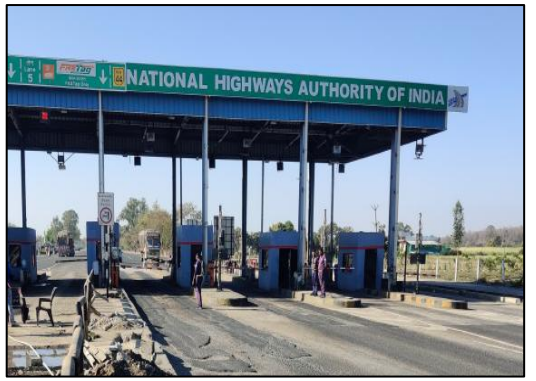
Annexure 4g: Site pictures - ILTPL







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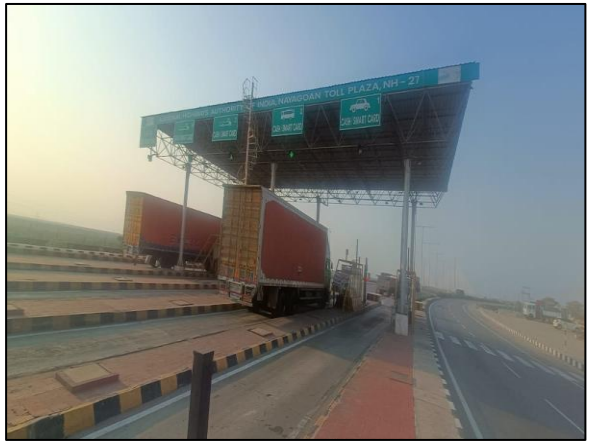
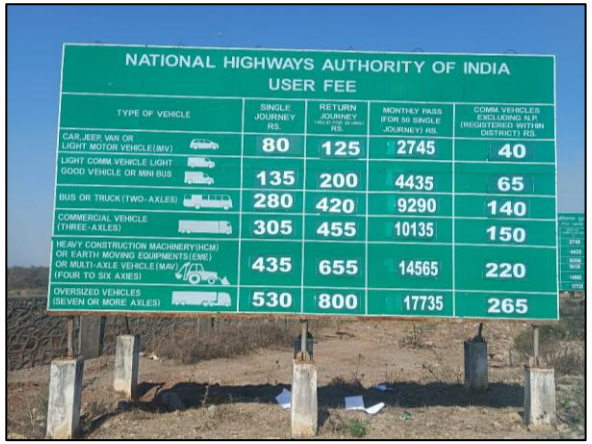
Annexure 4g: Site pictures - IKTPL





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Annexure 4g: Site pictures - MBEL

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Annexure 4g: Site pictures - IHCPL

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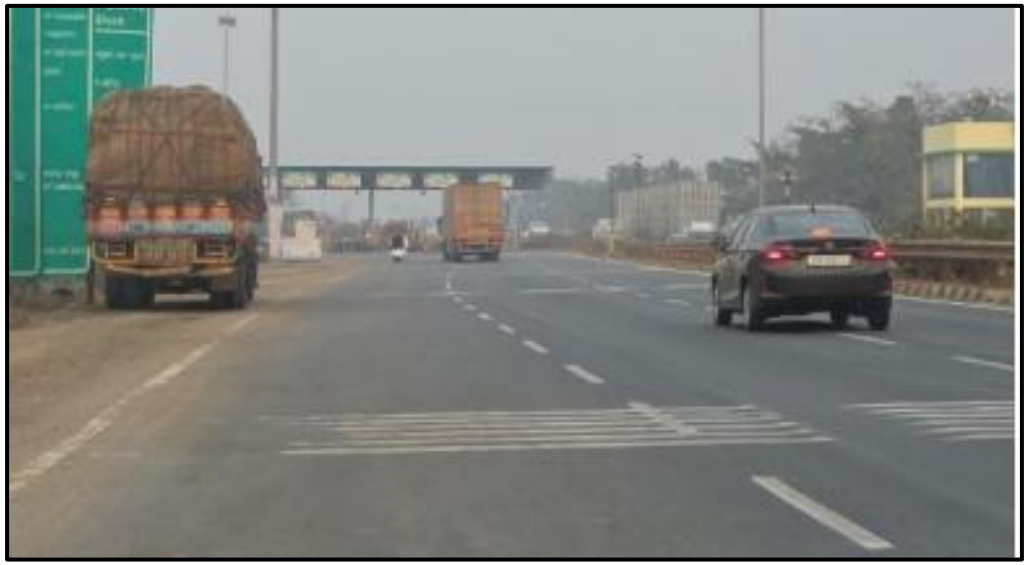
Annexure 4g: Site pictures - CBTPL



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Annexure 4h: Valuer Profile

Valuer Details	
Name of Registered Valuer	**KPMG Valuation Services LLP**
Signing Partner	**Amit Jain – Partner, KPMG Valuation Services LLP**
Contact Details	Tel : +91 22 3090 2674 Cell : +91 98193 38660 amitsjain@kpmg.com
Registration Details	LLP Identification Number: AAP-2732 IBBI Registration No: (KVSL) - IBBI/RV/06/2018/10501 IBBI Registration No: - Amit Jain - IBBI/RV/06/2018/10501 Asset Class: Securities and Financial Assets
Brief detail on Valuer	KPMG Valuation Services LLP [a partnership firm with Registration no 414] converted into a Limited Liability Partnership Firm with effect from May 13,2019
Brief experience summary	KPMG Valuation Services LLP – Registered valuer entity – 6 years (Feb 2020) KPMG Valuation Services LLP has provided valuation advisory services for financial reporting, restructuring, dispute valuation, Purchase price allocation and regulatory requirements. Amit Jain has overall experience of more than 25 years and has advised clients with their valuation needs across key strategic purposes including (i) Transactions / Fairness Opinions / Funding (ii) Regulatory – RBI / Tax (iii) Accounting / Purchase price allocations (iv) Disputes / Arbitration etc. He has an experience ranging across several industries especially IT/ ITES, Infrastructure, Power, Renewable energy, Roads, Airports, Construction, Oil & Gas (Upstream/Mid / Downstream) and Chemicals sectors.

Annexure 5: Comparable companies business description (1/2)

Company	Description
IRB Infrastructure Developers Limited	IRB Infrastructure Developers Limited engages in the infrastructure development business in India. It operates in two segments, Built, Operate and Transfer/Toll Operate and Transfer; and Construction. The company develops roads and operates and maintains roadways. It also provides real estate, hospitality, and airport development services, as well as operates as an investment manager. The company was incorporated in 1998 and is based in Mumbai, India.
PNC Infratech Limited	PNC Infratech Limited, together with its subsidiaries, operates as an infrastructure investment, development, construction, operation, and management company in India. The company undertakes various infrastructure projects, including roads, highways, bridges, flyovers, power transmission lines, airport runways and pavements, rural drinking water supply, irrigation, industrial area development, rail freight corridors, and other infrastructure projects. It also provides end-to-end infrastructure implementation solutions, such as engineering, procurement, and construction services on a fixed-sum turnkey basis, as well as on an item rate basis; and executes and implements projects on a design-build-finance-operate-transfer, operate-maintain-transfer, hybrid annuity model, and other public-private partnership formats. The company was formerly known as PNC Construction Company Limited and changed its name to PNC Infratech Limited in August 2007. PNC Infratech Limited was founded in 1989 and is headquartered in Agra, India.
Capital Infra Trust	Capital Infra Trust, an infrastructure investment trust, focuses on investing in infrastructure projects primarily national highways in India. The company was formerly known as National Infrastructure Trust and changed its name to Capital Infra Trust in October 2024. The company was founded in 2023 and is based in Gurugram, India.
Dilip Buildcon Limited	Dilip Buildcon Limited, together its subsidiaries, engages in the development of infrastructure facilities on engineering, procurement, and construction (EPC) basis in India. The company operates through Engineering, Procurement and Construction (EPC) Projects & Road Infrastructure Maintenance and Annuity Projects & Others segments. It is involved in roads, highway, bridges, tunnels, water supply, canals, dams, metro and airport construction, mining, irrigation, metro rail viaducts, and urban development related business. In addition, the company engages in road infrastructure maintenance and toll operations. Dilip Buildcon Limited was founded in 1987 and is headquartered in Bhopal, India.
Bharat Road Network Limited	Bharat Road Network Limited owns, designs, develops, builds, and operates transfers road and related services in India. It is involved in project development an implementation; tolling operations and highway management; and advisory and project management services, including construction supervision/debt syndication. The company was incorporated in 2006 and is based in Kolkata, India.
National Highways Infra Trust	National Highways Infra Trust was set up by National Highways Authority of India (NHAI). The Trust was registered as an Infrastructure Investment Trust on 28th October 2020, under the Securities and Exchange Board of India (Infrastructure Investment Trusts) Regulations, 2014. The Investment objectives of the Trust are to carry on the activities of, and to make investments, as an Infrastructure Investment Trust, as permissible in terms of the applicable law.
Anantam Highways Trust	Anantam Highways Trust, an infrastructure investment trust, acquires, manages, and invests in road infrastructure assets in India. Its portfolio of road infrastructure assets include the national highways having total aggregate length of 271.65 Kms located in the states of Karnataka, Telangana, Gujarat, Bihar, and Tamil Nadu, India. The company was founded in 2024 and is based in Mumbai, India.

Source: S&P Capital IQ

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Annexure 5: Comparable companies business description (2/2)

Company	Description
Energy Infrastructure Trust	Energy Infrastructure Trust, previously known as India Infrastructure Trust is an infrastructure investment trust, engaging in the transportation of natural gas in India. The company owns and operates a natural gas pipeline with a length of approximately 1,480 kilometers across India, as well as compressor stations and pipeline operation centers. It also offers imbalance management services, such as parking and lending services. The company serves customers in the refinery, fertilizer, petrochemical, power, city gas distribution, and other industrial sectors. The company was formerly known as India Infrastructure Trust and changed its name to Energy Infrastructure Trust in January 2025. Energy Infrastructure Trust was incorporated in 2018 and is based in Thane, India. Energy Infrastructure Trust is a subsidiary of Rapid Holdings 2 Pte. Ltd.
Indigrid Infrastructure Trust	Indigrid Infrastructure Trust operates as an infrastructure investment trust that owns and operates power transmission and solar energy assets. Its asset portfolio consists of 46 transmission lines with a total circuit length of approximately 8,468 circuit kilometers, 13 substations with approximately 17,550 mega volt ampere transformation capacity, and 100 megawatt of solar power capacity in 19 states and 1 union territory in India. The company was formerly known as India Grid Trust and changed its name to Indigrid Infrastructure Trust in January 2025. Indigrid Infrastructure Trust was founded in 2016 and is based in Mumbai, India.
Powergrid Infrastructure Investment Trust	Powergrid Infrastructure Investment Trust, an infrastructure investment trust, owns, constructs, operates, maintains, and invests in power projects and power transmission assets in India. Its projects include 11 transmission lines comprising six 765 kV transmission lines and five 400 kV transmission lines, with a total circuit length of approximately 3,699 km; and three substations with transformation capacity of 6,630 MVA and 1,955.66 km of optical ground wire. The company was founded in 2020 and is based in Gurugram, India.
IRB InvIT Fund	IRB InvIT Fund (the “Trust”) is a Trust constituted by “The Indenture of Trust” dated October 16, 2015 registered under the Registration Act, 1908 and registered with the Securities and Exchange Board of India as an infrastructure investment trust under the Securities and Exchange Board of India (Infrastructure Investment Trusts) Regulations, 2014. The Trust is backed by IRB Infrastructure Developers Ltd., as a Sponsor and Project Manager. The Trustee to IRB InvIT is IDBI Trusteeship Services Limited (the Trustee”) and Investment manager for the Trust is IRB Infrastructure Private Limited. The Trust has been formed to invest in infrastructure assets primarily being in the road sector in India. All of the Trust’s road projects are implemented and held through Special Purpose Vehicles
Indus Infra Trust	Indus Infra Trust, an infrastructure investment trust, focuses to acquire, manage, and invest in a portfolio of infrastructure assets in India. The company was formerly known as Bharat Highways InvIT and changed its name Indus Infra Trust in November 2024. Indus Infra Trust was incorporated in 2022 and is based in Gurugram, India.
G R Infraprojects Limited	G R Infraprojects Limited, through its subsidiaries, provides engineering, procurement, and construction services for roads, bridges, rails, airport runways, metros, and highways in India. It operates through Construction and Contract; Built, Operate and Transfer/Annuity Projects; and Others segments. The company constructs state and national highways, bridges, culverts, flyovers, airport runways, tunnels, and rail over bridges. It also offers a range of services on a turnkey basis in railway infrastructure projects, such as civil infrastructures, including earthworks, bridges, station buildings, and facilities; new track laying & rehabilitation of existing tracks; railway electrification and power systems; and signaling & telecommunication services. In addition, the company designs, engineering, procures, fabricates, erects, installs, and commissions power transmission lines.

Source: S&P Capital IQ

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8.

Scope & Limitations

Scope & Limitations (1/3)

Terms of Engagement

- KPMG Valuation Services LLP ("KVSL" or "we" or "us" or "Valuer") has been appointed by IRBI Trust ("IRBI Trust/Trust" or "the Company"), MMK Toll Road Private Limited ("Investment Manager") and IDBI Trusteeship Services Limited ("Trustee") (together referred as the "Clients" or "You") in relation to carrying out Enterprise Valuation of 15 Special Purpose Vehicles ("SPVs" or "Trust Assets") of IRBI Trust and Equity Valuation of IRBI Trust (jointly referred as "Targets") as on the agreed date of the valuation in accordance with Regulation 21 of the Securities Exchange Board of India (Infrastructure Investment Trusts) Regulations, 2014 where valuation is required to be conducted by a registered valuer (as defined under section 247 of the Companies Act, 2013) and such valuation report ("Report") is required to be in compliance with the SEBI InvIT Regulations ("Engagement" or "Valuation").
- The terms of the Engagement are set out in our letter of engagement dated 17 July 2025 ("LoE"). This letter of engagement is preceded by a signed undertaking dated 11 June 2025 ("Undertaking letter") provided by us. As agreed, the Undertaking letter shall be read in conjunction and shall form part of the aforesaid letter of engagement.
- The date of Valuation is 31 March 2026 ("Valuation Date").
- This Report sets out KVSL's conclusions on the Valuation and has been prepared in accordance with LoE. Our Report is confidential to the Clients and will be used by the Clients only for purposes mentioned in the LoE. The Report will be issued by us on the express understanding that it shall not be copied, disclosed or circulated or referred to in correspondence or discussion with any third party. This Report is confidential to the Clients and it is given on the express understanding that it is not communicated, in whole or in part, to any third party without KVSL's prior written consent. Neither the Report nor its content may be used for any other purpose without prior written consent of KVSL. This Report has a limited scope as specified in it. KVSL will not accept any responsibilities to any other party to whom the Report may be shown or who may acquire a copy of the Report.
- We are not responsible to any other person/ party for any decision of such person/ party based on this Report. Any person/ party intending to provide finance/ invest in the shares/ businesses of the Targets/ their holding companies/ subsidiaries/ group companies, if any, shall do so after seeking their own professional advice and after carrying out their own due diligence procedures to ensure that they are making an informed decision. If any person/ party (other than the Clients) chooses to place reliance upon any matters included in the report, they shall do so at their own risk and without recourse to the Valuer. It is hereby notified that usage, reproduction, distribution, circulation, copying or otherwise quoting of this Report or any part thereof, except for the purpose as set out earlier in this report, without our prior written consent, is not permitted, unless there is a statutory or a regulatory requirement to do so.
- We are aware that the Report may have to be shared with certain regulatory authorities in India and stock exchanges in India and therefore Report may enter the public domain and hereby provide our consent to such sharing subject to the following:
  - You shall indemnify and hold us harmless against any loss that may be incurred by us arising out of or relating to sharing of the Report with regulatory authorities in India or stock exchanges in India, or the Report entering the public domain as mentioned herein, as also against all costs, charges and expenses (including legal expenses) suffered or incurred by us on account of the aforesaid. In this clause "us" shall include all Firm Persons and "you" shall include Other Beneficiaries (as these terms have been defined in the LoE).
  - Such Report shall be disclosed in full and strictly in such forms as KVSL has provided to the Clients without any deviation.
  - KVSL shall not be liable to any person or party for any reason and under any circumstances.
  - The readers of the Report shall not bring any claim against KVSL for matters arising out of or consequent upon disclosure of the Report.
  - The Report shall be issued with all the disclaimers as provided by KVSL at the time of issuance of the Report.

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Scope & Limitations (2/3)

Disclosure of Interest/Conflict

- KVSL is not affiliated to IRBI Trust in any manner whatsoever. Further, KVSL does not have a prospective interest in the business which is the subject of this Report.
- KVSL's fee is not contingent on an action or event resulting from the analyses, opinions or conclusions in this Report.
- You are aware that KVSL is already providing/has provided valuation services to IRB InvIT Fund and IRBIDL. Notwithstanding the aforesaid past/ongoing relationship with you, we do not perceive any conflict in undertaking this engagement.
- We have previously carried out valuation of IRBI Trust and its SPVs as per SEBI InvIT Regulations in FY2025, pursuant to appointment as a registered valuer by IRBI Trust.

Basis of Value

- The report has been prepared on the basis of "Fair Value" as at Valuation Date. The generally accepted definition of "Fair Value" is the value as applied between a hypothetical willing vendor and a hypothetical willing prudent buyer in an open market and with access to all relevant information.

Premise of Value

- The report has adopted "Going Concern Value" as the premise of value in the given circumstances. The generally accepted definition of Going concern value is the value of a business enterprise that is expected to continue to operate in the future.
- The valuation has been performed as per internationally accepted valuation methodologies and in cognizance of international valuation standards and ICAI Valuation Standards 2018 issued by the Institute of Chartered Accountants of India.

Scope and Limitations

- This Report is based on the information provided by the Clients and has been confirmed by the Clients. KVSL have not independently verified or checked the accuracy or timeliness of the same. KVSL have indicated within this Report the sources of the information presented and have satisfied ourselves, so far as possible, that the information presented is consistent with other information which is made available to us in the course of our work in accordance with the terms of this engagement letter. KVSL have not, however, sought to establish the reliability of the sources by reference to other evidence, except as may be specifically agreed in writing between us.
- KVSL has read, analyzed and discussed the financial information and underlying Management assumptions pertaining to the Targets as provided by the Management of the Targets ("Management"). This information has been solely relied upon by KVSL for the Valuation.
- We have based our analysis on the historical audited financial statements of the Targets (other than ILTPL, IGTPL and IKTPL) and provisional financial statements of the Targets for the period ended 31 March 2026. Additionally, our analysis is based on the business plan of the SPVs for the period from 1 April 2026 to the end of the concession periods of respective SPVs as provided by the Management ("Management Business Plan") and key underlying assumptions. Any changes in the assumptions or methodology used to consolidate the financial statements may significantly impact our analysis and therefore the Valuation.
- KVSL has read and analyzed but have not commented on the appropriateness of or independently verified the Management Business Plan and underlying data and assumptions and accordingly provided no opinion on the same. If there were any omissions, inaccuracies or misrepresentations of the information provided by the Management, this may have a material effect on our findings and therefore the Valuation.
- The realization of the projections in the Management Business Plan will be dependent on the continuing validity of assumptions on which it is based. Our analysis therefore will not and cannot be directed to providing any assurance about the achievability of the future plans. Since the projections relate to the future, actual results are likely to be different from the projected results because events and circumstances do not occur as expected and the differences may be material.

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Scope & Limitations (3/3)

- This Report makes reference to 'KVSL analysis'. This indicates only that we have (where specified) undertaken certain analytical activities on the underlying data to arrive at the information presented.
- Our work did not constitute an audit of the financial statements and accordingly, we do not express any opinion on the truth and fairness of the financial position as indicated in this Report. Our work did not constitute a validation of the financial statements of the Targets, and accordingly, we do not express any opinion on the same.
- We have carried out the Valuation based on Management Business Plan received. Our scope of work does not include any commercial / legal / technical due diligence or carrying out any environmental / technical feasibility analysis or comparison of Management Business Plan with approved budgets / annual operating plans of the Targets. We have relied on Management's representation on such considerations and any changes in the same may significantly impact our analysis and therefore the Valuation.
- Wherever applicable, we have relied upon the legal opinion document / affidavit copies provided by Management in relation to the current status of the projects. We have not carried out / sought any independent legal opinion, nor have we verified the accuracy of the legal opinion shared. Any discrepancy in the same may significantly impact our analysis and therefore the Valuation.
- Our opinion is based on prevailing market, economic, and other conditions at the Valuation Date. It should be appreciated that these conditions can change over relatively short periods of time, not only as a result of internal factors, but because of external factors, which could impact the value, either positively or negatively.
- For our analysis, we have relied on published and secondary sources of data, whether or not made available by the Clients. We have not independently verified the accuracy or timeliness of the same.
- Neither KVSL nor any of its affiliates worldwide are responsible for updating this Report because of events or transactions occurring subsequent to the date of this Report. Any updates or second opinions in this Report cannot be sought by the Management from external agencies including global offices of KVSL without the prior written permission of KVSL.
- KVSL has not considered any finding made by other external agencies in carrying out the Valuation analysis other than the one explicitly mentioned in the report.
- For the purpose of the Valuation, our scope does not include valuation or legal due diligence of current assets and liabilities and as represented by the Management, the same has been considered at their respective book value.
- For the purpose of this Engagement and Report, we have made no investigation of, and assume no responsibility for the title to, or liabilities against the Targets. Our conclusion of value assumes that the title to the assets and liabilities of the Targets reflected in the financial statements as on Valuation Date is intact as at the date of this Report.
- Any discrepancies in any table/ annexure between the total and the sums of the amounts listed are due to rounding-off.
- The Report should be read in the light of these limitations, and we caution that had these matters been within the scope of our review, our conclusions may have changed, and that change could be material.
- The information presented in this Report does not reflect the outcome of any due diligence procedures. The reader is cautioned that the outcome of due diligence process could change the information herein and our Valuation, and that change could be material.
- This Report forms an integral whole and cannot be split in parts. The outcome of the Valuation can only lead to proper conclusions if the Report as a whole is taken into account.

Management representation

- This Report is prepared on the basis of the sources of information listed in Annexure 1. KVSL has relied upon written representation by the Management that the information contained in the Report is materially accurate and complete, fair in its manner of portrayal and therefore forms a reliable basis for the Valuation.

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AGRA TO ETAWAH (KM 199.660 TO KM 323.525) SECTION OF NH-2 IN THE STATE OF UTTAR PRADESH.

MAY 2026

TRAFFIC STUDY & REVENUE PROJECTION REPORT (FINAL)

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AGRA TO ETAWAH (KM 199.660 TO KM 323.525)

SECTION OF NH-2 IN THE STATE OF

UTTAR PRADESH.

TRAFFIC STUDY & REVENUE PROJECTION REPORT (FINAL)

MAY 2026

GMD CONSULTANTS
NAVI MUMBAI

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ABBREVIATIONS

AADT	-	Annual Average Daily Traffic	**NHAI**	-	National Highway Authority of India
BOT	-	Build Operate Transfer	**NHDP**	-	National Highways Development Project
CAGR	-	Compound Annual Growth Rate	**NSDP**	-	Net State Domestic Product
CTV	-	Classified traffic volume	**O&M**	-	Operation & Maintenance
DBFOT	-	Design, Build, Finance, Operate & Transfer	**PCDP**	-	Per Capita Domestic Product
EME	-	Earth Moving Equipment	**PCI**	-	Per Capita Income
GDP	-	Gross Domestic Product	**PCU**	-	Passenger Car Unit
GSDP	-	Gross State Domestic Product	**PSC**	-	Pre-stressed Concrete
HCM	-	Heavy Construction Machinery	**RCC**	-	Reinforced cement concrete
HCV	-	Heavy Commercial Vehicle	**RHS**	-	Right Hand Side
HTMS	-	Highway Traffic Management System	**SH**	-	State Highway
IRC	-	Indian Road Congress	**TP**	-	Toll Plaza
IRR	-	Internal Rate of Return	**WPI**	-	Wholesale Price Index
LCV	-	Light Commercial Vehicle	**SIR**	-	Special Investment Region
LHS	-	Left Hand Side	**c.**	-	Circa
LGV	-	Light Goods Vehicle	**ROB**	-	Railway Over Bridge
MAV	-	Multi Axle Vehicle	**MDR**	-	Major District Road
MORTH	-	Ministry of Road Transport and Highways	**ODR**	-	Other District Road
NH	-	National Highway	**CA**	-	Concession Agreement
PCC	-	Plain Cement Concrete	**RMT**	-	Running Meter
CR	-	Coarse Rubble			

CHAPTER 1

INTRODUCTION

1.1 Background

The Government of India through National Highway Authority of India (NHAI) embarked upon a program to enhance the traffic capacity and safety for efficient transportation of goods as well as passenger traffic on National Highway Sections under NHDP Phase V. Under Phase V NHAI has planned to convert 6,500 km of existing 4-lane National Highways into 6-lane National Highway. Sections envisaged under 6-laning comprise the Golden Quadrilateral section (5,700 km) and some other sections which are 800 km in length.

The project under consideration, **Agra** to **Etawah** section of NH-2 from km 199.660 to km 323.525is one such road project NHAI intended to implement on a BOT basis in the DBFOT format. *M/s AE Tollway. Ltd*. (Concessionaire) has been awarded the Project for a concession period of 24 years starting from 1st August 2016. The Project has been commissioned and is currently in the operation / maintenance phase. Six Laning of projects have also been completed in Nov 2020.

Length of project road is 124.524 Kms. The project road is section of NH-2, which starts from Delhi and ends at Kolkata and is a part of the Golden Quadrilateral Project. The project road section passes through the districts of Agra, Firozabad and Etawah.

Project road alignment passes through the towns/ built-up areas of Tundla, Firozabad, Shikohabad, Sirsaganj, & Jaswantnagar. The following figure shows alignment of project road section from Agra to Etawah.

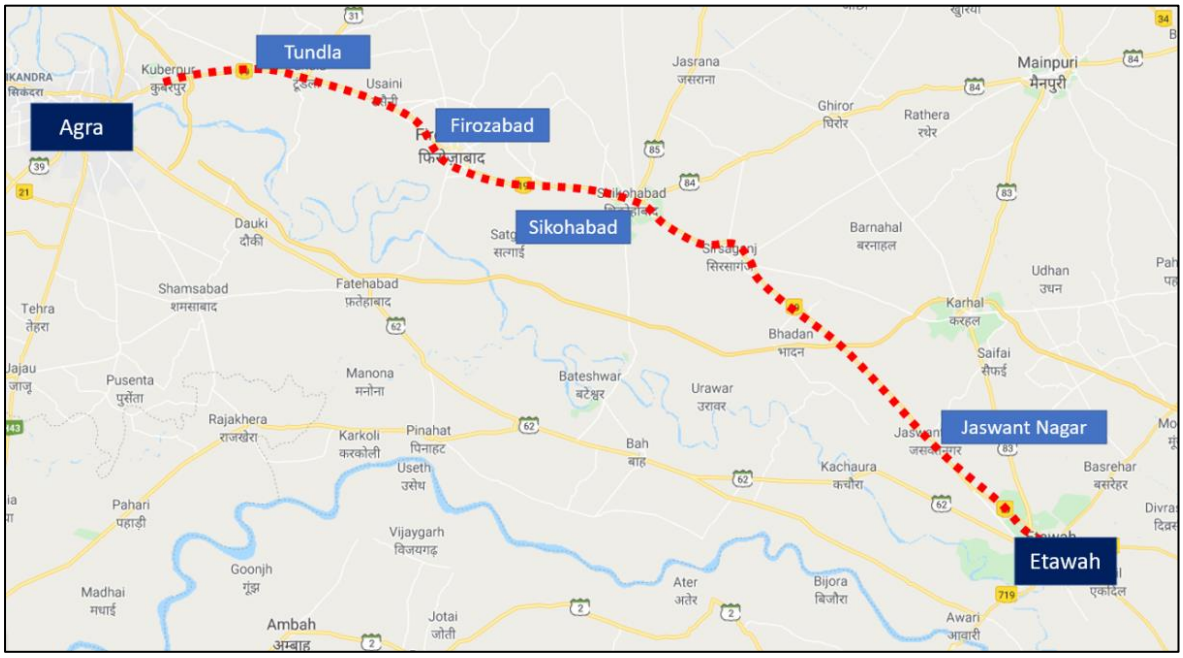

Figure 1-1: Alignment of Project Stretch

1.2 Objective of the Study

M/s IRB INFRASTRUCTURE TRUST has engaged *GMD Consultants* to assess the future traffic and toll potential of project along with related operation & maintenance expenditure involved.

This report named as **"Traffic Study &*Toll Revenue Projection Report*"** mainly focuses on traffic and revenue aspects of the project. Other parameters like competing road, area developments etc. have been considered from a traffic development point of view.

1.2.1 Scope of Services

The broad scope of work covered in the assignment is as follows.

a) Analysis of Traffic Growth
b) Toll Rate Growth
c) Revenue Forecasting

The Concessionaire has provided basic traffic data and other project details on the basis of which the above analysis has been carried out.

CHAPTER 2

PROJECT DETAILS

2.1 Project Corridor

National Highway 2 (NH 2) which is now renumbered as NH-19 is oldest highway in India and connects state of Delhi, Haryana, Uttar Pradesh, Bihar, Jharkhand and West Bengal. It constitutes a major portion of the historical grand truck road.

It connects the national capital Delhi to Kolkata, as well as important cities Mathura, Agra, Kanpur, Allahabad, Varanasi, Dhanbad, Asansol, Durgapur and Bardhman. The highway is part of the Golden Quadrilateral project undertaken by National Highways Authority of India (NHAI).

The project road is a link between Agra and Kanpur in the state of Uttar Pradesh. The main project influence area of the project road consists of the three districts through which the project road passes. In addition, the project influence area includes the districts of Kanpur, Mathura and Aligarh also.

2.2 Project Stretch Description

Section of NH-2 from Agra to Etawah is part of the major transportation link in the area connecting industrial cities of Agra- Kanpur and Lucknow. Important cities of Firozabad, Shikohabad, and Jaswant Nagar fall on project alignment. Firozabad has a famous glass work industry. Like other parts of India rapid ribbon development is happening around these cities on project highway. This also contributes to sustainable traffic growth.

There are two operative toll plazas at project stretch. The first is at Tundla at Km 224.950 and second at Gurau at Km 285.200. The following figure shows project alignment and toll plaza locations.

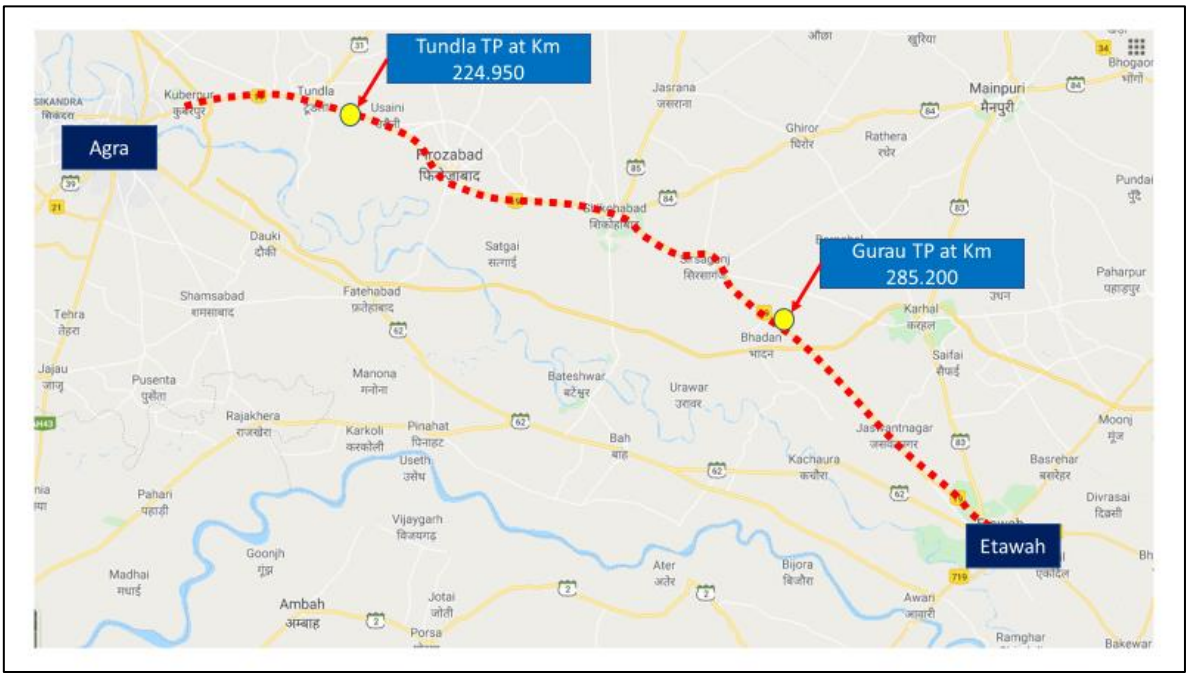

Figure 2-1: Project Alignment with Toll Plaza

2.3 Project Corridor Illustration

Six laning of project stretches are complete. The following photographs illustrate the project section along the corridor.

Figure 2-2: Photographs showing Project Corridor

CHAPTER 3

TRAFFIC SURVEYS AND ANALYSIS

3.1 Traffic Surveys

The Consultants have collected the required information for the project corridor to understand the general traffic and travel characteristics on the corridor.

The following traffic data has been collected from a client for a project.

- Classified traffic volume counts at toll plaza locations on Agra- Etawah section of NH-2 for years 2017-18, 2018-19, 2019-20, 2020-21,2021-22,2022-23,2023-24,2024-25 and Annual traffic data from April 2025 to February 2026.
- Local Component of traffic
- Component of Return Journey
- Component of Monthly Pass Journey

The main objective of the traffic data analysis is to:

- Determine the existing traffic movement characteristics of the project.
- Establish base year traffic.
- Identification of travel patterns and modal split of project traffic
- Deriving growth factors for traffic forecasting
- Estimation of corridor traffic including traffic diversion if any
- Preparation of revenue model and projection of revenue as per toll policy for various scenarios

Table 3-1below lists provides details of locations from where traffic details have been collected.

Table 3-1 : Traffic Data Details

SR. NO	LOCATION	CTV	Single Journey Traffic	Daily Return Journey	Monthly Pass	Local Pass
1	**Km 224.950 Toll Plaza at Tundla**	AADT for Year 2017-18, 2018-19, 2019-20,2020-21 ,2021-22, 2022-23, 2024-25 & Eleven months from April 2025 to February 2026	For Year 2017-18, 2018-19, 2019-20, 2020-21, 2021-22, 2022-2023, 2024-25 & Eleven months from April 2025 to February 2026	For Year 2017-18, 2018-19, 2019-20, 2020-21, 2021-22, 2022-2023, 2024-25 & Eleven months from April 2025 to February 2026	For Year 2017-18, 2018-19, 2019-20, 2020-21, 2021-22, 2022-2023, 2024-25 & Eleven months from April 2025 to February 2026	For Year 2017-18, 2018-19, 2019-20, 2020-21, 2021-22, 2022-2023, 2024-25 & Eleven months from April 2025 to February 2026

SR. NO	LOCATION	CTV	Single Journey Traffic	Daily Return Journey	Monthly Pass	Local Pass
2	**Km 285.200 Toll Plaza at Gurau**	AADT for Year 2017-18, 2018-19, 2019- 20, 2020-21, 2021-22, 2022-23, 2024-25 & Eleven months from April 2025 to February 2026	For Year 2017-18, 2018-19, 2019-20, 2020-21, 2021-22, 2022-23, 2024-& Eleven months from April 2025 to February 2026	For Year 2017-18, 2018-19, 2019-20, 2020-21, 2021-22, 2022-23, 2024-25 & Eleven months from April 2025 to February 2026	For Year 2017-18, 2018-19, 2019-20, 2020-21, 2021-22, 2022-23, 2024-25 & Eleven months from April 2025 to February 2026	For Year 2017-18, 2018-19, 2019-20, 2020-21, 2021-22, 2022-23, 2024-25 & Eleven months from April 2025 to February 2026

Toll plaza no. 1 & 2 are located in Uttar Pradesh.

3.2 Classified Traffic Volume

The objective of conducting a Classified Traffic Volume Count is to understand the traffic flow pattern including modal split on a roadway. The Classified Traffic Volume Count survey has been provided by the concessionaire of project highway from actual traffic data gathered at toll plaza locations based on monthly data shared with NHAI.

The vehicles can broadly be classified into fast moving / motorized and slow moving / non-motorized vehicles, which can be further classified into specific categories of vehicles. The groupings of vehicles are further segregated to capture the tollable vehicle categories specifically and toll exempted vehicles are counted separately. The detailed vehicle classification system as per IRC: 64-1990 is given in the table below.

Table 3-2 : Vehicle Classification System

Vehicle Type	
Auto Rickshaw	
Passenger Car	Car, Jeep, Taxi & Van (Old / new technology)
Bus	Minibus
	Standard Bus
Truck	Light Goods Vehicle (LCV)
	2 – Axle Truck
	3 Axle Truck (HCV)
	Multi Axle Truck (4-6 Axle)
	Oversized Vehicles (7 or more axles)

Vehicle Type	
Other Vehicles	Agriculture Tractor, Tractor & Trailer

Source - IRC: 64 – 1990

However, since the project highway is currently under toll operation, the data collected corresponds to the category of tollable vehicles. The following are the types of vehicles as per concession agreement.

- Car / Jeep / van
- Min Bus /LCV
- Bus
- Truck
- 3-Axle
- Multi Axle

3.3 Traffic Characteristic

Toll revenue of project highway does not solely depend on traffic volume. There are certain characteristics of traffic which have substantial potential to affect toll collection. Component of local traffic, component of passenger and commercial traffic, portion of return journey traffic, % of monthly pass traffic are some of such characteristics of traffic. These will be discussed in subsequent sections of the report.

3.3.1 Traffic Data

Project concessionaire has provided Traffic data for the years 2019-20 ,2020-21, 2021-22, 2022-23 ,2023-24,2024- 25 & traffic data from April 2025 to February 2026.
Since the traffic data available for this update is for only Annual, from April 2025 to February 2026, it may not represent the whole year traffic. Hence a seasonality factor for balance part of year has been applied to average traffic of the current Eleven months to arrive at Annual Average Daily Traffic of base year 2025-26. Thus, corrected traffic is used for future projections and revenue calculations. The following table shows historical traffic on project stretch and derived Annual Average Daily Traffic (AADT) for year 2025-26.

Table 3-3 : Traffic Data at Gurau Toll Plaza at Km 285.200

Sr. No	Type of Vehicle	Annual Average Daily Traffic (Nos.)- 2019-20	Annual Average Daily Traffic (Nos.)- 2020-21	Annual Average Daily Traffic (Nos.)- 2021-22	Annual Average Daily Traffic (Nos.)- 2022-23	Annual Average Daily Traffic (Nos.)- 2023-24	Annual Average Daily Traffic (Nos.)- 2024-25	Annual Average Daily Traffic (Nos.)- 2025-26
1	Car	2071	3535	5268	3371	3525	4053	4736
2	LCV	1097	1286	919	748	742	722	719
3	Bus	494	492	635	530	559	575	596

Sr. No	Type of Vehicle	Annual Average Daily Traffic (Nos.)- 2019-20	Annual Average Daily Traffic (Nos.)- 2020-21	Annual Average Daily Traffic (Nos.)- 2021-22	Annual Average Daily Traffic (Nos.)- 2022-23	Annual Average Daily Traffic (Nos.)- 2023-24	Annual Average Daily Traffic (Nos.)- 2024-25	Annual Average Daily Traffic (Nos.)- 2025-26
4	Truck	891	1100	1351	1410	1532	1471	1606
5	3-Axle	901	909	882	839	826	693	720
6	Multi Axle	1426	1760	2138	2386	2685	2680	2826
7	Oversize Vehicle	11	8	4	10	10	7	7
	Total	**6892**	**9090**	**11197**	**9292**	**9880**	**10201**	**11211**

Table 3-4 : Traffic Data at Tundla Toll Plaza at Km 224.950

Sr. No	Type of Vehicle	Annual Average Daily Traffic (Nos.)- 2019-20	Annual Average Daily Traffic (Nos.)- 2020-21	Annual Average Daily Traffic (Nos.)- 2021-22	Annual Average Daily Traffic (Nos.)- 2022-23	Annual Average Daily Traffic (Nos.)- 2023-24	Annual Average Daily Traffic (Nos.)- 2024-25	Annual Average Daily Traffic (Nos.)- 2025-26
1	Car	8324	5849	7347	8954	9575	10188	12991
2	LCV	1917	1514	1012	1082	1067	1029	1046
3	Bus	1148	777	856	1181	1328	974	1390
4	Truck	1309	1272	1506	1775	1957	2160	2007
5	3-Axle	955	948	924	887	879	761	785
6	Multi Axle	1255	1725	2179	2372	2764	2692	2782
7	Oversize Vehicle	10	11	8	10	10	7	7
	Total	**14918**	**12096**	**13832**	**16260**	**17580**	**17811**	**21007**

3.4 Data Analysis

3.4.1 Analysis of Traffic Volume Count

Understanding the character of existing traffic forms the basis of the traffic forecast. The various vehicle types having different sizes and characteristics can be converted into a single unit called Passenger Car Unit (PCU). Passenger Car equivalents for various vehicles are adopted based on recommendations of Indian Road Congress prescribed in "IRC-64-1990: Guidelines for Capacity of Roads in Rural areas". The adopted passenger car unit values (PCU) are presented in Table 3-5.

Table 3-5 : PCU Factors Adopted for Study

Vehicle Type	PCUs
Car	1.0
Minibus	1.5
Standard Bus	3.0
LCV/LGV	1.5
2 Axle Truck	3.0
3 – 6 Axle Truck	4.5
MAV	4.5
Auto Rickshaw	1.0
Van/Tempo	1.0
Agriculture Tractor with Trailer	4.5
Agriculture Tractor without Trailer	1.5

Source: IRC: 64-1990

Traffic volume at each toll plaza was converted to PCU and same is presented as under

Table 3-6 : Traffic in PCU at Project Stretch Base Year 2025-26

Year	Toll Plaza Location (Km)	Traffic No.	PCU	PCU Index
2019-2020	Gurau Km 285.200	6892	17043	2.47
	Tundla Km 224.950	14918	27128	1.82

Year	Toll Plaza Location (Km)	Traffic No.	PCU	PCU Index
2020-2021	Gurau Km 285.200	9090	20922	2.30
	Tundla Km 224.950	12096	24923	2.06
2021-2022	Gurau Km 285.200	11197	24889	2.22
	Tundla Km 224.950	13832	28565	2.07
2022-2023	Gurau Km 285.200	9292	23606	2.54
	Tundla Km 224.950	16260	32820	2.02
2023-2024	Gurau Km 285.200	9880	25521	2.58
	Tundla Km 224.950	17580	36151	2.06
2024-2025	Gurau Km 285.200	10201	25444	2.49
	Tundla Km 224.950	17811	35562	2.00
2025-2026	Gurau Km 285.200	11211	27332	2.44
	Tundla Km 224.950	21007	39651	1.89

It can be observed from above that project traffic has PCU index close to 2.5 at Guarau which is an indicator of high proportion of commercial traffic in traffic mix. At Tundla the index is more toward passenger traffic due to urban impact. The following figure illustrates variation of PCU index at two toll plaza locations.

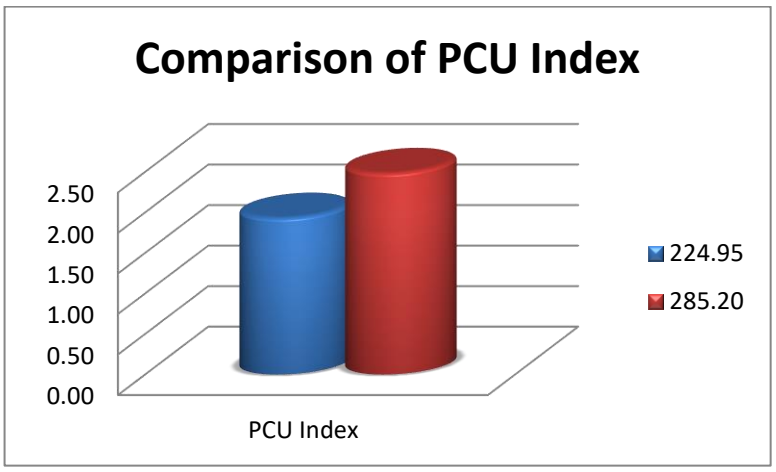

Figure 3-1: Comparison of PCU Index

3.4.2 Components of Traffic

As discussed previously, components of traffic volume play an important role in determining project revenue. A larger component of commercial traffic with higher axle configuration adds to project revenue positively. Similarly, a larger component of local traffic affects the project revenue potential negatively.

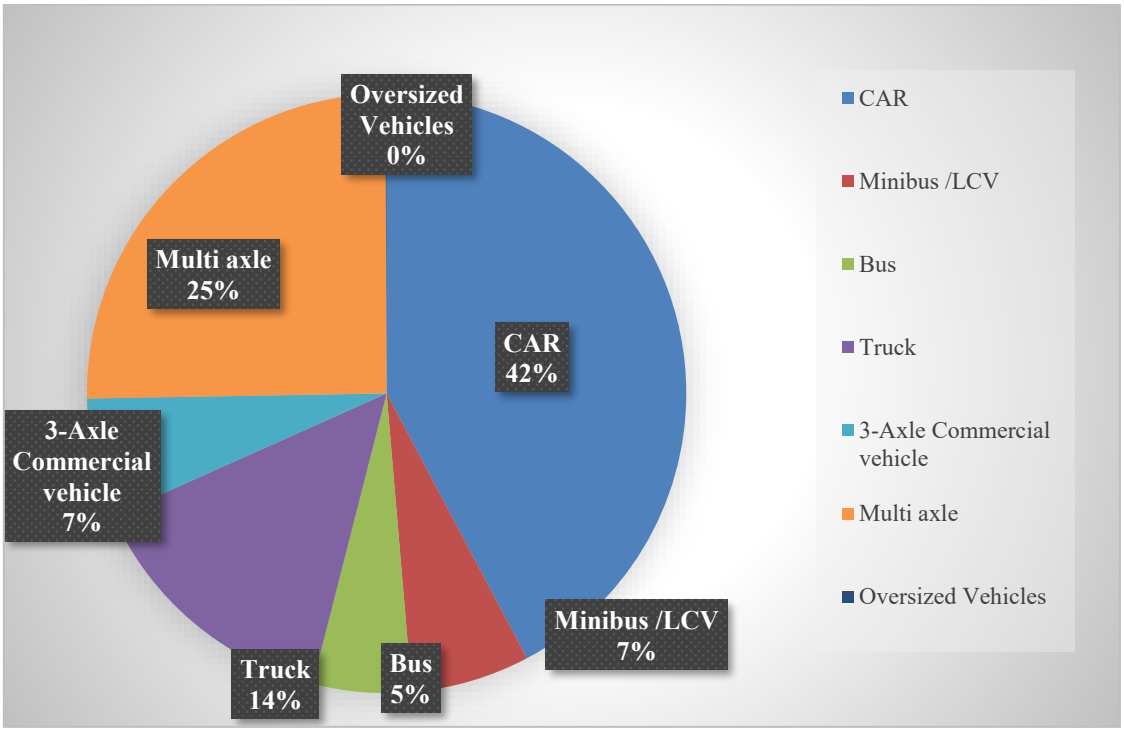

Figure 3-2 :Model Split of Tollable Vehicle-Km 285.200

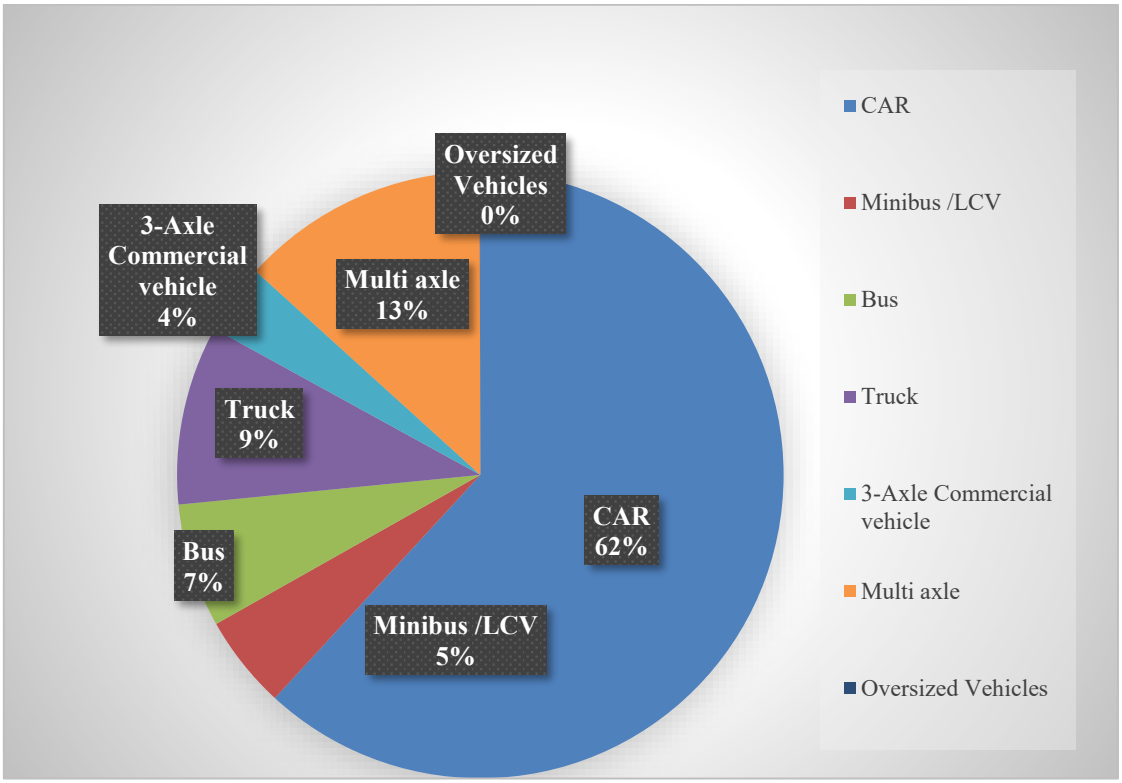

Figure 3-3 :Model Split of Tollable Vehicle-Km 224.950

It is observed that car & Bus traffic forms about 42% & 5% of total traffic at Gurau toll plaza location while multi axle commercial vehicles and trucks & LCV are about 46% & 7% of total traffic.

While at Tundla toll plaza car & Bus share rises to 62% & 7% and commercial vehicles multi axle and trucks & LCV share about 26%. & 5% This is due to the presence of strong urban impact of Tundla.

Another important bifurcation of traffic is components of traffic with respect to various type of toll ticketing like

1. Single Journey
2. Multi Journey
3. Local Commercial Single Journey
4. Monthly Pass Local
5. Monthly Pass
6. Annual Pass Car

The following table provides numbers of vehicles falling in each of the above categories on base year 2025-26.

Table 3-7 : Journey Type Bifurcation of Traffic at Gurau Toll Plaza KM 285.200

Sr. No	Type	Traffic Volume (Nos.)
		2025-26
1	Single Journey	6762
2	Return Journey	3182
3	Local Commercial Single Journey	15
4	Monthly Pass Local	10
5	Monthly Pass	3
6	Annual Pass Car	1238

Most dominant part of the above is the single journey type followed by return journey at project stretch. Monthly pass commuters are a very low fraction of the total traffic on the project corridor.

At Gurav toll plaza single journey share drops to 60% while return share is 29% respectively. Monthly pass is 0% and Local 0% and Annual Pass Cover 11%.

The following tables give the details of the journey distribution at Tundla toll plaza at Km 224.950.

Table 3-8 : Journey Type Bifurcation of Traffic at Tundla Toll Plaza KM 224.950

Sr. No	Type	Traffic Volume (Nos.)
		2025-26
1	Single Journey	8725

Sr. No	Type	Traffic Volume (Nos.)
		2025-26
2	Return Journey	8576
3	Local Commercial Single Journey	101
4	Monthly Pass Local	152
5	Monthly Pass	7
6	Annual Pass Car	3446

At Tundla toll plaza single journey share drops to 42% while return share is 41% respectively. Monthly pass is 0% and Local 1% and Annual Pass Cover 16%.

It is observed that the project corridor demonstrates a similar pattern of single journey dominating mix of traffic across the entire stretch which is typical of major national highways.

3.5 Secondary Data Collection

There are several other factors which have a substantial impact on traffic patterns and growth on any project corridor. The following are some of such important factors.

- Industrial development around project corridor and its catchment
- Educational infrastructure along project corridor
- Demographic pattern
- Urban area development
- Tourism potential
- Upcoming major infrastructural or Industrial projects
- Special Industry in project corridor
- Overall trends of economic growth local as well as national / regional

Hence in addition to traffic details on the project site, secondary data was also collected from various other sources. Typical secondary data includes the following:

1. Vehicle registration data of regional and national level.
2. Economic Data
   a) GDP
   b) NSDP
   c) Population Growth
   d) Per Capita Income growth
   e) Industrial Growth
   f) Special Industry Potential
   g) Regional and National development vision / plan
   h) Any other relevant data
3. Competing road network

We have collected and utilized such underlying data in the study to estimate the growth and risk factors for traffic along the project corridor.

CHAPTER 4

INFLUENCE ZONE TRANSPORT NETWORK ANALYSIS

4.1 Introduction

Highway corridors behave like integrated circuit networks and more often than not every road is connected to various networks having different origins and destinations. Traffic running on these networks behaves like fluid and flow on network on alignment of least friction.

The following Factors can be considered as major contributors to friction on transportation networks.

- Travel Speed / Travel Time
- Geometric deficiencies like blind horizontal curves and steep vertical gradients etc.,
- Configuration of road
- Riding quality
- Traffic delays,
- Length of road,
- Passing through built up or Urban Area,
- Terrain,
- Facilities,

4.2 Competing / Alternate route

Project stretch has toll application history from last few years, and it can be assumed that project traffic is settled. However, from an analysis point of view there can be one alternate route using Agra Lucknow Expressway at local level.

At the regional level, this route connects Delhi to Kanpur and then goes towards Prayagraj and West Bengal. Most obvious alternate route is through Lucknow - Agra Expressway again.

The following maps show these routes in relation to project stretches at both local and regional level.

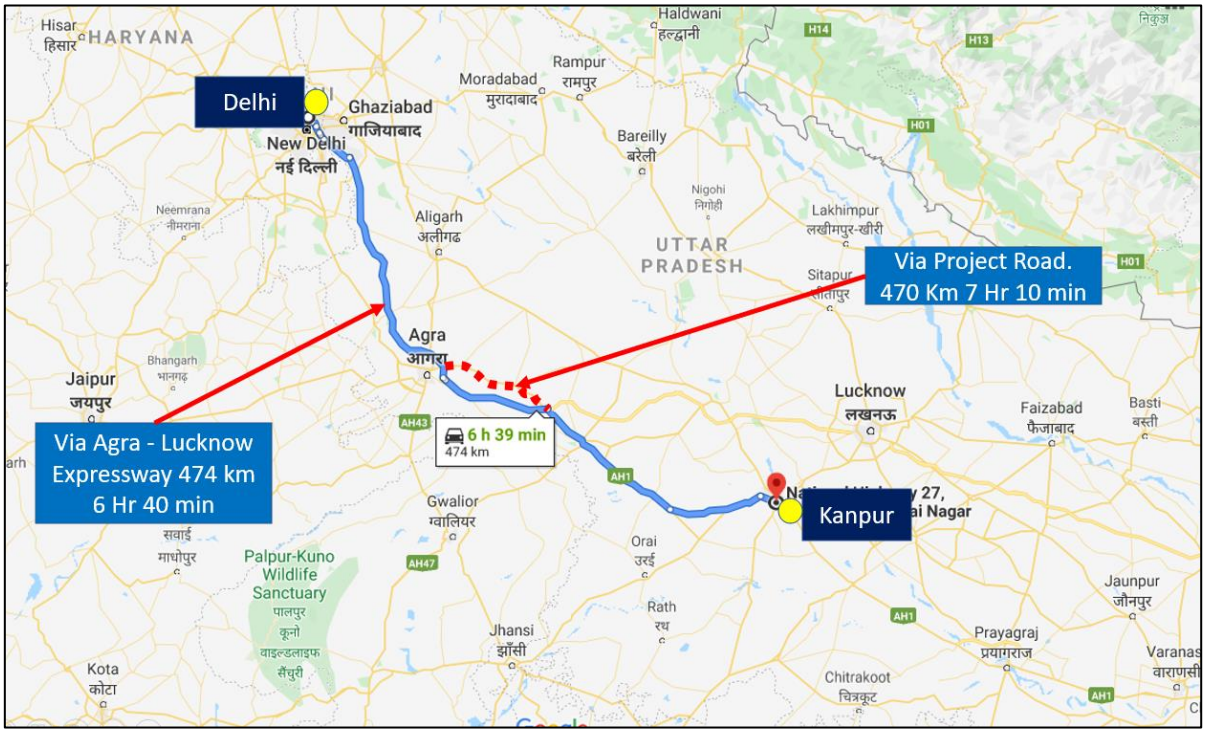

Figure 4-1: Alternate route at regional level.

Figure 4-2: Alternate route at local level.

It can be observed that the project highway forms one of the main spines of the corridor between Agra and Etawah. Agra – Lucknow Expressway is a faster connectivity for obvious regions. It's been in operation for the last few years and most of the traffic which had potential of diversion had done so. Traffic on project road is now settled, and it can be assumed as dedicated traffic on project road for logistic obligations. With six laning now complete, the project stretch has become slightly more attractive due to the improved level of service.

At regional level also the difference between two alignment is only of Agra- Lucknow Expressway. Hence there too, regional level traffic is expected to have settled.

The following table provides a summary of analysis of alternate route/ roads discussed above.

Table 4-1 : Competing Roads Details

Sr. No	Route Details	Designation	Length (Km)	Avg. Speed (KMPH)	Time Taken (Min)	Observations
Regional Level						
1	Delhi to Kanpur Via Agra- Lucknow Expressway	Alternate Route	474	70	6 Hr 40 Min	Alternate route running for years after toll on project road. Traffic Settled. No further diversion expected
	Delhi to Kanpur Via Project Road (NH-19)	Project Road	470	65	7 Hr 10 Min	
Local Level						
2	Agra to Etawah Via Agra- Lucknow Expressway	Alternate Route	123	65	1 Hr. 52 Min	Alternate route running for years after toll on project road. Traffic Settled. No further diversion expected
	Agra to Etawah Via Project Road (NH-19)	Project Road	129	50	2 Hr. 30 Min	

Under these circumstances it is not envisaged that commercial or passenger traffic would switch to alternate roads from the project road. Further, it may be noted that during its construction phase, the project road had many bottlenecks like Firozabad bypass etc. Due to this part of traffic preferred Agra Lucknow expressway over project road despite higher toll tariff at Agra – Lucknow Expressway. Now as these bottlenecks are removed it is expected that some part of traffic would return to Project Corridor due to improved level of service and low toll fee as compared to Agra – Lucknow Expressway.

CHAPTER 5

GROWTH OF TRAFFIC ON PROJECT HIGHWAY

5.1 Introduction

Traffic growth is a function of the interplay of a number of contributory factors such as National economy, Government policy, socio-economic conditions of the people, and changes in land uses along the project corridor precincts etc. As these factors have a number of uncertainties associated with them, forecasts of traffic are dependent on the projections of other factors such as population, gross domestic product (GDP), vehicle ownership, per capita income (PCI), agricultural output, fuel consumption etc. Future patterns of change in these factors can be estimated with only a reasonable degree of accuracy and hence the resultant traffic forecast levels may not be precise.

Traffic growth forecast for project corridor Surat- Dahisar section of NH-8has been done taking the above factors into consideration. "**IRC: 108-2015-Guidelines for Traffic Prediction on Rural Highways**" is established best practice and has been used for traffic growth forecast.

5.2 Trend Analysis

One of the methods of estimation of future rate of growth is to assume the same rate of growth as in the past. Although such a method is more suitable for projects of short durations say 5-10 years, however for long term projections it would be erroneous to assume that the past rate of growth will continue to prevail for a long time in future. Economic conditions, which are major influencing factors, are bound to change over a long period of time. Thus, it would be necessary to modify the past trends of growth suitably.

Elasticity model of growth projection is one of the most widely acceptable methods for traffic forecasts. The same is recommended in **IRC: 108-2015-Guidelines for Traffic Prediction on Rural Highways**.

In this method the past trend of vehicular data is paired with an economic indicator and a regression analysis is done to yield the economic model of growth. Growth of vehicle traffic varies for different types of vehicles. It is a proven fact that the growth pattern for passengers and goods vehicles is different. Traffic growth on any highway typically depends on a number of economic parameters. Most important and direct parameters are given as below

- Per Capita Income
- Net State Domestic Product (NSDP)
- Population

It can be observed that the ownership of a car is more closely related to affordability; hence per capita is the index which closely fits the growth of car traffic among other criteria. In a similar fashion, the following can be pairs of vehicle type and independent variable for elasticity modeling of growth.

- Car / Jeep – Par Capita Income
- Bus / Minibus – Population
- Goods Vehicle – NSDP

5.3 Estimation of Traffic Demand Elasticity

Elasticity of traffic demand is defined as the rate at which traffic intensity varies due to a change in the corresponding indicator selected. Hence, in order to estimate the elasticity of traffic demand, it is necessary to establish a relationship between the growth in number of given category of vehicles with the relevant economic variable considered, such as NSDP, per capita income and population growth. Latest available data for vehicle registration, per capita income, NSDP and population is used in analysis.

As per IRC: 108-1996 the model for estimating elasticity index for the project corridor is of the following form and is given as below:

$Log\ (P) = k \times Log\ (EI) + A$

Where,

P = *Number of Vehicles (Mode wise)*

EI = *Economic Indicator*

A = *Regression constant*

k = *Elasticity coefficient (Regression coefficient)*

The elasticity for cars and bus (passenger vehicles) is calculated based on the Population and Per Capita Domestic Product (PCDP) and the elasticity for trucks is calculated based on the Net State Domestic Product (NSDP).

The project corridor spreads across the state of Uttar. Toll plazas at Tunda and Gurau are in the state of Uttar Pradesh. Project corridor has certain impact of traffic from Delhi, and Haryana also. For elasticity calculations, working data from these states has been analyzed.

The following tables and graphs depict regression and elasticity of growth model for stretch falling in Uttar Pradesh State.

Table 5-1 : Per Capita Income Vs Car Uttar Pradesh

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2012	32002	1108100	4.51	6.04		
2013	32908	1205374	4.52	6.08	3%	
2014	34044	1423020	4.53	6.15	3%	
2015	34583	1572217	4.54	6.20	2%	
2016	36973	1746117	4.57	6.24	7%	
2017	40641	2027972	4.61	6.31	10%	4.94%

Regression analysis of same is given in figure below.

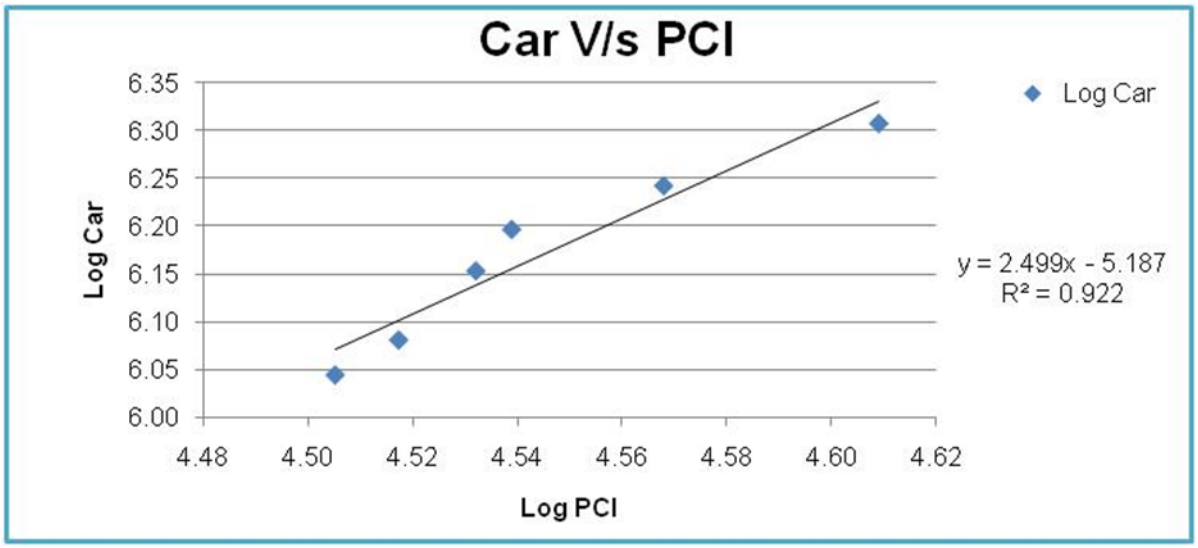

Figure 5-1: Regression and Elasticity PCI vs. Car–Extrapolation Uttar Pradesh

Table 5-2 : Population Vs Bus Uttar Pradesh

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth
2012	199812341	57901	8.30	4.76		
2013	203382046	64147	8.31	4.81	2%	
2014	206942855	74389	8.32	4.87	2%	
2015	210493544	80460	8.32	4.91	2%	
2016	214032922	89127	8.33	4.95	2%	
2017	217559836	112020	8.34	5.05	2%	1.72%

Regression analysis of same is given in figure below.

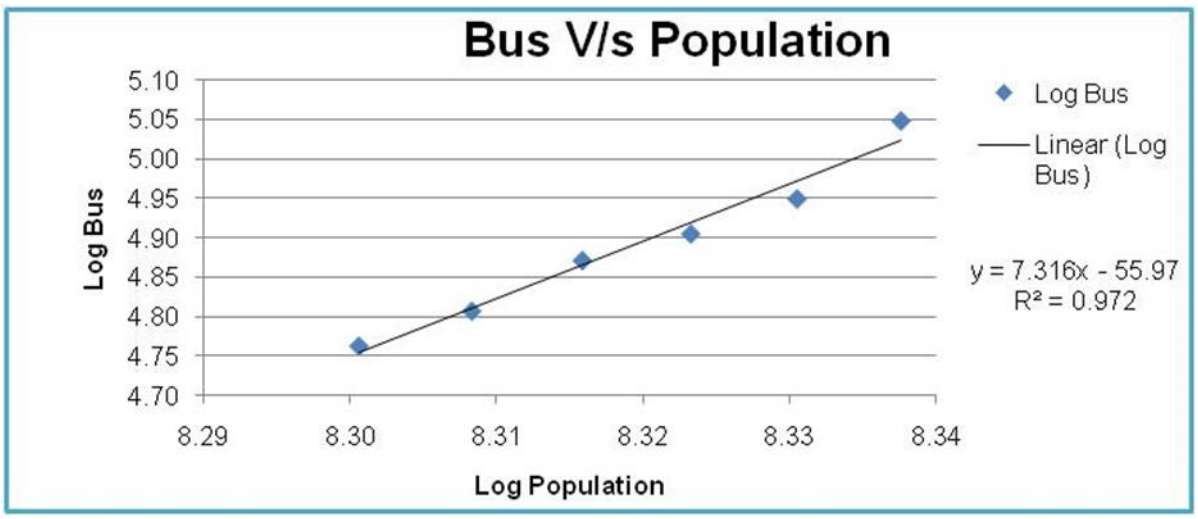

Figure 5-2: Regression and Elasticity Population vs. Bus – Extrapolation Uttar Pradesh

The elasticity of goods traffic has been worked out by regression analysis with NSDP. The following table represents the data and details.

Table 5-3 : LCV Traffic Vs NSDP Uttar Pradesh

Year	NSDP	Trucks	Log NDSP	Log Truck	NSDP Growth	Average Growth (5 Year)
2012	645132	176164	5.81	5.25		
2013	673552	213657	5.83	5.33	4%	
2014	707469	265025	5.85	5.42	5%	
2015	729686	294022	5.86	5.47	3%	
2016	792049	316815	5.90	5.50	9%	5.28%

The following figure depicts regression analysis and extrapolation.

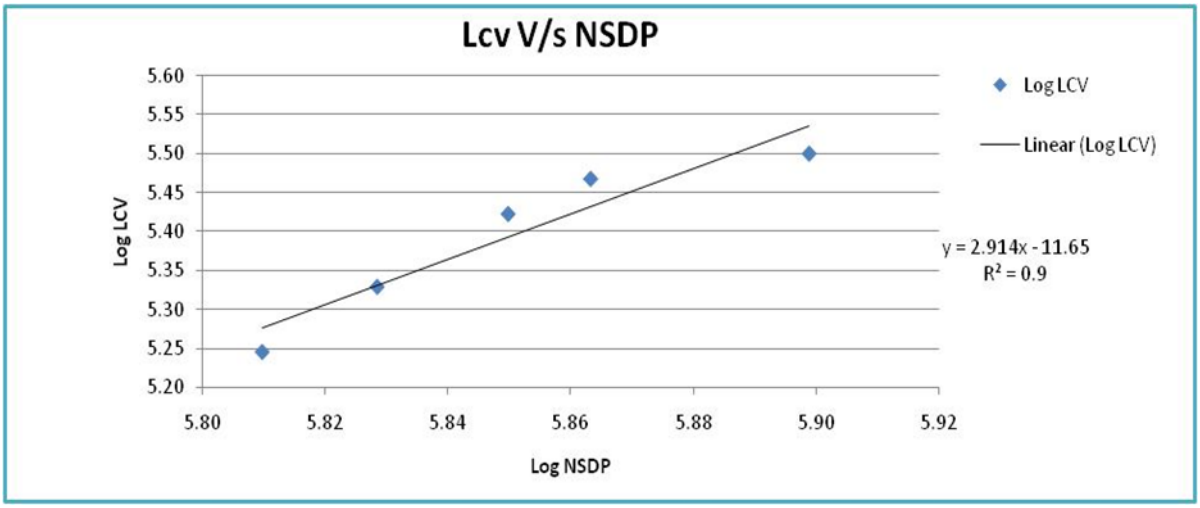

Figure 5-3: Regression and Elasticity NSDP vs. LCV Traffic – extrapolation Uttar Pradesh.

Table 5-4 : Truck Traffic Vs NSDP Uttar Pradesh

Year	NSDP	Trucks	Log NDSP	Log Truck	NSDP Growth	Average Growth (5 Year)
2012	645132	162813	5.81	5.21		
2013	673552	186404	5.83	5.27	4%	
2014	707469	202761	5.85	5.31	5%	
2015	729686	217609	5.86	5.34	3%	
2016	792049	245688	5.90	5.39	9%	
2017	883962	265167	5.95	5.42	12%	6.55%

The following figure depicts regression analysis and extrapolation.

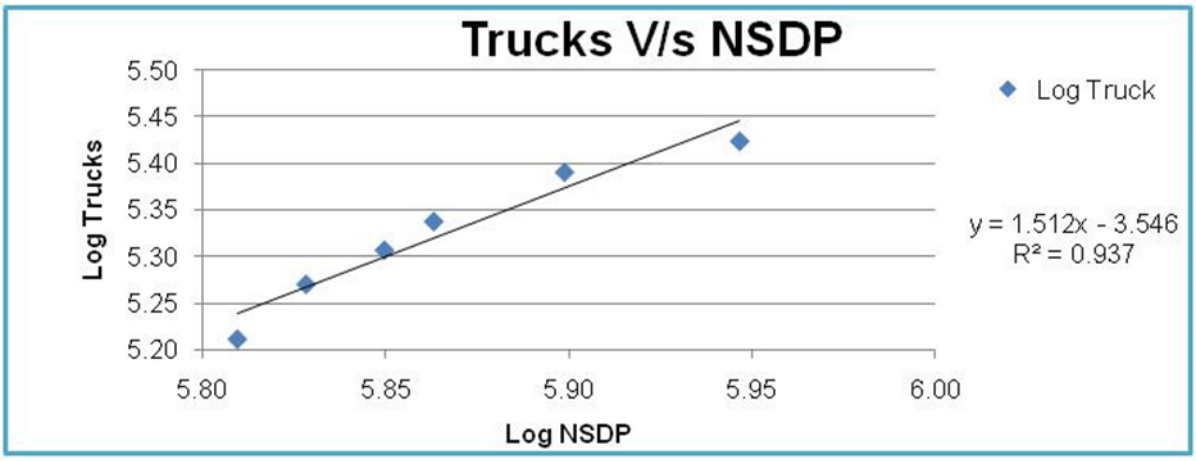

Figure 5-4: Regression and Elasticity NSDP vs. Truck Traffic – extrapolation Uttar Pradesh.

Using the regression analysis above, we have arrived at the elasticity of traffic demand for each class of vehicle to a given change in relevant economic indicators. Average traffic growth of a vehicle class is multiplied by the corresponding elasticity coefficient to arrive at traffic growth. R2 statistical measure of how close the data are to the fitted regression line. It varies from 0 to 1. The higher the value of R2 more representative is the regression model of data.

The results of these analyses for *the good fit* regression as reflected by R^2 values are presented in the Table below.

Table 5-5 : Summary Regression Analysis Uttar Pradesh

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average IV Growth (5yrs)	Growth Elastic Model	Remarks
Uttar Pradesh	Car/Jeep	PCI	y = 2.499x + -5.1874	R² = 0.922	2.4990	4.94%	12.34%	Good Regression
	Bus	Population	y = 7.3167x - -55.9791	R² = 0.9726	7.3167	1.72%	12.56%	Good Regression
	LCV	NSDP	y = 2.9149x - -11.6585	R² = 0.9	2.9149	5.28%	15.40%	Good Regression
	Truck	NSDP	y = 1.5121x - -3.5463	R² = 0.9373	1.5121	6.55%	9.90%	Good Regression

The following tables and graphs depict regression and elasticity of growth model for stretch falling in Delhi State.

Table 5-6 : Per Capita Income Vs Car Delhi

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2012	185361	2172069	5.27	6.34		
2013	193175	2416974	5.29	6.38	4%	

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2014	202216	2568380	5.31	6.41	5%	
2015	215726	2730071	5.33	6.44	7%	
2016	235737	2986579	5.37	6.48	9%	
2017	247255	3061817	5.39	6.49	5%	5.95%

Regression analysis of same is given in figure below.

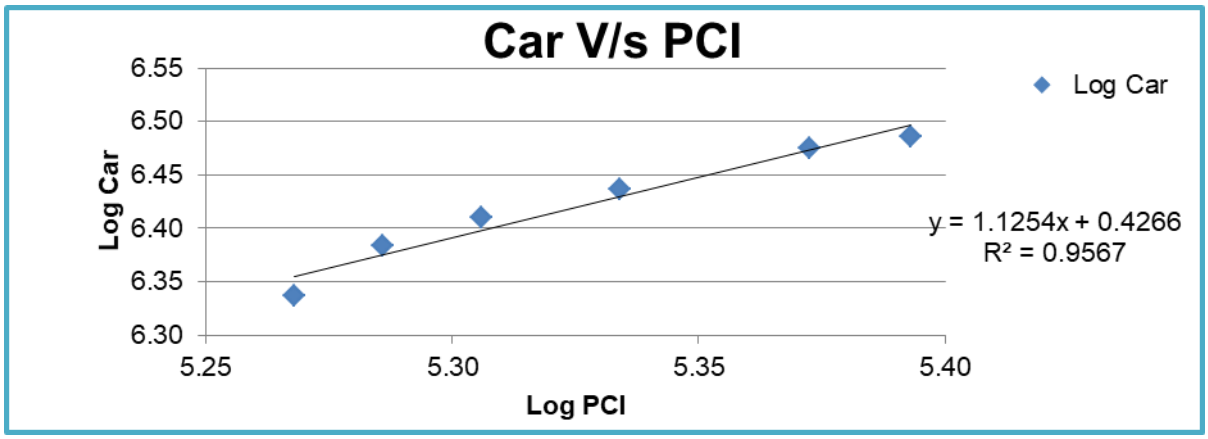

Figure 5-5: Regression and Elasticity PCI vs. Car–Extrapolation Delhi

Table 5-7 : Population Vs Bus Delhi

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth
2012	16787941	109790	7.22	5.04		
2013	17071599	19917	7.23	4.30	2%	
2014	17354281	19595	7.24	4.29	2%	
2015	17635897	19700	7.25	4.29	2%	
2016	17916359	43723	7.25	4.64	2%	
2017	18195583	41686	7.26	4.62	2%	1.62%

Regression analysis of same is given in figure below.

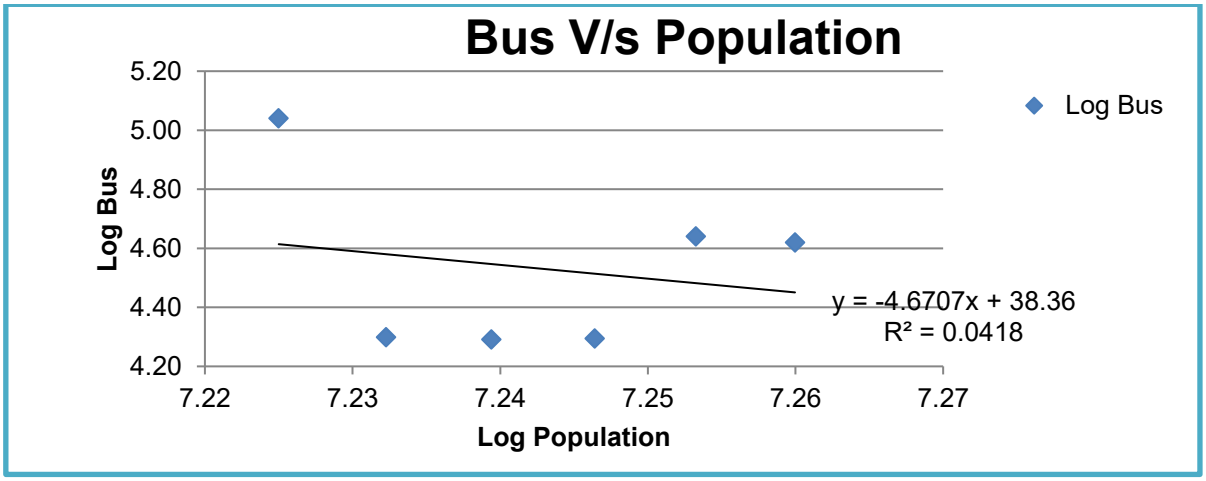

Figure 5-6: Regression and Elasticity Population vs. Bus – Extrapolation Delhi

The elasticity of goods traffic has been worked out by regression analysis with NSDP. The following table represents the data and details.

Table 5-8 : LCV Traffic Vs NSDP Delhi

Year	NSDP	LCV	Log NDSP	Log LCV	NSDP Growth	Average Growth (5 Year)
2012	314650	124547	5.50	5.10		
2013	334193	126539	5.52	5.10	6%	
2014	356528	136110	5.55	5.13	7%	
2015	387639	145903	5.59	5.16	9%	
2016	431730	183486	5.64	5.26	11%	
2017	461476	221068	5.66	5.34	7%	7.98%

The following figure depicts regression analysis and extrapolation.

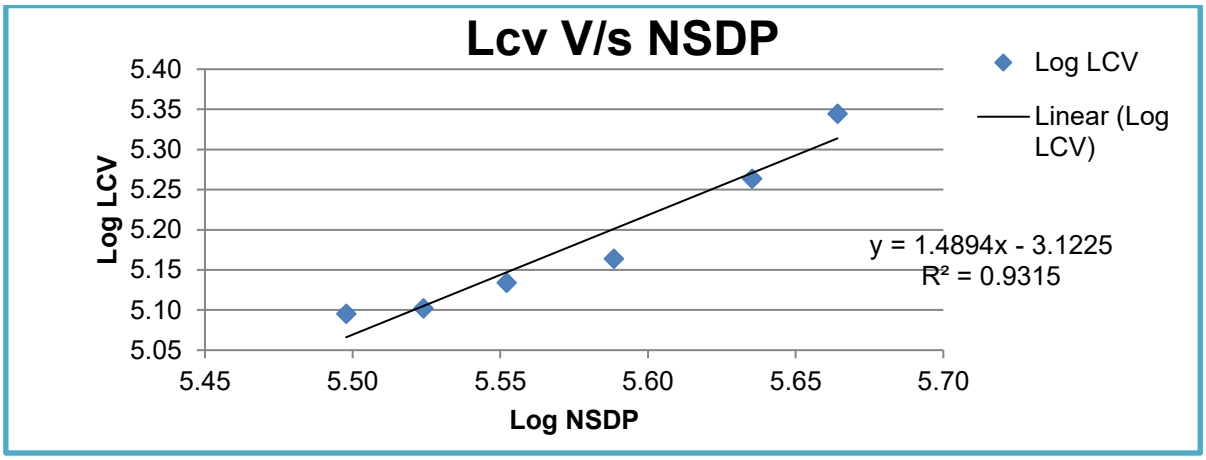

Figure 5-7: Regression and Elasticity NSDP vs. LCV Traffic – extrapolation Delhi.

Table 5-9 : Truck Traffic Vs NSDP Delhi

Year	NSDP	Trucks	Log NDSP	Log Truck	NSDP Growth	Average Growth (5 Year)
2012	314650	4792	5.50	3.68		
2013	334193	5176	5.52	3.71	6%	
2014	356528	6093	5.55	3.78	7%	
2015	387639	7503	5.59	3.88	9%	
2016	431730	8703	5.64	3.94	11%	
2017	461476	10440	5.66	4.02	7%	7.98%

The following figure depicts regression analysis and extrapolation.

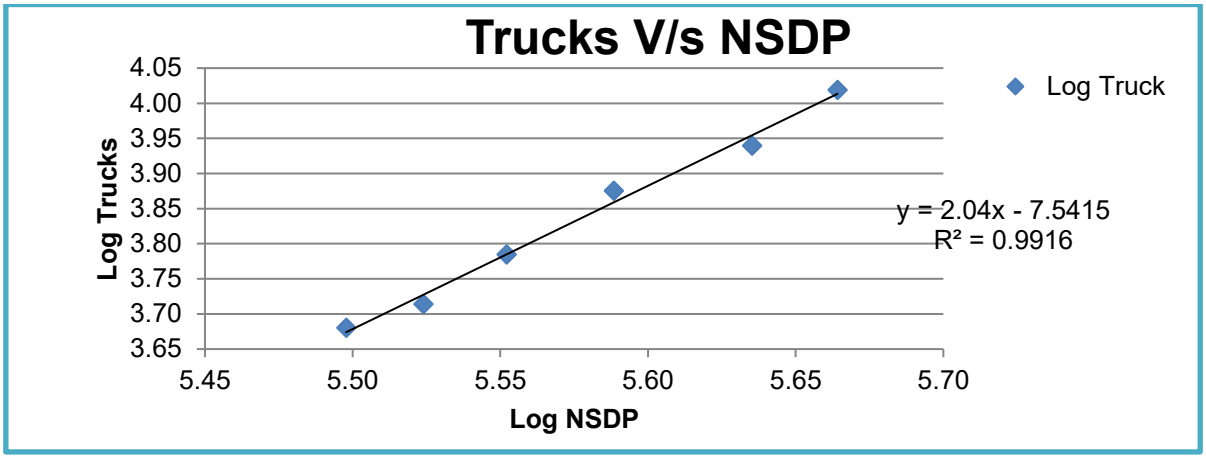

Figure 5-8: Regression and Elasticity NSDP vs. Truck Traffic – extrapolation Delhi.

Using the regression analysis above, we have arrived at the elasticity of traffic demand for each class of vehicle to a given change in relevant economic indicators. Average traffic growth of a vehicle class is multiplied by the corresponding elasticity coefficient to arrive at traffic growth. R2 statistical measure of how close the data are to the fitted regression line. It varies from 0 to 1. The higher the value of R2 more representative is the regression model of data.

The results of these analyses for *the good fit* regression as reflected by R^2 values are presented in the Table below.

Table 5-10 : Summary Regression Analysis Delhi

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average IV Growth (5yrs)	Growth Elastic Model	Remarks
Delhi	Car/Jeep	PCI	y = 1.1254x + 0.4266	R² = 0.9567	1.1254	5.95%	6.69%	Good Regression
	Bus	Population	y = -4.6707x - 38.36	R² = 0.0418	-4.6707	1.62%	-7.58%	Poor Regression
	LCV	NSDP	y = 1.4894x - - 3.1225	R² = 0.9315	1.4894	7.98%	11.88%	Good Regression
	Truck	NSDP	y = 2.04x - -7.5415	R² = 0.9916	2.0400	7.98%	16.27%	Good Regression

The following tables and graphs depict regression and elasticity of growth model for stretch falling in Haryana State.

Table 5-11 : Per Capita Income Vs Car Haryana

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2012	106085	989519	5.03	6.00		
2013	111780	1134616	5.05	6.05	5%	
2014	119791	1278272	5.08	6.11	7%	
2015	125032	1420621	5.10	6.15	4%	

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2016	137818	1711692	5.14	6.23	10%	
2017	150241	1851788	5.18	6.27	9%	7.23%

Regression analysis of same is given in figure below.

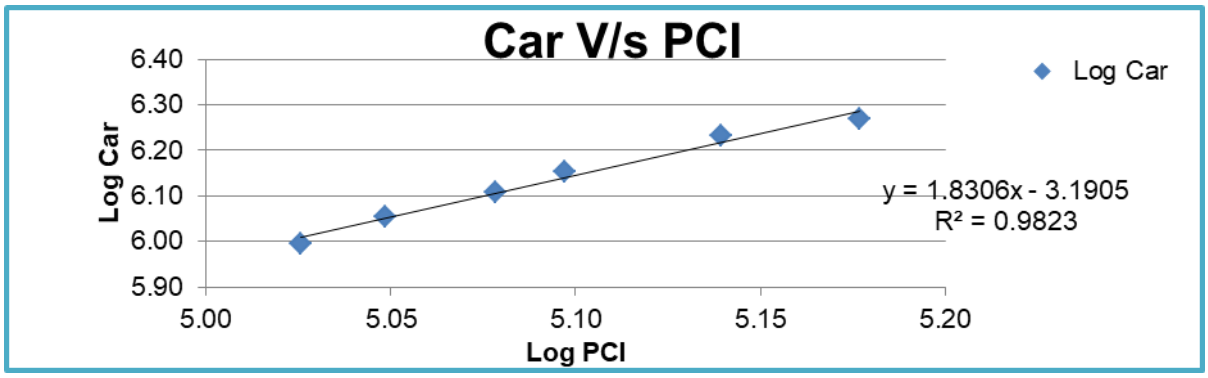

Figure 5-9: Regression and Elasticity PCI vs. Car–Extrapolation Haryana

Table 5-12 : Population Vs Bus Haryana

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth
2012	25351462	39153	7.40	4.59		
2013	25751257	43456	7.41	4.64	2%	
2014	26149236	46558	7.42	4.67	2%	
2015	26545282	52640	7.42	4.72	2%	
2016	26939286	55781	7.43	4.75	1%	
2017	27331141	60129	7.44	4.78	1%	1.52%

Regression analysis of same is given in figure below.

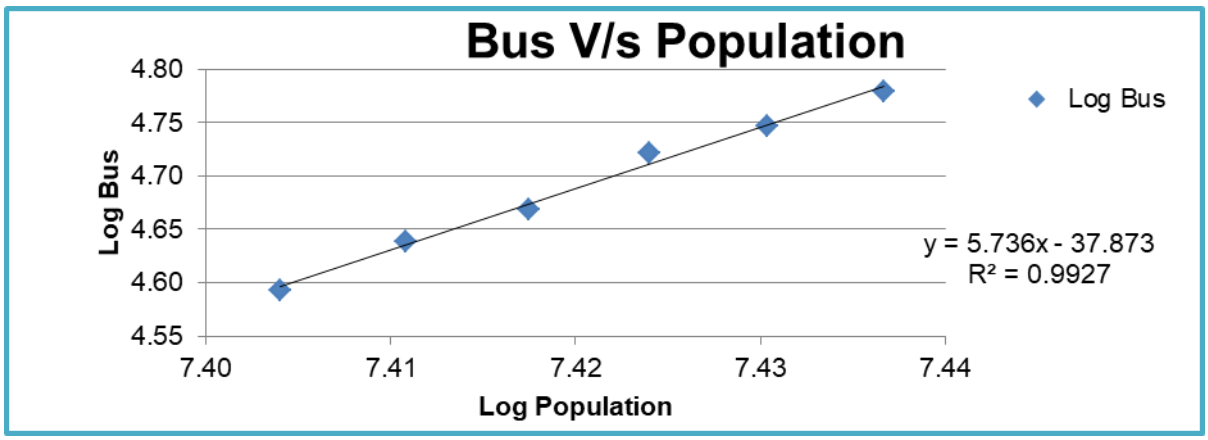

Figure 5-10: Regression and Elasticity Population vs. Bus – Extrapolation Haryana

The elasticity of goods traffic has been worked out by regression analysis with NSDP. The following table represents the data and details.

Table 5-13 : LCV Traffic Vs NSDP Haryana

Year	NSDP	LCV	Log NDSP	Log LCV	NSDP Growth	Average Growth (5 Year)
2012	271152	124897	5.43	5.10		
2013	289756	137511	5.46	5.14	7%	
2014	314931	152069	5.50	5.18	9%	
2015	333359	167901	5.52	5.23	6%	
2016	372659	182776	5.57	5.26	12%	

The following figure depicts regression analysis and extrapolation.

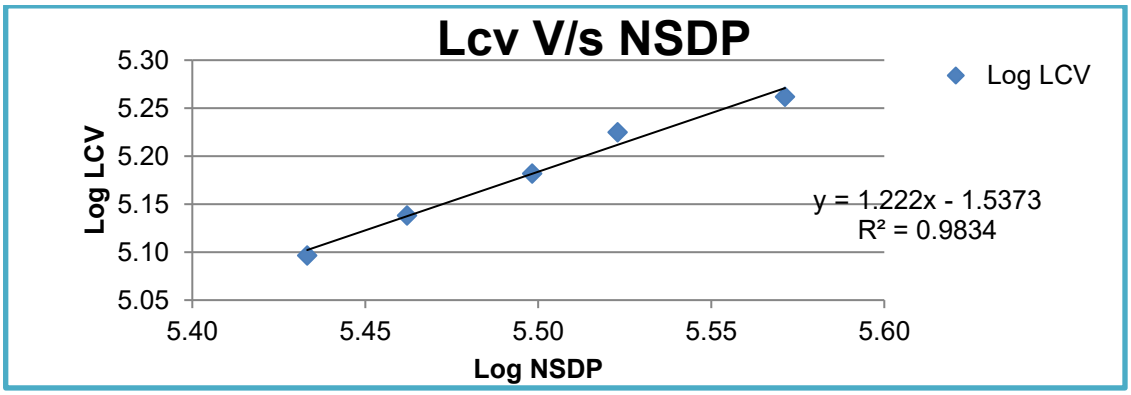

Figure 5-11: Regression and Elasticity NSDP vs. LCV Traffic – extrapolation Haryana.

Table 5-14 : Truck Traffic Vs NSDP Haryana

Year	NSDP	Trucks	Log NDSP	Log Truck	NSDP Growth	Average Growth (5 Year)
2012	271152	292735	5.43	5.47		
2013	289756	307509	5.46	5.49	7%	
2014	314931	327882	5.50	5.52	9%	
2015	333359	348732	5.52	5.54	6%	
2016	372659	367730	5.57	5.57	12%	
2017	412006	390321	5.61	5.59	11%	8.75%

The following figure depicts regression analysis and extrapolation.

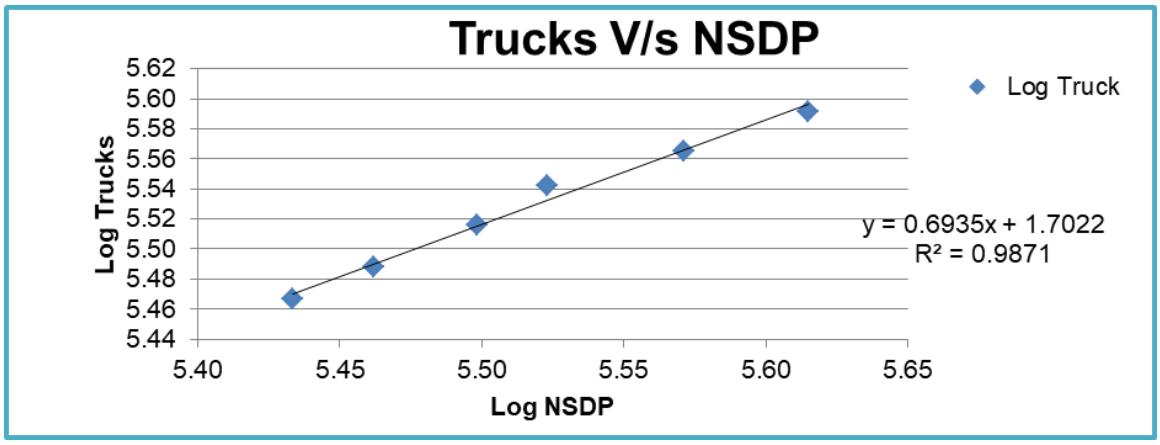

Figure 5-12: Regression and Elasticity NSDP vs. Truck Traffic – extrapolation Haryana.

Using the regression analysis above, we have arrived at the elasticity of traffic demand for each class of vehicle to a given change in relevant economic indicators. Average traffic growth of a vehicle class is multiplied by the corresponding elasticity coefficient to arrive at traffic growth. R2 statistical measure of how close the data are to the fitted regression line. It varies from 0 to 1. The higher the value of R2 more representative is the regression model of data.

The results of these analyses for *the good fit* regression as reflected by R^2 values are presented in the Table below.

Table 5-15 : Summary Regression Analysis Haryana

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average IV Growth (5yrs)	Growth Elastic Model	Remarks
Haryana	Car/Jeep	PCI	y = 1.8306x + -3.1905	R^2 = 0.9823	1.8306	7.23%	13.24 %	Good Regression
	Bus	Population	y = 5.736x - - 37.8732	R^2 = 0.9927	5.7360	1.52%	8.69%	Good Regression
	LCV	NSDP	y = 1.222x - - 1.5373	R^2 = 0.9834	1.2220	8.30%	10.14 %	Good Regression
	Truck	NSDP	y = 0.6935x - 1.7022	R^2 = 0.9871	0.6935	8.75%	6.07%	Good Regression

The economic model for predicting growth is a good tool, however other local, regional, and national factors should also be considered before finalizing growth factors. Considering factors such as proposed developments and other influencing economic factors, moderate growth should be considered. These factors are discussed in subsequent sections.

5.4 Analysis of Historic Traffic Data

Historical traffic data forms useful information for any highway project. It provides useful information for establishing past trends of growth. Project stretch of Agra to Etawah has recently been commissioned and is under tolling operation since 2016-17. As traffic data is available with the project concessionaire of three years, we do not have sufficient data points to be able to establish a reliable past trend of traffic growth. Moreover, the part two years traffic is affected by COVID-19 impact. A minimum of about 5 -6 years' traffic data is required for establishing a reliable past trend.

5.5 Other Factors Influencing Growth

There are many factors which have an impact on traffic growth. As discussed previously these factors can be economical, social, educational, and industrial.

Potentiality of such factors for project highway is discussed as under.

ECONOMY

After witnessing a slowdown during 2011-12, the economy recovered in 2013-14, and a high growth rate of GDP was recorded up to 2018-19. Pandemic of COVID-19 impacted all economies of world including India up to year 2021-22. Following figure show trend of GDP growth in India.

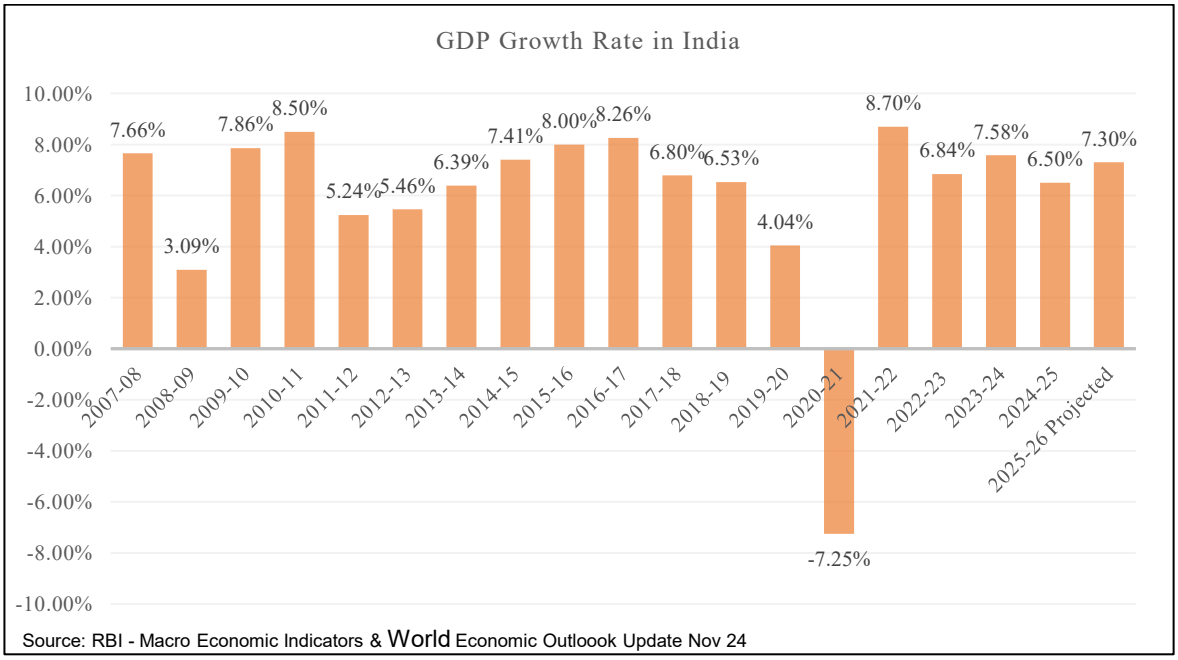

Figure 5-13 : Growth of GDP in India

FY 2017-18 recorded a growth of 6.7% which had a slight impact of GST and demonetization. Indian economy appears on recovery path with estimated growth of 6.8% in FY 2018-19. The government took major policy decisions including tax infrastructure reforming, banking sector improvement and ease of doing business.

In post COVID-19 scenario, in year 2022-23 and 2023-24 India registered an impressive growth of 7% to 7.5%. In last year despite global slow down due to Russia-Ukraine war and Gaza crises, India grew at good rate of 7%(Estimated). Indian economy is now on good growth path and all major institutions including IMF / ADB have estimated growth of Indian Economy to peg around 6.5% to 7% in coming years.

5.6 Developments along and around Project Corridor & State

Though the growth of Delhi has been consistently below the national average economic growth, it is the largest state in terms of population and consumption driven demand for goods and services will remain significantly high. The rate of growth of NSDP also seems to be catching up with the national average over the years. Other regions in the influenced area states, namely Delhi, Haryana and Uttarakhand are all growing significantly faster than the national average. Considering the scenario, it may be assumed that the traffic growth on the project highway would remain high and there are minimal risks in terms of growth.

Table 5-16 : GDP of India, UP and other important states

Year	India (GDP)	Bihar	Haryana	Madhya Pradesh	Maharashtra	Odisha	Punjab	Rajasthan	Uttar Pradesh	Uttarakhand	West Bengal	Delhi
1980-81	12336	514	357	623	1464	529	504	560	1631	138	830	269
1981-82	13030	543	371	639	1498	528	551	607	1670	141	808	291
1982-83	13411	548	394	668	1556	497	568	620	1800	152	840	328
1983-84	14464	601	402	702	1654	597	578	761	1871	158	939	320
1984-85	15037	658	418	668	1675	569	623	706	1900	161	964	333
1985-86	15663	672	493	726	1807	635	670	704	1975	167	1005	386
1986-87	16339	725	493	694	1832	643	694	771	2060	174	1045	411
1987-88	16917	685	484	789	1955	623	730	718	2154	182	1101	447
1988-89	18635	772	602	847	2159	754	769	1014	2434	206	1148	486
1989-90	19778	759	610	865	2515	805	834	993	2502	212	1188	531
1990-91	20824	831	674	987	2629	668	849	1149	2651	224	1251	553
1991-92	21122	784	688	916	2620	753	888	1061	2662	225	1349	638
1992-93	22254	737	688	983	3017	740	930	1220	2690	228	1389	660
1993-94	23519	755	719	1088	3349	788	970	1121	2757	233	1490	705
1994-95	25023	842	771	1107	3414	826	995	1325	2901	254	1594	790
1995-96	26846	712	787	1174	3791	864	1032	1374	2995	251	1713	804
1996-97	28987	893	879	1252	3941	804	1107	1535	3327	267	1832	915
1997-98	30234	850	887	1318	4158	920	1137	1721	3292	270	1985	1063
1998-99	32255	904	934	1405	4324	948	1203	1797	3316	274	2112	1116
1999-00	34837	950	1002	1552	4735	1008	1267	1801	3440	274	2264	1170
2000-01	36282	1106	1081	1426	4589	982	1309	1743	3511	308	2343	1215
2001-02	38236	1043	1165	1528	4751	1042	1326	1941	3575	323	2512	1262
2002-03	39719	1175	1236	1449	5079	1034	1348	1708	3690	353	2600	1359
2003-04	42883	1099	1358	1611	5471	1185	1433	2251	3885	381	2753	1433
2004-05	45906	1238	1475	1664	5948	1340	1504	2196	4079	431	2936	1588
2005-06	50257	1207	1608	1748	6810	1399	1577	2344	4317	492	3121	1752
2006-07	55066	1416	1791	1907	7748	1574	1748	2620	4660	551	3366	1969
2007-08	60199	1489	1931	1997	8650	1708	1899	2739	4959	648	3627	2191
2008-09	64248	1716	2080	2250	8786	1837	2004	2969	5336	716	3774	2464
2009-10	69769	1798	2340	2463	9634	1852	2132	3142	5668	839	4067	2667
2010-11	75987	2073	2498	2592	10732	1968	2270	3614	6120	927	4313	2888
2011-12	81069	2285	2712	2824	11222	2042	2392	3953	6451	1020	4471	3147
2012-13	85463	2369	2894	3069	11842	2163	2518	4098	6736	1095	4838	3342
2013-14	90636	2469	3142	3226	12671	2331	2675	4343	7075	1178	5247	3565
2014-15	97121	2557	3314	3394	13322	2359	2777	4656	7297	1257	5633	3882
2015-16	105033	2749	3612	3597	14417	2557	2926	4981	7894	1355	-	4291
2016-17	112476	3033	3927	4129	15744	2828	3095	5352	8457	1448	-	4658
2017-18	119762	-	-	4432	-	3029	-	5736	9011	1547	-	5035
Growth 1981-2018	6.34	5.05	6.88	5.44	6.82	4.83	5.17	6.49	4.73	6.75	5.79	8.24
Growth 1994-2018	7.02	6.23	7.66	6.03	6.96	5.77	5.17	7.04	5.06	8.20	6.54	8.53
Growth 2000-2018	7.10	7.07	8.37	6.00	7.32	6.30	5.40	6.65	5.50	10.10	6.27	8.45

5.7 Industrial Units along Project Corridor

There are a number of big and small industrial units along the project corridor. The following figure shows some of these along corridors.

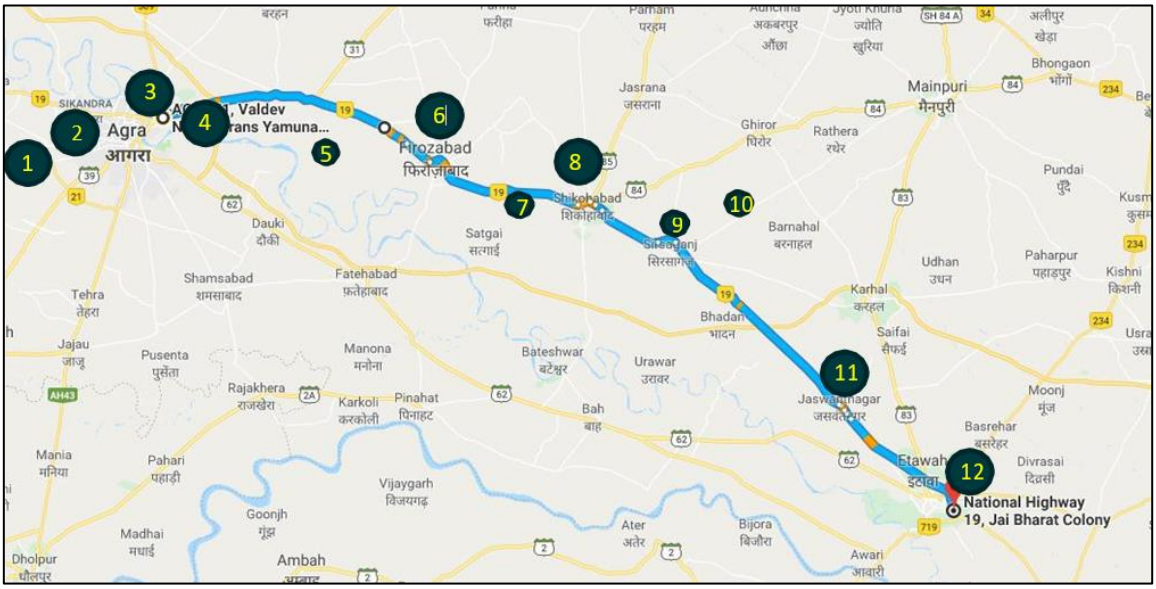

Figure 5-14 : Industrial Units along project corridor.

The following is the list of industrial units along the project corridor.

1. Leather Park, **Agra**
2. Export Promotional Industrial Park (EPIP)
3. Foundry Nagar (BK Casting, Agricultural Industries, Paint Industries, Plastic Industries, Metal Industries), **Agra**
4. Industrial Estate, **Agra**
5. Agarbatti Industry
6. Glass Industries, **Firozabad**
7. Pipe Industries, Glass Bulb Industries
8. Agro Industries, Glass Industries, Cold Storage
9. Food Processing Industries
10. PVC Pipe Industries
11. Rural Industrial Estate, **Jaswant Nagar**
12. **Etawah** (Caplock Industries Private Limited, Rice Mills)

Such industries along project corridor and urban development around major cities of Firozabad, Tundla, Shikohabad, Jaswantnagar and Wtawah provide impetus to project traffic on corridor.

5.8 Recommended Growth Rates of Traffic

Based on the above analysis and after giving due consideration to the entire listed factors, the following overall growth rates are recommended for each category of vehicle as below. The rate of growth is moderate in light of overall regional trends. Growth of multi-Axle is kept slightly higher as trend of technological advances in logistic industry favors multi-axle over 2/3 axle carriage. It is also expected that as the economy moves from developing to developed, the rate of growth diminishes. Same growth rate is not sustainable for long. Hence growth rates have been suitably stepped down in future years.

Growth rates are recommended for three scenarios for sensitivity analysis namely **Optimistic, Pessimistic** and **Most Likely** with a positive and negative variation from Most Likely case for corridor in both states.

5.8.1 Recommended Growth Rates of Traffic for Project Stretch

Table 5-17 : Recommended Growth Rates Optimistic

Category / Year	FY 2027-2030	FY 2031-2035	FY 2036-2040	FY 2041-2045	FY 2046-2050
Car/Jeep/Van	8.75%	8.71%	7.42%	6.23%	5.15%
Bus	4.70%	4.68%	3.29%	2.58%	1.95%
LCV	5.71%	5.65%	4.63%	3.71%	3.16%
2- Axle	6.07%	6.01%	5.06%	4.20%	3.42%
3 - Axle	6.39%	6.33%	5.32%	4.41%	3.59%
4 to 6 Axle	6.72%	6.64%	5.58%	4.62%	3.76%
7 and Above Axle	6.72%	6.64%	5.58%	4.62%	3.76%

Table 5-18 : Recommended Growth Rates Pessimistic

Category / Year	FY 2027-2030	FY 2031-2035	FY 2036-2040	FY 2041-2045	FY 2046-2050
Car/Jeep/Van	8.25%	8.21%	6.92%	5.73%	4.65%
Bus	4.20%	4.18%	2.79%	2.08%	1.45%
LCV	5.21%	5.15%	4.13%	3.21%	2.66%
2- Axle	5.57%	5.51%	4.56%	3.70%	2.92%
3 - Axle	5.89%	5.83%	4.82%	3.91%	3.09%
4 to 6 Axle	6.22%	6.14%	5.08%	4.12%	3.26%
7 and Above Axle	6.22%	6.14%	5.08%	4.12%	3.26%

Table 5-19 : Recommended Growth Rates Most Likely

Category / Year	FY 2027-2030	FY 2031-2035	FY 2036-2040	FY 2041-2045	FY 2046-2050
Car/Jeep/Van	8.50%	8.46%	7.17%	5.98%	4.90%
Bus	4.45%	4.43%	3.04%	2.33%	1.70%
LCV	5.46%	5.40%	4.38%	3.46%	2.91%
2- Axle	5.82%	5.76%	4.81%	3.95%	3.17%
3 - Axle	6.14%	6.08%	5.07%	4.16%	3.34%
4 to 6 Axle	6.47%	6.39%	5.33%	4.37%	3.51%
7 and Above Axle	6.47%	6.39%	5.33%	4.37%	3.51%

Traffic and revenue have been worked out on the basis of the above growth, and some are presented in subsequent chapters of the report.

CHAPTER 6

TRAFFIC FORECAST

6.1 Traffic Projections

The growth rates recommended in the previous section of the report are used to arrive at traffic projections for future years. Toll plaza wise futuristic traffic projection is given in tables below.

These projections have been done for the following three cases of growth up to the concession period.

1. Optimistic Scenario
2. Pessimistic Scenario
3. Most Likely Scenario

Table 6-1 : Total Tollable Traffic @ Toll Plaza 1- Chainage 285.20 KM

(Optimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	5150	761	624	1703	766	3016	7	**12027**	**29345**
2027-28	5601	804	653	1806	815	3219	7	**12905**	**31333**
2028-29	6091	850	683	1916	867	3435	7	**13849**	**33459**
2029-30	6624	898	715	2032	923	3666	7	**14865**	**35733**
2030-31	7200	949	748	2154	981	3909	7	**15948**	**38142**
2031-32	7827	1003	783	2284	1044	4169	7	**17117**	**40718**
2032-33	8508	1059	820	2421	1110	4446	7	**18371**	**43473**
2033-34	9247	1119	858	2566	1180	4741	7	**19718**	**46419**
2034-35	10053	1182	898	2720	1255	5056	7	**21171**	**49569**
2035-36	10798	1237	927	2858	1322	5338	7	**22487**	**52393**
2036-37	11599	1294	957	3003	1392	5636	7	**23888**	**55382**
2037-38	12459	1354	989	3155	1466	5950	7	**25380**	**58548**
2038-39	13383	1417	1021	3315	1544	6282	7	**26969**	**61901**
2039-40	14375	1482	1054	3483	1627	6633	7	**28661**	**65452**
2040-41	15271	1537	1082	3629	1699	6940	7	**30165**	**68573**
2041-42	16222	1594	1110	3781	1774	7260	7	**31748**	**71848**
2042-43	17234	1653	1139	3940	1852	7595	7	**33420**	**75286**
2043-44	18308	1714	1168	4106	1934	7946	7	**35183**	**78893**
2044-45	19448	1778	1198	4279	2019	8313	7	**37042**	**82680**
2045-46	20449	1834	1222	4425	2092	8626	7	**38655**	**85928**

Table 6-2 : Total Tollable Traffic @ Toll Plaza 2- Chainage 224.95 KM

(Optimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	14128	1107	1455	2129	835	2968	7	**22629**	**44519**
2027-28	15364	1171	1523	2259	889	3167	7	**24380**	**47686**
2028-29	16707	1238	1594	2397	946	3380	7	**26269**	**51087**
2029-30	18170	1308	1668	2542	1007	3607	7	**28309**	**54739**
2030-31	19752	1382	1746	2695	1070	3847	7	**30499**	**58632**
2031-32	21473	1460	1827	2857	1138	4102	7	**32864**	**62811**
2032-33	23343	1542	1912	3028	1210	4374	7	**35416**	**67300**
2033-34	25374	1629	2002	3210	1287	4665	7	**38174**	**72120**
2034-35	27583	1721	2095	3403	1369	4975	7	**41153**	**77299**
2035-36	29629	1800	2164	3575	1442	5252	7	**43869**	**81964**
2036-37	31827	1883	2235	3756	1519	5545	7	**46772**	**86924**
2037-38	34189	1970	2308	3946	1599	5854	7	**49873**	**92198**
2038-39	36726	2061	2384	4145	1684	6181	7	**53188**	**97807**
2039-40	39451	2156	2462	4355	1773	6526	7	**56730**	**103772**
2040-41	41910	2236	2525	4538	1851	6828	7	**59895**	**109053**
2041-42	44522	2319	2590	4728	1933	7143	7	**63242**	**114616**
2042-43	47299	2405	2656	4926	2018	7473	7	**66784**	**120476**
2043-44	50248	2494	2725	5133	2107	7818	7	**70532**	**126651**
2044-45	53379	2586	2795	5348	2200	8179	7	**74494**	**133157**
2045-46	56129	2668	2850	5531	2279	8487	7	**77951**	**138775**

Table 6-3 : Total Tollable Traffic @ Toll Plaza 1- Chainage 285.20 KM

(Pessimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	5127	757	621	1695	762	3002	7	**11971**	**29208**
2027-28	5550	796	647	1789	807	3189	7	**12785**	**31040**
2028-29	6008	838	674	1889	855	3387	7	**13658**	**32991**
2029-30	6503	881	702	1994	905	3597	7	**14589**	**35068**
2030-31	7037	927	731	2104	958	3818	7	**15582**	**37258**
2031-32	7614	974	761	2220	1014	4053	7	**16643**	**39588**
2032-33	8238	1024	793	2343	1073	4302	7	**17780**	**42068**
2033-34	8914	1076	826	2472	1136	4567	7	**18998**	**44708**
2034-35	9644	1131	860	2608	1202	4848	7	**20300**	**47519**
2035-36	10312	1178	884	2727	1260	5094	7	**21462**	**49989**
2036-37	11025	1226	909	2851	1320	5353	7	**22691**	**52592**
2037-38	11788	1277	934	2981	1384	5625	7	**23996**	**55336**

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2038-39	12603	1329	960	3117	1451	5911	7	**25378**	**58228**
2039-40	13475	1384	986	3260	1521	6212	7	**26845**	**61278**
2040-41	14248	1428	1006	3381	1580	6468	7	**28118**	**63893**
2041-42	15064	1474	1027	3506	1641	6734	7	**29453**	**66626**
2042-43	15928	1521	1048	3636	1705	7011	7	**30856**	**69481**
2043-44	16842	1569	1069	3770	1772	7300	7	**32329**	**72463**
2044-45	17808	1620	1091	3909	1841	7601	7	**33877**	**75580**
2045-46	18636	1663	1107	4023	1898	7848	7	**35182**	**78171**

Table 6-4 : Total Tollable Traffic @ Toll Plaza 2- Chainage 224.95 KM (Pessimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	14063	1101	1448	2119	831	2955	7	**22524**	**44311**
2027-28	15222	1158	1508	2237	881	3139	7	**24152**	**47242**
2028-29	16479	1218	1571	2362	933	3334	7	**25904**	**50375**
2029-30	17838	1281	1636	2493	988	3541	7	**27784**	**53725**
2030-31	19303	1347	1705	2631	1045	3759	7	**29797**	**57277**
2031-32	20886	1416	1776	2776	1106	3990	7	**31957**	**61073**
2032-33	22600	1488	1850	2929	1170	4235	7	**34279**	**65132**
2033-34	24456	1564	1927	3090	1238	4495	7	**36777**	**69472**
2034-35	26463	1644	2007	3260	1310	4771	7	**39462**	**74114**
2035-36	28293	1711	2063	3409	1373	5013	7	**41869**	**78217**
2036-37	30250	1781	2120	3565	1439	5267	7	**44429**	**82560**
2037-38	32343	1854	2179	3727	1508	5535	7	**47153**	**87157**
2038-39	34580	1930	2239	3897	1581	5816	7	**50050**	**92024**
2039-40	36973	2009	2301	4075	1658	6112	7	**53135**	**97177**
2040-41	39094	2073	2349	4226	1723	6364	7	**55836**	**101638**
2041-42	41335	2139	2398	4382	1790	6626	7	**58677**	**106315**
2042-43	43705	2208	2448	4544	1859	6899	7	**61670**	**111221**
2043-44	46212	2278	2499	4712	1932	7184	7	**64824**	**116366**
2044-45	48862	2351	2551	4886	2007	7480	7	**68144**	**121763**
2045-46	51133	2414	2588	5029	2069	7723	7	**70963**	**126293**

Traffic projections for Most Likely scenario is given as under

Table 6-5 : Total Tollable Traffic @ Toll Plaza 1-Tundla- Chainage 285.20 KM (Most Likely Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	5139	758	623	1700	765	3009	7	**12001**	**29276**
2027-28	5575	800	651	1799	812	3203	7	**12847**	**31186**
2028-29	6049	843	680	1903	862	3410	7	**13754**	**33225**
2029-30	6564	889	710	2013	915	3630	7	**14728**	**35399**
2030-31	7119	937	742	2129	971	3862	7	**15767**	**37698**
2031-32	7720	988	775	2252	1030	4109	7	**16881**	**40150**
2032-33	8372	1041	809	2382	1093	4371	7	**18075**	**42766**
2033-34	9079	1097	845	2519	1159	4650	7	**19356**	**45556**
2034-35	9847	1156	882	2664	1229	4947	7	**20732**	**48534**
2035-36	10553	1207	909	2792	1292	5210	7	**21970**	**51178**
2036-37	11310	1259	937	2926	1358	5488	7	**23285**	**53971**
2037-38	12121	1314	965	3066	1427	5781	7	**24681**	**56921**
2038-39	12989	1371	994	3213	1500	6089	7	**26163**	**60039**
2039-40	13921	1431	1024	3367	1576	6414	7	**27740**	**63333**
2040-41	14754	1481	1048	3500	1642	6695	7	**29127**	**66195**
2041-42	15635	1532	1072	3638	1710	6988	7	**30582**	**69191**
2042-43	16571	1585	1097	3782	1782	7293	7	**32117**	**72328**
2043-44	17564	1640	1122	3931	1856	7612	7	**33732**	**75614**
2044-45	18615	1696	1148	4086	1933	7945	7	**35430**	**79054**
2045-46	19527	1746	1168	4216	1998	8223	7	**36885**	**81962**

Table 6-6 : Total Tollable Traffic @ Toll Plaza 2- Gurau - Chainage 224.95 KM (Most Likely Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	14096	1103	1451	2124	833	2961	7	**22575**	**44415**
2027-28	15295	1163	1515	2248	884	3152	7	**24264**	**47464**
2028-29	16595	1226	1582	2379	939	3355	7	**26083**	**50730**
2029-30	18005	1292	1652	2518	997	3572	7	**28043**	**54230**
2030-31	19527	1361	1725	2663	1058	3801	7	**30142**	**57951**
2031-32	21179	1433	1801	2816	1122	4044	7	**32402**	**61937**
2032-33	22971	1510	1880	2978	1190	4302	7	**34838**	**66208**
2033-34	24912	1591	1963	3149	1262	4577	7	**37461**	**70785**
2034-35	27019	1677	2049	3330	1339	4869	7	**40290**	**75691**
2035-36	28956	1750	2111	3491	1407	5128	7	**42850**	**80071**
2036-37	31032	1826	2175	3659	1479	5402	7	**45580**	**84717**
2037-38	33257	1906	2241	3835	1554	5690	7	**48490**	**89645**
2038-39	35642	1989	2309	4019	1633	5993	7	**51592**	**94875**
2039-40	38197	2076	2379	4212	1716	6313	7	**54900**	**100424**
2040-41	40482	2148	2435	4378	1788	6589	7	**57827**	**105284**
2041-42	42904	2222	2492	4550	1862	6877	7	**60914**	**110392**
2042-43	45472	2299	2550	4730	1940	7177	7	**64175**	**115761**
2043-44	48192	2378	2609	4917	2020	7491	7	**67614**	**121405**

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2044-45	51075	2459	2670	5111	2104	7818	7	**71244**	**127339**
2045-46	53579	2530	2715	5273	2175	8092	7	**74371**	**132395**

6.2 Modification in Concession Period

As per Article 29 of the concession agreement, if actual traffic on the project falls short or exceeds Target Traffic on project highway on defined date, concession period shall be modified subject to calculation stipulated therein. For Agra-Etawah project, the Target Date and Target Traffic are defined as under:

Target Date - 1st April 2025

Target Traffic - 52995 PCU

It was observed that as per traffic projections, average traffic volume falls short of target traffic in all scenarios. The probable extension of the concession period is estimated according to article 29 of the concession agreement which comes to about 5 years. Traffic forecast and revenue projections are done for probable extended period accordingly.

Most Likely

Target Year	Target Traffic	Actual Traffic	% of Excess / Short traffic	% Revision (+ or -) in CP as per CA	% Variation in CP	Original CP	Change in CP (In Years)
2025	52995	34711	-35%	52%	20%	24	4.8

Optimistic

Target Year	Target Traffic	Actual Traffic	% of Excess / Short traffic	% Revision (+ or -) in CP as per CA	% Variation in CP	Original CP	Change in CP (In Years)
2025	52995	34740	-34%	52%	20%	24	4.8

Pessimistic

Target Year	Target Traffic	Actual Traffic	% of Excess / Short traffic	% Revision (+ or -) in CP as per CA	% Variation in CP	Original CP	Change in CP (In Years)
2025	52995	34683	-35%	52%	20%	24	4.8

CHAPTER 7

FORECAST OF TOLL REVENUE

7.1 General

This chapter presents the tolling rate calculations, categories and toll revenue of the project.

7.2 Discount Categories

The fee schedule in the CA of Surat-Dahisar section of NH-8 is based on the old toll policy. As per the Toll Notification (Schedule -G) the discounts and special provisions have been considered. In addition to discounts as per Fee Notification concessionaire has declared special category rates also. Salient features of toll rate structure are given as under

1. Monthly Pass: For frequent user's monthly pass would be issued at fee 50 time the single journey fee at 2/3rd Rate.
2. Multiple Journeys (for Return Trip): Will be charged at 1.5 times single journey.
3. Single Journey: Full single journey toll would be charged to this category of vehicles who are infrequent travelers or whose frequency does not yield any discount from the above categories.
4. Local Discounts: Local Car Jeep Van -Rs. 350 per month (for locals residing within a radius of 20 kms from toll plaza). Additionally, local commercial vehicles are charged at 50% rate of single journey.

Building of inflation and escalation of rate on the basis of WPI are done as per toll notification (Schedule G) as given under as extract from concession agreement.

The formula for determining the applicable rate of fee shall be as follows:-

$$\text{Applicable rate of fee} = \text{base rate} + \text{base rate} \times \left\{ \frac{\text{WPI A-WPI B}}{\text{WPI B}} \right\} \times 0.4$$

Factors of inflation / growth have been incorporated as per Schedule R. WPI are available up to the year 2025-26.

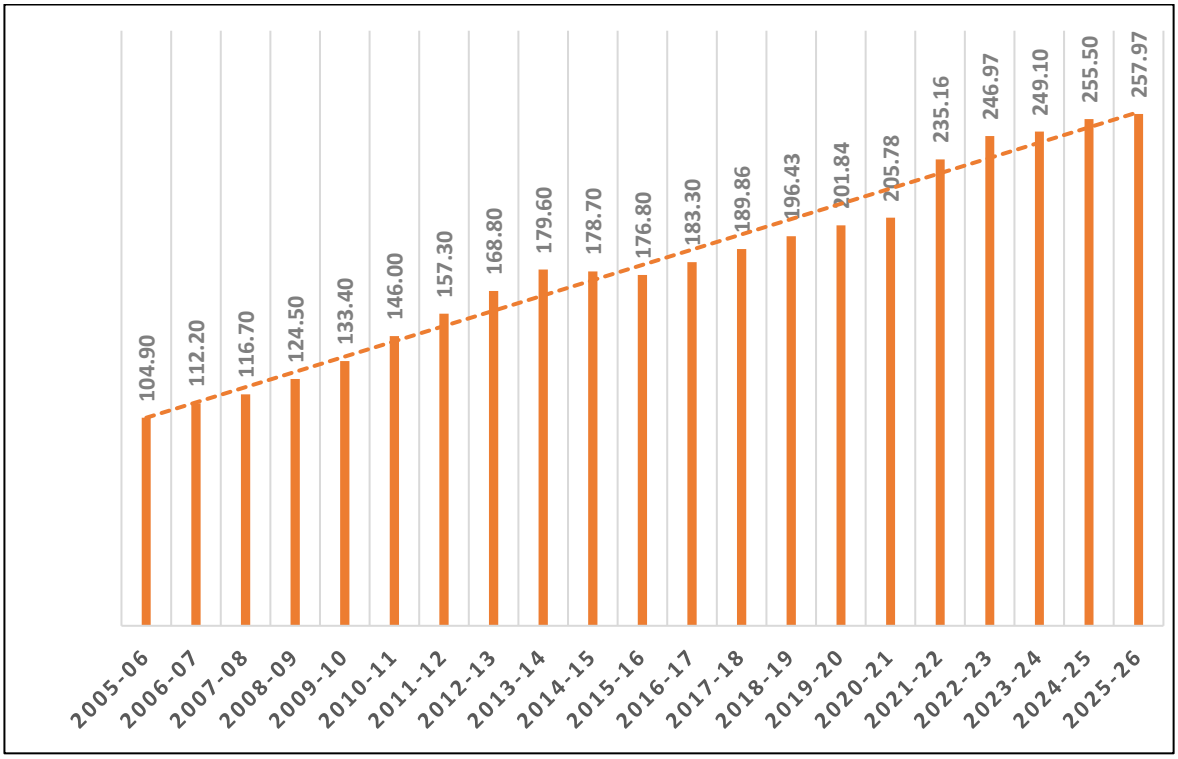

Figure 7-1 : Historical Rate of WPI Inflation in India

The wholesale price index (WPI) and the inflation rate in the past are presented in Table below.

Table 7-1 : Historical WPI Value and Growth Inflation

December of year	2021	2022	2023	2024	2025	Avg.
WPI	235.2	247.0	249.1	255.5	257.97	
Inflation	14.27%	5.02%	0.86%	2.57%	0.96%	4.74%

WPI of December 2025 is posted on ministry site which is shows 0.96% inflation from the previous year. Same has been applied for FY 2026-27.

The average WPI inflation over the period FY 2021 to FY 2025 works out to approximately 4.74%, reflecting inflationary cycles across both high and low inflation years. Based on this analysis, an annual escalation factor of 4.5% has been adopted for the remaining concession period.

7.3 Estimation of Toll Rates

As per the applicable MORTH notification and Schedule R of contract agreement, the following Base rate of fee for the categories mentioned in the table stands true in the National Highways Fee Rules applicable for contract.

Table 7-2 : Base Toll Rates June 2007-08

Type of Vehicle	Base Rate of Fee / Km (in Rs.)
Car, Jeep, Van or Light Motor Vehicle	0.65

Type of Vehicle	Base Rate of Fee / Km (in Rs.)
Light Commercial Vehicle, Light Goods Vehicle or Minibus	1.05
Bus or Truck (Two Axles)	2.20
Three Axle Commercial Vehicles	2.40
Heavy Construction Machinery (HCM) or Earth Moving Equipment (EME) or Multi Axle Vehicle (MAV) (4 to 6 axles)	3.45
Oversized Vehicles (7 or more Axles)	4.20

Toll rates are calculated as per guidelines provided in schedule R (rounded to nearest Rs.) for the concession period and are given below.

Thus, worked out rates for various categories of vehicle and discounts are given as under

Table 7-3 : Toll Rates for Single Journey@ Km 285.20

Year	Car	Minibus /LCV	Bus	Truck	3 axles	Multi axle	Oversized Vehicles
2026-27	125	200	415	415	455	655	795
2027-28	130	210	435	435	475	685	830
2028-29	135	220	455	455	500	715	870
2029-30	140	230	480	480	520	750	910
2030-31	150	240	500	500	545	785	955
2031-32	155	250	525	525	570	820	1000
2032-33	160	260	550	550	600	860	1050
2033-34	170	275	575	575	625	900	1100
2034-35	180	290	605	605	655	945	1150
2035-36	185	300	630	630	690	990	1205
2036-37	195	315	660	660	720	1040	1265
2037-38	205	330	695	695	755	1090	1325
2038-39	215	345	730	730	795	1140	1390
2039-40	225	365	765	765	830	1195	1455
2040-41	235	380	800	800	875	1255	1530
2041-42	250	400	840	840	915	1315	1600
2042-43	260	420	880	880	960	1380	1680
2043-44	275	440	925	925	1010	1450	1765
2044-45	285	465	970	970	1060	1520	1850
2045-46	300	485	1015	1015	1110	1595	1940

Table 7-4 : Toll Rates for Single Journey @ Km 224.95

Year	Car	Minibus /LCV	Bus	Truck	3 axles	Multi axle	Oversized Vehicles
2026-27	115	185	385	385	420	605	735
2027-28	120	195	405	405	440	635	770
2028-29	125	200	425	425	460	665	805
2029-30	130	210	445	445	485	695	845
2030-31	135	220	465	465	505	725	885
2031-32	145	230	485	485	530	760	925
2032-33	150	245	510	510	555	800	970
2033-34	160	255	535	535	580	835	1020
2034-35	165	265	560	560	610	875	1065
2035-36	175	280	585	585	640	920	1120
2036-37	180	295	615	615	670	960	1170
2037-38	190	305	645	645	700	1010	1230
2038-39	200	320	675	675	735	1060	1290
2039-40	210	340	705	705	770	1110	1350
2040-41	220	355	740	740	810	1165	1415
2041-42	230	370	780	780	850	1220	1485
2042-43	240	390	815	815	890	1280	1560
2043-44	255	410	855	855	935	1345	1635
2044-45	265	430	900	900	980	1410	1715
2045-46	280	450	945	945	1030	1480	1800

Table 7-5 : Toll Rates for Return Journey @ Km 285.20

Year	Car	Minibus /LCV	Bus	Truck	3 axles	Multi axle	Oversized Vehicles
2026-27	185	300	625	625	680	980	1190
2027-28	195	310	655	655	715	1025	1250
2028-29	200	325	685	685	745	1075	1305
2029-30	210	340	715	715	780	1125	1370
2030-31	220	360	750	750	820	1175	1435
2031-32	230	375	785	785	855	1235	1500
2032-33	245	395	825	825	900	1290	1570
2033-34	255	410	865	865	940	1355	1645
2034-35	265	430	905	905	985	1420	1725
2035-36	280	450	945	945	1035	1485	1810
2036-37	295	475	995	995	1085	1555	1895
2037-38	310	495	1040	1040	1135	1630	1985
2038-39	320	520	1090	1090	1190	1710	2085
2039-40	340	545	1145	1145	1250	1795	2185
2040-41	355	575	1200	1200	1310	1880	2290
2041-42	370	600	1260	1260	1375	1975	2405
2042-43	390	630	1320	1320	1440	2070	2520
2043-44	410	660	1385	1385	1510	2175	2645
2044-45	430	695	1455	1455	1585	2280	2775
2045-46	450	730	1525	1525	1665	2395	2915

Table 7-6 : Toll Rates for Return Journey @ Km 224.95

Year	Car	Minibus /LCV	Bus	Truck	3 axles	Multi axle	Oversized Vehicles
2026-27	170	275	580	580	630	905	1105
2027-28	180	290	605	605	660	950	1155
2028-29	185	305	635	635	690	995	1210
2029-30	195	315	665	665	725	1040	1270
2030-31	205	330	695	695	760	1090	1330
2031-32	215	350	730	730	795	1145	1390
2032-33	225	365	765	765	835	1195	1455
2033-34	235	380	800	800	870	1255	1525
2034-35	250	400	840	840	915	1315	1600
2035-36	260	420	880	880	960	1375	1675
2036-37	270	440	920	920	1005	1445	1755
2037-38	285	460	965	965	1055	1515	1840
2038-39	300	485	1010	1010	1105	1585	1930
2039-40	315	505	1060	1060	1155	1665	2025
2040-41	330	530	1115	1115	1215	1745	2125
2041-42	345	555	1165	1165	1275	1830	2230
2042-43	360	585	1225	1225	1335	1920	2335
2043-44	380	615	1285	1285	1400	2015	2450
2044-45	400	645	1350	1350	1470	2115	2575
2045-46	420	675	1415	1415	1545	2220	2700

Table 7-7 : Toll Rates for Monthly pass Local @ 285.20

Year	Car	Minibus /LCV
2026-27	360	360
2027-28	375	375
2028-29	395	395
2029-30	415	415
2030-31	430	430
2031-32	455	455
2032-33	475	475
2033-34	495	495
2034-35	520	520
2035-36	545	545
2036-37	570	570
2037-38	600	600
2038-39	630	630
2039-40	660	660
2040-41	690	690
2041-42	725	725
2042-43	760	760
2043-44	800	800
2044-45	835	835
2045-46	880	880

Table 7-8 : Toll Rates for Monthly pass Local @ 224.95

Year	Car	Minibus /LCV
2026-27	360	360
2027-28	375	375
2028-29	395	395
2029-30	415	415
2030-31	430	430
2031-32	455	455
2032-33	475	475
2033-34	495	495
2034-35	520	520
2035-36	545	545
2036-37	570	570
2037-38	600	600
2038-39	630	630
2039-40	660	660
2040-41	690	690
2041-42	725	725
2042-43	760	760
2043-44	800	800
2044-45	835	835
2045-46	880	880

Table 7-9 : Toll Rates for Monthly Pass @ Km 285.20

Year	Car	Minibus /LCV	Bus	Truck	3 axles	Multi axle	Oversized Vehicles
2026-27	4100	6620	13870	13870	15135	21755	26480
2027-28	4290	6930	14525	14525	15845	22775	27725
2028-29	4495	7255	15205	15205	16590	23845	29030
2029-30	4705	7600	15925	15925	17370	24970	30400
2030-31	4925	7960	16675	16675	18190	26150	31835
2031-32	5160	8335	17465	17465	19055	27390	33345
2032-33	5405	8735	18300	18300	19960	28695	34930
2033-34	5665	9150	19170	19170	20915	30065	36600
2034-35	5935	9590	20090	20090	21915	31500	38350
2035-36	6220	10050	21050	21050	22965	33015	40190
2036-37	6520	10530	22065	22065	24070	34605	42125
2037-38	6835	11040	23130	23130	25235	36275	44160
2038-39	7165	11575	24255	24255	26460	38035	46300
2039-40	7515	12140	25430	25430	27745	39880	48550
2040-41	7880	12730	26670	26670	29095	41825	50920
2041-42	8265	13355	27975	27975	30520	43875	53410
2042-43	8670	14010	29350	29350	32020	46025	56030
2043-44	9100	14695	30795	30795	33595	48290	58790
2044-45	9545	15425	32315	32315	35250	50675	61690
2045-46	10020	16185	33915	33915	36995	53185	64745

Table 7-10 : Toll Rates for Monthly Pass @ Km 224.95

Year	Car	Minibus /LCV	Bus	Truck	3 axles	Multi axle	Oversized Vehicles
2026-27	3800	6135	12860	12860	14030	20165	24550
2027-28	3980	6425	13460	13460	14685	21110	25700
2028-29	4165	6730	14095	14095	15375	22105	26910
2029-30	4360	7045	14760	14760	16105	23150	28180
2030-31	4565	7380	15460	15460	16865	24240	29510
2031-32	4785	7730	16190	16190	17665	25390	30910
2032-33	5010	8095	16960	16960	18505	26600	32380
2033-34	5250	8480	17770	17770	19385	27870	33925
2034-35	5500	8890	18620	18620	20315	29200	35550
2035-36	5765	9315	19515	19515	21290	30605	37255
2036-37	6045	9765	20455	20455	22315	32080	39050
2037-38	6335	10235	21445	21445	23395	33625	40940
2038-39	6645	10730	22485	22485	24525	35255	42920
2039-40	6965	11250	23575	23575	25720	36970	45010
2040-41	7305	11800	24725	24725	26975	38775	47205
2041-42	7665	12380	25935	25935	28290	40670	49510
2042-43	8040	12985	27205	27205	29680	42665	51940
2043-44	8435	13625	28545	28545	31140	44765	54495
2044-45	8850	14295	29955	29955	32680	46975	57185
2045-46	9290	15005	31440	31440	34295	49300	60020

7.4 Toll Revenue

As indicated earlier, toll revenue on the Project Road has been calculated in all three scenarios based on the above rates and projected traffic. The estimates of toll revenue under ***Optimistic***, ***Pessimistic*** and ***Most Likely*** growth scenarios are presented in the following section.

7.5 Toll Revenue at all toll plazas under Scenarios

Toll Revenue estimates under all scenarios at each of the toll plaza up to 2045-46 years starting from the year 2026-27 are shown in tables below.

Table 7-11 : Toll Revenue Optimistic Scenario

(Rs. Crores)

Year	TP-1	TP2	Total
2026-27	139.21	175.33	**314.55**
2027-28	155.86	197.40	**353.26**
2028-29	173.29	219.88	**393.16**
2029-30	193.78	246.18	**439.96**
2030-31	216.46	274.93	**491.39**
2031-32	242.03	310.53	**552.56**
2032-33	269.77	347.01	**616.78**
2033-34	301.81	388.51	**690.32**
2034-35	337.98	435.34	**773.32**

Year	TP-1	TP2	Total
2035-36	374.01	485.56	**859.57**
2036-37	413.88	534.40	**948.28**
2037-38	458.95	595.30	**1054.25**
2038-39	507.35	660.49	**1167.84**
2039-40	564.08	735.99	**1300.07**
2040-41	617.58	808.42	**1426.00**
2041-42	678.69	889.05	**1567.74**
2042-43	745.09	974.95	**1720.04**
2043-44	822.33	1082.02	**1904.34**
2044-45	899.71	1187.48	**2087.20**
2045-46	980.73	1300.03	**2280.76**

Table 7-12 : Toll Revenue Pessimistic Scenario

(Rs. Crores)

Year	TP-1	TP2	Total
2026-27	138.52	174.49	**313.01**
2027-28	154.34	195.48	**349.83**
2028-29	170.75	216.71	**387.46**
2029-30	190.04	241.49	**431.52**
2030-31	211.31	268.43	**479.74**
2031-32	235.13	301.72	**536.85**
2032-33	260.90	335.63	**596.53**
2033-34	290.49	374.02	**664.52**
2034-35	323.72	417.07	**740.78**
2035-36	356.58	463.03	**819.61**
2036-37	392.68	507.17	**899.85**
2037-38	433.44	562.33	**995.76**
2038-39	476.79	620.94	**1097.73**
2039-40	527.68	688.70	**1216.38**
2040-41	574.98	752.92	**1327.90**
2041-42	628.75	824.04	**1452.79**
2042-43	686.98	899.31	**1586.29**
2043-44	754.69	993.34	**1748.03**
2044-45	821.81	1084.99	**1906.80**
2045-46	891.48	1182.09	**2073.57**

Table 7-13 : Toll Revenue Most Likely Scenario

(Rs. Crores)

Year	TP-1	TP2	Total
2026-27	138.86	174.86	**313.72**
2027-28	155.11	196.40	**351.51**
2028-29	171.99	218.24	**390.23**
2029-30	191.84	243.78	**435.61**

Year	TP-1	TP2	Total
2030-31	213.85	271.60	**485.46**
2031-32	238.56	306.09	**544.65**
2032-33	265.30	341.25	**606.55**
2033-34	296.08	381.13	**677.21**
2034-35	330.73	426.04	**756.77**
2035-36	365.12	474.12	**839.24**
2036-37	403.09	520.58	**923.68**
2037-38	446.03	578.63	**1024.66**
2038-39	491.84	640.48	**1132.31**
2039-40	545.56	711.99	**1257.55**
2040-41	595.96	780.21	**1376.17**
2041-42	653.34	856.03	**1509.38**
2042-43	715.58	936.59	**1652.16**
2043-44	787.92	1036.89	**1824.81**
2044-45	860.12	1135.31	**1995.43**
2045-46	935.25	1239.86	**2175.11**

CHAPTER 8

CONCLUSION & RECOMMENDATIONS

8.1 Conclusion & Recommendations

Project stretch of Agra to Etawah section of NH-2 in state of Delhi from km 199.660 to km 323.525 is currently six lane road. The road is in sound condition and serves healthy traffic volumes. Project corridor is a part of the most busy and prominent national highway NH-2 which connects political and cultural capitals of India. This is one of the most important trunk roads which spread across many states. There are large number of townships, industrial corridors and other business establishments coming up along the project corridor. As discussed, the dominant portion of traffic is long route traffic, which is more sensitive towards the growth of national economy. As Indian economy is poised to grow at 7%+ post COVID-19, the project corridor is expected to pick up the same trend in terms of traffic flow. All these developments have potential to have a positive impact to traffic flow on the project. The following can be considered as major outcomes of the study.

a) There is a good amount of tollable traffic running on the project.

b) Project corridor has potential to witness traffic growth @ 6-8% annually in near future due to various development in area and overall development of economy.

c) The Project corridor has committed traffic as long route traffic and does not run a risk of traffic leakage due to quality competing road.

Based on the above it can be considered a stable healthy project from the traffic and revenue point of view.

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GULABPURA TO CHITTORGARH SECTION OF NH 79 (KM 90.000 TO KM 214.870) IN THE STATE OF RAJASTHAN

TRAFFIC STUDY & REVENUE PROJECTION REPORT (FINAL)

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ABBREVIATIONS

AADT	-	Annual Average Daily Traffic	**NHAI**	-	National Highway Authority of India
BOT	-	Build Operate Transfer	**NHDP**	-	National Highways Development Project
CAGR	-	Compound Annual Growth Rate	**NSDP**	-	Net State Domestic Product
CTV	-	Classified traffic volume	**O&M**	-	Operation & Maintenance
DBFOT	-	Design, Build, Finance, Operate & Transfer	**PCDP**	-	Per Capita Domestic Product
EME	-	Earth Moving Equipment	**PCI**	-	Per Capita Income
GDP	-	Gross Domestic Product	**PCU**	-	Passenger Car Unit
GSDP	-	Gross State Domestic Product	**PSC**	-	Pre-stressed Concrete
HCM	-	Heavy Construction Machinery	**RCC**	-	Reinforced cement concrete
HCV	-	Heavy Commercial Vehicle	**RHS**	-	Right Hand Side
HTMS	-	Highway Traffic Management System	**SH**	-	State Highway
IRC	-	Indian Road Congress	**TP**	-	Toll Plaza
IRR	-	Internal Rate of Return	**WPI**	-	Wholesale Price Index
LCV	-	Light Commercial Vehicle	**SIR**	-	Special Investment Region
LHS	-	Left Hand Side	**c.**	-	Circa
LGV	-	Light Goods Vehicle	**ROB**	-	Railway Over Bridge
MAV	-	Multi Axle Vehicle	**MDR**	-	Major District Road
MORTH	-	Ministry of Road Transport and Highways	**ODR**	-	Other District Road
NH	-	National Highway	**CA**	-	Concession Agreement
PCC	-	Plain Cement Concrete	**RMT**	-	Running Meter
CR	-	Coarse Rubble			

CHAPTER 1

INTRODUCTION

1.1 Background

The Government of India through National Highway Authority of India (NHAI) embarked upon a program to enhance the traffic capacity and safety for efficient transportation of goods as well as passenger traffic on National Highway Sections under NHDP Phase V. Under Phase V NHAI has planned to convert 6,500 km of existing 4-lane National Highways into 6-lane National Highway. Sections envisaged under 6-laning comprise the Golden Quadrilateral section (5,700 km) and some other sections which are 800 km in length.

The project under consideration, Six Laning of Gulabpura to Chittorgarh section of NH-79 from km 90.000 to km 214.870is one such road project NHAI intended to implement on a BOT basis in the DBFOT format. M/s CG Tollway Ltd. (Concessionaire) has been awarded the Project for a concession period of 20 years starting from 4th November 2017. The Project has been commissioned and is currently in the operation / maintenance phase for four laning. Six laning of project has also been completed in August 2021.

Length ofprojectroadis124.870Kms. The project road is section of NH-79, which connects Ajmer to Ghat Bilod. Project section of NH-79 passes through district of Bhiwara and Chittorgarh. Project road connects to Udaipur via NH-76.

Project road alignment passes through the towns/ built-up areas Fakirabad, Bhilwara, Gulabpura, & Chittorgarh. Following figure shows alignment of project road section from Gulabpura to Chittorgarh

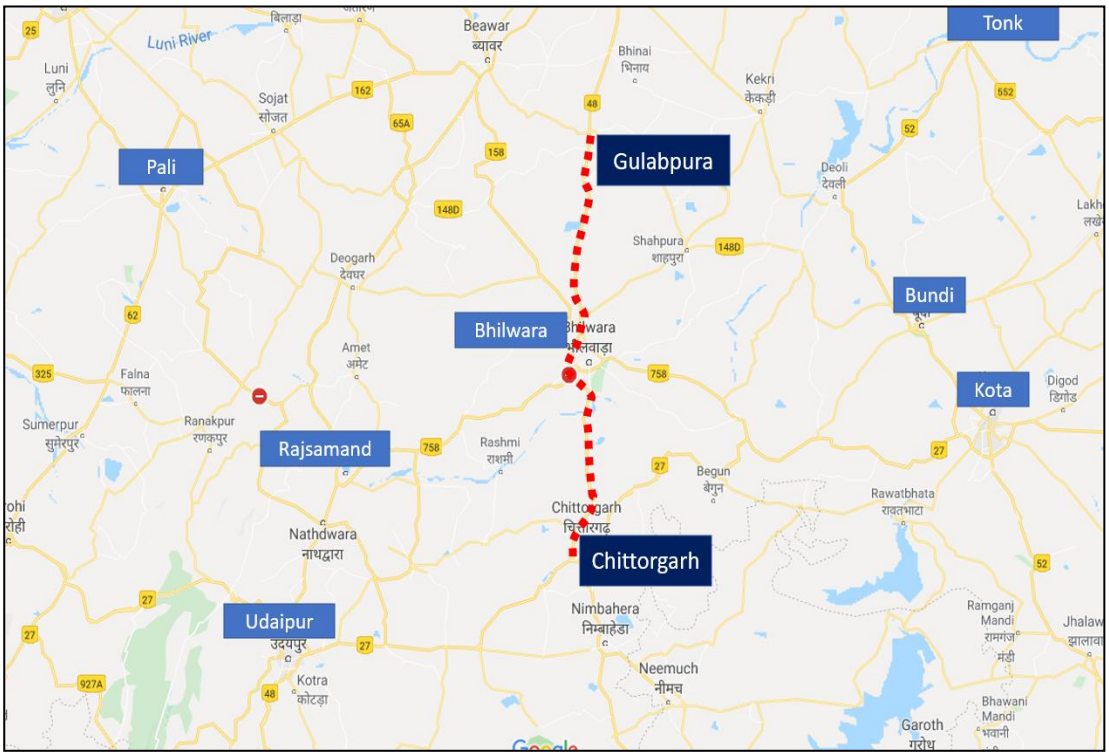

Figure 1-1: Alignment of Project Stretch

1.2 Objective of the Study

M/s IRB INFRASTRUCTURE TRUST has engaged GMD Consultants to assess the future traffic and toll potential of project along with related operation & maintenance expenditure involved.

This report named as "Traffic Study &Toll Revenue Projection Report" mainly focuses on traffic and revenue aspects of the project. Other parameters like competing road, area developments etc. have been considered from a traffic development point of view.

1.2.1 Scope of Services

The broad scope of work covered in the assignment is as follows.

a) Analysis of Traffic Growth
b) Toll Rate Growth
c) Revenue Forecasting

The Concessionaire has provided basic traffic data and other project details on the basis of which the above analysis has been carried out.

CHAPTER 2

PROJECT DETAILS

2.1 Project Corridor

National Highway 79 (NH-79) is an important link for traffic connecting Delhi, Jaipur to Udaipur, Chittorgarh and down south.

It is one of the major north-south road connectivity for the traffic from northern states of Haryana, Punjab and Delhi to Industrial and tourist areas of Rajasthan like Jaipur, Chittorgarh, Udaipur and then to Dahod, Ratlam and other parts of Madhya Pradesh.

2.2 Project Stretch Description

Section of NH-79 from Gulabpura to Chittorgarh is part of major transportation link in the area connecting industrial / tourist cities of Jaipur, Bhilwara, Chitttorgar and Udaipur. Important cities of Firozabad, Shikohabad, and Jaswant Nagar fall on project alignment. Major mining industries of marble, Zink, felspar, quarts of Udaipur and textile industry of Bhiwara provide are major contributors of commercial traffic on project corridor. Additionally, Udaipur, Chittorgarh and Bhilwara major tourist centers of India. This adds substantial value for passenger traffic on the project corridor section.

Like other parts of India rapid ribbon development is happening around these cities on project highway. This also contributes to sustainable traffic growth.

There are two operative toll plazas at project stretch. First is at Lambia Kalan at Km 121.020 and second at Jojro ka Khera at Km 184.020. The following figures show project alignment and toll plaza locations.

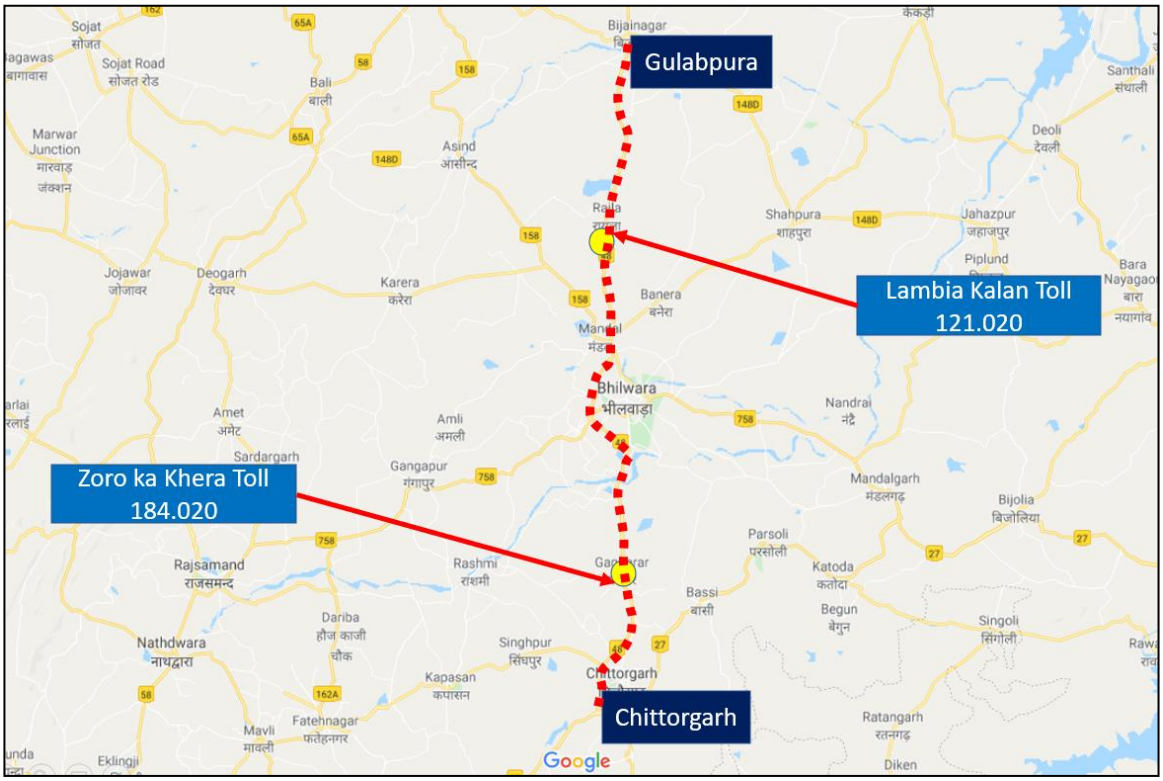

Figure 2-1: Project Alignment with Toll Plaza

2.3 Project Corridor Illustration

Six laning of project stretches are in progress and soon will be completed. The following photographs illustrate the project section along the corridor.

Figure 2-2: Photographs showing Project Corridor

CHAPTER 3

TRAFFIC SURVEYS AND ANALYSIS

3.1 Traffic Surveys

The Consultants have collected the required information for the project corridor to understand the general traffic and travel characteristics on the corridor.

The following traffic data has been collected from a client for a project.

- Classified traffic volume counts at toll plaza locations on Gulabpura-Chittorgarh section of NH-79 for years 2018-19,2019-20,2020-21,2021-22,2022-23,2023-24 and Annual traffic data from April 2025 to February 2026.
- Local Component of traffic
- Component of Return Journey
- Component of Monthly Pass Journey

The main objective of the traffic data analysis is to:

- Determine the existing traffic movement characteristics of the project.
- Establish base year traffic.
- Identification of travel patterns and modal split of project traffic
- Deriving growth factors for traffic forecasting
- Estimation of corridor traffic including traffic diversion if any
- Preparation of revenue model and projection of revenue as per toll policy for various scenarios

Table 3-1below lists provides details of locations from where traffic details have been collected.

Table 3-1 : Traffic Data Details

SR. NO	LOCATION	CTV	Single Journey Traffic	Daily Return Journey	Monthly Pass	Local Pass
1	**Km 121.020 Toll Plaza at Lambia Kalan**	AADT for Year 2017-18, 2018-19, 2019-20,2020-21 ,2021-22, 2022-23, 2023-24, 2024-25 & Eleven months from April 2025 to February 2026	For Year 2017-18, 2018-19, 2019-20, 2020-21, 2021-22, 2022-2023,2023-24 2024-25 & Eleven months from April 2025 to February 2026	For Year 2017-18, 2018-19, 2019-20, 2020-21, 2021-22, 2022-2023,2023-24 2024-25 & Eleven months from April 2025 to February 2026	For Year 2017-18, 2018-19, 2019-20, 2020-21, 2021-22, 2022-2023,2023-24 2024-25 & Eleven months from April 2025 to February 2026	For Year 2017-18, 2018-19, 2019-20, 2020-21, 2021-22, 2022-2023,2023-24,2024-25 & Eleven months from April 2025 to February 2026

SR. NO	LOCATION	CTV	Single Journey Traffic	Daily Return Journey	Monthly Pass	Local Pass
2	**Km 184.020 Toll Plaza at Jojro ka Khera**	AADT for Year 2017-18, 2018-19, 2019-20,2020-21 ,2021-22, 2022-23, 2023-24, 2024-25 & Eleven months from April 2025 to February 2026	For Year 2017-18, 2018-19, 2019-20, 2020-21, 2021-22, 2022-2023,2023-24 2024-25 & Eleven months from April 2025 to February 2026	For Year 2017-18, 2018-19, 2019-20, 2020-21, 2021-22, 2022-2023,2023-24 2024-25 & Eleven months from April 2025 to February 2026	For Year 2017-18, 2018-19, 2019-20, 2020-21, 2021-22, 2022-2023,2023-24 2024-25 & Eleven months from April 2025 to February 2026	For Year 2017-18, 2018-19, 2019-20, 2020-21, 2021-22, 2022-2023,2023-24,2024-25 & Eleven months from April 2025 to February 2026

3.2 Classified Traffic Volume

The objective of conducting a Classified Traffic Volume Count is to understand the traffic flow pattern including modal split on a roadway. The Classified Traffic Volume Count survey has been provided by the concessionaire of project highway from actual traffic data gathered at toll plaza locations based on monthly data shared with NHAI.

The vehicles can broadly be classified into fast moving / motorized and slow moving / non-motorized vehicles, which can be further classified into specific categories of vehicles. The groupings of vehicles are further segregated to capture the tollable vehicle categories specifically and toll exempted vehicles are counted separately. The detailed vehicle classification system as per IRC: 64-1990 is given in the table below.

Table 3-2 : Vehicle Classification System

Vehicle Type	
Auto Rickshaw	
Passenger Car	Car, Jeep, Taxi & Van (Old / new technology)
Bus	Minibus
	Standard Bus
Truck	Light Goods Vehicle (LCV)
	2 – Axle Truck
	3 Axle Truck (HCV)
	Multi Axle Truck (4-6 Axle)
	Oversized Vehicles (7 or more axles)
Other Vehicles	Agriculture Tractor, Tractor & Trailer

Source - IRC: 64 – 1990

However, since the project highway is currently under toll operation, the data collected corresponds to the category of tollable vehicles. The following are the types of vehicles as per concession agreement.

- Car / Jeep / van
- Min Bus /LCV
- Bus
- Truck
- 3-Axle
- Multi Axle

3.3 Traffic Characteristic

Toll revenue of project highway does not solely depend on traffic volume. There are certain characteristics of traffic which have substantial potential to affect toll collection. Component of local traffic, component of passenger and commercial traffic, portion of return journey traffic, % of monthly pass traffic are some of such characteristics of traffic. These will be discussed in subsequent sections of the report.

3.3.1 Traffic Data

Project concessionaire has provided Traffic data for the years 2019-20 ,2020-21, 2021-22, 2022-23 ,2023-24,2024- 25 & traffic data from April 2025 to February 2026.
Since the traffic data available for this update is for only Annual, from April 2025 to February 2026, it may not represent the whole year traffic. Hence a seasonality factor for balance part of year has been applied to average traffic of the current Eleven Month months to arrive at Annual Average Daily Traffic of base year 2025-26. Thus, corrected traffic is used for future projections and revenue calculations. The following table shows historical traffic on project stretch and derived Annual Average Daily Traffic (AADT) for year 2025-26.

Table 3-3 : Traffic Data at Lambial Kalan Toll Plaza at Km 121.020

Sr. No	Type of Vehicle	Annual Average Daily Traffic (Nos.)-2019-20	Annual Average Daily Traffic (Nos.)-2020-21	Annual Average Daily Traffic (Nos.)-2021-22	Annual Average Daily Traffic (Nos.)-2022-23	Annual Average Daily Traffic (Nos.)-2023-24	Annual Average Daily Traffic (Nos.)-2024-25	Annual Average Daily Traffic (Nos.)-2025-26
1	Car	3563	3366	4812	6301	6851	6916	10431
2	Minibus /LCV	1266	933	585	768	754	759	857
3	Bus	428	270	376	446	455	409	501
4	Truck	1587	1321	1788	2455	2520	2296	2497
5	3-Axle Commercial vehicle	2139	1591	1771	2006	1869	1589	1737
6	Multi axle	4606	4011	4587	5086	5130	4877	5237
7	Oversized Vehicle	23	19	30	11	12	10	12
Total		**13612**	**11511**	**13949**	**17072**	**17590**	**16855**	**21272**

Table 3-4 : Traffic Data at Jojro ka Khera Toll Plaza at Km 184.0200

Sr. No	Type of Vehicle	Annual Average Daily Traffic (Nos.)- 2019-20	Annual Average Daily Traffic (Nos.)- 2020-21	Annual Average Daily Traffic (Nos.)- 2021-22	Annual Average Daily Traffic (Nos.)- 2022-23	Annual Average Daily Traffic (Nos.)- 2023-24	Annual Average Daily Traffic (Nos.)- 2024-25	Annual Average Daily Traffic (Nos.)- 2025-26
1	Car	3042	3077	4440	5603	6077	6741	9441
2	Minibus /LCV	1081	824	549	716	777	800	847
3	Bus	423	265	347	408	435	391	441
4	Truck	1285	1164	1634	2306	2613	2590	2599
5	3-Axl Commercial vehicle	1568	1344	1666	1950	2042	1909	1890
6	Multi axle	4360	4201	4934	5536	5971	5938	6128
7	Oversized Vehicle	21	21	21	14	12	9	11
Total		**11781**	**10896**	**13592**	**16532**	**17926**	**18377**	**21357**

3.4 Data Analysis

3.4.1 Analysis of Traffic Volume Count

Understanding the character of existing traffic forms the basis of the traffic forecast. The various vehicle types having different sizes and characteristics can be converted into a single unit called Passenger Car Unit (PCU). Passenger Car equivalents for various vehicles are adopted based on recommendations of Indian Road Congress prescribed in "IRC-64-1990: Guidelines for Capacity of Roads in Rural areas". The adopted passenger car unit values (PCU) are presented in Table 3-5.

Table 3-5 : PCU Factors Adopted for Study

Vehicle Type	PCUs
Car	1.0
Minibus	1.5
Standard Bus	3.0
LCV/LGV	1.5
2 Axle Truck	3.0

Vehicle Type	PCUs
3 – 6 Axle Truck	4.5
MAV	4.5
Auto Rickshaw	1.0
Van/Tempo	1.0
Agriculture Tractor with Trailer	4.5
Agriculture Tractor without Trailer	1.5

Source: IRC: 64-1990

Traffic volume at each toll plaza was converted to PCU and same is presented as under.

Table 3-6 : Traffic in PCU at Project Stretch Base Year 2023-24

Year	Toll Plaza Location (Km)	Traffic No	PCU	PCU Index
2019-2020	Lambia Kalan Km 121.020	13612	38754	2.85
	Jojro ka Khera Km 184.020	11781	34208	2.90
2020-2021	Lambia Kalan Km 121.020	11511	32446	2.82
	Jojro ka Khera Km 184.020	10896	31630	2.90
2021-2022	Lambia Kalan Km 121.020	13949	38721	2.74
	Jojro ka Khera Km 184.020	13592	38503	2.83
2022-23	Lambia Kalan Km 121.020	17072	45107	2.64
	Jojro ka Khera Km 184.020	16532	45642	2.76
2023-24	Lambia Kalan Km 121.020	17590	45650	2.60
	Jojro ka Khera Km 184.020	17926	49431	2.76

Year	Toll Plaza Location (Km)	Traffic No	PCU	PCU Index
2024-25	Lambia Kalan Km 121.020	16855	42924	2.55
	Jojro ka Khera Km 184.020	18377	49368	2.69
2025-26	Lambia Kalan Km 121.020	21272	49541	2.33
	Jojro ka Khera Km 184.020	21357	53127	2.49

It can be observed from above that project traffic has PCU index close to 3 which is an indicator of high proportion of commercial traffic in traffic mix in project corridor. The following figure illustrates variation of PCU index at four toll plaza locations.

It can be observed that PCU index is consistent at both toll plaza locations.

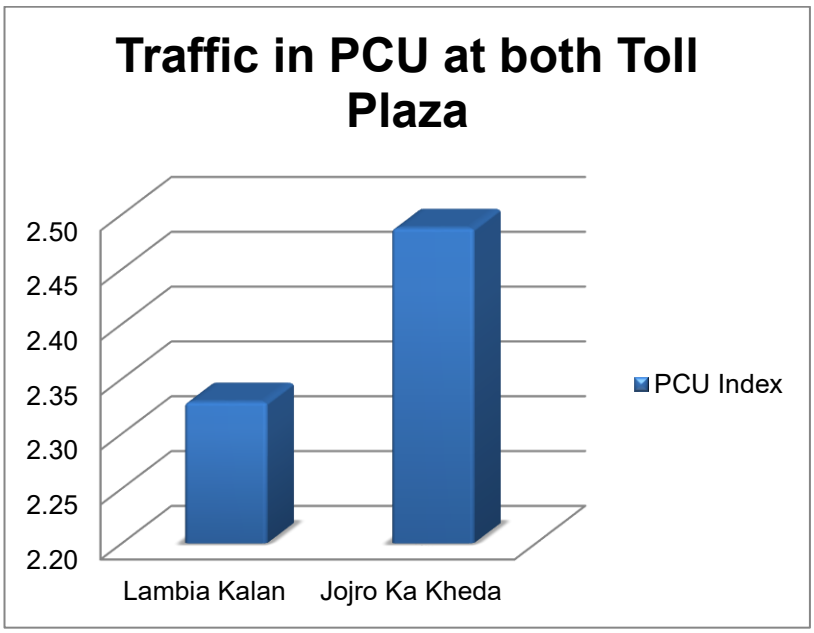

Figure 3-1: Comparison of PCU Index

3.4.2 Components of Traffic

As discussed previously, components of traffic volume play an important role in determining project revenue. A larger component of commercial traffic with higher axle configuration adds to project revenue positively. Similarly, a larger component of local traffic affects the project revenue potential negatively.

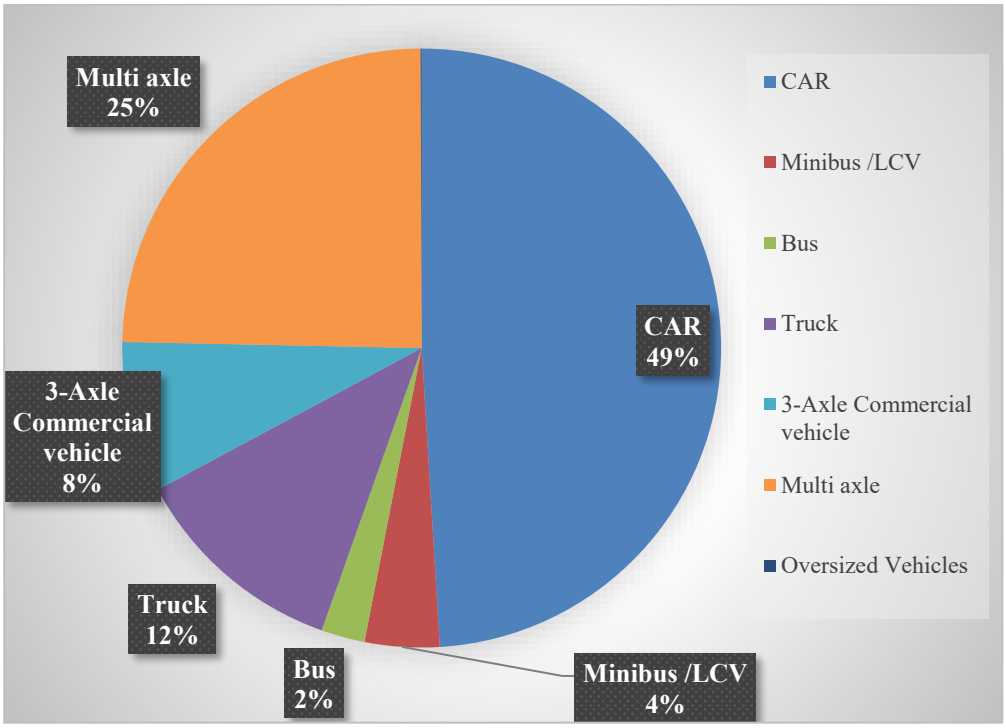

Figure 3-2 :Model Split of Tollable Vehicle-Km 121.020

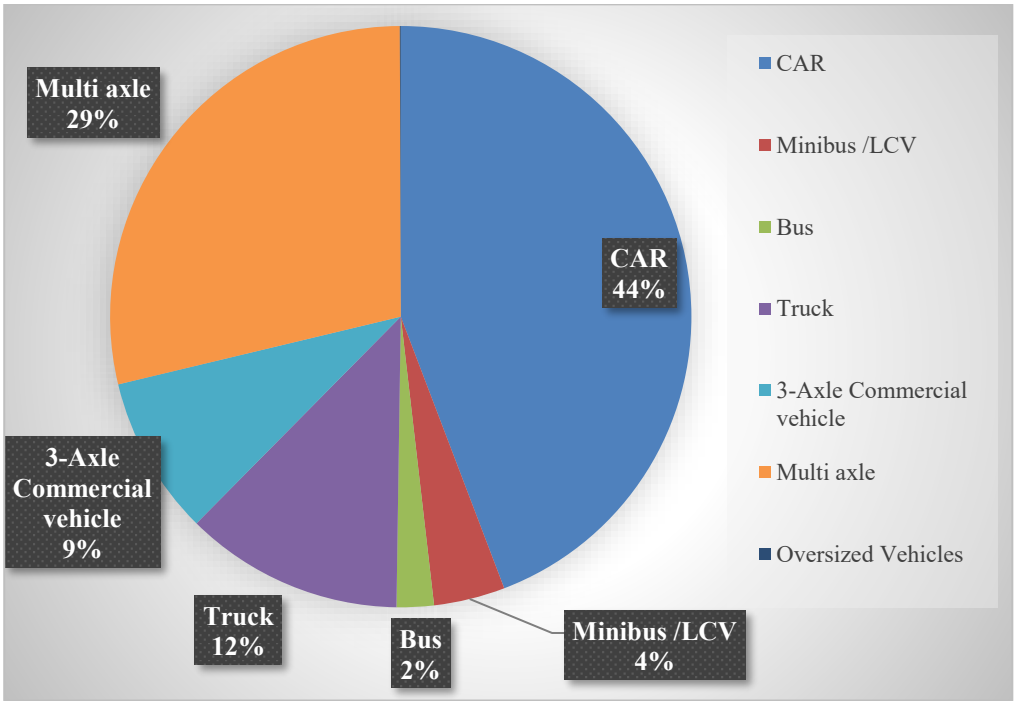

Figure 3-3 :Model Split of Tollable Vehicle- Km 184.020

It is observed that car traffic forms about 49% & 44% of total traffic at Toll Plaza locations while multi axle commercial vehicles are about 33% & 38% of total traffic. Truck / Bus and LCV share about 18% and 18% of traffic volume respectively.

Another important bifurcation of traffic is components of traffic with respect to various type of toll ticketing like

1. Single Journey
2. Multi Journey
3. Local Commercial Single Journey
4. Monthly Pass Local
5. Monthly Pass
6. Annual Pass Car

The following table provides numbers of vehicles falling in each of above categories for year 2025-26.

Table 3-7 : Journey Type Bifurcation of Traffic at Lambia Kalan TP KM 121.020

Sr. No	Type	Traffic Volume (Nos.)
		2025-26
1	Single Journey	13098
2	Return Journey	4808
3	Local Commercial Single Journey	259
4	Monthly Pass Local	32
5	Monthly Pass	12
6	Annual Pass Car	3063

Most dominant part of the above is the single journey type followed by return journey at project stretch. Monthly pass commuters are a very low fraction of the total traffic on the project corridor.

The single journey component in total traffic numbers is as high as 62%. Return journey component is 23%. The number of monthly Local passes is 0% and Local commercial Single Journey 1% and annual Pass Car is 14% at Lambia Kalan toll plaza.

The following tables give the details of journey distribution at Jojro ka Khera toll plaza at Km 184.020.

Table 3-8 : Journey Type Bifurcation of Traffic at Jojro ka Khera TP Km 184.020

Sr. No	Type	Traffic Volume (Nos.)
		2025-26
1	Single Journey	13571

Sr. No	Type	Traffic Volume (Nos.)
		2025-26
2	Return Journey	5188
3	Local Commercial Single Journey	222
4	Monthly Pass Local	13
5	Monthly Pass	12
6	Annual Pass Car	2351

It is observed that the project corridor demonstrates a similar pattern of single journey dominating mix of traffic across the entire stretch which is typical of major national highways.

3.5 Secondary Data Collection

There are several other factors which have a substantial impact on traffic patterns and growth on any project corridor. The following are some of such important factors.

- Industrial development around project corridor and its catchment
- Educational infrastructure along project corridor
- Demographic pattern
- Urban area development
- Tourism potential
- Upcoming major infrastructural or Industrial projects
- Special Industry in project corridor
- Overall trends of economic growth local as well as national / regional

Hence in addition to traffic details on the project site, secondary data was also collected from various other sources. Typical secondary data includes the following:

1. Vehicle registration data of regional and national level.
2. Economic Data
   a) GDP
   b) NSDP
   c) Population Growth
   d) Per Capita Income growth
   e) Industrial Growth
   f) Special Industry Potential
   g) Regional and National development vision / plan
   h) Any other relevant data
3. Competing road network

We have collected and utilized such underlying data in the study to estimate the growth and risk factors for traffic along the project corridor.

CHAPTER 4
INFLUENCE ZONE TRANSPORT NETWORK ANALYSIS

4.1 Introduction

Highway corridors behave like integrated circuit networks and more often than not every road is connected to various networks having different origins and destinations. Traffic running on these networks behaves like fluid and flow on network on alignment of least friction.

The following Factors can be considered as major contributors to friction on transportation networks.

- Travel Speed / Travel Time
- Geometric deficiencies like blind horizontal curves and steep vertical gradients etc.
- Configuration of road
- Riding quality
- Traffic delays,
- Length of road,
- Passing through built up or Urban Area,
- Terrain,
- Facilities,

4.2 Competing / Alternate route

Project stretch has toll application history from last few years, and it can be assumed that project traffic is settled. However, from an analysis point of view there can be two alternate routes at local level. One uses Ajmer Road to go from Kishangarh to Chittorgarh and the other on the east side via Shapur.

At regional level, there can be two alternates for Udaipur traffic after Kishangarh. One via project road (Kishangarh – Bhiwara- Chittorgarh- Udaipur)

The following maps show these routes in relation to project stretches at both local and regional level.

Figure 4-1: Alternate route at regional level.

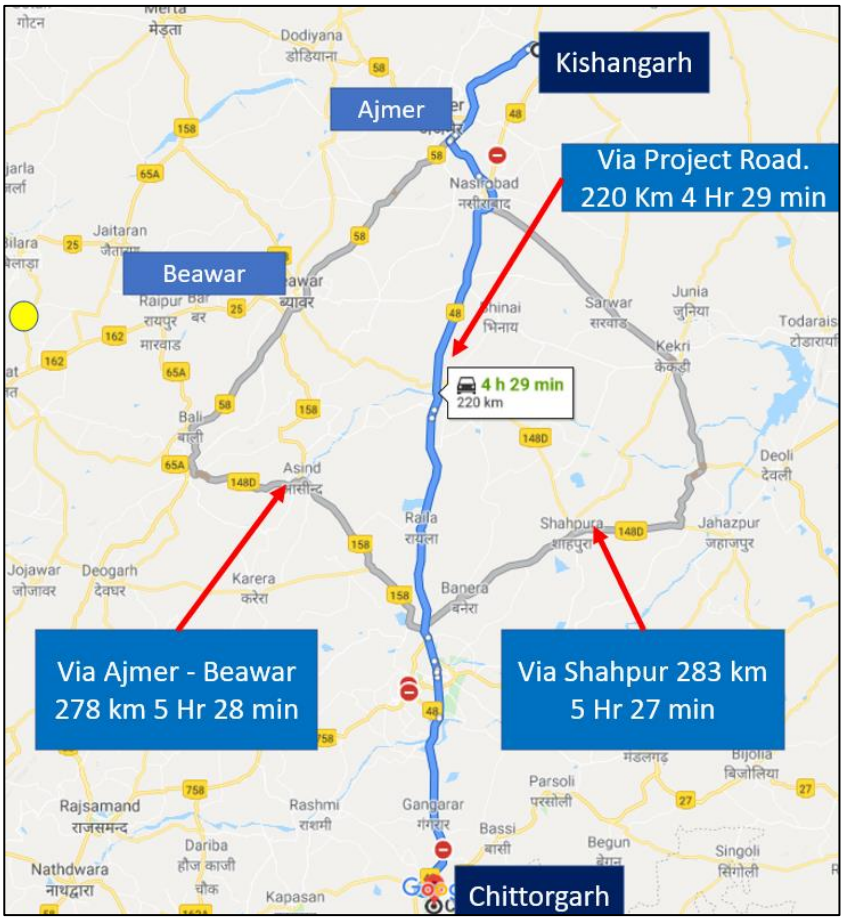

Figure 4-2: Alternate route at local level.

It can be observed that the project highway forms one of the main spines of the corridor between Kishangarh / Jaipurand Chittorgarh. Traffic on project road is now settled, and it can be assumed as dedicated traffic on project road for logistic obligations.

At regional level for Udaipur traffic alternate route is faster and traffic is already using this alternate.

With six laning now nearing completion, the project stretch would become slightly more attractive due to the improved level of service. In such a case further diversion of traffic from the project road is not envisaged.

The following table provides a summary of analysis of alternate route/ roads discussed above.

Table 4-1 : Competing Roads Details

Sr. No	Route Details	Designation	Length (Km)	Avg. Speed (KMPH)	Time Taken (Min)	Observations
Regional Level						
1	Kishangarh – Ajmer-Udaipur	Alternate Route	299	58	5 Hr 8 Min	Alternate route has clear advantage for this pair of destination. Traffic Settled. No further diversion expected
	Kishangarh-Chittorgarh- Udaipur	Project Road	330	51	6 Hr 127 Min	
Local Level						
2	Kishangarh – Ajmer-Chittorgarh (West)	Alternate Route	278	50	5 Hr. 28 Min	Project Road has advantage. Alternate route running for years after toll on project road. Traffic Settled. No further diversion expected
	Kishangarh – Shahpur-Chittorgarh (East)	Alternate Route	283	51	5 Hr. 28 Min	
	Kishangarh – Bhilwara-Chittorgarh	Project Road	220	50	4 Hr. 29 Min	

Under these circumstances it is not envisaged that commercial or passenger traffic would switch to alternate roads from the project road. Further, it may be noted that since the project highway has already been commissioned and has a tolling history, the current traffic traversing the project corridor already factors in traffic diversion (if any) that may have taken place.

CHAPTER 5

GROWTH OF TRAFFIC ON PROJECT HIGHWAY

5.1 Introduction

Traffic growth is a function of the interplay of a number of contributory factors such as National economy, Government policy, socio-economic conditions of the people, and changes in land uses along the project corridor precincts etc. As these factors have a number of uncertainties associated with them, forecasts of traffic are dependent on the projections of other factors such as population, gross domestic product (GDP), vehicle ownership, per capita income (PCI), agricultural output, fuel consumption etc. Future patterns of change in these factors can be estimated with only a reasonable degree of accuracy and hence the resultant traffic forecast levels may not be precise.

Traffic growth forecast for project corridor Gulabpur- Chittorgarh section of NH-79has been done taking the above factors into consideration. **"IRC: 108-2015-Guidelines for Traffic Prediction on Rural Highways"** is established best practice and has been used for traffic growth forecast.

5.2 Trend Analysis

One of the methods of estimation of future rate of growth is to assume the same rate of growth as in the past. Although such a method is more suitable for projects of short durations say 5-10 years, however for long term projections it would be erroneous to assume that the past rate of growth will continue to prevail for a long time in future. Economic conditions, which are major influencing factors, are bound to change over a long period of time. Thus, it would be necessary to modify the past trends of growth suitably.

Elasticity model of growth projection is one of the most widely acceptable methods for traffic forecasts. The same is recommended in **IRC: 108-2015-Guidelines for Traffic Prediction on Rural Highways.**

In this method the past trend of vehicular data is paired with an economic indicator and a regression analysis is done to yield the economic model of growth. Growth of vehicle traffic varies for different types of vehicles. It is a proven fact that the growth pattern for passengers and goods vehicles is different. Traffic growth on any highway typically depends on a number of economic parameters. Most important and direct parameters are given as under

- Per Capita Income
- Net State Domestic Product (NSDP)
- Population

It can be observed that the ownership of a car is more closely related to affordability; hence per capita is the index which closely fits the growth of car traffic among other criteria. In a similar fashion, the following can be pairs of vehicle type and independent variable for elasticity modeling of growth.

- Car / Jeep – Par Capita Income
- Bus / Minibus – Population
- Goods Vehicle – NSDP

5.3 Estimation of Traffic Demand Elasticity

Elasticity of traffic demand is defined as the rate at which traffic intensity varies due to a change in the corresponding indicator selected. Hence, in order to estimate the elasticity of traffic demand, it is necessary to establish relationship between the growth in number of given category of vehicles with the relevant economic variable considered, such as NSDP, per capita income and population growth. Latest available data for vehicle registration, per capita income, NSDP and population is used in analysis.

As per IRC: 108-1996 the model for estimating elasticity index for the project corridor is of the following form and is given as below:

$$Log\ (P) = k \times Log\ (EI) + A$$

Where,

P = *Number of Vehicles (Mode wise)*
EI = *Economic Indicator*
A = *Regression constant*
k = *Elasticity coefficient (Regression coefficient)*

The elasticity for cars and bus (passenger vehicles) is calculated based on the Population and Per Capita Domestic Product (PCDP) and the elasticity for trucks is calculated based on the Net State Domestic Product (NSDP).

The project corridor spreads across the state of Rajasthan. Toll plazas at Lambia Kalan and Jojro ka Khera are in the state of Rajasthan. For elasticity calculations, working data from Rajasthan has been analyzed. Additionally, data of Gujarat is also analyzed as project corridor has close transportation link with Gujarat also.

The following tables and graphs depict regression and elasticity of growth model for stretch falling in Rajasthan State.

Table 5-1 : Per Capita Income Vs Car Rajasthan

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2012	57192	591069	4.76	5.77		
2013	58441	659542	4.77	5.82	2%	
2014	61053	733916	4.79	5.87	4%	
2015	64496	814079	4.81	5.91	6%	
2016	68565	899307	4.84	5.95	6%	

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2017	71394	988391	4.85	5.99	4%	4.55%

Regression analysis of same is given in figure below.

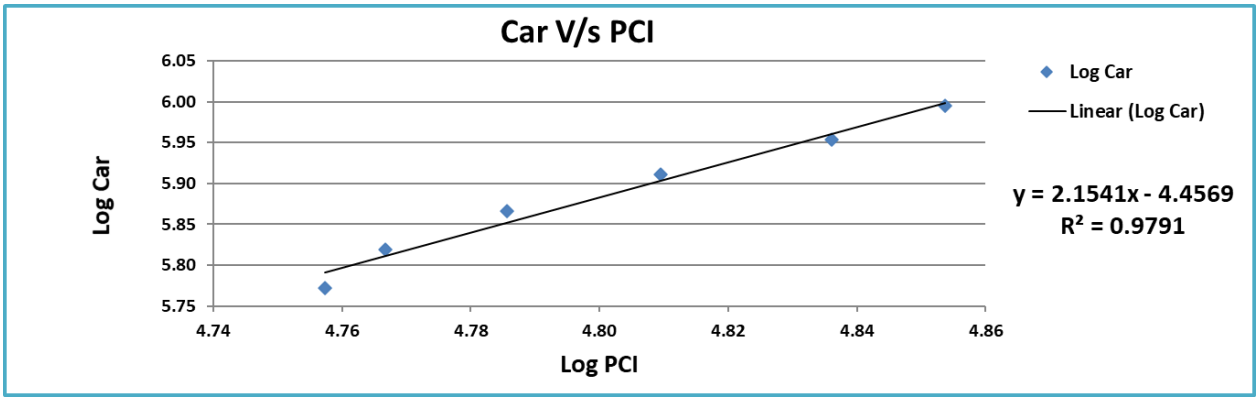

Figure 5-1: Regression and Elasticity PCI vs. Car – Extrapolation Rajasthan

Table 5-2 : Population Vs Bus Rajasthan

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth
2012	68548437	83345	7.84	4.92		
2013	69783885	88616	7.84	4.95	2%	
2014	71016445	93892	7.85	4.97	2%	
2015	72245688	97650	7.86	4.99	2%	
2016	73471198	102818	7.87	5.01	2%	
2017	74692571	108680	7.87	5.04	2%	1.73%

Regression analysis of same is given in figure below.

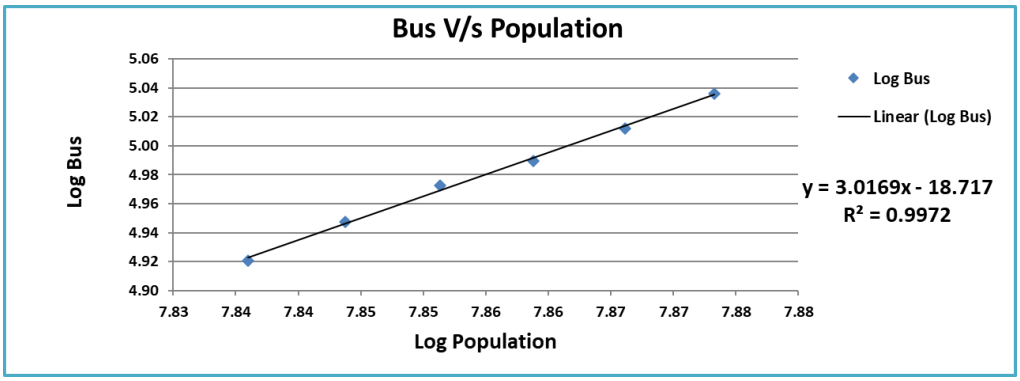

Figure 5-2: Regression and Elasticity Population vs. Bus – Extrapolation Rajasthan

The elasticity of goods traffic has been worked out by regression analysis with NSDP. The following table represents the data and details.

Table 5-3 : LCV Traffic Vs NSDP Rajasthan

Year	NSDP	LCV	Log NDSP	Log LCV	NSDP Growth	Average Growth
2012	395331	69509	5.60	4.84		
2013	409802	76396	5.61	4.88	4%	
2014	434292	33379	5.64	4.52	6%	
2015	465408	91787	5.67	4.96	7%	
2016	501922	99763	5.70	5.00	8%	6.16%

The following figure depicts regression analysis and extrapolation.

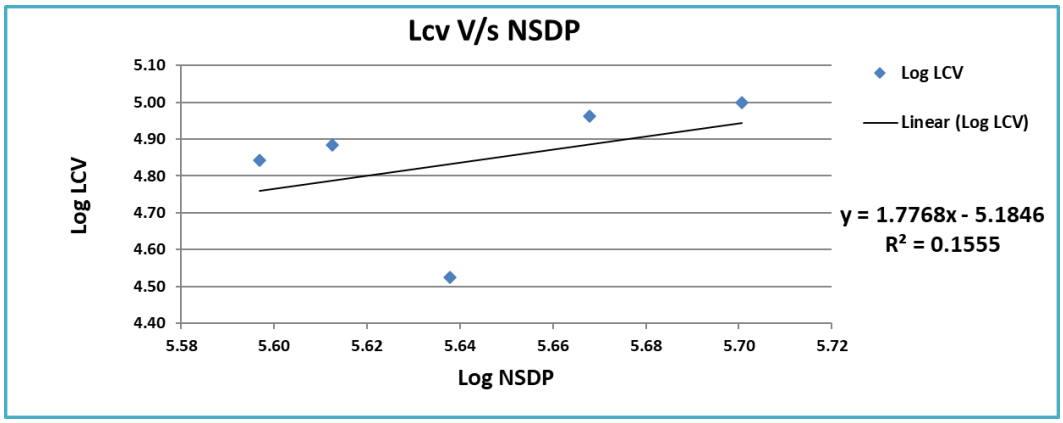

Figure 5-3: Regression and Elasticity NSDP vs. LCV Traffic - extrapolation Rajasthan.

The following figure depicts regression analysis and extrapolation.

Table 5-4 : Truck Traffic Vs NSDP Rajasthan

Year	NSDP	Trucks	Log NDSP	Log Truck	NSDP Growth	Average Growth
2012	395331	362028	5.60	5.56		
2013	409802	401983	5.61	5.60	4%	
2014	434292	434379	5.64	5.64	6%	
2015	465408	472365	5.67	5.67	7%	
2016	501922	517604	5.70	5.71	8%	
2017	530172	561158	5.72	5.75	6%	6.06%

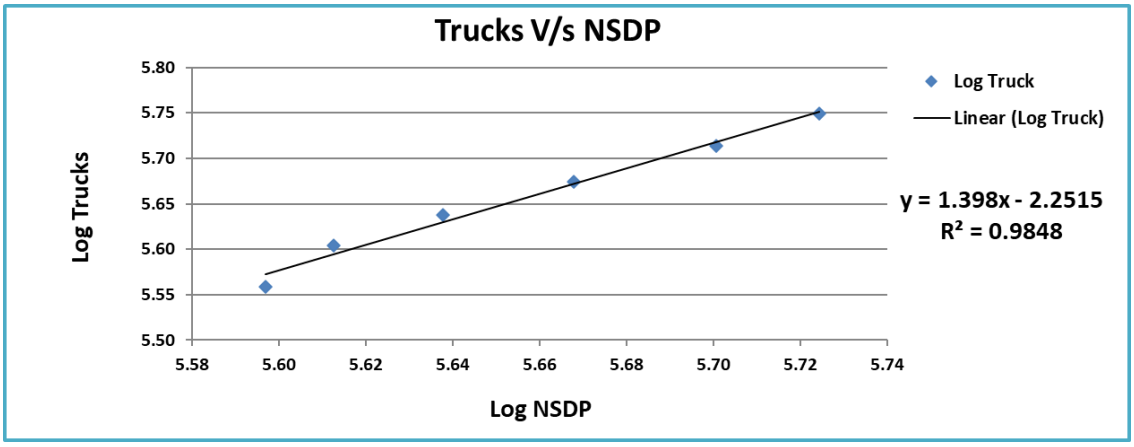

Figure 5-4: Regression and Elasticity NSDP vs. Truck Traffic - extrapolation Rajasthan.

Using the regression analysis above, we have arrived at the elasticity of traffic demand for each class of vehicle to a given change in relevant economic indicators. Average traffic growth of a vehicle class is multiplied by the corresponding elasticity coefficient to arrive at traffic growth. R2 statistical measure of how close the data are to the fitted regression line. It varies from 0 to 1. The higher the value of R2 more representative is the regression model of data.

The results of these analyses for the good fit regression as reflected by R2 values are presented in the Table below.

Table 5-5 : Summary Regression Analysis Rajasthan

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average IV Growth (5yrs)	Growth Elastic Model	Remarks
Rajasthan	Car/Jeep	PCI	y = 2.1541x + -4.4569	R² = 0.9791	2.1541	4.55%	9.79%	Good Regression
	Bus	Population	y = 3.0169x - -18.7174	R² = 0.9972	3.0169	1.73%	5.22%	Good Regression
	LCV	NSDP	y = 1.7768x - -5.1846	R² = 0.1555	1.7768	6.16%	10.95%	Poor Regression
	Truck	NSDP	y = 1.398x - -2.2515	R² = 0.9848	1.3980	6.06%	8.46%	Good Regression

Table 5-6 : Per Capita Income Vs Car Gujarat

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2012	87481	1411898	4.94	6.15		
2013	96683	1602129	4.99	6.20	11%	
2014	102589	1771298	5.01	6.25	6%	
2015	111370	2008748	5.05	6.30	9%	

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2016	120683	2260084	5.08	6.35	8%	
2017	129738	2527537	5.11	6.40	8%	8.21%

Regression analysis of same is given in figure below.

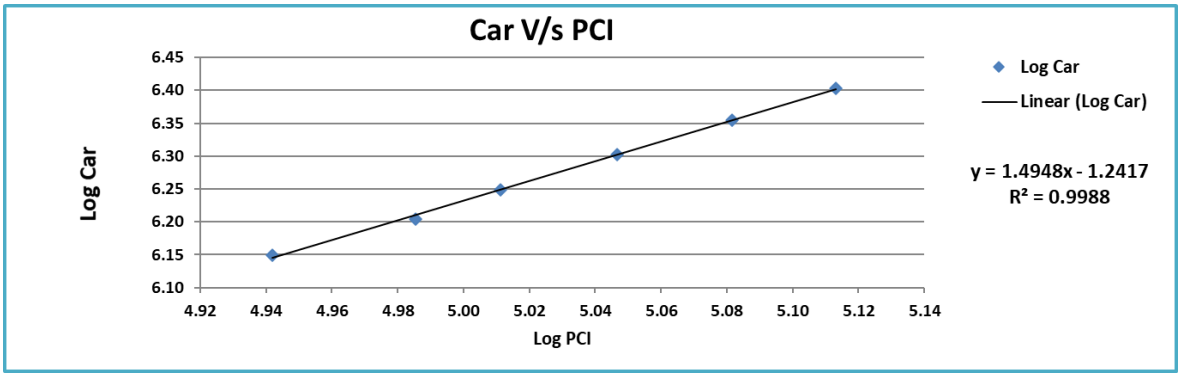

Figure 5-5: Regression and Elasticity PCI vs. Car – Extrapolation Gujarat

Table 5-7 : Population Vs Bus Gujarat

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth
2012	60439692	67546	7.78	4.83		
2013	61563037	70615	7.79	4.85	2%	
2014	62684375	72998	7.80	4.86	2%	
2015	63803304	76435	7.80	4.88	2%	
2016	64919427	82734	7.81	4.92	2%	
2017	66032362	74855	7.82	4.87	2%	1.79%

Regression analysis of same is given in figure below.

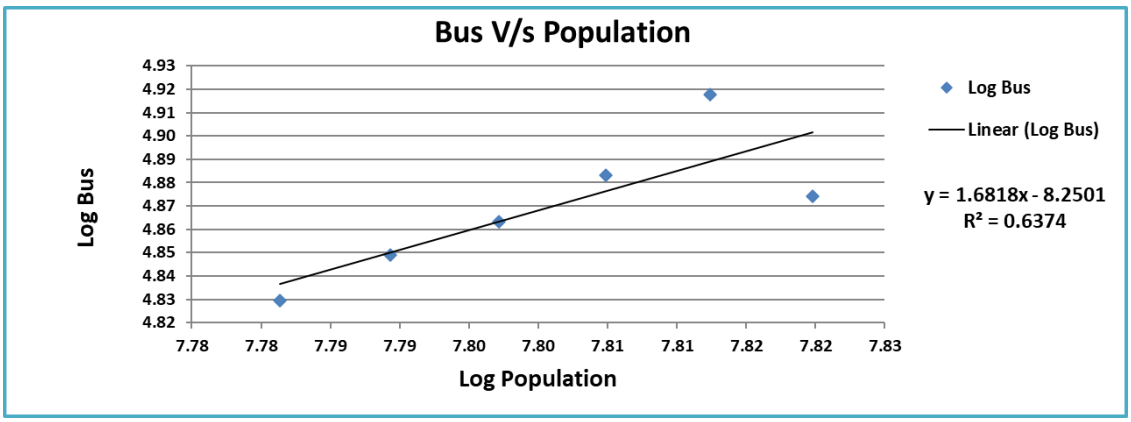

Figure 5-6: Regression and Elasticity Population vs. Bus – Extrapolation Gujarat

The elasticity of goods traffic has been worked out by regression analysis with NSDP. The following table represents the data and details.

Table 5-8 : LCV Traffic Vs NSDP Gujarat

Year	NSDP	LCV	Log NDSP	Log LCV	NSDP Growth	Average Growth
2012	532809	448958	5.73	5.65		
2013	596659	499277	5.78	5.70	12%	
2014	641489	542918	5.81	5.73	8%	
2015	705629	589984	5.85	5.77	10%	
2016	774775	633599	5.89	5.80	10%	9.82%

The following figure depicts regression analysis and extrapolation.

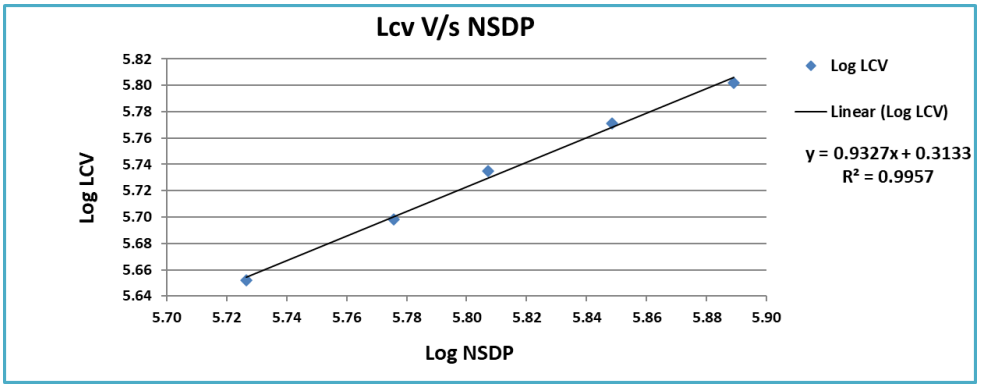

Figure 5-7: Regression and Elasticity NSDP vs. LCV Traffic - extrapolation Gujarat.

The following figure depicts regression analysis and extrapolation.

Table 5-9 : Truck Traffic Vs NSDP Gujarat

Year	NSDP	Trucks	Log NDSP	Log Truck	NSDP Growth	Average Growth
2012	532809	301533	5.73	5.48		
2013	596659	319207	5.78	5.50	12%	
2014	641489	332185	5.81	5.52	8%	
2015	705629	352225	5.85	5.55	10%	
2016	774775	375265	5.89	5.57	10%	
2017	843930	396061	5.93	5.60	9%	9.64%

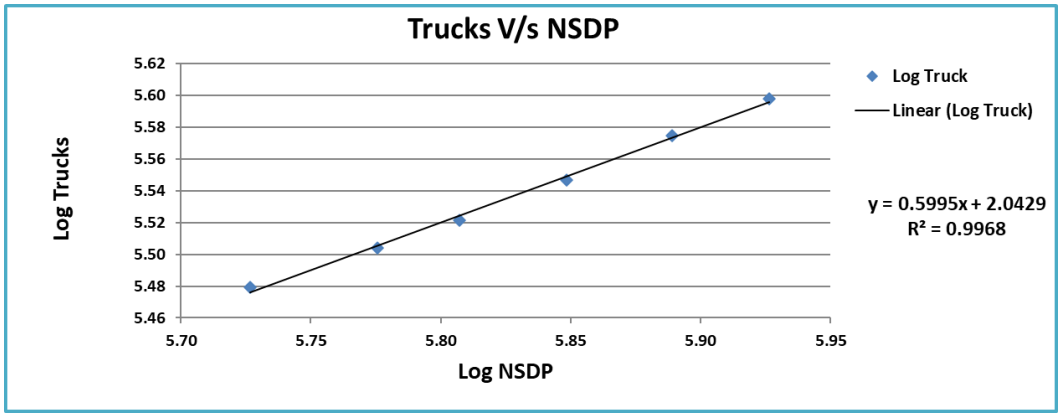

Figure 5-8: Regression and Elasticity NSDP vs. Truck Traffic - extrapolation Gujarat.

Using the regression analysis above, we have arrived at the elasticity of traffic demand for each class of vehicle to a given change in relevant economic indicators. Average traffic growth of a vehicle class is multiplied by the corresponding elasticity coefficient to arrive at traffic growth. R2 statistical measure of how close the data are to the fitted regression line. It varies from 0 to 1. The higher the value of R2 more representative is the regression model of data.

The results of these analyses for *the good fit* regression as reflected by R^2 values are presented in the Table below.

Table 5-10 : Summary Regression Analysis Gujarat

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average IV Growth (5yrs)	Growth Elastic Model	Remarks
Gujarat	Car/Jeep	PCI	y = 1.4948x + -1.2417	R² = 0.9988	1.4948	8.21%	12.27%	Good Regression
	Bus	Population	y = 1.6818x - -8.2501	R² = 0.6374	1.6818	1.79%	3.00%	Fair Regression
	LCV	NSDP	y = 0.9327x - 0.3133	R² = 0.9957	0.9327	9.82%	9.16%	Good Regression
	Truck	NSDP	y = 0.5995x - 2.0429	R² = 0.9968	0.5995	9.64%	5.78%	Good Regression

The economic model for predicting growth is a good tool, however other local, regional, and national factors should also be considered before finalizing growth factors. Considering factors such as proposed developments and other influencing economic factors, moderate growth should be considered. These factors are discussed in subsequent sections.

5.4 Analysis of Historic Traffic Data

Historical traffic data forms useful information for any highway project. It provides useful information for establishing past trends of growth. Project stretch of Gulabpura to Chittorgarh is under tolling operation with current concessionaire and has two years of tolling history from 2018-19. As traffic data available with the project concessionaire is

of year two years and that too affected by COVI-19, we do not have sufficient data points to be able to establish a reliable past trend of traffic growth. A minimum of about 5 -6 years' consistent traffic data is required for establishing a reliable past trend.

5.5 Other Factors Influencing Growth

There are many factors which have an impact on traffic growth. As discussed previously these factors can be economic, social, educational, and industrial.

Potentiality of such factors for project highway is discussed as under.

ECONOMY

After witnessing a slowdown during 2011-12, the economy recovered in 2013-14, and a high growth rate of GDP was recorded up to 2018-19. Pandemic of COVID-19 impacted all economies of world including India up to year 2021-22. Following figure show trend of GDP growth in India.

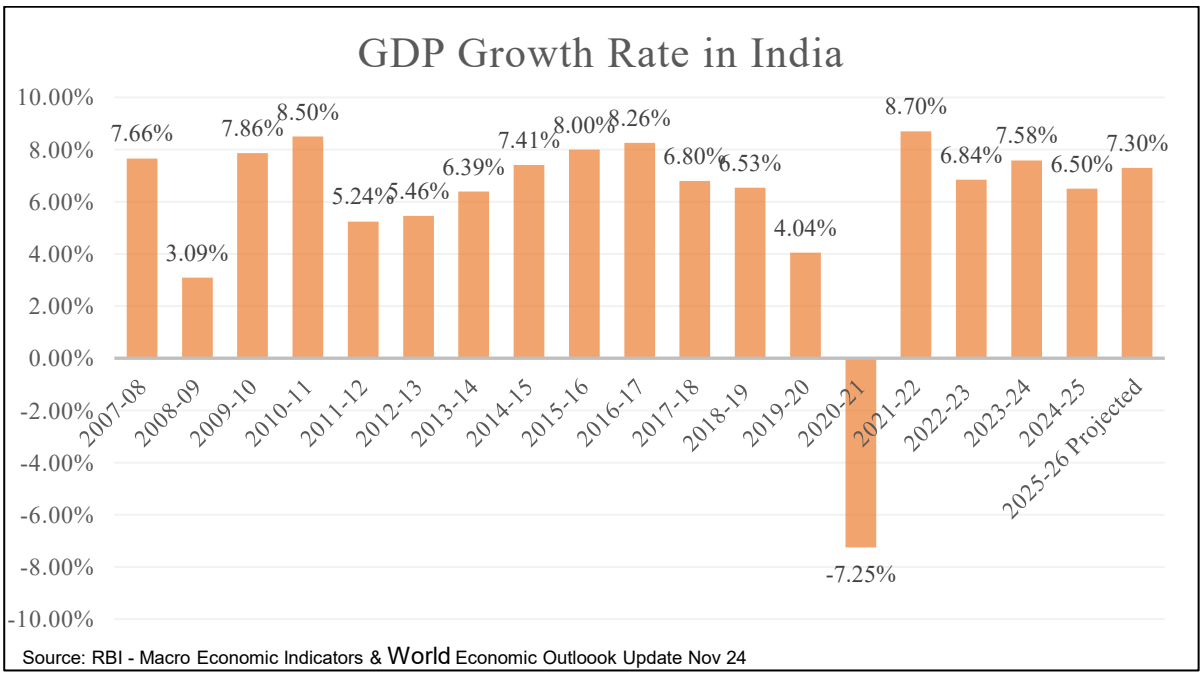

Figure 5-9 : Growth of GDP in India

FY 2017-18 recorded a growth of 6.7% which had a slight impact of GST and demonetization. Indian economy appears on recovery path with estimated growth of 6.8% in FY 2018-19. The government took major policy decisions including tax infrastructure reforming, banking sector improvement and ease of doing business.

In post COVID-19 scenario, in year 2022-23 and 2023-24 India registered an impressive growth of 7% to 7.5%. In last year despite global slow down due to Russia-Ukraine war and Gaza crises, India grew at good rate of 7%(Estimated).
Indian economy is now on good growth path and all major institutions including IMF / ADB have estimated growth of Indian Economy to peg around 6.5% to 7% in coming years.

5.6 Developments along and around Project Corridor & State

This Asset primarily serves traffic travelling between Delhi, Rajasthan, Gujarat and Maharashtra. It is observed that the vehicle distribution to be dominated by heavy vehicles. We further noticed several textile industries and marble/granite industries bordering the Asset. Udaipur serves as a big tourism hub as well as a consumption center which also results in traffic feeding into the demand being generated.

In addition, Chittorgarh has 4 major cement plants located in Chanderiya and Nimbahera villages. There is a regular movement of Cement bulkers to and from these locations along asset. Chanderiya Lead-Zinc Smelter, is the one of the largest zinc-lead smelting complexes in the world, is also located in Chittorgarh. Bhilwara is home to the textile industry and the only center in the country producing insulation bricks. Mining is another major sector for large scale mining of sandstone, soapstone feldspar, quartz, mica China clay and granite. Also, Iron Ore, Led, and Zinc are mined and processed in Bhilwara.

Rajasthan is rich in natural resources and benefits from its strategic geographic location in India. The state is pre-eminent in quarrying, mining in India and has been a leader in crude oil extraction over the past few years. Moreover, Rajasthan is also major tourism attractor in India. Considering the scenario, it may be assumed that the traffic growth on the project highway would remain high and there are minimal risks in terms of growth.

5.6.1 Industrial Units along Project Corridor

Bhilwara district occupies an important place in the mineral map of Rajasthan. The main minerals are lead Zinc, Soap Stone, China Clay, Feldspar, Quartz, Mica, Asbestos and Garnet.

Besides being a major tourist attraction in India Chittorgarh has a very rich profile in industrial mineral extraction. Limestone (Cement Grade), Red Occur, Silica sand, China Clay and Quartz are major minerals which are in abundance. There are a large number of cement plants in the area. Chanderiya Lead-Zinc Smelter is one of the largest zinc-lead smelting complexes in the world.

5.7 Recommended Growth Rates of Traffic

Based on the above analysis and after giving due consideration to the entire listed factors, the following overall growth rates are recommended for each category of vehicle as below. The rate of growth is moderate in light of overall regional trends. Growth of multi-Axle is kept slightly higher as trend of technological advances in logistic industry favors multi-axle over 2/3 axle carriage. It is also expected that as the economy moves from developing to developed, the rate of growth diminishes. The same growth rate is not sustainable for long. Traffic growth is suitably stepped down from future years.

Growth rates are recommended for three scenarios for sensitivity analysis namely Optimistic, **Pessimistic and Most Likely** with a positive and negative variation 0.5% from Most Likely case for corridor in both states.

5.7.1 Recommended Growth Rates of Traffic for Project Stretch

Table 5-11 : Recommended Growth Rates Optimistic

Category / Year	FY 2027-2031	FY 2031-2036	FY 2036-2041	FY 2041-2046
Car/Jeep/Van	8.31%	7.01%	6.58%	6.33%
Bus	4.73%	3.77%	3.56%	3.41%
LCV	4.89%	3.83%	3.34%	3.08%
2- Axle	4.38%	4.30%	3.80%	3.53%
3 – Axle	4.71%	4.30%	3.80%	3.53%
4 to 6 Axle	5.03%	4.30%	3.80%	3.53%
7 and Above Axle	4.71%	4.30%	3.80%	3.53%

Table 5-12 : Recommended Growth Rates Pessimistic

Category / Year	FY 2027-2031	FY 2031-2036	FY 2036-2041	FY 2041-2046
Car/Jeep/Van	7.81%	6.51%	6.08%	5.83%
Bus	4.23%	3.27%	3.06%	2.91%
LCV	4.39%	3.33%	2.84%	2.58%
2- Axle	3.88%	3.80%	3.30%	3.03%
3 – Axle	4.21%	3.80%	3.30%	3.03%
4 to 6 Axle	4.53%	3.80%	3.30%	3.03%
7 and Above Axle	4.21%	3.80%	3.30%	3.03%

Table 5-13 : Recommended Growth Rates Most Likely

Category / Year	FY 2027-2031	FY 2031-2036	FY 2036-2041	FY 2041-2046
Car/Jeep/Van	8.06%	6.76%	6.33%	6.08%
Bus	4.48%	3.52%	3.31%	3.16%
LCV	4.64%	3.58%	3.09%	2.83%
2- Axle	4.13%	4.05%	3.55%	3.28%
3 - Axle	4.46%	4.05%	3.55%	3.28%
4 to 6 Axle	4.78%	4.05%	3.55%	3.28%
7 and Above Axle	4.46%	4.05%	3.55%	3.28%

Traffic and revenue have been worked out on the basis of the above growth, and some are presented in subsequent chapters of the report.

CHAPTER 6

TRAFFIC FORECAST

6.1 Traffic Projections

Growth rates recommended in the previous section of the report are used to arrive at traffic projections for future years. Toll plaza wise futuristic traffic projection is given in tables below.

These projections have been done for the following three cases of growth up to the concession period.

1. Optimistic Scenario
2. Pessimistic Scenario
3. Most Likely Scenario

Table 6-1 : Total Tollable Traffic @ Toll Plaza 1- Lambia Kalan121.020 KM

(Optimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU
2026-27	11299	900	524	2608	1818	5500	13	**22662**	**52290**
2027-28	12235	943	548	2722	1903	5776	13	**24140**	**55216**
2028-29	13251	989	573	2842	1993	6066	13	**25727**	**58316**
2029-30	14354	1037	599	2966	2086	6371	13	**27426**	**61602**
2030-31	15358	1077	620	3094	2176	6645	13	**28983**	**64620**
2031-32	16435	1118	642	3226	2269	6930	13	**30633**	**67794**
2032-33	17586	1161	666	3364	2366	7227	13	**32383**	**71133**
2033-34	18817	1205	690	3508	2467	7537	13	**34237**	**74645**
2034-35	20135	1251	715	3657	2573	7860	13	**36204**	**78341**
2035-36	21459	1293	740	3795	2670	8157	13	**38127**	**81859**
2036-37	22870	1336	765	3939	2771	8467	13	**40161**	**85546**
2037-38	24374	1380	792	4087	2877	8788	13	**42311**	**89412**
2038-39	25977	1426	819	4241	2986	9121	13	**44583**	**93466**
2039-40	27685	1473	847	4401	3099	9467	13	**46985**	**97718**
2040-41	29438	1519	875	4556	3209	9802	13	**49412**	**101930**
2041-42	31301	1566	904	4716	3322	10148	13	**51970**	**106340**

Table 6-2 : Total Tollable Traffic @ Toll Plaza 2- Jojro ka Khera184.020 KM

(Optimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU
2026-27	10225	889	462	2713	1979	6435	12	**22715**	**57566**
2027-28	11075	932	484	2832	2071	6759	12	**24165**	**60727**

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU
2028-29	11995	976	507	2956	2169	7099	12	**25714**	**64072**
2029-30	12992	1024	531	3085	2272	7456	12	**27372**	**67613**
2030-31	13901	1063	551	3217	2370	7776	12	**28890**	**70862**
2031-32	14874	1104	572	3354	2472	8111	12	**30499**	**74276**
2032-33	15916	1146	594	3498	2578	8459	12	**32203**	**77863**
2033-34	17030	1189	617	3647	2688	8822	12	**34005**	**81633**
2034-35	18224	1233	640	3803	2804	9200	12	**35916**	**85594**
2035-36	19421	1274	663	3947	2910	9550	12	**37777**	**89348**
2036-37	20697	1316	686	4096	3020	9912	12	**39739**	**93278**
2037-38	22059	1359	711	4251	3134	10287	12	**41813**	**97392**
2038-39	23508	1403	737	4412	3253	10677	12	**44002**	**101702**
2039-40	25053	1450	763	4580	3376	11081	12	**46315**	**106215**
2040-41	26640	1494	789	4742	3495	11472	12	**48644**	**110673**
2041-42	28326	1539	816	4910	3618	11876	12	**51097**	**115334**

Table 6-3 : Total Tollable Traffic @ Toll Plaza 1- Lambia Kalan121.020 KM (Pessimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU
2026-27	11246	894	521	2595	1810	5474	13	**22553**	**52042**
2027-28	12124	933	542	2696	1886	5722	13	**23916**	**54694**
2028-29	13069	974	564	2801	1965	5981	13	**25367**	**57492**
2029-30	14090	1016	587	2910	2047	6252	13	**26915**	**60444**
2030-31	15007	1050	605	3020	2125	6489	13	**28309**	**63103**
2031-32	15982	1084	624	3134	2205	6735	13	**29777**	**65887**
2032-33	17021	1119	644	3253	2288	6990	13	**31328**	**68803**
2033-34	18128	1155	664	3375	2375	7256	13	**32966**	**71857**
2034-35	19308	1193	685	3502	2465	7531	13	**34697**	**75056**
2035-36	20480	1227	705	3617	2546	7779	13	**36367**	**78051**
2036-37	21726	1261	726	3736	2629	8035	13	**38126**	**81177**
2037-38	23046	1296	747	3858	2716	8300	13	**39976**	**84441**
2038-39	24446	1332	769	3986	2805	8574	13	**41925**	**87848**
2039-40	25931	1369	792	4117	2897	8856	13	**43975**	**91406**
2040-41	27443	1404	814	4242	2985	9125	13	**46026**	**94890**
2041-42	29043	1440	837	4371	3075	9402	13	**48181**	**98522**

Table 6-4 : Total Tollable Traffic @Toll Plaza 2- Jojro ka Khera184.020 KM (Pessimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU
2026-27	10180	885	459	2700	1970	6406	12	**22612**	**57293**
2027-28	10975	924	478	2804	2053	6696	12	**23942**	**60153**
2028-29	11831	964	497	2912	2139	6998	12	**25353**	**63166**
2029-30	12755	1006	518	3024	2228	7314	12	**26857**	**66340**
2030-31	13585	1039	534	3137	2313	7592	12	**28212**	**69197**
2031-32	14468	1073	550	3256	2401	7880	12	**29640**	**72185**
2032-33	15409	1109	568	3379	2492	8179	12	**31148**	**75311**
2033-34	16411	1147	586	3507	2586	8489	12	**32738**	**78580**
2034-35	17479	1186	605	3640	2685	8810	12	**34417**	**82001**
2035-36	18542	1219	623	3760	2773	9100	12	**36029**	**85188**
2036-37	19667	1253	642	3884	2864	9399	12	**37721**	**88509**
2037-38	20861	1289	661	4011	2958	9708	12	**39500**	**91972**
2038-39	22128	1326	680	4143	3055	10026	12	**41370**	**95582**
2039-40	23472	1364	701	4279	3156	10356	12	**43340**	**99347**
2040-41	24841	1399	720	4409	3252	10669	12	**45302**	**103021**
2041-42	26290	1435	741	4542	3351	10992	12	**47363**	**106845**

Traffic projections for Most Likely scenario is given as under

Table 6-5 : Total Tollable Traffic @ Toll Plaza 1- Lambia Kalan121.020 KM (Most Likely Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU
2026-27	11273	898	523	2602	1815	5487	13	**22611**	**52166**
2027-28	12181	940	545	2710	1896	5750	13	**24035**	**54955**
2028-29	13162	983	569	2823	1980	6025	13	**25555**	**57903**
2029-30	14222	1029	593	2939	2068	6313	13	**27177**	**61021**
2030-31	15181	1065	613	3057	2151	6568	13	**28648**	**63858**
2031-32	16206	1104	634	3179	2238	6834	13	**30208**	**66835**
2032-33	17301	1144	655	3308	2328	7110	13	**31859**	**69959**
2033-34	18469	1185	677	3441	2422	7398	13	**33605**	**73239**
2034-35	19717	1227	700	3580	2519	7696	13	**35452**	**76683**
2035-36	20964	1265	722	3707	2608	7969	13	**37248**	**79935**
2036-37	22291	1305	745	3838	2700	8251	13	**39143**	**83336**
2037-38	23700	1346	769	3974	2795	8542	13	**41139**	**86894**
2038-39	25199	1387	794	4114	2893	8845	13	**43245**	**90617**
2039-40	26793	1429	819	4259	2995	9159	13	**45467**	**94513**
2040-41	28422	1470	844	4398	3093	9459	13	**47699**	**98351**
2041-42	30152	1512	869	4542	3193	9769	13	**50050**	**102361**

Table 6-6 : Total Tollable Traffic @ Toll Plaza 2- Jojro ka Khera184.020 KM (Most Likely Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU
2026-27	10204	887	461	2707	1974	6421	12	**22666**	**57430**
2027-28	11025	928	480	2818	2062	6727	12	**24052**	**60440**
2028-29	11914	970	501	2935	2153	7048	12	**25533**	**63618**
2029-30	12874	1014	523	3056	2249	7385	12	**27113**	**66974**
2030-31	13744	1051	541	3179	2339	7684	12	**28550**	**70026**
2031-32	14672	1089	559	3308	2433	7994	12	**30067**	**73225**
2032-33	15662	1128	578	3441	2532	8316	12	**31669**	**76578**
2033-34	16720	1168	597	3579	2635	8653	12	**33364**	**80094**
2034-35	17850	1209	618	3723	2742	9004	12	**35158**	**83781**
2035-36	18979	1247	637	3855	2840	9322	12	**36892**	**87246**
2036-37	20179	1286	658	3991	2941	9653	12	**38720**	**90865**
2037-38	21455	1326	679	4132	3046	9995	12	**40645**	**94646**
2038-39	22812	1367	701	4278	3154	10349	12	**42673**	**98598**
2039-40	24255	1409	723	4428	3265	10716	12	**44808**	**102728**
2040-41	25730	1449	745	4573	3372	11068	12	**46949**	**106783**
2041-42	27294	1490	768	4722	3482	11431	12	**49199**	**111013**

6.2 Modification in Concession Period

As per Article 29 of the concession agreement, if actual traffic on the project falls short or exceeds Target Traffic on project highway on defined date, concession period shall be modified subject to calculation stipulated therein. For Gulabpura-Chittorgarh project, the Target Date and Target Traffic are defined as under:

Target Date - 1st June 2026

Target Traffic - 76316 in PCU

It was observed that as per traffic projections, average traffic volume falls short of target traffic in all scenarios. Probable extension of concession period is estimated according to article 29 of concession agreement which comes to about 3-4 years Traffic forecast and revenue projections are done for probable extended period accordingly.

Most Likely

Target Year	Target Traffic	Actual Traffic	% of Excess / Short traffic	% Revision (+ or -) in CP as per CA	% Variation in CP	Original CP	Change in CP (In Years)
2026	76316	54850	-28%	42%	20%	20	4

Optimistic

Target Year	Target Traffic	Actual Traffic	% of Excess / Short traffic	% Revision (+ or -) in CP as per CA	% Variation in CP	Original CP	Change in CP (In Years)
2026	76316	54984	-28%	42%	20%	20	4

Pessimistic

Target Year	Target Traffic	Actual Traffic	% of Excess / Short traffic	% Revision (+ or -) in CP as per CA	% Variation in CP	Original CP	Change in CP (In Years)
2026	76316	54715	-28%	42%	20%	20	4

CHAPTER 7

FORECAST OF TOLL REVENUE

7.1 General

This chapter presents the tolling rate calculations, categories and toll revenue of the project.

7.2 Discount Categories

The fee schedule in the CA of Gulabpura-Chittorgarh section of NH-19 is based on the old toll policy. As per the Toll Notification (Schedule -G) the discounts and special provisions have been considered. In addition to discounts as per Fee Notification concessionaire has declared special category rates also. Salient features of toll rate structure are given as under

1. Monthly Pass: For frequent user's monthly pass would be issued for 50 trips in month at 2/3d rate. Additionally, concessionaire has announced special monthly passes for local commercial cars at Rs. 670.
2. Multiple Journeys (for Return Trip): Will be charged at 1.5 times single journey.
3. Single Journey: Full single journey toll would be charged to this category of vehicles who are infrequent travelers or whose frequency does not yield any discount from the above categories.
4. Local Discounts: There are several categories of local discounts.
    a) Local Car Jeep Van I - Rs.350 per
    b) Local LCV - Rs. 1525 per trip
    c) Local Commercial Vehicles at 50% rate for single journey

Building of inflation and escalation of rate on the basis of WPI are done as per toll notification (Schedule G) as given under as extract from concession agreement.

The formula for determining the applicable rate of fee shall be as follows:-

$$\text{Applicable rate of fee} = \text{base rate} + \text{base rate} \times \left\{ \frac{\text{WPI A-WPI B}}{\text{WPI B}} \right\} \times 0.4$$

Factors of inflation / growth have been incorporated as per Schedule R. WPI are available up to the year 2025-26.

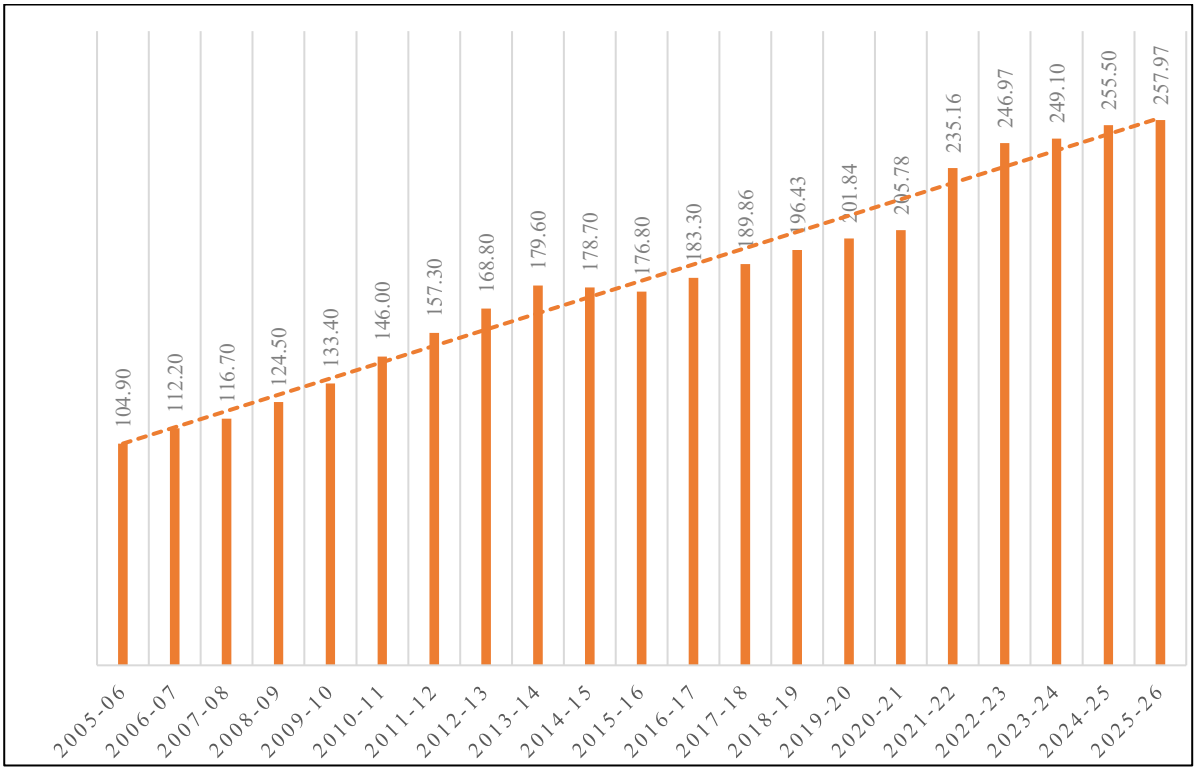

Figure 7-1 : Historical Rate of WPI Inflation in India

The wholesale price index (WPI) and the inflation rate in the past are presented in Table below.

Table 7-1 : Historical WPI value and Growth Inflation

December of year	2021	2022	2023	2024	2025	Avg.
WPI	235.2	247.0	249.1	255.5	257.97	
Inflation	14.27%	5.02%	0.86%	2.57%	0.96%	4.74%

WPI of December 2025 is posted on ministry site which is shows 0.96% inflation from the previous year. Same has been applied for FY 2026-27.

The average WPI inflation over the period FY 2021 to FY 2025 works out to approximately 4.74%, reflecting inflationary cycles across both high and low inflation years. Based on this analysis, an annual escalation factor of 4.5% has been adopted for the remaining concession period.

7.3 Estimation of Toll Rates

As per the applicable MORTH notification and Schedule R of contract agreement, the following Base rate of fee for the categories mentioned in the table stands true in the National Highways Fee Rules applicable for contract.

Table 7-2 : Base Toll Rates June 2007-08

Type of Vehicle	Base Rate of Fee / Km (in Rs.)
Car, Jeep, Van or Light Motor Vehicle	0.65

Light Commercial Vehicle, Light Goods Vehicle or Minibus	1.05
Bus or Truck (Two Axles)	2.20
Three Axle Commercial Vehicles	2.40
Heavy Construction Machinery (HCM) or Earth Moving Equipment (EME) or Multi Axle Vehicle (MAV) (4 to 6 axles)	3.45
Oversized Vehicles (7 or more Axles)	4.20

There is no bypass or structure to be factored in for rates calculations.

Toll rates are calculated as per guidelines provided in schedule R (rounded to nearest Rs.) for the concession period and are given below.

Thus, worked out rates for various categories of vehicle and discounts are given as under.

Table 7-3 : Toll Rates for Single Journey@ Km 121.020

Year	Car	Minibus /LCV	Bus	Truck	3-Axle	Multi axle	Oversized Vehicles
2026-27	105	170	355	355	385	555	675
2027-28	110	175	370	370	405	580	710
2028-29	115	185	390	390	425	610	740
2029-30	120	195	405	405	445	635	775
2030-31	125	205	425	425	465	665	815
2031-32	130	215	445	445	485	700	850
2032-33	140	225	465	465	510	730	890
2033-34	145	235	490	490	535	765	935
2034-35	150	245	515	515	560	805	980
2035-36	160	255	535	535	585	845	1025
2036-37	165	270	565	565	615	885	1075
2037-38	175	280	590	590	645	925	1125
2038-39	185	295	620	620	675	970	1180
2039-40	190	310	650	650	710	1020	1240
2040-41	200	325	680	680	745	1065	1300
2041-42	210	340	715	715	780	1120	1365

Table 7-4 : Toll Rates for Single Journey @ Km 184.020

Year	Car	Minibus /LCV	Bus	Truck	3-Axle	Multi axle	Oversized Vehicles
2026-27	110	175	365	365	400	575	700
2027-28	115	185	385	385	420	605	735
2028-29	120	190	400	400	440	630	770
2029-30	125	200	420	420	460	660	805
2030-31	130	210	440	440	480	690	845
2031-32	135	220	460	460	505	725	885
2032-33	145	230	485	485	530	760	925

Year	Car	Minibus /LCV	Bus	Truck	3-Axle	Multi axle	Oversized Vehicles
2033-34	150	240	505	505	555	795	970
2034-35	155	255	530	530	580	835	1015
2035-36	165	265	555	555	610	875	1065
2036-37	175	280	585	585	635	915	1115
2037-38	180	290	610	610	670	960	1170
2038-39	190	305	640	640	700	1005	1225
2039-40	200	320	675	675	735	1055	1285
2040-41	210	335	705	705	770	1105	1350
2041-42	220	355	740	740	810	1160	1415

Table 7-5 : Toll Rates for Return Journey @ Km 121.02

Year	Car	Minibus /LCV	Bus	Truck	3-Axle	Multi axle	Oversized Vehicles
2026-27	155	255	530	530	580	835	1015
2027-28	165	265	555	555	605	870	1060
2028-29	170	280	580	580	635	915	1110
2029-30	180	290	610	610	665	955	1165
2030-31	190	305	640	640	695	1000	1220
2031-32	200	320	670	670	730	1050	1275
2032-33	205	335	700	700	765	1100	1335
2033-34	215	350	735	735	800	1150	1400
2034-35	225	365	770	770	840	1205	1470
2035-36	240	385	805	805	880	1265	1540
2036-37	250	405	845	845	920	1325	1615
2037-38	260	425	885	885	965	1390	1690
2038-39	275	445	930	930	1015	1455	1775
2039-40	290	465	975	975	1060	1525	1860
2040-41	300	485	1020	1020	1115	1600	1950
2041-42	315	510	1070	1070	1170	1680	2045

Table 7-6 : Toll Rates for Return Journey @ Km 184.020

Year	Car	Minibus /LCV	Bus	Truck	3-Axle	Multi axle	Oversized Vehicles
2026-27	165	265	550	550	600	865	1050
2027-28	170	275	575	575	630	905	1100
2028-29	180	290	605	605	660	945	1150
2029-30	185	300	630	630	690	990	1205
2030-31	195	315	660	660	720	1040	1265
2031-32	205	330	695	695	755	1085	1325
2032-33	215	345	725	725	790	1140	1385
2033-34	225	365	760	760	830	1195	1455
2034-35	235	380	795	795	870	1250	1520
2035-36	245	400	835	835	910	1310	1595
2036-37	260	420	875	875	955	1375	1670
2037-38	270	440	920	920	1000	1440	1755
2038-39	285	460	965	965	1050	1510	1840
2039-40	300	480	1010	1010	1100	1585	1930

Year	Car	Minibus /LCV	Bus	Truck	3-Axle	Multi axle	Oversized Vehicles
2040-41	315	505	1060	1060	1155	1660	2020
2041-42	330	530	1110	1110	1210	1740	2120

Table 7-7 : Toll Rates for Monthly Pass Local @ Km 121.020

Year	Car	Minibus /LCV
2026-27	360	1540
2027-28	375	1610
2028-29	395	1680
2029-30	415	1755
2030-31	430	1835
2031-32	455	1920
2032-33	475	2005
2033-34	495	2095
2034-35	520	2190
2035-36	545	2290
2036-37	570	2395
2037-38	600	2505
2038-39	630	2620
2039-40	660	2740
2040-41	690	2865
2041-42	725	2995

Table 7-8 : Toll Rates for Monthly Pass Local @ Km 184.020

Year	Car	Minibus /LCV
2026-27	360	1215
2027-28	375	1270
2028-29	395	1325
2029-30	415	1385
2030-31	430	1445
2031-32	455	1510
2032-33	475	1580
2033-34	495	1650
2034-35	520	1725
2035-36	545	1805
2036-37	570	1885
2037-38	600	1970
2038-39	630	2060
2039-40	660	2155
2040-41	690	2250
2041-42	725	2350

Table 7-9 : Toll Rates for Monthly Pass @ Km 121.020

Year	Car	Minibus /LCV	Bus	Truck	3-Axle	Multi axle	Oversized Vehicles
2026-27	3485	5630	11800	11800	12875	18505	22530
2027-28	3650	5895	12355	12355	13480	19375	23585
2028-29	3820	6175	12935	12935	14110	20285	24695
2029-30	4000	6465	13545	13545	14775	21245	25860
2030-31	4190	6770	14185	14185	15475	22245	27085
2031-32	4390	7090	14860	14860	16210	23300	28370
2032-33	4600	7430	15565	15565	16980	24410	29715
2033-34	4820	7785	16310	16310	17790	25575	31135
2034-35	5050	8155	17090	17090	18645	26800	32625
2035-36	5290	8550	17910	17910	19540	28085	34190
2036-37	5545	8960	18770	18770	20480	29440	35840
2037-38	5815	9390	19680	19680	21470	30860	37570
2038-39	6095	9845	20630	20630	22510	32355	39390
2039-40	6390	10325	21635	21635	23600	33930	41305
2040-41	6705	10830	22690	22690	24755	35585	43320
2041-42	7030	11360	23800	23800	25965	37325	45435

Table 7-10 : Toll Rates for Monthly Pass @ Km 184.02

Year	Car	Minibus /LCV	Bus	Truck	3-Axle	Multi axle	Oversized Vehicles
2026-27	3615	5840	12240	12240	13350	19190	23365
2027-28	3785	6115	12810	12810	13975	20090	24460
2028-29	3965	6405	13415	13415	14635	21035	25610
2029-30	4150	6705	14050	14050	15325	22030	26820
2030-31	4345	7020	14710	14710	16050	23070	28085
2031-32	4555	7355	15410	15410	16810	24165	29420
2032-33	4770	7705	16145	16145	17610	25315	30820
2033-34	4995	8070	16915	16915	18450	26520	32290
2034-35	5235	8460	17720	17720	19335	27790	33835
2035-36	5485	8865	18575	18575	20260	29125	35455
2036-37	5750	9290	19465	19465	21235	30530	37165
2037-38	6030	9740	20410	20410	22265	32005	38960
2038-39	6320	10210	21395	21395	23340	33555	40850
2039-40	6630	10710	22435	22435	24475	35185	42835
2040-41	6950	11230	23530	23530	25670	36900	44920
2041-42	7290	11780	24680	24680	26925	38705	47120

7.4 Toll Revenue

As indicated earlier, toll revenue on the Project Road has been calculated in all three scenarios based on above rates and projected traffic. The estimates of toll revenue under ***Optimistic***, ***Pessimistic*** and ***Most Likely*** growth scenarios are presented in the following section.

7.5 Toll Revenue at all toll plazas under Scenarios

Toll Revenue estimates under most likely scenario at each of the toll plaza up to 2041-42 starting from the year 2026-27 are shown in tables below.

Table 7-11 : Toll Revenue Optimistic Scenario

(Rs. Crores)

Year	TP-1	TP2	Total
2026-27	218.05	243.79	**461.84**
2027-28	241.34	270.03	**511.36**
2028-29	265.87	296.25	**562.11**
2029-30	292.78	326.73	**619.50**
2030-31	321.37	357.92	**679.30**
2031-32	354.31	394.10	**748.41**
2032-33	388.53	433.17	**821.70**
2033-34	426.52	474.06	**900.57**
2034-35	468.63	519.19	**987.82**
2035-36	514.37	570.18	**1084.55**
2036-37	560.63	622.68	**1183.30**
2037-38	613.51	679.06	**1292.57**
2038-39	673.33	743.31	**1416.64**
2039-40	738.37	816.32	**1554.69**
2040-41	746.20	887.86	**1634.06**
2041-42	815.51	970.54	**1786.05**

Table 7-12 : Toll Revenue Pessimistic Scenario

(Rs. Crores)

Year	TP-1	TP2	Total
2026-27	216.96	242.63	**459.59**
2027-28	238.93	267.40	**506.33**
2028-29	261.91	291.90	**553.80**
2029-30	287.09	320.33	**607.42**
2030-31	313.53	349.19	**662.73**
2031-32	343.99	382.61	**726.60**
2032-33	375.41	418.46	**793.88**
2033-34	410.18	455.74	**865.93**
2034-35	448.56	496.73	**945.29**
2035-36	490.01	542.90	**1032.91**
2036-37	531.53	589.98	**1121.51**
2037-38	579.00	640.24	**1219.24**
2038-39	632.43	697.43	**1329.86**
2039-40	690.21	762.26	**1452.48**

Year	TP-1	TP2	Total
2040-41	694.13	825.07	**1519.20**
2041-42	754.99	897.49	**1652.49**

Table 7-13 : Toll Revenue Most Likely Scenario

(Rs. Crores)

Year	TP-1	TP2	Total
2026-27	217.55	243.18	**460.73**
2027-28	240.22	268.64	**508.85**
2028-29	264.01	293.96	**557.97**
2029-30	290.07	323.42	**613.49**
2030-31	317.59	353.40	**671.00**
2031-32	349.25	388.11	**737.36**
2032-33	382.05	425.43	**807.48**
2033-34	418.44	464.54	**882.98**
2034-35	458.69	507.61	**966.30**
2035-36	502.24	556.08	**1058.32**
2036-37	546.12	605.89	**1152.00**
2037-38	596.19	659.21	**1255.40**
2038-39	652.71	719.91	**1372.62**
2039-40	713.94	788.68	**1502.62**
2040-41	719.65	855.79	**1575.44**
2041-42	784.54	933.19	**1717.73**

CHAPTER 8

CONCLUSION & RECOMMENDATIONS

8.1 Conclusion & Recommendations

Project stretch of Gulabpura to Chittrorgarh section of NH-79 in state of Rajasthan from km 90.000 to km 214.870 nearing completion of six laning. The road is in sound condition and serves healthy traffic volumes. Project corridor is a part of the busy and prominent national highway NH-79 which connects Kishangarh to Udaipur via Bhiwala and Chittorgarh. There are large number of townships, industrial corridors and other business establishments coming up along the project corridor. As discussed, the dominant portion of traffic is long route traffic, which is more sensitive towards the growth of national economy. As Indian economy is poised to grow at 7%+, the project corridor is expected to pick up the same trend in terms of traffic flow. All these developments have potential to give a positive impact to traffic flow on the project. The following can be considered as major outcomes of the study.

a) There is a good amount of tollable traffic running on the project.

b) Project corridor has potential to witness traffic growth @ 6-8% annually in near future post COVID-19 due to various developments in area and overall development of economy.

c) The Project corridor has committed traffic as long route traffic and does not run a risk of traffic leakage due to quality competing road.

Based on the above it can be considered a stable healthy project from the traffic and revenue point of view.

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IRB INFRASTRUCTURE TRUST

GOA/KARNATAKA BORDER TO KUNDARPUR (KM 93.300 TO KM 283.300) SECTION OF NH-17 IN THE STATE OF GOA & KARNATAKA

TRAFFIC STUDY & REVENUE PROJECTION REPORT (FINAL)

MAY 2026

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GOA/KARNATAKA BORDER TO KUNDARPUR

(KM 93.300 TO KM 283.300)

SECTION OF NH-17 IN THE STATE OF

GOA & KARNATAKA

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MAY 2026

GMD CONSULTANTS
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ABBREVIATIONS

AADT	-	Annual Average Daily Traffic	**NHAI**	-	National Highway Authority of India
BOT	-	Build Operate Transfer	**NHDP**	-	National Highways Development Project
CAGR	-	Compound Annual Growth Rate	**NSDP**	-	Net State Domestic Product
CTV	-	Classified traffic volume	**O&M**	-	Operation & Maintenance
DBFOT	-	Design, Build, Finance, Operate & Transfer	**PCDP**	-	Per Capita Domestic Product
EME	-	Earth Moving Equipment	**PCI**	-	Per Capita Income
GDP	-	Gross Domestic Product	**PCU**	-	Passenger Car Unit
GSDP	-	Gross State Domestic Product	**PSC**	-	Pre-stressed Concrete
HCM	-	Heavy Construction Machinery	**RCC**	-	Reinforced cement concrete
HCV	-	Heavy Commercial Vehicle	**RHS**	-	Right Hand Side
HTMS	-	Highway Traffic Management System	**SH**	-	State Highway
IRC	-	Indian Road Congress	**TP**	-	Toll Plaza
IRR	-	Internal Rate of Return	**WPI**	-	Wholesale Price Index
LCV	-	Light Commercial Vehicle	**SIR**	-	Special Investment Region
LHS	-	Left Hand Side	**c.**	-	Circa
LGV	-	Light Goods Vehicle	**ROB**	-	Railway Over Bridge
MAV	-	Multi Axle Vehicle	**MDR**	-	Major District Road
MORTH	-	Ministry of Road Transport and Highways	**ODR**	-	Other District Road
NH	-	National Highway	**CA**	-	Concession Agreement
PCC	-	Plain Cement Concrete	**RMT**	-	Running Meter
CR	-	Coarse Rubble			

CHAPTER 1

INTRODUCTION

1.1 Background

The Government of India through National Highway Authority of India (NHAI) embarked upon a program to enhance the traffic capacity and safety for efficient transportation of goods as well as passenger traffic on National Highway Sections under various phases of NHDP. Under Phase IV NHAI has planned to convert existing 2-lane National Highways into 4-lane National Highway.

The project under consideration, Four Laning of Goa / Karnataka Border to Kundapur section of NH-17 from km 93.300 to km 283.300 is one such road project NHAI intended to implement on a BOT basis in the DBFOT format. M/s IRB Westcoast Tollway Ltd. (Concessionaire) has been awarded the Project for a concession period of 28 years starting from the appointed date of 3rd March 2014. The Project is under capacity augmentation to six lanes. Tolling operation under current concession has commenced in February 2020 after partial COD on 31st January 2020. Further to it additional length of 161.050 Km has been completed and put to commercial operation in February 2022. PCOD-3 has been received in March 2023 & the rest of length is expected to complete by Financial Year 2024.

Project road from Goa/ Karnataka Border (Near Karwar) to Kundapur is about 190 km section of Mumbai - Goa highway (NH-17) from Km 93.700 to Km 283.300. NH-17 is most important transportation corridor along west cost of India. It starts at Panvel, at the junction of National Highway 4 (NH 4), and ends at Kanyakumari. NH-17 mainly traverses through the west coast of India, sometimes touching the shores of the Arabian Sea. The NH 17 touches the Arabian Sea at Maravanthe in Karnataka, Thalassery, Alappuzha and Kollam in Kerala. It passes through the Indian states of Maharashtra, Goa, Karnataka, Kerala and Tamil Nadu

The following figure shows the project road alignment.

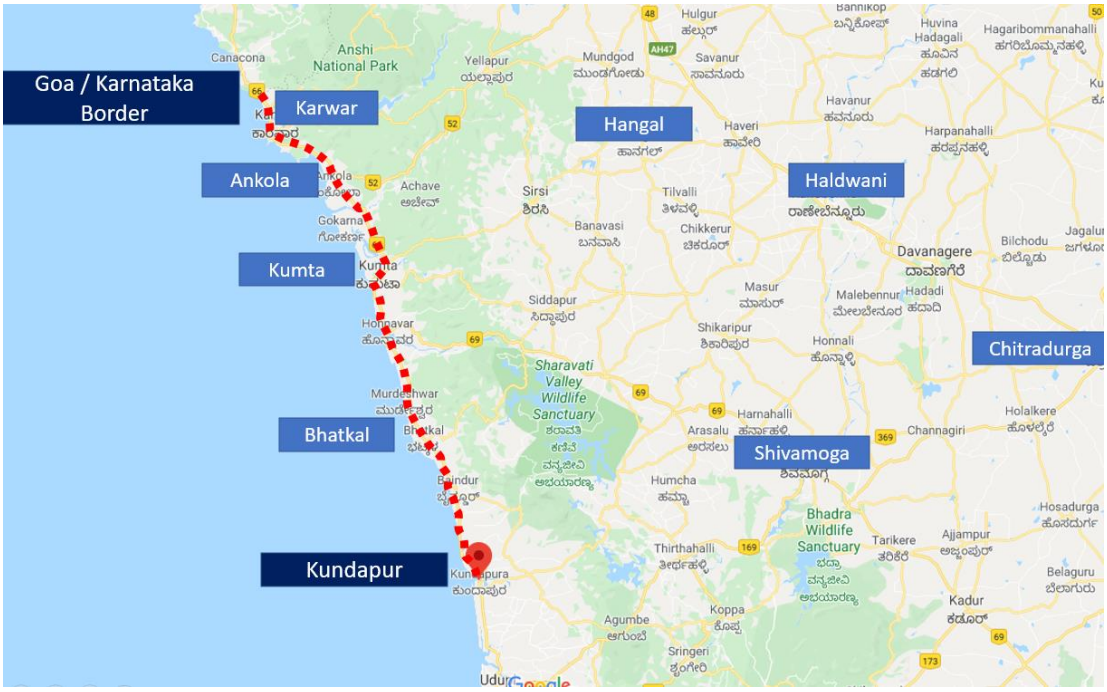

Figure 1-1 : Alignment of Project Stretch

1.2 Objective of the Study

M/s IRB INFRASTRUCTURE TRUST has engaged GMD Consultants to assess the future traffic and toll potential of project along with related operation & maintenance expenditure involved.

This report named as "Traffic Study & Toll Revenue Projection Report" mainly focuses on traffic and revenue aspects of the project. Other parameters like competing road, area developments etc. have been considered from a traffic development point of view.

1.2.1 Scope of Services

The broad scope of work covered in the assignment is as follows.

a) Analysis of Traffic Growth

b) Toll Rate Growth

c) Revenue Forecasting

The Concessionaire has provided basic traffic data and other project details on the basis of which the above analysis has been carried out.

CHAPTER 2

PROJECT DETAILS

2.1 Project Corridor

Project of Four Laning of Goa / Karnataka Border – Kundapur section of NH-17 from Km 93.700 to Km 283.300 is Phase-IV project of NHAI on PPP basis under DBFOT pattern. Ankola, Bhatkal, Kumta and Karwar are the main urban centers on project Corridor. For most of the length of the project road runs parallel to the western coast.

It can be observed that project road forms a main connectivity between Mumbai and southern parts on west coast like Goa, Kanoor, Kocchi, Thiruanantpuram and finally Kanyakumai. Thus, transportation requirements in terms of passenger and goods are largely dependent on this spinal road.

2.2 Project Stretch Description

Project road section of NH-17 (now NH-66) passes through the important places like Karwar, Bhatkal, Ankola. This is the main connectivity between Mumbai and- Goa and Kerala. The Project Road passes through the districts of Karnataka and Goa.

National Highway 66, commonly referred to as NH 66 (Erstwhile NH-17 and a part of NH-47),is a busy National Highway that runs roughly north–south along the western coast of India, parallel to the Western Ghats. It connects Panvel (a city south of Mumbai) to Kanyakumari, passing through the states of Maharashtra, Goa, Karnataka, Kerala and Tamil Nadu

The following are the major centers of areas which have an impact on project road in terms of traffic.

Goa: Is a state in India within the coastal region known as the Konkan, in Western India. It is bounded by Maharashtra to the north and Karnataka to the east and south, with the Arabian Sea forming its Western coast. It is India's smallest state by area and the fourth smallest by population. Goa has the highest GDP per capita among all Indian states,[3] that is two and a half times that of the country. It was ranked the 'best placed State' by the "Eleventh Finance Commission" for its infrastructure and ranked on top for the 'best quality of life' in India by the National Commission on Population based on the 12 Indicators.

Kumta: Is a town and a taluk in the Uttara Kannada district of Karnataka, India. Kumta is about 142 km south of Margao and 58 km north of Bhatkal. It is situated 72.7 km from Karwar, the district headquarters. It is one of the important stations along the Konkan Railway line running between Mumbai and Mangalore.

Bhatkal: Is a port town in the Uttara Kannada District of the South Indian state of Karnataka. The town of Bhatkal lies on National Highway 66, which runs between Mumbai and Kochi, and has one of the major railway stations along the Konkan Railway line, which runs between Mumbai and Mangaluru

As the project highway runs along the west coast for most parts of its alignment, there are only radial roads connecting to the project highway which work as feeder network to project road.

Four laning of project highway is higher priority of both central & concerned state governments. Currently highways have bottlenecks at many places which are being improved as a priority. Due to the poor condition of NH-17 and higher number of accidents some part of traffic uses Mumbai -Pune Expressway and then take Bangalore Highway (NH-48) to go to Goa and parts of Karnataka and Kerala. This traffic is expected to come back on the project highway.

There are three operative toll plazas at project stretch. at km 119.00, km 184.00 and km 243.00 respectively. The following figure shows project alignment and toll plaza locations.

Figure 2-1 : Project Alignment with Toll Plaza

2.3 Project Corridor Illustration

Six laning of project stretches are complete. The following photographs illustrate the project section along the corridor.

Figure 2-2 : Photographs showing Project Corridor

CHAPTER 3

TRAFFIC SURVEYS AND ANALYSIS

3.1 Traffic Surveys

The Consultants have collected the required information for project corridor to understand the general traffic and travel characteristics on the corridor.

The following traffic data has been collected from a client for a project.

- Classified traffic volume counts at toll plaza locations on Goa Karnataka Border to Kundapur section of NH17 for years 2017-18, 2018-19, 2019-20, 2020-21,2021-22,2022-23,2023-24,2024-25 and Annual traffic data from April 2025 to February 2026.
- Local Component of traffic
- Component of Return Journey
- Component of Monthly Pass Journey

The main objective of the traffic data analysis is to:

- Determine the existing traffic movement characteristics of the project
- Establish base year traffic
- Identification of travel patterns and modal split of project traffic
- Deriving growth factors for traffic forecasting
- Estimation of corridor traffic including traffic diversion if any
- Preparation of revenue model and projection of revenue as per toll policy for various scenarios

Table 3-1 below lists provides details of locations from where traffic details have been collected.

Table 3-1 : Traffic Data Details

SR. NO	LOCATION	CTV	Single Journey Traffic	Daily Return Journey	Monthly Pass	Local Pass
1	**Km 119 Toll Plaza**	AADT for Period from February 2020 to March 2020, 2020-21, 2021-2022, 2022-2023, 2023-24, 2024-25 & Eleven months from April 2025 to February 2026	For Period from February 2020 to March 2020, 2020-21, 2021-2022, 2022-2023, 2023-24, 2024-25 & Eleven months from April 2025 to February 2026	For Period from February 2020 to March 2020, 2020-21, 2021-2022, 2022-2023, 2023-24, 2024-25 & Eleven months from April 2025 to February 2026	For Period from February 2020 to March 2020, 2020-21, 2021-2022, 2022-2023, 2023-24, 2024-25 & Eleven months from April 2025 to February 2026	For Period from February 2020 to March 2020, 2020-21, 2021-2022, 2022-2023, 2023-24, 2024-25 & Eleven months from April 2025 to February 2026
2	**Km 184 Toll Plaza**	AADT for Period from February 2020 to March 2020, 2020-21, 2021-2022, 2022-2023, 2023-24, 2024-25 & Eleven months from April 2025 to February 2026	For Period from February 2020 to March 2020, 2020-21, 2021-2022, 2022-2023, 2023-24, 2024-25 & Eleven months from April 2025 to February 2026	For Period from February 2020 to March 2020, 2020-21, 2021-2022, 2022-2023, 2023-24, 2024-25 & Eleven months from April 2025 to February 2026	For Period from February 2020 to March 2020, 2020-21, 2021-2022, 2022-2023, 2023-24, 2024-25 & Eleven months from April 2025 to February 2026	For Period from February 2020 to March 2020, 2020-21, 2021-2022, 2022-2023, 2023-24, 2024-25 & Eleven months from April 2025 to February 2026
3	**Km 243 Toll Plaza**	AADT for Period from February 2020 to March 2020, 2020-21, 2021-2022, 2022-2023, 2023-24, 2024-25 & Eleven months from April 2025 to February 2026	For Period from February 2020 to March 2020, 2020-21, 2021-2022, 2022-2023, 2023-24, 2024-25 & Eleven months from April 2025 to February 2026	For Period from February 2020 to March 2020, 2020-21, 2021-2022, 2022-2023, 2023-24, 2024-25 & Eleven months from April 2025 to February 2026	For Period from February 2020 to March 2020, 2020-21, 2021-2022, 2022-2023, 2023-24, 2024-25 & Eleven months from April 2025 to February 2026	For Period from February 2020 to March 2020, 2020-21, 2021-2022, 2022-2023, 2023-24, 2024-25 & Eleven months from April 2025 to February 2026

3.2 Classified Traffic Volume

The objective of conducting a Classified Traffic Volume Count is to understand the traffic flow pattern including modal split on a roadway. The Classified Traffic Volume Count survey has been provided by the concessionaire of project highway from actual traffic data gathered at toll plaza locations based on monthly data shared with NHAI.

The vehicles can broadly be classified into fast moving / motorized and slow moving / non-motorized vehicles, which can be further classified into specific categories of vehicles.

The groupings of vehicles are further segregated to capture the tollable vehicle categories specifically and toll exempted vehicles are counted separately. The detailed vehicle classification system as per IRC: 64-1990 is given in table below.

Table 3-2 : Vehicle Classification System

Vehicle Type	
Auto Rickshaw	
Passenger Car	Car, Jeep, Taxi & Van (Old / new technology)
Bus	Minibus
	Standard Bus
Truck	Light Goods Vehicle (LCV)
	2 – Axle Truck
	3 Axle Truck (HCV)
	Multi Axle Truck (4-6 Axle)
	Oversized Vehicles (7 or more axles)
Other Vehicles	Agriculture Tractor, Tractor & Trailer

Source - IRC: 64 – 1990

However, since the project highway is currently under toll operation, the data collected corresponds to the category of tollable vehicles. The following are the types of vehicles as per concession agreement.

- Car / Jeep / van
- Minibus /LCV
- Bus
- Truck
- 3 Axle commercial vehicle
- Multi Axle

3.3 Traffic Characteristic

Toll revenue of project highway does not solely depend on traffic volume. There are certain characteristics of traffic which have substantial potential to affect toll collection. Component of local traffic, component of passenger and commercial traffic, portion of return journey traffic, % of monthly pass traffic are some of such characteristics of traffic. These will be discussed in subsequent sections of report.

3.3.1 Traffic Data

Project concessionaire has provided Traffic data for the years 2019-20 ,2020-21, 2021-22, 2022-23 ,2023-24,2024- 25 & traffic data from April 2025 to February 2026.
Since the traffic data available for this update is for only Annual, from April 2025 to February 2026, it may not represent the whole year traffic. Hence a seasonality factor for balance part of year has been applied to average traffic of the current Eleven months to arrive at Annual Average Daily Traffic of base year 2025-26. Thus, corrected traffic is used for

future projections and revenue calculations. The following table shows historical traffic on project stretch and derived Annual Average Daily Traffic (AADT) for year 2025-26.

Table 3-3 : Traffic Data at Belekeri Toll Plaza at Km 119.00

Sr. No	Type of Vehicle	Annual Average Daily Traffic (Nos.)- February 20 to March 20	Annual Average Daily Traffic (Nos.)- 2020-21	Annual Average Daily Traffic (Nos.)- 2021-22	Annual Average Daily Traffic (Nos.)- 2022-23	Annual Average Daily Traffic (Nos.)- 2023-24	Annual Average Daily Traffic (Nos.)- 2024-25	Annual Average Daily Traffic (Nos.)- 2025-26
1	Car	1485	1639	1974	3061	3058	2565	3181
2	Minibus/LCV	380	360	150	130	129	134	142
3	Bus	308	101	159	234	256	251	281
4	Truck	177	256	240	259	253	247	261
5	3 Axle	162	130	155	182	132	104	104
6	Multi Axle	339	329	519	627	462	328	359
7	Oversized Vehicles	8	7	5	6	5	4	5
Total		**2859**	**2821**	**3202**	**4497**	**4295**	**3633**	**4333**

Table 3-4 : Traffic Data at Holegadde Toll Plaza at Km 184.00

Sr. No	Type of Vehicle	Annual Average Daily Traffic (Nos.)- February 20 to March 20	Annual Average Daily Traffic (Nos.)- 2020-21	Annual Average Daily Traffic (Nos.)- 2021-22	Annual Average Daily Traffic (Nos.)- 2022-23	Annual Average Daily Traffic (Nos.)- 2023-24	Annual Average Daily Traffic (Nos.)- 2024-25	Annual Average Daily Traffic (Nos.)- 2025-26
1	Car	2587	2759	3240	5084	5297	4441	5388
2	Minibus/LCV	830	582	266	292	306	286	295
3	Bus	455	293	343	532	614	549	556
4	Truck	662	676	693	844	853	777	758
5	3 Axle	312	272	277	303	313	257	271
6	Multi Axle	888	815	869	1139	1186	1054	1121
7	Oversized Vehicles	2	5	6	6	5	4	5

Sr. No	Type of Vehicle	Annual Average Daily Traffic (Nos.)- February 20 to March 20	Annual Average Daily Traffic (Nos.)- 2020-21	Annual Average Daily Traffic (Nos.)- 2021-22	Annual Average Daily Traffic (Nos.)- 2022-23	Annual Average Daily Traffic (Nos.)- 2023-24	Annual Average Daily Traffic (Nos.)- 2024-25	Annual Average Daily Traffic (Nos.)- 2025-26
Total		**5736**	**5401**	**5693**	**8198**	**8573**	**7368**	**8394**

Table 3-5 : Traffic Data at Shirur Toll Plaza at Km 243.00

Sr. No	Type of Vehicle	Annual Average Daily Traffic (Nos.)- February 20 to March 20	Annual Average Daily Traffic (Nos.)- 2020-21	Annual Average Daily Traffic (Nos.)- 2021-22	Annual Average Daily Traffic (Nos.)- 2022-23	Annual Average Daily Traffic (Nos.)- 2023-24	Annual Average Daily Traffic (Nos.)- 2024-25	Annual Average Daily Traffic (Nos.)- 2025-26
1	Car	2600	2953	3644	5778	6137	5090	6031
2	Minibus/LCV	756	602	318	394	397	373	391
3	Bus	463	295	334	523	582	547	596
4	Truck	700	684	814	950	941	831	821
5	3 Axle	305	273	315	319	325	269	285
6	Multi Axle	853	805	873	1123	1168	1048	1125
7	Oversized Vehicles	2	7	6	6	5	4	5
Total		**5679**	**5619**	**6304**	**9092**	**9554**	**8162**	**9255**

3.4 Data Analysis

3.4.1 Analysis of Traffic Volume Count

Understanding the character of existing traffic forms the basis of the traffic forecast. The various vehicle types having different sizes and characteristics can be converted into a single unit called Passenger Car Unit (PCU). Passenger Car equivalents for various vehicles are adopted based on recommendations of Indian Road Congress prescribed in "IRC-64-1990: Guidelines for Capacity of Roads in Rural areas". The adopted passenger car unit values (PCU) are presented in ***Table 3-6.***

Table 3-6 : PCU Factors Adopted for Study

Vehicle Type	PCUs
Car	1.0
Minibus	1.5
Standard Bus	3.0
LCV/LGV	1.5
2 Axle Truck	3.0
3 – 6 Axle Truck	4.5
MAV	4.5
Auto Rickshaw	1.0
Van/Tempo	1.0
Agriculture Tractor with Trailer	4.5
Agriculture Tractor without Trailer	1.5

Source: IRC: 64-1990

Traffic volume at each toll plaza was converted to PCU and same is presented as under

Table 3-7 : Traffic in PCU at Project Stretch Base Year 2023-24

Year	Toll Plaza Location (Km)	Traffic No	PCU	PCU Index
2019-20	Belekeri at Km 119.00	2859	5557	1.94
	Holegadde at Km 184.00	5736	12124	2.11
	Shirur at Km 243.00	5679	11986	2.11
2020-21	Belekeri at Km 119.00	2821	5150	1.83
	Holegadde at Km 184.00	5401	11043	2.04

Year	Toll Plaza Location (Km)	Traffic No	PCU	PCU Index
	Shirur at Km 243.00	5619	11266	2.00
2021-22	Belekeri at Km 119.00	3202	6219	1.94
	Holegadde at Km 184.00	5693	11512	2.02
	Shirur at Km 243.00	6304	12465	1.98
2022-23	Belekeri at Km 119.00	4497	8125	1.81
	Holegadde at Km 184.00	8198	15705	1.92
	Shirur at Km 243.00	9092	16823	1.85
2023-24	Belekeri at Km 119.00	4295	7276	1.69
	Holegadde at Km 184.00	8573	16452	1.92
	Shirur at Km 243.00	9554	17551	1.84
2024-25	Belekeri at Km 119.00	3633	6066	1.67
	Holegadde at Km 184.00	7368	14380	1.95
	Shirur at Km 243.00	8162	15323	1.88
2025-26	Belekeri at Km 119.00	4333	6969	1.61
	Holegadde at Km 184.00	8394	15651	1.86
	Shirur at Km 243.00	9255	16812	1.82

It can be observed from above that project traffic has PCU index from 1.8 to 2.0 which is an indicator of good proportion of commercial traffic in traffic mix in project corridor. The following figure illustrates variation of PCU index at three toll plaza locations.

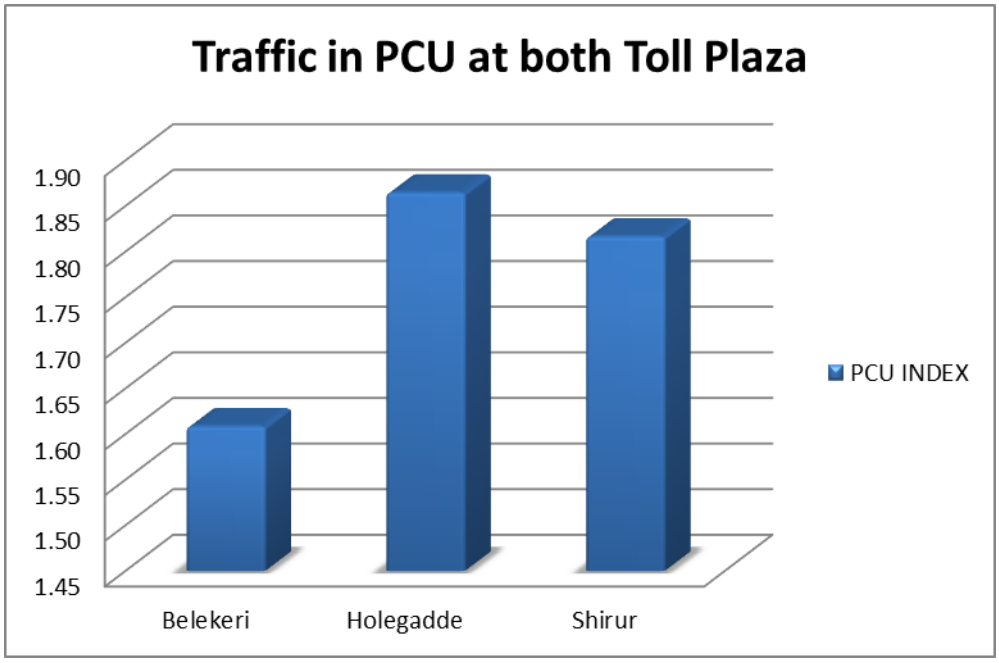

Figure 3-1 : Comparison of PCU Index

It can be observed that PCU index is consistent at all three plaza locations.

3.4.2 Components of Traffic

As discussed previously, components of traffic volume play an important role in determining project revenue. A larger component of commercial traffic with higher axle configuration adds to project revenue positively. Similarly, a larger component of local traffic affects the project revenue potential negatively.

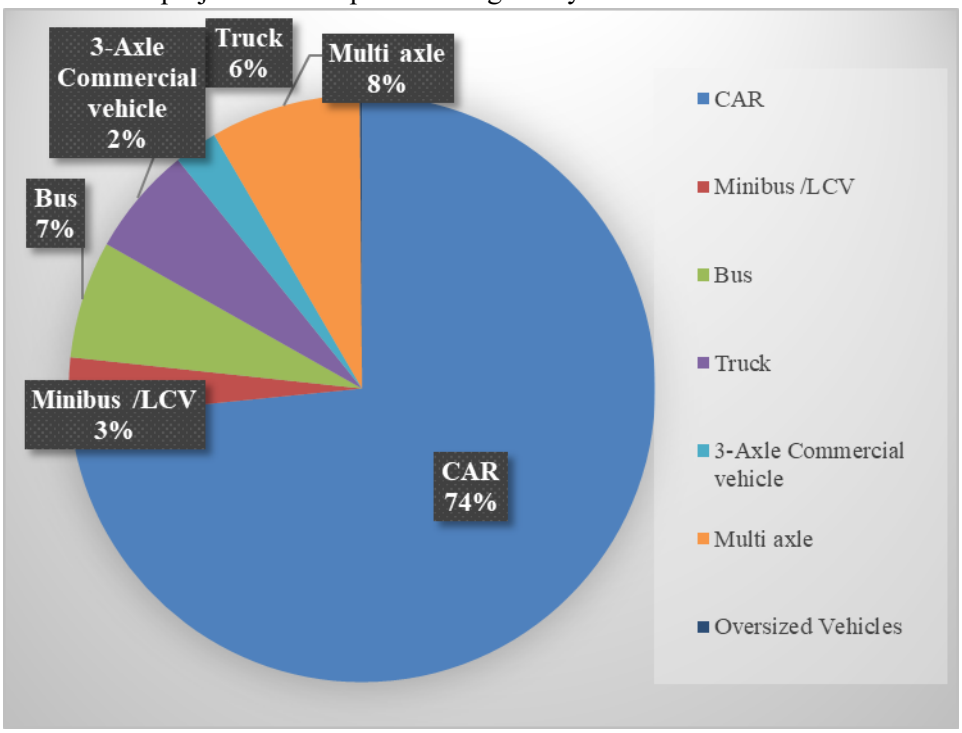

Figure 3-2 : Model Split of Tollable Vehicle @ KM 119.000

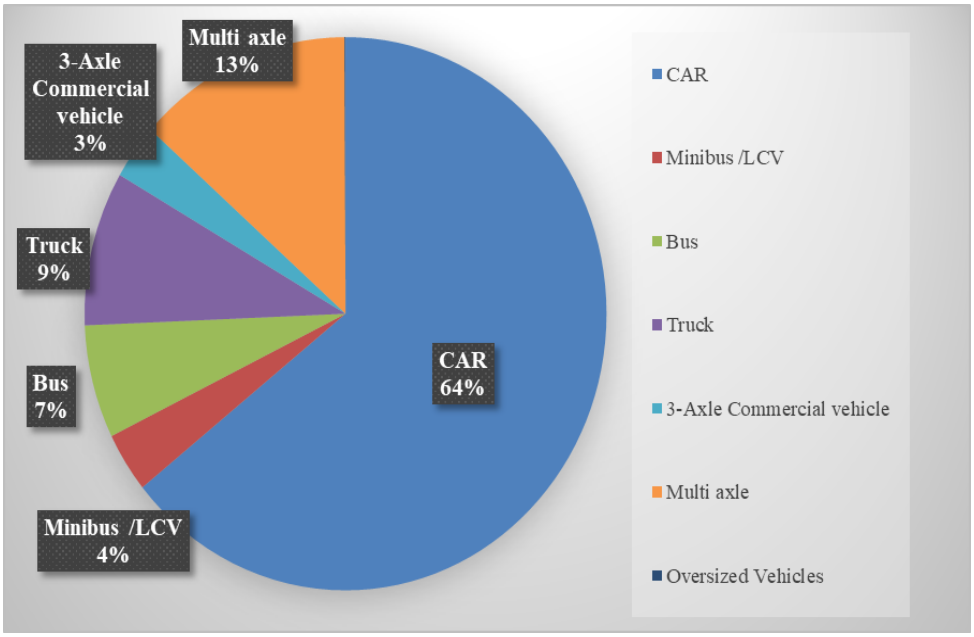

Figure 3-3 :Model Split of Tollable Vehicle @ KM 184.000

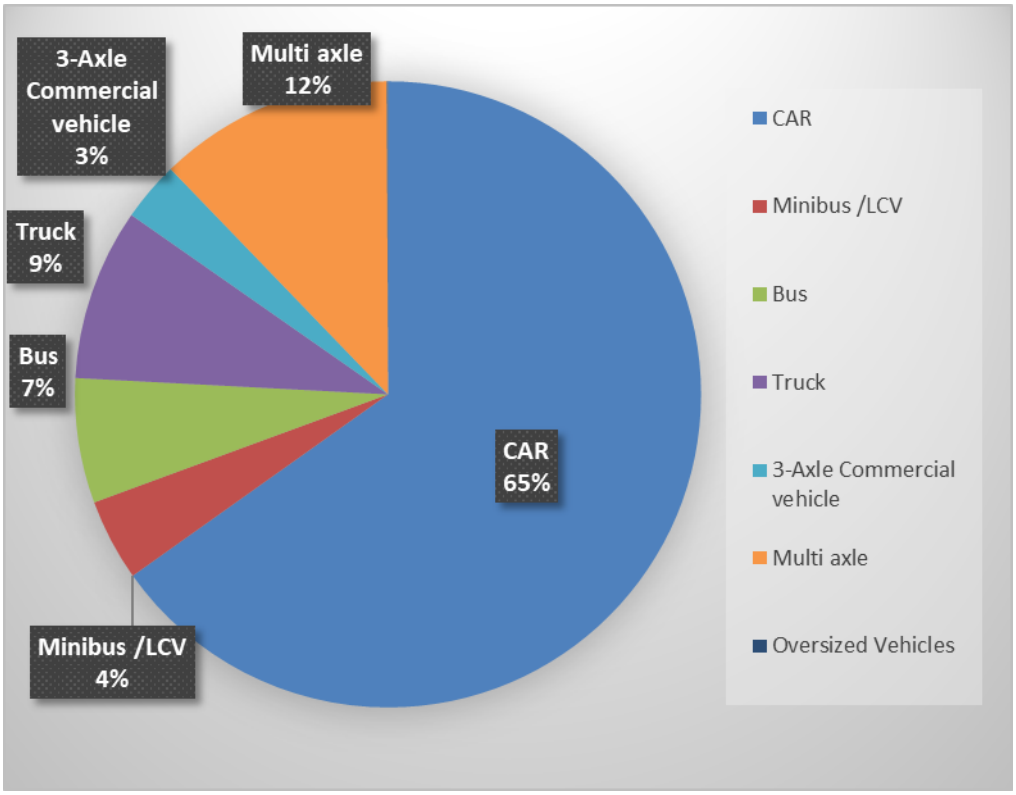

Figure 3-4 :Model Split of Tollable Vehicle @ KM 243.000

It is observed that car traffic forms about 74% of total traffic at toll plaza location 1 while multi axle along with 3 axle commercial vehicles are about 11% of total traffic. Truck / Bus and LCV share about 13% and 3% of traffic volume respectively at toll plaza on 119.000 km.

It is observed that car traffic forms about 64% of total traffic at toll plaza location 2 while multi axle along with 3 axle commercial vehicles are about 16% of total traffic. Truck /

Bus and LCV share about 16% and 4% of traffic volume respectively at toll plaza on 184.000 km.

It is observed that car traffic forms about 65% of total traffic at toll plaza location 3 while multi axle along with 3 axle commercial vehicles are about 15% of total traffic. Truck / Bus and LCV share about 16% and 4% of traffic volume respectively at toll plaza on 243.000 km.

Thus, the project corridor has a goods mix of about 60% -70% passenger and 30-40% commercial traffic.

Another important bifurcation of traffic is components of traffic with respect various type of toll ticketing like

1. Single Journey
2. Multi Journey
3. Local Commercial Single Journey
4. Monthly Pass Local
5. Monthly Pass
6. Annual Pass Car

The following table provides numbers of vehicles falling in each of above category on base years 2019-20, 2020-21, 2021-22, 2022-2023, 2023-24 & April 2025 to February 2026.

Table 3-8 : Journey Type Bifurcation of Traffic at TP-1 KM 119.00

Sr. No	Type	Traffic Volume (Nos.) 2025-26
1	Single Journey	2130
2	Return Journey	1618
3	Local Commercial Single Journey	208
4	Monthly Pass Local	2
5	Monthly Pass	3
6	Annual Pass Car	373

Table 3-9 : Journey Type Bifurcation of Traffic at TP KM 184.00

Sr. No	Type	Traffic Volume (Nos.) 2025-26
1	Single Journey	4481
2	Return Journey	2863
3	Local Commercial Single Journey	396

Sr. No	Type	Traffic Volume (Nos.) 2025-26
4	Monthly Pass Local	3
5	Monthly Pass	3
6	Annual Pass Car	647

Table 3-10 : Journey Type Bifurcation of Traffic at TP KM 243.00

Sr. No	Type	Traffic Volume (Nos.) 2025-26
1	Single Journey	4384
2	Return Journey	3868
3	Local Commercial Single Journey	276
4	Monthly Pass Local	10
5	Monthly Pass	2
6	Annual Pass Car	716

Most dominant part of the above is the single journey type followed by return journey at project stretch. Monthly pass commuters are a very low fraction of the total traffic on the project corridor.

The single journey component in total traffic numbers is as high as 49%. Return journey component is 37% and Local Commercial Single Journey is 5% and Annual pass car is 9%at toll plaza at Km 119.00

The single journey component in total traffic numbers is as high as 53%. Return journey component is 38% and Local Commercial single journey 5% and Annual Pass Car is 8% at toll plaza at Km 184.00

The single journey component in total traffic numbers is as high as 47%. Return journey component is 42% and Local Commercial Single Journey is 3% and Annual Pass Car is 8% at toll plaza at Km 243.00

It is observed that the project corridor demonstrates a similar pattern of single journey dominating a mix of traffic across the entire stretch which is typical of major national highways.

3.5 Secondary Data Collection

There are several other factors which have a substantial impact on traffic patterns and growth on any project corridor. The following are some of such important factors.

- Industrial development around project corridor and its catchment
- Educational infrastructure along project corridor

- Demographic pattern
- Urban area development
- Tourism potential
- Upcoming major infrastructural or Industrial projects
- Special Industry in project corridor
- Overall trends of economic growth local as well as national / regional

Hence in addition to traffic details on the project site, secondary data was also collected from various other sources. Typical secondary data includes the following:

1. Vehicle registration data of regional and national level.
2. Economic Data
   a) GDP
   b) NSDP
   c) Population Growth
   d) Per Capita Income growth
   e) Industrial Growth
   f) Special Industry Potential
   g) Regional and National development vision / plan
   h) Any other relevant data
3. Competing road network

We have collected and utilized such underlying data in the study to estimate the growth and risk factors for traffic along the project corridor.

CHAPTER 4
INFLUENCE ZONE TRANSPORT NETWORK ANALYSIS

4.1 Introduction

Highway corridors behave like integrated circuit networks and more often than not every road is connected to various networks having different origins and destinations. Traffic running on these networks behaves like fluid and flow on network on alignment of least friction.

The following Factors can be considered as major contributors to friction on transportation networks.

- Travel Speed / Travel Time
- Geometric deficiencies like blind horizontal curves and steep vertical gradients etc.,
- Configuration of road
- Riding quality
- Traffic delays,
- Length of road,
- Passing through built up or Urban Area,
- Terrain,
- Facilities,

4.2 Competing / Alternate route

Project stretch runs on west coast of India. Most of the roads other than NH-17 run radial to NH-17 as a complimentary network. There are large number of stream and rivers falling into Arabian sea on west coast. Hence any parallel road would require many major bridges. This has prevented any parallel road to NH-17. The following figure shows bird's eye view of the project corridor.

Figure 4-1 : Project corridor and radial roads.

Still geographically there can be alternate routes to project road between certain pairs of origin and destinations. The following figure shows such routes which are much longer than project road practically cannot be considered as alternate routes.

Figure 4-2 : Alternate route at regional level.

Thus, practically there is no alternate route to the project road between Goa/ Karnataka border and Kundapur. Under these circumstances it is not envisaged that commercial or passenger traffic would switch to alternate roads from the project road. Further with completion of Mumbai Kanyakumari section of road traffic on project road would get a boost in period 2024-2026 when it would be completed.

CHAPTER 5

GROWTH OF TRAFFIC ON PROJECT HIGHWAY

5.1 Introduction

Traffic growth is a function of the interplay of a number of contributory factors such as National economy, Government policy, socio-economic conditions of the people, and changes in land uses along the project corridor precincts etc. As these factors have a number of uncertainties associated with them, forecasts of traffic are dependent on the projections of other factors such as population, gross domestic product (GDP), vehicle ownership, per capita income (PCI), agricultural output, fuel consumption etc. Future patterns of change in these factors can be estimated with only a reasonable degree of accuracy and hence the resultant traffic forecast levels may not be precise.

Traffic growth forecast for project corridor Goa/ Karnataka Border – Kundapur section of NH-17 has been done taking the above factors into consideration. "**IRC: 108-2015-Guidelines for Traffic Prediction on Rural Highways**" is established best practice and has been used for traffic growth forecast.

5.2 Trend Analysis

One of the methods of estimation of future rate of growth is to assume the same rate of growth as in the past. Although such a method is more suitable for projects of short durations say 5-10 years, however for long term projections it would be erroneous to assume that the past rate of growth will continue to prevail for a long time in future. Economic conditions, which are major influencing factors, are bound to change over a long period of time. Thus, it would be necessary to modify the past trends of growth suitably.

Elasticity model of growth projection is one of the most widely acceptable methods for traffic forecasts. The same is recommended in **IRC: 108-2015-Guidelines for Traffic Prediction on Rural Highways**.

In this method the past trend of vehicular data is paired with an economic indicator and a regression analysis is done to yield the economic model of growth. Growth of vehicle traffic varies for different types of vehicles. It is a proven fact that the growth pattern for passengers and goods vehicle is different. Traffic growth on any highway typically depends on a number of economic parameters. Most important and direct parameters are given as below

- Per Capita Income
- Net State Domestic Product (NSDP)
- Population

It can be observed that the ownership of a car is more closely related to affordability; hence per capita is the index which closely fits the growth of car traffic among other criteria. In a similar fashion, the following can be pairs of vehicle type and independent variable for elasticity modeling of growth.

- Car / Jeep – Par Capita Income
- Bus / Minibus – Population

- Goods Vehicle – NSDP

5.3 Estimation of Traffic Demand Elasticity

Elasticity of traffic demand is defined as the rate at which traffic intensity varies due to a change in the corresponding indicator selected. Hence, In order to estimate the elasticity of traffic demand, it is necessary to establish relationship between the growth in number of given category of vehicles with the relevant economic variable considered, such as NSDP, per capita income and population growth. Latest available data for vehicle registration, per capita income, NSDP and population is used in analysis.

As per IRC: 108-1996 the model for estimating elasticity index for the project corridor is of the following form and is given as below:

$Log (P) = k \times Log (EI) + A$

Where,

P = *Number of Vehicles (Mode wise)*

EI = *Economic Indicator*

A = *Regression constant*

k = *Elasticity coefficient (Regression coefficient)*

The elasticity for car and bus (passenger vehicles) is calculated based on the Population and Per Capita Domestic Product (PCDP) and the elasticity for trucks is calculated based on the Net State Domestic Product (NSDP).

The project corridor spreads across state of Karnataka. Toll plazas at Km 119.00. Km 184.00 and 243.00 are in the state of Karnataka. Contribution of Goa / Maharashtra is also substantial at stretch. For elasticity calculations, working data from Karnataka and Maharashtra / Goa has been analysed.

Following tables and graphs depict regression and elasticity of growth model for stretch falling in Karnataka State.

Table 5-1 : Per Capita Income Vs Car Karnataka

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2012	90269	1269430	4.96	6.10		
2013	94382	1420767	4.97	6.15	5%	
2014	101864	1572521	5.01	6.20	8%	
2015	105703	1741831	5.02	6.24	4%	
2016	116819	1916373	5.07	6.28	11%	
2017	131260	2110493	5.12	6.32	12%	7.83%

Regression analysis of same is given in figure below

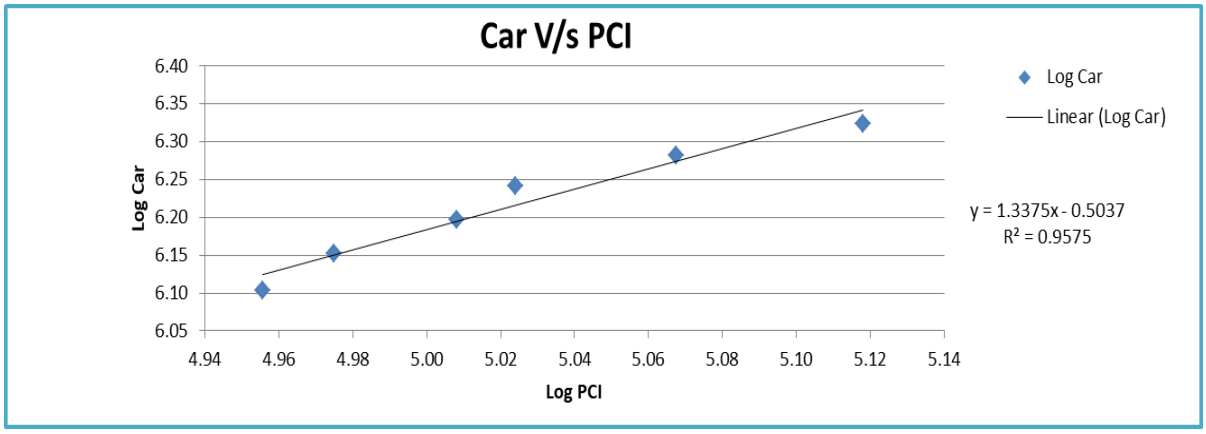

Figure 5-1 : Regression and Elasticity PCI vs. Car – Extrapolation Karnataka

Table 5-2 : Population Vs Bus Karnataka

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth
2012	1458545	9513	6.16	3.98		
2013	1466020	9956	6.17	4.00	1%	
2014	1473384	10925	6.17	4.04	1%	
2015	1480636	11224	6.17	4.05	0%	
2016	1487779	11503	6.17	4.06	0%	
2017	1494812	11888	6.17	4.08	0%	0.49%

Regression analysis of same is given in figure below

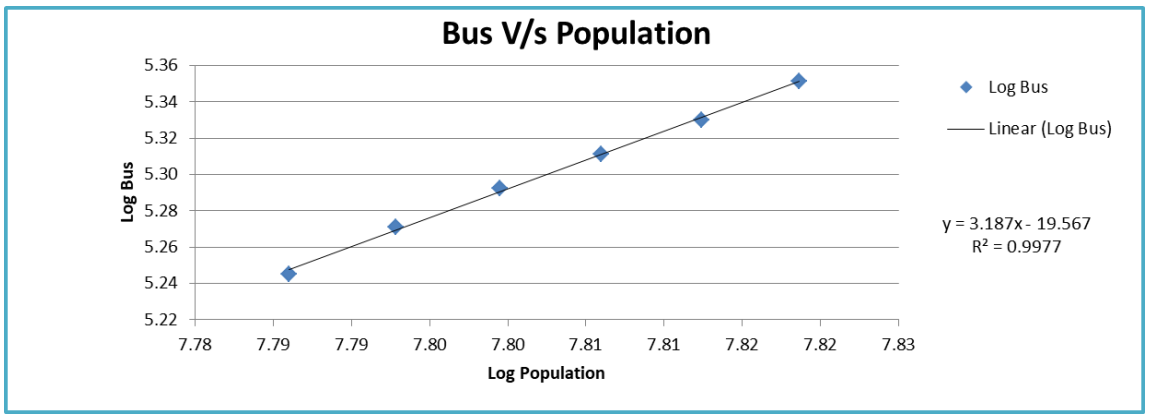

Figure 5-2 : Regression and Elasticity Population vs. Bus – Extrapolation Karnataka

Elasticity of goods traffic has been worked out by regression analysis with NSDP. Following table represents the data and details

Table 5-3 : Goods Traffic Vs NSDP Karnataka

Year	NSDP	LCV	Log NSDP	Log LCV	NSDP Growth	Average Growth
2012	554990	221160	5.74	5.34		
2013	586592	258701	5.77	5.41	6%	
2014	639981	294266	5.81	5.47	9%	
2015	671322	331381	5.83	5.52	5%	
2016	749990	367572	5.88	5.57	12%	7.85%

Following figure depict regression analysis and extrapolation.

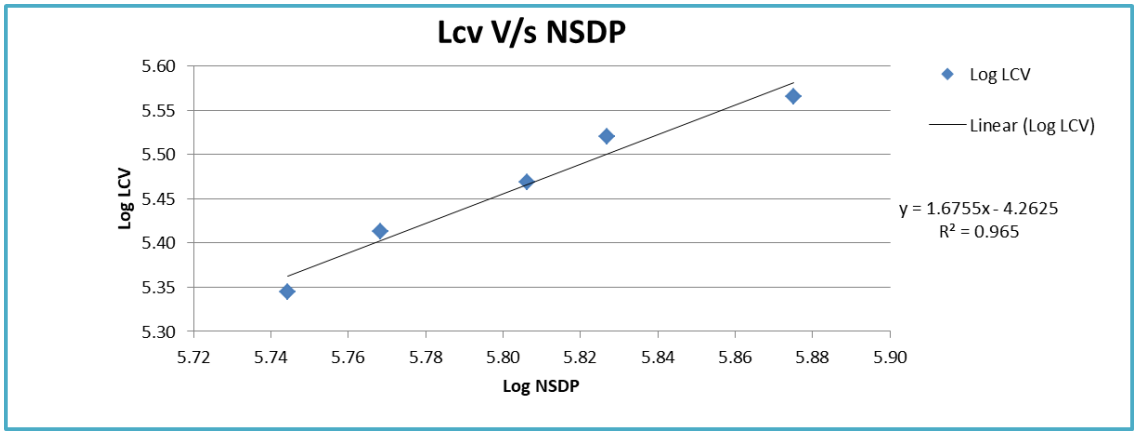

Figure 5-3 : Regression and Elasticity NSDP vs. LCV Traffic - extrapolation Karnataka.

Table 5-4 : Traffic Truck Vs NSDP Karnataka

Year	NSDP	Trucks	Log NSDP	Log Truck	NSDP Growth	Average Growth (5 Year)
2012	554990	233422	5.74	5.37		
2013	586592	247639	5.77	5.39	6%	
2014	639981	260989	5.81	5.42	9%	
2015	671322	274971	5.83	5.44	5%	
2016	749990	290415	5.88	5.46	12%	
2017	851880	306290	5.93	5.49	14%	9.00%

Following figure depict regression analysis and extrapolation.

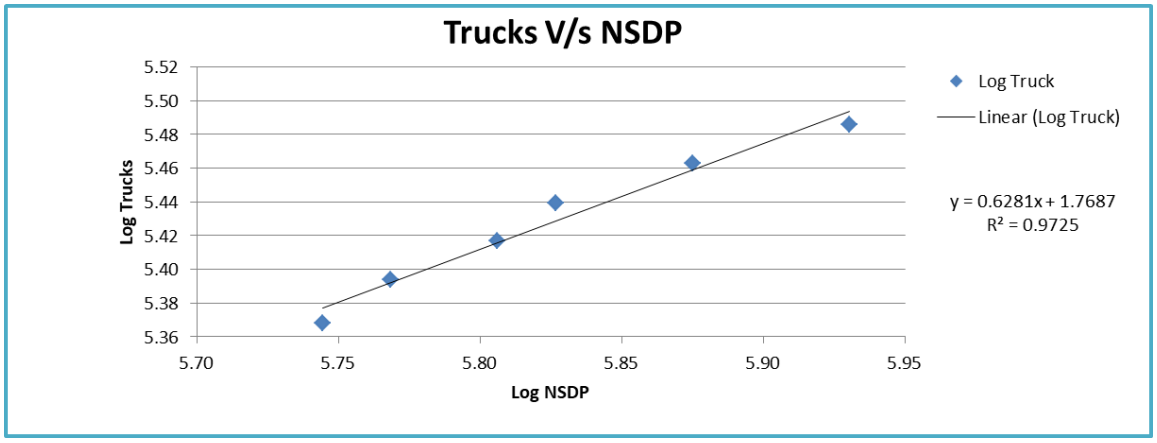

Figure 5-4 : Regression and Elasticity NSDP vs. Truck Traffic - extrapolation Karnataka.

Using the regression analysis above, we have arrived at the elasticity of traffic demand for each class of vehicle to a given change in relevant economic indicators. Average traffic growth of a vehicle class is multiplied by the corresponding elasticity coefficient to arrive at traffic growth. R2 statistical measure of how close the data are to the fitted regression line. It varies from 0 to 1. Higher the value of R2 more representative is the regression model of data.

The results of these analyses for *the good fit* regression as reflected by R^2 values are presented in the Table below

Table 5-5 : Summary Regression Analysis Karnataka

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average Growth	Growth Elastic Model
Karnataka	Car/Jeep	PCI	y = 1.3375x + -0.5037	R^2 = 0.9575	1.3375	7.83%	10.47%
	Bus	Population	y = 3.187x - -19.567	R^2 = 0.9977	3.1870	1.52%	4.83%
	LCV	NSDP	y = 1.6755x - -4.2625	R^2 = 0.965	1.6755	7.85%	13.16%
	Truck	NSDP	y = 0.6281x - 1.7687	R^2 = 0.9725	0.6281	9.00%	5.65%

Following tables and graphs depict regression and elasticity of growth model for stretch falling in Maharashtra State.

Table 5-6 : Per Capita Income Vs Car Maharashtra

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2012	99564	2307841	5.00	6.36		
2013	103904	2592565	5.02	6.41	4%	
2014	109399	2834847	5.04	6.45	5%	
2015	114746	3113773	5.06	6.49	5%	
2016	122422	3406872	5.09	6.53	7%	
2017	132899	3715744	5.12	6.57	9%	5.96%

Regression analysis of same is given in figure below

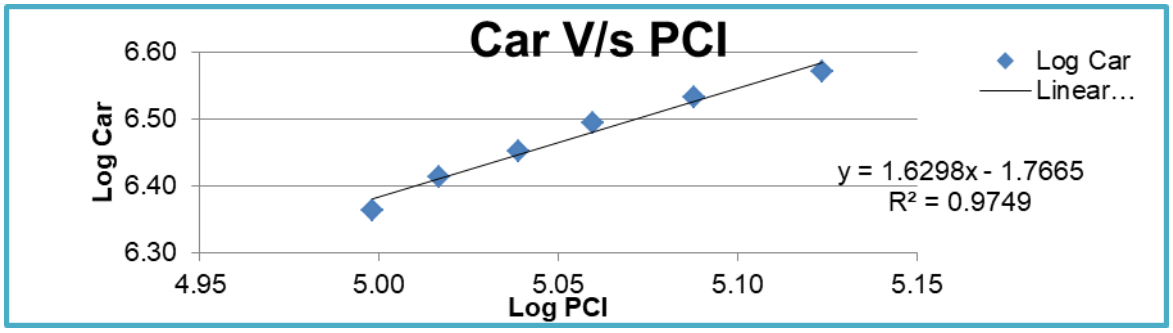

Figure 5-5 : Regression and Elasticity PCI vs. Car – Extrapolation Maharashtra

Table 5-7 : Population Vs Bus Maharashtra

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth
2012	112374333	119298	8.05	5.08		
2013	113807248	129535	8.06	5.11	1%	
2014	115229410	140087	8.06	5.15	1%	
2015	116640546	140102	8.07	5.15	1%	
2016	118040394	150427	8.07	5.18	1%	
2017	119428710	160042	8.08	5.20	1%	1.23%

Regression analysis of same is given in figure below

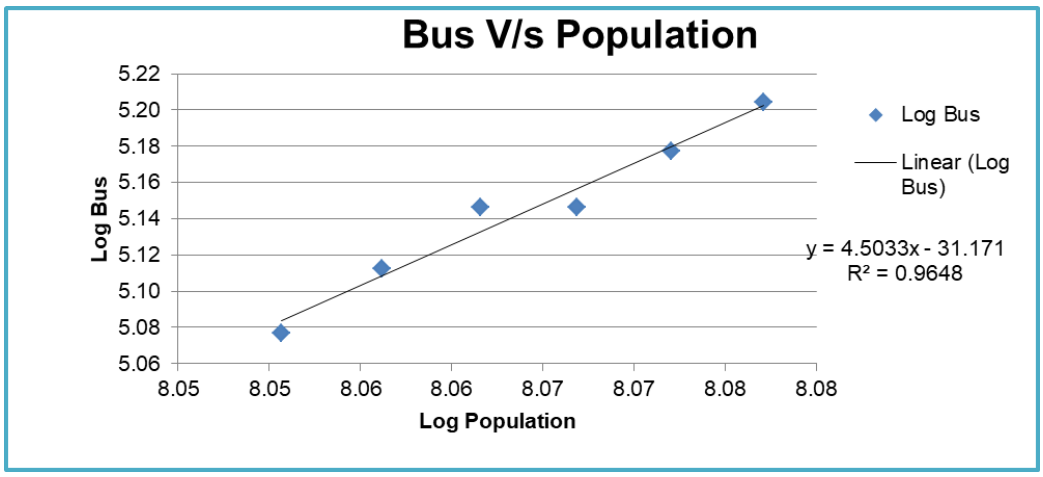

Figure 5-6 : Regression and Elasticity Population vs. Bus – Extrapolation Maharashtra

Elasticity of goods traffic has been worked out by regression analysis with NSDP. Following table represents the data and details.

Table 5-8 : LCV Traffic Vs NSDP Maharashtra

Year	NSDP	LCV	Log NSDP	Log LCV	NSDP Growth	Average Growth (5 Year)
2012	1126595	656407	6.05	5.82		
2013	1189711	739725	6.08	5.87	6%	
2014	1267551	803128	6.10	5.90	7%	
2015	1345341	868632	6.13	5.94	6%	
2016	1452439	927903	6.16	5.97	8%	6.56%

Following figure depict regression analysis and extrapolation.

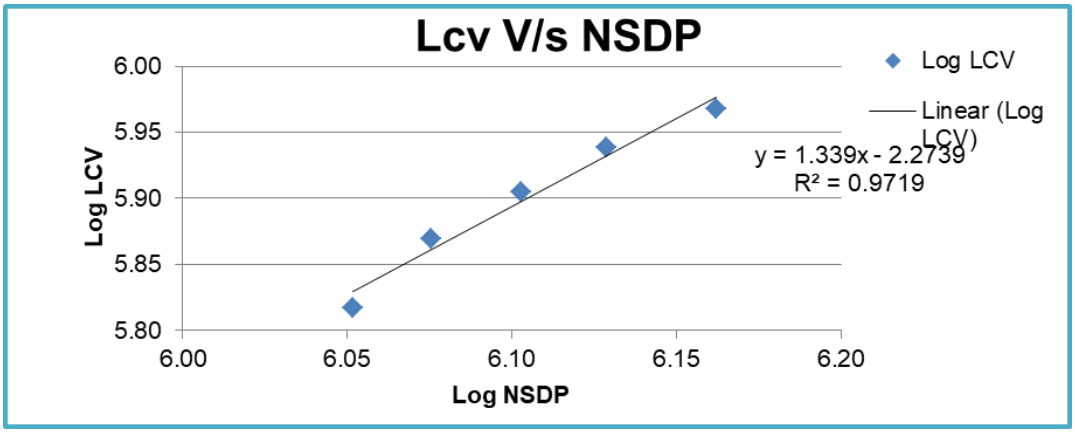

Figure 5-7 : Regression and Elasticity NSDP vs. Goods Traffic - extrapolation Maharashtra.

Table 5-9 : Trucks Traffic Vs NSDP Maharashtra

Year	NSDP	Trucks	Log NSDP	Log Truck	NSDP Growth	Average Growth (5 Year)
2012	1126595	411418	6.05	5.61		
2013	1189711	402366	6.08	5.60	6%	
2014	1267551	470128	6.10	5.67	7%	
2015	1345341	491582	6.13	5.69	6%	
2016	1452439	468810	6.16	5.67	8%	
2017	1595514	496439	6.20	5.70	10%	7.22%

Following figure depict regression analysis and extrapolation.

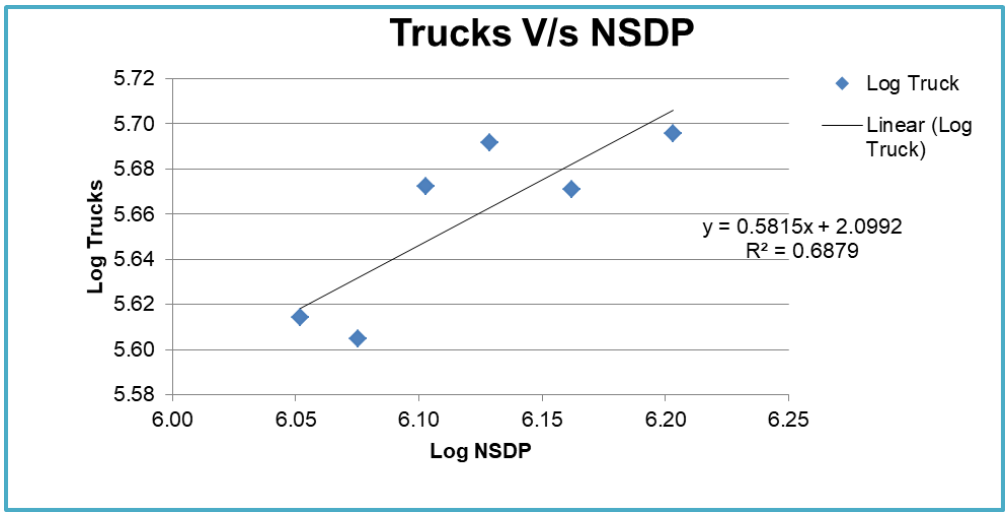

Figure 5-8 : Regression and Elasticity NSDP vs. Goods Traffic - extrapolation Maharashtra.

Using the regression analysis above, we have arrived at the elasticity of traffic demand for each class of vehicle to a given change in relevant economic indicators. Average traffic growth of a vehicle class is multiplied by the corresponding elasticity coefficient to arrive at traffic growth. R2 statistical measure of how close the data are to the fitted regression line. It varies from 0 to 1. Higher the value of R2 more representative is the regression model of data.

The results of these analyses for *the good fit* regression as reflected by R^2 values are presented in the Table below

Table 5-10 : Summary Regression Analysis Maharashtra.

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average Growth	Growth Elastic Model
Maharashtra	Car/Jeep	PCI	y = 1.6298x + -1.7665	R^2 = 0.9749	1.6298	5.96%	9.71%
	Bus	Population	y = 4.5033x - -31.1713	R^2 = 0.9648	4.5033	1.23%	5.52%
	LCV	NSDP	y = 1.339x - -2.2739	R^2 = 0.9719	1.3390	6.56%	8.78%
	Truck	NSDP	y = 0.5815x - 2.0992	R^2 = 0.6879	0.5815	7.22%	4.20%

Economical model for predicting growth is good tool, however other local, regional, national factors should also be considered before finalizing growth factors. Considering factors such as proposed developments and other influencing economic factors, moderated growth should be considered. These factors are discussed in subsequent sections.

5.4 Analysis of Historic Traffic Data

Historical traffic data forms useful information for any highway project. It provides useful information for establishing past trend of growth. Project stretch of Goa/ Karnataka Border to Kundapur is under tolling operation with current concessionaire and has only two month of tolling history from February 2020. Further for last two years traffic is impacted by COVID-19 pandemic. Hence sufficient data points to be able to establish a reliable past trend of traffic growth are not available. A minimum of about 5 - 6 years' consistent traffic data is required for establishing a reliable past trend.

5.5 Other Factors Influencing Growth

There are many factors which have impact on traffic growth. As discussed previously these factors can be economical, social, educational, and industrial.

Potentiality of such factors for project highway is discussed as under.

ECONOMY

After witnessing a slowdown during 2011-12, the economy recovered in 2013-14, and a high growth rate of GDP was recorded up to 2018-19. Pandemic of COVID-19 impacted all economies of world including India up to year 2021-22. Following figure show trend of GDP growth in India.

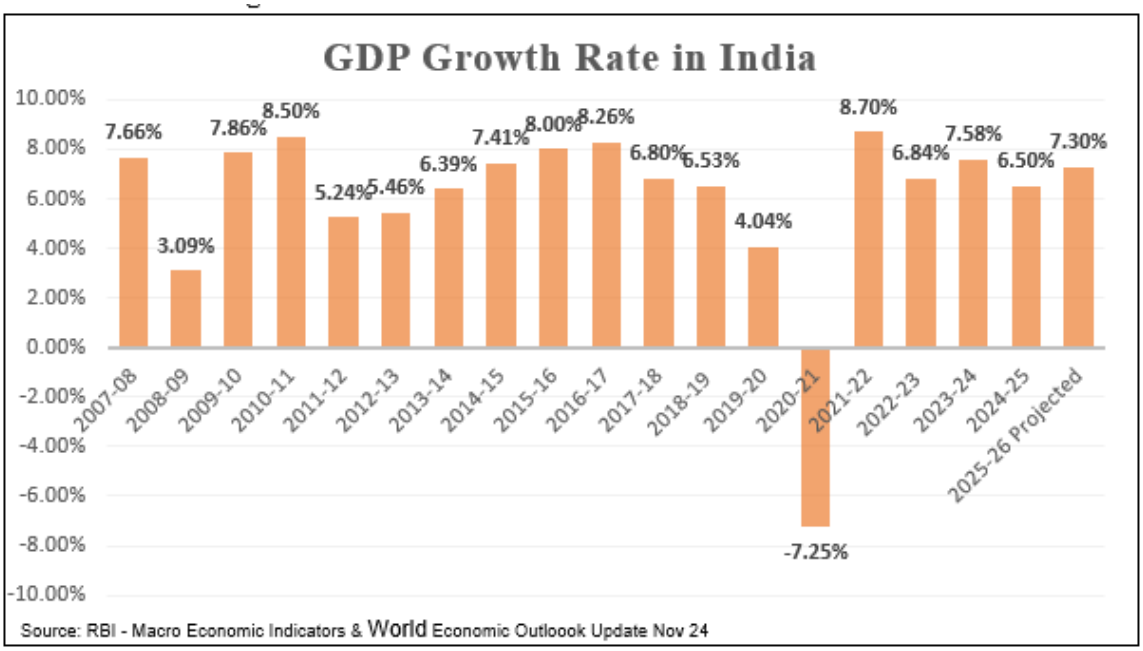

Figure 5-9 : Growth of GDP in India

FY 2017-18 recorded a growth of 6.7% which had a slight impact of GST and demonetization. Indian economy appears on recovery path with estimated growth of 6.8% in FY 2018-19. The government took major policy decisions including tax infrastructure reforming, banking sector improvement and ease of doing business.

In post COVID-19 scenario, in year 2022-23 and 2023-24 India registered an impressive growth of 7% to 7.5%. In last year despite global slow down due to Russia-Ukraine war and Gaza crises, India grew at good rate of 7%(Estimated).

Indian economy is now on good growth path and all major institutions including IMF / ADB have estimated growth of Indian Economy to peg around 6.5% to 7% in coming years.

5.6 Developments along and around the Project Corridor & State

West Coast Ports - West coast is coast of submergence (except Malabar Coast) while east coast is an emergent coast. These imply that sea is deeper in west coast than sea on east coast. So, west coast has favourable conditions for natural harbours. This is the reason that ports on west coast of India contribute more in terms of commercial cargo traffic. Expansion of JNPT port may further boost cargo traffic from Kerala, Karnataka and Parts of Tamilnaduon project corridor.

Mangalore - The coastal city of Mangalore is one of the upcoming and fastest developing metropolises of Karnataka. While Mangalore embeds itself in the conventional city affairs, what sets it apart from others is the amalgamation of its heritage, history, culture, food and scenic coastal lines.

Known for its architectural marvels, temples, churches and pristine beaches, the city attracts tourists throughout the year. Some of the popular tourist spots include Mangaladevi temple, St. Aloysius church, Pilikula Nisarga Dhama (a biological park and a picnic spot), Panambur beach and Surathkal beach. Its proximity to Agumbe, Coorg, Kaup beach and temple town Udupi also makes for a quick getaway for city folks.

Mangalore is the largest exporter of coffee in India. One of the flourishing industries in the city is the automobile leaf spring business. Petrochemicals, iron-ore, fertilizers and agricultural processing are some other thriving industries.

In addition, three special economic zones (SEZs) are being set up in the city with IT companies such as TCS, Wipro and Lotus estimated to invest up to Rs.30 billion, creating 67,000 jobs over the next three years. Mangalore is also one of the top five emerging cities of India for outsourcing, according to Alsbridge.

The city is witnessing aggressive industrial development, aiding in its economic growth. Growth of Mangalore as tourism and Industrial hub would have positive impact on growth of traffic on project road

5.7 Recommended Growth Rates of Traffic

Based on the above analysis and after giving due consideration to the entire listed factors, the following overall growth rates are recommended for each category of vehicle as under. Rate of growth is moderated in light of overall regional trend. Growth of Multi-Axle is kept slightly higher as trend of technological advances in logistic industry favours multi-axle over 2/3 axle carriage. It is also expected that as the economy moves from developing to developed, rate of growth diminishes. Same growth rate is not sustainable for long. Traffic growth is suitably stepped down for future years.
Growth rates are recommended for three scenarios for sensitivity analysis namely Optimistic, Pessimistic and Most Likely with a positive and negative variation 0.5% from Most Likely case for corridor in both states.

5.7.1 Recommended Growth Rates of Traffic for Project Stretch

Table 5-11 : Recommended Growth Rates Optimistic

Category / Year	FY 2027-2030	FY 2031-2035	FY 2036-2040	FY 2041-2045	FY 2046-2050
Car/Jeep/Van	9.29%	8.50%	8.14%	8.03%	7.57%
Bus	5.28%	4.97%	4.90%	4.75%	4.52%
LCV	4.95%	4.12%	3.72%	3.70%	3.28%
2- Axle	5.04%	4.36%	4.04%	4.02%	3.68%
3 - Axle	5.32%	4.60%	4.26%	4.24%	3.88%
4 to 6 Axle	6.17%	5.33%	4.93%	4.90%	4.47%
7 and Above Axle	6.17%	5.33%	4.93%	4.90%	4.47%

Table 5-12 : Recommended Growth Rates Pessimistic

Category / Year	FY 2027-2030	FY 2031-2035	FY 2036-2040	FY 2041-2045	FY 2046-2050
Car/Jeep/Van	8.79%	8.00%	7.64%	7.53%	7.07%
Bus	4.78%	4.47%	4.40%	4.25%	4.02%
LCV	4.45%	3.62%	3.22%	3.20%	2.78%
2- Axle	4.54%	3.86%	3.54%	3.52%	3.18%
3 - Axle	4.82%	4.10%	3.76%	3.74%	3.38%
4 to6 Axle	5.67%	4.83%	4.43%	4.40%	3.97%
7 and Above Axle	5.67%	4.83%	4.43%	4.40%	3.97%

Table 5-13 : Recommended Growth Rates Most Likely

Category / Year	FY 2027-2030	FY 2031-2035	FY 2036-2040	FY 2041-2045	FY 2046-2050
Car/Jeep/Van	9.04%	8.25%	7.89%	7.78%	7.32%
Bus	5.03%	4.72%	4.65%	4.50%	4.27%
LCV	4.70%	3.87%	3.47%	3.45%	3.03%
2- Axle	4.79%	4.11%	3.79%	3.77%	3.43%
3 - Axle	5.07%	4.35%	4.01%	3.99%	3.63%
4 to 6 Axle	5.92%	5.08%	4.68%	4.65%	4.22%
7 and Above Axle	5.92%	5.08%	4.68%	4.65%	4.22%

Traffic and revenue have been worked out on the basis of the above growth, and some is presented in subsequent chapter of report.

CHAPTER 6

TRAFFIC FORECAST

6.1 Traffic Projections

The growth rates recommended in the previous section of the report are used to arrive at traffic projections for future years. Toll plaza wise futuristic traffic projection is given in tables below.

These projections have been done for the following three cases of growth up to the concession period.

1. Optimistic Scenario
2. Pessimistic Scenario
3. Most Likely Scenario

Table 6-1 : Total Tollable Traffic @ Toll Plaza 1- 119 KM

(Optimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	3476	149	296	274	109	381	5	**4690**	**10420**
2027-28	3798	156	312	289	115	405	5	**5080**	**11187**
2028-29	4150	164	328	304	121	430	5	**5502**	**12013**
2029-30	4536	172	345	319	127	457	5	**5961**	**12905**
2030-31	4921	179	362	334	133	481	5	**6415**	**13773**
2031-32	5339	186	380	349	139	506	5	**6904**	**14704**
2032-33	5793	194	399	364	145	533	5	**7433**	**15703**
2033-34	6285	202	418	380	152	561	5	**8003**	**16774**
2034-35	6817	210	439	396	159	591	5	**8617**	**17924**
2035-36	7370	218	461	412	166	620	5	**9252**	**19098**
2036-37	7969	226	484	428	173	651	5	**9936**	**20354**
2037-38	8617	234	508	446	180	683	5	**10673**	**21699**
2038-39	9317	243	532	464	187	717	5	**11465**	**23139**
2039-40	10075	252	558	483	195	752	5	**12320**	**24682**

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2040-41	10883	261	584	502	203	789	5	**13227**	**26314**
2041-42	11756	271	612	522	212	827	5	**14205**	**28061**
2042-43	12700	281	641	543	221	868	5	**15259**	**29933**
2043-44	13720	291	672	564	231	910	5	**16393**	**31937**
2044-45	14822	302	704	586	241	955	5	**17615**	**34085**
2045-46	15944	312	736	607	251	997	5	**18852**	**36243**
2046-47	17150	322	769	629	261	1042	5	**20178**	**38547**
2047-48	18448	333	804	652	271	1088	5	**21601**	**41007**

Table 6-2 : Total Tollable Traffic @ Toll Plaza 2- 184KM

(Optimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	5889	309	585	796	284	1190	5	**9058**	**19038**
2027-28	6435	324	617	836	299	1264	5	**9780**	**20384**
2028-29	7032	339	649	878	315	1342	5	**10560**	**21831**
2029-30	7684	356	683	922	331	1425	5	**11406**	**23387**
2030-31	8336	371	717	962	346	1501	5	**12238**	**24891**
2031-32	9044	386	753	1004	362	1582	5	**13136**	**26498**
2032-33	9813	401	791	1048	378	1667	5	**14103**	**28217**
2033-34	10647	418	831	1093	395	1756	5	**15145**	**30056**
2034-35	11552	435	873	1140	413	1850	5	**16268**	**32024**
2035-36	12491	451	915	1186	430	1942	5	**17420**	**34022**
2036-37	13506	468	961	1233	449	2038	5	**18660**	**36154**
2037-38	14604	485	1008	1284	468	2138	5	**19992**	**38431**
2038-39	15792	503	1058	1336	488	2243	5	**21425**	**40863**
2039-40	17076	522	1110	1391	508	2353	5	**22965**	**43460**

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2040-41	18447	541	1162	1447	529	2468	5	**24599**	**46202**
2041-42	19929	561	1218	1505	552	2588	5	**26358**	**49130**
2042-43	21528	581	1275	1565	575	2715	5	**28244**	**52258**
2043-44	23256	603	1335	1628	599	2847	5	**30273**	**55600**
2044-45	25123	625	1399	1694	624	2986	5	**32456**	**59171**
2045-46	27025	645	1463	1756	648	3120	5	**34662**	**62742**
2046-47	29071	666	1529	1821	673	3259	5	**37024**	**66546**
2047-48	31272	688	1599	1888	699	3405	5	**39556**	70599

Table 6-3 : Total Tollable Traffic @ Toll Plaza 3- Chainage 243 KM

(Optimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	6591	411	628	863	301	1195	5	**9994**	**18428**
2027-28	7204	431	661	907	318	1269	5	**10795**	**19714**
2028-29	7872	453	695	953	335	1346	5	**11659**	**21094**
2029-30	8603	476	732	1001	353	1429	5	**12599**	**22579**
2030-31	9334	495	768	1045	370	1505	5	**13522**	**24008**
2031-32	10127	515	807	1091	387	1585	5	**14517**	**25534**
2032-33	10988	537	847	1139	405	1669	5	**15590**	**27166**
2033-34	11922	559	890	1189	424	1758	5	**16747**	**28909**
2034-35	12935	583	934	1241	444	1851	5	**17993**	**30774**
2035-36	13987	605	979	1291	464	1942	5	**19273**	**32662**
2036-37	15125	628	1027	1343	484	2038	5	**20650**	**34676**
2037-38	16357	652	1077	1397	505	2138	5	**22131**	**36824**
2038-39	17687	676	1130	1454	526	2243	5	**23721**	**39117**
2039-40	19125	702	1185	1512	549	2354	5	**25432**	**41564**

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2040-41	20660	728	1240	1572	572	2469	5	**27246**	**44146**
2041-42	22319	754	1299	1635	596	2590	5	**29198**	**46901**
2042-43	24110	782	1361	1702	622	2717	5	**31299**	**49841**
2043-44	26047	810	1426	1770	648	2850	5	**33556**	**52980**
2044-45	28139	840	1494	1841	675	2989	5	**35983**	**56332**
2045-46	30270	868	1562	1909	701	3123	5	**38438**	**59679**
2046-47	32562	896	1632	1980	728	3262	5	**41065**	**63240**
2047-48	35027	926	1706	2053	756	3407	5	**43880**	**67032**

Table 6-4 : Total Tollable Traffic @ Toll Plaza 1- Chainage 119 KM (Pessimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	3461	149	294	273	109	379	5	**4670**	**10372**
2027-28	3765	155	308	286	115	400	5	**5034**	**11083**
2028-29	4095	162	323	299	121	423	5	**5428**	**11846**
2029-30	4454	169	338	312	127	447	5	**5852**	**12667**
2030-31	4811	175	353	324	133	468	5	**6269**	**13456**
2031-32	5195	181	369	337	139	491	5	**6717**	**14298**
2032-33	5609	187	386	350	145	515	5	**7197**	**15198**
2033-34	6058	194	403	363	151	540	5	**7714**	**16159**
2034-35	6542	201	421	378	157	566	5	**8270**	**17185**
2035-36	7041	207	439	391	163	591	5	**8837**	**18225**
2036-37	7578	214	458	405	169	617	5	**9446**	**19333**
2037-38	8157	221	477	420	175	644	5	**10099**	**20514**
2038-39	8779	228	499	435	182	672	5	**10800**	**21773**
2039-40	9450	235	521	450	189	702	5	**11552**	**23117**

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2040-41	10161	242	543	466	196	733	5	**12346**	**24530**
2041-42	10927	250	567	482	203	765	5	**13199**	**26037**
2042-43	11750	258	591	499	210	799	5	**14112**	**27644**
2043-44	12634	266	616	517	217	834	5	**15089**	**29357**
2044-45	13585	275	642	535	225	871	5	**16138**	**31185**
2045-46	14544	283	668	552	232	905	5	**17189**	**33004**
2046-47	15573	291	694	570	239	940	5	**18312**	**34938**
2047-48	16674	299	722	588	247	977	5	**19512**	**36994**

Table 6-5 : Total Tollable Traffic @ Toll Plaza 2- Chainage 184 KM
(Pessimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	5863	308	582	793	283	1184	5	**9018**	**18949**
2027-28	6378	322	610	829	296	1251	5	**9691**	**20194**
2028-29	6937	336	639	866	310	1323	5	**10416**	**21526**
2029-30	7546	351	670	906	325	1398	5	**11201**	**22954**
2030-31	8150	363	699	942	338	1466	5	**11963**	**24315**
2031-32	8801	376	731	979	351	1538	5	**12781**	**25763**
2032-33	9504	390	763	1017	366	1613	5	**13658**	**27306**
2033-34	10264	404	797	1057	381	1691	5	**14599**	**28950**
2034-35	11084	418	833	1098	396	1773	5	**15607**	**30701**
2035-36	11930	432	869	1137	411	1851	5	**16635**	**32463**
2036-37	12841	446	907	1177	426	1933	5	**17735**	**34336**
2037-38	13820	460	947	1218	442	2019	5	**18911**	**36327**
2038-39	14875	475	989	1260	458	2108	5	**20170**	**38444**
2039-40	16011	490	1032	1305	475	2202	5	**21520**	**40696**

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2040-41	17216	505	1075	1351	492	2299	5	**22943**	**43061**
2041-42	18512	521	1121	1399	511	2400	5	**24469**	**45576**
2042-43	19906	538	1168	1449	530	2506	5	**26102**	**48251**
2043-44	21405	555	1218	1500	550	2616	5	**27849**	**51096**
2044-45	23018	572	1270	1553	570	2731	5	**29719**	**54124**
2045-46	24645	588	1321	1603	589	2839	5	**31590**	**57121**
2046-47	26389	604	1374	1654	609	2952	5	**33587**	**60300**
2047-48	28254	621	1430	1706	629	3069	5	**35714**	**63672**

Table 6-6 : Total Tollable Traffic @ Toll Plaza 3- Chainage 243 KM (Pessimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	6563	409	625	859	299	1188	5	**9948**	**18342**
2027-28	7139	427	655	897	313	1255	5	**10691**	**19530**
2028-29	7766	446	686	938	327	1325	5	**11493**	**20800**
2029-30	8448	465	719	981	343	1400	5	**12361**	**22160**
2030-31	9124	481	751	1019	356	1467	5	**13203**	**23452**
2031-32	9852	498	784	1059	370	1537	5	**14105**	**24826**
2032-33	10640	516	818	1101	385	1611	5	**15076**	**26288**
2033-34	11490	534	854	1144	401	1688	5	**16116**	**27844**
2034-35	12409	553	893	1189	417	1769	5	**17235**	**29501**
2035-36	13357	571	933	1231	433	1847	5	**18377**	**31164**
2036-37	14378	589	974	1275	449	1929	5	**19599**	**32930**
2037-38	15476	608	1017	1320	465	2014	5	**20905**	**34806**
2038-39	16658	627	1062	1367	482	2103	5	**22304**	**36800**
2039-40	17930	647	1109	1415	499	2196	5	**23801**	**38919**

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2040-41	19280	667	1157	1465	518	2293	5	**25385**	**41142**
2041-42	20730	688	1206	1516	537	2393	5	**27075**	**43505**
2042-43	22291	709	1257	1570	557	2498	5	**28887**	**46015**
2043-44	23971	731	1310	1625	577	2607	5	**30826**	**48685**
2044-45	25776	755	1365	1682	599	2721	5	**32903**	**51523**
2045-46	27598	776	1419	1736	619	2829	5	**34982**	**54327**
2046-47	29550	797	1476	1791	639	2941	5	**37199**	**57299**
2047-48	31639	819	1535	1848	661	3057	5	**39564**	**60450**

Traffic projections for Most Likely scenario is given as under

Table 6-7 : Total Tollable Traffic @ Toll Plaza 1- Chainage 119 KM (Most Likely Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	3468	149	294	273	109	380	5	**4678**	**10396**
2027-28	3781	156	309	286	115	402	5	**5054**	**11135**
2028-29	4123	163	324	300	121	426	5	**5462**	**11930**
2029-30	4495	171	340	315	127	451	5	**5904**	**12785**
2030-31	4865	177	356	328	133	474	5	**6338**	**13614**
2031-32	5266	184	373	341	139	498	5	**6806**	**14500**
2032-33	5699	191	390	356	145	523	5	**7309**	**15449**
2033-34	6169	198	408	371	151	550	5	**7852**	**16464**
2034-35	6678	206	427	386	158	578	5	**8438**	**17551**
2035-36	7205	213	446	401	164	605	5	**9039**	**18657**
2036-37	7772	220	468	416	171	633	5	**9685**	**19837**
2037-38	8384	228	490	432	178	663	5	**10380**	**21099**
2038-39	9046	236	513	448	185	694	5	**11127**	**22447**

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2039-40	9759	244	537	465	192	726	5	**11928**	**23887**
2040-41	10518	252	561	483	199	760	5	**12778**	**25407**
2041-42	11337	261	587	501	207	795	5	**13693**	**27031**
2042-43	12219	270	613	520	215	832	5	**14674**	**28767**
2043-44	13168	279	641	539	224	870	5	**15726**	**30621**
2044-45	14192	288	670	559	233	911	5	**16858**	**32604**
2045-46	15231	297	699	578	242	949	5	**18001**	**34588**
2046-47	16347	306	730	598	251	989	5	**19226**	**36700**
2047-48	17543	315	761	619	260	1031	5	**20534**	**38951**

Table 6-8 : Total Tollable Traffic @ Toll Plaza 2- Chainage 184 KM
(Most Likely Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	5876	308	584	794	284	1188	5	**9039**	**18994**
2027-28	6406	322	613	832	299	1259	5	**9736**	**20289**
2028-29	6985	337	645	872	314	1334	5	**10492**	**21678**
2029-30	7615	352	677	914	330	1413	5	**11306**	**23170**
2030-31	8242	366	709	952	345	1485	5	**12104**	**24601**
2031-32	8921	380	742	992	360	1561	5	**12961**	**26128**
2032-33	9657	395	778	1033	375	1640	5	**13883**	**27758**
2033-34	10453	410	815	1075	391	1724	5	**14873**	**29498**
2034-35	11314	425	853	1119	407	1812	5	**15935**	**31356**
2035-36	12206	440	893	1161	423	1897	5	**17025**	**33234**
2036-37	13167	455	935	1205	439	1986	5	**18192**	**35234**
2037-38	14205	470	978	1250	456	2079	5	**19443**	**37365**
2038-39	15325	487	1024	1297	474	2176	5	**20788**	**39636**

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2039-40	16533	504	1071	1347	493	2278	5	**22231**	**42057**
2040-41	17818	521	1118	1398	512	2384	5	**23756**	**44606**
2041-42	19204	538	1168	1451	532	2494	5	**25392**	**47322**
2042-43	20699	557	1220	1506	553	2610	5	**27150**	**50217**
2043-44	22308	576	1275	1563	575	2731	5	**29033**	**53303**
2044-45	24044	596	1332	1621	598	2858	5	**31054**	**56594**
2045-46	25804	614	1389	1677	619	2978	5	**33086**	**59869**
2046-47	27694	633	1449	1734	642	3104	5	**35261**	**63350**
2047-48	29720	652	1510	1794	665	3235	5	**37581**	67050

Table 6-9 : Total Tollable Traffic @ Toll Plaza 3- Chainage 230 KM (Most Likely Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	6577	410	627	860	300	1192	5	**9971**	**18385**
2027-28	7170	429	658	902	316	1262	5	**10742**	**19621**
2028-29	7818	449	691	945	333	1336	5	**11577**	**20947**
2029-30	8525	471	725	990	350	1414	5	**12480**	**22368**
2030-31	9227	489	759	1031	366	1485	5	**13362**	**23728**
2031-32	9989	508	794	1073	383	1560	5	**14312**	**25178**
2032-33	10812	527	832	1118	400	1638	5	**15332**	**26724**
2033-34	11704	547	872	1164	418	1721	5	**16431**	**28372**
2034-35	12669	568	913	1212	436	1808	5	**17611**	**30131**
2035-36	13668	587	956	1258	454	1892	5	**18820**	**31905**
2036-37	14746	607	1001	1306	472	1981	5	**20118**	**33793**
2037-38	15909	628	1047	1355	492	2073	5	**21509**	**35802**
2038-39	17163	649	1096	1406	512	2170	5	**23001**	**37942**

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2039-40	18516	671	1146	1460	533	2271	5	**24602**	**40221**
2040-41	19956	695	1197	1515	554	2376	5	**26298**	**42619**
2041-42	21509	719	1251	1572	577	2487	5	**28120**	**45173**
2042-43	23182	745	1306	1630	600	2602	5	**30070**	**47892**
2043-44	24987	771	1364	1691	624	2723	5	**32165**	**50789**
2044-45	26930	797	1425	1755	648	2850	5	**34410**	**53877**
2045-46	28902	821	1486	1815	672	2970	5	**36671**	**56943**
2046-47	31018	847	1550	1876	696	3096	5	**39088**	**60200**
2047-48	33288	873	1616	1941	721	3226	5	**41670**	**63660**

6.2 Modification in Concession Period

As per Article 29 of the concession agreement, if actual traffic on the project falls short or exceeds Target Traffic on project highway on defined date, concession period shall be modified subject to calculation stipulated therein. For Goa/ Karnataka - Kundarpur project, the Target Date and Target Traffic are defined as under:

Target Date - 1st April 2022

Target Traffic - 21307 in PCU

Target Year	Target Traffic	Actual Traffic	% of Excess / Short traffic	% Revision (+ or -) in CP as per CA	% Variation in CP	Original CP	Change in CP (In Years)
2022	21307	12894	-39%	59%	20%	28	5.6

PCUs have been considered for arriving at the concession period end date.

CHAPTER 7

FORECAST OF TOLL REVENUE

7.1 General

This chapter presents the tolling rate calculations, categories and toll revenue of the project.

7.2 Discount Categories

The fee schedule in the CA of Goa / Karnataka Border- Kundapur section of NH-17 is based on the old toll policy. As per the Toll Notification (Schedule - G) the discounts and special provisions have been considered. In addition to discounts as per Fee Notification concessionaire has declared special category rates also. Salient features of toll rate structure are given as under

1. Monthly Pass: For frequent users monthly pass would be issued for 50 trips in month at 2/3d rate..
2. Multiple Journeys (for Return Trip): Will be charged at 1.5 times single journey.
3. Single Journey: Full single journey toll would be charged to this category of vehicles who are infrequent travellers or whose frequency does not yield any discount from the above categories.
4. Local Discounts: There are several categories of local discounts.
    a) Local Passenger Car Jeep Van I - Rs. 350 per month as per fee notification
    b) Local commercial vehicles single at 50% rate for normal single trip

Building of inflation and escalation of rate on the basis of WPI are done as per toll notification (Schedule G) as given under as extract from concession agreement.

The formula for determining the applicable rate of fee shall be as follows:-

$$\text{Applicable rate of fee} = \text{base rate} + \text{base rate} \times \left\{ \frac{\text{WPI A} - \text{WPI B}}{\text{WPI B}} \right\} \times 0.4$$

Factors of inflation / growth have been incorporated as per Schedule R. WPI are available up to the year 2025-26.

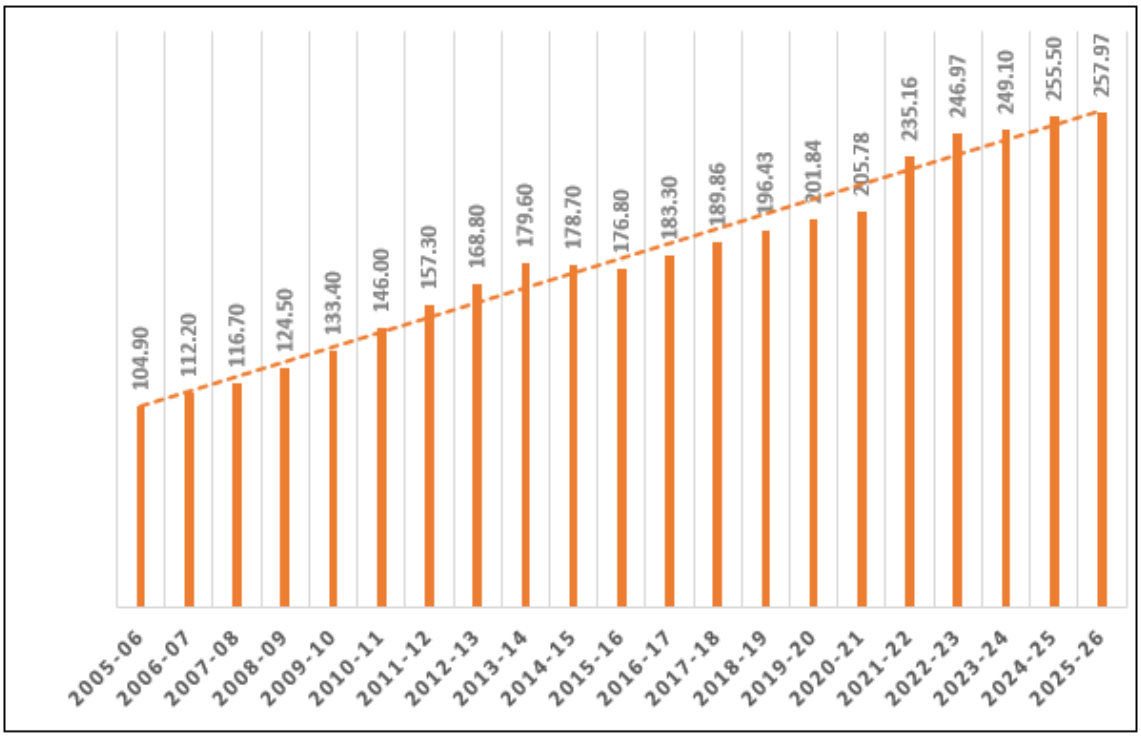

Figure 7-1 : Historical Rate of WPI Inflation in India

The wholesale price index (WPI) and the inflation rate in the past are presented in Table below.

Table 7-1 :Historical WPI value and Growth Inflation

December of year	2021	2022	2023	2024	2025	Avg.
WPI	235.2	247.0	249.1	255.5	257.97	
Inflation	14.27%	5.02%	0.86%	2.57%	0.96%	4.74%

WPI of December 2025 is posted on ministry site which is shows 0.96% inflation from the previous year. Same has been applied for FY 2026-27.

The average WPI inflation over the period FY 2021 to FY 2025 works out to approximately 4.74%, reflecting inflationary cycles across both high and low inflation years. Based on this analysis, an annual escalation factor of 4.5% has been adopted for the remaining concession period.

7.3 Estimation of Toll Rates

As per the applicable MORTH notification and Schedule R of contract agreement, the following Base rate of fee for the categories mentioned in the table stands true in the National Highways Fee Rules applicable for contract.

Table 7-2 : Base Toll Rates June 2007-08

Type of Vehicle	Base Rate of Fee / Km (in Rs.)
Car, Jeep, Van or Light Motor Vehicle	0.65
Light Commercial Vehicle, Light Goods Vehicle or Minibus	1.05
Bus or Truck (Two Axles)	2.20
Three Axle Commercial Vehicles	2.40
Heavy Construction Machinery (HCM) or Earth Moving Equipment (EME) or Multi Axle Vehicle (MAV) (4 to 6 axles)	3.45
Oversized Vehicles (7 or more Axles)	4.20

There is no bypass or structure to be factored in for rates calculations.

Toll rates are calculated as per guidelines provided in schedule R (rounded to nearest Rs.) for the concession period and are given below.

The toll rates have been projected on the basis of existing project length received vide PCOD- III certificate.

Thus, worked out rates for various categories of vehicle and discounts are given as under

Table 7-3 : Toll Rates for Single Journey @ Km 119.000

Year	Car	Minibus /LCV	Bus	Truck	3-Axle	Multi axle	Oversized Vehicles
2026-27	120	190	320	395	415	545	690
2027-28	125	200	335	410	435	575	720
2028-29	135	210	350	430	455	600	755
2029-30	140	220	450	450	495	695	880
2030-31	145	230	475	475	520	730	920
2031-32	155	240	495	495	545	765	965
2032-33	160	255	520	520	570	800	1010
2033-34	170	265	545	545	600	840	1060
2034-35	175	280	575	575	625	880	1115
2035-36	185	290	600	600	655	925	1165
2036-37	195	305	630	630	690	970	1225
2037-38	205	320	660	660	725	1020	1285
2038-39	215	335	695	695	760	1070	1350
2039-40	225	355	730	730	795	1120	1415
2040-41	235	370	765	765	835	1175	1485
2041-42	250	390	805	805	880	1235	1560
2042-43	260	410	845	845	920	1295	1640

Year	Car	Minibus /LCV	Bus	Truck	3-Axle	Multi axle	Oversized Vehicles
2043-44	275	430	885	885	970	1360	1720
2044-45	290	450	930	930	1015	1430	1805
2045-46	305	475	975	975	1070	1505	1900
2046-47	320	500	1025	1025	1125	1580	1995
2047-48	335	525	1080	1080	1180	1660	2095

Table 7-4 : Toll Rates for Single Journey @ Km 184.000

Year	Car	Minibus /LCV	Bus	Truck	3-Axle	Multi axle	Oversized Vehicles
2026-27	120	185	385	385	420	595	745
2027-28	125	195	405	405	440	625	780
2028-29	130	205	425	425	465	655	820
2029-30	135	215	445	445	485	685	855
2030-31	140	225	465	465	510	720	900
2031-32	150	235	485	485	530	755	940
2032-33	155	245	510	510	560	790	985
2033-34	165	260	535	535	585	830	1035
2034-35	170	270	560	560	615	870	1085
2035-36	180	285	590	590	645	910	1135
2036-37	190	300	615	615	675	955	1190
2037-38	195	310	645	645	705	1000	1250
2038-39	205	330	680	680	740	1050	1310
2039-40	215	345	710	710	780	1100	1375
2040-41	230	360	745	745	815	1155	1445
2041-42	240	380	785	785	855	1210	1515
2042-43	250	400	825	825	900	1270	1590
2043-44	265	415	865	865	945	1335	1670
2044-45	275	440	905	905	990	1400	1755
2045-46	290	460	950	950	1040	1475	1840
2046-47	305	485	1000	1000	1095	1545	1935
2047-48	320	510	1050	1050	1150	1625	2030

Table 7-5 : Toll Rates for Single Journey @ Km 243.000

Year	Car	Minibus /LCV	Bus	Truck	3-Axle	Multi axle	Oversized Vehicles
2026-27	105	170	360	360	390	565	685
2027-28	110	180	375	375	410	590	715
2028-29	115	190	395	395	430	620	755
2029-30	120	195	415	415	450	650	790
2030-31	130	205	435	435	475	680	825
2031-32	135	215	455	455	495	710	865
2032-33	140	225	475	475	520	745	910
2033-34	145	240	500	500	545	780	950
2034-35	155	250	520	520	570	820	995
2035-36	160	260	545	545	595	860	1045

Year	Car	Minibus /LCV	Bus	Truck	3-Axle	Multi axle	Oversized Vehicles
2036-37	170	275	575	575	625	900	1095
2037-38	180	285	600	600	655	940	1145
2038-39	185	300	630	630	685	990	1205
2039-40	195	315	660	660	720	1035	1260
2040-41	205	330	695	695	755	1085	1325
2041-42	215	345	725	725	795	1140	1390
2042-43	225	365	760	760	830	1195	1455
2043-44	235	380	800	800	875	1255	1525
2044-45	250	400	840	840	915	1315	1605
2045-46	260	420	880	880	960	1380	1680
2046-47	275	440	925	925	1010	1450	1765
2047-48	285	465	970	970	1060	1520	1855

Table 7-6 : Toll Rates for Return journey @ Km 119.000

Year	Car	Minibus /LCV	Bus	Truck	3-Axle	Multi axle	Oversized Vehicles
2026-27	180	285	480	590	625	820	1035
2027-28	190	300	500	615	655	860	1080
2028-29	200	315	525	645	685	900	1135
2029-30	210	330	680	680	740	1045	1320
2030-31	220	345	710	710	780	1095	1380
2031-32	230	360	745	745	815	1145	1450
2032-33	240	380	780	780	855	1205	1520
2033-34	255	400	820	820	895	1260	1590
2034-35	265	415	860	860	940	1320	1670
2035-36	280	440	900	900	985	1385	1750
2036-37	295	460	945	945	1035	1455	1835
2037-38	305	480	990	990	1085	1525	1930
2038-39	320	505	1040	1040	1140	1600	2025
2039-40	340	530	1090	1090	1195	1680	2125
2040-41	355	555	1145	1145	1255	1765	2230
2041-42	375	585	1205	1205	1315	1855	2340
2042-43	390	615	1265	1265	1385	1945	2455
2043-44	410	645	1325	1325	1455	2045	2580
2044-45	430	680	1395	1395	1525	2145	2710
2045-46	455	710	1465	1465	1605	2255	2845
2046-47	475	750	1540	1540	1685	2370	2990
2047-48	500	785	1615	1615	1770	2490	3145

Table 7-7 : Toll Rates for Return Journey @ Km 184.000

Year	Car	Minibus /LCV	Bus	Truck	3-Axle	Multi axle	Oversized Vehicles
2026-27	175	280	580	580	635	895	1120
2027-28	185	295	605	605	665	940	1170
2028-29	195	305	635	635	695	985	1225

Year	Car	Minibus /LCV	Bus	Truck	3-Axle	Multi axle	Oversized Vehicles
2029-30	205	320	665	665	725	1030	1285
2030-31	215	335	695	695	760	1080	1345
2031-32	225	355	730	730	800	1130	1410
2032-33	235	370	765	765	835	1185	1480
2033-34	245	390	800	800	875	1240	1550
2034-35	255	405	840	840	920	1300	1625
2035-36	270	425	880	880	965	1365	1705
2036-37	280	445	925	925	1010	1430	1790
2037-38	295	470	970	970	1060	1500	1875
2038-39	310	490	1015	1015	1110	1575	1965
2039-40	325	515	1065	1065	1165	1650	2065
2040-41	340	540	1120	1120	1225	1735	2165
2041-42	360	570	1175	1175	1285	1820	2270
2042-43	375	595	1235	1235	1350	1910	2385
2043-44	395	625	1295	1295	1415	2005	2505
2044-45	415	655	1360	1360	1485	2105	2630
2045-46	435	690	1430	1430	1560	2210	2760
2046-47	460	725	1500	1500	1640	2320	2900
2047-48	480	760	1575	1575	1720	2435	3045

Table 7-8 : Toll Rates for Return journey @ Km 243.000

Year	Car	Minibus /LCV	Bus	Truck	3-Axle	Multi axle	Oversized Vehicles
2026-27	160	255	540	540	585	845	1030
2027-28	165	270	565	565	615	885	1075
2028-29	175	285	595	595	645	930	1130
2029-30	185	295	620	620	675	975	1185
2030-31	190	310	650	650	710	1020	1240
2031-32	200	325	680	680	745	1065	1300
2032-33	210	340	715	715	780	1120	1360
2033-34	220	355	745	745	815	1170	1425
2034-35	230	375	785	785	855	1230	1495
2035-36	240	390	820	820	895	1285	1565
2036-37	255	410	860	860	940	1350	1640
2037-38	265	430	900	900	985	1415	1720
2038-39	280	450	945	945	1030	1480	1805
2039-40	295	475	990	990	1080	1555	1890
2040-41	305	495	1040	1040	1135	1630	1985
2041-42	320	520	1090	1090	1190	1710	2080
2042-43	340	545	1145	1145	1250	1795	2185
2043-44	355	575	1200	1200	1310	1880	2290
2044-45	370	600	1260	1260	1375	1975	2405
2045-46	390	630	1320	1320	1440	2075	2525
2046-47	410	660	1385	1385	1515	2175	2650
2047-48	430	695	1455	1455	1590	2285	2780

Table 7-9 : Toll Rates for Monthly Pass Local Car Ticket @ all Toll Plaza

Year	Car	Minibus /LCV
2026-27	360	360
2027-28	375	375
2028-29	395	395
2029-30	415	415
2030-31	430	430
2031-32	455	455
2032-33	475	475
2033-34	495	495
2034-35	520	520
2035-36	545	545
2036-37	570	570
2037-38	600	600
2038-39	630	630
2039-40	660	660
2040-41	690	690
2041-42	725	725
2042-43	760	760
2043-44	800	800
2044-45	835	835
2045-46	880	880
2046-47	920	920
2047-48	970	970

Table 7-10 : Toll Rates for Monthly Pass @ Km 119.000

Year	Car	Minibus /LCV	Bus	Truck	3-Axle	Multi axle	Oversized Vehicles
2026-27	4055	6360	10645	13095	13840	18240	22955
2027-28	4250	6665	11150	13720	14500	19110	24045
2028-29	4455	6985	11685	14385	15200	20030	25205
2029-30	4670	7320	15075	15075	16495	23205	29290
2030-31	4890	7675	15795	15795	17285	24320	30700
2031-32	5130	8045	16560	16560	18120	25490	32180
2032-33	5375	8435	17360	17360	19000	26725	33740
2033-34	5640	8845	18205	18205	19920	28020	35375
2034-35	5915	9275	19090	19090	20890	29385	37100
2035-36	6205	9730	20025	20025	21915	30820	38915
2036-37	6510	10205	21005	21005	22990	32330	40825
2037-38	6830	10710	22040	22040	24120	33920	42835
2038-39	7165	11240	23130	23130	25310	35595	44950
2039-40	7520	11795	24275	24275	26565	37360	47180
2040-41	7895	12380	25480	25480	27885	39215	49525
2041-42	8290	13000	26750	26750	29275	41170	52000
2042-43	8705	13650	28090	28090	30740	43230	54600
2043-44	9145	14335	29500	29500	32285	45395	57345
2044-45	9605	15060	30985	30985	33910	47680	60235
2045-46	10090	15820	32550	32550	35625	50090	63275
2046-47	10600	16620	34200	34200	37430	52625	66485

Year	Car	Minibus /LCV	Bus	Truck	3-Axle	Multi axle	Oversized Vehicles
2047-48	11140	17465	35935	35935	39330	55295	69865

Table 7-11 : Toll Rates for Monthly Pass @ Km 184.000

Year	Car	Minibus /LCV	Bus	Truck	3-Axle	Multi axle	Oversized Vehicles
2026-27	3925	6215	12865	12865	14065	19910	24865
2027-28	4115	6510	13475	13475	14730	20850	26040
2028-29	4310	6820	14115	14115	15430	21840	27275
2029-30	4515	7145	14785	14785	16165	22875	28575
2030-31	4730	7485	15490	15490	16935	23970	29940
2031-32	4955	7845	16230	16230	17745	25115	31370
2032-33	5195	8220	17010	17010	18595	26320	32880
2033-34	5445	8615	17830	17830	19495	27585	34460
2034-35	5710	9030	18690	18690	20435	28920	36130
2035-36	5985	9470	19600	19600	21425	30320	37880
2036-37	6275	9930	20550	20550	22470	31795	39725
2037-38	6585	10415	21555	21555	23565	33350	41665
2038-39	6905	10925	22610	22610	24720	34980	43705
2039-40	7245	11465	23720	23720	25935	36700	45855
2040-41	7605	12030	24890	24890	27215	38505	48115
2041-42	7980	12625	26120	26120	28560	40410	50495
2042-43	8375	13250	27420	27420	29975	42415	53005
2043-44	8795	13910	28785	28785	31470	44525	55645
2044-45	9235	14605	30220	30220	33040	46750	58425
2045-46	9695	15340	31735	31735	34695	49090	61350
2046-47	10185	16110	33330	33330	36440	51555	64435
2047-48	10695	16920	35010	35010	38275	54155	67685

Table 7-12 : Toll Rates for Monthly Pass @ Km 243.000

Year	Car	Minibus /LCV	Bus	Truck	3-Axle	Multi axle	Oversized Vehicles
2026-27	3535	5710	11960	11960	13050	18760	22835
2027-28	3700	5975	12525	12525	13660	19640	23905
2028-29	3890	6285	13170	13170	14365	20650	25140
2029-30	4075	6580	13790	13790	15045	21625	26325
2030-31	4265	6890	14440	14440	15755	22645	27570
2031-32	4470	7220	15125	15125	16500	23720	28880
2032-33	4680	7565	15845	15845	17285	24850	30250
2033-34	4905	7925	16600	16600	18110	26035	31695
2034-35	5140	8305	17395	17395	18980	27280	33210
2035-36	5385	8700	18230	18230	19890	28590	34805
2036-37	5645	9120	19110	19110	20845	29965	36480
2037-38	5920	9560	20030	20030	21855	31415	38245
2038-39	6205	10025	21005	21005	22910	32935	40095
2039-40	6505	10510	22025	22025	24025	34535	42045
2040-41	6825	11025	23100	23100	25200	36220	44095
2041-42	7160	11565	24230	24230	26430	37995	46255
2042-43	7510	12130	25415	25415	27725	39860	48520

Year	Car	Minibus /LCV	Bus	Truck	3-Axle	Multi axle	Oversized Vehicles
2043-44	7880	12730	26665	26665	29090	41820	50910
2044-45	8270	13355	27985	27985	30530	43885	53425
2045-46	8675	14015	29370	29370	32040	46055	56070
2046-47	9110	14715	30825	30825	33630	48340	58850
2047-48	9560	15445	32360	32360	35305	50750	61780

7.4 Toll Revenue

As indicated earlier, toll revenue on the Project Road has been calculated in all three scenarios based on above rates and projected traffic. The estimates of toll revenue under ***Optimistic***, ***Pessimistic*** and ***Most Likely*** growth scenarios are presented in the following section.

7.5 Toll Revenue at all toll plazas under Scenarios

Toll Revenue estimates under all scenarios at each of the toll plaza up to 2047-48 starting from the year 2026-27 are shown in tables below.

Table 7-13 : Toll Revenue Optimistic Scenario

(Rs. Crores)

Year	TP-1	TP2	TP3	Total
2026-27	28.78	68.94	68.36	**166.09**
2027-28	32.43	77.30	76.48	**186.21**
2028-29	36.67	86.36	85.69	**208.71**
2029-30	43.00	96.49	95.74	**235.24**
2030-31	47.94	107.21	107.00	**262.15**
2031-32	54.06	119.90	119.00	**292.96**
2032-33	59.92	132.68	131.94	**324.54**
2033-34	67.42	148.10	146.56	**362.08**
2034-35	74.84	164.21	163.73	**402.78**
2035-36	84.18	183.44	181.54	**449.15**
2036-37	94.05	203.11	202.42	**499.57**
2037-38	104.75	224.67	224.91	**554.33**
2038-39	117.11	250.49	249.21	**616.81**
2039-40	131.50	278.99	278.41	**688.90**
2040-41	146.12	310.53	308.22	**764.86**

Year	TP-1	TP2	TP3	Total
2041-42	164.35	345.80	343.05	**853.21**
2042-43	182.83	383.65	382.08	**948.56**
2043-44	205.50	429.76	426.06	**1061.32**
2044-45	230.05	475.71	474.50	**1180.26**
2045-46	257.37	529.08	525.20	**1311.65**
2046-47	286.54	588.47	585.07	**1460.08**
2047-48	319.63	652.32	646.76	**1618.71**

Table 7-14 : Toll Revenue Pessimistic Scenario

(Rs. Crores)

Year	TP-1	TP2	TP3	Total
2026-27	28.68	68.59	68.04	**165.31**
2027-28	32.18	76.53	75.69	**184.41**
2028-29	36.22	85.08	84.43	**205.72**
2029-30	42.23	94.69	93.88	**230.80**
2030-31	46.83	104.72	104.39	**255.93**
2031-32	52.54	116.59	115.58	**284.71**
2032-33	57.97	128.45	127.54	**313.96**
2033-34	64.97	142.75	140.98	**348.70**
2034-35	71.81	157.56	156.69	**386.07**
2035-36	80.36	175.22	172.94	**428.52**
2036-37	89.33	193.09	191.91	**474.34**
2037-38	98.96	212.57	212.20	**523.73**
2038-39	110.12	235.87	234.03	**580.01**
2039-40	123.08	261.43	260.29	**644.80**
2040-41	136.21	289.66	286.93	**712.79**
2041-42	152.58	321.04	317.81	**791.43**
2042-43	168.97	354.52	352.26	**875.75**

Year	TP-1	TP2	TP3	Total
2043-44	189.06	395.38	390.97	**975.41**
2044-45	210.56	435.55	433.36	**1079.47**
2045-46	234.39	482.06	477.31	**1193.77**
2046-47	259.73	533.58	529.21	**1322.51**
2047-48	288.34	588.67	582.33	**1459.34**

Table 7-15 : Toll Revenue Most Likely Scenario

(Rs. Crores)

Year	TP-1	TP2	TP3	Total
2026-27	28.72	68.78	68.20	**165.70**
2027-28	32.30	76.93	76.08	**185.31**
2028-29	36.42	85.74	85.07	**207.24**
2029-30	42.58	95.63	94.78	**233.00**
2030-31	47.32	106.00	105.67	**258.99**
2031-32	53.19	118.26	117.28	**288.73**
2032-33	58.88	130.61	129.72	**319.20**
2033-34	66.09	145.44	143.72	**355.25**
2034-35	73.22	160.90	160.18	**394.30**
2035-36	82.08	179.36	177.20	**438.64**
2036-37	91.49	198.11	197.13	**486.73**
2037-38	101.68	218.53	218.52	**538.72**
2038-39	113.42	243.09	241.51	**598.01**
2039-40	127.10	270.09	269.22	**666.40**
2040-41	140.95	299.93	297.43	**738.30**
2041-42	158.19	333.16	330.21	**821.56**
2042-43	175.54	368.78	366.84	**911.16**
2043-44	196.89	412.26	408.12	**1017.27**
2044-45	219.84	455.24	453.43	**1128.50**

Year	TP-1	TP2	TP3	Total
2045-46	245.42	505.12	500.56	**1251.10**
2046-47	272.62	560.56	556.29	**1389.46**
2047-48	303.39	619.99	613.64	**1537.01**

CHAPTER 8

CONCLUSION & RECOMMENDATIONS

8.1 Conclusion & Recommendations

Project stretch of Goa/ Karnataka to Kundapur section of NH-17 in state of Karnataka from km 93.70.000 to km 183.300 is four lane. The road is in sound condition and serves healthy traffic volumes. Project corridor is a part of the busy and prominent national highway NH-17 which is main link for traffic on west coast to from Rajasthan, Gujarat, Maharashtra to Kerala. There are large number of townships, industrial corridors and other business establishment coming up along project corridor. As Indian economy is poised to grow at 6%+ post COVID-19, the project corridor is expected to pick up the same trend in terms of traffic flow. All these developments have potential to give positive impact to traffic flow on project. The following can be considered as major outcomes of the study

a) There is good amount of tollable traffic running on project

b) Project corridor has potential to witness traffic growth @ 6-8% annually in near future due to various development in area and overall development of economy

c) Project corridor has committed traffic as long route traffic and does not run a risk of traffic leakage due to quality competing road

Based on above it can be considered a stable healthy project from traffic and revenue point of view.

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IRB INFRASTRUCTURE TRUST

SOLAPUR TO YEDISHI SECTION OF NH 211 IN THE STATE OF MAHARASHTRA (KM 0.000 TO KM 100.000)

TTRAFFIC STUDY & REVENUE PROJECTION REPORT (FINAL)

MAY 2026

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GMD Adding Value

SOLAPUR TO YESDISHI SECTION OF NH 211

(KM 0.000 TO KM 100.000)

IN THE STATE OF MAHARASHTRA.

TRAFIC STUDY & REVENUE PROJECTION REPORT (FINAL)

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GMD CONSULTANTS ★ NAVI MUMBAI ★

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ABBREVIATIONS

AADT	-	Annual Average Daily Traffic	**NHAI**	-	National Highway Authority of India
BOT	-	Build Operate Transfer	**NHDP**	-	National Highways Development Project
CAGR	-	Compound Annual Growth Rate	**NSDP**	-	Net State Domestic Product
CTV	-	Classified traffic volume	**O&M**	-	Operation & Maintenance
DBFOT	-	Design, Build, Finance, Operate & Transfer	**PCDP**	-	Per Capita Domestic Product
EME	-	Earth Moving Equipment	**PCI**	-	Per Capita Income
GDP	-	Gross Domestic Product	**PCU**	-	Passenger Car Unit
GSDP	-	Gross State Domestic Product	**PSC**	-	Pre-stressed Concrete
HCM	-	Heavy Construction Machinery	**RCC**	-	Reinforced cement concrete
HCV	-	Heavy Commercial Vehicle	**RHS**	-	Right Hand Side
HTMS	-	Highway Traffic Management System	**SH**	-	State Highway
IRC	-	Indian Road Congress	**TP**	-	Toll Plaza
IRR	-	Internal Rate of Return	**WPI**	-	Wholesale Price Index
LCV	-	Light Commercial Vehicle	**SIR**	-	Special Investment Region
LHS	-	Left Hand Side	**c.**	-	Circa
LGV	-	Light Goods Vehicle	**ROB**	-	Railway Over Bridge
MAV	-	Multi Axle Vehicle	**MDR**	-	Major District Road
MORTH	-	Ministry of Road Transport and Highways	**ODR**	-	Other District Road
NH	-	National Highway	**CA**	-	Concession Agreement
PCC	-	Plain Cement Concrete	**RMT**	-	Running Meter
CR	-	Coarse Rubble			

CHAPTER 1

INTRODUCTION

1.1 Background

The Government of India through National Highway Authority of India (NHAI) embarked upon a program to enhance the traffic capacity and safety for efficient transportation of goods as well as passenger traffic on National Highway Sections under various NHDP Phases.

The project under consideration, Four Laning of **Solapur** to **Yedeshi** section of NH-211 from km 0.000 to km 100.000 in the state of Maharashtrais, one such road project NHAI intended to implement on a BOT basis in the DBFOT format. *M/s Solapur Yedeshi Tollway Ltd*. (Concessionaire) has been awarded the Project for a concession period of 29 years starting from appointed date of 21st January2015.COD was achieved for part length of project on 15th October 2019 and Tolling Operation on Project started for full length.

Project road section from Solapur to Yedeshi is part of important north-south connectivity. It connects Karnataka, southern parts of Maharashtra and other southern states to Solapur, Aurangabad, Dhule and then northern parts of India.

The following figure shows the project road alignment.

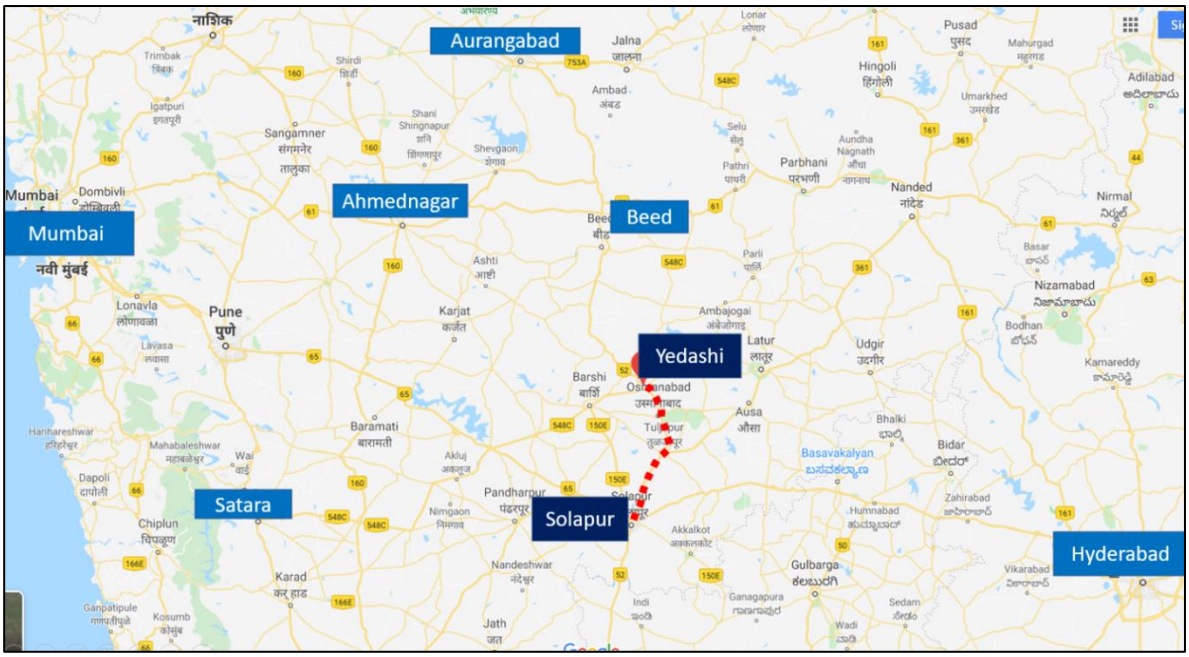

Figure 1-1: Alignment of Project Stretch

1.2 Objective of the Study

M/s IRB INFRASTRUCTURE TRUST has engaged *GMD Consultants* to assess the future traffic and toll potential of project along with related operation & maintenance expenditure involved.

This report named as **"Traffic Study &*Toll Revenue Projection Report*"** mainly focuses on traffic and revenue aspects of the project. Other parameters like competing road, area developments etc. have been considered from a traffic development point of view.

1.2.1 Scope of Services

The broad scope of work covered in the assignment is as follows.

a) Analysis of Traffic Growth
b) Toll Rate Growth
c) Revenue Forecasting

The Concessionaire has provided basic traffic data and other project details on the basis of which the above analysis has been carried out.

CHAPTER 2

PROJECT DETAILS

2.1 Project Corridor

NH-211 is an important national highway of Maharashtra. It connects northern Karnataka to Marathwada region of Maharashtra.
Solapur, the textile and sugar belt of Maharashtra, Jalna, India's first dry port, Aurangabad fall in project corridor. Bidkin, Shendre areas which are coming up with mega green field Industrial smart city of 10000 acre at Bidkin and Shendra in Maharashtra also fall in influence zone of project corridor.

2.2 Project Stretch Description

The Project highway from Solapur to Yedeshi border from Km 0.000 to km 100.00 has been widened to four lanes as per schedules.

Project road forms part of very important transportation corridor which works as gateway to Karnataka and rest of south India for Marathwada region of Maharashtra. Though it connects Solapur – Dhule but forms important transportation link for traffic from Vijapur, Hubli and other parts of north Karnataka to Aurangabad, Jalna, Beed and other places in Marathwada region. Project has two toll plazas at Tamamwadi and Yedeshi.

The following figure shows project alignment and toll plaza locations.

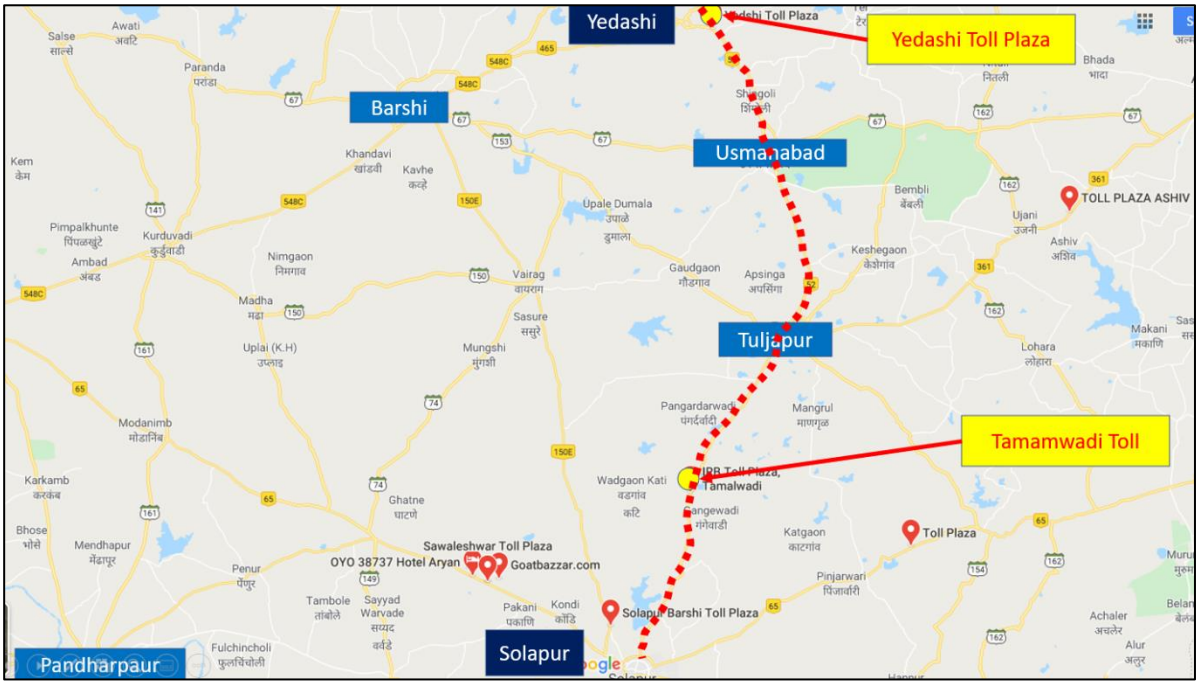

Figure 2-1: Project Alignment with Toll Plaza

2.3 Project Corridor Illustration

Four laning of project stretch is complete. The following photographs illustrate the project section along the corridor.

Figure 2-2: Photographs showing Project Corridor

CHAPTER 3

TRAFFIC SURVEYS AND ANALYSIS

3.1 Traffic Surveys

The Consultants have collected the required information for the project corridor to understand the general traffic and travel characteristics on the corridor.

The following traffic data has been collected from a client for a project.

- Classified traffic volume counts at two toll plaza locations on Solapur- Yedeshi section of NH-211 for years 2017-18, 2018-19, 2019-20, 2020-21 ,2021-22,2022-23, 2023-24,2024-25 and Annual traffic data from April 2025 to February 2026.
- Local Component of traffic
- Component of Return Journey
- Component of Monthly Pass Journey

The main objective of the traffic data analysis is to:

- Determine the existing traffic movement characteristics of the project.
- Establish base year traffic.
- Identification of travel patterns and modal split of project traffic
- Deriving growth factors for traffic forecasting
- Estimation of corridor traffic including traffic diversion if any
- Preparation of revenue model and projection of revenue as per toll policy for various scenarios

Table 3-1 below lists provides details of locations from where traffic details have been collected.

Table 3-1 : Traffic Data Details

SR. No.	LOCATION	CTV	Single Journey Traffic	Daily Return Journey	Monthly Pass	Local Pass
1	**Km 19.300 Toll Plaza at Tamalwadi**	AADT for Year 2017-18, 2018-19, 2019-20,2020-21 ,2021-22, 2022-23, 2024-25 & Eleven months from April 2025 to	For Year 2017-18, 2018-19, 2019-20, 2020-21, 2021-22, 2022-2023, 2024-25 & Eleven months from April 2025	For Year 2017-18, 2018-19, 2019-20, 2020-21, 2021-22, 2022-2023, 2024-25 & Eleven months from April 2025	For Year 2017-18, 2018-19, 2019-20, 2020-21, 2021-22, 2022-2023, 2024-25 & Eleven months from April 2025 to	For Year 2017-18, 2018-19, 2019-20, 2020-21, 2021-22, 2022-2023, 2024-25 & Eleven months from April 2025 to

SR. No.	LOCATION	CTV	Single Journey Traffic	Daily Return Journey	Monthly Pass	Local Pass
		February 2026	to February 20262025	to February 2026	February 2026	February 2026
2	**Km 77.400 Toll Plaza at Yedeshi**	AADT for Year 2017-18, 2018-19, 2019-20,2020-21 ,2021-22, 2022-23, 2024-25 & Eleven months from April 2025 to February 2026	For Year 2017-18, 2018-19, 2019-20, 2020-21, 2021-22, 2022-2023, 2024-25 & Eleven months from April 2025 to February 2026	For Year 2017-18, 2018-19, 2019-20, 2020-21, 2021-22, 2022-2023, 2024-25 & Eleven months from April 2025 to February 2026	For Year 2017-18, 2018-19, 2019-20, 2020-21, 2021-22, 2022-2023, 2024-25 & Eleven months from April 2025 to February 2026	For Year 2017-18, 2018-19, 2019-20, 2020-21, 2021-22, 2022-2023, 2024-25 & Eleven months from April 2025 to February 2026

3.2 Classified Traffic Volume

The objective of conducting a Classified Traffic Volume Count is to understand the traffic flow pattern including modal split on a roadway. The Classified Traffic Volume Count survey has been provided by the concessionaire of project highway from actual traffic data gathered at toll plaza locations based on monthly data shared with NHAI.

The vehicles can broadly be classified into fast moving / motorized and slow moving / non-motorized vehicles, which can be further classified into specific categories of vehicles. The groupings of vehicles are further segregated to capture the tollable vehicle categories specifically and toll exempted vehicles are counted separately. The detailed vehicle classification system as per IRC: 64-1990 is given in the table below.

Table 3-2 : Vehicle Classification System

Vehicle Type	
Auto Rickshaw	
Passenger Car	Car, Jeep, Taxi & Van (Old / new technology)
Bus	Minibus
	Standard Bus
Truck	Light Goods Vehicle (LCV)
	2 – Axle Truck
	3 Axle Truck (HCV)
	Multi Axle Truck (4-6 Axle)

Vehicle Type	
	Oversized Vehicles (7 or more axles)
Other Vehicles	Agriculture Tractor, Tractor & Trailer

Source - IRC: 64 – 1990

However, since the project highway is currently under toll operation, the data collected corresponds to the category of tollable vehicles. The following are the types of vehicles as per concession agreement.

- Car / Jeep / van
- Minibus /LCV
- Bus
- Truck
- 3-Axle
- Multi Axle

3.3 Traffic Characteristic

Toll revenue of project highway does not solely depend on traffic volume. There are certain characteristics of traffic which have substantial potential to affect toll collection. Component of local traffic, component of passenger and commercial traffic, portion of return journey traffic, % of monthly pass traffic are some of such characteristics of traffic. These will be discussed in subsequent sections of the report.

3.3.1 Traffic Data

Project concessionaire has provided Traffic data for the years 2019-20 ,2020-21, 2021-22, 2022-23 ,2023-24,2024- 25 & traffic data from April 2025 to February 2026.
Since the traffic data available for this update is for only Annual, from April 2025 to February 2026, it may not represent the whole year traffic. Hence a seasonality factor for balance part of year has been applied to average traffic of the current Eleven months to arrive at Annual Average Daily Traffic of base year 2025-26. Thus, corrected traffic is used for future projections and revenue calculations. The following table shows historical traffic on project stretch and derived Annual Average Daily Traffic (AADT) for year 2025-26.

Table 3-3 : Traffic Data at Tamalwadi Toll Plaza at Km 19.300

Sr. No	Type of Vehicle	Annual Average Daily Traffic (Nos.)- 2019-20	Annual Average Daily Traffic (Nos.)- 2020-21	Annual Average Daily Traffic (Nos.)- 2021-22	Annual Average Daily Traffic (Nos.)- 2022-23	Annual Average Daily Traffic (Nos.)- 2023-24	Annual Average Daily Traffic (Nos.)- 2024-25	Annual Average Daily Traffic (Nos.)- 2025-26
1	Car	4964	3564	6308	7840	9084	11573	11573
2	Minibus/LCV	1068	782	362	442	420	560	560
3	Bus	675	304	343	678	812	993	993
4	Truck	907	835	946	1149	1229	1438	1438

Sr. No	Type of Vehicle	Annual Average Daily Traffic (Nos.)- 2019-20	Annual Average Daily Traffic (Nos.)- 2020-21	Annual Average Daily Traffic (Nos.)- 2021-22	Annual Average Daily Traffic (Nos.)- 2022-23	Annual Average Daily Traffic (Nos.)- 2023-24	Annual Average Daily Traffic (Nos.)- 2024-25	Annual Average Daily Traffic (Nos.)- 2025-26
5	3-Axle	861	783	823	953	903	978	978
6	Multi Axle	934	1074	1286	1889	1868	1889	1889
7	Oversized Vehicles	4	1	1	6	11	36	36
Total		**9413**	**7343**	**10070**	**12958**	**14326**	**14500**	**17468**

Table 3-4 : Traffic Data at Yedeshi Toll Plaza at Km 77.400

Sr. No	Type of Vehicle	Annual Average Daily Traffic (Nos.)- 2019-20	Annual Average Daily Traffic (Nos.)- 2020-21	Annual Average Daily Traffic (Nos.)- 2021-22	Annual Average Daily Traffic (Nos.)- 2022-23	Annual Average Daily Traffic (Nos.)- 2023-24	Annual Average Daily Traffic (Nos.)- 2024-25	Annual Average Daily Traffic (Nos.)- 2025-26
1	Car	2840	2132	3308	3647	4273	4537	6447
2	Minibus/LCV	613	514	263	283	296	288	370
3	Bus	233	118	127	238	284	282	384
4	Truck	674	682	783	951	1042	1021	1204
5	3-Axle	807	826	870	986	918	833	941
6	Multi Axle	1101	1343	1615	2132	2026	2026	1800
7	Oversized Vehicles	0	1	1	6	12	12	30
Total		**6269**	**5616**	**6967**	**8245**	**8850**	**8461**	**11175**

3.4 Data Analysis

3.4.1 Analysis of Traffic Volume Count

Understanding the character of existing traffic forms the basis of the traffic forecast. The various vehicle types having different sizes and characteristics can be converted into a single unit called Passenger Car Unit (PCU). Passenger Car equivalents for various vehicles are adopted based on recommendations of Indian Road Congress prescribed in “IRC-64-1990: Guidelines for Capacity of Roads in Rural areas”. The adopted passenger car unit values (PCU) are presented in Table 3-5.

Table 3-5 : PCU Factors Adopted for Study

Vehicle Type	PCUs
Car	1.0
Minibus	1.5
Standard Bus	3.0
LCV/LGV	1.5
2 Axle Truck	3.0
3 – 6 Axle Truck	4.5
MAV	4.5
Auto Rickshaw	1.0
Van/Tempo	1.0
Agriculture Tractor with Trailer	4.5
Agriculture Tractor without Trailer	1.5

Source: IRC: 64-1990

Traffic volume at each toll plaza was converted to PCU and same is presented as under

Table 3-6 : Traffic in PCU at Project Stretch Base Year 2024-25

Year	Toll Plaza Location (Km)	Traffic No	PCU	PCU Index
2019-20	Tamalwadi Km 19.300	9413	18116	1.92
	Yedeshi Km 77.400	6269	13859	2.21
2020-21	Tamalwadi Km 19.300	7343	15339	2.09
	Yedeshi Km 77.400	5616	13829	2.46
2021-22	Tamalwadi Km 19.300	10070	18981	1.88
	Yedeshi Km 77.400	6967	16316	2.34
2022-23	Tamalwadi Km 19.300	12958	25377	1.96
	Yedeshi Km 77.400	8245	20222	2.45

Year	Toll Plaza Location (Km)	Traffic No	PCU	PCU Index
2023-24	Tamalwadi Km 19.300	14326	27001	1.88
	Yedeshi Km 77.400	8850	20619	2.33
2024-25	Tamalwadi Km 19.300	14500	26382	1.82
	Yedeshi Km 77.400	8461	18128	2.14
2025-26	Tamalwadi Km 19.300	17468	31305	1.79
	Yedeshi Km 77.400	11175	22821	2.04

It can be observed from above that project traffic has PCU index more than 2 which is an indicator of high proportion of commercial traffic in traffic mix in project corridors. The following figure illustrates variation of PCU index at two toll plaza locations.

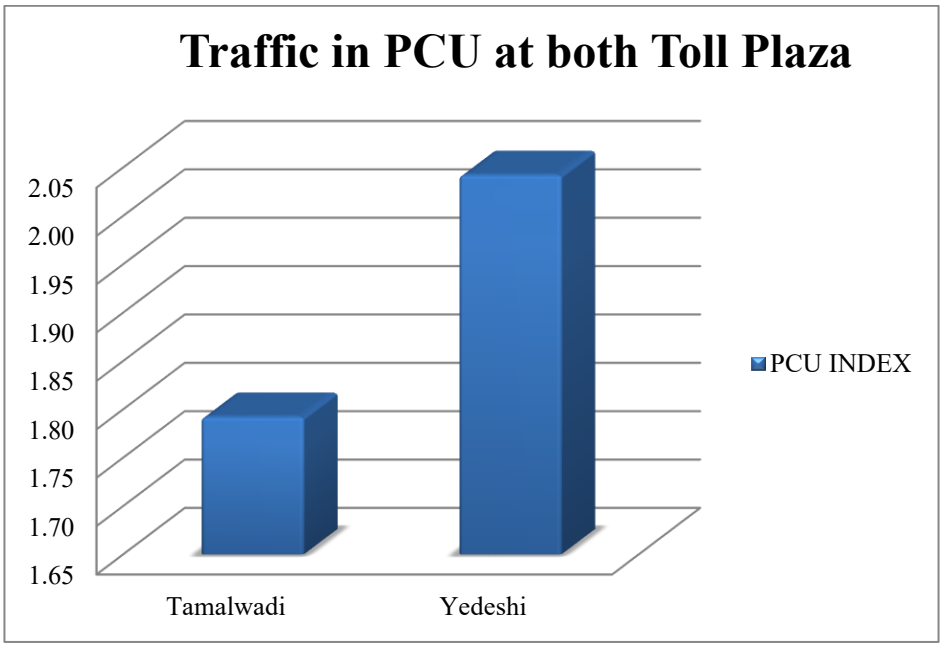

Figure 3-1: Comparison of PCU Index

It can be observed that PCU index is consistent at two toll plaza locations with commercial traffic slightly higher at Yedeshi toll plaza.

3.4.2 Components of Traffic

As discussed previously, components of traffic volume play an important role in determining project revenue. A larger component of commercial traffic with higher axle configuration adds to project revenue positively. Similarly, a larger component of local traffic affects the project revenue potential negatively.

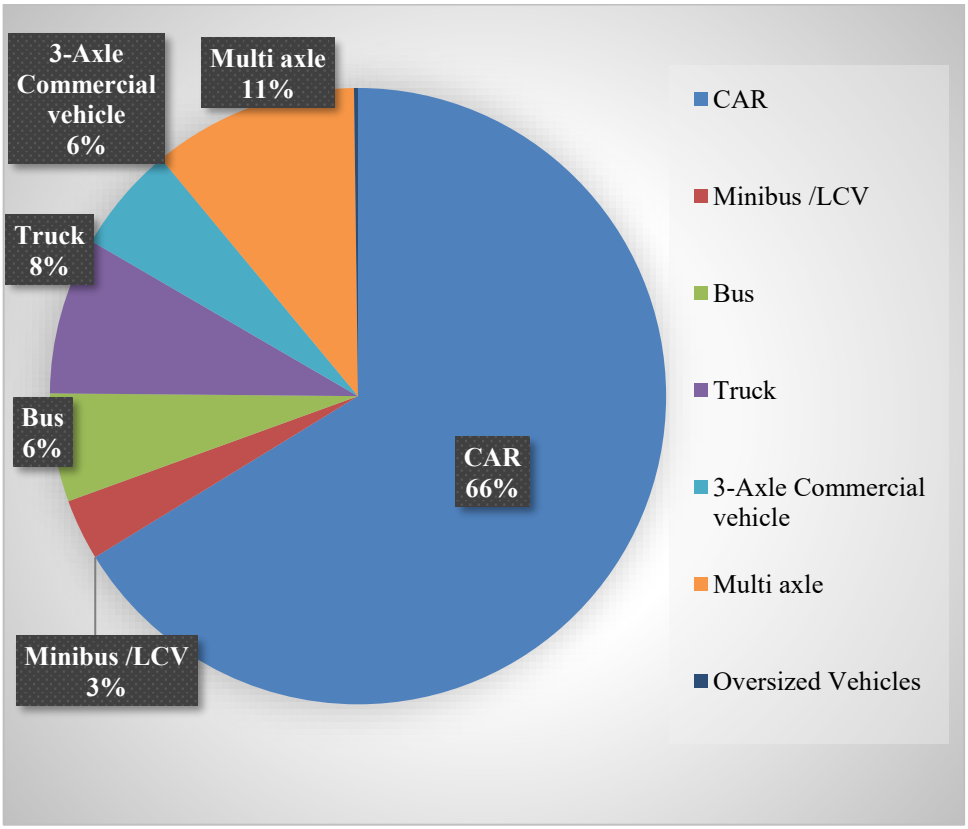

Figure 3-2: Model Split of Tollable Vehicle @TP-1

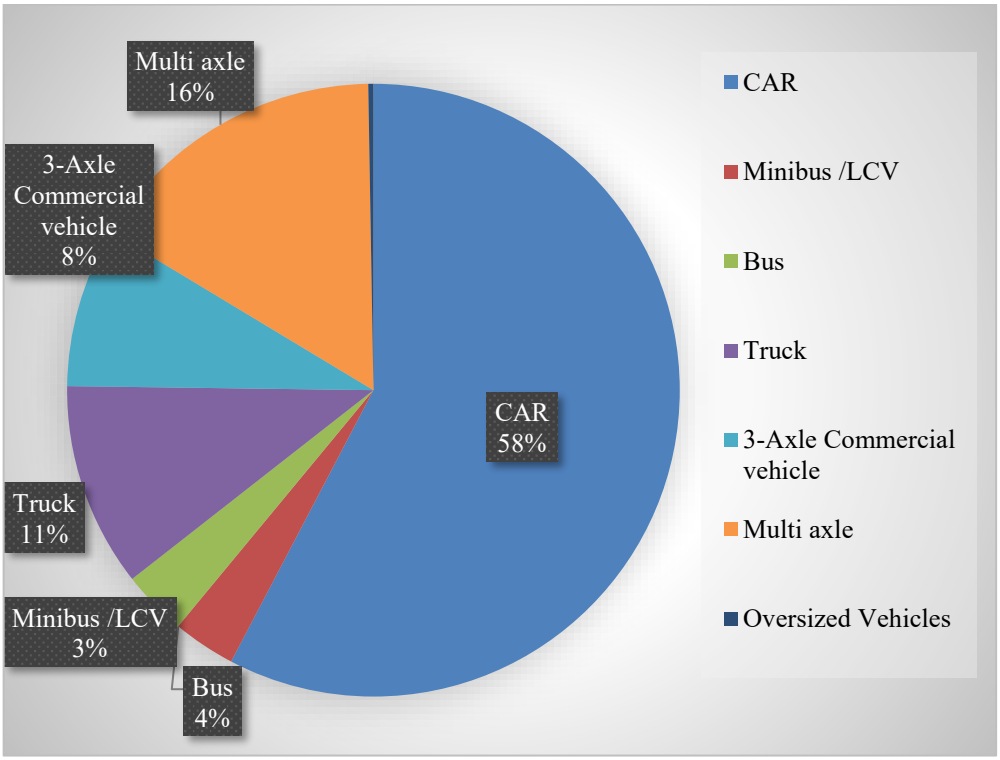

Figure 3-3: Model Split of Tollable Vehicle @TP-2

It is observed that car traffic forms about 66% - 58% of total traffic at toll plaza locations while multi axle commercial vehicles are about 17% -24% of total traffic. Trucks / Bus and LCV share about 14% -3% and 15% - 3% of traffic volume respectively.

Another important bifurcation of traffic is components of traffic with respect to various type of toll ticketing like

1. Single Journey
2. Multi Journey
3. Local Commercial Single Journey
4. Monthly Pass Local
5. Monthly Pass
6. Local Monthly Pass Commercial
7. Annual Pass Car

The following table provides numbers of vehicles falling in each of above category on base year 2025-26

Table 3-7 : Journey Type Bifurcation of Traffic at Tamalwadi TP-1 KM 19.300

Sr. No	Type	Traffic Volume (Nos.) 2025-26
1	Single Journey	8187
2	Return Journey	6736
3	Local Commercial Single Journey	274
4	Monthly Pass Local	10
5	Monthly Pass	0
6	Local Monthly Pass Commercial	12
7	Annual Pass Car	2250

Most dominant part of the above is the single journey type followed by return journey at project stretch. Monthly pass commuters are a very low fraction of the total traffic on the project corridor.

The single journey component in total traffic numbers is as high as 47%. Return journey component is 38%. The number of monthly pass local is 0% and Local commercial Single Journey 2% and annual pass is 13% at Tamalwadi toll plaza.

The following tables give the details of journey distribution at Yedeshi toll plaza at Km 77.400.

Table 3-8 : Journey Type Bifurcation of Traffic at Yedashi TP-2 KM 77.400

Sr. No	Type	Traffic Volume (Nos.) 2025-26
1	Single Journey	6605
2	Return Journey	3094
3	Local Commercial Single Journey	136
4	Monthly Pass Local	15
5	Monthly Pass	0
6	Local Monthly Pass Commercial	10
7	Annual Pass Car	1315

It is observed that the project corridor demonstrates a similar pattern of single journey dominating mix of traffic across the entire stretch which is typical of major national highways.

3.5 Secondary Data Collection

There are several other factors which have a substantial impact on traffic patterns and growth on any project corridor. The following are some of such important factors.

- Industrial development around project corridor and its catchment
- Educational infrastructure along project corridor
- Demographic pattern
- Urban area development
- Tourism potential
- Upcoming major infrastructural or Industrial projects
- Special Industry in project corridor
- Overall trends of economic growth local as well as national / regional

Hence in addition to traffic details on the project site, secondary data was also collected from various other sources. Typical secondary data includes the following:

1. Vehicle registration data of regional and national level.
2. Economic Data
   a) GDP
   b) NSDP
   c) Population Growth
   d) Per Capita Income growth
   e) Industrial Growth
   f) Special Industry Potential
   g) Regional and National development vision / plan
   h) Any other relevant data
3. Competing road network

We have collected and utilized such underlying data in the study to estimate the growth and risk factors for traffic along the project corridor.

CHAPTER 4

INFLUENCE ZONE TRANSPORT NETWORK ANALYSIS

4.1 Introduction

Highway corridors behave like integrated circuit networks and more often than not every road is connected to various networks having different origins and destinations. Traffic running on these networks behaves like fluid and flow on network on alignment of least friction.

Following Factors can be considered as major contributors to friction on transportation networks.

- Travel Speed / Travel Time
- Geometric deficiencies like blind horizontal curves and steep vertical gradients etc,
- Configuration of road
- Riding quality
- Traffic delays,
- Length of road,
- Passing through built up or Urban Area,
- Terrain,
- Facilities,

4.2 Competing / Alternate route

Project road from Solapur to Yedashi is important transportation link between Solapur and Aurangabad. It can be observed that between Solapur and Yedashi all other roads cross or meet project road alignment radially. There is no important parallel road network which can be a competing link for project road traffic. At the local level there is no competing road. Moreover, after completion of four laning project road is under toll operation for last two years from 2018. In such a case local diversion, if any, would have settled by now.
At regional level also project road (NH-211) is preferred route for Solapur – Aurangabad traffic. Though there could be one alternate route via Ahmednager for Solapur-Aurangabad pair origin and destination.

The following figures show the layout of competing routes between both these Zones.

Figure 4-1: Alternate route at regional level.

For this alternate route also, traffic would have settled since project road is under toll operation for last two years under toll. With completion of Aurangabad – Yedashi stretch four laning last year project route has become more attractive for candidate traffic. The following table provides a summary of analysis of competing or alternate routes.

Sr. No	Route Details	Designation	Length (Km)	Avg. Speed (KMPH)	Time Taken (Min)	Observations
Regional Level						
1	Solapur-Ahmednagar-Aurangabad	Alternate Route	346	64	6 Hr 50 Min	Alternate route is longer and has higher travel time. Project road has clear advantage
	Solapur-Yedeshi-Aurangabad	Project Road	310	55	5 Hr 27 Min	

Table 4-1 : Competing Roads Details

Under these circumstances it is not envisaged that commercial or passenger traffic would switch to alternate roads from the project road.

CHAPTER 5

GROWTH OF TRAFFIC ON PROJECT HIGHWAY

5.1 Introduction

Traffic growth is a function of the interplay of a number of contributory factors such as National economy, Government policy, socio-economic conditions of the people, and changes in land uses along the project corridor precincts etc. As these factors have a number of uncertainties associated with them, forecasts of traffic are dependent on the projections of other factors such as population, gross domestic product (GDP), vehicle ownership, per capita income (PCI), agricultural output, fuel consumption etc. Future patterns of change in these factors can be estimated with only a reasonable degree of accuracy and hence the resultant traffic forecast levels may not be precise.

Traffic growth forecast for project corridor Solapur–Yedeshi section of NH-211has been done taking the above factors into consideration. "**IRC: 108-2015-Guidelines for Traffic Prediction on Rural Highways**" is established best practice and has been used for traffic growth forecast.

5.2 Trend Analysis

One of the methods of estimation of future rate of growth is to assume the same rate of growth as in the past. Although such a method is more suitable for projects of short durations say 5-10 years, however for long term projections it would be erroneous to assume that the past rate of growth will continue to prevail for a long time in future. Economic conditions, which are major influencing factors, are bound to change over a long period of time. Thus, it would be necessary to modify the past trends of growth suitably.

Elasticity model of growth projection is one of the most widely acceptable methods for traffic forecast. The same is recommended in **IRC: 108-2015-Guidelines for Traffic Prediction on Rural Highways**.

In this method the past trend of vehicular data is paired with an economic indicator and a regression analysis is done to yield the economic model of growth. Growth of vehicle traffic varies for different types of vehicles. It is a proven fact that the growth pattern for passenger and goods vehicle is different. Traffic growth on any highway typically depends on a number of economic parameters. Most important and direct parameters are given as under

- Per Capita Income
- Net State Domestic Product (NSDP)
- Population

It can be observed that the ownership of a car is more closely related to affordability; hence per capita is the index which closely fits the growth of car traffic among other criteria. In a similar fashion, the following can be pairs of vehicle type and independent variable for elasticity modeling of growth.

- Car / Jeep – Par Capita Income
- Bus / Minibus – Population
- Goods Vehicle – NSDP

5.3 Estimation of Traffic Demand Elasticity

Elasticity of traffic demand is defined as the rate at which traffic intensity varies due to a change in the corresponding indicator selected. Hence, in order to estimate the elasticity of traffic demand, it is necessary to establish relationship between the growth in number of given category of vehicles with the relevant economic variable considered, such as NSDP, per capita income and population growth. Latest available data for vehicle registration, per capita income, NSDP and population is used in analysis.

As per IRC: 108-1996 the model for estimating elasticity index for the project corridor is of the following form and is given as below:

$Log\ (P) = k \times Log\ (EI) + A$

Where,

P = *Number of Vehicles (Mode wise)*

EI = *Economic Indicator*

A = *Regression constant*

k = *Elasticity coefficient (Regression coefficient)*

The elasticity for cars and bus (passenger vehicles) is calculated based on the Population and Per Capita Domestic Product (PCDP) and the elasticity for trucks is calculated based on the Net State Domestic Product (NSDP).

The project corridor is entirely in the state of Maharashtra but being at the border of Karnataka there is certain of Karnataka on project traffic. In such circumstances for elasticity calculations, working data from above Maharashtra and Karnataka states has been analyzed.

The following tables and graphs depict regression and elasticity of growth model for stretch falling in Maharashtra State.

Table 5-1 : Per Capita Income Vs Car Maharashtra

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2012	99564	2307841	5.00	6.36		
2013	103904	2592565	5.02	6.41	4%	
2014	109399	2834847	5.04	6.45	5%	
2015	114746	3113773	5.06	6.49	5%	
2016	122422	3406872	5.09	6.53	7%	
2017	132899	3715744	5.12	6.57	9%	5.96%

Regression analysis of same is given in figure below.

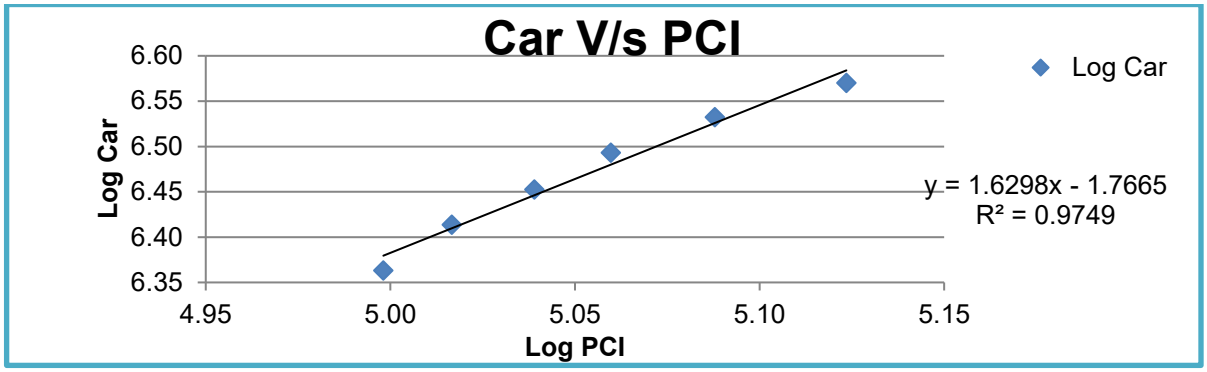

Figure 5-1: Regression and Elasticity PCI vs. Car–Extrapolation Maharashtra

Table 5-2 : Population Vs Bus Maharashtra

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth
2012	112374333	119298	8.05	5.08		
2013	113807248	129535	8.06	5.11	1%	
2014	115229410	140087	8.06	5.15	1%	
2015	116640546	140102	8.07	5.15	1%	
2016	118040394	150427	8.07	5.18	1%	
2017	119428710	160042	8.08	5.20	1%	1.23%

Regression analysis of same is given in figure below.

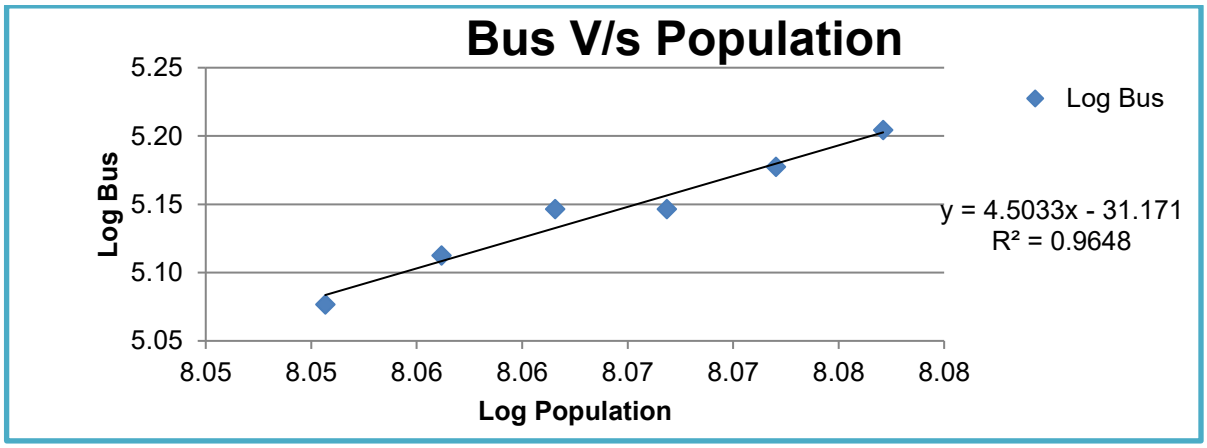

Figure 5-2: Regression and Elasticity Population vs. Bus – Extrapolation Maharashtra

The elasticity of goods traffic has been worked out by regression analysis with NSDP. The following table represents the data and details.

Table 5-3 : LCV Traffic Vs NSDP Maharashtra

Year	NSDP	LCV	Log NDSP	Log Truck	NSDP Growth	Average Growth (5 Year)
2012	1126595	656407	6.05	5.82		
2013	1189711	739725	6.08	5.87	6%	
2014	1267551	803128	6.10	5.90	7%	
2015	1345341	868632	6.13	5.94	6%	
2016	1452439	927903	6.16	5.97	8%	6.56%

The following figure depicts regression analysis and extrapolation.

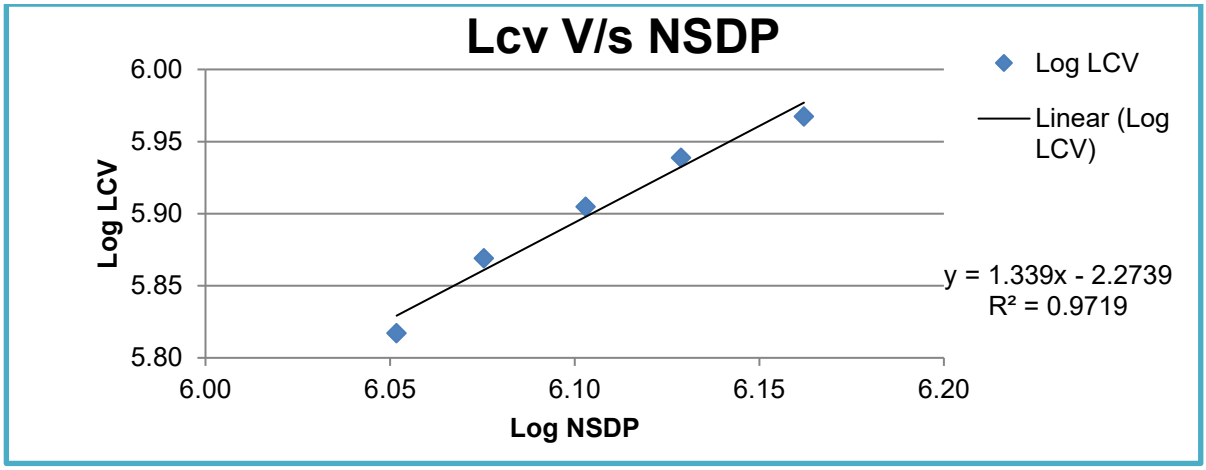

Table 5-4: Truck Traffic Vs NSDP Maharashtra

Year	NSDP	TRUCK	Log NDSP	Log Truck	NSDP Growth	Average Growth (5 Year)
2012	1126595	411418	6.05	5.61		
2013	1189711	402366	6.08	5.60	6%	
2014	1267551	470128	6.10	5.67	7%	
2015	1345341	491582	6.13	5.69	6%	
2016	1452439	468810	6.16	5.67	8%	
2017	1595514	496439	6.20	5.70	10%	7.22%

The following figure depicts regression analysis and extrapolation.

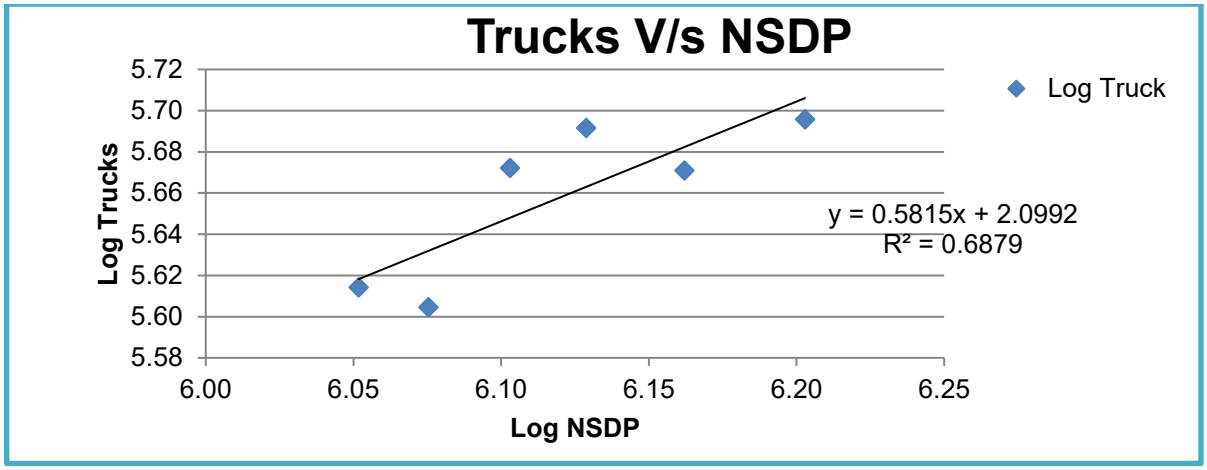

Figure 5-3: Regression and Elasticity NSDP vs. Goods Traffic – extrapolation Maharashtra.

Using the regression analysis above, we have arrived at the elasticity of traffic demand for each class of vehicle to a given change in relevant economic indicators. Average traffic growth of a vehicle class is multiplied by the corresponding elasticity coefficient to arrive at traffic growth. R2 statistical measure of how close the data are to the fitted regression line. It varies from 0 to 1. The higher the value of R2 more representative is the regression model of data.

The results of these analyses for *the good fit* regression as reflected by R^2 values are presented in the Table below.

Table 5-4 : Summary Regression Analysis Maharashtra

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average Growth	Growth Elastic Model
Maharashtra	Car/Jeep	PCI	y = 1.6298x + -1.7665	R² = 0.9749	1.6298	5.96%	9.71%
	Bus	Population	y = 4.5033x - -31.1713	R² = 0.9648	4.5033	1.23%	5.52%
	LCV	NSDP	y = 1.339x - -2.2739	R² = 0.9719	1.3390	6.56%	8.78%
	Truck	NSDP	y = 0.5815x - 2.0992	R² = 0.6879	0.5815	7.22%	4.20%

The following tables and graphs depict regression and elasticity of growth model for stretch falling in Karnataka State.

Table 5-5 : Per Capita Income Vs Car Karnataka

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2012	90269	1269430	4.96	6.10		
2013	94382	1420767	4.97	6.15	5%	
2014	101864	1572521	5.01	6.20	8%	
2015	105703	1741831	5.02	6.24	4%	
2016	116819	1916373	5.07	6.28	11%	
2017	131260	2110493	5.12	6.32	12%	7.83%

Regression analysis of same is given in figure below.

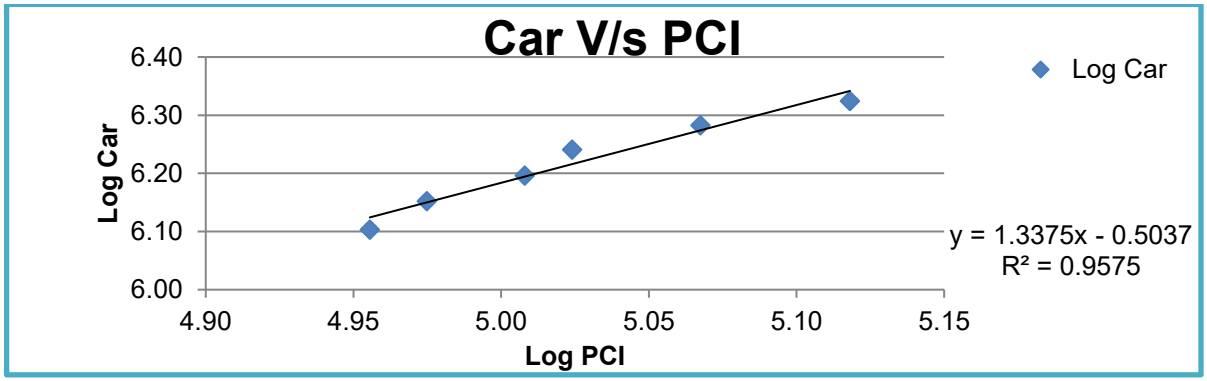

Figure 5-4: Regression and Elasticity PCI vs. Car–Extrapolation Karnataka

Table 5-6 : Population Vs Bus Karnataka

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth
2012	61095297	175705	7.79	5.24		
2013	62058777	186705	7.79	5.27	2%	
2014	63017877	195913	7.80	5.29	2%	
2015	63972322	204803	7.81	5.31	2%	
2016	64921845	213699	7.81	5.33	1%	

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth
2017	65866188	224580	7.82	5.35	1%	1.52%

Regression analysis of same is given in figure below.

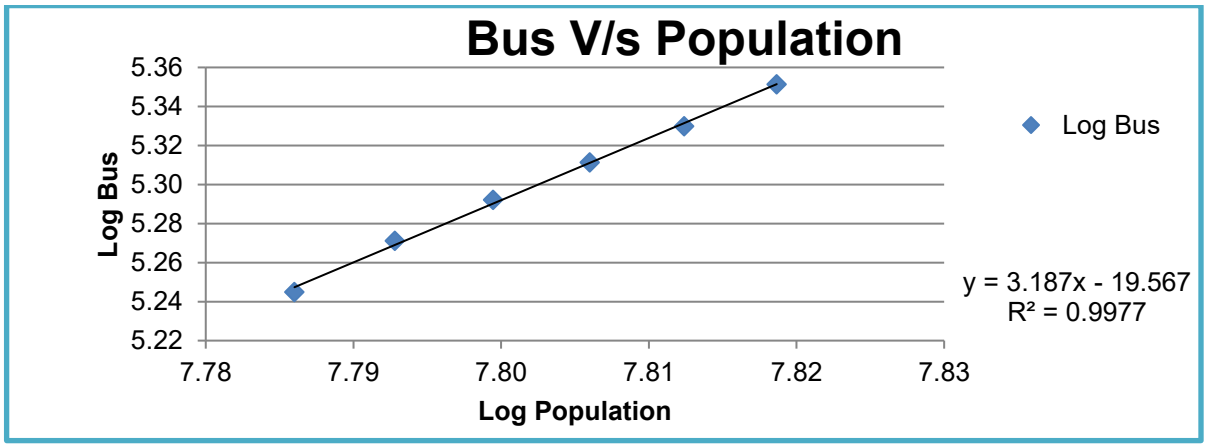

Figure 5-5: Regression and Elasticity Population vs. Bus – Extrapolation Karnataka

The elasticity of goods traffic has been worked out by regression analysis with NSDP. The following table represents the data and details.

Table 5-7 : LCV Traffic Vs NSDP Karnataka

Year	NSDP	LCV	Log NSDP	Log Truck	NSDP Growth	Average Growth (5 Year)
2012	554990	221160	5.74	5.34		
2013	586592	258701	5.77	5.41	6%	
2014	639981	294266	5.81	5.47	9%	
2015	671322	331381	5.83	5.52	5%	
2016	749990	367572	5.88	5.57	12%	7.85%

The following figure depicts regression analysis and extrapolation.

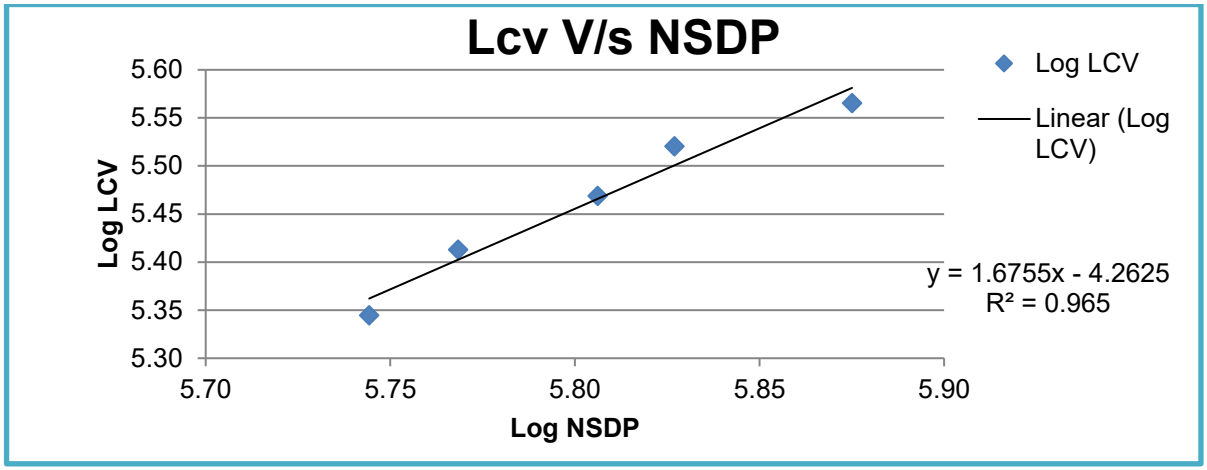

Table 5-4: Truck Traffic Vs NSDP Karnataka

Year	NSDP	TRUCK	Log NSDP	Log Truck	NSDP Growth	Average Growth (5 Year)
2012	554990	233422	5.74	5.37		
2013	586592	247639	5.77	5.39	6%	
2014	639981	260989	5.81	5.42	9%	
2015	671322	274971	5.83	5.44	5%	
2016	749990	290415	5.88	5.46	12%	
2017	851880	306290	5.93	5.49	14%	9.00%

The following figure depicts regression analysis and extrapolation.

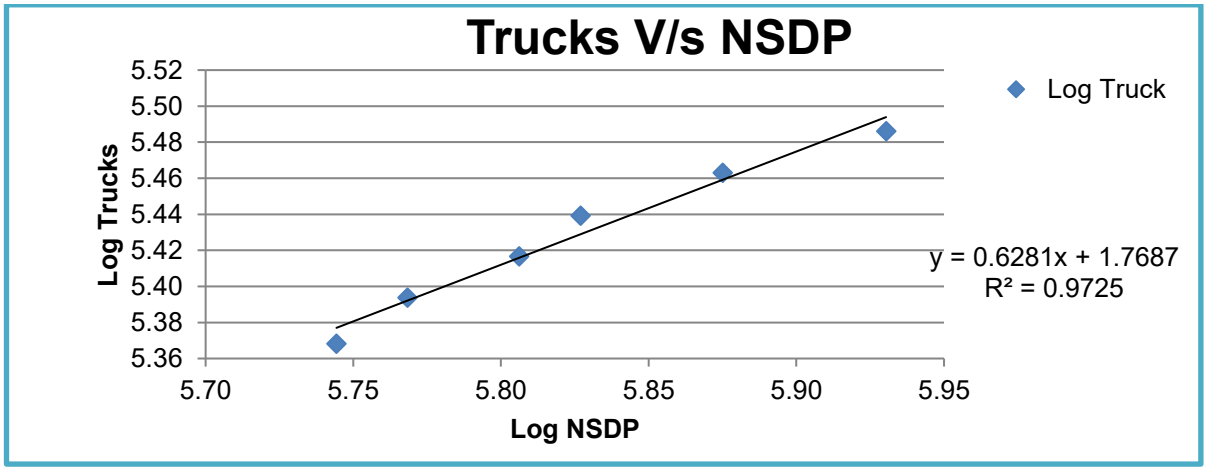

Figure 5-6: Regression and Elasticity NSDP vs. Goods Traffic – extrapolation Karnataka.

Using the regression analysis above, we have arrived at the elasticity of traffic demand for each class of vehicle to a given change in relevant economic indicators. Average traffic growth of a vehicle class is multiplied by the corresponding elasticity coefficient to arrive at traffic growth. R2 statistical measure of how close the data are to the fitted regression line. It varies from 0 to 1. The higher the value of R2 more representative is the regression model of data.

The results of these analyses for *the good fit* regression as reflected by R^2 values are presented in the Table below.

Table 5-8 : Summary Regression Analysis Karnataka

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average Growth	Growth Elastic Model
Karnataka	Car/Jeep	PCI	y = 1.3375x + -0.5037	R² = 0.9575	1.3375	7.83%	10.47%
	Bus	Population	y = 3.187x - -19.567	R² = 0.9977	3.1870	1.52%	4.83%
	LCV	NSDP	y = 1.6755x - -4.2625	R² = 0.965	1.6755	7.85%	13.16%
	Truck	NSDP	y = 0.6281x - 1.7687	R² = 0.9725	0.6281	9.00%	5.65%

The economic model for predicting growth is a good tool, however other local, regional, and national factors should also be considered before finalizing growth factors. Considering factors such as proposed developments and other influencing economic factors, moderate growth should be considered. These factors are discussed in subsequent sections.

5.4 Analysis of Historic Traffic Data

Historical traffic data forms useful information for any highway project. It provides useful information for establishing past trends of growth. Project stretch of Kaithal to Rajasthan Border is under tolling operation with current concessionaire and has only two years of tolling history from 2018-19. As traffic data is available with the project concessionaires of just a year about, we do not have sufficient data points to be able to establish a reliable past trend of traffic growth. A minimum of about 5 -6 years' traffic data is required for establishing a reliable past trend.

5.5 Other Factors Influencing Growth

There are many factors which have an impact on traffic growth. As discussed previously these factors can be economical, social, educational, and industrial.

Potentiality of such factors for project highway is discussed as under.

ECONOMY

After witnessing a slowdown during 2011-12, the economy recovered in 2013-14, and a high growth rate of GDP was recorded up to 2018-19. Pandemic of COVID-19 impacted all economies of world including India up to year 2021-22. Following figure show trend of GDP growth in India.

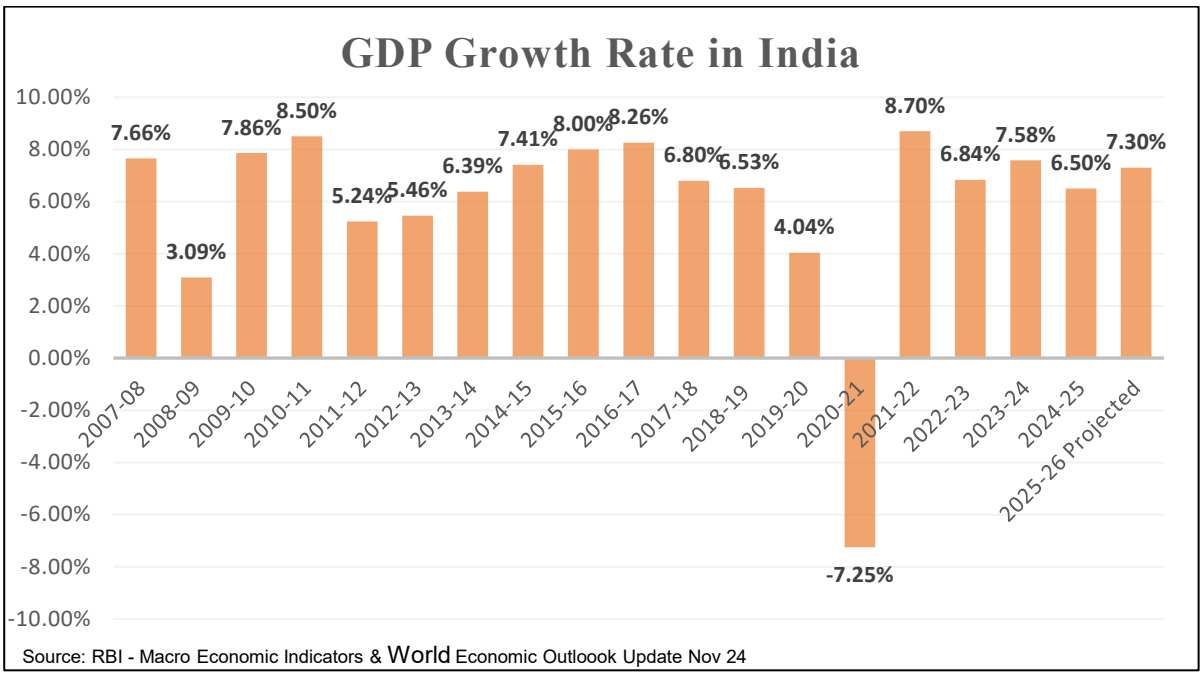

Figure 5-7 : Growth of GDP in India

FY 2017-18 recorded a growth of 6.7% which had a slight impact of GST and demonetization. Indian economy appears on recovery path with estimated growth of 6.8% in FY 2018-19. The government took major policy decisions including tax infrastructure reforming, banking sector improvement and ease of doing business.

In post COVID-19 scenario, in year 2022-23 and 2023-24 India registered an impressive growth of 7% to 7.5%. In last year despite global slow down due to Russia-Ukraine war and Gaza crises, India grew at good rate of 7%(Estimated).
Indian economy is now on good growth path and all major institutions including IMF / ADB have estimated growth of Indian Economy to peg around 6.5% to 7% in coming years.

5.6 Developments along and around Project Corridor & State

Project stretch falls in regions of good development potential. The same is discussed as under.

Solapur

Solapur is one of the major cities of Karnataka which shares boundary with Karnataka. Thus, it can be called the gateway to the south for this region. Solapur district has highest number of sugar factories in India.

Solapur leads Karnataka in production of Indian cigarettes or beedi.Solapuri Chadars and towels are famous in India and also at a global level, however, there has been a significant

decline in their exports due to quality reasons. ***"SolapuriChadars"*** are the most famous and first product in Karnataka. It has been a leading centre for cotton mills and power looms in Karnataka. Solapur had the world's second largest and Asia's largest spinning mill. The National Research Centre on Pomegranate (NRCP) of India is located in Solapur and pomegranate farming is done on a large scale in Solapur District. MIDC (Karnataka Industrial Development Corporation) has been very successful in creating and promoting industrial hubs in various parts of Karnataka. It provides businesses with infrastructure such as land (open plot or built-up spaces), roads, water supply, drainage facilities and streetlights along with necessary clearances. In total MIDC has developed about 300 industrial centres which have attracted a large number of domestic and international industries to set up their business and production houses in Karnataka. Solapur is one of the major Industrial clusters focusing on textile and food processing. The following are major MIDCs spread over Solapur district.

- Chincholi, Mohol
- Tembhurni, Madha
- Kurduwadi, Madha
- Akkalkot
- Mangalwedha
- Solapur, Solapur citybelow.

Pandharpur

This is a holy place of Shri.Vitthal and Shri Rukmini. It is also known as the Southern Kashi of India and Kuldaivat of Karnataka State. It is located at a distance of 72 kms by road. from Solapur District headquarters. Large numbers of devotees from all over Karnataka and surrounding States gather at Pandharpur mainly to celebrate the Aashadhi and Kartiki Ekadashis (in the month of June and July) every year in addition to the regular rush of devotees every day. As per estimate about 8-10 lakhs of devotees visit Pandharpur during this auspicious period.

Jalna

The government of Karnataka and JNPT are developing dry ports at Jalna and Bidkin Shendra which is on Paithan road. Project road would work like feeder to these economic hubs for traffic from Karnataka and other southern states.

5.7 Recommended Growth Rates of Traffic

Based on the above analysis and after giving due consideration to the entire listed factors, the following overall growth rates are recommended for each category of vehicle as below. The rate of growth is moderate in light of overall regional trends. Growth of multi-Axle is kept slightly higher as trend of technological advances in logistic industry favors multi-axle over 2/3 axle carriage. It is also expected that as the economy moves from developing to developed, the rate of growth diminishes. The same growth rate is not sustainable for long. Traffic growth is suitably stepped down for future years.

Growth rates are recommended for three scenarios for sensitivity analysis namely **Optimistic, Pessimistic** and **Most Likely** with a positive and negative variation 0.5% from Most Likely case for corridor in both states.

5.7.1 Recommended Growth Rates of Traffic for Project Stretch

Table 5-9 : Recommended Growth Rates Optimistic

Category / Year	FY 2026-27	FY 2028-30	FY 2031-35	FY 2036-40	FY 2041-45	FY 2046-50
Car/Jeep/Van	8.92%	7.17%	7.02%	6.72%	6.36%	5.64%
Bus	5.50%	3.75%	3.72%	3.66%	3.40%	3.08%
LCV	4.02%	2.27%	2.13%	1.86%	1.57%	1.29%
2- Axle	4.56%	2.81%	2.68%	2.40%	2.11%	1.56%
3 - Axle	5.72%	3.97%	3.80%	3.45%	3.07%	2.36%
4 to 6 Axle	6.30%	4.55%	4.36%	3.97%	3.55%	2.76%
7 and Above Axle	6.30%	4.55%	4.36%	3.97%	3.55%	2.76%

Table 5-10 : Recommended Growth Rates Pessimistic

Category / Year	FY 2026-27	FY 2028-30	FY 2031-35	FY 2036-40	FY 2041-45	FY 2046-50
Car/Jeep/Van	8.42%	6.67%	6.52%	6.22%	5.86%	5.14%
Bus	5.00%	3.25%	3.22%	3.16%	2.90%	2.58%
LCV	3.52%	1.77%	1.63%	1.36%	1.07%	0.79%
2- Axle	4.06%	2.31%	2.18%	1.90%	1.61%	1.06%
3 - Axle	5.22%	3.47%	3.30%	2.95%	2.57%	1.86%
4 to 6 Axle	5.80%	4.05%	3.86%	3.47%	3.05%	2.26%
7 and Above Axle	5.80%	4.05%	3.86%	3.47%	3.05%	2.26%

Table 5-11 : Recommended Growth Rates Most Likely

Category / Year	FY 2026-27	FY 2028-30	FY 2031-35	FY 2036-40	FY 2041-45	FY 2046-50
Car/Jeep/Van	8.67%	6.92%	6.77%	6.47%	6.11%	5.39%
Bus	5.25%	3.50%	3.47%	3.41%	3.15%	2.83%
LCV	3.77%	2.02%	1.88%	1.61%	1.32%	1.04%
2- Axle	4.31%	2.56%	2.43%	2.15%	1.86%	1.31%
3 - Axle	5.47%	3.72%	3.55%	3.20%	2.82%	2.11%

Category / Year	FY 2026-27	FY 2028-30	FY 2031-35	FY 2036-40	FY 2041-45	FY 2046-50
4 to 6 Axle	6.05%	4.30%	4.11%	3.72%	3.30%	2.51%
7 and Above Axle	6.05%	4.30%	4.11%	3.72%	3.30%	2.51%

Traffic and revenue have been worked out on the basis of the above growth, and some are presented in subsequent chapters of the report.

CHAPTER 6

TRAFFIC FORECAST

6.1 Traffic Projections

Growth rates recommended in the previous section of the report are used to arrive at traffic projections for future years. Toll plaza wise futuristic traffic projection is given in tables below.

These projections have been done for the following three cases of growth up to the concession period.

1. Optimistic Scenario
2. Pessimistic Scenario
3. Most Likely Scenario

Table 6-1 : Total Tollable Traffic @ Toll Plaza 1- Tamalwadi19.300 KM

(Optimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU
2026-27	12334	616	1066	1574	1093	2362	50	**19095**	**33132**
2027-28	13219	630	1106	1618	1136	2470	52	**20231**	**34822**
2028-29	14168	644	1147	1663	1182	2582	54	**21440**	**36608**
2029-30	15184	658	1190	1709	1229	2700	56	**22726**	**38495**
2030-31	16250	672	1234	1755	1276	2818	58	**24063**	**40432**
2031-32	17391	686	1280	1802	1325	2941	60	**25485**	**42478**
2032-33	18611	700	1327	1850	1375	3069	62	**26994**	**44639**
2033-34	19917	714	1377	1898	1428	3202	65	**28601**	**46922**
2034-35	21316	730	1428	1948	1482	3342	68	**30314**	**49335**
2035-36	22748	744	1481	1995	1533	3475	71	**32047**	**51736**
2036-37	24277	758	1535	2042	1586	3613	74	**33885**	**54268**
2037-38	25907	772	1591	2090	1640	3756	77	**35833**	**56939**
2038-39	27648	786	1648	2140	1697	3905	80	**37904**	**59757**
2039-40	29506	800	1709	2191	1755	4060	83	**40104**	**62730**
2040-41	31381	813	1766	2237	1809	4204	86	**42296**	**65642**
2041-42	33376	826	1827	2284	1864	4354	89	**44620**	**68706**
2042-43	35499	839	1889	2332	1921	4508	92	**47080**	**71931**
2043-44	37756	852	1953	2380	1980	4668	95	**49684**	**75327**
2044-45	40157	865	2019	2430	2041	4833	98	**52443**	**78904**

Table 6-2 : Total Tollable Traffic @ Toll Plaza 2- Yedashi77.400 KM (Optimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU
2026-27	5980	360	351	1276	1038	2255	34	**11294**	**23940**
2027-28	6408	368	364	1311	1079	2357	35	**11922**	**25111**
2028-29	6868	376	377	1347	1121	2464	37	**12590**	**26345**
2029-30	7360	384	391	1384	1165	2576	39	**13299**	**27647**
2030-31	7877	392	406	1420	1209	2688	41	**14033**	**28976**
2031-32	8429	400	421	1457	1254	2805	43	**14809**	**30376**
2032-33	9020	408	436	1495	1301	2927	45	**15632**	**31850**
2033-34	9652	416	452	1534	1351	3054	47	**16506**	**33405**
2034-35	10330	424	469	1575	1402	3186	49	**17435**	**35044**
2035-36	11024	432	486	1612	1451	3312	51	**18368**	**36659**
2036-37	11765	440	504	1650	1501	3443	53	**19356**	**38357**
2037-38	12556	448	523	1689	1553	3579	55	**20403**	**40145**
2038-39	13400	456	542	1729	1606	3721	57	**21511**	**42026**
2039-40	14300	464	562	1771	1661	3869	59	**22686**	**44006**
2040-41	15209	471	581	1808	1712	4007	61	**23849**	**45928**
2041-42	16176	478	601	1846	1765	4149	63	**25078**	**47946**
2042-43	17203	485	621	1884	1819	4296	65	**26373**	**50064**
2043-44	18297	492	641	1923	1875	4448	67	**27743**	**52289**
2044-45	19460	499	663	1963	1932	4606	69	**29192**	**54627**

Table 6-3 : Total Tollable Traffic@ Toll Plaza 1- Tamalwadi19.300 KM (Pessimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU
2026-27	12278	612	1061	1566	1088	2351	50	**19006**	**32977**
2027-28	13098	623	1095	1602	1126	2447	52	**20043**	**34494**
2028-29	13972	634	1130	1638	1165	2546	54	**21139**	**36091**
2029-30	14904	645	1166	1676	1206	2650	56	**22303**	**37771**
2030-31	15876	656	1203	1712	1246	2752	58	**23503**	**39483**
2031-32	16911	667	1242	1749	1288	2859	60	**24776**	**41284**
2032-33	18014	678	1282	1787	1331	2969	62	**26123**	**43178**
2033-34	19189	689	1323	1826	1375	3084	64	**27550**	**45171**
2034-35	20440	700	1365	1865	1421	3203	66	**29060**	**47268**
2035-36	21710	710	1408	1900	1463	3314	68	**30573**	**49333**
2036-37	23061	720	1452	1936	1506	3430	70	**32175**	**51501**
2037-38	24495	730	1498	1972	1551	3549	72	**33867**	**53779**

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU
2038-39	26019	740	1545	2009	1597	3672	74	**35656**	**56173**
2039-40	27636	750	1593	2047	1644	3800	76	**37546**	**58688**
2040-41	29254	758	1639	2080	1686	3916	78	**39411**	**61119**
2041-42	30967	766	1686	2113	1729	4036	80	**41377**	**63668**
2042-43	32780	774	1734	2147	1774	4159	82	**43450**	**66340**
2043-44	34699	782	1784	2182	1820	4286	84	**45637**	**69141**
2044-45	36732	790	1836	2217	1867	4417	86	**47945**	**72080**

Table 6-4 : Total Tollable Traffic @ Toll Toll Plaza 2- Yedashi77.400 KM (Pessimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU
2026-27	5952	358	349	1271	1033	2245	34	**11242**	**23827**
2027-28	6349	364	361	1300	1069	2336	35	**11814**	**24874**
2028-29	6771	370	373	1329	1106	2430	36	**12415**	**25973**
2029-30	7222	376	385	1359	1144	2528	37	**13051**	**27126**
2030-31	7693	382	397	1388	1182	2625	38	**13705**	**28294**
2031-32	8195	388	410	1417	1221	2726	39	**14396**	**29520**
2032-33	8730	394	423	1447	1261	2830	40	**15125**	**30806**
2033-34	9298	400	436	1478	1302	2939	41	**15894**	**32155**
2034-35	9904	406	450	1510	1344	3052	43	**16709**	**33572**
2035-36	10519	412	464	1538	1383	3157	44	**17517**	**34952**
2036-37	11172	418	479	1567	1424	3267	45	**18372**	**36398**
2037-38	11867	424	494	1596	1466	3380	46	**19273**	**37912**
2038-39	12607	430	509	1626	1509	3497	48	**20226**	**39500**
2039-40	13391	436	525	1656	1553	3618	50	**21229**	**41164**
2040-41	14175	441	540	1682	1593	3729	51	**22211**	**42756**
2041-42	15005	446	555	1709	1634	3843	52	**23244**	**44422**
2042-43	15884	451	571	1736	1676	3960	54	**24332**	**46163**
2043-44	16814	456	588	1764	1719	4081	56	**25478**	**47985**
2044-45	17798	461	605	1792	1763	4205	58	**26682**	**49892**

Traffic projections for Most Likely scenario is given as under

Table 6-5 : Total Tollable Traffic @ Toll Plaza 1- Tamalwadi19.300 KM (Most Likely Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU
2026-27	12306	614	1063	1570	1091	2356	50	**19050**	**33055**
2027-28	13157	627	1099	1610	1132	2457	52	**20134**	**34658**
2028-29	14068	640	1138	1650	1174	2563	54	**21287**	**36349**
2029-30	15042	653	1178	1692	1218	2673	56	**22512**	**38132**
2030-31	16061	666	1219	1732	1261	2783	58	**23780**	**39956**
2031-32	17150	679	1261	1774	1306	2898	60	**25128**	**41878**
2032-33	18311	692	1304	1817	1352	3017	62	**26555**	**43903**
2033-34	19551	705	1349	1861	1401	3141	64	**28072**	**46039**
2034-35	20875	718	1396	1905	1451	3270	66	**29681**	**48292**
2035-36	22226	729	1443	1945	1497	3392	68	**31300**	**50522**
2036-37	23664	741	1492	1987	1546	3519	70	**33019**	**52868**
2037-38	25195	754	1543	2030	1596	3650	72	**34840**	**55339**
2038-39	26825	767	1596	2073	1647	3786	75	**36769**	**57939**
2039-40	28560	780	1650	2117	1700	3927	78	**38812**	**60678**
2040-41	30304	791	1702	2156	1749	4057	80	**40839**	**63343**
2041-42	32154	802	1756	2196	1799	4191	83	**42981**	**66142**
2042-43	34118	813	1811	2236	1850	4330	86	**45244**	**69082**
2043-44	36202	824	1867	2278	1903	4473	89	**47636**	**72172**
2044-45	38413	835	1926	2320	1957	4621	92	**50164**	**75419**

Table 6-6 : Total Tollable Traffic @ Toll Toll Plaza 2- Yedeshi 77.400 KM (Most Likely Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU
2026-27	5966	359	350	1273	1036	2250	34	**11268**	**23883**
2027-28	6377	366	362	1306	1074	2346	35	**11866**	**24992**
2028-29	6818	373	374	1339	1114	2446	36	**12500**	**26159**
2029-30	7290	380	387	1373	1155	2550	37	**13172**	**27386**
2030-31	7783	387	400	1406	1196	2654	38	**13864**	**28634**
2031-32	8309	394	414	1440	1238	2763	39	**14597**	**29945**
2032-33	8871	401	428	1475	1281	2877	41	**15374**	**31324**
2033-34	9471	408	443	1510	1326	2995	43	**16196**	**32775**
2034-35	10111	415	458	1546	1372	3118	45	**17065**	**34301**
2035-36	10764	422	473	1579	1415	3234	47	**17934**	**35796**
2036-37	11460	429	489	1613	1460	3354	49	**18854**	**37366**

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU
2037-38	12203	436	506	1647	1506	3478	51	**19827**	**39014**
2038-39	12992	443	523	1682	1553	3607	53	**20853**	**40745**
2039-40	13833	450	542	1718	1603	3741	55	**21942**	**42563**
2040-41	14677	456	559	1750	1648	3864	57	**23011**	**44316**
2041-42	15573	462	576	1783	1694	3991	59	**24138**	**46152**
2042-43	16523	468	595	1816	1741	4122	61	**25326**	**48077**
2043-44	17532	474	614	1850	1790	4257	63	**26580**	**50094**
2044-45	18602	480	633	1884	1841	4398	65	**27903**	**52209**

6.2 Modification in Concession Period

As per Article 29 of the concession agreement, if actual traffic on the project falls short or exceeds Target Traffic on project highway on defined date, concession period shall be modified subject to calculation stipulated therein. For Solapur- Yedeshi project, the Target Date and Target Traffic are defined as under:

Target Date - 1stOctober 2023

Target Traffic - 22210 in PCU

The Independent Engineer (IE), vide its letter dated 14 January 2026, has recommended an extension of the Concession Period by 318 days on account of variation in traffic growth, as per Clause 29.2 of the Concession Agreement.

CHAPTER 7

FORECAST OF TOLL REVENUE

7.1 General

This chapter presents the tolling rate calculations, categories and toll revenue of the project.

7.2 Discount Categories

As per the Toll Notification (Schedule -R) the discounts and special provisions have been considered. In addition to discounts as per Fee Notification concessionaire has declared special category rates also. Salient features of toll rate structure are given as under

1. Monthly Pass: For frequent user's monthly pass would be issued for 50 trips at 2/3rd rate as per provision of fee notification.
2. Multiple Journeys (for Return Trip): Will be charged at 1.5 times single journey.
3. Single Journey: Full single journey toll would be charged to this category of vehicles who are infrequent travelers or whose frequency does not yield any discount from the above categories.
4. Local Discounts: There are several categories of local discounts.
    a) Local Car – Rs. 350 Per Month
    b) Local Commercial Traffic at 50% rate for single trip.

Building of inflation and escalation of rate on the basis of WPI are done as per toll notification (Schedule G) as given under as extract from concession agreement.

The formula for determining the applicable rate of fee shall be as follows:-

$$\text{Applicable rate of fee} = \text{base rate} + \text{base rate} \times \left\{ \frac{\text{WPI A-WPI B}}{\text{WPI B}} \right\} \times 0.4$$

Factors of inflation / growth have been incorporated as per Schedule R. WPI are available up to the year 2025-26.

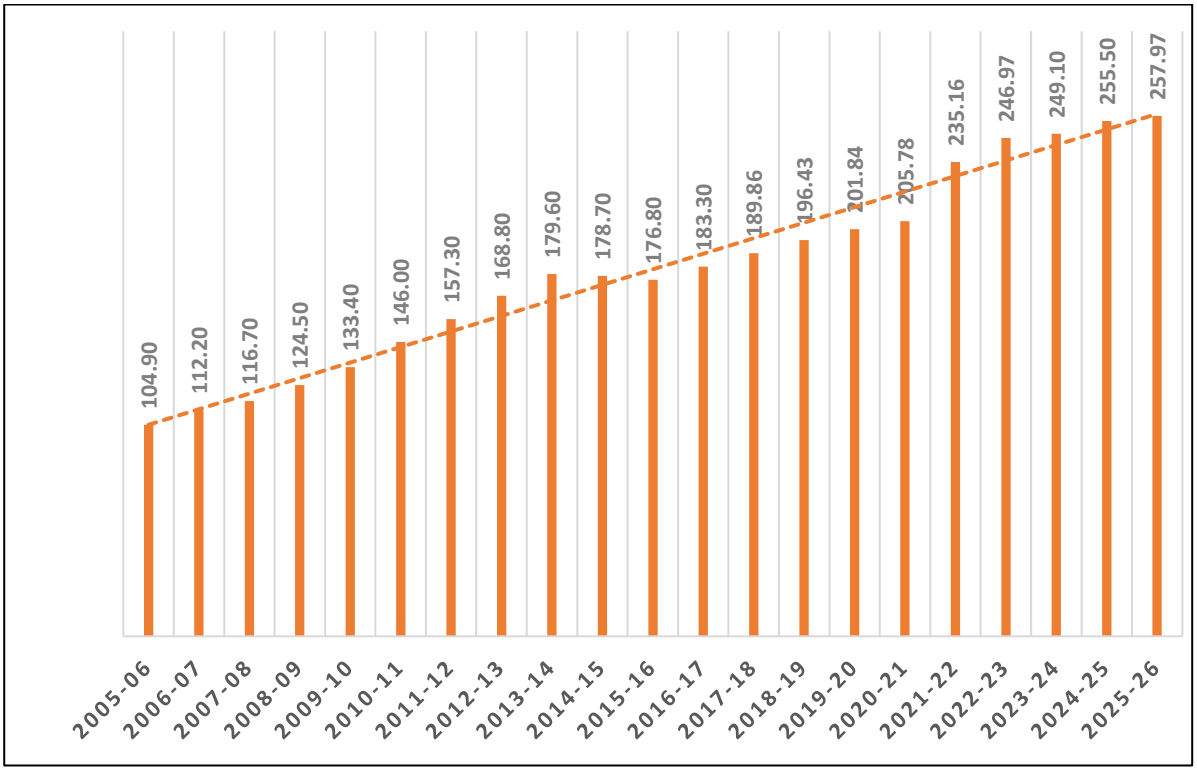

Figure 7-1 : Historical Rate of WPI Inflation in India

The wholesale price index (WPI) and the inflation rate in the past are presented in Table below.

Table 7-1 : Historical WPI value and Growth Inflation

December of year	2021	2022	2023	2024	2025	Avg.
WPI	235.2	247.0	249.1	255.5	257.97	
Inflation	14.27%	5.02%	0.86%	2.57%	0.96%	4.74%

WPI of December 2025 is posted on ministry site which is shows 0.96% inflation from the previous year. Same has been applied for FY 2026-27.
The average WPI inflation over the period FY 2021 to FY 2025 works out to approximately 4.74%, reflecting inflationary cycles across both high and low inflation years. Based on this analysis, an annual escalation factor of 4.5% has been adopted for the remaining concession period.

7.3 Estimation of Toll Rates

As per the applicable MORTH notification and Schedule R of contract agreement, the following Base rate of fee for the categories mentioned in the table stands true in the National Highways Fee Rules applicable for contract.

Table 7-2 : Base Toll Rates June 2007-08

Type of Vehicle	Base Rate of Fee / Km (in Rs.)
Car, Jeep, Van or Light Motor Vehicle	0.65
Light Commercial Vehicle, Light Goods Vehicle or Minibus	1.05
Bus or Truck (Two Axles)	2.20
Three Axle Commercial Vehicles	2.40
Heavy Construction Machinery (HCM) or Earth Moving Equipment (EME) or Multi Axle Vehicle (MAV) (4 to 6 axles)	3.45
Oversized Vehicles (7 or more Axles)	4.20

There is no bypass or structure to be factored in for rates calculations.

Toll rates are calculated as per guidelines provided in schedule R (rounded to nearest Rs.) for the concession period and are given below.

Thus, worked out rates for various categories of vehicle and discounts are given as under

Table 7-3 : Toll Rates for Single Journey@ Toll Plaza 1- Tamalwadi 19.300 KM

Year	Car	Minibus /LCV	Bus	Truck	3 - Axle	Multi axle	Oversized Vehicles
2026-27	80	130	265	265	290	420	510
2027-28	85	135	280	280	305	440	535
2028-29	85	140	295	295	320	460	560
2029-30	90	145	305	305	335	480	585
2030-31	95	155	320	320	350	505	615
2031-32	100	160	335	335	365	530	645
2032-33	105	170	355	355	385	555	675
2033-34	110	175	370	370	405	580	705
2034-35	115	185	385	385	420	605	740
2035-36	120	195	405	405	445	635	775
2036-37	125	205	425	425	465	665	810
2037-38	130	215	445	445	485	700	850
2038-39	140	225	465	465	510	735	890
2039-40	145	235	490	490	535	770	935
2040-41	150	245	515	515	560	805	980
2041-42	160	255	540	540	590	845	1030
2042-43	165	270	565	565	615	885	1080
2043-44	175	285	595	595	645	930	1135

Year	Car	Minibus /LCV	Bus	Truck	3 - Axle	Multi axle	Oversized Vehicles
2044-45	185	295	625	625	680	975	1190

Table 7-4 : Toll Rates for Single Journey @ Toll Plaza 2- Yedashi 77.400 KM

Year	Car	Minibus /LCV	Bus	Truck	3 - Axle	Multi axle	Oversized Vehicles
2026-27	80	130	270	270	290	420	510
2027-28	85	135	280	280	305	440	535
2028-29	85	140	295	295	320	460	560
2029-30	90	145	305	305	335	480	585
2030-31	95	155	320	320	350	505	615
2031-32	100	160	335	335	370	530	645
2032-33	105	170	355	355	385	555	675
2033-34	110	175	370	370	405	580	705
2034-35	115	185	390	390	425	610	740
2035-36	120	195	405	405	445	635	775
2036-37	125	205	425	425	465	670	815
2037-38	130	215	445	445	485	700	850
2038-39	140	225	470	470	510	735	895
2039-40	145	235	490	490	535	770	935
2040-41	150	245	515	515	560	805	985
2041-42	160	260	540	540	590	845	1030
2042-43	165	270	565	565	620	890	1080
2043-44	175	285	595	595	650	930	1135
2044-45	185	300	625	625	680	980	1190

Table 7-5 : Toll Rates for Return Journey@ Toll Plaza 1- Tamalwadi 19.300 KM

Year	Car	Minibus /LCV	Bus	Truck	3 - Axle	Multi axle	Oversized Vehicles
2026-27	120	190	400	400	435	630	765
2027-28	125	200	420	420	460	660	800
2028-29	130	210	440	440	480	690	840
2029-30	135	220	460	460	500	720	880
2030-31	140	230	480	480	525	755	920
2031-32	150	240	505	505	550	790	965
2032-33	155	250	530	530	575	830	1010
2033-34	165	265	555	555	605	870	1060
2034-35	170	275	580	580	635	910	1110
2035-36	180	290	610	610	665	955	1160
2036-37	190	305	640	640	695	1000	1220

Year	Car	Minibus /LCV	Bus	Truck	3 - Axle	Multi axle	Oversized Vehicles
2037-38	200	320	670	670	730	1050	1275
2038-39	205	335	700	700	765	1100	1340
2039-40	215	350	735	735	800	1155	1405
2040-41	230	370	770	770	840	1210	1470
2041-42	240	385	810	810	880	1270	1545
2042-43	250	405	850	850	925	1330	1620
2043-44	265	425	890	890	970	1395	1700
2044-45	275	445	935	935	1020	1465	1785

Table 7-6 : Toll Rates for Return Journey @ Toll Plaza 2- Yedashi 77.400 KM

Year	Car	Minibus /LCV	Bus	Truck	3 - Axle	Multi axle	Oversized Vehicles
2026-27	120	190	400	400	440	630	765
2027-28	125	200	420	420	460	660	800
2028-29	130	210	440	440	480	690	840
2029-30	135	220	460	460	505	725	880
2030-31	145	230	485	485	525	755	920
2031-32	150	240	505	505	550	795	965
2032-33	155	255	530	530	580	830	1010
2033-34	165	265	555	555	605	870	1060
2034-35	170	280	580	580	635	910	1110
2035-36	180	290	610	610	665	955	1165
2036-37	190	305	640	640	695	1000	1220
2037-38	200	320	670	670	730	1050	1280
2038-39	205	335	700	700	765	1100	1340
2039-40	215	350	735	735	805	1155	1405
2040-41	230	370	770	770	840	1210	1475
2041-42	240	385	810	810	885	1270	1545
2042-43	250	405	850	850	925	1330	1620
2043-44	265	425	890	890	970	1400	1700
2044-45	275	445	935	935	1020	1465	1785

Table 7-7 : Toll Rates for Monthly Pass Local @ Toll Plaza 1- Tamalwadi 19.300 KM

Year	Car
2026-27	360
2027-28	375
2028-29	395
2029-30	415
2030-31	430
2031-32	455
2032-33	475
2033-34	495

Year	Car
2034-35	520
2035-36	545
2036-37	570
2037-38	600
2038-39	630
2039-40	660
2040-41	690
2041-42	725
2042-43	760
2043-44	800
2044-45	835

Table 7-8 : Toll Rates for Monthly Pass Local @ Toll Plaza 2- Yedashi 77.400 KM

Year	Car
2025-26	360
2026-27	375
2027-28	395
2028-29	415
2029-30	430
2030-31	455
2031-32	475
2032-33	495
2033-34	520
2034-35	545
2035-36	570
2036-37	600
2037-38	630
2038-39	660
2039-40	690
2040-41	725
2041-42	760
2042-43	800
2043-44	835
2044-45	360

Table 7-9 : Toll Rates for Monthly Pass @ Toll Plaza 1- Tamalwadi 19.300 KM

Year	Car	Minibus /LCV	Bus	Truck	3 - Axle	Multi axle	Oversized Vehicles
2026-27	2635	4255	8910	8910	9720	13975	17010
2027-28	2755	4455	9330	9330	10180	14630	17810
2028-29	2885	4660	9770	9770	10655	15320	18650
2029-30	3020	4880	10230	10230	11160	16040	19530
2030-31	3165	5115	10715	10715	11685	16800	20450
2031-32	3315	5355	11220	11220	12240	17595	21420

Year	Car	Minibus /LCV	Bus	Truck	3 - Axle	Multi axle	Oversized Vehicles
2032-33	3475	5610	11755	11755	12825	18435	22440
2033-34	3640	5880	12315	12315	13435	19315	23510
2034-35	3815	6160	12905	12905	14080	20235	24635
2035-36	3995	6455	13525	13525	14755	21210	25820
2036-37	4190	6765	14175	14175	15465	22230	27065
2037-38	4390	7090	14860	14860	16210	23305	28370
2038-39	4605	7435	15580	15580	16995	24435	29745
2039-40	4825	7800	16340	16340	17825	25620	31190
2040-41	5060	8180	17135	17135	18690	26870	32710
2041-42	5310	8580	17975	17975	19605	28185	34310
2042-43	5570	9000	18855	18855	20570	29565	35995
2043-44	5845	9440	19780	19780	21580	31020	37765
2044-45	6135	9910	20760	20760	22645	32555	39630

Table 7-10 : Toll Rates for Monthly Pass @ Toll Plaza 2- Yedashi77.400 KM

Year	Car	Minibus /LCV	Bus	Truck	3 - Axle	Multi axle	Oversized Vehicles
2026-27	2635	4260	8920	8920	9735	13990	17035
2027-28	2760	4460	9340	9340	10190	14650	17835
2028-29	2890	4670	9780	9780	10670	15340	18670
2029-30	3025	4890	10240	10240	11175	16060	19555
2030-31	3170	5120	10725	10725	11700	16820	20480
2031-32	3320	5360	11235	11235	12255	17620	21450
2032-33	3475	5615	11770	11770	12840	18455	22470
2033-34	3645	5885	12330	12330	13450	19335	23540
2034-35	3820	6165	12920	12920	14095	20265	24670
2035-36	4000	6465	13540	13540	14770	21235	25850
2036-37	4195	6775	14195	14195	15485	22260	27095
2037-38	4395	7100	14880	14880	16230	23335	28405
2038-39	4610	7445	15600	15600	17020	24465	29780
2039-40	4835	7805	16360	16360	17845	25655	31230
2040-41	5070	8190	17155	17155	18715	26905	32750
2041-42	5315	8590	17995	17995	19630	28220	34355
2042-43	5580	9010	18880	18880	20595	29605	36040
2043-44	5850	9455	19805	19805	21610	31060	37815
2044-45	6140	9920	20785	20785	22675	32595	39680

7.4 Toll Revenue

As indicated earlier, toll revenue on the Project Road has been calculated in all three scenarios based on the above rates and projected traffic. The estimates of toll revenue under ***Optimistic***, ***Pessimistic*** and ***Most Likely*** growth scenarios are presented in the following section.

7.5 Toll Revenue at all toll plazas under Scenarios

Toll Revenue estimates under all scenarios at each of the toll plaza up to 2044-45 starting from the year 2026-27 are shown in tables below.

Table 7-11 : Toll Revenue Optimistic Scenario

(Rs. Crores)

Year	Toll Plaza Km 19.300	Toll Plaza Km 77.400	Total
2026-27	102.47	77.25	**179.72**
2027-28	112.90	84.72	**197.63**
2028-29	122.56	92.00	**214.55**
2029-30	134.50	100.62	**235.13**
2030-31	148.02	110.78	**258.80**
2031-32	163.82	121.86	**285.69**
2032-33	179.71	133.20	**312.91**
2033-34	197.81	145.94	**343.75**
2034-35	216.33	160.14	**376.47**
2035-36	237.74	174.44	**412.18**
2036-37	260.06	190.68	**450.73**
2037-38	285.37	207.91	**493.29**
2038-39	314.60	228.64	**543.25**
2039-40	345.69	250.16	**595.85**
2040-41	377.09	271.64	**648.74**

Year	Toll Plaza Km 19.300	Toll Plaza Km 77.400	Total
2041-42	413.78	297.05	**710.83**
2042-43	450.70	323.52	**774.23**
2043-44	498.25	354.98	**853.24**
2044-45	543.85	386.89	**930.75**

Table 7-12 : Toll Revenue Pessimistic Scenario (Rs. Crores)

Year	Toll Plaza Km 19.300	Toll Plaza Km 77.400	Total
2026-27	101.99	76.91	**178.89**
2027-28	111.82	83.93	**195.75**
2028-29	120.81	90.68	**211.50**
2029-30	132.00	98.71	**230.70**
2030-31	144.59	108.15	**252.74**
2031-32	159.29	118.41	**277.70**
2032-33	173.93	128.77	**302.71**
2033-34	190.56	140.39	**330.94**
2034-35	207.44	153.33	**360.77**
2035-36	226.79	166.21	**392.99**
2036-37	246.90	180.83	**427.73**
2037-38	269.66	196.21	**465.87**
2038-39	295.92	214.78	**510.69**
2039-40	323.58	233.87	**557.45**
2040-41	351.26	252.71	**603.97**
2041-42	383.59	275.01	**658.60**
2042-43	415.83	298.14	**713.97**

Year	Toll Plaza Km 19.300	Toll Plaza Km 77.400	Total
2043-44	457.52	325.66	**783.18**
2044-45	497.01	353.22	**850.23**

Table 7-13 : Toll Revenue Most Likely Scenario

(Rs. Crores)

Year	Toll Plaza Km 19.300	Toll Plaza Km 77.400	Total
2026-27	102.21	77.08	**179.29**
2027-28	112.32	84.33	**196.64**
2028-29	121.62	91.34	**212.95**
2029-30	133.18	99.63	**232.81**
2030-31	146.24	109.40	**255.64**
2031-32	161.45	120.05	**281.50**
2032-33	176.69	130.93	**307.62**
2033-34	194.06	143.11	**337.17**
2034-35	211.73	156.71	**368.44**
2035-36	232.08	170.32	**402.39**
2036-37	253.27	185.76	**439.03**
2037-38	277.25	202.08	**479.33**
2038-39	304.97	221.70	**526.67**
2039-40	334.35	242.01	**576.35**
2040-41	363.85	262.16	**626.01**
2041-42	398.29	286.01	**684.29**
2042-43	432.84	310.79	**743.63**
2043-44	477.47	340.27	**817.73**
2044-45	519.95	369.96	**889.91**

CHAPTER 8

CONCLUSION & RECOMMENDATIONS

8.1 Conclusion & Recommendations

Project stretch of Solapur to Yedashi section of NH-211 in state of Karnataka from km 0.000 to km 100.000has been widened to four lane. The road is in sound condition and serves healthy traffic volumes. Project corridor is the main transport link for Karnataka-Marathwada traffic. There are large number of townships, industrial corridors and other business establishments coming up along the project corridor. As Indian economy is poised to grow at 6%+ post COVID-19, the project corridor is expected to pick up the same trend in terms of traffic flow. All these developments have potential to give a positive impact to traffic flow on the project. The following can be considered as major outcomes of the study.

a) There is a good amount of tollable traffic running on the project.

b) Project corridor has potential to witness traffic growth @ 6-8% annually in near future due to various development in area and overall development of economy.

c) The Project corridor has committed traffic as long route traffic and does not run a risk of traffic leakage due to quality competing road.

Based on the above it can be considered a stable healthy project from the traffic and revenue point of view.

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IRB INFRASTRUCTURE TRUST

UDAIPUR TO GUJARAT BORDER ON NH 8 (KM 287.400 TO KM 401.200) IN THE STATE OF RAJASTHAN

MAY 2026

TRAFFIC STUDY & REVENUE PROJECTION REPORT (FINAL)

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UDAIPUR TO GUJARAT BORDER SECTION OF NH-8

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ABBREVIATIONS

AADT	-	Annual Average Daily Traffic	**NHAI**	-	National Highway Authority of India
BOT	-	Build Operate Transfer	**NHDP**	-	National Highways Development Project
CAGR	-	Compound Annual Growth Rate	**NSDP**	-	Net State Domestic Product
CTV	-	Classified traffic volume	**O&M**	-	Operation & Maintenance
DBFOT	-	Design, Build, Finance, Operate & Transfer	**PCDP**	-	Per Capita Domestic Product
EME	-	Earth Moving Equipment	**PCI**	-	Per Capita Income
GDP	-	Gross Domestic Product	**PCU**	-	Passenger Car Unit
GSDP	-	Gross State Domestic Product	**PSC**	-	Pre-stressed Concrete
HCM	-	Heavy Construction Machinery	**RCC**	-	Reinforced cement concrete
HCV	-	Heavy Commercial Vehicle	**RHS**	-	Right Hand Side
HTMS	-	Highway Traffic Management System	**SH**	-	State Highway
IRC	-	Indian Road Congress	**TP**	-	Toll Plaza
IRR	-	Internal Rate of Return	**WPI**	-	Wholesale Price Index
LCV	-	Light Commercial Vehicle	**SIR**	-	Special Investment Region
LHS	-	Left Hand Side	**c.**	-	Circa
LGV	-	Light Goods Vehicle	**ROB**	-	Railway Over Bridge
MAV	-	Multi Axle Vehicle	**MDR**	-	Major District Road
MORTH	-	Ministry of Road Transport and Highways	**ODR**	-	Other District Road
NH	-	National Highway	**CA**	-	Concession Agreement
PCC	-	Plain Cement Concrete	**RMT**	-	Running Meter
CR	-	Coarse Rubble			

CHAPTER 1

INTRODUCTION

1.1 Background

The Government of India through National Highway Authority of India (NHAI) embarked upon a program to enhance the traffic capacity and safety for efficient transportation of goods as well as passenger traffic on National Highway Sections under NHDP Phase V. Under Phase V NHAI has planned to convert 6,500 km of existing 4-lane National Highways into 6-lane National Highway. Sections envisaged under 6-laning comprise the Golden Quadrilateral section (5,700 km) and some other sections which are 800 km in length.

The project under consideration, Six Laning of section from Km 287.400 to Km 401.200 of NH-8 in state of Rajasthan and Gujarat is one such road project NHAI intended to implement on a BOT basis in the DBFOT format. *M/s Udaipur Tollway Ltd*. (Concessionaire) has been awarded the Project for a concession period of 21 years starting from 3rd September 2017. The Project has been commissioned and is currently in the operation / maintenance phase. Six laning of project has also been completed in June 2021.

The length of the project road is 113.800 Km approx. The project road is section of NH-8, one of the busiest national highways of India and part of Mumbai – Delhi arm of golden quadrilateral.

Project road alignment passes through the rural area in most part of stretch. After Udaipur there is no major urban establishment other than Rishabhdeo, a famous religious place in the region. The following figure shows project road in regional context.

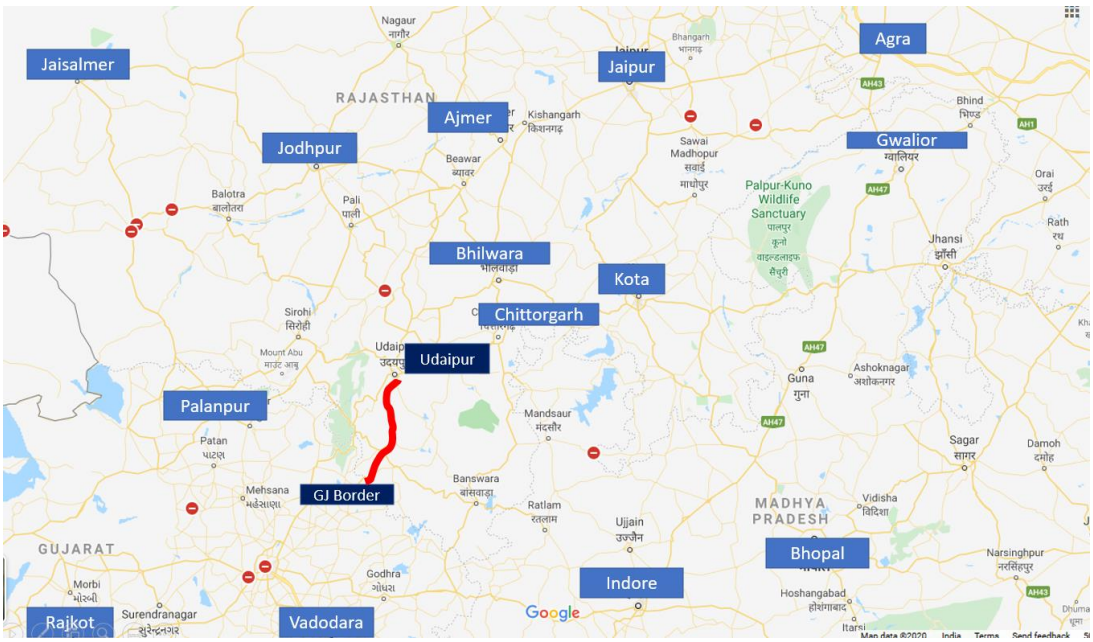

Figure 1-1 : Alignment of Project Stretch

1.2 Objective of the Study

M/s IRB INFRASTRUCTURE TRUST has engaged *GMD Consultants* to assess the future traffic and toll potential of project along with related operation & maintenance expenditure involved.

This report named as **"Traffic Study & *Toll Revenue Projection Report*"** mainly focuses on traffic and revenue aspects of the project. Other parameters like competing road, area developments etc. have been considered from a traffic development point of view.

1.2.1 Scope of Services

The broad scope of work covered in the assignment is as follows.

a) Analysis of Traffic Growth
b) Toll Rate Growth
c) Revenue Forecasting

The Concessionaire has provided basic traffic data and other project details on the basis of which the above analysis has been carried out.

CHAPTER 2

PROJECT DETAILS

2.1 Project Corridor

National Highway 8 is one of the busiest national highways of India. Project stretching from Udaipur to Gujarat border on NH-8 is part of Delhi Mumbai arm of Golden quadrilateral.

Besides being part of major transport link between Mumbai and Delhi, stretching from Udaipur to Shamlaji forms major connectivity between Udaipur, Ahmedabad, Rajkot Jamnagar and Porbandar. After renumbering of all national highways by National Highway Authority of India in 2010, the current NH 48 was formed by merging the old NH 8 (Delhi-Mumbai section) and NH 4 (Mumbai-Chennai). National Highway 48 starts at Delhi and terminates at Chennai and goes through Jaipur, Udaipur, Vadodara, Mumbai, Pune and Bengaluru, traversing through six states of India.

2.2 Project Stretch Description

Section of NH-8 (New NH-48) from Udaipur to Gujarat Border is part of major transportation link in the area connecting industrial / tourist cities of Udaipur-, Ahmedabad, Vadodara, Mumbai. Project stretch would be faster connectivity to Udaipur from Gujarat border and onwards to Ahmedabad once six laning is complete.

Project stretch from Udaipur to Gujarat border as such passes through rural areas. The area has a number of green marble mines and there are many establishments on the way. Rishabhdeo in one such area having more than 500 such units.

Major religious centers like Shamlaji and Ekling ji contribute to substantial passenger traffic on project stretch.

There is one operative toll plaza at project stretch at Khandi Obri at 348.450 km. The following figure shows project alignment and toll plaza location.

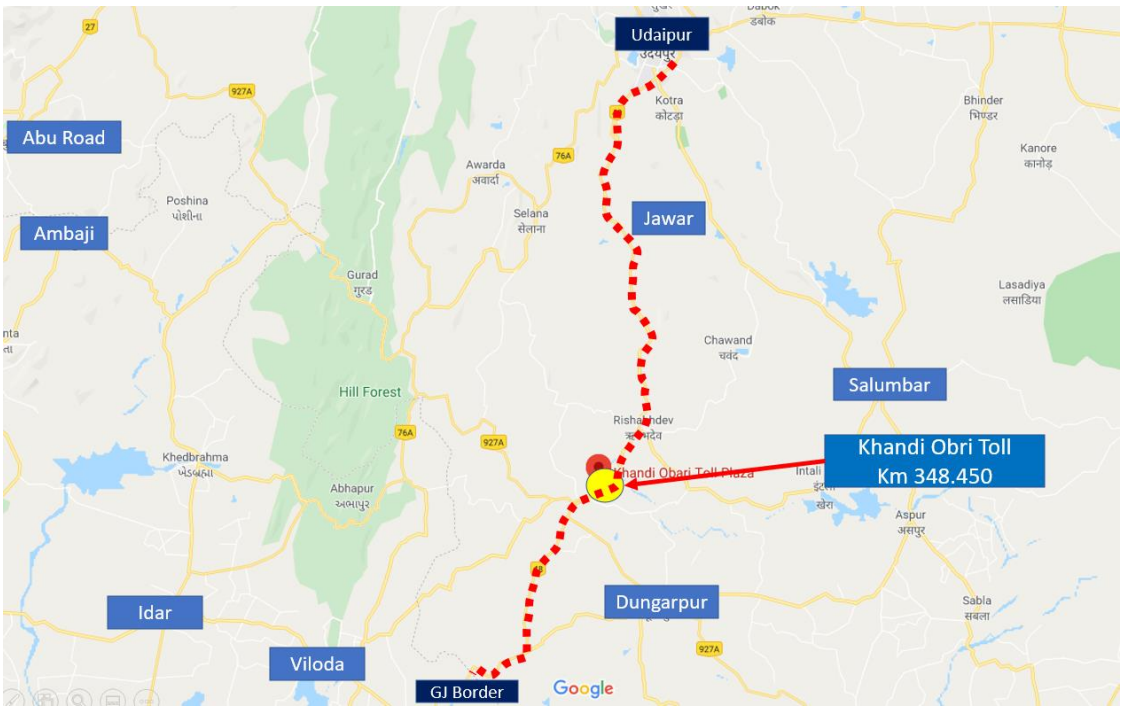

Figure 2-1 : Project Alignment with Toll Plaza

2.3 Project Corridor Illustration

The sixth laning of the project stretch is completely underway and is expected to be completed soon. The following photographs illustrate the project section along the corridor.

Figure 2-2 : Photographs showing Project Corridor

CHAPTER 3

TRAFFIC SURVEYS AND ANALYSIS

3.1 Traffic Surveys

The Consultants have collected the required information for project corridor to understand the general traffic and travel characteristics in the corridor.

The following traffic data has been collected from a client for a project.

- Classified traffic volume counts at toll plaza location on Udaipur – Gujarat section of NH-8 for year 2017-18, 2018-19, 2019-20, 2020-21 ,2021-22,2022-23,2023-24,2024-25, and Annual traffic data from April 2025 to February 2026.
- Local Component of traffic
- Component of Return Journey
- Component of Monthly Pass Journey

The main objective of the traffic data analysis is to:

- Determine the existing traffic movement characteristics of the project.
- Establish base year traffic.
- Identification of travel patterns and modal split of project traffic
- Deriving growth factors for traffic forecasting
- Estimation of corridor traffic including traffic diversion if any
- Preparation of revenue model and projection of revenue as per toll policy for various scenarios

Table 3-1 below lists provides details of locations from where traffic details have been collected.

Table 3-1 : Traffic Data Details

SR. No	LOCATION	CTV	Single Journey Traffic	Daily Return Journey	Monthly Pass	Local Pass
1	**Km 348.450 Toll Plaza at Khandi Obri**	AADT for Year 2017-18, 2018-19, 2019-20,2020-21 ,2021-22, 2022-23, 2024-25 & Eleven months from April 2025 to February 2026	For Year 2017-18, 2018-19, 2019-20, 2020-21, 2021-22, 2022-2023, 2024-25 & Eleven months from April 2025 to February 2026	For Year 2017-18, 2018-19, 2019-20, 2020-21, 2021-22, 2022-2023, 2024-25 & Eleven months from April 2025 to February 2026	For Year 2017-18, 2018-19, 2019-20, 2020-21, 2021-22, 2022-2023, 2024-25 & Eleven months from April 2025 to February 2026	For Year 2017-18, 2018-19, 2019-20, 2020-21, 2021-22, 2022-2023, 2024-25 & Eleven months from April 2025 to February 2026

3.2 Classified traffic Volume

The objective of conducting a Classified Traffic Volume Count is to understand the traffic flow pattern including modal split on a roadway. The Classified Traffic Volume Count survey has been provided by the concessionaire of project highway from actual traffic data gathered at toll plaza locations based on monthly data shared with NHAI.

The vehicles can broadly be classified into fast moving / motorized and slow moving / non-motorized vehicles, which can be further classified into specific categories of vehicles. The groupings of vehicles are further segregated to capture the tollable vehicle categories specifically and toll exempted vehicles are counted separately. The detailed vehicle classification system as per IRC: 64-1990 is given in the table below.

Table 3-2 : Vehicle Classification System

Vehicle Type	
Auto Rickshaw	
Passenger Car	Car, Jeep, Taxi & Van (Old / new technology)
Bus	Minibus
	Standard Bus
Truck	Light Goods Vehicle (LCV)
	2 – Axle Truck
	3 Axle Truck (HCV)
	Multi Axle Truck (4-6 Axle)
	Oversized Vehicles (7 or more axles)
Other Vehicles	Agriculture Tractor, Tractor & Trailer

Source - IRC: 64 – 1990

However, since the project highway is currently under toll operation, the data collected corresponds to the category of tollable vehicles. The following are the types of vehicles as per concession agreement.

- Car / Jeep / van
- Min Bus /LCV
- Truck / Bus
- Multi Axle

3.3 Traffic Characteristic

Toll revenue of project highway does not solely depend on traffic volume. There are certain characteristics of traffic which have substantial potential to affect toll collection. Component of local traffic, component of passenger and commercial traffic, portion of return journey traffic, % of monthly pass traffic are some of such characteristics of traffic. These will be discussed in subsequent sections of the report.

3.3.1 Traffic Data

Project concessionaire has provided Traffic data for the years 2019-20 ,2020-21, 2021-22, 2022-23 ,2023-24,2024- 25 & traffic data from April 2025 to February 2026.
Since the traffic data available for this update is for only Annual, from April 2025 to February 2026, it may not represent the whole year traffic. Hence a seasonality factor for balance part of year has been applied to average traffic of the current Eleven months to arrive at Annual Average Daily Traffic of base year 2025-26. Thus, corrected traffic is used for future projections and revenue calculations. The following table shows historical traffic on project stretch and derived Annual Average Daily Traffic (AADT) for year 2025-26.

Table 3-3 : Traffic Data at Khandi Obri Toll Plaza at Km 348.450

Sr. No	Type of Vehicle	Annual Average Daily Traffic (Nos.)- 2019-20	Annual Average Daily Traffic (Nos.)- 2020-21	Annual Average Daily Traffic (Nos.)- 2021-22	Annual Average Daily Traffic (Nos.)- 2022-23	Annual Average Daily Traffic (Nos.)- 2023-24	Annual Average Daily Traffic (Nos.)- 2024-25	Annual Average Daily Traffic (Nos.)- 2025-26
1	Car	4532	3574	4773	5335	6220	7147	9351
2	LCV	934	737	619	672	777	809	849
3	Bus	800	472	661	781	894	811	909
4	Truck	1448	1402	1703	1864	2213	2232	2127
5	3-Axle	1806	1548	1691	1724	1934	1796	1800
6	Multi Axle	3717	3367	3887	4157	4868	4798	4796
7	Oversized Vehicle	11	13	21	13	13	9	8
	Total	**13248**	**11113**	**13355**	**14545**	**16919**	**17602**	**19838**

3.4 Data Analysis

3.4.1 Analysis of Traffic Volume Count

Understanding the character of existing traffic forms the basis of the traffic forecast. The various vehicle types having different sizes and characteristics can be converted into a single unit called Passenger Car Unit (PCU). Passenger Car equivalents for various vehicles are adopted based on recommendations of Indian Road Congress prescribed in “IRC-64-1990: Guidelines for Capacity of Roads in Rural areas”. The adopted passenger car unit values (PCU) are presented in

Table 3-4.

Table 3-4 : PCU Factors Adopted for Study

Vehicle Type	PCUs
Car	1.0
Minibus	1.5
Standard Bus	3.0
LCV/LGV	1.5
2 Axle Truck	3.0
3 – 6 Axle Truck	4.5
MAV	4.5
Auto Rickshaw	1.0
Van/Tempo	1.0
Agriculture Tractor with Trailer	4.5
Agriculture Tractor without Trailer	1.5

Source: IRC: 64-1990

Traffic volume at each toll plaza was converted to PCU and same is presented as under

Table 3-5 : Traffic in PCU at Project Stretch Base Year 2023-24

Year	Toll Plaza Location (Km)	Traffic No	PCU	PCU Index
2019-20	Khandi Obri at Km 348.450	13248	34871	2.63
2020-21	Khandi Obri at Km 348.450	11113	30155	2.71
2021-22	Khandi Obri at Km 348.450	13355	35453	2.65
2022-23	Khandi Obri at Km 348.450	14545	38213	2.63
2023-24	Khandi Obri at Km 348.450	16919	44472	2.63
2024-25	Khandi Obri at Km 348.450	17602	44509	2.53
2025-26	Khandi Obri at Km 348.450	19838	46745	2.36

It can be observed from above that project traffic has PCU index more than 2.5 which is an indicator of high proportion of commercial traffic in traffic mix in project corridor.

3.4.2 Components of Traffic

As discussed previously, components of traffic volume play an important role in determining project revenue. A larger component of commercial traffic with higher axle configuration adds to project revenue positively. Similarly, a larger component of local traffic affects the project revenue potential negatively.

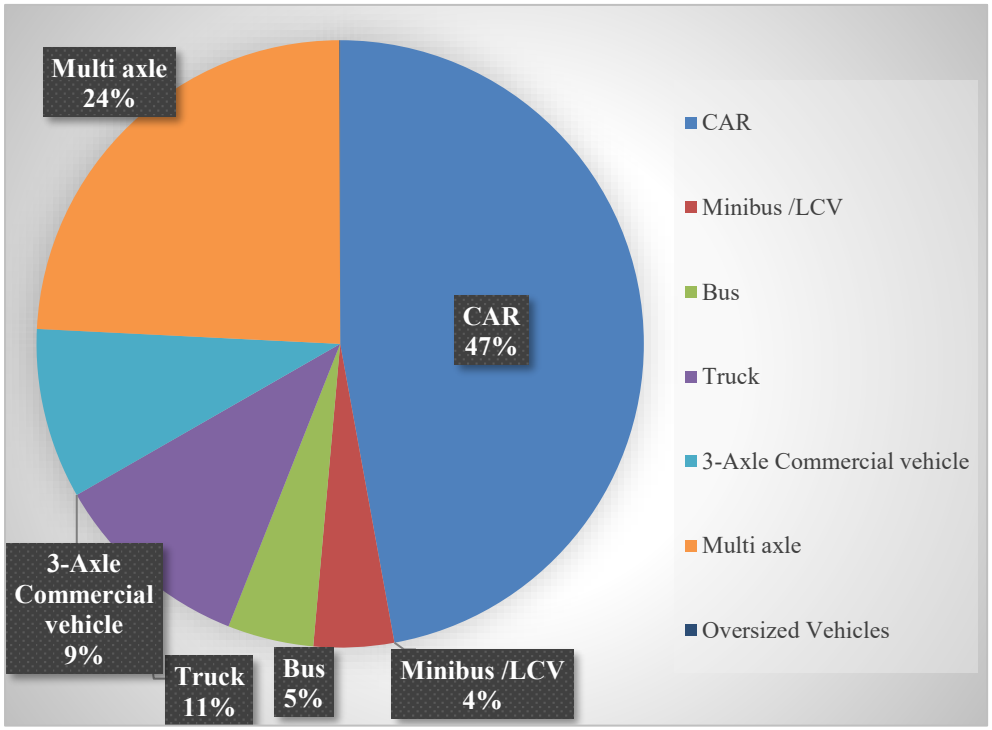

Figure 3-1 : Model Split of Tollable Vehicle

It is observed that car traffic forms about 47% of total traffic at toll plaza locations while multi axle commercial vehicles are about 33% of total traffic. Truck /Bus and LCV share about 16% and 4 % of traffic volume respectively.

Another important bifurcation of traffic is components of traffic with respect various type of toll ticketing like

1. Single Journey
2. Multi Journey
3. Local Commercial Single Journey
4. Monthly Pass Local
5. Monthly Pass
6. Annual Pass Car

The following table provides numbers of vehicles falling in each of above category on base year 2025-26

Table 3-6 : Journey Type Bifurcation of Traffic at Khandi Obri TP KM 348.450

Sr. No	Type	Traffic Volume (Nos.) 2025-26
1	Single Journey	14035

Sr. No	Type	Traffic Volume (Nos.) 2025-26
2	Return Journey	3178
3	Local Commercial Single Journey	187
4	Monthly Pass Local	63
5	Monthly Pass	0
6	Annual Pass Car	2375

Most dominant part of the above is the single journey type followed by return journey at project stretch. Monthly pass commuters are a very low fraction of the total traffic on the project corridor.

The single journey component in total traffic numbers is as high as 71%. Return journey component is 16%. The number of monthly pass Local is 0% and Local Commercial Single journey is 1% and Annual Pass Car is 12% at Khandi Obri toll plaza.

It is observed that the project corridor demonstrates pattern of single journey dominating mix of traffic which is typical of major national highways having more long-distance traffic.

3.5 Secondary Data Collection

There are several other factors which have a substantial impact on traffic patterns and growth on any project corridor. The following are some of such important factors.

- Industrial development around project corridor and its catchment
- Educational infrastructure along project corridor
- Demographic pattern
- Urban area development
- Tourism potential
- Upcoming major infrastructural or Industrial projects
- Special Industry in project corridor
- Overall trends of economic growth local as well as national / regional

Hence in addition to traffic details on the project site, secondary data was also collected from various other sources. Typical secondary data includes the following:

1. Vehicle registration data of regional and national level.
2. Economic Data
   a) GDP
   b) NSDP
   c) Population Growth
   d) Per Capita Income growth
   e) Industrial Growth
   f) Special Industry Potential
   g) Regional and National development vision / plan
   h) Any other relevant data
3. Competing road network

We have collected and utilized such underlying data in the study to estimate the growth and risk factors for traffic along the project corridor.

CHAPTER 4

INFLUENCE ZONE TRANSPORT NETWORK ANALYSIS

4.1 Introduction

Highway corridors behave like integrated circuit networks and more often than not every road is connected to various networks having different origins and destinations. Traffic running on these networks behaves like fluid and flow on network on alignment of least friction.

Following Factors can be considered as major contributors to friction on transportation network.

- Travel Speed / Travel Time
- Geometric deficiencies like blind horizontal curves and steep vertical gradients etc,
- Configuration of road
- Riding quality
- Traffic delays,
- Length of road,
- Passing through built up or Urban Area,
- Terrain,
- Facilities,

4.2 Competing / Alternate route

Project stretch is part of Delhi – Mumbai arm of golden quadrilateral transport network. Additionally, it also forms good connectivity to Ahmedabad, Rajkot, Jamnagar and other port and industrial establishments in bay of Khambat of Gujarat.
At regional level, there can be three alternates for Udaipur- Ahmedabad pair of Origin & Destination. One via project road (Udaipur – Rishabhdeo- Shamlaji- Ahemedabad), second on east side (via Himmatnagar) and third on far east side via Palanpur- Mehsana.
The following maps show these routes in relation to project stretch at regional level.

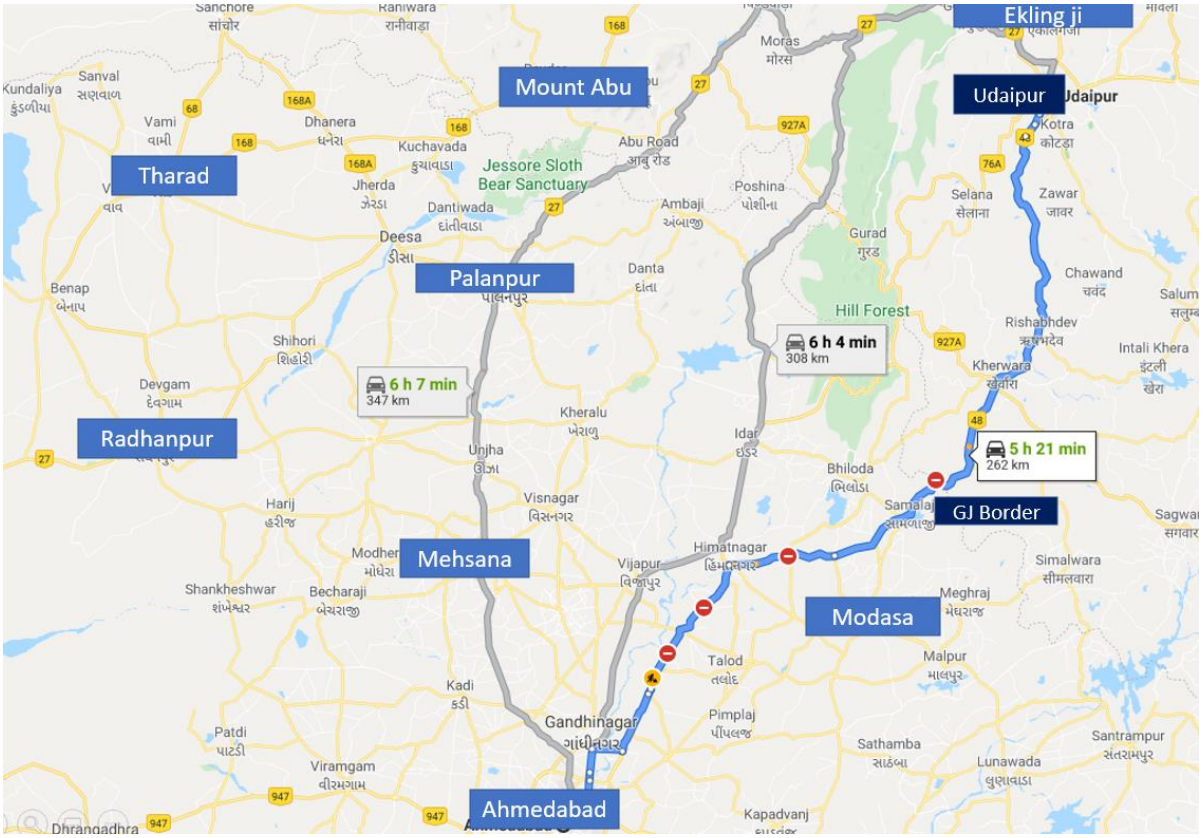

Figure 4-1 : Alternate route at regional level Udaipur - Ahmedabad

The route via project road is the most preferred one due to minimum travel time and shortest length.

On a high level, between Delhi and Vadodara, there can be three alternatives. One via project road (Delhi- Jaipur- Udaipur- Shamlaji -Vadodara), second via Delhi-Sikar-Ahmedabad- Vadodara) and third via Delhi- Jaipur- Mandsauar – Banswara- Godhra- Vadodara. The following map shows these alignments.

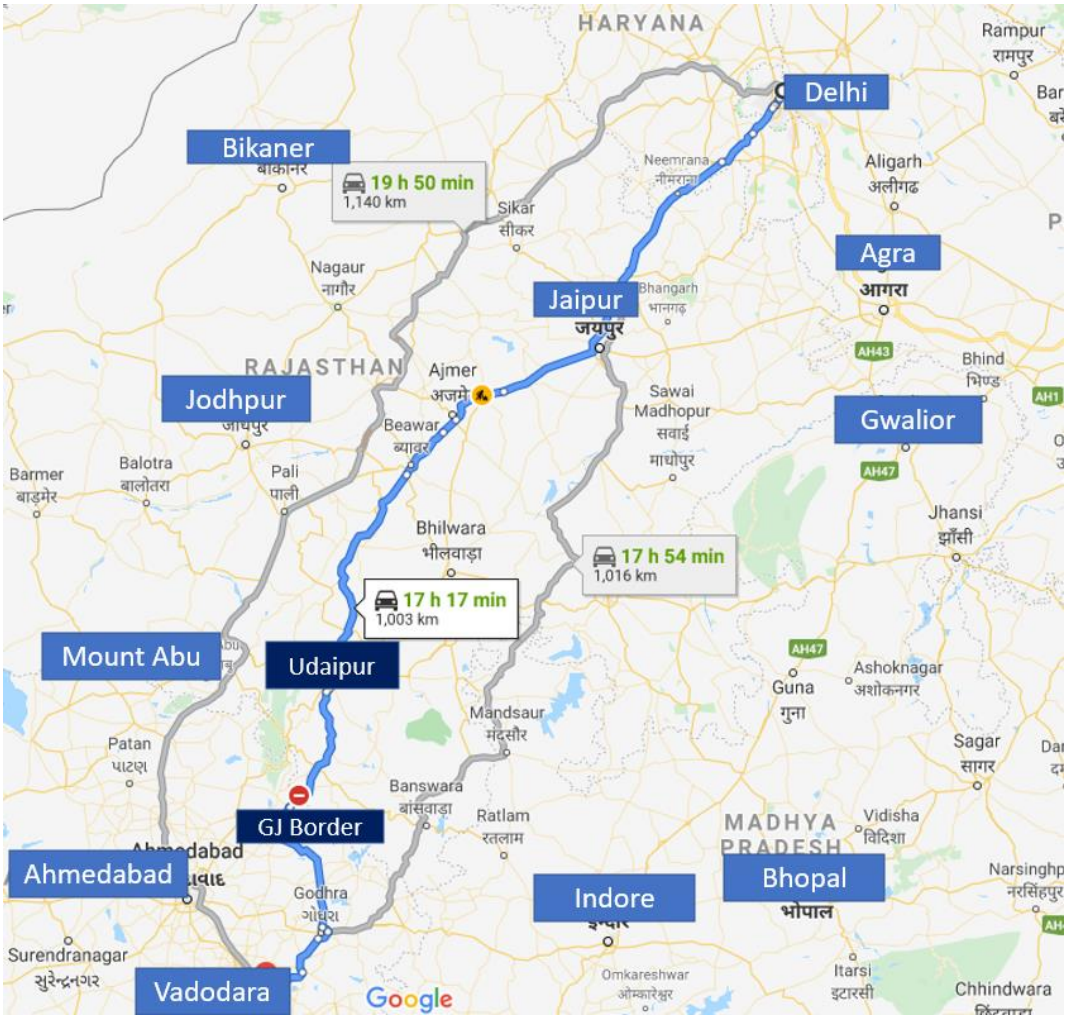

Figure 4-2 : Alternate route at regional level Delhi - Vadodara

For Delhi- Vadodara pair of origin and destination, route via project road (Udaipur – Shamlaji) is most preferred one due to minimum travel time and length of route.

Thus, at regional level project road is preferred route of long-distance traffic between Mumbai- Delhi and Udaipur- Ahmedabad. Project road is under toll operation since long hence traffic on project road is now settled and it can be assumed as dedicated traffic on project road for logistic obligations.

After six laning completion, the project stretch would become slightly more attractive due to the improved level of service. In such a case any further diversion of traffic from the project road is not envisaged. It is expected that there could be some attracted traffic on the project road after completion of the six laning of Kishangarh Gulabpura stretch which is connecting section for project corridor.

At the local level there is no potential alternate route to bypass the toll plaza.

The following table provides summary of analysis of alternate route/ roads discussed above.

Table 4-1 : Competing Roads Details

Sr. No	Route Details	Designation	Length (Km)	Avg. Speed (KMPH)	Time Taken (Min)	Observations
Regional Level						
1	Udaipur- Palanpur -Mehsana- Ahemedabad	Alternate Route	347	64	6 Hr 7 Min	Project road alternate has minimum travel time and shortest road
	Udaipur- Idar - Himmatnagar- Ahemedabad	Alternate Route	308	50	6 Hr 8 Min	
	Udaipur- Rishabhdeo- Shamlaji- Ahemedabad	Project Road	262	49	5 Hr 21 Min	
2	Delhi- Jaipur- Mandsaur - Banswara- Vadodara	Alternate Route	1140	57	19 Hr 50 Min	Project road alternate has minimum travel time and shortest road
	Delhi- Sikar- Mt. Abu - Ahemedabad- Vadodara	Alternate Route	1016	57	17 Hr 54 Min	
	Delhi- Jaipur- Udaipur - Vadodara	Project Road	1003	58	17 Hr 54 Min	

Under these circumstances it is not envisaged that commercial or passenger traffic would switch to alternate roads from the project road. Further, it may be noted that since the project highway has already been commissioned and has a tolling history, the current traffic traversing the project corridor already factors in traffic diversion (if any) that may have taken place. Further after completion of six laning, level of service would improve on project corridor, and this would create favorable conditions for traffic.

CHAPTER 5

GROWTH OF TRAFFIC ON PROJECT HIGHWAY

5.1 Introduction

Traffic growth is a function of the interplay of a number of contributory factors such as National economy, Government policy, socio-economic conditions of the people, and changes in land uses along the project corridor precincts etc. As these factors have a number of uncertainties associated with them, forecasts of traffic are dependent on the projections of other factors such as population, gross domestic product (GDP), vehicle ownership, per capita income (PCI), agricultural output, fuel consumption etc. Future patterns of change in these factors can be estimated with only a reasonable degree of accuracy and hence the resultant traffic forecast levels may not be precise.

Traffic growth forecast for project corridor Udaipur to Gujarat Border section of NH-8 has been done taking the above factors into consideration. "**IRC: 108-2015-Guidelines for Traffic Prediction on Rural Highways**" is established best practice and has been used for traffic growth forecast.

5.2 Trend Analysis

One of the methods of estimation of future rate of growth is to assume the same rate of growth as in the past. Although such a method is more suitable for projects of short durations say 5-10 years, however for long term projections it would be erroneous to assume that the past rate of growth will continue to prevail for a long time in future. Economic conditions, which are major influencing factors, are bound to change over a long period of time. Thus, it would be necessary to modify the past trends of growth suitably.

Elasticity model of growth projection is one of the most widely acceptable methods for traffic forecast. The same is recommended in **IRC: 108-2015-Guidelines for Traffic Prediction on Rural Highways**.

In this method the past trend of vehicular data is paired with an economic indicator and a regression analysis is done to yield the economic model of growth. Growth of vehicle traffic varies for different types of vehicles. It is a proven fact that the growth pattern for passenger and goods vehicle is different. Traffic growth on any highway typically depends on a number of economic parameters. Most important and direct parameters are given as under

- Per Capita Income
- Net State Domestic Product (NSDP)
- Population

It can be observed that the ownership of a car is more closely related to affordability; hence per capita is the index which closely fits the growth of car traffic among other criteria. In a similar fashion, the following can be pairs of vehicle type and independent variable for elasticity modeling of growth.

- Car / Jeep – Par Capita Income
- Bus / Minibus – Population
- Goods Vehicle – NSDP

5.3 Estimation of Traffic Demand Elasticity

Elasticity of traffic demand is defined as the rate at which traffic intensity varies due to a change in the corresponding indicator selected. Hence, in order to estimate the elasticity of traffic demand, it is necessary to establish relationship between the growth in number of given category of vehicles with the relevant economic variable considered, such as NSDP, per capita income and population growth. Latest available data for vehicle registration, per capita income, NSDP and population is used in analysis.

As per IRC: 108-1996 the model for estimating elasticity index for the project corridor is of the following form and is given as below:

$Log\ (P) = k \times Log\ (EI) + A$

Where,

P = *Number of Vehicles (Mode wise)*

EI = *Economic Indicator*

A = *Regression constant*

k = *Elasticity coefficient (Regression coefficient)*

The elasticity for cars and bus (passenger vehicles) is calculated based on the Population and Per Capita Domestic Product (PCDP) and the elasticity for trucks is calculated based on the Net State Domestic Product (NSDP).

The project corridor spreads across the state of Rajasthan. Toll plazas at Khondi Obri is in the state of Rajasthan but the traffic on project stretch has certain contribution from other states as well. For elasticity calculations, working data from such states in addition to Rajasthan has been analyzed.

The following tables and graphs depict regression and elasticity of growth model for stretch falling in Rajasthan State.

Table 5-1 : Per Capita Income Vs Car Rajasthan

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2012	57192	591069	4.76	5.77		
2013	58441	659542	4.77	5.82	2%	
2014	61053	733916	4.79	5.87	4%	
2015	64496	814079	4.81	5.91	6%	
2016	68565	899307	4.84	5.95	6%	
2017	71394	988391	4.85	5.99	4%	4.55%

Regression analysis of same is given in figure below.

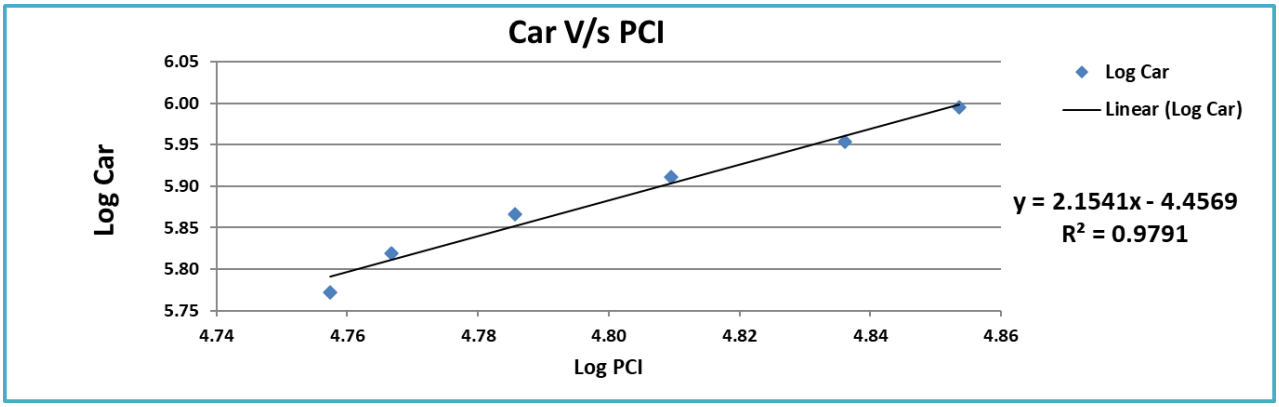

Figure 5-1 : Regression and Elasticity PCI vs. Car – Extrapolation Rajasthan

Table 5-2 : Population Vs Bus Rajasthan

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth
2012	68548437	83345	7.84	4.92		
2013	69783885	88616	7.84	4.95	2%	
2014	71016445	93892	7.85	4.97	2%	
2015	72245688	97650	7.86	4.99	2%	
2016	73471198	102818	7.87	5.01	2%	
2017	74692571	108680	7.87	5.04	2%	1.73%

Regression analysis of same is given in figure below.

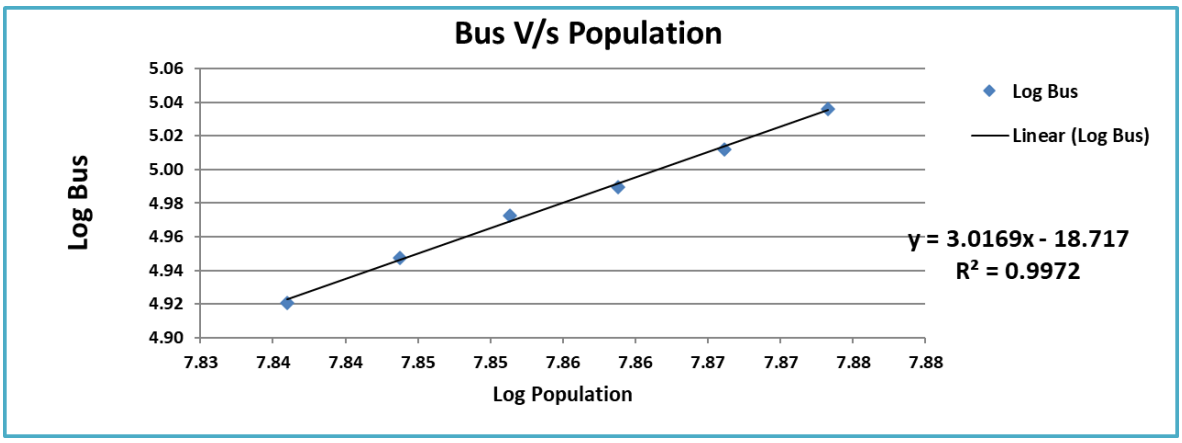

Figure 5-2 : Regression and Elasticity Population vs. Bus – Extrapolation Rajasthan

Elasticity of LCV has been worked out by regression analysis with NSDP. The following table represents the data and details.

Table 5-3 : LCV Vs NSDP Rajasthan

Year	NSDP	LCV	Log NSDP	Log LCV	NSDP Growth	Average Growth
2012	395331	69509	5.60	4.84		
2013	409802	76396	5.61	4.88	4%	
2014	434292	33379	5.64	4.52	6%	
2015	465408	91787	5.67	4.96	7%	
2016	501922	99763	5.70	5.00	8%	6.16%

The following figure depicts regression analysis and extrapolation.

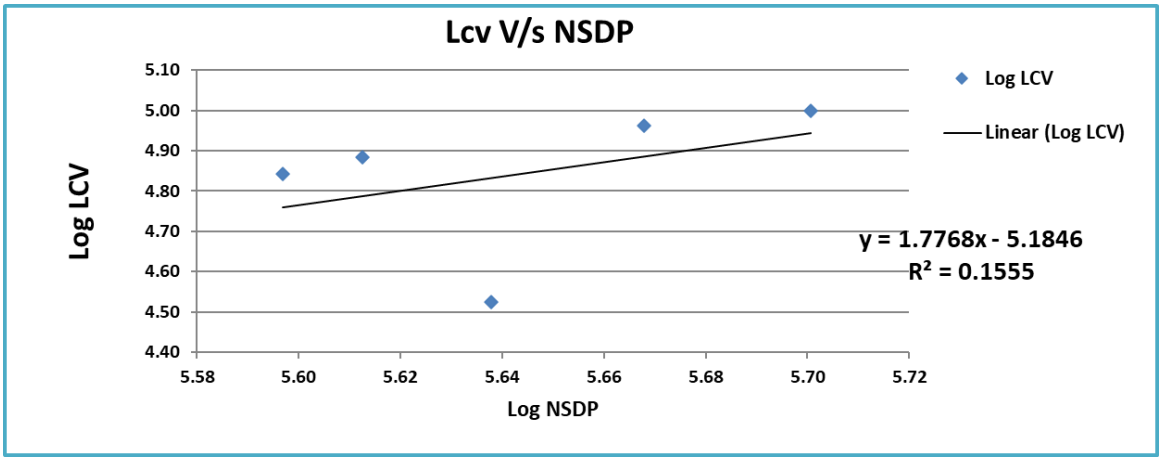

Figure 5-3 : Regression and Elasticity NSDP vs. LCV Traffic - extrapolation Rajasthan.

Elasticity of Goods Traffic has been worked out by regression analysis with NSDP. The following table represents the data and details.

Table 5-4 : GOODS Traffic Vs NSDP Rajasthan

Year	NSDP	Trucks	Log NSDP	Log Truck	NSDP Growth	Average Growth
2012	395331	362028	5.60	5.56		
2013	409802	401983	5.61	5.60	4%	
2014	434292	434379	5.64	5.64	6%	
2015	465408	472365	5.67	5.67	7%	
2016	501922	517604	5.70	5.71	8%	
2017	530172	561158	5.72	5.75	6%	6.06%

Following figure depict regression analysis and extrapolation.

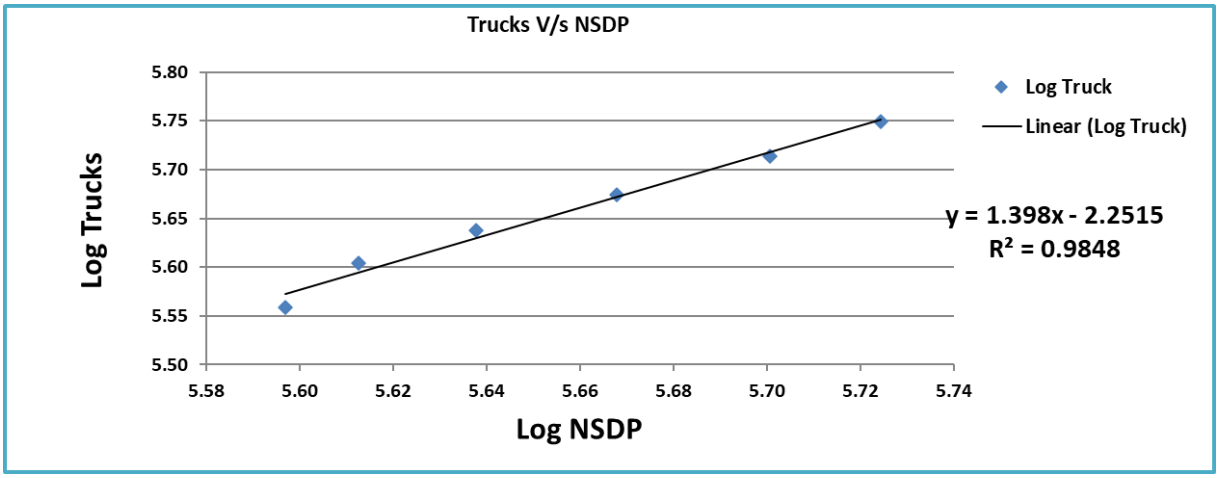

Figure 5-4 : Regression and Elasticity NSDP vs. Goods Traffic - extrapolation Rajasthan.

Using the regression analysis above, we have arrived at the elasticity of traffic demand for each class of vehicle to a given change in relevant economic indicators. Average traffic growth of a vehicle class is multiplied by the corresponding elasticity coefficient to arrive at traffic growth. R2 statistical measure of how close the data are to the fitted regression line. It varies from 0 to 1. The higher the value of R2 more representative is the regression model of data.

The results of these analyses for *the good fit* regression as reflected by R^2 values are presented in the Table below.

Table 5-5 : Summary Regression Analysis Rajasthan

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average IV Growth (5yrs)	Growth Elastic Model	Remarks
Rajasthan	Car/Jeep	PCI	y = 2.1541x + -4.4569	R² = 0.9791	2.1541	4.55%	9.79%	Good Regression
	Bus	Population	y = 3.0169x - -18.7174	R² = 0.9972	3.0169	1.73%	5.22%	Good Regression
	LCV	NSDP	y = 1.7768x - -5.1846	R² = 0.1555	1.7768	6.16%	10.95%	Poor Regression
	Truck	NSDP	y = 1.398x - -2.2515	R² = 0.9848	1.3980	6.06%	8.46%	Good Regression

The following tables and graphs depict regression and elasticity of growth model for stretch falling in Rajasthan State.

Table 5-6 : Per Capita Income Vs Car Gujarat

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2012	87481	1411898	4.94	6.15		
2013	96683	1602129	4.99	6.20	11%	
2014	102589	1771298	5.01	6.25	6%	
2015	111370	2008748	5.05	6.30	9%	
2016	120683	2260084	5.08	6.35	8%	
2017	129738	2527537	5.11	6.40	8%	8.21%

Regression analysis of same is given in figure below.

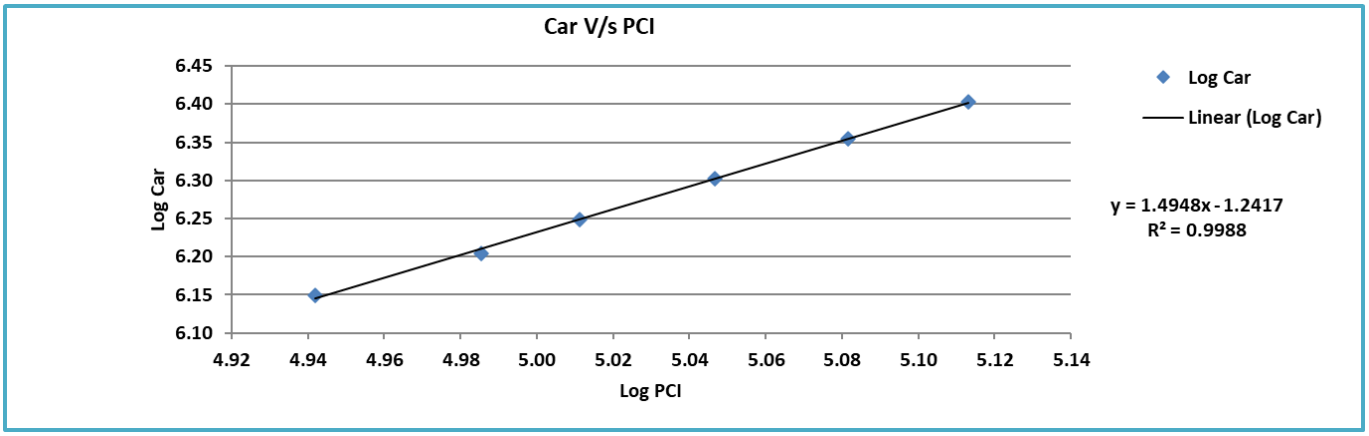

Figure 5-5 : Regression and Elasticity PCI vs. Car – Extrapolation Gujarat

Table 5-7 : Population Vs Bus Gujarat

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth
2012	60439692	67546	7.78	4.83		
2013	61563037	70615	7.79	4.85	2%	
2014	62684375	72998	7.80	4.86	2%	
2015	63803304	76435	7.80	4.88	2%	
2016	64919427	82734	7.81	4.92	2%	
2017	66032362	74855	7.82	4.87	2%	1.79%

Regression analysis of same is given in figure below.

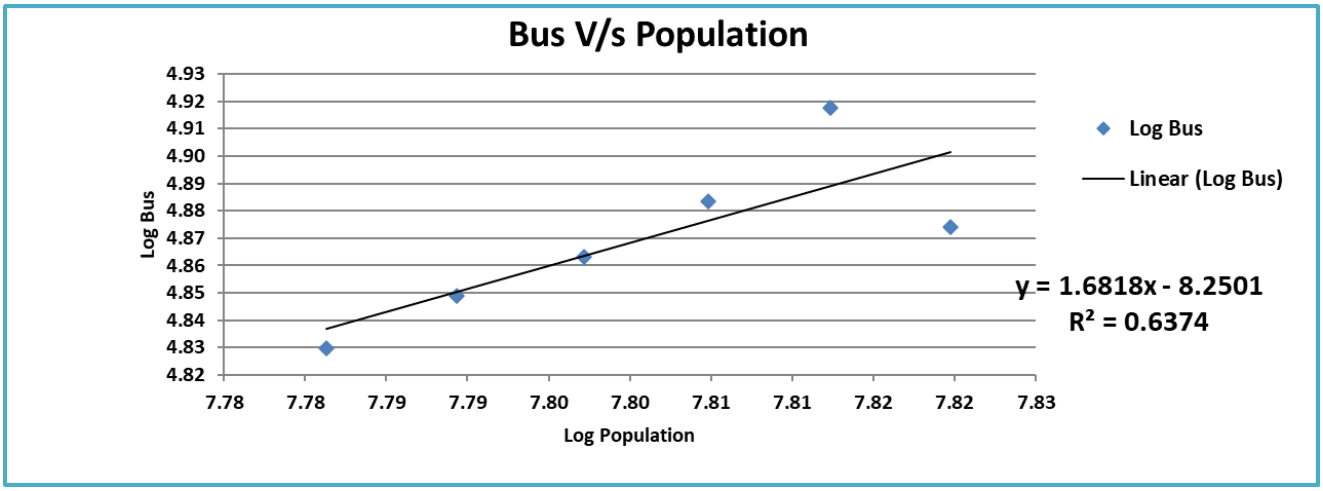

Figure 5-6 : Regression and Elasticity Population vs. Bus – Extrapolation Gujarat

Elasticity of LCV has been worked out by regression analysis with NSDP. The following table represents the data and details.

Table 5-8 : LCV Vs NSDP Gujarat

Year	NSDP	LCV	Log NSDP	Log LCV	NSDP Growth	Average Growth (5 Year)
2012	532809	448958	5.73	5.65		
2013	596659	499277	5.78	5.70	12%	
2014	641489	542918	5.81	5.73	8%	
2015	705629	589984	5.85	5.77	10%	
2016	774775	633599	5.89	5.80	10%	9.82%

The following figure depicts regression analysis and extrapolation.

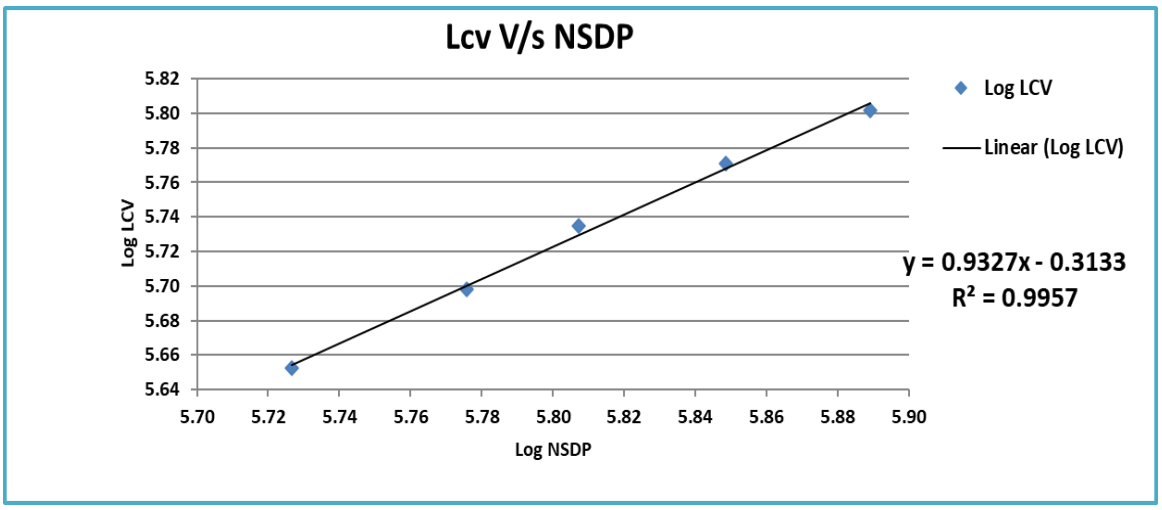

Figure 5-7 : Regression and Elasticity NSDP vs. LCV Traffic - extrapolation Gujarat.

Elasticity of Goods Traffic has been worked out by regression analysis with NSDP. The following table represents the data and details.

Table 5-9 : GOODS Traffic Vs NSDP Gujarat

Year	NSDP	Trucks	Log NSDP	Log Truck	NSDP Growth	Average Growth (5 Year)
2012	532809	301533	5.73	5.48		
2013	596659	319207	5.78	5.50	12%	
2014	641489	332185	5.81	5.52	8%	
2015	705629	352225	5.85	5.55	10%	
2016	774775	375265	5.89	5.57	10%	
2017	843930	396061	5.93	5.60	9%	9.64%

The following figure depicts regression analysis and extrapolation.

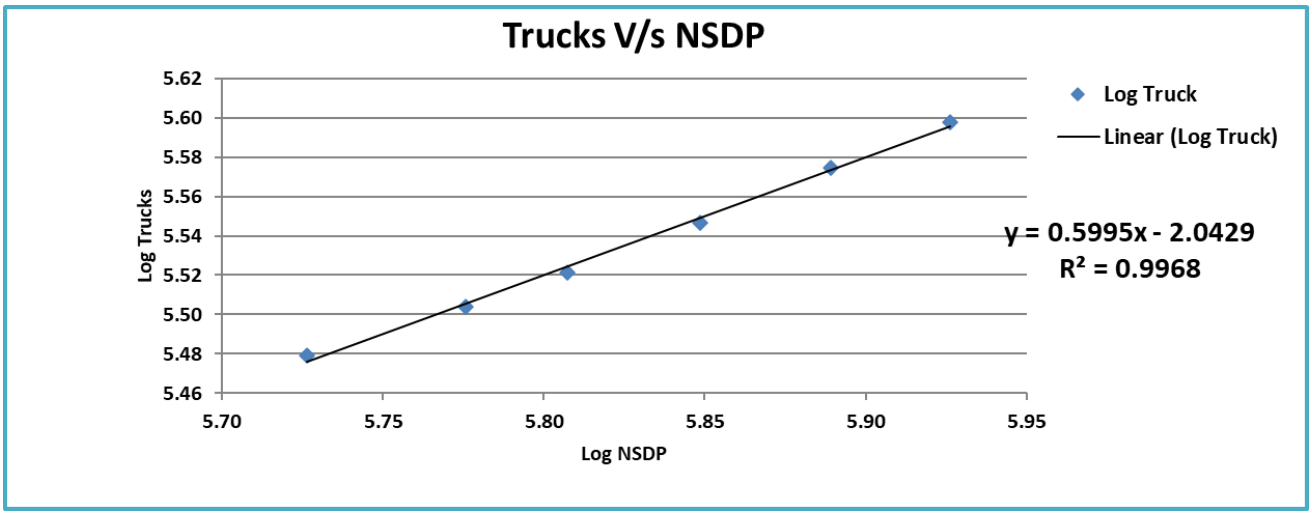

Figure 5-8 : Regression and Elasticity NSDP vs. Goods Traffic - extrapolation Gujarat.

Using the regression analysis above, we have arrived at the elasticity of traffic demand for each class of vehicle to a given change in relevant economic indicators. Average traffic growth of a vehicle class is multiplied by the corresponding elasticity coefficient to arrive at traffic growth. R2 statistical measure of how close the data are to the fitted regression line. It varies from 0 to 1. The higher the value of R2 more representative is the regression model of data.

The results of these analyses for *the good fit* regression as reflected by R^2 values are presented in the Table below.

Table 5-10 : Summary Regression Analysis Gujarat

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average IV Growth (5yrs)	Growth Elastic Model	Remarks
Gujarat	Car/Jeep	PCI	y = 1.4948x - - 1.2417	R^2 = 0.9988	1.4948	8.21%	12.27%	Good Regression
	Bus	Population	y = 1.6818x - - 8.2501	R^2 = 0.6374	1.6818	1.79%	3.00%	Fair Regression
	LCV	NSDP	y = 0.9327x - - 0.3133	R^2 = 0.9957	0.9327	9.82%	9.16%	Good Regression
	Truck	NSDP	y = 0.5995x - - 2.0429	R^2 = 0.9968	0.5995	9.64%	5.78%	Good Regression

The economic model for predicting growth is a good tool, however other local, regional, and national factors should also be considered before finalizing growth factors. Considering factors such as proposed developments and other influencing economic factors, moderated growth should be considered. These factors are discussed in subsequent sections.

5.4 Analysis of Historic Traffic Data

Historical traffic data forms useful information for any highway project. It provides useful information for establishing past trends of growth. Project stretch of Udaipur to Gujarat on NH-8 is under tolling operation with current concessionaire and has three year of tolling history from 2017-18 (Part year). As traffic data available with the project concessionaire is of less than three years, we do not have sufficient data points to be able to establish a reliable past trend of traffic growth. A minimum of about 5 -6 years' traffic data is required for establishing a reliable past trend.

5.5 Other Factors Influencing Growth

There are many factors which have an impact on traffic growth. As discussed previously these factors can be economical, social, educational, and industrial.

Potentiality of such factors for project highway is discussed as under.

ECONOMY

After witnessing a slowdown during 2011-12, the economy recovered in 2013-14, and a high growth rate of GDP was recorded up to 2018-19. Pandemic of COVID-19 impacted all economies of world including India up to year 2021-22. Following figure show trend of GDP growth in India.

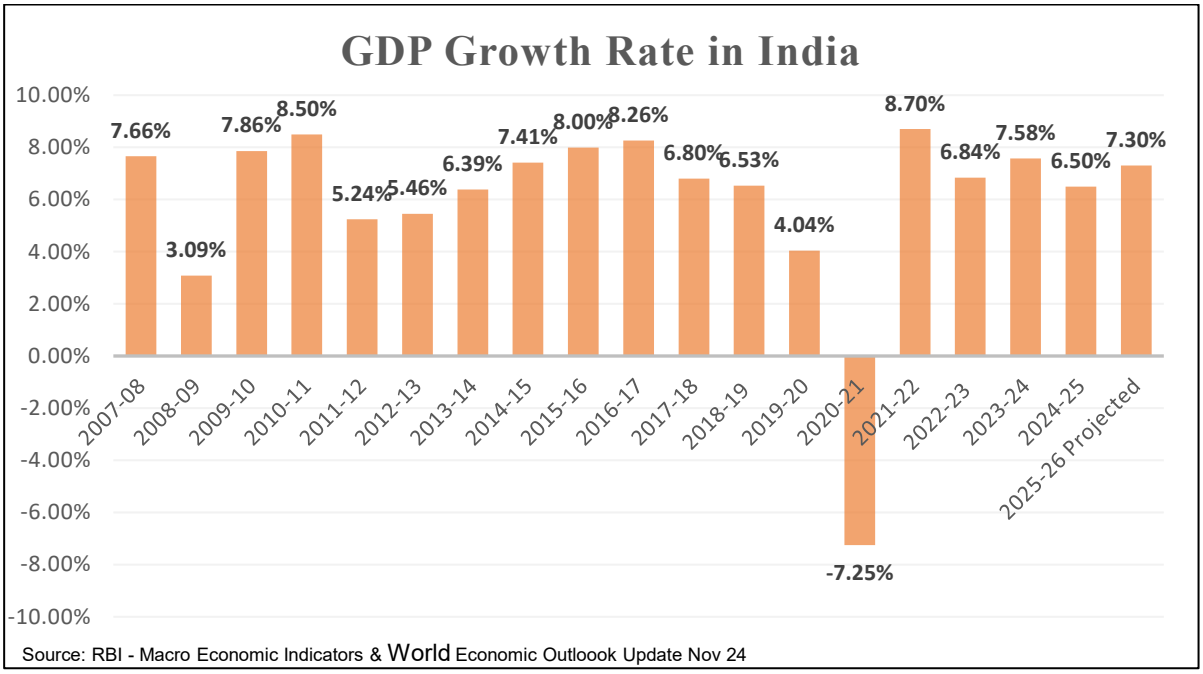

Figure 5-9 : Growth of GDP in India

FY 2017-18 recorded a growth of 6.7% which had a slight impact of GST and demonetization. Indian economy appears on recovery path with estimated growth of 6.8% in FY 2018-19. The government took major policy decisions including tax infrastructure reforming, banking sector improvement and ease of doing business.

In post COVID-19 scenario, in year 2022-23 and 2023-24 India registered an impressive growth of 7% to 7.5%. In last year despite global slow down due to Russia-Ukraine war and Gaza crises, India grew at good rate of 7%(Estimated).
Indian economy is now on good growth path and all major institutions including IMF / ADB have estimated growth of Indian Economy to peg around 6.5% to 7% in coming years.

5.6 Developments along and around Project Corridor & State

Project stretch passes through mineral rich belt of marble and minerals.
Tourism, agriculture, and mineral industries contribute to Udaipur's diverse economic base. Udaipur sees major tourist footfall throughout the year owing to its picturesque landscape, lakes, and historic palaces and architecture. Shamlaji is a major Hindu pilgrimage dedicated to God Vishnu. Each year an annual fair is held in October which attracts huge crowds from the surrounding region. Udaipur district is rich in lead, zinc, silver, phosphate, calcite, copper and limestone minerals. Udaipur is known for its marble which is mined, processed, and exported across the world. Nathdwara in the north of asset is one of biggest extractors of marble and limestone minerals. Hindustran Zinc, which is the world's second largest zinc producer, is based out of Udaipur.

Rishbhdeo is one of the major religious and industrial settlement on project corridor. This region has more than 200 mines of green marble. Rishabhdeo is the largest miner of green marble.9 0 per-cent of green marble in the world is produced in Rishabhdev. The turnover of marble industry is more than 500 crores. It also gives employment to many labourers. Beyond this the town also has spinning and weaving mill by lnjbhilwara group. Thus, it gives employment to 10000 local workers. The presence of temple also leads to income of many people.

The growth of Rajasthan has been comparable to the national average economic growth. Rajasthan is rich in natural resources and benefits from its strategic geographic location in India. The state is pre-eminent in quarrying, mining in India and has been a leader in crude oil extraction over the past the few years. Moreover, Rajasthan is also a relevant tourism attractor in India. Considering the scenario, it may be assumed that the traffic growth on the project highway would remain high and there are minimal risks in terms of growth.

Table 5-11 : GDP of India, Rajasthan and other important states

Year	India (GDP)	Bihar	Haryana	Madhya Pradesh	Maharashtra	Odisha	Punjab	Rajasthan	Uttar Pradesh	Uttarakhand	West Bengal	Delhi
1980-81	12336	514	357	623	1464	529	504	560	1631	138	830	269
1981-82	13030	543	371	639	1498	528	551	607	1670	141	808	291
1982-83	13411	548	394	668	1556	497	568	620	1800	152	840	328
1983-84	14464	601	402	702	1654	597	578	761	1871	158	939	320
1984-85	15037	658	418	668	1675	569	623	706	1900	161	964	333
1985-86	15663	672	493	726	1807	635	670	704	1975	167	1005	386
1986-87	16339	725	493	694	1832	643	694	771	2060	174	1045	411
1987-88	16917	685	484	789	1955	623	730	718	2154	182	1101	447
1988-89	18635	772	602	847	2159	754	769	1014	2434	206	1148	486
1989-90	19778	759	610	865	2515	805	834	993	2502	212	1188	531
1990-91	20824	831	674	987	2629	668	849	1149	2651	224	1251	553
1991-92	21122	784	688	916	2620	753	888	1061	2662	225	1349	638
1992-93	22254	737	688	983	3017	740	930	1220	2690	228	1389	660
1993-94	23519	755	719	1088	3349	788	970	1121	2757	233	1490	705
1994-95	25023	842	771	1107	3414	826	995	1325	2901	254	1594	790
1995-96	26846	712	787	1174	3791	864	1032	1374	2995	251	1713	804
1996-97	28987	893	879	1252	3941	804	1107	1535	3327	267	1832	915
1997-98	30234	850	887	1318	4158	920	1137	1721	3292	270	1985	1063
1998-99	32255	904	934	1405	4324	948	1203	1797	3316	274	2112	1116
1999-00	34837	950	1002	1552	4735	1008	1267	1801	3440	274	2264	1170
2000-01	36282	1106	1081	1426	4589	982	1309	1743	3511	308	2343	1215
2001-02	38236	1043	1165	1528	4751	1042	1326	1941	3575	323	2512	1262
2002-03	39719	1175	1236	1449	5079	1034	1348	1708	3690	353	2600	1359
2003-04	42883	1099	1358	1611	5471	1185	1433	2251	3885	381	2753	1433
2004-05	45906	1238	1475	1664	5948	1340	1504	2196	4079	431	2936	1588
2005-06	50257	1207	1608	1748	6810	1399	1577	2344	4317	492	3121	1752
2006-07	55066	1416	1791	1907	7748	1574	1748	2620	4660	551	3366	1969
2007-08	60199	1489	1931	1997	8650	1708	1899	2739	4959	648	3627	2191
2008-09	64248	1716	2080	2250	8786	1837	2004	2969	5336	716	3774	2464
2009-10	69769	1798	2340	2463	9634	1852	2132	3142	5668	839	4067	2667
2010-11	75987	2073	2498	2592	10732	1968	2270	3614	6120	927	4313	2888
2011-12	81069	2285	2712	2824	11222	2042	2392	3953	6451	1020	4471	3147
2012-13	85463	2369	2894	3069	11842	2163	2518	4098	6736	1095	4838	3342
2013-14	90636	2469	3142	3226	12671	2331	2675	4343	7075	1178	5247	3565
2014-15	97121	2557	3314	3394	13322	2359	2777	4656	7297	1257	5633	3882
2015-16	105033	2749	3612	3597	14417	2557	2926	4981	7894	1355	-	4291
2016-17	112476	3033	3927	4129	15744	2828	3095	5352	8457	1448	-	4658
2017-18	119762	-	-	4432	-	3029	-	5736	9011	1547	-	5035
Growth 1981-2018	6.34	5.05	6.88	5.44	6.82	4.83	5.17	6.49	4.73	6.75	5.79	8.24
Growth 1994-2018	7.02	6.23	7.66	6.03	6.96	5.77	5.17	7.04	5.06	8.20	6.54	8.53
Growth 2000-2018	7.10	7.07	8.37	6.00	7.32	6.30	5.40	6.65	5.50	10.10	6.27	8.45

5.7 Recommended Growth Rates of Traffic

Based on the above analysis and after giving due consideration to the entire listed factors, the following overall growth rates are recommended for each category of vehicle as below. The rate of growth is moderate in light of overall regional trends. Growth of multi-Axle is kept slightly higher as trend of technological advances in logistic industry favors multi-axle over 2/3 axle carriage. It is also expected that as the economy moves from developing to developed, the rate of growth diminishes. The same growth rate is not sustainable for long. Traffic growth is suitably stepped down for future years.

Growth rates are recommended for three scenarios for sensitivity analysis namely **Optimistic, Pessimistic** and **Most Likely** with a positive and negative variation 0.5% from Most Likely case for corridor in both states.

5.7.1 Recommended Growth Rates of Traffic for Project Stretch

Table 5-12 : Recommended Growth Rates Optimistic

Category / Year	FY 2027-2030	FY 2031-2035	FY 2036-2040	FY 2041-2045	FY 2046-2050
Car/Jeep/Van	8.82%	8.21%	7.60%	7.01%	6.43%
Bus	4.95%	4.64%	4.35%	4.07%	3.79%
LCV	3.09%	2.64%	2.19%	1.75%	1.31%
2- Axle	3.35%	2.96%	2.58%	2.21%	1.84%
3 - Axle	5.20%	4.59%	3.99%	3.39%	2.80%
4 to6 Axle	5.82%	5.13%	4.45%	3.78%	3.12%
7 and Above Axle	5.82%	5.13%	4.45%	3.78%	3.12%

Table 5-13 : Recommended Growth Rates Pessimistic

Category / Year	FY 2027-2030	FY 2031-2035	FY 2036-2040	FY 2041-2045	FY 2046-2050
Car/Jeep/Van	8.32%	7.71%	7.10%	6.51%	5.93%
Bus	4.45%	4.14%	3.85%	3.57%	3.29%
LCV	2.59%	2.14%	1.69%	1.25%	0.81%
2- Axle	2.85%	2.46%	2.08%	1.71%	1.34%
3 - Axle	4.70%	4.09%	3.49%	2.89%	2.30%
4 to6 Axle	5.32%	4.63%	3.95%	3.28%	2.62%
7 and Above Axle	5.32%	4.63%	3.95%	3.28%	2.62%

Table 5-14 : Recommended Growth Rates Most Likely

Category / Year	FY 2027-2030	FY 2031-2035	FY 2036-2040	FY 2041-2045	FY 2046-2050
Car/Jeep/Van	8.57%	7.96%	7.35%	6.76%	6.18%
Bus	4.70%	4.39%	4.10%	3.82%	3.54%
LCV	2.84%	2.39%	1.94%	1.50%	1.06%
2- Axle	3.10%	2.71%	2.33%	1.96%	1.59%
3 - Axle	4.95%	4.34%	3.74%	3.14%	2.55%
4 to6 Axle	5.57%	4.88%	4.20%	3.53%	2.87%
7 and Above Axle	5.57%	4.88%	4.20%	3.53%	2.87%

Traffic and revenue have been worked out on the basis of the above growths, and some are presented in subsequent chapters of the report.

CHAPTER 6

TRAFFIC FORECAST

6.1 Traffic Projections

Growth rates recommended in the previous section of the report are used to arrive at traffic projections for future years. Toll plaza wise futuristic traffic projection is given in tables below.

These projections have been done for the following three cases of growth up to concession period.

1. Optimistic Scenario
2. Pessimistic Scenario
3. Most Likely Scenario

Table 6-1 : Total Tollable Traffic @ Toll Plaza - 348.450 KM

(Optimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	10175	875	953	2197	1893	5075	9	**21177**	**47787**
2027-28	11072	903	1000	2270	1991	5370	9	**22615**	**50616**
2028-29	12048	931	1050	2346	2095	5682	9	**24161**	**53626**
2029-30	13111	960	1101	2424	2205	6013	9	**25823**	**56830**
2030-31	14187	985	1152	2495	2306	6322	9	**27456**	**59902**
2031-32	15351	1012	1205	2568	2412	6646	9	**29203**	**63156**
2032-33	16611	1039	1260	2644	2523	6987	9	**31073**	**66603**
2033-34	17974	1067	1318	2722	2639	7346	9	**33075**	**70257**
2034-35	19448	1095	1379	2802	2760	7724	9	**35217**	**74130**
2035-36	20927	1119	1438	2874	2871	8067	9	**37305**	**77797**
2036-37	22518	1143	1500	2948	2986	8427	9	**39531**	**81667**
2037-38	24231	1168	1566	3024	3105	8803	9	**41906**	**85751**
2038-39	26074	1194	1635	3102	3229	9195	9	**44438**	**90062**
2039-40	28058	1221	1707	3182	3357	9604	9	**47138**	**94615**
2040-41	30025	1242	1777	3252	3471	9967	9	**49743**	**98868**
2041-42	32131	1264	1850	3323	3589	10344	9	**52510**	**103340**
2042-43	34386	1287	1926	3396	3711	10735	9	**55450**	**108041**

Table 6-2 : Total Tollable Traffic @ Toll Plaza - Chainage 348.450 KM (Pessimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	10129	870	949	2187	1884	5051	9	**21079**	**47561**
2027-28	10972	893	992	2249	1972	5320	9	**22407**	**50139**
2028-29	11885	916	1036	2312	2064	5603	9	**23825**	**52870**
2029-30	12873	940	1082	2378	2160	5901	9	**25343**	**55765**
2030-31	13865	960	1126	2436	2248	6174	9	**26818**	**58501**
2031-32	14933	980	1173	2496	2340	6460	9	**28391**	**61386**
2032-33	16083	1001	1221	2557	2435	6759	9	**30065**	**64431**
2033-34	17322	1022	1271	2619	2534	7072	9	**31849**	**67644**
2034-35	18656	1043	1323	2683	2637	7400	9	**33751**	**71035**
2035-36	19982	1060	1374	2739	2729	7692	9	**35585**	**74195**
2036-37	21402	1077	1427	2796	2824	7996	9	**37531**	**77515**
2037-38	22922	1095	1481	2854	2922	8312	9	**39595**	**81005**
2038-39	24550	1114	1538	2913	3023	8641	9	**41788**	**84674**
2039-40	26294	1133	1597	2973	3128	8982	9	**44116**	**88533**
2040-41	28008	1147	1654	3024	3218	9276	9	**46336**	**92072**
2041-42	29832	1161	1712	3075	3311	9581	9	**48681**	**95777**
2042-43	31775	1176	1773	3127	3406	9895	9	**51161**	**99658**

Traffic projections for Most Likely scenario is given as under

Table 6-3 : Total Tollable Traffic @ Toll Plaza - Chainage 348.450 KM (Most Likely Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	10152	873	951	2192	1889	5063	9	**21129**	**47674**
2027-28	11022	898	995	2260	1982	5345	9	**22511**	**50377**
2028-29	11965	923	1042	2330	2079	5642	9	**23990**	**53247**
2029-30	12989	950	1090	2402	2181	5956	9	**25577**	**56296**
2030-31	14023	973	1138	2467	2275	6247	9	**27132**	**59198**
2031-32	15139	996	1188	2534	2373	6552	9	**28791**	**62266**
2032-33	16344	1020	1240	2603	2475	6871	9	**30562**	**65509**
2033-34	17644	1044	1294	2673	2582	7206	9	**32452**	**68939**
2034-35	19049	1069	1351	2745	2695	7559	9	**34477**	**72568**
2035-36	20451	1089	1406	2808	2795	7876	9	**36434**	**75977**
2036-37	21955	1110	1463	2874	2899	8207	9	**38517**	**79566**
2037-38	23569	1131	1522	2941	3007	8551	9	**40730**	**83347**
2038-39	25302	1153	1584	3009	3119	8911	9	**43087**	**87330**
2039-40	27163	1176	1650	3079	3236	9286	9	**45599**	**91527**
2040-41	29001	1193	1712	3139	3337	9614	9	**48005**	**95413**
2041-42	30962	1210	1778	3200	3441	9953	9	**50553**	**99491**
2042-43	33057	1227	1847	3262	3549	10305	9	**53256**	**103770**

6.2 Modification in Concession Period

As per Article 29 of the concession agreement, if actual traffic on the project falls short or exceeds Target Traffic on project highway on defined date, concession period shall be modified subject to calculation stipulated therein. For Udaipur – Gujarat Border on NH-8 project stretch, the Target Date and Target Traffic are defined as under:

Target Date – 21st September 2026

Target Traffic - 61435 in PCU

It was observed that as per traffic projections, average traffic volume falls short of target traffic in all scenarios. The probable extension of the concession period is estimated according to article 29 of the concession agreement which comes to about a year. Traffic forecast and revenue projections are done for probable extended period accordingly.

Most Likely

Target Year	Target Traffic	Actual Traffic	% of Excess / Short traffic	% Revision (+ or -) in CP as per CA	% Variation in CP	Original CP	Change in CP (In Years)
2026	61435	47727	-22%	33%	20%	21	4.2

Optimistic

Target Year	Target Traffic	Actual Traffic	% of Excess / Short traffic	% Revision (+ or -) in CP as per CA	% Variation in CP	Original CP	Change in CP (In Years)
2026	61435	47844	-22%	33%	20%	21	4.2

Pessimistic

Target Year	Target Traffic	Actual Traffic	% of Excess / Short traffic	% Revision (+ or -) in CP as per CA	% Variation in CP	Original CP	Change in CP (In Years)
2026	61435	47610	-23%	34%	20%	21	4.2

CHAPTER 7

FORECAST OF TOLL REVENUE

7.1 General

This chapter presents the tolling rate calculations, categories and toll revenue of the project.

7.2 Discount Categories

The fee schedule in the CA of Udaipur- Gujarat Border section of NH-8 is based on the old toll policy. As per the Toll Notification (Schedule - G) the discounts and special provisions have been considered. In addition to discounts as per Fee Notification concessionaire has declared special category rates also. Salient features of toll rate structure are given as under

1. Monthly Pass: For frequent user's monthly pass would be issued at fee 30 time the single journey fee.
2. Multiple Journeys (for Return Trip): Will be charged at 1.5 times single journey.
3. Single Journey: Full single journey toll would be charged to this category of vehicles who are infrequent travelers or whose frequency does not yield any discount from the above categories.
4. Local Discounts: There are several categories of local discounts.
    a) Local Car Jeep Van I - Rs. 350 per month
    b) Other local Commercial at 50% of the regular single journey toll fee

Building of inflation and escalation of rate on the basis of WPI are done as per toll notification (Schedule G) as given under as extract from concession agreement.

The formula for determining the applicable rate of fee shall be as follows:-

$$\text{Applicable rate of fee} = \text{base rate} + \text{base rate} \times \left\{ \frac{\text{WPI A-WPI B}}{\text{WPI B}} \right\} \times 0.4$$

Factors of inflation / growth have been incorporated as per Schedule R. WPI are available up to the year 2025-26.

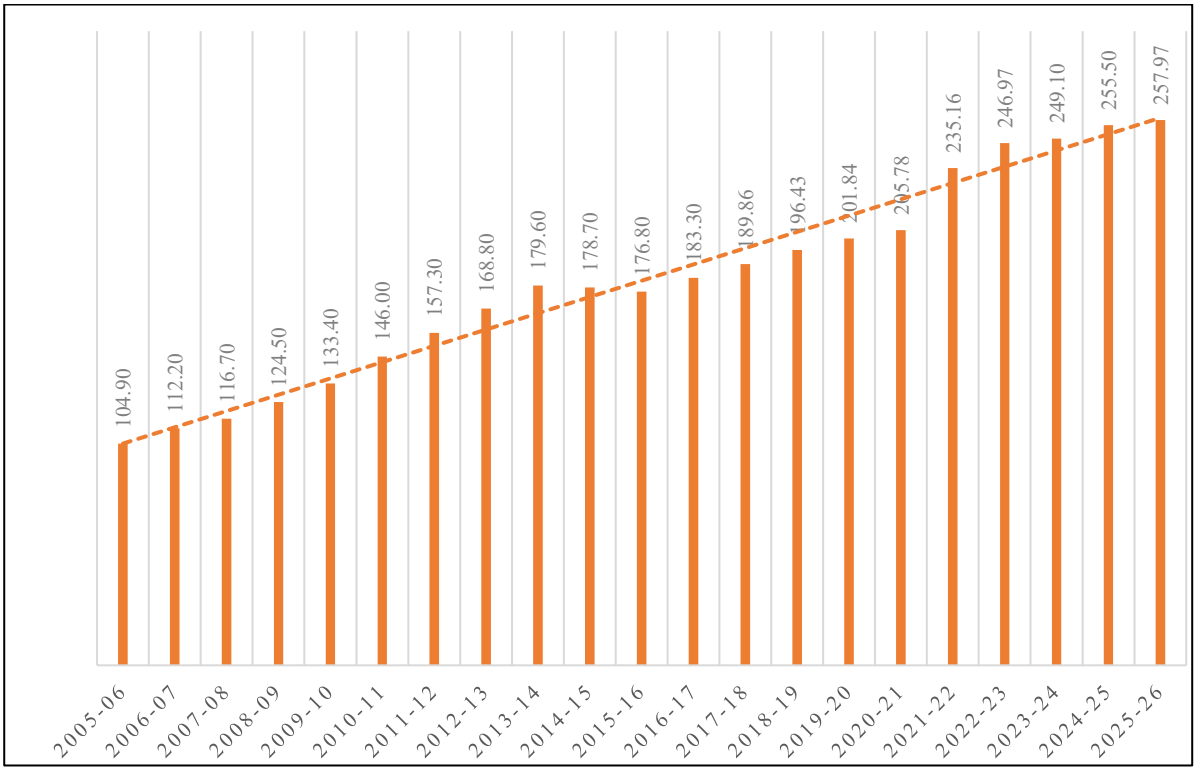

Figure 7-1 : Historical Rate of WPI Inflation in India

The wholesale price index (WPI) and the inflation rate in the past are presented in Table below.

Table 7-1 : Historical WPI value and Growth Inflation

December of year	2021	2022	2023	2024	2025	Avg.
WPI	235.2	247.0	249.1	255.5	257.97	
Inflation	14.27%	5.02%	0.86%	2.57%	0.96%	4.74%

WPI of December 2025 is posted on ministry site which is shows 0.96% inflation from the previous year. Same has been applied for FY 2026-27.
The average WPI inflation over the period FY 2021 to FY 2025 works out to approximately 4.74%, reflecting inflationary cycles across both high and low inflation years. Based on this analysis, an annual escalation factor of 4.5% has been adopted for the remaining concession period.

7.3 Estimation of Toll Rates

As per the applicable MORTH notification and Schedule R of contract agreement, the following Base rate of fee for the categories mentioned in the table stands true in the National Highways Fee Rules applicable for contract.

Table 7-2 : Base Toll Rates June 2007-08

Type of Vehicle	Base Rate of Fee / Km (in Rs.)
Car, Jeep, Van or Light Motor Vehicle	0.65

Type of Vehicle	Base Rate of Fee / Km (in Rs.)
Light Commercial Vehicle, Light Goods Vehicle or Minibus	1.05
Bus or Truck (Two Axles)	2.20
Three Axle Commercial Vehicles	2.40
Heavy Construction Machinery (HCM) or Earth Moving Equipment (EME) or Multi Axle Vehicle (MAV) (4 to 6 axles)	3.45
Oversized Vehicles (7 or more Axles)	4.20

There is no bypass or structure to be factored in for rates calculations.

Toll rates are calculated as per guidelines provided in schedule R (rounded to nearest Rs.) for the concession period and are given below.

Thus, worked out rates for various categories of vehicles and discounts are given as under

Table 7-3 : Toll Rates for Single Journey @ Km TP-348.450 KM

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial Vehicle	Multi Axle	Oversized Vehicle
2026-27	190	305	635	635	695	995	1215
2027-28	195	320	665	665	725	1045	1270
2028-29	205	335	695	695	760	1095	1330
2029-30	215	350	730	730	795	1145	1395
2030-31	225	365	765	765	835	1200	1460
2031-32	235	380	800	800	875	1255	1530
2032-33	250	400	840	840	915	1315	1600
2033-34	260	420	880	880	960	1380	1680
2034-35	270	440	920	920	1005	1445	1760
2035-36	285	460	965	965	1055	1515	1845
2036-37	300	485	1010	1010	1105	1585	1930
2037-38	315	505	1060	1060	1155	1665	2025
2038-39	330	530	1110	1110	1215	1745	2125
2039-40	345	555	1165	1165	1270	1830	2225
2040-41	360	585	1225	1225	1335	1920	2335
2041-42	380	610	1285	1285	1400	2010	2450
2042-43	400	640	1345	1345	1470	2110	2570

Table 7-4 : Toll Rates for Return Journey @ TP-348.450 KM

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial Vehicle	Multi Axle	Oversized Vehicle
2026-27	280	455	955	955	1040	1495	1820
2027-28	295	475	1000	1000	1090	1565	1905
2028-29	310	500	1045	1045	1140	1640	1995
2029-30	325	525	1095	1095	1195	1715	2090
2030-31	340	545	1145	1145	1250	1800	2190

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial Vehicle	Multi Axle	Oversized Vehicle
2031-32	355	575	1200	1200	1310	1885	2295
2032-33	370	600	1260	1260	1375	1975	2405
2033-34	390	630	1320	1320	1440	2070	2515
2034-35	410	660	1380	1380	1505	2165	2640
2035-36	430	690	1450	1450	1580	2270	2765
2036-37	450	725	1520	1520	1655	2380	2895
2037-38	470	760	1590	1590	1735	2495	3035
2038-39	495	795	1670	1670	1820	2615	3185
2039-40	515	835	1750	1750	1910	2745	3340
2040-41	540	875	1835	1835	2000	2875	3500
2041-42	570	920	1925	1925	2100	3015	3675
2042-43	595	965	2020	2020	2200	3165	3855

Table 7-5 : Toll Rates for Monthly Pass Local @ TP-348.450 KM

Year	Car
2026-27	360
2027-28	375
2028-29	395
2029-30	415
2030-31	430
2031-32	455
2032-33	475
2033-34	495
2034-35	520
2035-36	545
2036-37	570
2037-38	600
2038-39	630
2039-40	660
2040-41	690
2041-42	725
2042-43	760

Table 7-6 : Toll Rates for Monthly Pass @ TP-348.450 KM

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial Vehicle	Multi Axle	Oversized Vehicle
2026-27	6265	10120	21200	21200	23130	33245	40475
2027-28	6560	10595	22195	22195	24215	34810	42375
2028-29	6865	11090	23240	23240	25355	36445	44370
2029-30	7190	11615	24335	24335	26550	38165	46460
2030-31	7530	12165	25490	25490	27805	39970	48660
2031-32	7890	12740	26695	26695	29125	41865	50965
2032-33	8265	13350	27965	27965	30510	43855	53390
2033-34	8655	13985	29300	29300	31965	45950	55935
2034-35	9070	14655	30705	30705	33495	48145	58615
2035-36	9505	15355	32175	32175	35100	50460	61425
2036-37	9965	16095	33725	33725	36790	52890	64385
2037-38	10445	16875	35355	35355	38570	55445	67495

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial Vehicle	Multi Axle	Oversized Vehicle
2038-39	10950	17690	37070	37070	40440	58130	70765
2039-40	11485	18550	38870	38870	42405	60955	74205
2040-41	12045	19455	40765	40765	44470	63925	77825
2041-42	12635	20410	42760	42760	46645	67055	81630
2042-43	13255	21410	44855	44855	48935	70345	85635

7.4 Toll Revenue

As indicated earlier, toll revenue on the Project Road has been calculated in all three scenarios based on above rates and projected traffic. The estimates of toll revenue under ***Optimistic***, ***Pessimistic*** and ***Most Likely*** growth scenarios are presented in the following section.

7.5 Toll Revenue at all toll plazas under Scenarios

Toll Revenue estimates under all scenarios at each of the toll plaza up to 2042-43 years starting from the year 2026-27 are shown in tables below.

Table 7-7 : Toll Revenue Optimistic Scenario

(Rs. Crores)

Year	TP-1	Total
2026-27	370.67	**370.67**
2027-28	411.21	**411.21**
2028-29	454.90	**454.90**
2029-30	504.32	**504.32**
2030-31	556.45	**556.45**
2031-32	614.03	**614.03**
2032-33	677.79	**677.79**
2033-34	748.25	**748.25**
2034-35	824.52	**824.52**
2035-36	910.11	**910.11**
2036-37	997.33	**997.33**
2037-38	1096.34	**1096.34**
2038-39	1206.19	**1206.19**
2039-40	1329.29	**1329.29**
2040-41	1450.54	**1450.54**
2041-42	1587.95	**1587.95**
2042-43	1740.93	**1740.93**

Table 7-8 : Toll Revenue Pessimistic Scenario

(Rs. Crores)

Year	TP-1	Total
2026-27	368.84	**368.84**
2027-28	407.25	**407.25**
2028-29	448.39	**448.39**
2029-30	494.75	**494.75**
2030-31	543.28	**543.28**
2031-32	596.59	**596.59**
2032-33	655.39	**655.39**
2033-34	720.07	**720.07**
2034-35	789.65	**789.65**
2035-36	867.49	**867.49**
2036-37	946.11	**946.11**
2037-38	1035.10	**1035.10**
2038-39	1133.40	**1133.40**
2039-40	1243.19	**1243.19**
2040-41	1350.19	**1350.19**
2041-42	1471.07	**1471.07**
2042-43	1604.96	**1604.96**

Table 7-9 : Toll Revenue Most Likely Scenario

(Rs. Crores)

Year	TP-1	Total
2026-27	369.77	**369.77**
2027-28	409.21	**409.21**
2028-29	451.60	**451.60**
2029-30	499.50	**499.50**
2030-31	549.84	**549.84**
2031-32	605.21	**605.21**
2032-33	666.44	**666.44**
2033-34	733.93	**733.93**
2034-35	806.88	**806.88**
2035-36	888.47	**888.47**
2036-37	971.29	**971.29**
2037-38	1065.05	**1065.05**
2038-39	1168.86	**1168.86**
2039-40	1285.23	**1285.23**
2040-41	1399.15	**1399.15**
2041-42	1528.01	**1528.01**
2042-43	1671.12	**1671.12**

CHAPTER 8

CONCLUSION & RECOMMENDATIONS

8.1 Conclusion & Recommendations

Project stretch of Udaipur to Gujarat Border section of NH-8 in state of Rajasthan is nearing completion of six laning. The road is in sound condition and serves healthy traffic volumes. Project corridor is a part of the busy and prominent national highway NH-8 which connects Mumbai to Delhi and is part of golden quadrilateral. There are large number of townships, industrial corridors and other business establishments coming up along the project corridor. As discussed, the dominant portion of traffic is long route traffic, which is more sensitive towards the growth of national economy. As Indian economy is poised to grow at 7%+ post COVID-19, the project corridor is expected to pick up the same trend in terms of traffic flow. All these developments have potential to give a positive impact to traffic flow on the project. The following can be considered as major outcomes of the study.

a) There is a good amount of tollable traffic running on the project.

b) Project corridor has potential to witness traffic growth @ 6-8% annually in near future due to various development in area and overall development of economy.

c) The Project corridor has committed traffic as long route traffic and does not run a risk of traffic leakage due to quality competing road.

Based on the above it can be considered a stable healthy project from the traffic and revenue point of view.

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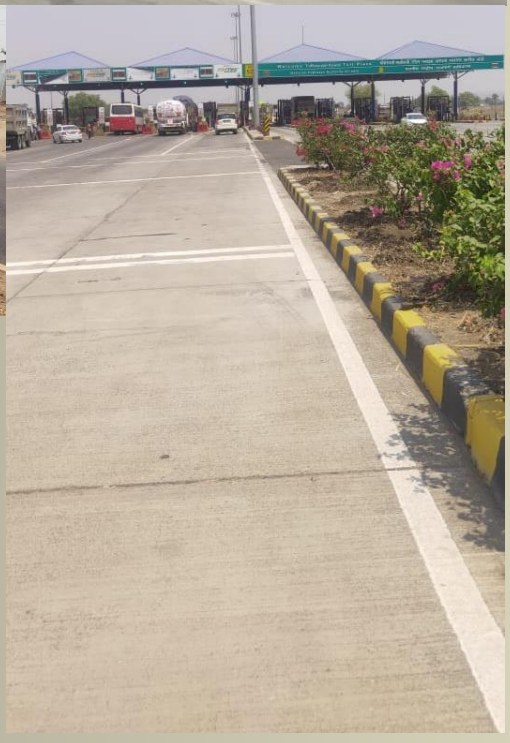
IRB INFRASTRUCTURE TRUST

YEDISHI TO AURANGABAD SECTION OF NH-211

(KM 100.000 TO KM 290.200)

IN THE STATE OF MAHARASHTRA



TRAFFIC STUDY & REVENUE PROJECTION REPORT (FINAL)

MAY 2026

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YEDISHI TO AURANGABAD SECTION OF NH-211

(KM 100.000 TO KM 290.200)

IN THE STATE OF MAHARASHTRA

TRAFFIC STUDY & REVENUE

PROJECTION REPORT

(FINAL)

MAY 2026

GMD CONSULTANTS
NAVI MUMBAI

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ABBREVIATIONS

AADT	-	Annual Average Daily Traffic	**NHAI**	-	National Highway Authority of India
BOT	-	Build Operate Transfer	**NHDP**	-	National Highways Development Project
CAGR	-	Compound Annual Growth Rate	**NSDP**	-	Net State Domestic Product
CTV	-	Classified traffic volume	**O&M**	-	Operation & Maintenance
DBFOT	-	Design, Build, Finance, Operate & Transfer	**PCDP**	-	Per Capita Domestic Product
EME	-	Earth Moving Equipment	**PCI**	-	Per Capita Income
GDP	-	Gross Domestic Product	**PCU**	-	Passenger Car Unit
GSDP	-	Gross State Domestic Product	**PSC**	-	Pre-stressed Concrete
HCM	-	Heavy Construction Machinery	**RCC**	-	Reinforced cement concrete
HCV	-	Heavy Commercial Vehicle	**RHS**	-	Right Hand Side
HTMS	-	Highway Traffic Management System	**SH**	-	State Highway
IRC	-	Indian Road Congress	**TP**	-	Toll Plaza
IRR	-	Internal Rate of Return	**WPI**	-	Wholesale Price Index
LCV	-	Light Commercial Vehicle	**SIR**	-	Special Investment Region
LHS	-	Left Hand Side	**c.**	-	Circa
LGV	-	Light Goods Vehicle	**ROB**	-	Railway Over Bridge
MAV	-	Multi Axle Vehicle	**MDR**	-	Major District Road
MORTH	-	Ministry of Road Transport and Highways	**ODR**	-	Other District Road
NH	-	National Highway	**CA**	-	Concession Agreement
PCC	-	Plain Cement Concrete	**RMT**	-	Running Meter
CR	-	Coarse Rubble			

CHAPTER 1
INTRODUCTION

1.1 Background

The Government of India through National Highway Authority of India (NHAI) embarked upon a program to enhance the traffic capacity and safety for efficient transportation of goods as well as passenger traffic on National Highway Sections under various NHDP Phases.

The project under consideration, four laning of **Yedeshi** to **Aurangabad** section of NH-211 from km 100.000 to km 290.200 is one such road project NHAI intended to implement on a BOT basis in the DBFOT format. *M/s YA Tollway Ltd*. (Concessionaire) has been awarded the Project for a concession period of 26 years starting from 1st July 2015. Four laning of project has also been completed in September 2020.

Length of project road is 189.090 Kms. The project road is section of NH-211, is one of the important transportation link in Maharashtra which connects Solapur to Dhule and then at Dhule it can join other important highway like NH-3 (Mumbai – Agra Road) and NH-6 (east-west highway). The project road passes through the important places like Chausala, Beed, Adul, Chitegaon and then Aurangabad. The Project Road passes through the districts of Beed and Aurangabad.

The following figure shows alignment of project road section from Yedeshi to Aurangabad.

Figure 1-1 : Alignment of Project Stretch

1.2 Objective of the Study

M/s IRB INFRASTRUCTURE TRUST has engaged *GMD Consultants* to assess the future traffic and toll potential of project along with related operation & maintenance expenditure involved.

This report named as **"Traffic Study & *Toll Revenue Projection Report*"** mainly focuses on traffic and revenue aspects of the project. Other parameters like competing road, area developments etc. have been considered from a traffic development point of view.

1.2.1 Scope of Services

The broad scope of work covered in the assignment is as follows.

a) Analysis of Traffic Growth
b) Toll Rate Growth
c) Revenue Forecasting

The Concessionaire has provided basic traffic data and other project details on the basis of which the above analysis has been carried out.

CHAPTER 2

PROJECT DETAILS

2.1 Project Corridor

National Highway 211 which is now part of NH-52. The national highway 52 was numbered after amalgamating many existing national highways of India.

It connects the important places like Chausala, Beed, Adul, Chitegaon and then Aurangabad. The Project Road passes through the districts of Beed and Aurangabad. Following are the major centres of development around project road.

Project Stretch Description

Like other parts of India rapid ribbon development is happening around these cities on project highway. This also contributes to sustainable traffic growth.

There are three operative toll plazas at project stretch. The first is at Yedeshi at Km 134.000, second at Padalshingi at Km 194.000 and third at Bhokarwadi at Km 254.000. The following figure show project alignment and toll plaza locations.

Figure 2-1 : Project Alignment with Toll Plaza

2.2 Project Corridor Illustration

Four laning of project stretch is complete. The following photographs illustrate the project section along the corridor.

Figure 2-2 : Photographs showing Project Corridor

CHAPTER 3

TRAFFIC SURVEYS AND ANALYSIS

3.1 Traffic Surveys

The Consultants have collected the required information for the project corridor to understand the general traffic and travel characteristics on the corridor.

The following traffic data has been collected from a client for a project.

- Classified traffic volume counts at toll plaza locations on Yedeshi - Aurangabad section of NH-211 for years 2017-18, 2018-19, 2019-20, 2020-21 ,2021-22,2022-23,2023-24,2024-25 and Annual traffic data from April 2025 to February 2026.
- Local Component of traffic
- Component of Return Journey
- Component of Monthly Pass Journey

The main objective of the traffic data analysis is to:

- Determine the existing traffic movement characteristics of the project
- Establish base year traffic
- Identification of travel patterns and modal split of project traffic
- Deriving growth factors for traffic forecasting
- Estimation of corridor traffic including traffic diversion if any
- Preparation of revenue model and projection of revenue as per toll policy for various scenarios

Table 3-1 below lists provides details of locations from where traffic details have been collected.

Table 3-1 : Traffic Data Details

Sr. No	Location	CTV	Single Journey Traffic	Daily Return Journey	Monthly Pass	Local Pass
1	**Km 134.000 Toll Plaza at Pargaon**	AADT for Year 2017-18, 2018-19, 2019-20,2020-21 ,2021-22, 2022-23, 2024-25 & Eleven months from April 2025 to February 2026	For Year 2017-18, 2018-19, 2019-20, 2020-21, 2021-22, 2022-2023, 2024-25 & Eleven months from April 2025 to February 2026	For Year 2017-18, 2018-19, 2019-20, 2020-21, 2021-22, 2022-2023, 2024-25 & Eleven months from April 2025 to February 2026	For Year 2017-18, 2018-19, 2019-20, 2020-21, 2021-22, 2022-2023, 2024-25 & Eleven months from April 2025 to February 2026	For Year 2017-18, 2018-19, 2019-20, 2020-21, 2021-22, 2022-2023, 2024-25 & Eleven months from April 2025 to February 2026
2	**Km 194.000 Toll Plaza at Padalshingi**	AADT for Year 2017-18, 2018-19, 2019-20,2020-21 ,2021-22, 2022-23, 2024-25 & Eleven months from April 2025 to February 2026	For Year 2017-18, 2018-19, 2019-20, 2020-21, 2021-22, 2022-2023, 2024-25 & Eleven months from April 2025 to February 2026	For Year 2017-18, 2018-19, 2019-20, 2020-21, 2021-22, 2022-2023, 2024-25 & Eleven months from April 2025 to February 2026	For Year 2017-18, 2018-19, 2019-20, 2020-21, 2021-22, 2022-2023, 2024-25 & Eleven months from April 2025 to February 2026	For Year 2017-18, 2018-19, 2019-20, 2020-21, 2021-22, 2022-2023, 2024-25 & Eleven months from April 2025 to February 2026
3	**Km 254.000 Toll Plaza at Maliwadi**	AADT for Year 2017-18, 2018-19, 2019-20,2020-21 ,2021-22, 2022-23, 2024-25 & Eleven months from April 2025 to February 2026	For Year 2017-18, 2018-19, 2019-20, 2020-21, 2021-22, 2022-2023, 2024-25 & Eleven months from April 2025 to February 2026	For Year 2017-18, 2018-19, 2019-20, 2020-21, 2021-22, 2022-2023, 2024-25 & Eleven months from April 2025 to February 2026	For Year 2017-18, 2018-19, 2019-20, 2020-21, 2021-22, 2022-2023, 2024-25 & Eleven months from April 2025 to February 2026	For Year 2017-18, 2018-19, 2019-20, 2020-21, 2021-22, 2022-2023, 2024-25 & Eleven months from April 2025 to February 2026

All toll plazas are located in Maharashtra.

3.2 Classified Traffic Volume

The objective of conducting a Classified Traffic Volume Count is to understand the traffic flow pattern including modal split on a roadway. The Classified Traffic Volume Count survey has been provided by the concessionaire of project highway from actual traffic data gathered at toll plaza locations based on monthly data shared with NHAI.

The vehicles can broadly be classified into fast moving / motorized and slow moving / non-motorized vehicles, which can be further classified into specific categories of vehicles. The groupings of vehicles are further segregated to capture the tollable vehicle categories specifically and toll exempted vehicles are counted separately. The detailed vehicle classification system as per IRC: 64-1990 is given in table below .

Table 3-2 : Vehicle Classification System

Vehicle Type	
Auto Rickshaw	
Passenger Car	Car, Jeep, Taxi & Van (Old / new technology)
Bus	Minibus
	Standard Bus
Truck	Light Goods Vehicle (LCV)
	2 – Axle Truck
	3 Axle Truck (HCV)
	Multi Axle Truck (4-6 Axle)
	Oversized Vehicles (7 or more axles)
Other Vehicles	Agriculture Tractor, Tractor & Trailer

Source - IRC: 64 – 1990

However, since the project highway is currently under toll operation, the data collected corresponds to the category of tollable vehicles. The following are the types of vehicles as per concession agreement.

- Car / Jeep / van
- Minibus /LCV
- Bus
- Truck /
- 3 Axle commercial vehicle
- Multi Axle

3.3 Traffic Characteristic

Toll revenue of project highway does not solely depend on traffic volume. There are certain characteristics of traffic which have substantial potential to affect toll collection. Component of local traffic, component of passenger and commercial traffic, portion of return journey traffic, % of monthly pass traffic are some of such characteristics of traffic. These will be discussed in subsequent sections of report.

3.3.1 Traffic Data

Project concessionaire has provided Traffic data for the years 2019-20 ,2020-21, 2021-22, 2022-23 ,2024-2025 and Annual traffic data from April 2025 to February 2026.
Since the traffic data available for this update is for only Annual, from April 2025 to February 2026, it may not represent the whole year traffic. Hence a seasonality factor for balance part of year has been applied to average traffic of the current Eleven months to arrive at Annual Average Daily Traffic of base year 2025-26. Thus, corrected traffic is used for future projections and revenue calculations. The following table shows historical traffic on project stretch and derived Annual Average Daily Traffic (AADT) for year 2025-26.

Table 3-3 : Traffic Data at Pargaon Toll Plaza at Km 134.000

Sr. No	Type of Vehicle	Annual Average Daily Traffic (Nos.)- 2019-20	Annual Average Daily Traffic (Nos.)- 2020-21	Annual Average Daily Traffic (Nos.)- 2021-22	Annual Average Daily Traffic (Nos.)- 2022-23	Annual Average Daily Traffic (Nos.)- 2023-24	Annual Average Daily Traffic (Nos.)- 2024-25	Annual Average Daily Traffic (Nos.)- 2025-26
1	Car	1641	1439	2426	2863	3388	3548	4594
2	Minibus /LCV	658	482	257	317	332	338	308
3	Bus	199	109	110	215	244	238	287
4	Truck	635	704	786	988	1078	1057	1221
5	3-Axle Commercial vehicle	793	845	876	967	924	857	952
6	Multi axle	1081	1284	1567	2164	2089	1538	1867
7	Oversize Vehicle	0	50	74	31	29	29	14
	Total	**5007**	**4913**	**6096**	**7544**	**8084**	**7605**	**9242**

Table 3-4 : Traffic Data at Padalshingi Toll Plaza at Km 194.000

Sr. No	Type of Vehicle	Annual Average Daily Traffic (Nos.)- 2019-20	Annual Average Daily Traffic (Nos.)- 2020-21	Annual Average Daily Traffic (Nos.)- 2021-22	Annual Average Daily Traffic (Nos.)- 2022-23	Annual Average Daily Traffic (Nos.)- 2023-24	Annual Average Daily Traffic (Nos.)- 2024-25	Annual Average Daily Traffic (Nos.)- 2025-26
1	Car	4114	3166	4969	5458	6558	7220	9075
2	Minibus /LCV	1095	883	383	451	483	517	477
3	Bus	473	260	252	478	547	570	641
4	Truck	788	839	891	1159	1324	1398	1551
5	3-Axle Commercial vehicle	944	1049	1098	1119	1145	1102	1085
6	Multi axle	1134	1363	1641	2290	2270	1790	2171
7	Oversize Vehicle	1	60	65	29	28	29	14
	Total	**8549**	**7620**	**9299**	**10985**	**12357**	**12626**	**15013**

Table 3-5 : Traffic Data at Maliwadi Toll Plaza at Km 254.000

Sr. No	Type of Vehicle	Annual Average Daily Traffic (Nos.)- 2019-20	Annual Average Daily Traffic (Nos.)- 2020-21	Annual Average Daily Traffic (Nos.)- 2021-22	Annual Average Daily Traffic (Nos.)- 2022-23	Annual Average Daily Traffic (Nos.)- 2023-24	Annual Average Daily Traffic (Nos.)- 2024-25	Annual Average Daily Traffic (Nos.)- 2025-26
1	Car	3089	2492	3992	4717	5799	6251	8068
2	Minibus /LCV	687	546	192	295	353	369	345
3	Bus	347	177	177	341	388	404	453
4	Truck	547	579	567	892	1075	975	1043
5	3-Axle Commercial vehicle	679	737	718	841	928	833	852
6	Multi axle	866	1046	1164	1914	1918	1275	1451
7	Oversize Vehicle	1	47	52	23	21	22	13
	Total	**6216**	**5623**	**6862**	**9023**	**10484**	**10128**	**12225**

3.4 Data Analysis

3.4.1 Analysis of Traffic Volume Count

Understanding the character of existing traffic forms the basis of the traffic forecast. The various vehicle types having different sizes and characteristics can be converted into a single unit called Passenger Car Unit (PCU). Passenger Car equivalents for various vehicles are adopted based on recommendations of Indian Road Congress prescribed in "IRC-64-1990: Guidelines for Capacity of Roads in Rural areas". The adopted passenger car unit values (PCU) are presented in Table 3-6.

Table 3-6 : PCU Factors Adopted for Study

Vehicle Type	PCUs
Car	1.0
Minibus	1.5
Standard Bus	3.0
LCV/LGV	1.5
2 Axle Truck	3.0
3 – 6 Axle Truck	4.5
MAV	4.5
Auto Rickshaw	1.0
Van/Tempo	1.0
Agriculture Tractor with Trailer	4.5
Agriculture Tractor without Trailer	1.5

Source: IRC: 64-1990

Traffic volume at each toll plaza was converted to PCU and same is presented as under

Table 3-7 : Traffic in PCU at Project Stretch

Year	Toll Plaza Location (Km)	Traffic No	PCU	PCU Index
2019-2020	Km 134.000 Toll Plaza at Pargaon	5007	12373	2.47

Year	Toll Plaza Location (Km)	Traffic No	PCU	PCU Index
	Km 194.000 Toll Plaza at Padalshingi	8549	17479	2.04
	Km 254.000 Toll Plaza at Maliwadi	6216	12740	2.05
2020-2021	Km 134.000 Toll Plaza at Pargaon	4913	13136	2.67
	Km 194.000 Toll Plaza at Padalshingi	7620	17339	2.28
	Km 254.000 Toll Plaza at Maliwadi	5623	12706	2.26
2021-2022	Km 134.000 Toll Plaza at Pargaon	6096	15511	2.54
	Km 194.000 Toll Plaza at Padalshingi	9299	19945	2.14
	Km 254.000 Toll Plaza at Maliwadi	6862	14138	2.06
2022-2023	Km 134.000 Toll Plaza at Pargaon	7544	19724	2.61
	Km 194.000 Toll Plaza at Padalshingi	10985	24840	2.26
	Km 254.000 Toll Plaza at Maliwadi	9023	20097	2.23
2023-2024	Km 134.000 Toll Plaza at Pargaon	8084	20153	2.49
	Km 194.000 Toll Plaza at Padalshingi	12357	26677	2.16
	Km 254.000 Toll Plaza at Maliwadi	10484	22233	2.12
	Km 134.000 Toll Plaza at Pargaon	7605	17563	2.31
	Km 194.000 Toll Plaza at Padalshingi	12626	25391	2.01

Year	Toll Plaza Location (Km)	Traffic No	PCU	PCU Index
2024-2025	Km 254.000 Toll Plaza at Maliwadi	10128	19274	1.90
2025-2026	Km 134.000 Toll Plaza at Pargaon	9242	20899	2.26
	Km 194.000 Toll Plaza at Padalshingi	15013	29452	1.96
	Km 254.000 Toll Plaza at Maliwadi	12225	22216	1.82

It can be observed from above that project traffic has PCU index 2 to 2.6 which is an indicator of high proportion of commercial traffic in traffic mix in project corridor. The following figure illustrates variation of PCU index at three toll plaza locations.

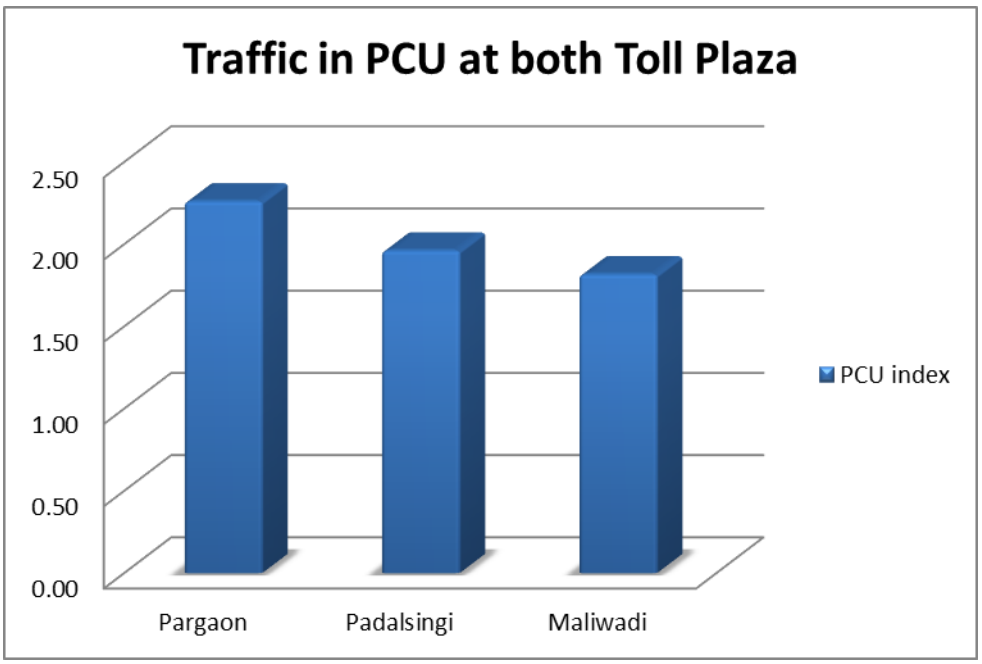

Figure 3-1 : Comparison of PCU Index

It can be observed that PCU index is consistent at all three toll plaza locations.

3.4.2 Components of Traffic

As discussed previously, components of traffic volume play an important role in determining project revenue. A larger component of commercial traffic with higher axle configuration adds to project revenue positively. Similarly, a larger component of local traffic affects the project revenue potential negatively.

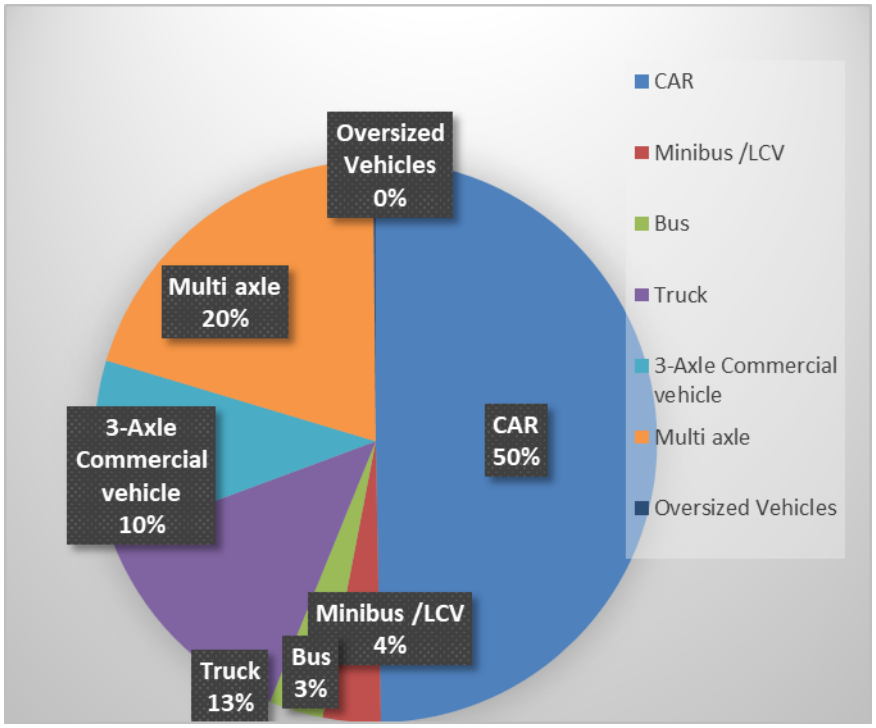

Figure 3-2: Model split of tollable vehicle @ Km 134.000

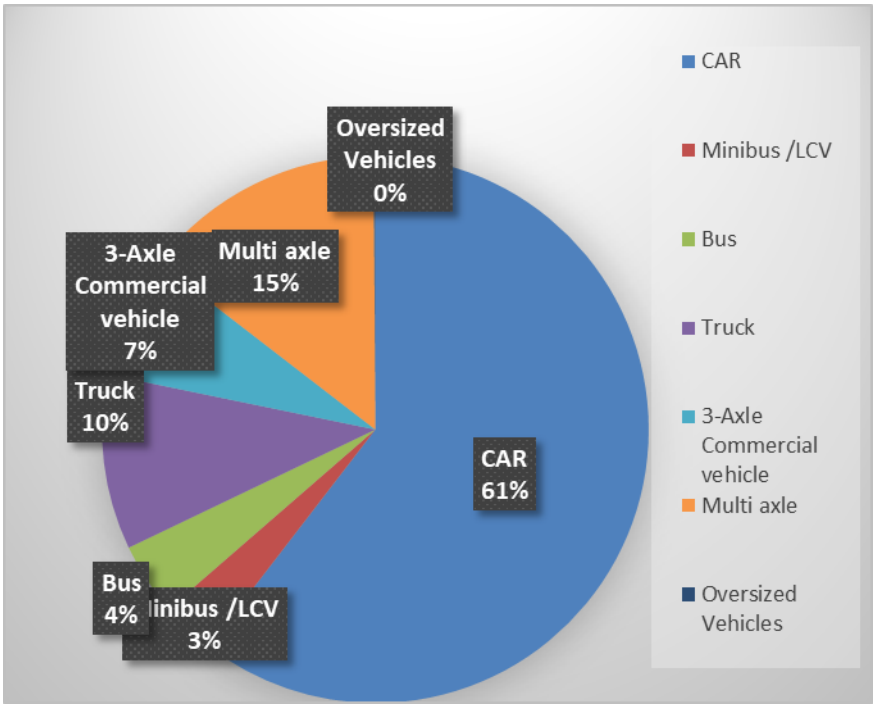

Figure 3-3: Model split of tollable vehicle @ Km 194.000

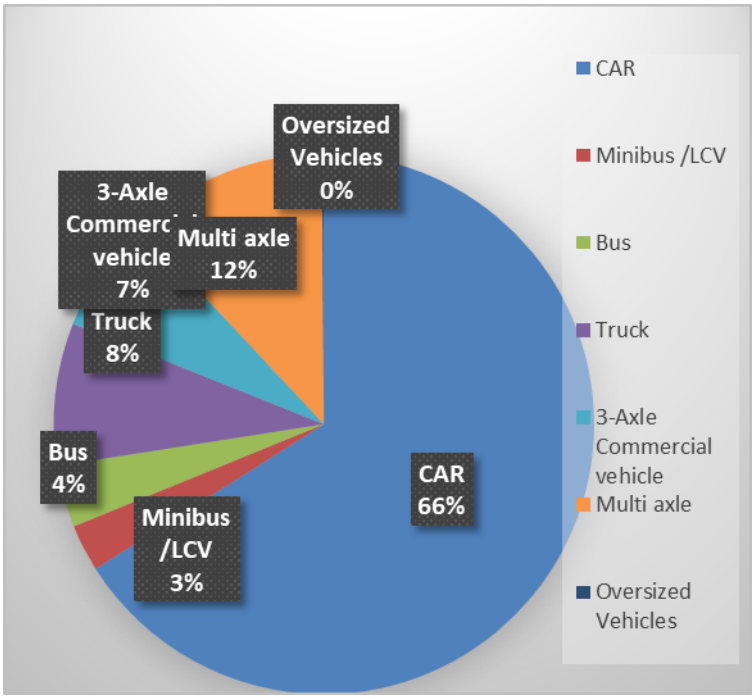

Figure 3-3: Model split of tollable vehicle @ Km 254.000

It is observed that car traffic forms about 50% of total traffic at toll plaza location KM 134.000 while multi axle commercial vehicles are about 30% of total traffic. Truck / Bus and LCV share about 16% and 4% of traffic volume respectively.

It is observed that car traffic forms about 61% of total traffic at toll plaza location KM 194.000 while multi axle commercial vehicles are about 22% of total traffic. Truck / Bus and LCV share about 14% and 3% of traffic volume respectively.

It is observed that car traffic forms about 66% of total traffic at toll plaza location KM 254.000 while multi axle commercial vehicles are about 19% of total traffic. Truck / Bus and LCV share about 12% and 3% of traffic volume respectively.

At second & third toll plaza passenger traffic component is higher due to urban settlement around.

Another important bifurcation of traffic is components of traffic with respect to various type of toll ticketing like

1. Single Journey
2. Multi Journey
3. Local Commercial Single Journey
4. Monthly Pass Local
5. Monthly Pass
6. Annual Pass Car

The following table provides numbers of vehicles falling in each of the above category on base year 2025-26

Table 3-8 : Journey Type Bifurcation of Traffic at Pargaon Toll Plaza KM 134.000

Sr. No	Type	Traffic Volume (Nos.)
		2025-26
1	Single Journey	6012
2	Return Journey	2232
3	Local Commercial Single Journey	83
4	Monthly Pass Local	5
5	Monthly Pass	5
6	Annual Pass Car	904

Most dominant part of the above is the single journey type followed by return journey at project stretch. Monthly pass commuters are a very low fraction of the total traffic on the project corridor.

The single journey component in total traffic numbers is as high as 65%. Return journey component is 24%. The number of monthly pass Local is 0% and Local Commercial single Journey 1% and Annual Pass Car is 10% at Pargaon toll plaza.

The following tables give the details of journey distribution at Padalshingi toll plaza at Km 194.000 and Km 254.000.

Table 3-9 : Journey Type Bifurcation of Traffic at Padalshingi Toll Plaza KM 194.000

Sr. No	Type	Traffic Volume (Nos.)
		2025-26
1	Single Journey	7744
2	Return Journey	4936
3	Local Commercial Single Journey	381
4	Monthly Pass Local	101

Sr. No	Type	Traffic Volume (Nos.)
		2025-26
5	Monthly Pass	1
6	Annual Pass Car	1849

Table 3-10 : Journey Type Bifurcation of Traffic at Maliwadi Toll Plaza KM 254.000

Sr. No	Type	Traffic Volume (Nos.)
		2025-26
1	Single Journey	6138
2	Return Journey	4466
3	Local Commercial Single Journey	26
4	Monthly Pass Local	38
5	Monthly Pass	5
6	Annual Pass Car	1552

It is observed that the project corridor demonstrates a similar pattern of single journey dominating mix of traffic across the entire stretch which is typical of major national highways.

3.5 Secondary Data Collection

There are several other factors which have a substantial impact on traffic patterns and growth on any project corridor. The following are some of such important factors.

- Industrial development around project corridor and its catchment
- Educational infrastructure along project corridor
- Demographic pattern
- Urban area development
- Tourism potential
- Upcoming major infrastructural or Industrial projects
- Special Industry in project corridor
- Overall trends of economic growth local as well as national / regional

Hence in addition to traffic details on the project site, secondary data was also collected from various other sources. Typical secondary data includes the following:

1. Vehicle registration data of regional and national level.
2. Economic Data
   a) GDP
   b) NSDP
   c) Population Growth
   d) Per Capita Income growth
   e) Industrial Growth
   f) Special Industry Potential
   g) Regional and National development vision / plan
   h) Any other relevant data
3. Competing road network

We have collected and utilized such underlying data in the study to estimate the growth and risk factors for traffic along the project corridor.

CHAPTER 4

INFLUENCE ZONE TRANSPORT NETWORK ANALYSIS

4.1 Introduction

Highway corridors behave like integrated circuit networks and more often than not every road is connected to various networks having different origins and destinations. Traffic running on these networks behaves like fluid and flow on network on alignment of least friction.

The following Factors can be considered as major contributors to friction on transportation network.

- Travel Speed / Travel Time
- Geometric deficiencies like blind horizontal curves and steep vertical gradients etc.
- Configuration of road
- Riding quality
- Traffic delays,
- Length of road,
- Passing through built up or Urban Area,
- Terrain,
- Facilities,

4.2 Competing / Alternate route

In BOT projects there is always a risk factor of traffic shifting on competing roads after imposition of toll. Shifting of traffic depends on factors such as road length, type, geometry, riding quality and capacity. Competing road networks were identified around section and a speed delay analysis was conducted. In this detail of competing roads are provided and a comparison with project road is made. There can be some alternate route between Yedashi and Aurangabad. The following figure provides alignment of competing road network between Yedashi and Aurangabad.

Figure 4-1 : Alternate routes – Yedashi- Aurangabad

It can be observed that alternate routes are quite long and take more time to travel. Hence the project road remains the most preferred option for travel between Yedashi and Aurangabad.

Similarly, at regional level there can be alternate via Ahmednagar for travel between Solapur and Aurangabad. The following figure shows competing networks in the area.

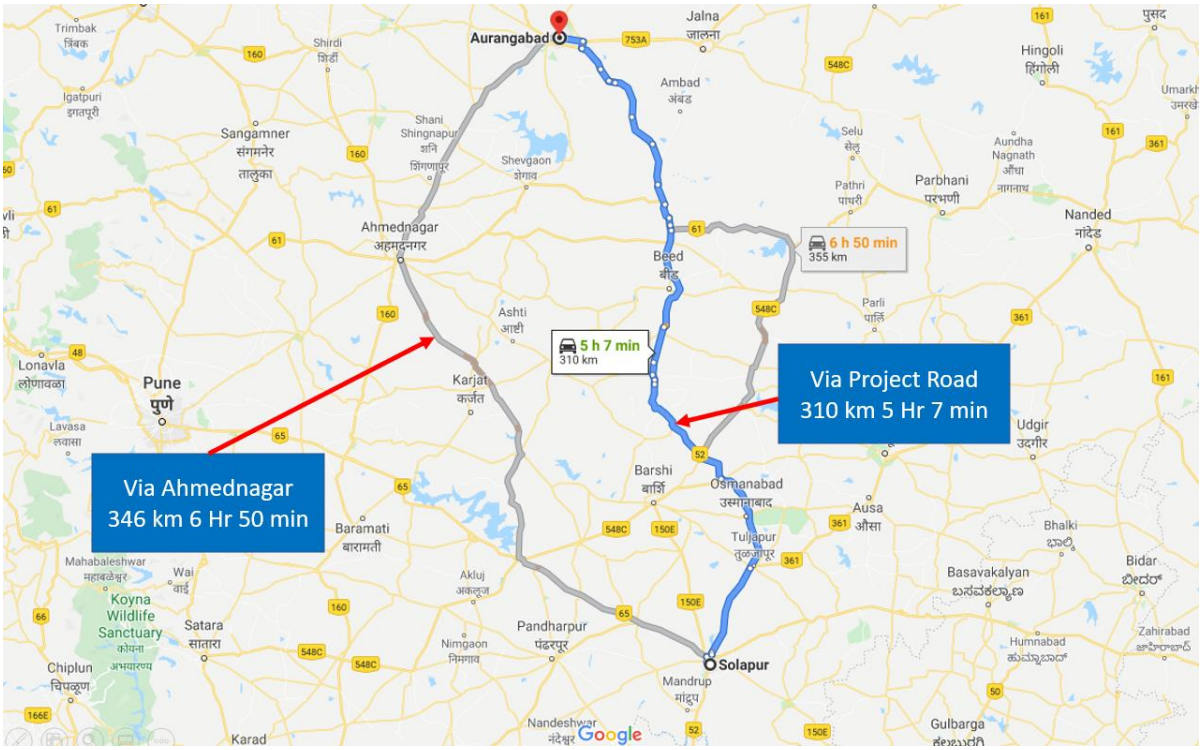

Figure 4-2 : Alternate route Between Solapur and Aurangabad

For travel between Solapur and Aurangabad as well project road is the preferred option due to shorter length and less travel time. Completion of four laning of Solapur Yedashi section has complemented travel on this route.

The following table provides a summary of analysis of alternate route/ roads discussed above.

Table 4-1 : Competing Roads Details

Sr. No	Route Details	Designation	Length (Km)	Avg. Speed (KMPH)	Time Taken (Min)	Observations
Regional Level						
1	Solapur-Ahmednagar-Aurangabad	Alternate Route	346	50	6 Hr 50 Min	Project road has minimum travel time and shortest road
	Solapur- Yedashi-Aurangabad	Project Road	310	60	5 Hr 10 Min	
2	Yedashi- Kalam-Madalmoni-Aurangabad (SH-61)	Alternate Route	270	50	5 Hr 24 Min	Project road has minimum travel time and shortest road
	Yedashi-Ahmednagar-Aurangabad	Alternate Route	289	50	5 Hr 49 Min	
	Yedashi- Beed-Aurangabad	Project Road	223	57	3 Hr 54 Min	

It light of the above discussion project road remains most preferred route for the traffic of influence area. Moreover, project stretch is under toll operation for last one year. Hence any shifting of traffic, if any, would have settled by now and any further shifting of traffic is not envisaged from project road.

Regional Network

Project corridor is an important transportation link for the traffic between Karnataka and Rajasthan / Delhi and other northern states. Part of this traffic uses the Bijapur- Solapur- Ahmednagar- Shirdi route to join back at Dhule and proceed towards northern parts of country. The length of route between Bijapur via project road and route via Ahmednagar is almost equal. Thus, it is expected that some part traffic will come back on the project road as the four laning is complete. The following figures show the route between Bijapur and Dhule via Project Road and via Ahmednagar for better understanding.

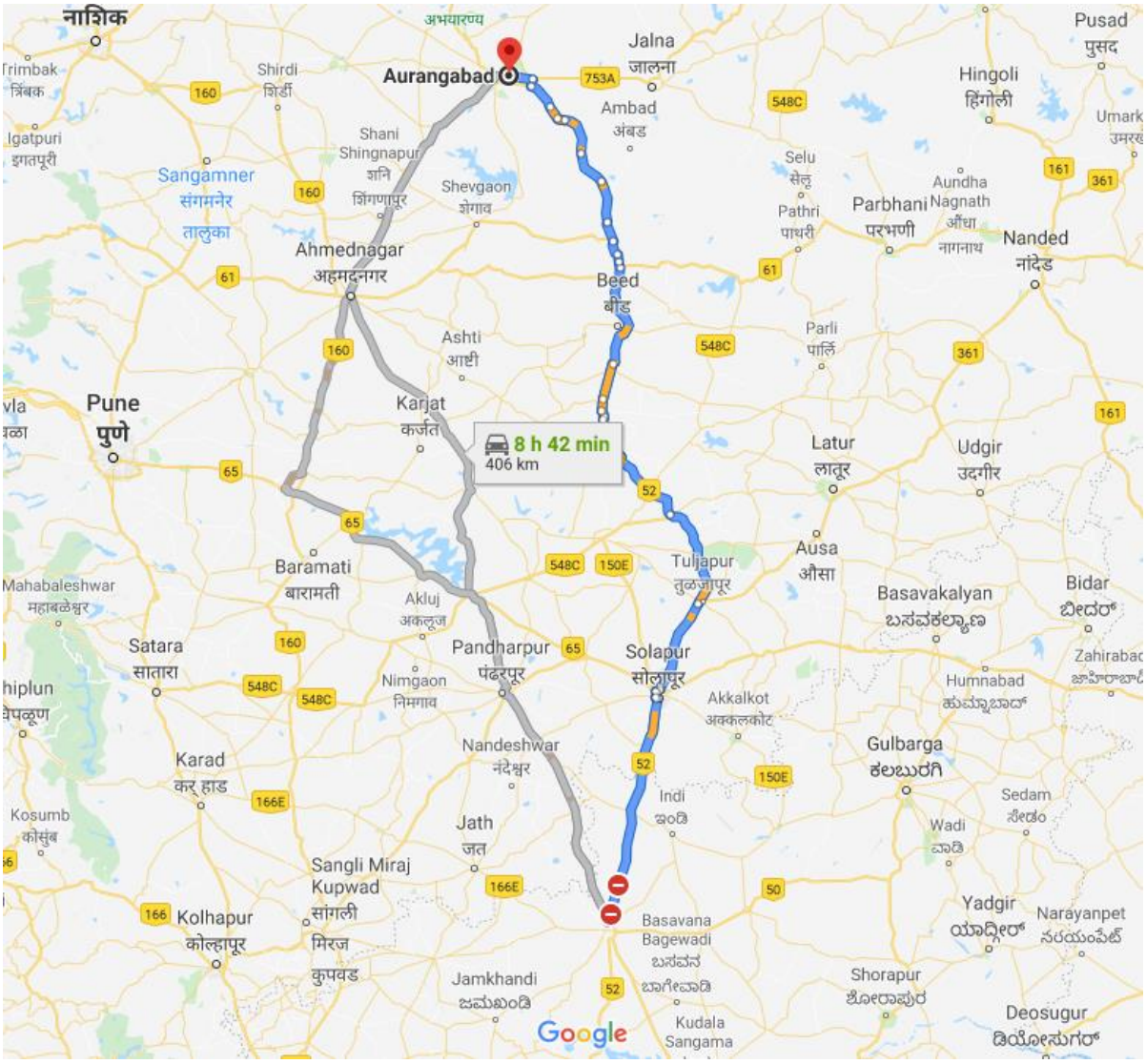

Figure 4-3 : Project Road in regional network.

CHAPTER 5

GROWTH OF TRAFFIC ON PROJECT HIGHWAY

5.1 Introduction

Traffic growth is a function of the interplay of a number of contributory factors such as National economy, Government policy, socio-economic conditions of the people, and changes in land uses along the project corridor precincts etc. As these factors have a number of uncertainties associated with them, forecasts of traffic are dependent on the projections of other factors such as population, gross domestic product (GDP), vehicle ownership, per capita income (PCI), agricultural output, fuel consumption etc. Future patterns of change in these factors can be estimated with only a reasonable degree of accuracy and hence the resultant traffic forecast levels may not be precise.

Traffic growth forecast for project corridor Yedeshi - Aurangabad section of NH-8 has been done taking the above factors into consideration. "**IRC: 108-2015-Guidelines for Traffic Prediction on Rural Highways**" is established best practice and has been used for traffic growth forecast.

5.2 Trend Analysis

One of the methods of estimation of future rate of growth is to assume the same rate of growth as in the past. Although such a method is more suitable to projects of short durations say 5-10 years, however for long term projections it would-be erroneous to assume that the past rate of growth will continue to prevail for a long time in future. Economic conditions, which are major influencing factors, are bound to change over a long period of time. Thus, it would be necessary to modify the past trends of growth suitably.

Elasticity model of growth projection is one of the most widely acceptable methods for traffic forecasts. The same is recommended in **IRC: 108-12015-Guidelines for Traffic Prediction on Rural Highways**.

In this method the past trend of vehicular data is paired with an economic indicator and a regression analysis is done to yield the economic model of growth. Growth of vehicle traffic varies for different types of vehicles. It is a proven fact that the growth pattern for passenger and goods vehicle is different. Traffic growth on any highway typically depends on a number of economic parameters. Most important and direct parameters are given as under

- Per Capita Income
- Net State Domestic Product (NSDP)
- Population

It can be observed that the ownership of a car is more closely related to affordability; hence per capita is the index which closely fits the growth of car traffic among other criteria. In a similar fashion, the following can be pairs of vehicle type and independent variable for elasticity modeling of growth.

- Car / Jeep – Par Capita Income
- Bus / Minibus – Population
- Goods Vehicle – NSDP

5.3 Estimation of Traffic Demand Elasticity

Elasticity of traffic demand is defined as the rate at which traffic intensity varies due to a change in the corresponding indicator selected. Hence, In order to estimate the elasticity of traffic demand, it is necessary to establish relationship between the growth in number of given category of vehicles with the relevant economic variable considered, such as NSDP, per capita income and population growth. Latest available data for vehicle registration, per capita income, NSDP and population is used in analysis.

As per IRC: 108-1996 the model for estimating elasticity index for the project corridor is of the following form and is given as below:

$$Log\ (P) = k \times Log\ (EI) + A$$

Where,

P = *Number of Vehicles (Mode wise)*
EI = *Economic Indicator*
A = *Regression constant*
k = *Elasticity coefficient (Regression coefficient)*

The elasticity for car and bus (passenger vehicles) is calculated based on the Population and Per Capita Domestic Product (PCDP) and the elasticity for trucks is calculated based on the Net State Domestic Product (NSDP).

The project corridor spreads across state of Maharashtra. Toll plazas at Paragaon, Padalsingi and Bhokharwadi are in the state of Maharashtra. Project traffic share of many states like Karnataka, Gujarat & Haryana also. For elasticity calculations, working data from these states also has been analyzed.

Following tables and graphs depict regression and elasticity of growth model for stretch falling in Maharashtra State.

Table 5-1 : Per Capita Income Vs Car Maharashtra

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2012	99564	2307841	5.00	6.36		
2013	103904	2592565	5.02	6.41	4%	
2014	109399	2834847	5.04	6.45	5%	
2015	114746	3113773	5.06	6.49	5%	
2016	122422	3406872	5.09	6.53	7%	
2017	132899	3715744	5.12	6.57	9%	5.96%

Regression analysis of same is given in figure below

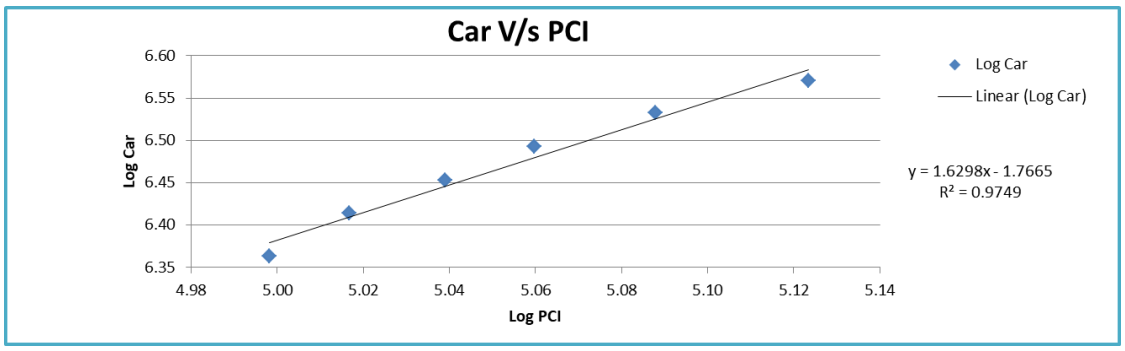

Figure 5-1 : Regression and Elasticity PCI vs. Car – Extrapolation Maharashtra

Table 5-2 : Population Vs Bus Maharashtra

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth
2012	112374333	119298	8.05	5.08		
2013	113807248	129535	8.06	5.11	1%	
2014	115229410	140087	8.06	5.15	1%	
2015	116640546	140102	8.07	5.15	1%	
2016	118040394	150427	8.07	5.18	1%	
2017	119428710	160042	8.08	5.20	1%	1.23%

Regression analysis of same is given in figure below

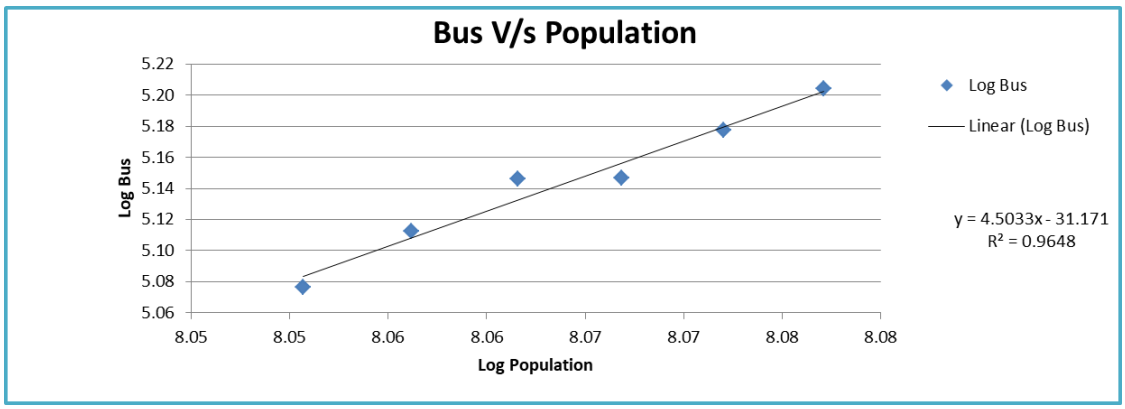

Figure 5-2 : Regression and Elasticity Population vs. Bus – Extrapolation Maharashtra

Elasticity of goods traffic has been worked out by regression analysis with NSDP. Following table represents the data and details.

Table 5-3 : LCV Traffic Vs NSDP Maharashtra

Year	NSDP	LCV	Log NSDP	Log LCV	NSDP Growth	Average Growth (5 Year)
2012	1126595	656407	6.05	5.82		
2013	1189711	739725	6.08	5.87	6%	
2014	1267551	803128	6.10	5.90	7%	
2015	1345341	868632	6.13	5.94	6%	
2016	1452439	927903	6.16	5.97	8%	6.56%

Following figure depict regression analysis and extrapolation.

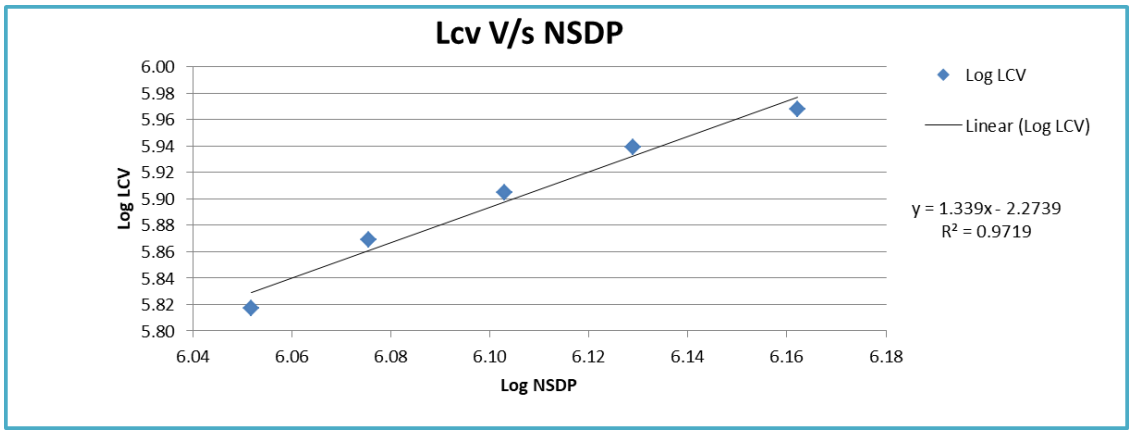

Table 5-4 : Truck Traffic Vs NSDP Maharashtra

Year	NSDP	Trucks	Log NSDP	Log Truck	NSDP Growth	Average Growth (5 Year)
2012	1126595	411418	6.05	5.61		
2013	1189711	402366	6.08	5.60	6%	
2014	1267551	470128	6.10	5.67	7%	
2015	1345341	491582	6.13	5.69	6%	
2016	1452439	468810	6.16	5.67	8%	
2017	1595514	496439	6.20	5.70	10%	7.22%

Following figure depict regression analysis and extrapolation

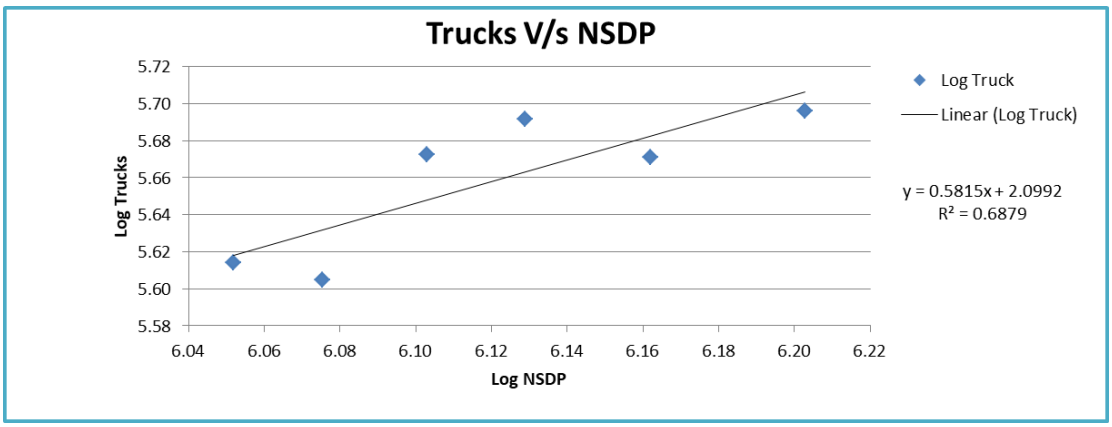

Figure 5-3 : Regression and Elasticity NSDP vs. Truck Traffic - extrapolation Maharashtra.

Using the regression analysis above, we have arrived at the elasticity of traffic demand for each class of vehicle to a given change in relevant economic indicators. Average traffic growth of a vehicle class is multiplied by the corresponding elasticity coefficient to arrive at traffic growth. R2 statistical measure of how close the data are to the fitted regression line. It varies from 0 to 1. Higher the value of R2 more representative is the regression model of data.

The results of these analyses for *the good fit* regression as reflected by R^2 values are presented in the Table below.

Table 5-5 : Summary Regression Analysis Maharashtra

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average Growth	Growth Elastic Model
Maharashtra	Car/Jeep	PCI	y = 1.6298x + -1.7665	R² = 0.9749	1.6298	5.96%	9.71%
	Bus	Population	y = 4.5033x - -31.1713	R² = 0.9648	4.5033	1.23%	5.52%
	LCV	NSDP	y = 1.339x - -2.2739	R² = 0.9719	1.3390	6.56%	8.78%
	Truck	NSDP	y = 0.5815x - 2.0992	R² = 0.6879	0.5815	7.22%	4.20%

Following tables and graphs depict regression and elasticity of growth model for stretch falling in Gujrat State.

Table 5-6 : Per Capita Income Vs Car Gujarat

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2012	87481	1411898	4.94	6.15		
2013	96683	1602129	4.99	6.20	11%	
2014	102589	1771298	5.01	6.25	6%	

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2015	111370	2008748	5.05	6.30	9%	
2016	120683	2260084	5.08	6.35	8%	
2017	129738	2527537	5.11	6.40	8%	8.21%

Regression analysis of same is given in figure below

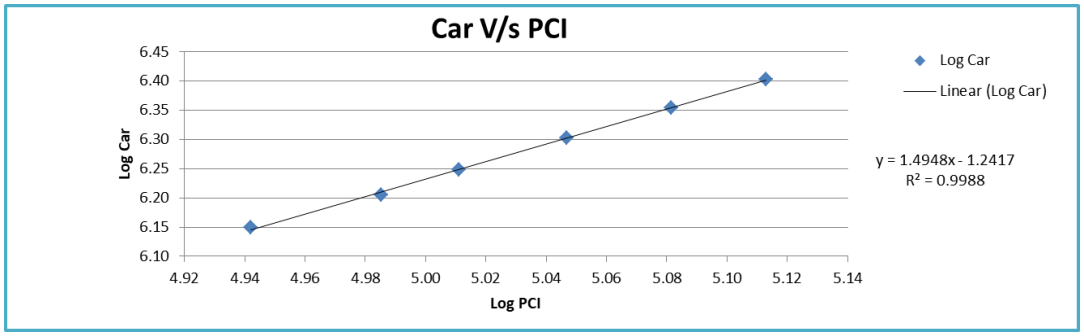

Figure 5-4 : Regression and Elasticity PCI vs. Car – Extrapolation Uttar Pradesh

Table 5-7 : Population Vs Bus Gujrat

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth
2012	60439692	67546	7.78	4.83		
2013	61563037	70615	7.79	4.85	2%	
2014	62684375	72998	7.80	4.86	2%	
2015	63803304	76435	7.80	4.88	2%	
2016	64919427	82734	7.81	4.92	2%	
2017	66032362	74855	7.82	4.87	2%	1.79%

Regression analysis of same is given in figure below

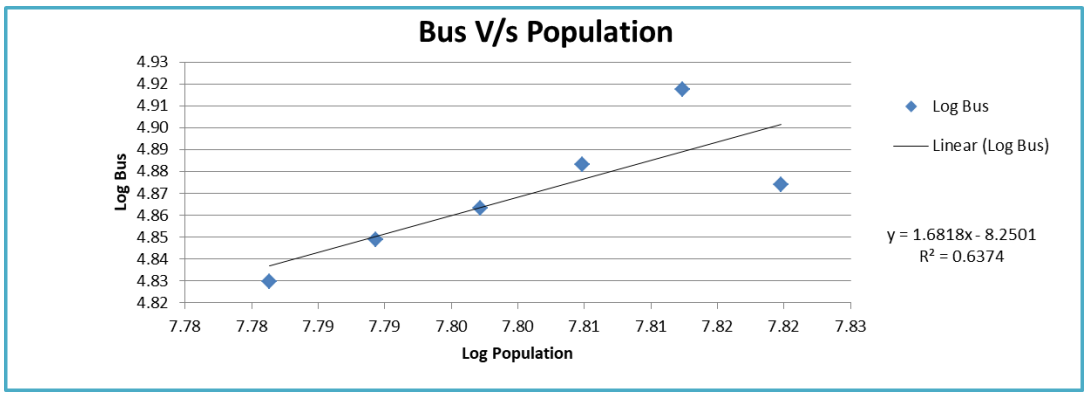

Figure 5-5 : Regression and Elasticity Population vs. Bus – Extrapolation Gujarat

Elasticity of goods traffic has been worked out by regression analysis with NSDP. Following table represents the data and details.

Table 5-8 : LCV Traffic Vs NSDP Gujarat

Year	NSDP	LCV	Log NSDP	Log LCV	NSDP Growth	Average Growth (5 Year)
2012	532809	448958	5.73	5.65		
2013	596659	499277	5.78	5.70	12%	
2014	641489	542918	5.81	5.73	8%	
2015	705629	589984	5.85	5.77	10%	
2016	774775	633599	5.89	5.80	10%	9.82%

Following figure depict regression analysis and extrapolation.

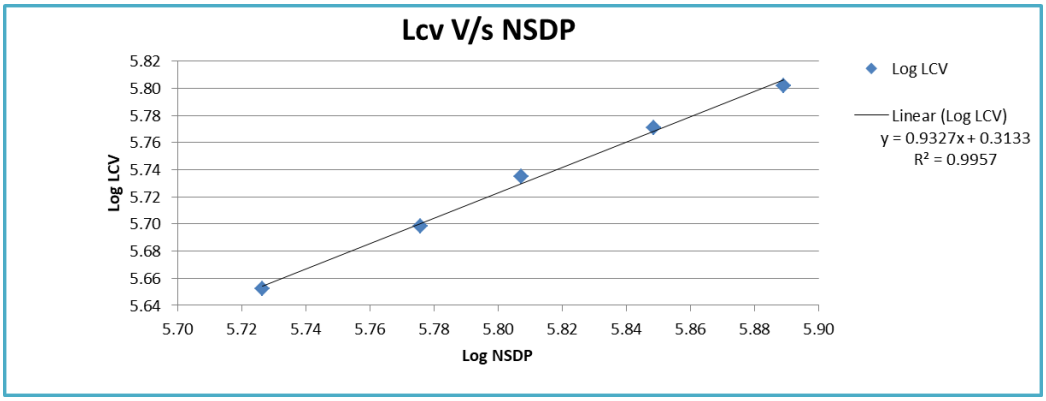

Table 5-9 : Truck Traffic Vs NSDP Gujarat

Year	NSDP	Trucks	Log NSDP	Log Truck	NSDP Growth	Average Growth (5 Year)
2012	532809	301533	5.73	5.48		
2013	596659	319207	5.78	5.50	12%	
2014	641489	332185	5.81	5.52	8%	
2015	705629	352225	5.85	5.55	10%	
2016	774775	375265	5.89	5.57	10%	
2017	843930	396061	5.93	5.60	9%	9.64%

Following figure depict regression analysis and extrapolation

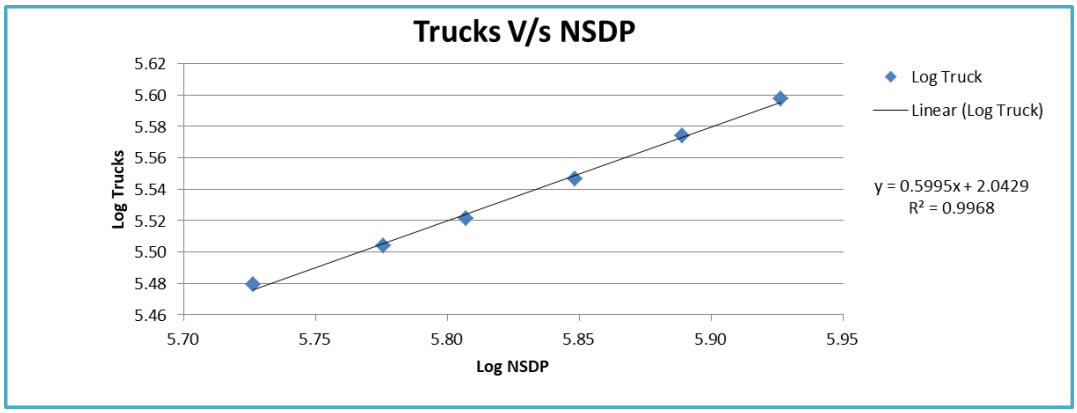

Figure 5-6 : Regression and Elasticity NSDP vs. Truck Traffic - extrapolation Gujarat.

Using the regression analysis above, we have arrived at the elasticity of traffic demand for each class of vehicle to a given change in relevant economic indicators. Average traffic growth of a vehicle class is multiplied by the corresponding elasticity coefficient to arrive at traffic growth. R2 statistical measure of how close the data are to the fitted regression line. It varies from 0 to 1. Higher the value of R2 more representative is the regression model of data.

The results of these analyses for *the good fit* regression as reflected by R^2 values are presented in the Table below

Table 5-10 : Summary Regression Analysis Gujrat

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average Growth	Growth Elastic Model
Gujarat	Car/Jeep	PCI	y = 1.4948x + -1.2417	R^2 = 0.9988	1.4948	8.21%	12.27%
	Bus	Population	y = 1.6818x - -8.2501	R^2 = 0.6374	1.6818	1.79%	3.00%
	LCV	NSDP	y = 0.9327x - 0.3133	R^2 = 0.9957	0.9327	9.82%	9.16%
	Truck	NSDP	y = 0.5995x - 2.0429	R^2 = 0.9968	0.5995	9.64%	5.78%

Following tables and graphs depict regression and elasticity of growth model for stretch falling in Haryana State.

Table 5-11 : Per Capita Income Vs Car Haryana

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2012	106085	1134514	5.03	6.05		
2013	111780	1293065	5.05	6.11	5%	
2014	119791	1454182	5.08	6.16	7%	
2015	125032	1609544	5.10	6.21	4%	
2016	137818	1764448	5.14	6.25	10%	
2017	150241	1879587	5.18	6.27	9%	7.23%

Regression analysis of same is given in figure below

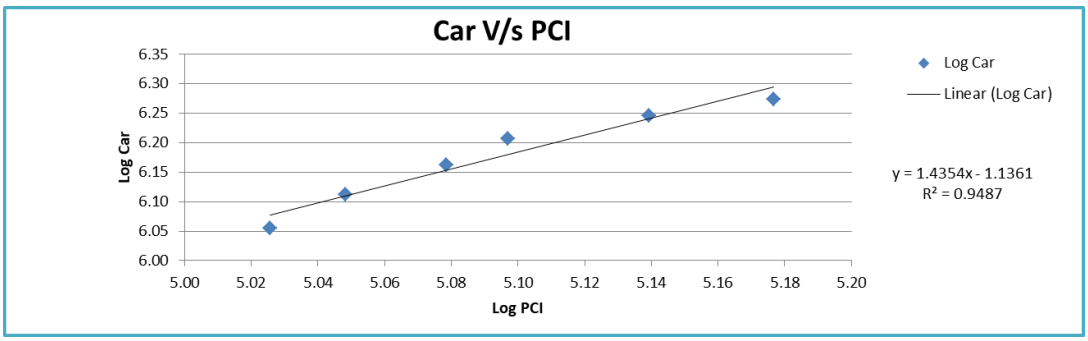

Figure 5-7 : Regression and Elasticity PCI vs. Car – Extrapolation Haryana

Table 5-12 : Population Vs Bus Haryana

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth
2012	25351462	39153	7.40	4.59		
2013	25751257	43456	7.41	4.64	2%	
2014	26149236	46558	7.42	4.67	2%	
2015	26545282	52640	7.42	4.72	2%	
2016	26939286	55781	7.43	4.75	1%	
2017	27331141	60129	7.44	4.78	1%	1.52%

Regression analysis of same is given in figure below

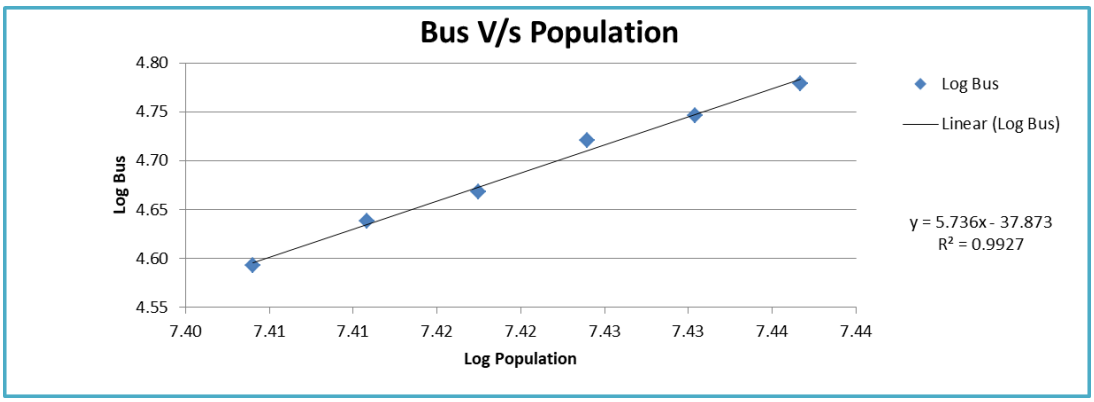

Figure 5-8 : Regression and Elasticity Population vs. Bus – Extrapolation Haryana

Elasticity of goods traffic has been worked out by regression analysis with NSDP. Following table represents the data and details.

Table 5-13 : LCV Traffic Vs NSDP Haryana

Year	NSDP	LCV	Log NSDP	Log LCV	NSDP Growth	Average Growth (5 Year)
2012	271152	124897	5.43	5.10		
2013	289756	137511	5.46	5.14	7%	
2014	314931	152069	5.50	5.18	9%	
2015	333359	167901	5.52	5.23	6%	

Year	NSDP	LCV	Log NSDP	Log LCV	NSDP Growth	Average Growth (5 Year)
2016	372659	182776	5.57	5.26	12%	8.30%

Following figure depict regression analysis and extrapolation.

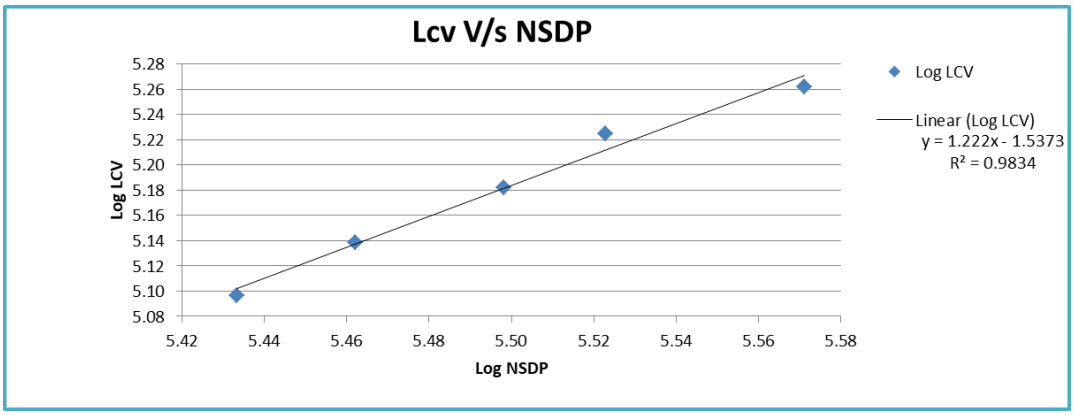

Figure 5-9 : Regression and Elasticity NSDP vs. Lcv – Extrapolation Haryana

Table 5-14 : Truck Traffic Vs NSDP Haryana

Year	NSDP	Trucks	Log NSDP	Log Truck	NSDP Growth	Average Growth (5 Year)
2012	271152	292735	5.43	5.47		
2013	289756	307509	5.46	5.49	7%	
2014	314931	327882	5.50	5.52	9%	
2015	333359	348732	5.52	5.54	6%	
2016	372659	367730	5.57	5.57	12%	
2017	412006	390321	5.61	5.59	11%	8.75%

Following figure depict regression analysis and extrapolation

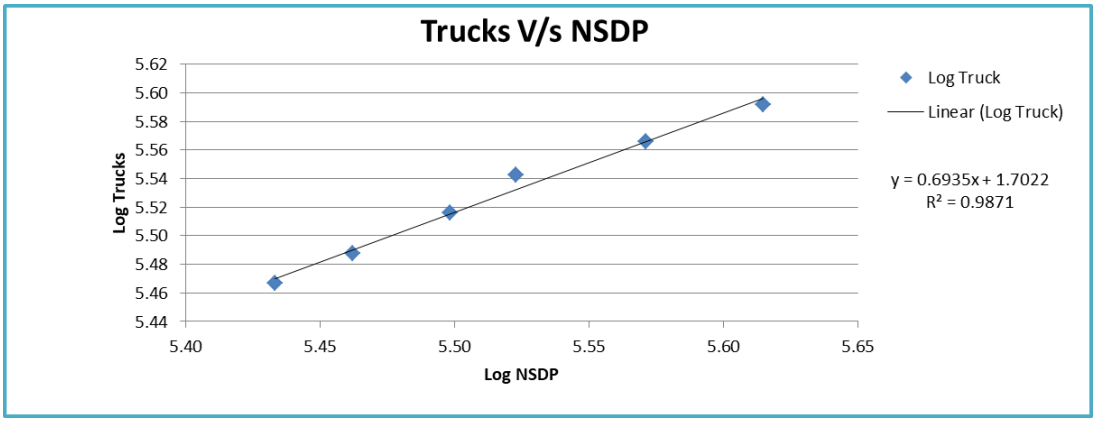

Figure 5-10 : Regression and Elasticity NSDP vs. Goods Traffic - extrapolation Haryana.

Using the regression analysis above, we have arrived at the elasticity of traffic demand for each class of vehicle to a given change in relevant economic indicators. Average traffic growth of a vehicle class is multiplied by the corresponding elasticity coefficient to arrive at traffic growth. R2 statistical measure of how close the data are to the fitted regression line. It varies from 0 to 1. Higher the value of R2 more representative is the regression model of data.

The results of these analyses for *the good fit* regression as reflected by R^2 values are presented in the Table below

Table 5-15 : Summary Regression Analysis Haryana

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average Growth	Growth Elastic Model
Haryana	Car/Jeep	PCI	y = 1.4354x - -1.1361	R² = 0.9487	1.4354	7.23%	10.38%
	Bus	Population	y = 5.736x - -37.8732	R² = 0.9927	5.7360	1.52%	8.69%
	LCV	NSDP	y = 1.222x - -1.5373	R² = 0.9834	1.2220	8.30%	10.14%
	Truck	NSDP	y = 0.6935x - 1.7022	R² = 0.9871	0.6935	8.75%	6.07%

Following tables and graphs depict regression and elasticity of growth model for stretch falling in Karnataka State.

Table 5-16 : Per Capita Income Vs Car Karnataka

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2012	90269	1454309	4.96	6.16		
2013	94382	1626924	4.97	6.21	5%	
2014	101864	1798035	5.01	6.25	8%	

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2015	105703	1992262	5.02	6.30	4%	
2016	116819	2207852	5.07	6.34	11%	
2017	131260	2203562	5.12	6.34	12%	7.83%

Regression analysis of same is given in figure below

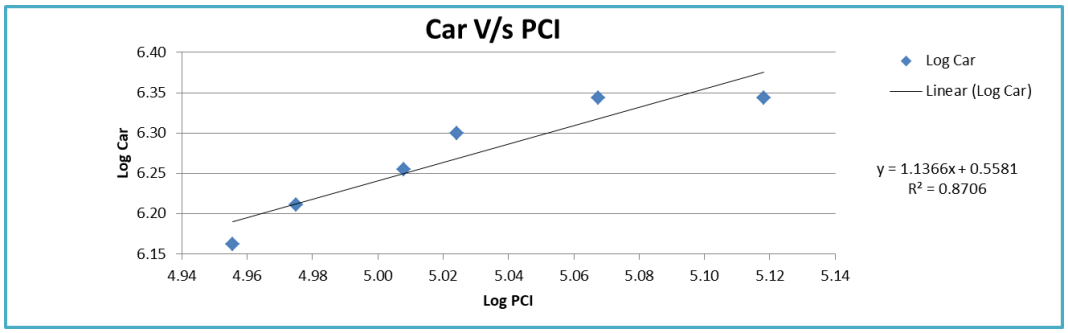

Figure 5-11 : Regression and Elasticity PCI vs. Car – Extrapolation Karnataka

Table 5-17 : Population Vs Bus Karnataka

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth
2012	61095297	175705	7.79	5.24		
2013	62058777	186705	7.79	5.27	2%	
2014	63017877	195913	7.80	5.29	2%	
2015	63972322	204803	7.81	5.31	2%	
2016	64921845	213699	7.81	5.33	1%	
2017	65866188	224580	7.82	5.35	1%	1.52%

Regression analysis of same is given in figure below

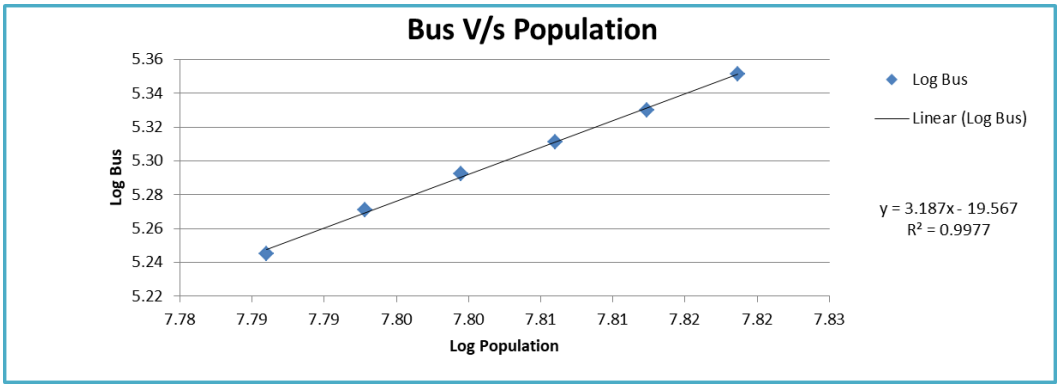

Figure 5-12 : Regression and Elasticity Population vs. Bus – Extrapolation Karnataka

Elasticity of goods traffic has been worked out by regression analysis with NSDP. Following table represents the data and details.

Table 5-18 : LCV Traffic Vs NSDP Karnataka

Year	NSDP	LCV	Log NSDP	Log LCV	NSDP Growth	Average Growth (5 Year)
2012	554990	221160	5.74	5.34		
2013	586592	258701	5.77	5.41	6%	
2014	639981	294266	5.81	5.47	9%	
2015	671322	331381	5.83	5.52	5%	
2016	749990	367572	5.88	5.57	12%	8%

Following figure depict regression analysis and extrapolation.

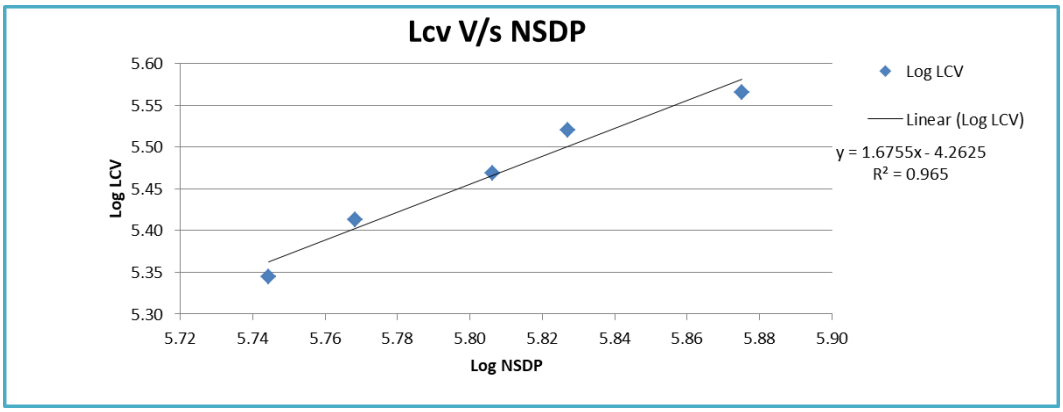

Figure 5-13 : Regression and Elasticity NSDP vs. LCV – Extrapolation Karnataka

Table 5-19 : Truck Traffic Vs NSDP Karnataka

Year	NSDP	Trucks	Log NSDP	Log Truck	NSDP Growth	Average Growth (5 Year)
2012	554990	233422	5.74	5.37		
2013	586592	247639	5.77	5.39	6%	
2014	639981	260989	5.81	5.42	9%	
2015	671322	274971	5.83	5.44	5%	
2016	749990	290415	5.88	5.46	12%	
2017	851880	306290	5.93	5.49	14%	9.00%

Following figure depict regression analysis and extrapolation

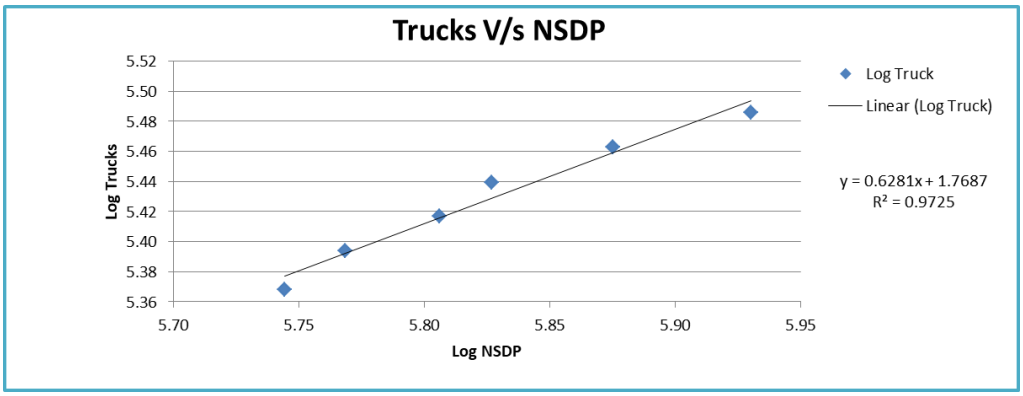

Figure 5-14 : Regression and Elasticity NSDP vs. Goods Traffic - extrapolation Karnataka.

Using the regression analysis above, we have arrived at the elasticity of traffic demand for each class of vehicle to a given change in relevant economic indicators. Average traffic growth of a vehicle class is multiplied by the corresponding elasticity coefficient to arrive at traffic growth. R2 statistical measure of how close the data are to the fitted regression line. It varies from 0 to 1. Higher the value of R2 more representative is the regression model of data.

The results of these analyses for *the good fit* regression as reflected by R^2 values are presented in the Table below.

Table 5-20 : Summary Regression Analysis Karnataka

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average Growth	Growth Elastic Model
Karnataka	Car/Jeep	PCI	y = 1.1366x - 0.5581	R^2 = 0.8706	1.1366	7.83%	8.90%
	Bus	Population	y = 3.187x - -19.567	R^2 = 0.9977	3.1870	1.52%	4.83%
	LCV	NSDP	y = 1.6755x - -4.2625	R^2 = 0.965	1.6755	7.85%	13.16%
	Truck	NSDP	y = 0.6281x - 1.7687	R^2 = 0.9725	0.6281	9.00%	5.65%

Economical model for predicting growth is good tool, however other local, regional, national factors should also be considered before finalizing growth factors. Considering factors such as proposed developments and other influencing economic factors, moderated growth should be considered. These factors are discussed in subsequent sections.

5.4 Analysis of Historic Traffic Data

Historical traffic data forms useful information for any highway project. It provides useful information for establishing past trend of growth. Project stretch of Yedashi to Aurangabad has recently been commissioned and is under tolling operation since March 2019. As traffic data available for last two years was affected due to COVID-19 the same cannot be taken as representative. A minimum of about 5 -6 years' consistent traffic data is required for establishing a reliable past trend.

5.5 Other Factors Influencing Growth

There are many factors which have an impact on traffic growth. As discussed previously these factors can be economical, social, educational, and industrial.

Potentiality of such factors for project highway is discussed as under.

ECONOMY

After witnessing a slowdown during 2011-12, the economy recovered in 2013-14, and a high growth rate of GDP was recorded up to 2018-19. Pandemic of COVID-19 impacted all economies of world including India up to year 2021-22. Following figure show trend of GDP growth in India.

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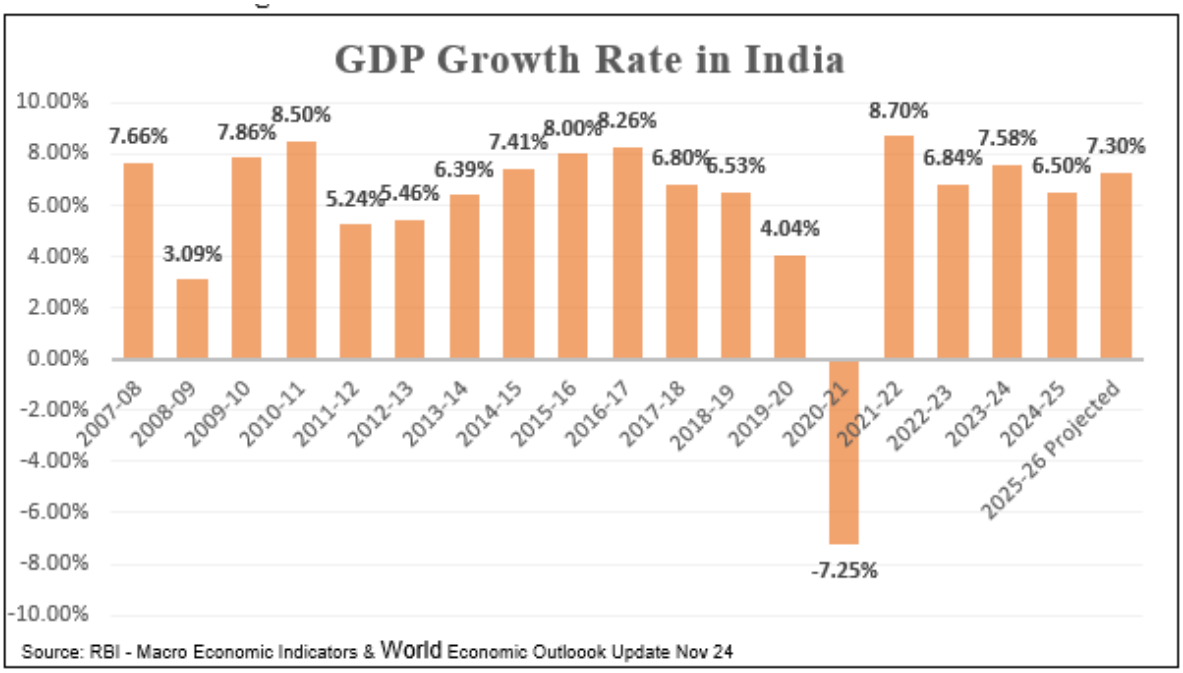

FY 2017-18 recorded a growth of 6.7% which had a slight impact of GST and demonetization. Indian economy appears on recovery path with estimated growth of 6.8% in FY 2018-19. The government took major policy decisions including tax infrastructure reforming, banking sector improvement and ease of doing business.

In post COVID-19 scenario, in year 2022-23 and 2023-24 India registered an impressive growth of 7% to 7.5%. In last year despite global slow down due to Russia-Ukraine war and Gaza crises, India grew at good rate of 7%(Estimated).
Indian economy is now on good growth path and all major institutions including IMF / ADB have estimated growth of Indian Economy to peg around 6.5% to 7% in coming years.

5.6 Developments along and around the Project Corridor & State

Aurangabad: is the fifth largest city in Maharashtra. It lies on a major trade route that used to connect north-west India's sea and land ports to the Deccan region. Aurangabad is administrative headquarters of the Aurangabad Division or Marathwada region.

Beed: Agriculture is the main business in Beed, and it is largely dependent on monsoon rain. Beed also is a district which provides a large number of laborers in India specially in the form of sugarcane cutters.

Jalna: is connected to major towns of the state-by-state highways. Road connectivity is excellent, roads connecting to Aurangabad, Pune, Ahmednagar, Nagpur, Beed, Mumbai having been upgraded to four-lane highways. A New Nagpur-Aurangabad-Mumbai highway, passing through Jalna, is being developed. There are various cotton-ginning & oil-pressing factories in Jalna.

Until 1960 Aurangabad was a undeveloped city and industrially backward area. After 1960 Growth began when the Maharashtra Industrial Development Corporation (MIDC) began

acquiring land and setting up industrial estates. Aurangabad is a now classic example of efforts of a state government towards the balanced industrialisation of the state. Major Industrial areas of Aurangabad are Chikhalthana MIDC, Shendra MIDC and Waluj MIDC. Many of the large India and multinational firms have established themselves in Industrial areas of Shendra, Waluj, Paithan.

Some of the big names include Audi, Skoda, Videocon, Siemens, Bajaj, Forbes, Goodyear, Wockhardt, Johnson & Johnson, Kenstar which have set up their production houses in Industrial areas of Aurangabad.

DMIC

Delhi Mumbai Industrial Corridor (DMIC) which is passing close to PIA envisaged to influence the pattern of development and industrialization of the region. To tap the development potential of the proposed freight corridor, an area spanning 150 kilometers wide on both sides of the freight corridor has been identified as Influence Region and is proposed to be developed as Delhi-Mumbai Industrial Corridor (DMIC). One of the Nashik Sinnar Igatpuri Investment Region's identified early bird projects is an industrial area comprising of total 40 sq. km to be developed into two parts one of 8 sq. km in Shendra and other with an area of 32 sq. km at Bidkin some 24 km from Aurangabad on the Paithan road.

The Aurangabad Industrial City (AURIC) Bidkin Industrial Area (BIA) is strategically positioned and directly connected to the major state highways which are Paithan Road, NH-211 and SH-178 (Jalna Road). The nearest major city is Aurangabad which is served by NH-211, Major State Highway (MSH) 6 and MSH-8, and SH-16, SH-60 and SH-148.

Considering the scenario, it may be assumed that the traffic growth on the project highway would remain high and there are minimal risks in terms of growth.

5.7 Recommended Growth Rates of Traffic

Based on the above analysis and after giving due consideration to the entire listed factors, the following overall growth rates are recommended for each category of vehicle as under. Rate of growth is moderated in light of overall regional trend. Growth of Multi-Axle is kept slightly higher as trend of technological advances in logistic industry favors multi-axle over 2/3 axle carriage. It is also expected that as the economy moves from developing to developed, rate of growth diminishes. Same growth rate is not sustainable for long. Traffic growth has been suitably stepped down for future years.

Growth rates are recommended for three scenarios for sensitivity analysis namely **Optimistic, Pessimistic** and **Most Likely** with a positive and negative variation 0.25% from Most Likely case for corridor in both states.

5.7.1 Recommended Growth Rates of Traffic for Maharashtra Part of Stretch

Table 5-21 : Recommended Growth Rates Optimistic

Category / Year	FY 2026-2027	FY 2028-30	FY 2031-2035	FY 2036-2040	FY 2041-2045	FY 2046-2050
Car/Jeep/Van	7.71%	6.71%	6.08%	5.77%	5.72%	5.47%

Category / Year	FY 2026-2027	FY 2028-30	FY 2031-2035	FY 2036-2040	FY 2041-2045	FY 2046-2050
Bus	4.79%	3.79%	3.27%	3.01%	3.01%	2.96%
Minibus	4.79%	3.79%	3.27%	3.01%	3.01%	2.96%
LCV	4.10%	3.10%	2.41%	2.07%	2.00%	1.68%
2- Axle	3.69%	2.69%	2.17%	1.91%	1.86%	1.62%
3 - Axle	4.75%	3.75%	3.05%	2.71%	2.65%	2.33%
4 to6 Axle	4.75%	3.75%	3.05%	2.71%	2.65%	2.33%
7 and Above Axle	4.75%	3.75%	3.05%	2.71%	2.65%	2.33%

Table 5-22 : Recommended Growth Rates Pessimistic

Category / Year	FY 2026-2027	FY 2028-30	FY 2031-2035	FY 2036-2040	FY 2041-2045	FY 2046-2050
Car/Jeep/Van	7.21%	6.21%	5.58%	5.27%	5.22%	4.97%
Bus	4.29%	3.29%	2.77%	2.51%	2.51%	2.46%
Minibus	4.29%	3.29%	2.77%	2.51%	2.51%	2.46%
LCV	3.60%	2.60%	1.91%	1.57%	1.50%	1.18%
2- Axle	3.19%	2.19%	1.67%	1.41%	1.36%	1.12%
3 - Axle	4.25%	3.25%	2.55%	2.21%	2.15%	1.83%
4 to6 Axle	4.25%	3.25%	2.55%	2.21%	2.15%	1.83%
7 and Above Axle	4.25%	3.25%	2.55%	2.21%	2.15%	1.83%

Table 5-23 : Recommended Growth Rates Most Likely

Category / Year	FY 2026-2027	FY 2028-30	FY 2031-2035	FY 2036-2040	FY 2041-2045	FY 2046-2050
Car/Jeep/Van	9.21%	7.46%	6.46%	5.83%	5.52%	5.22%
Bus	5.75%	4.54%	3.54%	3.02%	2.76%	2.71%
Minibus	5.75%	4.54%	3.54%	3.02%	2.76%	2.71%
LCV	5.73%	3.85%	2.85%	2.16%	1.82%	1.43%
2- Axle	4.67%	3.44%	2.44%	1.92%	1.66%	1.37%
3 - Axle	5.94%	4.50%	3.50%	2.80%	2.46%	2.08%
4 to6 Axle	6.57%	4.50%	3.50%	2.80%	2.46%	2.08%
7 and Above Axle	6.57%	4.50%	3.50%	2.80%	2.46%	2.08%

Traffic and revenue have been worked out on the basis of the above growth, and some are presented in subsequent chapters of the report.

CHAPTER 6

TRAFFIC FORECAST

6.1 Traffic Projections

The growth rates recommended in the previous section of the report are used to arrive at traffic projections for future years. Toll plaza wise futuristic traffic projection is given in tables below.

These projections have been done for the following three cases of growth up to the concession period.

1. Optimistic Scenario
2. Pessimistic Scenario
3. Most Likely Scenario

Table 6-1 : Total Tollable Traffic @ Toll Plaza 1- Chainage 134.000 KM (Optimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	4746	329	311	1331	1039	2324	15	**10095**	**22309**
2027-28	5063	339	323	1366	1079	2411	15	**10596**	**23249**
2028-29	5403	349	335	1402	1120	2501	15	**11125**	**24233**
2029-30	5765	359	348	1439	1163	2595	15	**11684**	**25264**
2030-31	6115	368	360	1470	1199	2674	15	**12201**	**26180**
2031-32	6486	377	372	1502	1236	2756	15	**12744**	**27134**
2032-33	6879	386	384	1534	1274	2840	15	**13312**	**28128**
2033-34	7297	395	396	1567	1314	2927	15	**13911**	**29164**
2034-35	7740	404	409	1601	1355	3016	15	**14540**	**30244**
2035-36	8186	412	421	1632	1392	3098	15	**15156**	**31275**
2036-37	8658	421	434	1663	1430	3182	15	**15803**	**32347**
2037-38	9157	430	447	1695	1470	3268	15	**16482**	**33462**
2038-39	9683	439	460	1727	1511	3357	15	**17192**	**34623**
2039-40	10241	448	474	1760	1553	3448	15	**17939**	**35832**
2040-41	10825	457	489	1793	1595	3539	15	**18713**	**37071**
2041-42	11444	466	504	1826	1638	3632	15	**19525**	**38361**
2042-43	12097	475	519	1860	1682	3728	15	**20376**	**39704**

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2043-44	12788	484	535	1894	1727	3826	15	**21269**	**41103**
2044-45	13519	494	551	1929	1773	3927	15	**22208**	**42561**
2045-46	14257	502	567	1960	1815	4018	15	**23134**	**43963**
2046-47	15036	511	583	1992	1858	4111	15	**24106**	**45421**

Table 6-2 : Total Tollable Traffic @ Toll Plaza 2- Chainage 194.000 KM

(Optimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	9395	524	678	1695	1188	2660	14	**16154**	**32161**
2027-28	10025	540	704	1741	1233	2759	14	**17016**	**33622**
2028-29	10697	557	730	1788	1279	2862	14	**17927**	**35157**
2029-30	11415	574	758	1836	1327	2969	14	**18893**	**36771**
2030-31	12108	588	783	1875	1368	3060	14	**19796**	**38232**
2031-32	12842	602	809	1915	1410	3154	14	**20746**	**39761**
2032-33	13622	616	835	1957	1453	3250	14	**21747**	**41360**
2033-34	14450	630	862	2000	1497	3349	14	**22802**	**43034**
2034-35	15327	646	890	2044	1543	3451	14	**23915**	**44785**
2035-36	16212	659	916	2082	1585	3545	14	**25013**	**46479**
2036-37	17147	673	944	2121	1628	3641	14	**26168**	**48248**
2037-38	18136	687	972	2161	1672	3740	14	**27382**	**50096**
2038-39	19181	701	1002	2202	1717	3841	14	**28658**	**52027**
2039-40	20288	715	1033	2244	1763	3945	14	**30002**	**54046**
2040-41	21448	729	1064	2286	1809	4049	14	**31399**	**56127**
2041-42	22674	743	1096	2329	1857	4156	14	**32869**	**58303**
2042-43	23970	757	1128	2373	1906	4266	14	**34414**	**60578**
2043-44	25341	773	1162	2418	1956	4379	14	**36043**	**62957**
2044-45	26789	789	1198	2463	2007	4495	14	**37755**	**65445**
2045-46	28253	802	1234	2503	2054	4599	14	**39459**	**67875**
2046-47	29798	816	1271	2544	2102	4705	14	**41250**	**70413**

Table 6-3 : Total Tollable Traffic @ Toll Plaza 3- Chainage 254.000 KM

(Optimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	8033	386	488	1148	880	1806	15	**12756**	**23736**
2027-28	8571	398	506	1179	912	1873	15	**13454**	**24843**
2028-29	9145	410	525	1211	946	1943	15	**14195**	**26007**
2029-30	9758	423	544	1243	981	2016	15	**14980**	**27231**
2030-31	10350	433	562	1270	1011	2078	15	**15719**	**28346**
2031-32	10978	444	580	1297	1041	2141	15	**16496**	**29514**
2032-33	11645	455	599	1325	1072	2206	15	**17317**	**30737**
2033-34	12353	466	618	1353	1104	2273	15	**18182**	**32018**
2034-35	13103	477	638	1383	1137	2342	15	**19095**	**33361**
2035-36	13859	487	657	1409	1167	2405	15	**19999**	**34664**
2036-37	14658	497	676	1436	1198	2470	15	**20950**	**36026**
2037-38	15502	507	696	1463	1230	2537	15	**21950**	**37451**
2038-39	16397	518	717	1491	1263	2605	15	**23006**	**38941**
2039-40	17343	529	739	1519	1296	2675	15	**24116**	**40501**
2040-41	18335	540	761	1547	1330	2745	15	**25273**	**42112**
2041-42	19383	551	784	1575	1365	2817	15	**26490**	**43798**
2042-43	20491	562	807	1605	1401	2892	15	**27773**	**45562**
2043-44	21663	573	831	1635	1438	2969	15	**29124**	**47410**
2044-45	22902	584	856	1666	1476	3048	15	**30547**	**49344**
2045-46	24154	594	881	1693	1511	3118	15	**31966**	**51239**
2046-47	25474	604	907	1720	1546	3190	15	**33456**	**53221**

Table 6-4 : Total Tollable Traffic @ Toll Plaza 1- Chainage 134.000 KM (Pessimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	4725	327	310	1324	1035	2313	15	**10049**	**22203**
2027-28	5017	336	321	1353	1069	2388	15	**10499**	**23028**
2028-29	5328	345	332	1383	1104	2465	15	**10972**	**23888**
2029-30	5658	354	343	1413	1140	2544	15	**11467**	**24784**
2030-31	5973	360	353	1436	1169	2609	15	**11915**	**25558**
2031-32	6306	366	364	1460	1198	2675	15	**12384**	**26362**
2032-33	6657	372	375	1484	1228	2743	15	**12874**	**27196**
2033-34	7028	379	386	1508	1259	2813	15	**13388**	**28062**
2034-35	7418	387	397	1533	1291	2884	15	**13925**	**28962**
2035-36	7808	393	408	1554	1319	2948	15	**14445**	**29804**
2036-37	8219	399	419	1576	1348	3013	15	**14989**	**30677**
2037-38	8652	405	430	1598	1377	3079	15	**15556**	**31582**
2038-39	9108	411	441	1620	1407	3147	15	**16149**	**32520**
2039-40	9587	417	452	1643	1438	3216	15	**16768**	**33493**
2040-41	10086	423	463	1665	1468	3285	15	**17405**	**34484**
2041-42	10613	429	475	1687	1499	3355	15	**18073**	**35512**
2042-43	11166	435	487	1710	1531	3427	15	**18771**	**36578**
2043-44	11748	441	499	1733	1563	3500	15	**19499**	**37685**

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2044-45	12360	447	511	1756	1596	3575	15	**20260**	**38834**
2045-46	12973	452	523	1776	1625	3640	15	**21004**	**39920**
2046-47	13616	457	536	1796	1654	3706	15	**21780**	**41045**

Table 6-5 : Total Tollable Traffic @ Toll Plaza 2- Chainage 194.000 KM (Pessimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	9351	521	675	1686	1183	2647	14	**16077**	**32008**
2027-28	9932	534	697	1723	1221	2733	14	**16854**	**33302**
2028-29	10548	548	720	1760	1261	2821	14	**17672**	**34657**
2029-30	11203	562	744	1798	1302	2913	14	**18536**	**36074**
2030-31	11828	573	764	1828	1335	2987	14	**19329**	**37328**
2031-32	12487	584	785	1858	1369	3063	14	**20160**	**38634**
2032-33	13184	595	807	1889	1404	3141	14	**21034**	**39995**
2033-34	13919	606	829	1920	1440	3221	14	**21949**	**41414**
2034-35	14695	617	852	1952	1476	3303	14	**22909**	**42893**
2035-36	15469	627	874	1980	1509	3376	14	**23849**	**44300**
2036-37	16283	637	896	2008	1542	3451	14	**24831**	**45765**
2037-38	17141	647	919	2037	1576	3527	14	**25861**	**47290**
2038-39	18044	657	942	2066	1611	3605	14	**26939**	**48878**
2039-40	18994	667	965	2095	1646	3685	14	**28066**	**50530**
2040-41	19986	677	990	2124	1681	3764	14	**29236**	**52225**
2041-42	21028	687	1015	2153	1717	3845	14	**30459**	**53989**
2042-43	22126	697	1040	2182	1754	3927	14	**31740**	**55827**
2043-44	23279	708	1066	2212	1791	4011	14	**33081**	**57741**
2044-45	24494	719	1092	2242	1829	4097	14	**34487**	**59736**
2045-46	25711	728	1118	2267	1862	4172	14	**35872**	**61657**
2046-47	26988	737	1146	2292	1896	4248	14	**37321**	**63655**

Table 6-6 : Total Tollable Traffic @ Toll Plaza 3- Chainage 254.000 KM (Pessimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	7995	385	486	1143	877	1798	15	**12699**	**23624**
2027-28	8491	395	502	1168	905	1857	15	**13333**	**24607**
2028-29	9018	405	519	1194	934	1917	15	**14002**	**25637**
2029-30	9578	416	536	1220	964	1979	15	**14708**	**26716**
2030-31	10112	424	551	1240	989	2030	15	**15361**	**27677**
2031-32	10675	432	566	1260	1014	2082	15	**16044**	**28678**
2032-33	11270	440	582	1281	1040	2136	15	**16764**	**29724**
2033-34	11898	448	598	1302	1067	2191	15	**17519**	**30814**
2034-35	12561	456	615	1323	1094	2247	15	**18311**	**31953**
2035-36	13223	464	631	1342	1118	2296	15	**19089**	**33041**
2036-37	13919	472	647	1361	1143	2347	15	**19904**	**34175**

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2037-38	14653	480	663	1380	1168	2399	15	**20758**	**35356**
2038-39	15425	488	680	1399	1194	2452	15	**21653**	**36587**
2039-40	16237	496	697	1419	1220	2506	15	**22590**	**37870**
2040-41	17083	504	714	1438	1246	2560	15	**23560**	**39188**
2041-42	17975	512	732	1457	1273	2615	15	**24579**	**40561**
2042-43	18913	520	750	1477	1300	2671	15	**25646**	**41993**
2043-44	19899	528	768	1497	1328	2728	15	**26763**	**43486**
2044-45	20937	536	787	1517	1356	2787	15	**27935**	**45044**
2045-46	21976	542	806	1534	1381	2838	15	**29092**	**46550**
2046-47	23067	548	826	1551	1406	2890	15	**30303**	**48119**

Traffic projections for Most Likely scenario is given as under

Table 6-7 : Total Tollable Traffic @ Toll Plaza 1- Chainage 134.000 KM (Most Likely Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	4735	327	311	1328	1037	2319	15	**10072**	**22256**
2027-28	5041	336	322	1360	1073	2400	15	**10547**	**23139**
2028-29	5366	345	334	1393	1111	2484	15	**11048**	**24060**
2029-30	5712	355	346	1427	1151	2571	15	**11577**	**25023**
2030-31	6045	363	357	1455	1184	2643	15	**12062**	**25867**
2031-32	6396	371	368	1483	1217	2717	15	**12567**	**26746**
2032-33	6768	379	379	1512	1251	2793	15	**13097**	**27659**
2033-34	7161	387	391	1541	1286	2871	15	**13652**	**28608**
2034-35	7578	395	403	1571	1322	2951	15	**14235**	**29597**
2035-36	7997	403	414	1596	1355	3023	15	**14803**	**30531**
2036-37	8437	411	426	1622	1389	3097	15	**15397**	**31502**
2037-38	8902	419	438	1649	1423	3173	15	**16019**	**32509**
2038-39	9393	427	450	1677	1458	3251	15	**16671**	**33556**
2039-40	9910	435	462	1705	1494	3330	15	**17351**	**34644**
2040-41	10451	443	475	1733	1530	3409	15	**18056**	**35756**
2041-42	11022	451	488	1761	1567	3490	15	**18794**	**36911**
2042-43	11624	459	502	1790	1604	3574	15	**19568**	**38111**
2043-44	12259	467	516	1819	1642	3660	15	**20378**	**39359**
2044-45	12929	475	531	1848	1681	3748	15	**21227**	**40657**
2045-46	13603	482	546	1873	1716	3825	15	**22060**	**41895**
2046-47	14312	489	561	1898	1752	3904	15	**22931**	**43180**

Table 6-8 : Total Tollable Traffic @ Toll Plaza 2- Chainage 194.000 KM (Most Likely Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	9373	523	676	1691	1185	2653	14	**16115**	**32084**
2027-28	9978	538	700	1732	1227	2746	14	**16935**	**33462**
2028-29	10622	554	725	1775	1270	2842	14	**17802**	**34906**
2029-30	11309	570	751	1819	1314	2941	14	**18718**	**36421**
2030-31	11968	583	774	1854	1351	3023	14	**19567**	**37778**
2031-32	12666	596	797	1890	1388	3107	14	**20458**	**39194**
2032-33	13402	609	822	1926	1426	3194	14	**21393**	**40673**
2033-34	14184	622	847	1963	1466	3283	14	**22379**	**42217**
2034-35	15010	635	872	2000	1507	3375	14	**23413**	**43830**
2035-36	15838	647	897	2033	1544	3458	14	**24431**	**45378**
2036-37	16712	659	922	2066	1582	3543	14	**25498**	**46992**
2037-38	17633	671	947	2101	1620	3630	14	**26616**	**48674**
2038-39	18606	684	973	2136	1660	3719	14	**27792**	**50430**
2039-40	19633	697	999	2171	1701	3811	14	**29026**	**52260**
2040-41	20706	710	1026	2206	1742	3903	14	**30307**	**54143**
2041-42	21838	723	1054	2242	1784	3997	14	**31652**	**56107**
2042-43	23031	736	1084	2278	1827	4093	14	**33063**	**58157**
2043-44	24290	749	1114	2315	1871	4191	14	**34544**	**60296**
2044-45	25618	762	1145	2352	1916	4291	14	**36098**	**62529**
2045-46	26955	773	1176	2384	1956	4379	14	**37637**	**64695**
2046-47	28361	784	1208	2416	1997	4470	14	**39250**	**66953**

Table 6-9 : Total Tollable Traffic @ Toll Plaza 3- Chainage 254.000 KM (Most Likely Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	8014	386	487	1145	879	1802	15	**12728**	**23680**
2027-28	8530	397	504	1173	909	1865	15	**13393**	**24725**
2028-29	9081	408	522	1201	940	1930	15	**14097**	**25821**
2029-30	9666	419	540	1231	972	1997	15	**14840**	**26973**
2030-31	10228	428	556	1255	999	2053	15	**15534**	**28010**
2031-32	10823	437	573	1279	1027	2111	15	**16265**	**29094**
2032-33	11454	446	590	1304	1056	2170	15	**17035**	**30227**
2033-34	12120	455	608	1329	1085	2231	15	**17843**	**31411**
2034-35	12827	465	626	1354	1115	2293	15	**18695**	**32650**
2035-36	13535	473	643	1376	1142	2350	15	**19534**	**33844**
2036-37	14282	481	661	1399	1170	2408	15	**20416**	**35089**
2037-38	15070	490	679	1423	1199	2467	15	**21343**	**36389**
2038-39	15901	499	697	1447	1228	2528	15	**22315**	**37747**
2039-40	16779	508	716	1471	1258	2590	15	**23337**	**39165**
2040-41	17697	517	735	1495	1288	2652	15	**24399**	**40625**
2041-42	18664	526	756	1519	1318	2715	15	**25513**	**42150**
2042-43	19684	535	777	1544	1349	2780	15	**26684**	**43743**
2043-44	20760	544	799	1569	1381	2846	15	**27914**	**45408**
2044-45	21896	553	821	1594	1413	2914	15	**29206**	**47147**
2045-46	23038	561	843	1615	1442	2975	15	**30489**	**48841**
2046-47	24238	569	866	1637	1472	3037	15	**31834**	**50608**

6.2 Modification in Concession Period

As per Article 29 of the concession agreement, if actual traffic on the project falls short or exceeds Target Traffic on project highway on defined date, concession period shall be modified subject to calculation stipulated therein. For Yedeshi – Aurangabad project, the Target Date and Target Traffic are defined as under:

Target Date - 1st October 2023

Target Traffic -24407 in PCU

Target Year	Target Traffic	Actual Traffic	% of Excess / Short traffic	% Revision (+ or -) in CP as per CA	% Variation in CP	Original CP	Change in CP (In Years)
2023	24407	21612	-11%	17%	17%	26	4.5

PCUs have been considered for arriving at the concession period end date

CHAPTER 7
FORECAST OF TOLL REVENUE

7.1 General

This chapter presents the tolling rate calculations, categories and toll revenue of the project.

7.2 Discount Categories

The fee schedule in the CA of Surat- Dahisar section of NH-8 is based on the old toll policy. As per the Toll Notification (Schedule - G) the discounts and special provisions have been considered. In addition to discounts as per Fee Notification concessionaire has declared special category rates also. Salient features of toll rate structure are given as under

1. Monthly Pass: For frequent users monthly pass would be issued at fee at 2/3rd rate for 50 single journey trips.
2. Multiple Journeys (for Return Trip): Will be charged at 1.5 times single journey.
3. Single Journey: Full single journey toll would be charged to this category of vehicles who are infrequent travellers or whose frequency does not yield any discount from the above categories.
4. Local Discounts: There are several categories of local discounts.
    a) Local Car Jeep Van - Rs. 350 per month (for locals residing within a radius of 20 kms from toll plaza)

Building of inflation and escalation of rate on the basis of WPI are done as per toll notification (Schedule G) as given under as extract from concession agreement.

The formula for determining the applicable rate of fee shall be as follows:-

$$\text{Applicable rate of fee} = \text{base rate} + \text{base rate} \times \left\{ \frac{\text{WPI A-WPI B}}{\text{WPI B}} \right\} \times 0.4$$

Factors of inflation / growth have been incorporated as per Schedule R. WPI are available up to the year 2025-26.

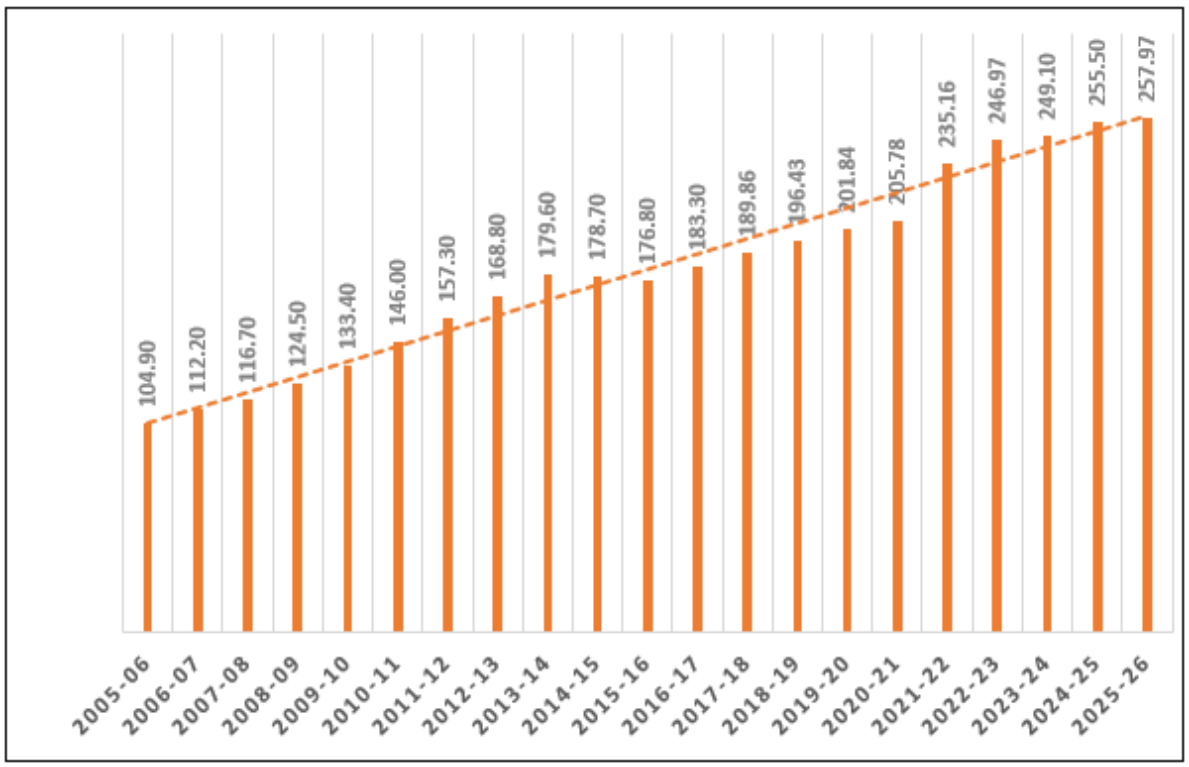

Figure 7-1 : Historical Rate of WPI Inflation in India

The wholesale price index (WPI) and the inflation rate in the past are presented in Table below.

Table 7-1 : Historical WPI value and Growth Inflation

December of year	2021	2022	2023	2024	2025	Avg.
WPI	235.2	247.0	249.1	255.5	257.97	
Inflation	14.27%	5.02%	0.86%	2.57%	0.96%	4.74%

WPI of December 2025 is posted on ministry site which is shows 0.96% inflation from the previous year. Same has been applied for FY 2026-27.
The average WPI inflation over the period FY 2021 to FY 2025 works out to approximately 4.74%, reflecting inflationary cycles across both high and low inflation years. Based on this analysis, an annual escalation factor of 4.5% has been adopted for the remaining concession period.

7.3 Estimation of Toll Rates

As per the applicable MORTH notification and Schedule R of contract agreement, the following Base rate of fee for the categories mentioned in the table stands true in the National Highways Fee Rules applicable for contract.

Table 7-2 : Base Toll Rates June 2007-08

Type of Vehicle	Base Rate of Fee / Km (in Rs.)
Car, Jeep, Van or Light Motor Vehicle	0.65
Light Commercial Vehicle, Light Goods Vehicle or Minibus	1.05
Bus or Truck (Two Axles)	2.20
Three Axle Commercial Vehicles	2.40
Heavy Construction Machinery (HCM) or Earth Moving Equipment (EME) or Multi Axle Vehicle (MAV) (4 to 6 axles)	3.45
Oversized Vehicles (7 or more Axles)	4.20

Toll rates are calculated as per guidelines provided in schedule R (rounded to nearest Rs. five) for the concession period and are given below. Since applicable length of highway length is equal for both plazas, applicable toll rates are also same

Thus, worked out rates for various categories of vehicle and discounts are given as under.

Table 7-3 : Toll Rates for Single Journey @ Km 134.000

Year	Car	Minibus /LCV	Bus	Truck	3 -Axle	Multi axle	Oversized Vehicles
2026-27	85	135	285	285	315	450	545
2027-28	90	145	300	300	325	470	575
2028-29	95	150	315	315	345	495	600
2029-30	95	155	330	330	360	515	630
2030-31	100	165	345	345	375	540	660
2031-32	105	170	360	360	395	565	690
2032-33	110	180	380	380	415	595	720
2033-34	115	190	395	395	430	620	755
2034-35	125	200	415	415	455	650	795
2035-36	130	210	435	435	475	680	830
2036-37	135	220	455	455	500	715	870
2037-38	140	230	480	480	520	750	915
2038-39	150	240	500	500	545	785	955
2039-40	155	250	525	525	575	825	1005
2040-41	165	265	550	550	600	865	1055
2041-42	170	275	580	580	630	905	1105
2042-43	180	290	605	605	660	950	1160
2043-44	190	305	635	635	695	1000	1215
2044-45	195	320	670	670	730	1050	1275
2045-46	205	335	700	700	765	1100	1340
2046-47	215	350	735	735	805	1155	1405

Table 7-4 : Toll Rates for Single Journey @ Km 194.000

Year	Car	Minibus /LCV	Bus	Truck	3 -Axle	Multi axle	Oversized Vehicles
2026-27	115	190	395	395	435	620	755
2027-28	125	200	415	415	455	650	795
2028-29	130	210	435	435	475	680	830
2029-30	135	215	455	455	495	715	870
2030-31	140	230	475	475	520	750	910
2031-32	150	240	500	500	545	785	955
2032-33	155	250	525	525	570	820	1000
2033-34	160	260	550	550	600	860	1045
2034-35	170	275	575	575	625	900	1095
2035-36	180	285	600	600	655	945	1150
2036-37	185	300	630	630	690	990	1205
2037-38	195	315	660	660	720	1035	1265
2038-39	205	330	695	695	755	1090	1325
2039-40	215	345	725	725	795	1140	1390
2040-41	225	365	765	765	830	1195	1455
2041-42	235	380	800	800	875	1255	1525
2042-43	250	400	840	840	915	1315	1600
2043-44	260	420	880	880	960	1380	1680
2044-45	275	440	925	925	1010	1450	1765
2045-46	285	465	970	970	1060	1520	1850
2046-47	300	485	1020	1020	1110	1595	1945

Table 7-5 : Toll Rates for Single Journey @ Km 243.00

Year	Car	Minibus /LCV	Bus	Truck	3 -Axle	Multi axle	Oversized Vehicles
2026-27	115	185	390	390	425	610	740
2027-28	120	195	405	405	445	635	775
2028-29	125	205	425	425	465	665	810
2029-30	130	210	445	445	485	700	850
2030-31	140	225	465	465	510	730	890
2031-32	145	235	490	490	535	765	930
2032-33	150	245	510	510	560	800	975
2033-34	160	255	535	535	585	840	1025
2034-35	165	270	560	560	615	880	1070
2035-36	175	280	590	590	640	925	1125
2036-37	180	295	615	615	675	965	1180
2037-38	190	310	645	645	705	1015	1235
2038-39	200	325	680	680	740	1065	1295
2039-40	210	340	710	710	775	1115	1355
2040-41	220	355	745	745	815	1170	1425
2041-42	230	375	780	780	855	1225	1495
2042-43	240	390	820	820	895	1285	1565
2043-44	255	410	860	860	940	1350	1645
2044-45	265	430	905	905	985	1415	1725

Year	Car	Minibus /LCV	Bus	Truck	3 -Axle	Multi axle	Oversized Vehicles
2045-46	280	455	950	950	1035	1485	1810
2046-47	295	475	995	995	1085	1560	1900

Table 7-6 : Toll Rates for Return Journey @ Km 134.000

Year	Car	Minibus /LCV	Bus	Truck	3 -Axle	Multi axle	Oversized Vehicles
2026-27	125	205	430	430	470	675	820
2027-28	135	215	450	450	490	705	860
2028-29	140	225	470	470	515	740	900
2029-30	145	235	495	495	540	775	945
2030-31	155	245	515	515	565	810	985
2031-32	160	260	540	540	590	850	1035
2032-33	170	270	565	565	620	890	1085
2033-34	175	285	595	595	650	930	1135
2034-35	185	295	625	625	680	975	1190
2035-36	195	310	655	655	710	1025	1245
2036-37	200	325	685	685	745	1075	1305
2037-38	210	340	715	715	780	1125	1370
2038-39	220	360	750	750	820	1180	1435
2039-40	235	375	790	790	860	1235	1505
2040-41	245	395	825	825	900	1295	1580
2041-42	255	415	865	865	945	1360	1655
2042-43	270	435	910	910	995	1425	1735
2043-44	280	455	955	955	1040	1495	1825
2044-45	295	480	1000	1000	1095	1570	1915
2045-46	310	500	1050	1050	1145	1650	2010
2046-47	325	525	1105	1105	1205	1730	2105

Table 7-7 : Toll Rates for Return journey @ Km 194.000

Year	Car	Minibus /LCV	Bus	Truck	3 -Axle	Multi axle	Oversized Vehicles
2026-27	175	285	595	595	650	935	1135
2027-28	185	295	625	625	680	975	1190
2028-29	195	310	650	650	710	1025	1245
2029-30	200	325	685	685	745	1070	1305
2030-31	210	340	715	715	780	1120	1365
2031-32	220	360	750	750	815	1175	1430
2032-33	230	375	785	785	855	1230	1500
2033-34	245	390	820	820	895	1290	1570
2034-35	255	410	860	860	940	1350	1645
2035-36	265	430	905	905	985	1415	1725
2036-37	280	450	945	945	1030	1485	1805
2037-38	295	475	990	990	1080	1555	1895

Year	Car	Minibus /LCV	Bus	Truck	3 -Axle	Multi axle	Oversized Vehicles
2038-39	305	495	1040	1040	1135	1630	1985
2039-40	320	520	1090	1090	1190	1710	2080
2040-41	340	545	1145	1145	1250	1795	2185
2041-42	355	575	1200	1200	1310	1880	2290
2042-43	370	600	1260	1260	1375	1975	2405
2043-44	390	630	1320	1320	1440	2070	2520
2044-45	410	660	1385	1385	1510	2175	2645
2045-46	430	695	1455	1455	1585	2280	2775
2046-47	450	730	1525	1525	1665	2395	2915

Table 7-8 : Toll Rates for Return journey @ Km 243.000

Year	Car	Minibus /LCV	Bus	Truck	3 -Axle	Multi axle	Oversized Vehicles
2026-27	170	280	580	580	635	910	1110
2027-28	180	290	610	610	665	955	1165
2028-29	190	305	640	640	695	1000	1215
2029-30	195	320	670	670	730	1045	1275
2030-31	205	335	700	700	765	1095	1335
2031-32	215	350	735	735	800	1150	1400
2032-33	225	365	765	765	835	1205	1465
2033-34	240	385	805	805	875	1260	1535
2034-35	250	400	840	840	920	1320	1610
2035-36	260	420	885	885	965	1385	1685
2036-37	275	440	925	925	1010	1450	1765
2037-38	285	465	970	970	1060	1520	1850
2038-39	300	485	1015	1015	1110	1595	1940
2039-40	315	510	1065	1065	1165	1675	2035
2040-41	330	535	1120	1120	1220	1755	2135
2041-42	345	560	1175	1175	1280	1840	2240
2042-43	365	585	1230	1230	1345	1930	2350
2043-44	380	615	1290	1290	1410	2025	2465
2044-45	400	645	1355	1355	1480	2125	2585
2045-46	420	680	1420	1420	1550	2230	2715
2025-26	440	715	1495	1495	1630	2340	2850
2046-47	170	280	580	580	635	910	1110

Table 7-9 : Toll Rates for Monthly Pass Local @ all Toll Plaza

Year	Car	Minibus /LCV
2026-27	360	360
2027-28	375	375
2028-29	395	395
2029-30	415	415

Year	Car	Minibus /LCV
2030-31	430	430
2031-32	455	455
2032-33	475	475
2033-34	495	495
2034-35	520	520
2035-36	545	545
2036-37	570	570
2037-38	600	600
2038-39	630	630
2039-40	660	660
2040-41	690	690
2041-42	725	725
2042-43	760	760
2043-44	800	800
2044-45	835	835
2045-46	880	880
2046-47	920	920

Table 7-10 : Toll Rates for Monthly Pass @ Km 134.000

Year	Car	Minibus /LCV	Bus	Truck	3 -Axle	Multi axle	Oversized Vehicles
2026-27	2825	4560	9560	9560	10425	14990	18245
2027-28	2955	4775	10005	10005	10915	15690	19105
2028-29	3095	5000	10475	10475	11430	16430	20000
2029-30	3240	5235	10970	10970	11970	17205	20945
2030-31	3395	5485	11490	11490	12535	18020	21935
2031-32	3555	5745	12035	12035	13130	18875	22975
2032-33	3725	6015	12610	12610	13755	19770	24070
2033-34	3905	6305	13210	13210	14410	20715	25220
2034-35	4090	6605	13840	13840	15100	21705	26425
2035-36	4285	6925	14505	14505	15825	22750	27695
2036-37	4490	7255	15205	15205	16585	23845	29025
2037-38	4710	7605	15940	15940	17390	24995	30430
2038-39	4935	7975	16710	16710	18230	26205	31905
2039-40	5175	8365	17525	17525	19115	27480	33455
2040-41	5430	8770	18380	18380	20050	28820	35085
2041-42	5695	9200	19275	19275	21030	30230	36800
2042-43	5975	9650	20225	20225	22060	31715	38610
2043-44	6270	10125	21220	21220	23145	33275	40510
2044-45	6580	10625	22265	22265	24290	34915	42505
2045-46	6905	11155	23370	23370	25490	36645	44610
2046-47	7245	11705	24530	24530	26760	38465	46825

Table 7-11 : Toll Rates for Monthly Pass @ Km 194.000

Year	Car	Minibus /LCV	Bus	Truck	3 -Axle	Multi axle	Oversized Vehicles
2026-27	3905	6310	13220	13220	14425	20735	25240
2027-28	4090	6605	13840	13840	15100	21705	26425
2028-29	4280	6915	14495	14495	15810	22730	27670
2029-30	4485	7245	15175	15175	16555	23800	28975
2030-31	4695	7585	15895	15895	17340	24925	30345
2031-32	4920	7945	16650	16650	18160	26110	31785
2032-33	5155	8325	17440	17440	19025	27350	33295
2033-34	5400	8720	18270	18270	19935	28655	34885
2034-35	5655	9140	19145	19145	20890	30025	36555
2035-36	5930	9575	20065	20065	21890	31465	38310
2036-37	6215	10040	21030	21030	22945	32980	40150
2037-38	6515	10525	22050	22050	24055	34575	42090
2038-39	6830	11035	23115	23115	25220	36250	44130
2039-40	7160	11570	24240	24240	26445	38015	46275
2040-41	7510	12135	25420	25420	27735	39865	48535
2041-42	7880	12725	26665	26665	29090	41815	50910
2042-43	8265	13350	27975	27975	30515	43870	53405
2043-44	8670	14010	29350	29350	32020	46030	56035
2044-45	9100	14700	30800	30800	33600	48300	58800
2045-46	9550	15430	32325	32325	35265	50690	61710
2046-47	10025	16195	33930	33930	37015	53205	64775

Table 7-12 : Toll Rates for Monthly Pass @ Km 243.000

Year	Car	Minibus /LCV	Bus	Truck	3 -Axle	Multi axle	Oversized Vehicles
2026-27	3820	6170	12930	12930	14105	20275	24680
2027-28	4000	6460	13535	13535	14765	21225	25840
2028-29	4185	6765	14170	14170	15460	22225	27055
2029-30	4385	7080	14840	14840	16190	23270	28330
2030-31	4590	7415	15540	15540	16955	24370	29670
2031-32	4810	7770	16280	16280	17760	25530	31075
2032-33	5040	8140	17055	17055	18605	26740	32555
2033-34	5280	8525	17865	17865	19490	28020	34110
2034-35	5530	8935	18720	18720	20425	29360	35740
2035-36	5795	9365	19620	19620	21405	30770	37455
2036-37	6075	9815	20565	20565	22435	32250	39260
2037-38	6370	10290	21560	21560	23520	33805	41155
2038-39	6680	10790	22605	22605	24655	35445	43150
2039-40	7005	11310	23700	23700	25855	37170	45250
2040-41	7345	11865	24855	24855	27115	38980	47455
2041-42	7705	12445	26075	26075	28445	40885	49775
2042-43	8080	13055	27350	27350	29840	42895	52220
2043-44	8480	13695	28700	28700	31305	45005	54790
2044-45	8900	14375	30115	30115	32855	47225	57490
2045-46	9340	15085	31605	31605	34480	49565	60340
2046-47	9800	15835	33175	33175	36190	52025	63335

7.4 Toll Revenue

As indicated earlier, toll revenue on the Project Road has been calculated in all three scenarios based on the above rates and projected traffic. The estimates of toll revenue under ***Optimistic***, ***Pessimistic*** and ***Most Likely*** growth scenarios are presented in the following section.

7.5 Toll Revenue at all toll plazas under Scenarios

Toll Revenue estimates under all scenarios at each of the toll plaza up to 2046-47 years starting from the year 2026-27 are shown in tables below.

Table 7-13 : Toll Revenue Optimistic Scenario

(Rs. Crores)

Year	TP-1	TP-2	TP-3	Total
2026-27	80.20	145.37	105.27	**330.84**
2027-28	87.69	159.93	115.14	**362.76**
2028-29	95.75	174.00	125.61	**395.35**
2029-30	103.35	189.70	137.05	**430.10**
2030-31	112.10	205.88	149.79	**467.77**
2031-32	121.40	225.26	162.84	**509.50**
2032-33	131.86	242.62	175.93	**550.42**
2033-34	142.09	263.74	192.83	**598.66**
2034-35	155.27	287.00	209.17	**651.44**
2035-36	168.07	312.53	227.87	**708.48**
2036-37	181.10	336.67	245.80	**763.58**
2037-38	195.66	365.44	267.47	**828.57**
2038-39	211.74	397.24	291.58	**900.56**
2039-40	230.20	432.27	317.16	**979.63**
2040-41	248.85	467.98	344.13	**1060.96**
2041-42	268.49	507.98	373.71	**1150.17**
2042-43	291.40	553.00	405.82	**1250.22**
2043-44	316.78	600.92	444.28	**1361.98**
2044-45	341.64	653.69	480.68	**1476.01**
2045-46	369.00	705.97	523.57	**1598.55**
2046-47	399.36	766.49	569.79	**1735.64**

Table 7-14 : Toll Revenue Pessimistic Scenario

(Rs. Crores)

Year	TP-1	TP-2	TP-3	Total
2026-27	79.85	144.70	104.77	**329.33**
2027-28	86.90	158.44	114.04	**359.37**
2028-29	94.46	171.48	123.78	**389.72**
2029-30	101.47	186.02	134.43	**421.91**
2030-31	109.53	200.93	146.18	**456.64**

Year	TP-1	TP-2	TP-3	Total
2031-32	118.04	218.80	158.09	**494.93**
2032-33	127.59	234.56	169.96	**532.11**
2033-34	136.82	253.76	185.42	**576.00**
2034-35	148.82	274.76	200.15	**623.73**
2035-36	160.33	297.81	216.96	**675.10**
2036-37	171.96	319.29	232.85	**724.10**
2037-38	184.89	344.95	252.15	**781.99**
2038-39	199.13	373.16	273.51	**845.81**
2039-40	215.44	404.10	296.05	**915.58**
2040-41	231.75	435.40	319.64	**986.79**
2041-42	248.83	470.37	345.45	**1064.65**
2042-43	268.76	509.58	373.28	**1151.63**
2043-44	290.77	551.04	406.70	**1248.51**
2044-45	312.07	596.61	437.90	**1346.58**
2045-46	335.46	641.22	474.65	**1451.33**
2046-47	361.24	692.83	514.02	**1568.08**

Table 7-15 : Toll Revenue Most Likely Scenario

(Rs. Crores)

Year	TP-1	TP-2	TP-3	Total
2026-27	80.03	145.02	104.99	**330.04**
2027-28	87.30	159.17	114.59	**361.05**
2028-29	95.13	172.71	124.70	**392.54**
2029-30	102.45	187.76	135.77	**425.98**
2030-31	110.87	203.28	147.99	**462.15**
2031-32	119.79	221.89	160.46	**502.14**
2032-33	129.81	238.43	172.91	**541.15**
2033-34	139.53	258.55	189.04	**587.12**
2034-35	152.11	280.57	204.60	**637.29**
2035-36	164.26	304.85	222.35	**691.46**
2036-37	176.62	327.63	239.22	**743.46**
2037-38	190.38	354.78	259.64	**804.80**
2038-39	205.53	384.67	282.36	**872.57**
2039-40	222.84	417.51	306.39	**946.74**
2040-41	240.27	450.88	331.65	**1022.80**
2041-42	258.59	488.23	359.28	**1106.11**
2042-43	279.98	530.21	389.33	**1199.52**
2043-44	303.65	574.74	425.31	**1303.71**
2044-45	326.69	623.68	459.12	**1409.49**
2045-46	352.03	671.91	498.93	**1522.86**
2046-47	380.05	727.67	541.71	**1649.44**

CHAPTER 8

CONCLUSION & RECOMMENDATIONS

8.1 Conclusion & Recommendations

Project stretch of Yedeshi to Aurangabad section of NH-211 in state of Maharashtra from km 100.000 to km 290.200 is currently four lane road. The road is in sound condition and serves healthy traffic volumes. Project corridor is a part of the important regional network connecting Maharashtra with Karnataka and other southern states. There are large number of townships, industrial corridors and other business establishment coming up along project corridor. As discussed, dominant portion of traffic is long route traffic, which is more sensitive towards the growth of national economy. As Indian economy is poised to grow at 7%+ post COVID-19, the project corridor is expected to pick up the same trend in terms of traffic flow. All these developments have potential to give positive impact to traffic flow on project. The following can be considered as major outcomes of the study

a) There is good amount of tollable traffic running on project

b) Project corridor has potential to witness traffic growth @ 6-8% annually in near future due to various development in area and overall development of economy

c) Project corridor has committed traffic as long route traffic and does not run a risk of traffic leakage due to quality competing road

Based on above it can be considered a stable healthy project from traffic and revenue point of view.

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TTRAFFIC STUDY & REVENUE PROJECTION REPORT (FINAL)

MAY 2026

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ABBREVIATIONS

AADT	-	Annual Average Daily Traffic	**NHAI**	-	National Highway Authority of India
BOT	-	Build Operate Transfer	**NHDP**	-	National Highways Development Project
CAGR	-	Compound Annual Growth Rate	**NSDP**	-	Net State Domestic Product
CTV	-	Classified traffic volume	**O&M**	-	Operation & Maintenance
DBFOT	-	Design, Build, Finance, Operate & Transfer	**PCDP**	-	Per Capita Domestic Product
EME	-	Earth Moving Equipment	**PCI**	-	Per Capita Income
GDP	-	Gross Domestic Product	**PCU**	-	Passenger Car Unit
GSDP	-	Gross State Domestic Product	**PSC**	-	Pre-stressed Concrete
HCM	-	Heavy Construction Machinery	**RCC**	-	Reinforced cement concrete
HCV	-	Heavy Commercial Vehicle	**RHS**	-	Right Hand Side
HTMS	-	Highway Traffic Management System	**SH**	-	State Highway
IRC	-	Indian Road Congress	**TP**	-	Toll Plaza
IRR	-	Internal Rate of Return	**WPI**	-	Wholesale Price Index
LCV	-	Light Commercial Vehicle	**SIR**	-	Special Investment Region
LHS	-	Left Hand Side	**c.**	-	Circa
LGV	-	Light Goods Vehicle	**ROB**	-	Railway Over Bridge
MAV	-	Multi Axle Vehicle	**MDR**	-	Major District Road
MORTH	-	Ministry of Road Transport and Highways	**ODR**	-	Other District Road
NH	-	National Highway	**CA**	-	Concession Agreement
PCC	-	Plain Cement Concrete	**RMT**	-	Running Meter
CR	-	Coarse Rubble			

CHAPTER 1

INTRODUCTION

1.1 Background

The Government of India through National Highway Authority of India (NHAI) embarked upon a program to enhance the traffic capacity and safety for efficient transportation of goods as well as passenger traffic on National Highway Sections under NHDP Phase V. Under Phase V NHAI has planned to convert 6,500 km of existing 4-lane National Highways into 6-lane National Highway. Sections envisaged under 6-laning comprise the Golden Quadrilateral section (5,700 km) and some other sections which are 800 km in length.

The project under consideration, **Palsit** to **Dankuni** section of NH-19 from km 588.870 to km 652.700 is one such road project NHAI intended to implement on a BOT basis in the DBFOT format. *M/s Palsit Dankuni Tollway. Ltd*. (Concessionaire) has been awarded the Project for a concession period of 17 years starting from 2nd April 2022. The Project has been commissioned and is currently under construction for six laning. Six laning of project is underway and expected to complete soon.

Project stretch from Palsit to Dankuni is part of new NH-19 Which was previously referred as Delhi -Kolkata. During renumbering of National Highway, Delhi to Agra route was numbered as NH-44 and Agra to Kolkata has been assigned as NH-19. From a transportation point of view, it is Delhi – Kolkata corridor.

New NH-19 connects industrial cities like Agra, Kanpur, Allahabad, Varanasi, Dhanbad, Durgapur, Bardhman and terminates at Dankuni near Kolkata. Close proximity to Kolkata and Howrah has given impetus to industrial development around project highway at various locations.

Old Delhi Road (GT Road) lies east of project highway from Palsit onwards. Project stretch is developed at new alignment between Palsit and Dankuni and is known as Durgapur Expressway. The following figure shows the alignment of project stretch.

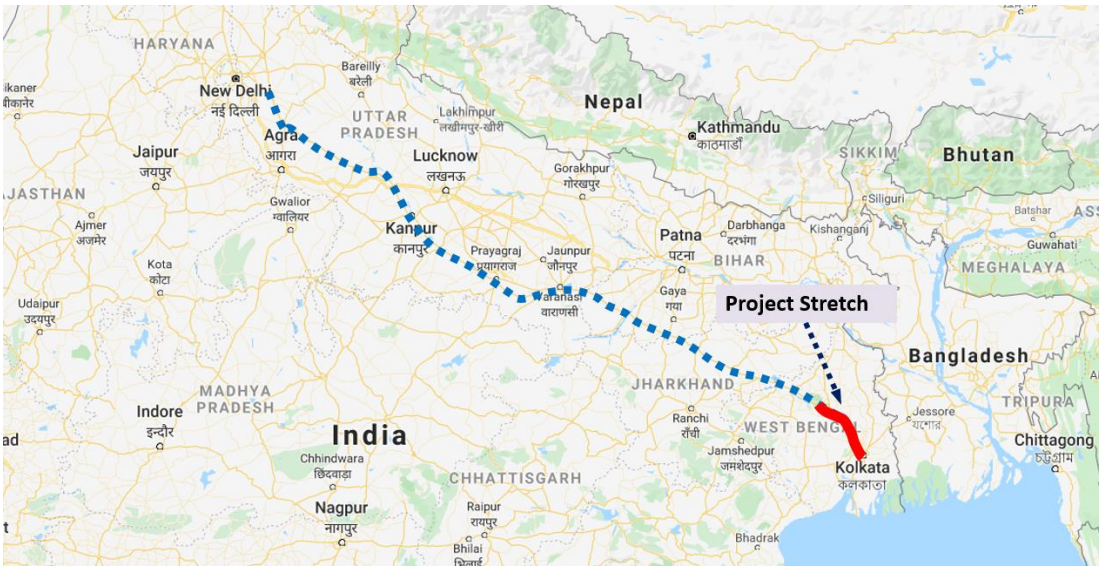

Figure 1-1: Alignment of Project Stretch

1.2 Objective of the Study

M/s IRB INFRASTRUCTURE TRUST has engaged *GMD Consultants* to assess the future traffic and toll potential of project stretch.
This report named as **"Traffic Study &*Toll Revenue Projection Report*"** mainly focuses on traffic and revenue aspects of the project. Other parameters like competing road, area developments etc. have been considered from a traffic development point of view.

1.2.1 Scope of Services

The broad scope of work covered in the assignment is as follows.

a) Analysis of Traffic Growth
b) Toll Rate Growth
c) Revenue Forecasting

The Concessionaire has provided basic traffic data and other project details on the basis of which the above analysis has been carried out.

CHAPTER 2

PROJECT DETAILS

2.1 Project Corridor

National Highway 2 (NH 2) which is now renumbered as NH-19 is oldest highway in India and connects state of Delhi, Haryana, Uttar Pradesh, Bihar, Jharkhand and West Bengal. It constitutes a major portion of the historical grand truck road.

It connects the national capital Delhi to Kolkata, as well as important cities Mathura, Agra, Kanpur, Allahabad, Varanasi, Dhanbad, Asansol, Durgapur and Bardhman. The highway is part of the Golden Quadrilateral project undertaken by National Highways Authority of India (NHAI).

The project road is the final link on Kolkata side between Palsit and Dankuni in the state of West Bengal. Dankuni is just out the outskirts of Kolkata on the northern side. The main project influence area of the project road consists of Dhanbad, Durgapur and Kolkata.

2.2 Project Stretch Description

Section of NH-19 from Palsit to Dankuni is part of the major transportation link in the area connecting industrial cities of Dhanbad, Asansol, Durgapur and Kolkata. Project stretch is basically and gateway link to Kolkata from northern India. Being just on the outskirts of the major metro city Kolkata, a large number of warehouses and logistic hubs are established on project road. This also contributes to sustainable traffic and growth on project highway.

There is one operative toll plaza at project stretch which is at Dankuni at km 646.005. The following figure shows project alignment and toll plaza location.

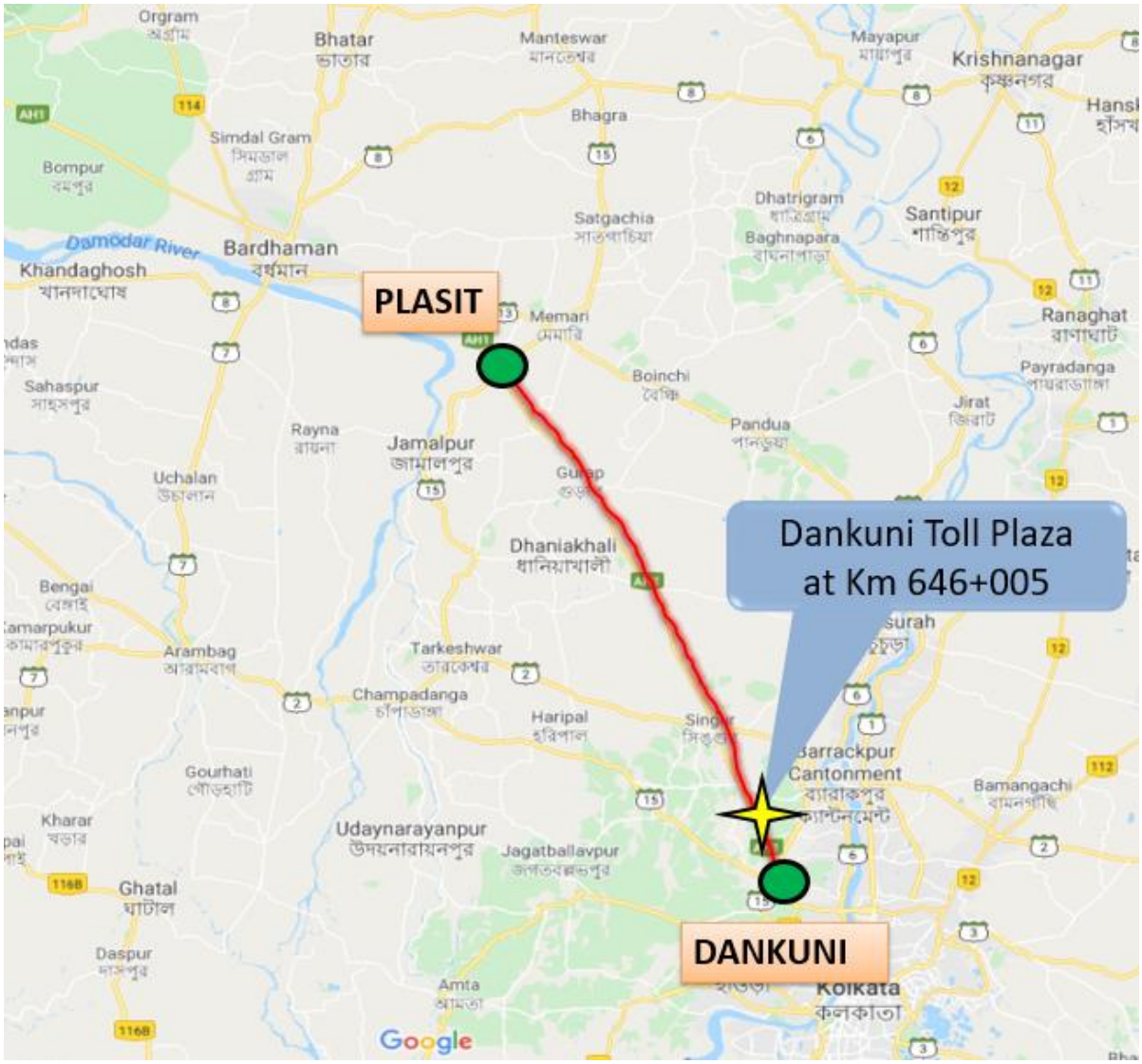

Figure 2-1: Project Alignment with Toll Plaza

2.3 Project Corridor Illustration

Four lane projects are under operation. Six laning has commenced on corridor. The following photographs illustrate the project section along the corridor.

Figure 2-2: Photographs showing Project Corridor

CHAPTER 3

TRAFFIC SURVEYS AND ANALYSIS

3.1 Traffic Surveys

The Consultants have collected the required information for project corridor to understand the general traffic and travel characteristics on the corridor.

The following traffic data has been collected from a client for a project.

- Classified traffic volume counts at toll plaza location on Palsit - Dankuni section of NH-19 for Yr. 2022-23, 2023-24,2024-25 and Annual traffic data from April 2025 to February 2026.
- Local Component of traffic
- Component of Return Journey
- Component of Monthly Pass Journey

The main objective of the traffic data analysis is to:

- Determine the existing traffic movement characteristics of the project.
- Establish base year traffic.
- Identification of travel patterns and modal split of project traffic
- Deriving growth factors for traffic forecasting
- Estimation of corridor traffic including traffic diversion if any
- Preparation of revenue model and projection of revenue as per toll policy for various scenarios

Table 3-1below lists provides details of locations from where traffic details have been collected.

Table 3-1 : Traffic Data Details

SR. NO	LOCATION	CTV	Single Journey Traffic	Daily Return Journey	Monthly Pass	Local Pass
1	**Toll Plaza Dankuni at km 646.005**	AADT for Year 2022-23,2023-24, 2024-25 & Eleven months from April 2025 to February 2026	For Year 2022-2023, 2023-24,2024-25 & Eleven months from April 2025 to February 2026	For Year 2022-2023, 2023-24,2024-25 & Eleven months from April 2025 to February 2026	For Year 2022-2023, 2023-24,2024-25 & Eleven months from April 2025 to February 2026	For Year 2022-2023, 2023-24,2024-25 & Eleven months from April 2025 to February 2026

3.2 Classified Traffic Volume

The objective of conducting a Classified Traffic Volume Count is to understand the traffic flow pattern including modal split on a roadway. The Classified Traffic Volume Count survey has been provided by the concessionaire of project highway from actual traffic data gathered at toll plaza locations based on monthly data shared with NHAI.

The vehicles can broadly be classified into fast moving / motorized and slow moving / non-motorized vehicles, which can be further classified into specific categories of vehicles. The groupings of vehicles are further segregated to capture the tollable vehicle categories specifically and toll exempted vehicles are counted separately. The detailed vehicle classification system as per IRC: 64-1990 is given in the table below.

Table 3-2 : Vehicle Classification System

Vehicle Type	
Auto Rickshaw	
Passenger Car	Car, Jeep, Taxi & Van (Old / new technology)
Bus	Minibus
	Standard Bus
Truck	Light Goods Vehicle (LCV)
	2 – Axle Truck
	3 Axle Truck (HCV)
	Multi Axle Truck (4-6 Axle)
	Oversized Vehicles (7 or more axles)
Other Vehicles	Agriculture Tractor, Tractor & Trailer

Source - IRC: 64 – 1990

However, since the project highway is currently under toll operation, the data collected corresponds to the category of tollable vehicles. The following are the types of vehicles as per concession agreement.

- Car / Jeep / van
- Min Bus /LCV
- Bus
- Truck
- 3-Axle
- Multi Axle

3.3 Traffic Characteristic

Toll revenue of project highway does not solely depend on traffic volume. There are certain characteristics of traffic which have substantial potential to affect toll collection. Component of local traffic, component of passenger and commercial traffic, portion of return journey traffic, % of monthly pass traffic are some of such characteristics of traffic. These will be discussed in subsequent sections of the report.

3.3.1 Traffic Data

Project concessionaire has provided Traffic data for the years 2019-20 ,2020-21, 2021-22, 2022-23 ,2023-24,2024- 25 & traffic data from April 2025 to February 2026.
Since the traffic data available for this update is for only Annual, from April 2025 to February 2026, it may not represent the whole year traffic. Hence a seasonality factor for balance part of year has been applied to average traffic of the current Eleven months to arrive at Annual Average Daily Traffic of base year 2025-26. Thus, corrected traffic is used for future projections and revenue calculations. The following table shows historical traffic on project stretch and derived Annual Average Daily Traffic (AADT) for year 2025-26.
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Table 3-3 : Traffic Data at Dankuni Toll Plaza at Km 646.005

Sr. No	Type of Vehicle	Annual Average Daily Traffic (Nos.)- 2022-23	Annual Average Daily Traffic (Nos.)- 2023-24	Annual Average Daily Traffic (Nos.)- 2024-25	Annual Average Daily Traffic (Nos.)- 2025-26
1	Car	10514	10935	10745	14591
2	LCV	1398	1031	941	1093
3	Bus	789	788	712	239
4	Truck	3707	2542	2120	2314
5	3-Axle	3061	2018	1524	1531
6	Multi Axle	8974	8799	8304	9717
7	Oversize Vehicle	8	9	9	11
	Total	**28451**	**26121**	**24355**	**29495**

3.4 Data Analysis

3.4.1 Analysis of Traffic Volume Count

Understanding the character of existing traffic forms the basis of the traffic forecast. The various vehicle types having different sizes and characteristics can be converted into a single unit called Passenger Car Unit (PCU). Passenger Car equivalents for various vehicles are adopted based on recommendations of Indian Road Congress prescribed in “IRC-64-1990: Guidelines for Capacity

of Roads in Rural areas". The adopted passenger car unit values (PCU) are presented in ***Table*** 3-4**.**

Table 3-4 : PCU Factors Adopted for Study

Vehicle Type	PCUs
Car	1.0
Minibus	1.5
Standard Bus	3.0
LCV/LGV	1.5
2 Axle Truck	3.0
3 – 6 Axle Truck	4.5
MAV	4.5
Auto Rickshaw	1.0
Van/Tempo	1.0
Agriculture Tractor with Trailer	4.5
Agriculture Tractor without Trailer	1.5

Source: IRC: 64-1990

Traffic volume at each toll plaza was converted to PCU and same is presented as under

Table 3-5 : Traffic in PCU at Project Stretch Base Year 2022-23

Year	Toll Plaza Location (Km)	Traffic No	PCU	PCU Index
2022-2023	Dankuni Km 646.005	28451	75699	2.66
2023-2024	Dankuni Km 646.005	26121	68159	2.61
2024-2025	Dankuni Km 646.005	24355	62632	2.57
2025-2026	Dankuni Km 646.005	29495	72257	2.45

It can be observed from above that project traffic has PCU index below 2.5 at Dankuni which is an indicator of high proportion of commercial traffic in traffic mix.

3.4.2 Components of Traffic

As discussed previously, components of traffic volume play an important role in determining project revenue. A larger component of commercial traffic with higher axle configuration adds to project revenue positively. Similarly, a larger component of local traffic affects the project revenue potential negatively.

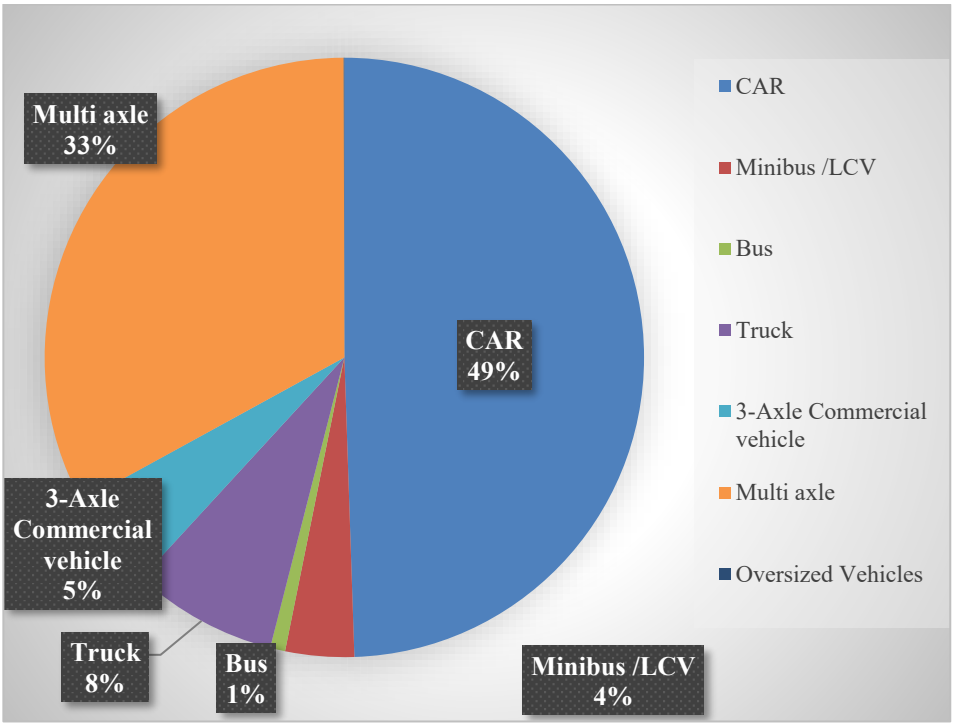

Figure 3-1 :Model Split of Tollable Vehicle-Dankuni Km 646.005

It is observed that car traffic forms about 49% of total traffic at Dankuni toll plaza location while multi axle commercial vehicles and 3-Axle are about 38% of total traffic. Truck/Bus & LCV are 9% & 4% respectively.

Another important bifurcation of traffic is components of traffic with respect to various type of toll ticketing like

1. Single Journey
2. Multi Journey
3. Local Commercial Single Journey
4. Monthly Pass Local
5. Monthly Pass
6. Annual Pass car

The following table provides numbers of vehicles falling in each of the above categories on base year 2025-26

Table 3-6 : Journey Type Bifurcation of Traffic at Dankuni Toll Plaza KM 646.005

Sr. No	Type	Traffic Volume (Nos.)
		2025-26
1	Single Journey	13914
2	Return Journey	13421
3	Local Commercial Single Journey	0

Sr. No	Type	Traffic Volume (Nos.)
		2025-26
4	Monthly Pass Local	15
5	Monthly Pass	3
6	Annual Pass car	2141

Most dominant part of the above is the single journey type followed by return journey at project stretch. Monthly pass commuters are a very low fraction of the total traffic on the project corridor.

The single journey component in total traffic numbers is as high as 47%. Return journey component is 46%. The number of monthly passes is 0% and Anuual Pass is 7% at Dankuni toll plaza. This indicates a higher share of long traffic.

It is observed that the project corridor demonstrates a similar pattern of single journey dominating a mix of traffic across the entire stretch which is typical of major national highways.

3.5 Secondary Data Collection

There are several other factors which have a substantial impact on traffic patterns and growth on any project corridor. The following are some of such important factors.

- Industrial development around project corridor and its catchment
- Educational infrastructure along project corridor
- Demographic pattern
- Urban area development
- Tourism potential
- Upcoming major infrastructural or Industrial projects
- Special Industry in project corridor
- Overall trends of economic growth local as well as national / regional

Hence in addition to traffic details on the project site, secondary data was also collected from various other sources. Typical secondary data includes the following:

1. Vehicle registration data of regional and national level.
2. Economic Data
   a) GDP
   b) NSDP
   c) Population Growth
   d) Per Capita Income growth
   e) Industrial Growth
   f) Special Industry Potential
   g) Regional and National development vision / plan
   h) Any other relevant data
3. Competing road network

We have collected and utilized such underlying data in the study to estimate the growth and risk factors for traffic along the project corridor.

CHAPTER 4

INFLUENCE ZONE TRANSPORT NETWORK ANALYSIS

4.1 Introduction

Highway corridors behave like integrated circuit networks and more often than not every road is connected to various networks having different origins and destinations. Traffic running on these networks behaves like fluid and flow on network on alignment of least friction.

The following Factors can be considered as major contributors to friction on transportation networks.

- Travel Speed / Travel Time
- Geometric deficiencies like blind horizontal curves and steep vertical gradients etc.,
- Configuration of road
- Riding quality
- Traffic delays,
- Length of road,
- Passing through built up or Urban Area,
- Terrain,
- Facilities,

4.2 Competing / Alternate route

Project stretch from Palsit to Dankuni is part of Golden Quadrilateral connecting four metros of India which has been widened to four lanes in year 2005. Part of the stretch, from Palsit to Dankuni, known as Durgapur Expressway, was constructed at different alignment to the east of old NH-2. Old NH-2, still known as GT road passes through congested built-up areas like Memari, Boinchi, Saptagram etc. It has a number of level rail crossings as well. Thus, traffic at project stretch is settled and as such has not much scope of diversion.
There are few alternate routes to stretch projects. These are discussed in subsequent sections including their potential impact on project traffic.

Old NH-2 (GT Road)

Between Palsit and Dankuni old NH-2 is an available alternate route to project stretch (Durgapur Expressway). The following figure shows both Durgapur Expressway and GT road.

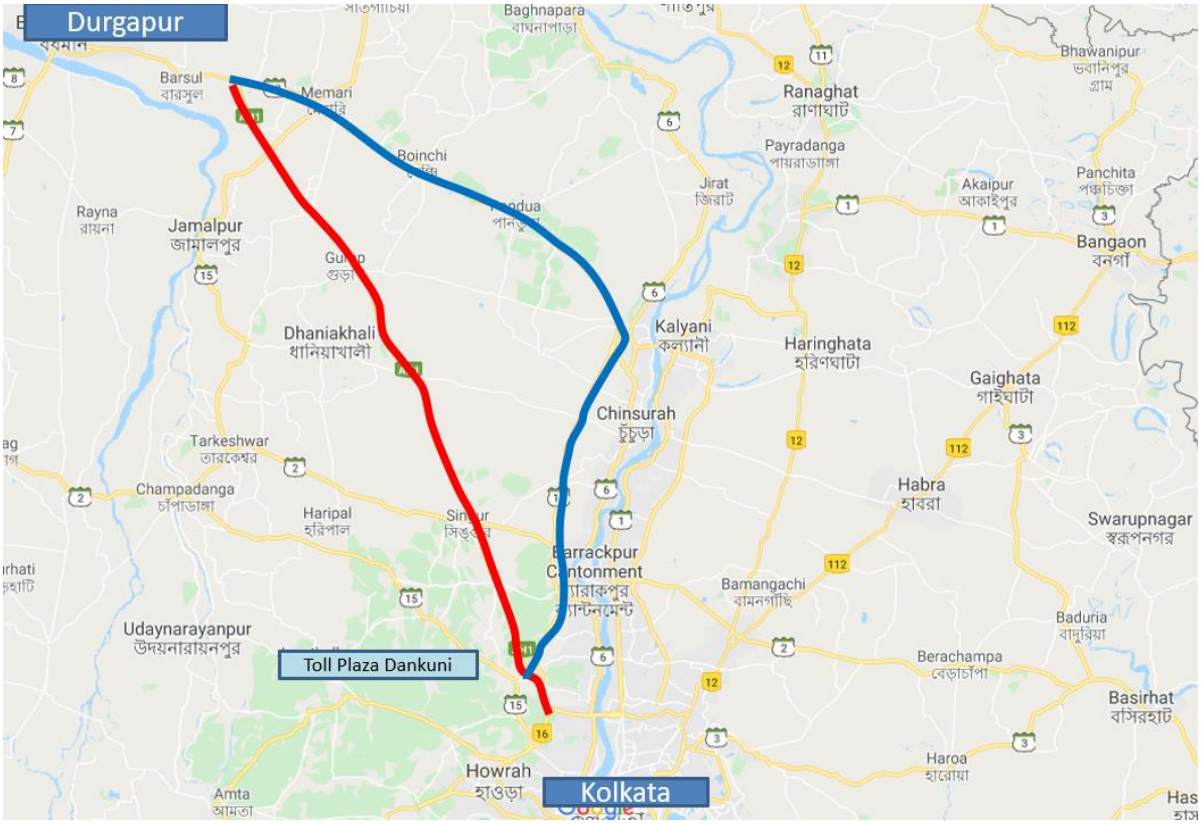

Figure 4-1 Project stretch and alternate GT Road

GT road passes through congested locations and is two lanes currently in most of the stretch.

The following figure shows the typical condition of GT road as compared to project stretch.

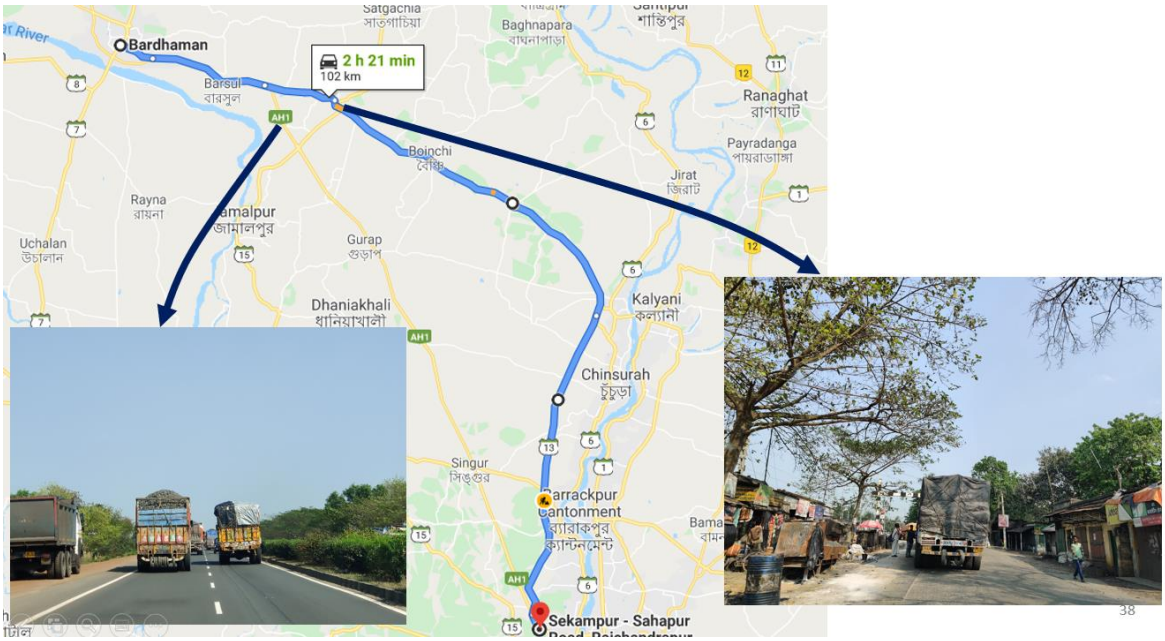

Figure 4-2 Project stretch and alternate GT Road Condition

There are as many as 5 level crossings on GT road which cause traffic congestion. The following figure shows one such typical crossing.

Figure 4-3 Railway level crossing at GT road.

The following table shows comparison of length and travel time via both project stretch and old GT road between Bardhman and Dankuni.

Table 4-1 Project Road and GT road comparison

Route	Distance (Km)	Time (Min)	Remarks
Bardhman -Kolkata Via Old NH-2 GT Road	102	141	Road is two lanes in most places and passes through congested built-up areas (Alikhoja, Memari, Boinchi, Saptagram) and 7 level crossings.
Bardhman -Kolkata Via Project Road	**84**	**79**	**Preferred Route**

Project road is quite short and saves lot of time. It such case any material shift of traffic from project stretch to old GT road is not envisaged.

B. Toll Plaza Local Leakage Roads

As such leakage roads are not there at toll plazas but there can be a longer detour to avoid toll plazas. The following figure shows the location and alignment of these roads at Dankuni Toll plaza.

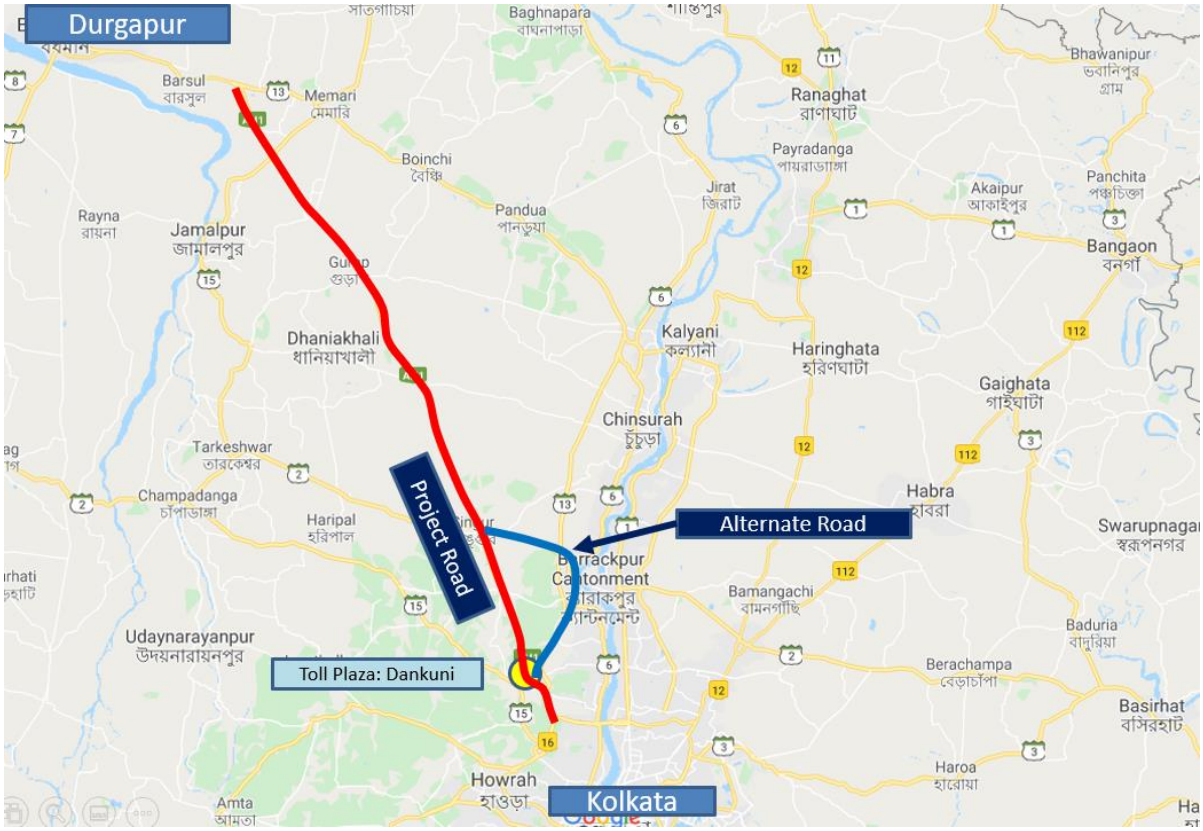

Figure 4-4 Local roads bypassing toll plaza.

At **Dankuni Toll Plaza,** there can be one alternate route via Singur- Baidyavati (Tarkeshwar) – Dankuni. The link from Singur to old Delhi Road is intermediate/ two lane. It's quite congested and geometrically very poor. Moreover, this road is used by pilgrims to reach the famous Tarkeshwar temple of Lord Shiva. Almost all through the year people walk in large groups on the way to Tarkeshwar. The major concentration of this Yatra is in the months of February to March and July- August. The following figure shows the typical condition of this link.

Old GT Road from Tarkeshwar to Dankuni is under widening to four lanes. There is one ROB under construction. Toll plaza is also under construction at GT Road. The following figures show under construction ROB and Toll Plaza at GT Road.

Figure 4-5 ROB & Toll Plaza under construction.

The following table provides comparison between project road and this alternate route around Dankuni toll plaza.

Table 4-2 Length time comparison of alternate route at Dankuni Toll

Route	Distance (Km)	Time (Min)	Remarks
Via Singur - Delhi Road (Old NH02)	27	41	From Singur to NH-2 road is intermediate lane and congested. Delhi road under four laning. Toll plaza under construction
Via Project Road (Dankuni)	**21.4**	**24**	**Preferred Route**

Between Singur and Kolkata- Road from Singur to Old NH-2 is two lane and quite congested. Currently part of NH-2 is under 4 laning and there is no toll as of now. Already passenger vehicles are using. Heavy commercial traffic is not allowed on existing bridge. Hence when ROB will be opened to traffic, certain amount of commercial traffic may divert to alternate route of Singur- NH-2.

Part of alternate route is congested and there is habitation on both sides. Progress on ROB at GT road has been very slow which is further impacted by pandemic COVI-19. As the route is existing since long and traffic is settled on both project stretch and GT road, it is unlikely that any further diversion of passenger traffic would take place. After completion of six laning of project stretch some passenger traffic may also divert to project stretch due to better traffic conditions at project stretch. However same is ignored for current analysis and projections.

At present heavy commercial traffic is not allowed on existing ROB on NH-2 however light commercial traffic is using the same. Hence some part of above diversion has already taken place.

Geometrics and condition of road from Singur to GT road is not good but still some amount of commercial traffic may divert to old GT road after ROB at GT road is competed. Following table shows potential diversion of traffic commercial traffic is taken into consideration for projection of traffic. Considering the above facts following diversion of commercial traffic has been assumed for traffic projections in 2025-26.

- Optimistic Case- 5%
- Most Likely Case- 10%
- Pessimistic Case- 15%

CHAPTER 5
GROWTH OF TRAFFIC ON PROJECT HIGHWAY

5.1 Introduction

Traffic growth is a function of the interplay of a number of contributory factors such as National economy, Government policy, socio-economic conditions of the people, and changes in land uses along the project corridor precincts etc. As these factors have a number of uncertainties associated with them, forecasts of traffic are dependent on the projections of other factors such as population, gross domestic product (GDP), vehicle ownership, per capita income (PCI), agricultural output, fuel consumption etc. Future patterns of change in these factors can be estimated with only a reasonable degree of accuracy and hence the resultant traffic forecast levels may not be precise.

Traffic growth forecast for project corridor Surat- Dahisar section of NH-8has been done taking the above factors into consideration. "**IRC: 108-2015-Guidelines for Traffic Prediction on Rural Highways**" is established best practice and has been used for traffic growth forecast.

5.2 Trend Analysis

One of the methods of estimation of future rate of growth is to assume the same rate of growth as in the past. Although such a method is more suitable for projects of short durations say 5-10 years, however for long term projections it would-be erroneous to assume that the past rate of growth will continue to prevail for a long time in future. Economic conditions, which are major influencing factors, are bound to change over a long period of time. Thus, it would be necessary to modify the past trends of growth suitably.

Elasticity model of growth projection is one of the most widely acceptable methods for traffic forecast. The same is recommended in **IRC: 108-2015-Guidelines for Traffic Prediction on Rural Highways**.

In this method the past trend of vehicular data is paired with an economic indicator and a regression analysis is done to yield the economic model of growth. Growth of vehicle traffic varies for different types of vehicles. It is a proven fact that the growth pattern for passenger and goods vehicle is different. Traffic growth on any highway typically depends on a number of economic parameters. Most important and direct parameters are given as under

- Per Capita Income
- Net State Domestic Product (NSDP)
- Population

It can be observed that the ownership of a car is more closely related to affordability; hence per capita is the index which closely fits the growth of car traffic among other criteria. In a similar fashion, the following can be pairs of vehicle type and independent variable for elasticity modeling of growth.

- Car / Jeep – Par Capita Income
- Bus / Minibus – Population
- Goods Vehicle – NSDP

5.3 Estimation of Traffic Demand Elasticity

Elasticity of traffic demand is defined as the rate at which traffic intensity varies due to a change in the corresponding indicator selected. Hence, in order to estimate the elasticity of traffic demand, it is necessary to establish a relationship between the growth in number of given category of vehicles with the relevant economic variable considered, such as NSDP, per capita income and population growth. Latest available data for vehicle registration, per capita income, NSDP and population is used in analysis.

As per IRC: 108-1996 the model for estimating elasticity index for the project corridor is of the following form and is given as below:

Log (P) = k x Log (EI) + A

Where,

P = Number of Vehicles (Mode wise)

EI = Economic Indicator

A = Regression constant

k = Elasticity coefficient (Regression coefficient)

The elasticity for cars and bus (passenger vehicles) is calculated based on the Population and Per Capita Domestic Product (PCDP) and the elasticity for trucks is calculated based on the Net State Domestic Product (NSDP).

As observed in OD analysis, the project stretch has a share of traffic from mainly three states of West Bengal, Jharkhand and Bihar and some traffic from Uttar Pradesh and Delhi. Hence regression of dependent variable and traffic has been done for these three states. The following tables and graphs present a summary of elasticity model of growth for project corridor.

Table 5-1 : Per Capita Income Vs. Car- West Bengal

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2011	31314	610218	4.50	5.79		
2012	32164	695463	4.51	5.84	3%	
2013	34177	791069	4.53	5.90	6%	
2014	36293	829478	4.56	5.92	6%	
2015	38624	916475	4.59	5.96	6%	5.40%

Regression analysis of above is given in following figure.

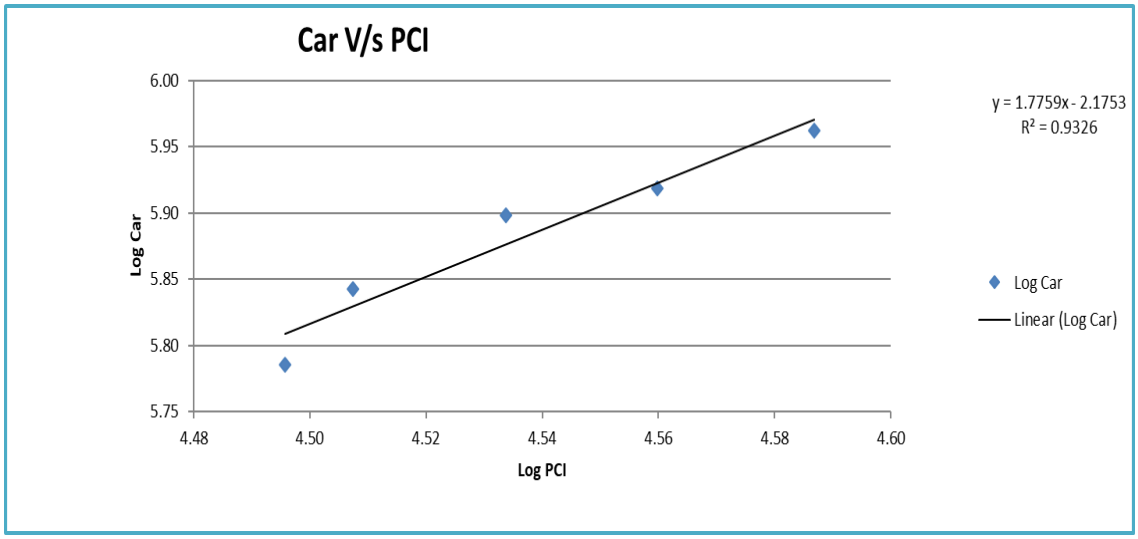

Figure 5-1 : Regression Analysis Car Vs. PCI West Bengal

Table 5-2 : NSDP Vs. Truck- West Bengal

Year	NSDP	Trucks	Log NSDP	Log Truck	NSDP Growth	Average Growth (5 Year)
2011	27919100	285733	7.45	5.46		
2012	28943200	318573	7.46	5.50	4%	
2013	31033800	344816	7.49	5.54	7%	
2014	33242500	350565	7.52	5.54	7%	
2015	35684500	377636	7.55	5.58	7%	6.34%

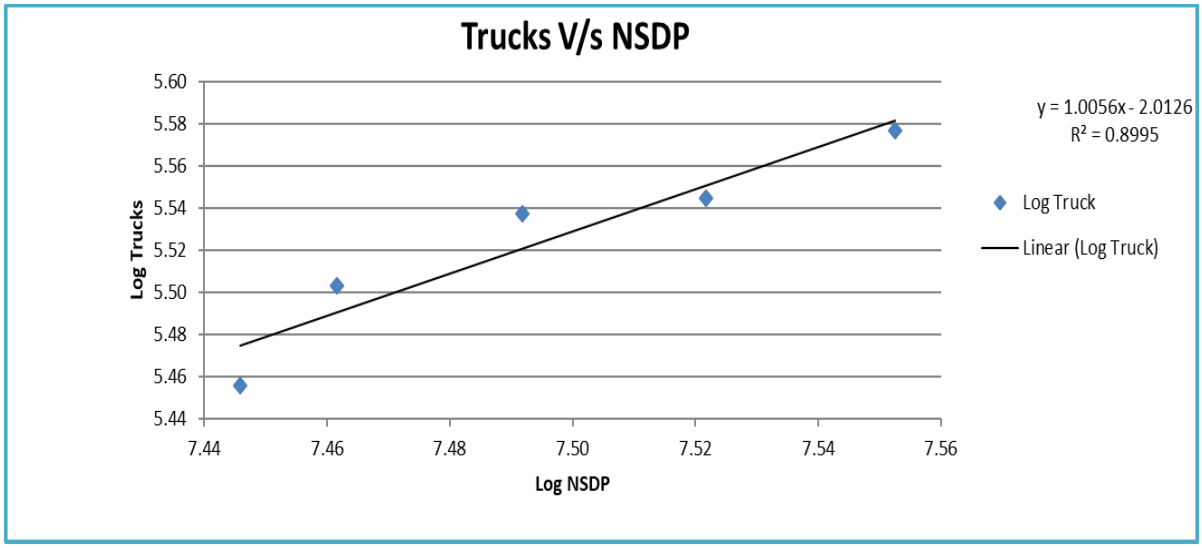

Figure 5-2 : Regression Analysis NSDP Vs. Truck West Bengal

Summary of regression analysis for elasticity and growth estimation for West Bengal are given in following table.

Table 5-3 : Summary Regression Analysis- West Bengal

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average IV Growth (5yrs)	Growth Elastic Model	Remarks
West Bengal	Car/Jeep	PCI	y = 1.7759x - -2.1753	R^2 = 0.9326	1.7759	5.40%	9.58%	Good Regression
	Bus	Population	y = 0.5092x - 0.5636	R^2 = 0.0364	0.5092	0.89%	0.46%	Poor Regression
	Truck	NSDP	y = 1.0056x - -2.0126	R^2 = 0.8995	1.0056	6.34%	6.37%	Good Regression

Similarly, regression tables and graphs of economic model for Jharkhand are given as below.

Table 5-4 : Per Capita Income Vs. Car- Jharkhand

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2011	24330	317931	4.39	5.50		
2012	25265	360662	4.40	5.56	4%	
2013	27010	408016	4.43	5.61	7%	
2014	28882	461587	4.46	5.66	7%	
2015	30950	522192	4.49	5.72	7%	6.2%

Regression analysis of above is given in following figure.

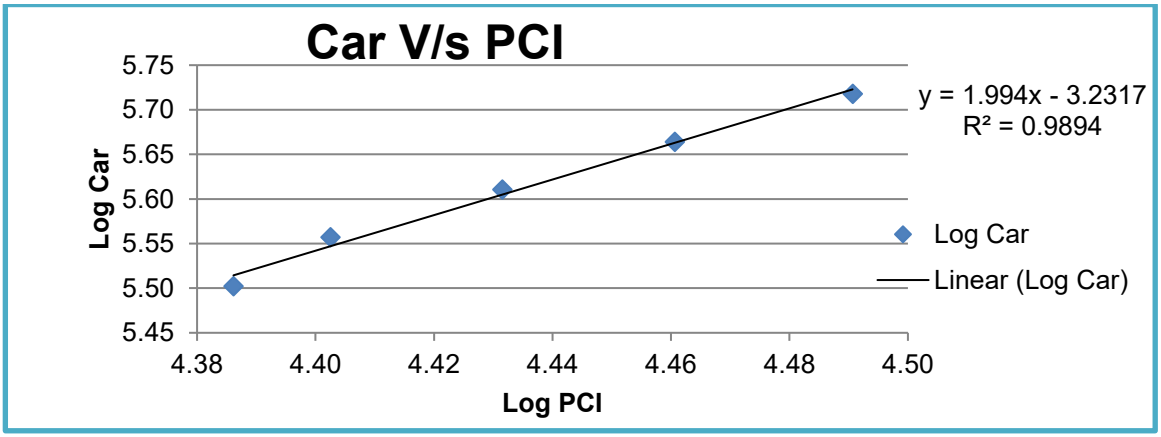

Figure 5-3 : Regression Analysis Car Vs. PCI Jharkhand

Table 5-5 : Population Vs. Bus- Jharkhand

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth
2011	31292000	12847	7.50	4.11		
2012	31726000	13561	7.50	4.13	1%	

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth
2013	32159000	14189	7.51	4.15	1%	
2014	32588000	14846	7.51	4.17	1%	
2015	33020000	15534	7.52	4.19	1%	1.35%

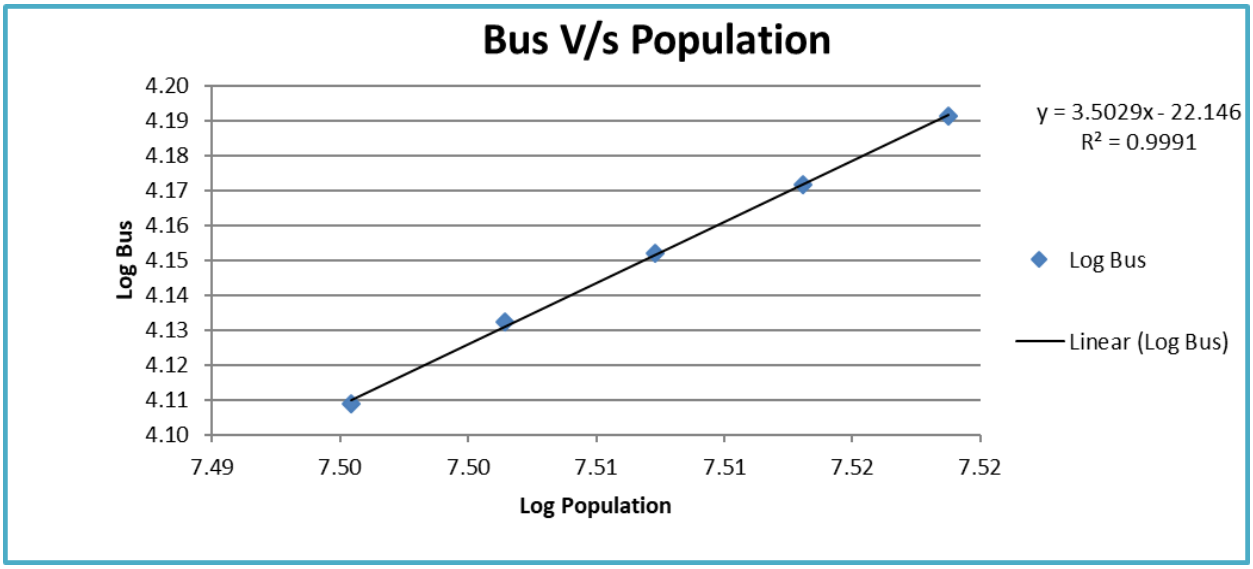

Figure 5-4 : Regression Analysis Population Vs. Bus Jharkhand

Table 5-6 : NSDP Vs. Truck- Jharkhand

Year	NSDP	Trucks	Log NSDP	Log Truck	NSDP Growth	Average Growth (5 Year)
2011	76134	100257	4.88	5.00		
2012	80157	107769	4.90	5.03	5%	
2013	86861	114903	4.94	5.06	8%	
2014	94121	121031	4.97	5.08	8%	
2015	102196	127374	5.01	5.11	9%	7.65%

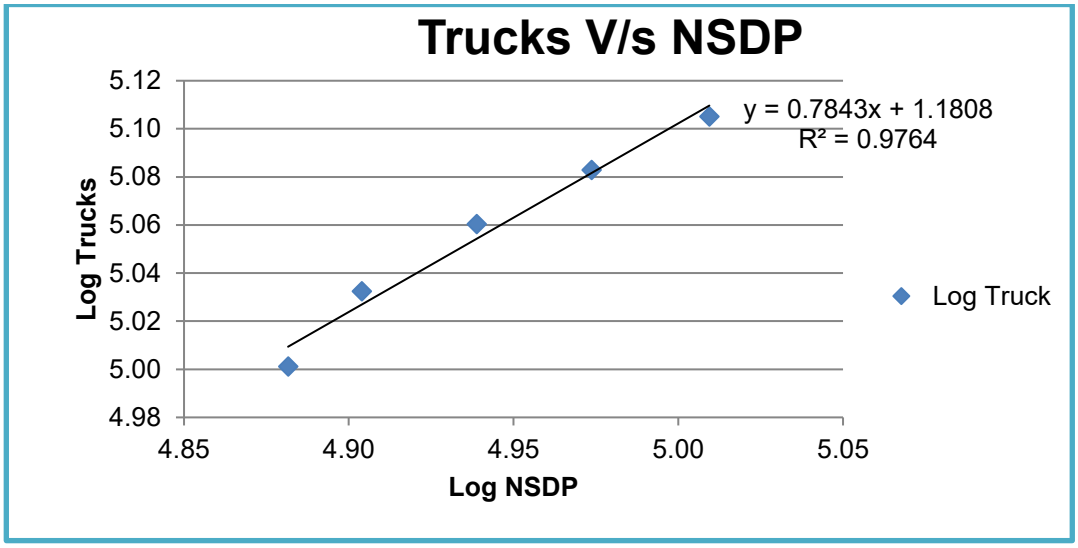

Figure 5-5 : Regression Analysis NSDP Vs. Jharkhand

Summary of regression analysis for elasticity and growth estimation for Jharkhand are given in following table.

Table 5-7 : Summary Regression Analysis- Jharkhand

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average IV Growth (5yrs)	Growth Elastic Model	Remarks
JHARKHAND	Car/Jeep	PCI	y = 1.994x - -3.2317	R^2 = 0.9894	1.9940	6.21%	12.38%	Good Regression
	Bus	Population	y = 3.5029x - - 22.1461	R^2 = 0.9991	3.5029	1.35%	4.74%	Good Regression
	Truck	NSDP	y = 0.7843x - 1.1808	R^2 = 0.9764	0.7843	7.65%	6.00%	Good Regression

Similar analysis for the state of Bihar is presented in the table and regression graphs given below.

Table 5-8 : Per Capita Income Vs. Car- Bihar

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2011	12090	136845	4.08	5.14		
2012	13149	160340	4.12	5.21	9%	
2013	14356	184792	4.16	5.27	9%	
2014	15506	208205	4.19	5.32	8%	
2015	16801	235762	4.23	5.37	8%	8.6%

Regression analysis of above is given in following figure.

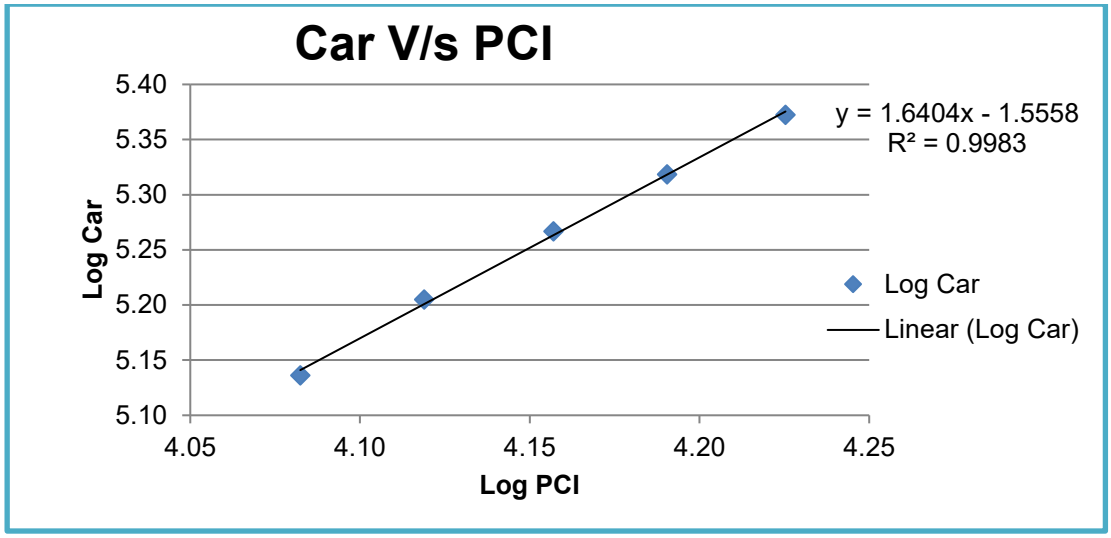

Figure 5-6 : Regression Analysis Car Vs. PCI Bihar

Table 5-9 : Population Vs. Bus- Bihar

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth
2011	104099452	22703	8.02	4.36		
2012	106763632	24097	8.03	4.38	3%	
2013	109441349	25992	8.04	4.41	3%	
2014	112131327	27638	8.05	4.44	2%	
2015	114832300	29384	8.06	4.47	2%	2%

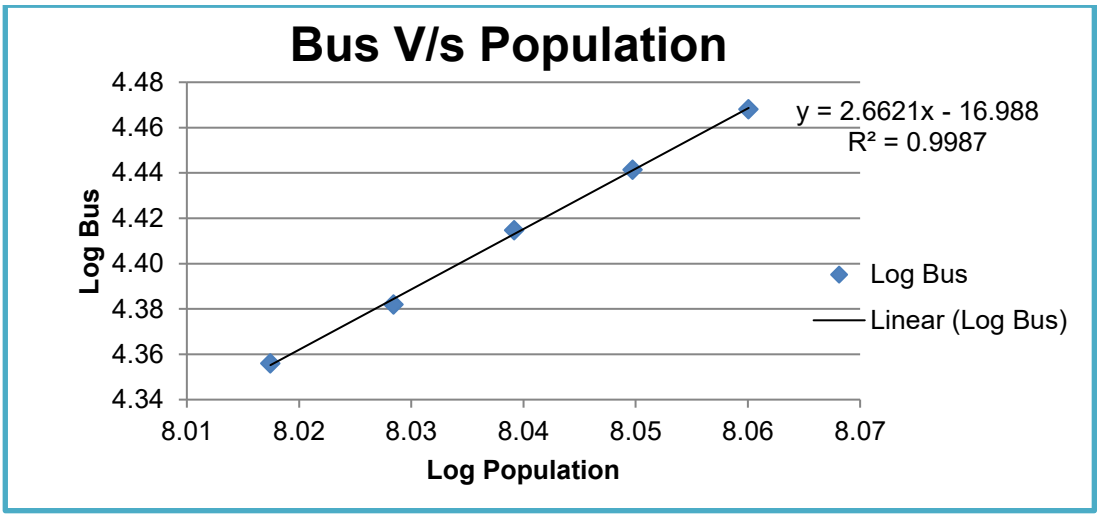

Figure 5-7 : Regression Analysis Population Vs. Bus Bihar

Table 5-10 : NSDP Vs. Truck- Bihar

Year	NSDP	Trucks	Log NSDP	Log Truck	NSDP Growth	Average Growth (5 Year)
2011	11750314	73472	7.07	4.87		
2012	12952142	83191	7.11	4.92	10%	
2013	14324962	103211	7.16	5.01	11%	
2014	15667055	109010	7.19	5.04	9%	
2015	17180244	123744	7.24	5.09	10%	10%

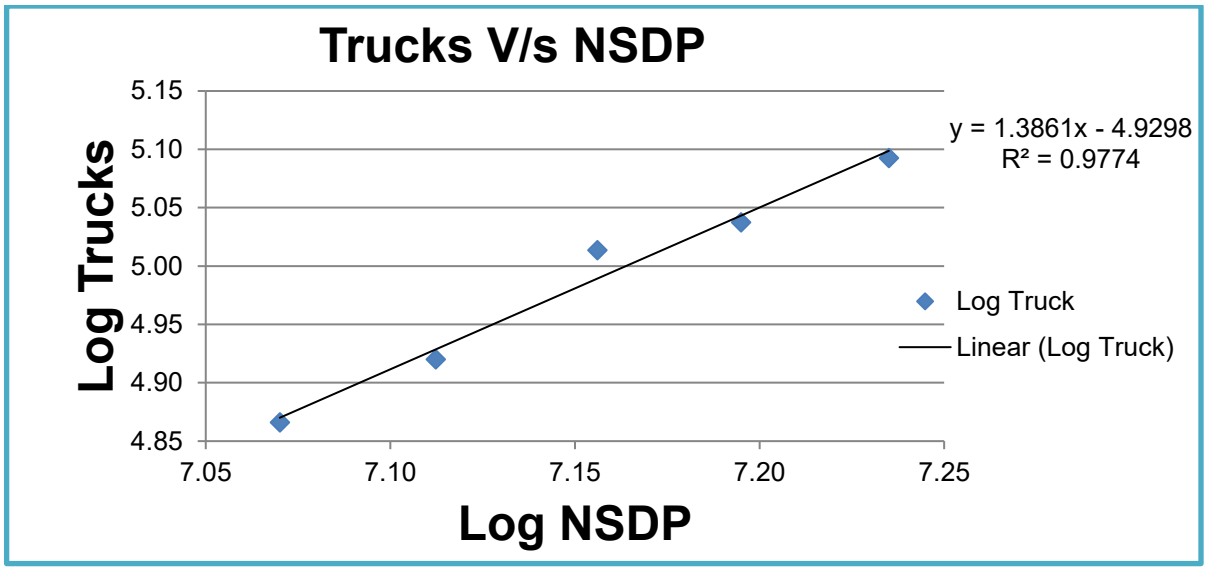

Figure 5-8 : Regression Analysis NSDP Vs. Truck Bihar

Summary of regression analysis for elasticity and growth estimation for Biharis given in following table

Table 5-11 : Summary Regression Analysis- Bihar

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average IV Growth (5yrs)	Growth Elastic Model	Remarks
BIHAR	Car/Jeep	PCI	y = 1.6404x - - 1.5558	R^2 = 0.9983	1.6404	8.58%	14.07%	Good Regression
	Bus	Population	y = 2.6621x - - 16.988	R^2 = 0.9987	2.6621	2.48%	6.61%	Good Regression
	Truck	NSDP	y = 1.3861x - - 4.9298	R^2 = 0.9774	1.3861	9.96%	13.81%	Good Regression

Table 5-12 : Per Capita Income Vs. Car- Uttar Pradesh

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2011	17388	984937	4.24	5.99		
2012	18014	1108100	4.26	6.04	4%	
2013	18635	1205374	4.27	6.08	3%	
2014	19233	1423020	4.28	6.15	3%	
2015	20057	1572217	4.30	6.20	4%	4%

Regression analysis of above is given in following figure.

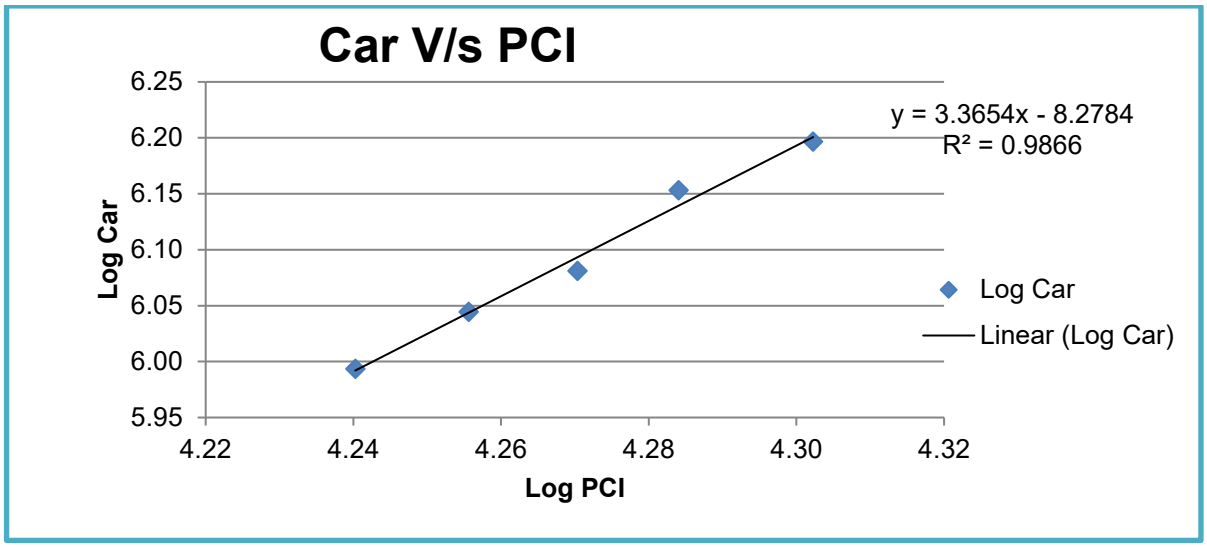

Figure 5-9 : Regression Analysis Car Vs. PCI Uttar Pradesh

Table 5-13 : Population Vs. Bus- Uttar Pradesh

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth
2011	199812341	31922	8.30	4.50		
2012	203382046	34428	8.31	4.54	2%	
2013	206942855	40501	8.32	4.61	2%	
2014	210493544	45607	8.32	4.66	2%	
2015	214032922	51866	8.33	4.71	2%	2%

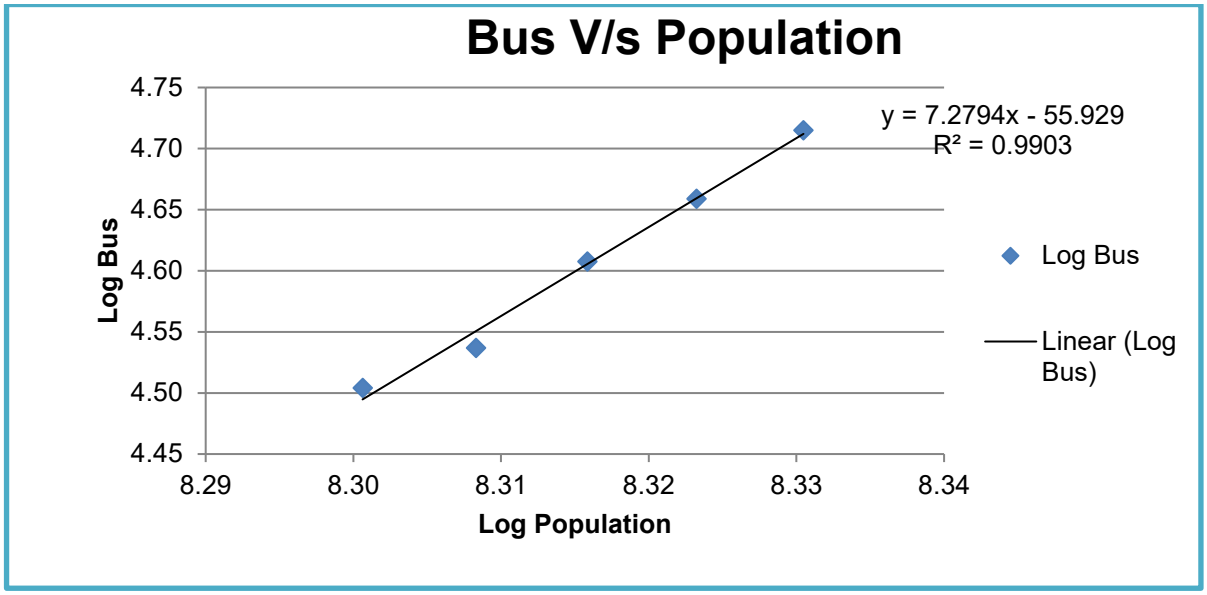

Figure 5-10 : Regression Analysis Population Vs. Bus Uttar Pradesh

Table 5-14 : NSDP Vs. Truck- Uttar Pradesh

Year	NSDP	Trucks	Log NSDP	Log Truck	NSDP Growth	Average Growth (5 Year)
2011	34662085	307058	7.54	5.49		
2012	36537453	338977	7.56	5.53	5%	
2013	38445814	400061	7.58	5.60	5%	
2014	40350882	467786	7.61	5.67	5%	
2015	42775892	511631	7.63	5.71	6%	5%

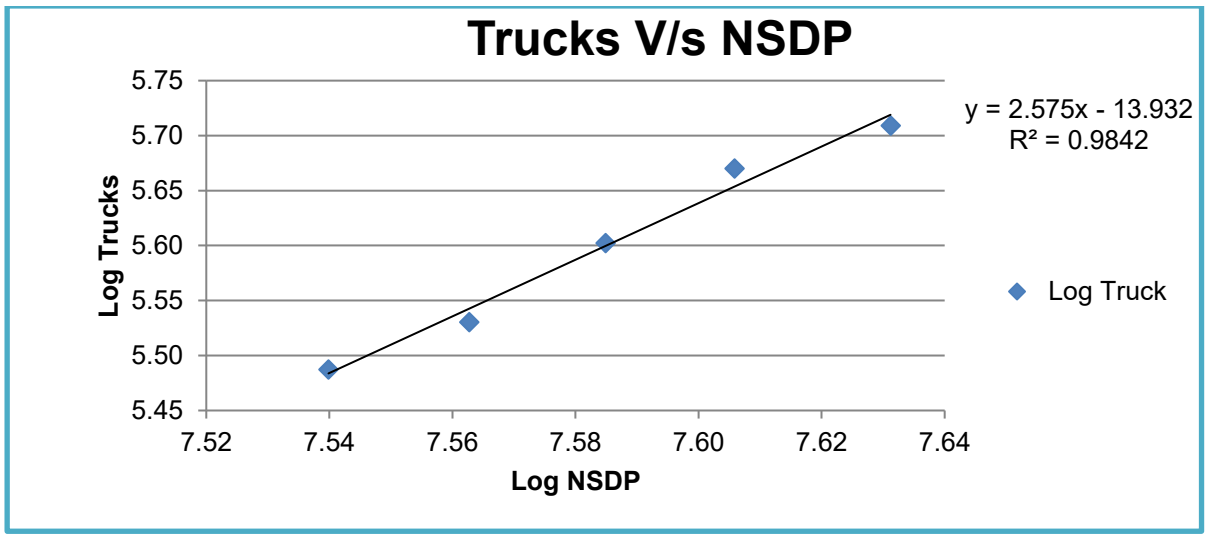

Figure 5-11 : Regression Analysis NSDP Vs. Truck Uttar Pradesh

Summary of regression analysis for elasticity and growth estimation for Uttar Pradesh are given in following table.

Table 5-15 : Summary Regression Analysis- Uttar Pradesh

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average IV Growth (5yrs)	Growth Elastic Model	Remarks
Uttar Pradesh	Car/Jeep	PCI	y = 3.3654x - - 8.2784	R^2 = 0.9866	3.3654	3.64%	12.23%	Good Regression
	Bus	Population	y = 7.2794x - - 55.9289	R^2 = 0.9903	7.2794	1.73%	12.62%	Good Regression
	Truck	NSDP	y = 2.575x - -13.9315	R^2 = 0.9842	2.5750	5.40%	13.90%	Good Regression

Table 5-16 : Per Capita Income Vs. Car- Delhi

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2011	103619	2258434	5.02	6.35		
2012	106677	2303052	5.03	6.36	3%	
2013	112441	2497167	5.05	6.40	5%	
2014	118411	2691282	5.07	6.43	5%	
2015	124698	2859620	5.10	6.46	5%	5%

Regression analysis of above is given in following figure.

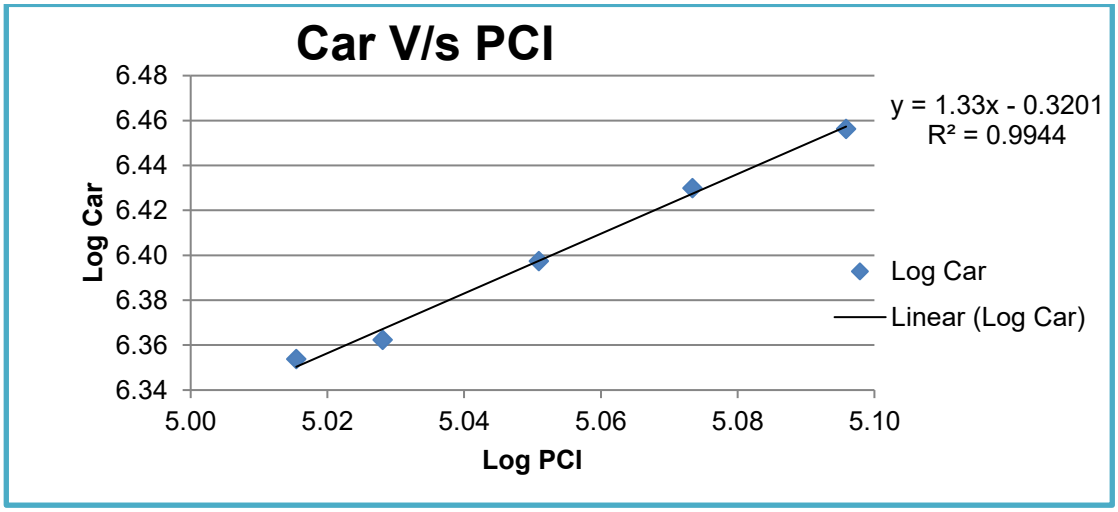

Figure 5-12 : Regression Analysis Car Vs. PCI Delhi

Table 5-17 : Population Vs. Bus- Delhi

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth
2011	16622000	135125	7.22	5.13		
2012	16941000	137310	7.23	5.14	2%	
2013	17266000	139495	7.24	5.14	2%	
2014	17597000	141680	7.25	5.15	2%	
2015	17934000	143865	7.25	5.16	2%	1.92%

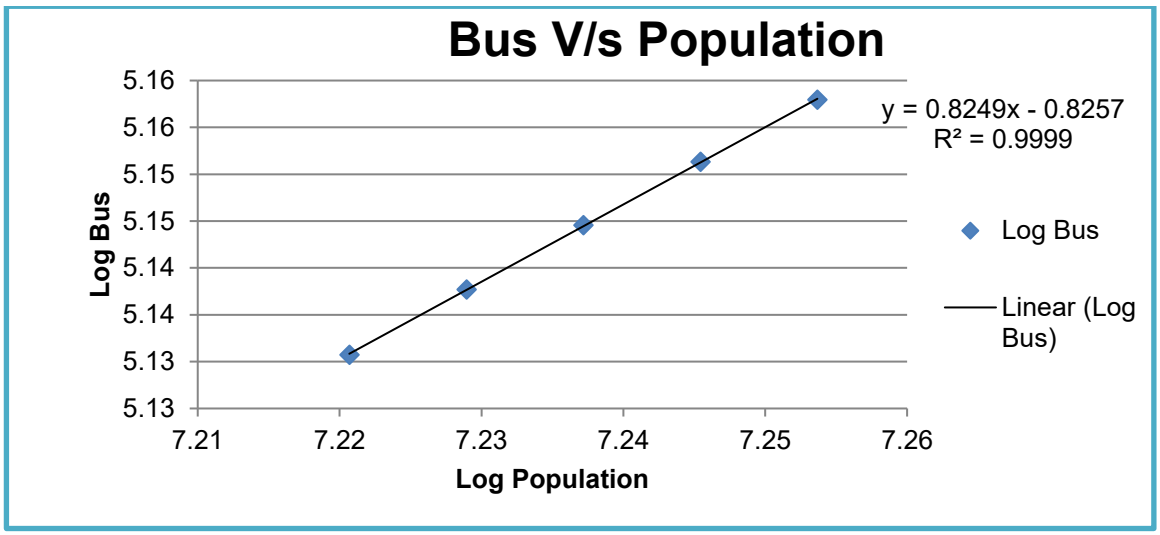

Figure 5-13 : Regression Analysis Population Vs. Bus Delhi

Table 5-18 : NSDP Vs. Truck- Delhi

Year	NSDP	Trucks	Log NSDP	Log Truck	NSDP Growth	Average Growth (5 Year)
2011	17223524	86301	7.24	4.94		
2012	18072223	87166	7.26	4.94	5%	
2013	19414032	88031	7.29	4.94	7%	
2014	20836819	88896	7.32	4.95	7%	
2015	22562961	89761	7.35	4.95	8%	7%

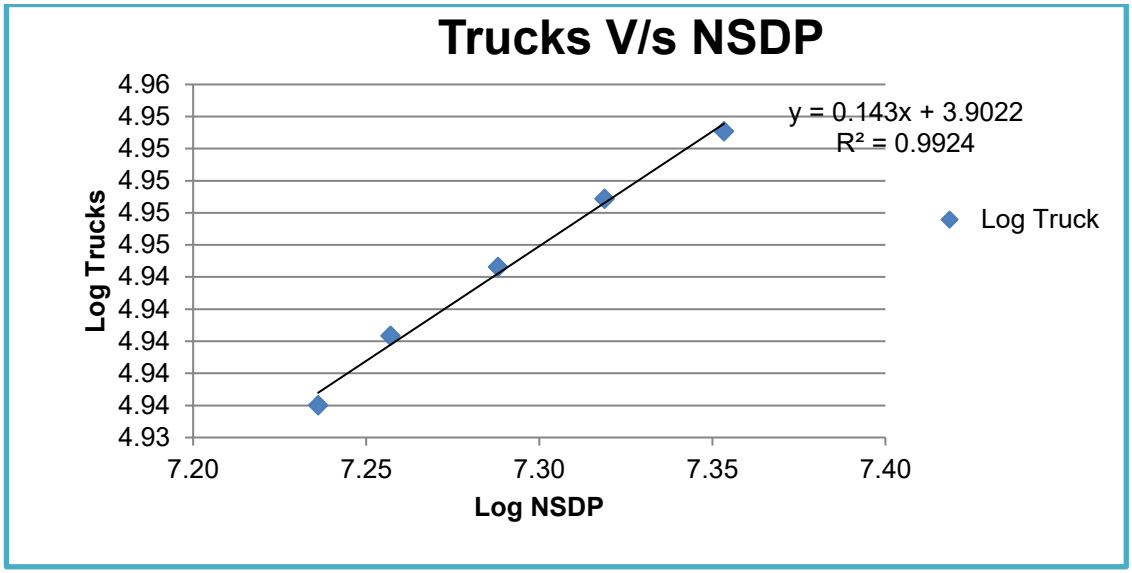

Figure 5-14 : Regression Analysis NSDP Vs. Truck Delhi

Summary of regression analysis for elasticity and growth estimation for Delhi are given in following table.

Table 5-19 : Summary Regression Analysis- Delhi

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average IV Growth (5yrs)	Growth Elastic Model	Remarks
Delhi	Car/Jeep	PCI	y = 1.33x - -0.3201	R^2 = 0.9944	1.3300	4.74%	6.31%	Good Regression
	Bus	Population	y = 0.8249x - -0.8257	R^2 = 0.9999	0.8249	1.92%	1.58%	Good Regression
	Truck	NSDP	y = 0.143x - 3.9022	R^2 = 0.9924	0.1430	6.99%	1.00%	Good Regression

Since most of the passenger traffic is from West Bengal and Jharkhand only, growth from economic model is considered only from these states. For commercial traffic weighed impact of these states in ratio of their respective share is considered

5.4 Analysis of Historic Traffic Data

Historical traffic data forms useful information for any highway project. It provides useful information for establishing past trends of growth. Project stretch of Agra to Etawah has recently been commissioned and is under tolling operation since 2022 with concessionaire. Hence, we do not have sufficient data points to be able to establish a reliable past trend of traffic growth. Moreover, the part two years traffic is affected by COVID-19 impact. A minimum of about 5 -6 years' traffic data is required for establishing a reliable past trend.

5.5 Other Factors Influencing Growth

There are many factors which have an impact on traffic growth. As discussed previously these factors can be economic, social, educational, and industrial.

Potentiality of such factors for project highway is discussed as under.

ECONOMY

After witnessing a slowdown during 2011-12, the economy recovered in 2013-14, and a high growth rate of GDP was recorded up to 2018-19. Pandemic of COVID-19 impacted all economies of world including India up to year 2021-22. Following figure show trend of GDP growth in India.

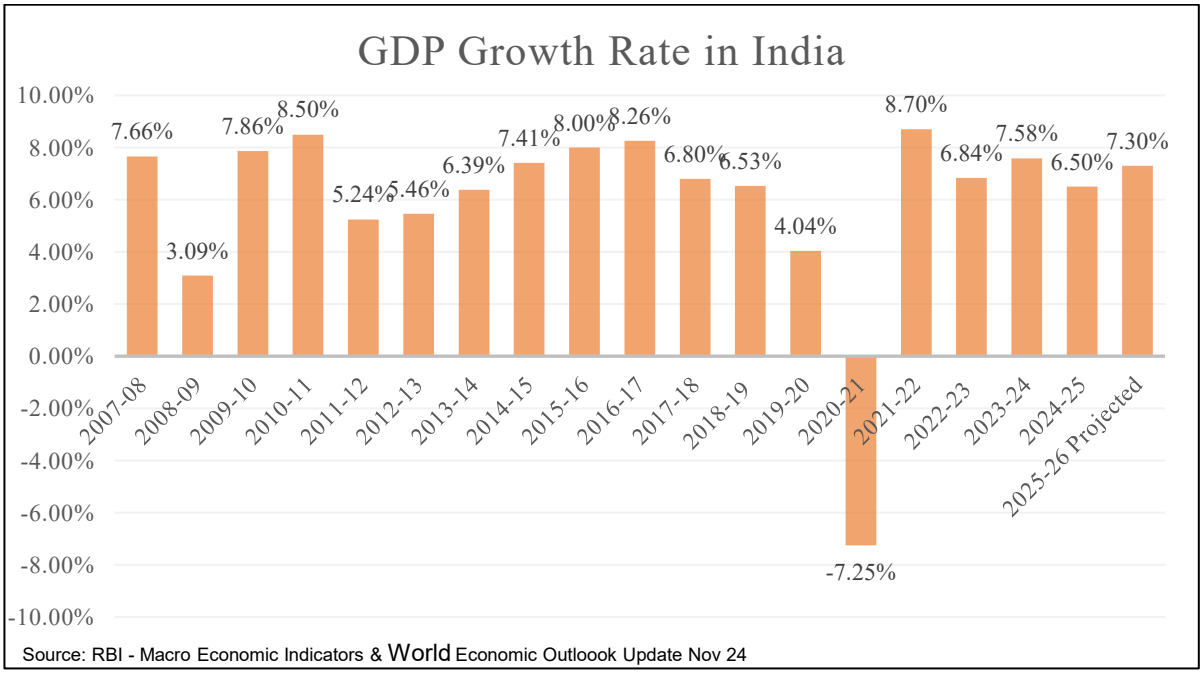

Figure 5-15 : Growth of GDP in India

FY 2017-18 recorded a growth of 6.7% which had a slight impact of GST and demonetization. Indian economy appears on recovery path with estimated growth of 6.8% in FY 2018-19. The government took major policy decisions including tax infrastructure reforming, banking sector improvement and ease of doing business.

In post COVID-19 scenario, in year 2022-23 and 2023-24 India registered an impressive growth of 7% to 7.5%. In last year despite global slow down due to Russia-Ukraine war and Gaza crises, India grew at good rate of 7%(Estimated).

Indian economy is now on good growth path and all major institutions including IMF / ADB have estimated growth of Indian Economy to peg around 6.5% to 7% in coming years.

5.6 Developments along and around the Project Corridor & State

Project stretch falls in one of the most mineral rich areas of India. Major Industries are developed for extraction of minerals and related manufacturing. The following are some major industrial establishments and areas in PIA.

Howrah - Often termed as Sheffield of the East, Howrah is known as an engineering hub, mainly in the area of light engineering industry. In 1823, Bishop Reginald Heber described Howrah as the place "chiefly inhabited by shipbuilders". There are small engineering firms all over Howrah, particularly around Belilios Road area near Howrah station. There are many foundries in Liluah area.

Burn Standard Company, a major company in the heavy engineering industry, has its oldest manufacturing unit located in Howrah. The Howrah plant of Shalimar Paints (established in 1902) was the first large-scale paint manufacturing plant to be set up not only in India but in entire Southeast Asia. The jute industry suffered during the Partition of Bengal (1947), when the larger jute production area became part of East Pakistan (now Bangladesh). The foundry industry saw a decline in demand due to growth in the steel industry. Still Howrah is a major industrial hub in area and Howrah being major terminal on Delhi – Kolkata rail attracts lot of goods movement.

Bardhman - Burdwan was one of the premier districts in India in terms of minerals. The Raniganj coalfield was the birthplace of the Indian coal industry. Besides coal, important minerals found in the district are iron ores, calcium carbonate, abrasives, silica bricks and molding sands, glass sands, building materials, manganese, bauxite, laterite etc. Chittaranjan Locomotives, Bengal Iron Works, IISCO- India Iron and Steel Co are some of major industrial establishments in district.

Dhanbad - Dhanbad has one of the oldest markets of the region and is also a hotbed of large-scale industries. It is famous for its coal mines and industrial establishments; the city is surrounded by about 112 coal mines with a total production of 27.5 million tonnes and an annual income of 7000 million rupees through the coal business. There are a number of coals washeries present there. BCCL, have it headquartered in Dhanbad and SAIL, Tata Steel and Eastern Coalfields (at Mugma) also operates their mines. Om Besco Rail Products.Ltd, a public limited rail wagon manufacturing company at Mugma, Hindustan Zinc Ltd (now Vendanta Resources) had a lead smelting pilot plant at Tundu, MaithonPower.Ltda J.V of Tata Power & DVC (first PPP project of India), HindusthanMalleables& Forgings Ltd, etc. are also operational in and around Dhanbad. Fertilizers Corporation of India (closed), Projects & Development IndiaLtd and ACC.Ltd at Sindri are also available and being one of the 5 divisions of Southeastern Railway zone, Indian Railways is also a big employer in Dhanbad. Also, Kandra Industrial Area at Gobindpur houses some small & middle scale industries

Durgapur- Durgapur is one of the biggest industrial hubs of India and was planned as an integrated industrial town. It lays on the banks of DamodarRiver and coalfields of Raniganj. Durgapur was a dream of former prime minister of India, Jawaharlal Nehru and chief minister of West Bengal, Bidhan Chandra Roy. The first project in Durgapur was Damodar Valley Corporation's Durgapur Barrage which attracted many public sector units. Durgapur Steel Plant was the first PSU established in the region in 1955 with the help of U.K which was later undertook by SAIL.

Durgapur Steel plant

Durgapur Steel Plant set up in late fifties is a leading producer of long products &only producer of Forged Railway Wheels & Axles in the country. Plant started production with an initial crude steel capacity of 1 MPTA (million ton per annum) in 1959, which has been progressively increased to 1.8 MTPA during the modernization in nineties and further to 2.2 MTPA during recently completed Modernization & Expansion Plan (MEP). The present Plant capacity is about 2.12 MTPA saleable steel.

Durgapur is also an emerging I.T and real estate hub has many proposed residential areas like DLF's Durgapur Township.

Kolkata - is the capital of the Indian state of West Bengal. According to the 2011 Indian census, it is the seventh most populous city in India; the city had a population of 4.5 million, while the suburb population brought the total to 14.1 million, making it the third-most populous metropolitan area in India. Kolkata Megalopolis is the area surrounding Kolkata Metropolitan city with additional population. Located on the east bank of the Hooghly River approximately 80 kilometres west of the border with Bangladesh, it is the principal commercial, cultural, and educational centre of East India, while the Port of Kolkata is India's oldest operating port and its sole major riverine port. The city nicknamed the "City of Joy" is widely regarded as the "cultural capital" of India and as of 2019, six Nobel Laureates have been associated with the city. Recent estimates of Kolkata Metropolitan Area's economy have ranged from $60 to $150 billion (GDP adjusted for purchasing power parity) making it the third most-productive metropolitan area in India, after Mumbai and Delhi. One end of project stretch at Dankuni is major gate to city from northern part of India.

Logistics and Warehousing–It is observed that as project stretch is the main connectivity between Kolkata and rest of India (especially north), there are large number of logistic and warehousing establishments on project stretch between Dankuni and Bardhman. Most computer companies have warehouses in Dankuni. As per a recent report an investment of Rs.4300 cr is expected in West Bengal by 2020 (May be delayed now due to COVID-19.)

5.7 Recommended Growth Rates of Traffic

Based on the above analysis and after giving due consideration to the entire listed factors, the following overall growth rates are recommended for each category of vehicle as below. The rate of growth is moderated in light of overall regional trends. Growth of multi-Axle is kept slightly higher as trend of technological advances in logistic industry favors multi-axle over 2/3 axle carriage. It is also expected that as the economy moves from developing to developed, the rate of growth diminishes. The same growth rate is not sustainable for long. Traffic growth is suitably stepped down for future years.

Growth rates are recommended for three scenarios for sensitivity analysis namely **Optimistic, Pessimistic** and **Most Likely** with a positive and negative variation 0.5% from Most Likely case for corridor in both states.

5.7.1 Recommended Growth Rates of Traffic for Project Stretch

Table 5-20 : Recommended Growth Rates Optimistic

Category / Year	FY 2027-2030	FY 2031-2035	FY 2036-2040	FY 2041-2046
Car/Jeep/Van	8.58%	5.99%	6.35%	5.18%
Bus	5.26%	4.81%	4.53%	4.21%
LCV	2.11%	1.71%	1.32%	0.93%
2- Axle	3.34%	2.68%	2.03%	1.38%
3 - Axle	4.89%	3.89%	2.91%	1.95%
4 to 6 Axle	5.82%	4.62%	3.45%	2.29%
7 and Above Axle	5.82%	4.62%	3.45%	2.29%

Table 5-21 : Recommended Growth Rates Pessimistic

Category / Year	FY 2027-2030	FY 2031-2035	FY 2036-2040	FY 2041-2046
Car/Jeep/Van	8.08%	5.49%	5.85%	4.68%
Bus	4.76%	4.31%	4.03%	3.71%
LCV	1.61%	1.21%	0.82%	0.43%
2- Axle	2.84%	2.18%	1.53%	0.88%
3 - Axle	4.39%	3.39%	2.41%	1.45%
4 to 6 Axle	5.32%	4.12%	2.95%	1.79%
7 and Above Axle	5.32%	4.12%	2.95%	1.79%

Table 5-22 : Recommended Growth Rates Most Likely

Category / Year	FY 2027-2030	FY 2031-2035	FY 2036-2040	FY 2041-2046
Car/Jeep/Van	8.33%	5.74%	6.10%	4.93%
Bus	5.01%	4.56%	4.28%	3.96%
LCV	1.86%	1.46%	1.07%	0.68%
2- Axle	3.09%	2.43%	1.78%	1.13%
3 - Axle	4.64%	3.64%	2.66%	1.70%
4 to 6 Axle	5.57%	4.37%	3.20%	2.04%
7 and Above Axle	5.57%	4.37%	3.20%	2.04%

Traffic and revenue have been worked out on the basis of above growths and same is presented in subsequent chapter of report.

CHAPTER 6

TRAFFIC FORECAST

6.1 Traffic Projections

Growth rates recommended in the previous section of the report are used to arrive at traffic projections for future years. Toll plaza wise futuristic traffic projection is given in tables below.

These projections have been done for the following three cases of growth up to concession period.

1. Optimistic Scenario
2. Pessimistic Scenario
3. Most Likely Scenario

Table 6-1 : Total Tollable Traffic @ Toll Plaza Dankuni- Chainage 646.005 KM (Optimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	15694	1139	932	2407	1595	10932	11	**32710**	**79271**
2027-28	17039	1163	981	2487	1673	11568	12	**34923**	**84115**
2028-29	18500	1187	1033	2570	1755	12241	13	**37299**	**89271**
2029-30	20086	1212	1087	2655	1841	12953	14	**39848**	**94760**
2030-31	21288	1232	1140	2727	1913	13552	15	**41867**	**99291**
2031-32	22563	1253	1194	2800	1987	14179	16	**43992**	**104046**
2032-33	23915	1275	1251	2875	2064	14834	17	**46231**	**109035**
2033-34	25347	1297	1311	2952	2144	15519	18	**48588**	**114269**
2034-35	26865	1319	1374	3031	2228	16236	19	**51072**	**119763**
2035-36	28570	1337	1436	3093	2293	16795	20	**53544**	**124671**
2036-37	30384	1355	1501	3156	2360	17373	21	**56150**	**129801**
2037-38	32313	1373	1568	3220	2429	17972	22	**58897**	**135164**
2038-39	34365	1391	1639	3285	2500	18591	23	**61794**	**140770**

Table 6-2 : Total Tollable Traffic @ Toll Plaza Dankuni- Chainage 646.005 KM (Pessimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	15622	1134	928	2395	1588	10879	11	**32557**	**78897**
2027-28	16883	1152	972	2463	1657	11457	11	**34595**	**83324**
2028-29	18246	1170	1018	2533	1730	12067	11	**36775**	**88015**
2029-30	19720	1188	1067	2605	1806	12709	11	**39106**	**92987**
2030-31	20802	1202	1113	2662	1867	13233	11	**40890**	**96969**
2031-32	21944	1216	1161	2720	1931	13778	11	**42761**	**101128**
2032-33	23149	1230	1211	2780	1996	14346	11	**44723**	**105471**
2033-34	24419	1244	1263	2840	2064	14938	11	**46779**	**110008**

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2034-35	25760	1259	1317	2902	2134	15553	11	**48936**	**114746**
2035-36	27267	1269	1370	2947	2186	16011	11	**51061**	**118876**
2036-37	28862	1279	1426	2992	2239	16483	11	**53292**	**123174**
2037-38	30550	1289	1483	3037	2293	16968	11	**55631**	**127648**
2038-39	32337	1299	1543	3084	2349	17468	11	**58091**	**132306**

Traffic projections for Most Likely scenario is given as under

Table 6-3 : Total Tollable Traffic @ Toll Plaza Dankuni- Chainage 646.005 KM (Most Likely Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	15659	1137	929	2401	1591	10906	11	**32634**	**79084**
2027-28	16963	1159	976	2475	1665	11514	12	**34764**	**83719**
2028-29	18375	1181	1025	2552	1742	12155	13	**37043**	**88642**
2029-30	19905	1203	1076	2631	1823	12832	14	**39484**	**93870**
2030-31	21047	1221	1125	2695	1889	13393	15	**41385**	**98125**
2031-32	22255	1239	1176	2760	1958	13979	16	**43383**	**102578**
2032-33	23532	1257	1230	2827	2030	14591	17	**45484**	**107240**
2033-34	24883	1275	1286	2896	2104	15229	18	**47691**	**112121**
2034-35	26311	1293	1345	2966	2181	15895	19	**50010**	**117231**
2035-36	27916	1307	1402	3019	2239	16403	20	**52306**	**121742**
2036-37	29618	1321	1462	3073	2299	16927	21	**54721**	**126448**
2037-38	31426	1335	1525	3128	2360	17468	22	**57264**	**131356**
2038-39	33343	1349	1591	3183	2423	18027	23	**59939**	**136477**

6.2 Modification in Concession Period

As per Article 29 of the concession agreement, if actual traffic on the project falls short or exceeds Target Traffic on project highway on defined date, concession period shall be modified subject to calculation stipulated therein. For Palsit - Dankuni project three target traffic have been defined in Article 29.

Target Date - 1st May 2026 Target Traffic 65830

Target Date - 1st May 2031 Target Traffic 100822

Target Date - 1st May 2036 Target Traffic 130452

It was observed that as per traffic projections, the average traffic volume exceeds target traffic in the first two target points. Probable shortening of concession period is estimated according to Article 29 of concession agreement for all cases which comes to about 3 years.

Pessimistic

Sr. No	Target Date	Target Traffic	Actual Traffic	Variation in CP as per CA %	Change in CP (Days	Total Variation in CP Years
1	01-May-26	65830	71153	-3.09%	-146	**- 1.0**
2	01-May-31	86611	97316	-7.36%	-213	
3	01-May-36	118719	119234	0.00%	0	

Optimistic

Sr. No	Target Date	Target Traffic	Actual Traffic	Variation in CP as per CA %	Change in CP (Days	Total Variation in CP Years
1	01-May-26	65830	71184	-3.13%	-148	**-1.2**
2	01-May-31	86650	99688	-10.05%	-291	
3	01-May-36	121745	125098	0.00%	0	

Most Likely

Sr. No	Target Date	Target Traffic	Actual Traffic	Variation in CP as per CA %	Change in CP (Days	Total Variation in CP Years
1	01-May-26	65830	71168	-3.11%	-147	**-1.1**
2	01-May-31	86630	98496	-8.70%	-252	
3	01-May-36	120225	122135	0.00%	0	

Thus, there is -ve 1.0 years variation in concession period in pessimistic scenarios.

CHAPTER 7

FORECAST OF TOLL REVENUE

7.1 General

This chapter presents the tolling rate calculations, categories, and toll revenue of the project.

7.2 Discount Categories

The fee schedule in the CA of Surat-Dahisar section of NH-8 is based on the old toll policy. As per the Toll Notification (Schedule -G) the discounts and special provisions have been considered. In addition to discounts as per Fee Notification concessionaire has declared special category rates also. Salient features of toll rate structure are given as under

1. Monthly Pass: For frequent user's monthly pass would be issued at fee 50 time the single journey fee at 2/3rd Rate.
2. Multiple Journeys (for Return Trip): Will be charged at 1.5 times single journey.
3. Single Journey: Full single journey toll would be charged to this category of vehicles who are infrequent travelers or whose frequency does not yield any discount from the above categories.
4. Local Discounts: Local Car Jeep Van -Rs.350 per month (for locals residing within a radius of 20 kms from toll plaza). Additionally, local commercial vehicles are charged at 50% rate of single journey.

Building of inflation and escalation of rate on the basis of WPI are done as per toll notification (Schedule G) as given under as extract from concession agreement.

The formula for determining the applicable rate of fee shall be as follows:-

$$\text{Applicable rate of fee} = \text{base rate} + \text{base rate} \times \left\{ \frac{\text{WPI A-WPI B}}{\text{WPI B}} \right\} \times 0.4$$

Factors of inflation / growth have been incorporated as per Schedule R. WPI are available up to the year 2025-26.

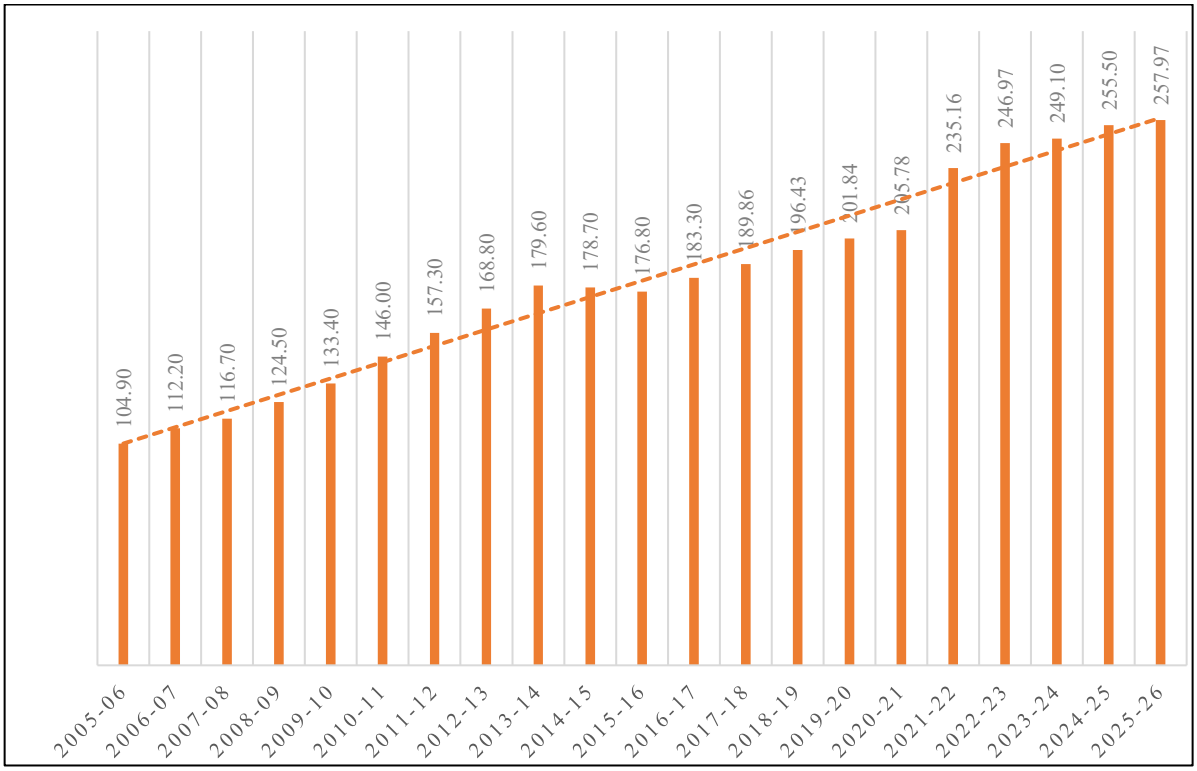

Figure 7-1 : Historical Rate of WPI Inflation in India

The wholesale price index (WPI) and the inflation rate in the past are presented in Table below.

Table 7-1 : Historical WPI value and Growth Inflation

December of year	2021	2022	2023	2024	2025	Avg.
WPI	235.2	247.0	249.1	255.5	257.97	
Inflation	14.27%	5.02%	0.86%	2.57%	0.96%	4.74%

WPI of December 2025 is posted on ministry site which is shows 0.96% inflation from the previous year. Same has been applied for FY 2026-27.
The average WPI inflation over the period FY 2021 to FY 2025 works out to approximately 4.74%, reflecting inflationary cycles across both high and low inflation years. Based on this analysis, an annual escalation factor of 4.5% has been adopted for the remaining concession period.

7.3 Estimation of Toll Rates

As per the applicable MORTH notification and Schedule R of contract agreement, the following Base rate of fee for the categories mentioned in the table stands true in the National Highways Fee Rules applicable for contract.

Table 7-2 : Base Toll Rates June 2007-08

Type of Vehicle	Base Rate of Fee / Km (in Rs.)
Car, Jeep, Van or Light Motor Vehicle	0.65
Light Commercial Vehicle, Light Goods Vehicle or Minibus	1.05
Bus or Truck (Two Axles)	2.20
Three Axle Commercial Vehicles	2.40
Heavy Construction Machinery (HCM) or Earth Moving Equipment (EME) or Multi Axle Vehicle (MAV) (4 to 6 axles)	3.45
Oversized Vehicles (7 or more Axles)	4.20

Toll rates are calculated as per guidelines provided in schedule R (rounded to nearest Rs.) for the concession period and are given below.

Thus, worked out rates for various categories of vehicle and discounts are given as under

Table 7-3 : Toll Rates for Single Journey Dankuni @ Km 646.005

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial Vehicle	Multi Axle	Oversized Vehicle
2026-27	110	175	365	365	395	570	695
2026-27	120	195	405	405	440	635	770
2027-28	125	200	425	425	460	665	810
2028-29	130	210	445	445	485	695	845
2029-30	135	220	465	465	505	725	885
2030-31	145	230	485	485	530	760	925
2031-32	150	245	510	510	555	800	970
2032-33	155	255	535	535	580	835	1015
2033-34	165	265	560	560	610	875	1065
2034-35	175	280	585	585	640	920	1115
2035-36	180	295	615	615	670	960	1170
2036-37	190	305	645	645	700	1010	1225
2037-38	200	320	675	675	735	1055	1285
2038-39	210	335	705	705	770	1110	1350

Table 7-3: Toll Rates for Return Journey Dankuni @ Km 646.005

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial Vehicle	Multi Axle	Oversized Vehicle
2026-27	160	260	545	545	595	855	1045
2026-27	180	290	605	605	660	950	1155
2027-28	185	305	635	635	690	995	1210
2028-29	195	315	665	665	725	1040	1270
2029-30	205	330	695	695	760	1090	1330

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial Vehicle	Multi Axle	Oversized Vehicle
2030-31	215	350	730	730	795	1145	1390
2031-32	225	365	765	765	835	1195	1455
2032-33	235	380	800	800	870	1255	1525
2033-34	245	400	840	840	915	1315	1600
2034-35	260	420	880	880	955	1375	1675
2035-36	270	440	920	920	1005	1440	1755
2036-37	285	460	965	965	1050	1510	1840
2037-38	300	480	1010	1010	1105	1585	1930
2038-39	315	505	1060	1060	1155	1660	2025

Table 7-4: Toll Rates for Monthly pass Local Dankuni @ Km 646.005

Year	Car	Minibus /LCV
2026-27	350	350
2026-27	360	360
2027-28	375	375
2028-29	395	395
2029-30	415	415
2030-31	430	430
2031-32	455	455
2032-33	475	475
2033-34	495	495
2034-35	520	520
2035-36	545	545
2036-37	570	570
2037-38	600	600
2038-39	630	630

Table 7-5: Toll Rates for Monthly Pass Dankuni @ Km 646.005

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial Vehicle	Multi Axle	Oversized Vehicle
2026-27	3590	5795	12145	12145	13250	19045	23185
2026-27	3980	6430	13470	13470	14690	21120	25710
2027-28	4165	6730	14100	14100	15380	22110	26920
2028-29	4360	7045	14765	14765	16105	23150	28185
2029-30	4570	7380	15460	15460	16865	24245	29515
2030-31	4785	7725	16190	16190	17660	25390	30910
2031-32	5010	8095	16960	16960	18500	26595	32375
2032-33	5250	8480	17765	17765	19380	27860	33915
2033-34	5500	8885	18615	18615	20305	29190	35535
2034-35	5760	9310	19505	19505	21275	30585	37235
2035-36	6040	9755	20440	20440	22300	32055	39020
2036-37	6330	10225	21425	21425	23370	33595	40900
2037-38	6635	10720	22460	22460	24500	35220	42875
2038-39	6955	11240	23545	23545	25685	36925	44955

7.4 Toll Revenue

As indicated earlier, toll revenue on the Project Road has been calculated in all three scenarios based on above rates and projected traffic. The estimates of toll revenue under ***Optimistic***, ***Pessimistic*** and ***Most Likely*** growth scenarios are presented in the following section.

7.5 Toll Revenue at all toll plazas under Scenarios

Toll Revenue estimates under all scenarios at each of the toll plaza starting from the year 2026-27 are shown in tables below.
The management expects balance stretch to be completed by June 30, 2026

Table 7-4 : Toll Revenue Optimistic Scenario

(Rs. Crores)

Year	TP-1	Total
2026-27	348.92	**348.92**
2027-28	397.30	**397.30**
2028-29	438.61	**438.61**
2029-30	485.45	**485.45**
2030-31	533.91	**533.91**
2031-32	586.97	**586.97**
2032-33	639.31	**639.31**
2033-34	701.98	**701.98**
2034-35	772.20	**772.20**
2035-36	839.03	**839.03**
2036-37	912.77	**912.77**
2037-38	993.85	**993.85**
2038-39	1084.09	**1084.09**

Table 7-5 : Toll Revenue Pessimistic Scenario

(Rs. Crores)

Year	TP-1	Total
2026-27	347.27	**347.27**
2027-28	393.49	**393.49**
2028-29	432.31	**432.31**
2029-30	476.17	**476.17**
2030-31	521.19	**521.19**
2031-32	570.21	**570.21**
2032-33	618.04	**618.04**
2033-34	675.42	**675.42**

Year	TP-1	Total
2034-35	739.42	**739.42**
2035-36	799.49	**799.49**
2036-37	865.57	**865.57**
2037-38	937.83	**937.83**
2038-39	1018.06	**1018.06**

Table 7-6 : Toll Revenue Most Likely Scenario

(Rs. Crores)

Year	TP-1	Total
2026-27	348.05	**348.05**
2027-28	395.35	**395.35**
2028-29	435.42	**435.42**
2029-30	480.77	**480.77**
2030-31	527.46	**527.46**
2031-32	578.48	**578.48**
2032-33	628.55	**628.55**
2033-34	688.61	**688.61**
2034-35	755.78	**755.78**
2035-36	819.24	**819.24**
2036-37	889.07	**889.07**
2037-38	965.70	**965.70**
2038-39	1050.94	**1050.94**

CHAPTER 8

CONCLUSION & RECOMMENDATIONS

8.1 Conclusion & Recommendations

Project stretch of Palsit to Dankuni section of NH-19 from km 588.870 to km 652.700 in state of West Bengal is currently four lane road and being upgraded to six lanes. The road is in sound condition and serves healthy traffic volumes. Project corridor is a part of the most busy and prominent national highway NH-19 which connects political and cultural capitals of India. This is one of the most important trunk roads which spreads across many states. There are large number of townships, industrial corridors and other business establishments coming up along the project corridor. As discussed, the dominant portion of traffic is long route traffic, which is more sensitive towards the growth of national economy. As Indian economy is poised to grow at 7%+ post COVID-19, the project corridor is expected to pick up the same trend in terms of traffic flow. All these developments have potential to give a positive impact to traffic flow on the project. The following can be considered as major outcomes of the study.

a) There is a good amount of tollable traffic running on the project.

b) Project corridor has potential to witness traffic growth @ 6-8% annually in near future due to various development in area and overall development of economy.

c) The Project corridor has committed traffic as long route traffic and does not run a risk of traffic leakage due to quality competing road.

Based on the above it can be considered a stable healthy project from the traffic and revenue point of view.

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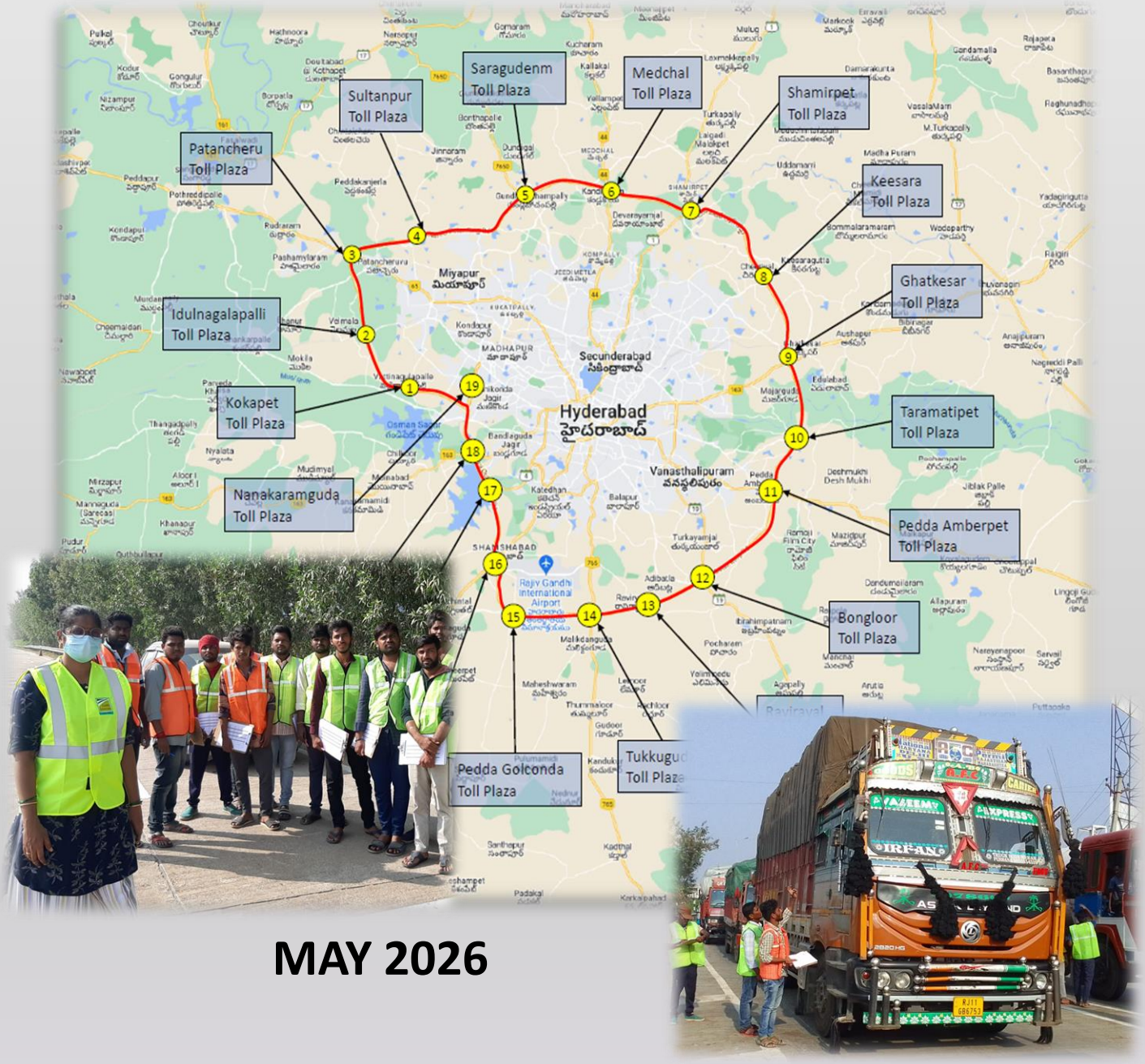
Nehru Outer Ring Road in Hyderabad from Km 0.000 to Km 158.000 in State of Telangana on TOT mode



MAY 2026

TRAFFIC STUDY & REVENUE PROJECTION REPORT (FINAL)

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TRAFFIC STUDY & REVENUE PROJECTION REPORT (FINAL)

MAY 2026

GMD CONSULTANTS ★ NAVI MUMBAI ★

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CHAPTER 1
INTRODUCTION

1.1 Background

The Outer Ring Road, officially as, Jawaharlal Nehru Outer Ring Road and abbreviated as, O.R.R., is a 158 kilometer, 8-lanes ring road expressway encircling Hyderabad, capital of the Indian state of Telangana. The expressway is designed for speeds up to 100 km/h. A large part, 124 km (covering urban nodes viz., Hi- Tech city, Nanakramguda Financial District, Rajiv Gandhi International Airport, IKP Knowledge park, Hardware Park, Telangana State Police Academy, Singapore Financial District, and Games village) of the 158-km was opened by December 2012. Rest of the length of Outer Ring Road was opened to traffic in year 2015-16. Hence onward, for ease of reference, Nehru Outer Ring Road will be referred as NORR or ORR.

ORR is one of the most important infrastructural developments which has complimented growth of Hyderabad as major metro of India. On Eastern side it has provided express connectivity to major commercial and upscale residential centres of Gachibowli, Banjara Hills, Jublee Hills, Hitec- City, Manikonda, Nanakramguda. As a result, large number of residential and commercial projects have come up on this north-east part of ORR. Tellapur, Mokila, Kollur, Narsingi can be named as few of these. On north and western side ORR connects to Shamirpet and Genome Valley.

ORR also provides fast connectivity to various radial state and national highways connecting to Mumbai, Nagpur, Karimnagar, Warangal, Suryapet, Vijayawada, Bengaluru. Regional traffic now does not need to go into congested network of Hyderabad.

The Outer Ring Road also helps in reducing the travel time from Rajiv Gandhi International Airport to cities like Nizamabad & Adilabad as it connects to NH44. The expressway is fenced, and 33 radial roads connect it with the Inner Ring Road.

ORR is fully accessing controlled road, and traffic can enter or exit from designated locations only. There is total 22 locations from where ORR can be entered or exited. Toll plaza and or booths have been placed at all such entry / exit points.

ORR has been developed by Hyderabad Metropolitan Development Authority (HMDA). It's maintained by HMDA and special purpose vehicle Hyderabad Growth Corridor Limited (HGCL). The bid for Operation, Maintenance of ORR for a longer concession period of 30 years on TOT model is invited by HMDA and HGCL.

Following figure show alignment of Hyderabad Outer Ring Road in regional context.

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Figure 1-1: Location & Alignment of ORR in Regional Context

M/s IRB Infrastructure Developers Limited (IRB) intends to participate in bidding for Nehru Outer Ring Road (NORR) on TOT basis.

GMD Consultants have been assigned by M/s IRB for the wok of conducting traffic study and developing revenue model based on traffic projections and forecast.

For making the proper assessment of traffic volume on project stretch, base year traffic and its projection.

CHAPTER 2

PROJECT DETAILS

2.1 Brief Description of the Project Influence Area (PIA)

Nehru Outer Ring Road is a 158 km access-controlled transportation ring around city of Hyderabad and Secundrabad Average radial distance of ORR from city centre is about 20-25 km. Hyderabad is fourth most populous city of India. It is capital of one of the fastest growing states of India, Telangana. Hyderabad if merging and the major global hum in field of IT, IT&ES, Pharmaceutical & Biotechnical Research. As discussed previously it provides fast connectivity to Airport (near Shamsabad) from various parts of city. Following figure show positioning of ORR in city context.

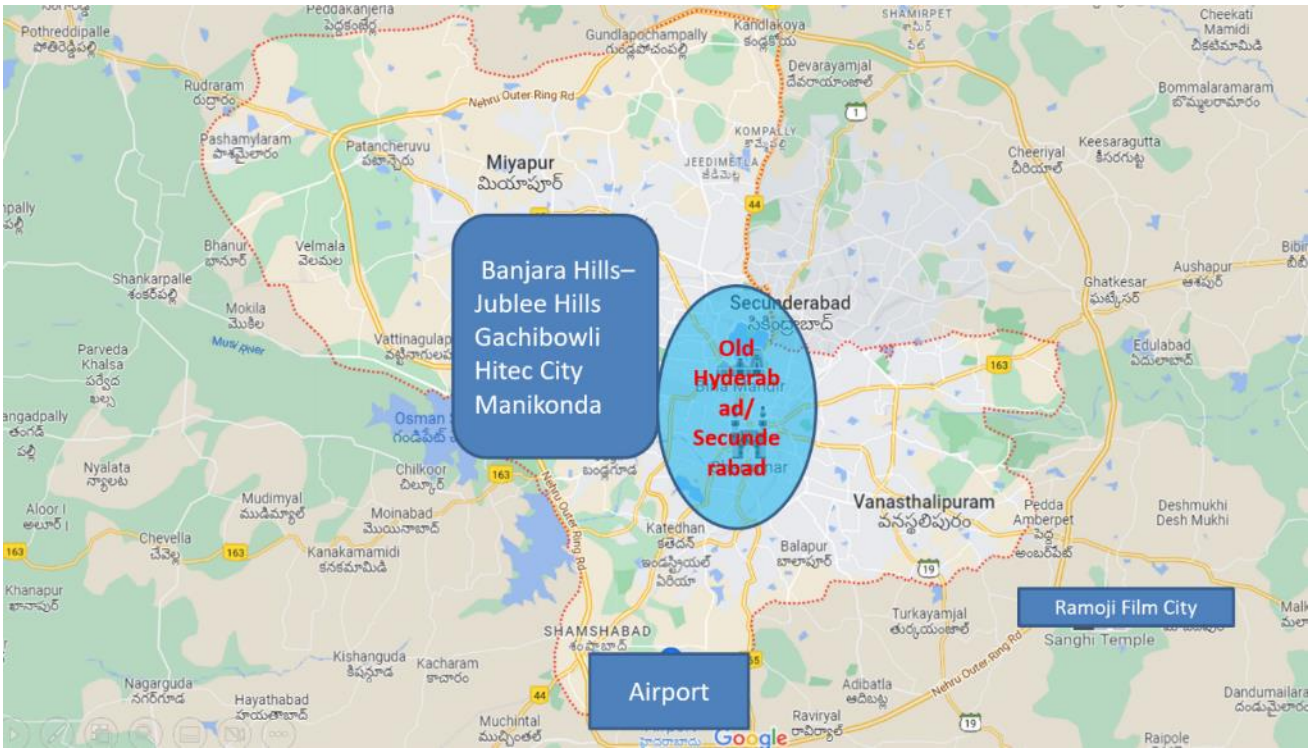


Figure 2-1: Positioning of ORR in city context.

NORR makes a complete circle around city of Hyderabad and Secunderabad. It provides fast connectivity to all part of Hyderabad Metropolitan Area (HMA). Hyderabad Metropolitan Area includes part of following districts.

- **Hyderabad** - Hyderabad district is a most populous district in the state of Telangana in India that contains a part of the metropolitan area of Hyderabad.
- **Rangareddy –** This is basically rural Hyderabad area. It has head quarter in Lakdi ka Pul which is basically part of Hyderabad City only. Ranga Reddy has maximum per capita income in entire state.

- **Nalgonda** – Nalgonda is another district which is part of HMA. This touches southeastern boundary of Hyderabad
- **Mahboob Nagar -** Mahabubnagar district is a district in **Telangana**. Mahabubnagar is the district headquarters which is popularly known as Palamoor. The district shares boundaries with Narayanapet, Vikarabad, Rangareddy, Nagarkurnool, Wanaparthy and Jogulamba Gadwal districts. It is famous for its milk production. It is on southwestern boundary of Hyderabad.
- **Medak –** It was one of the most backward districts of Andhra Pradesh. Now part of this district is in HMA. Geographically it on northwest side of Hyderabad. This is the most developing part of HMA now.

Hence all of HMA fall in immediate influence zone of ORR. In addition to Hyderabad city centre large number of suburban areas which are either developed on are upcoming, are part of PIA. Following figure shows major urban and commercial hubs in relation to ORR.

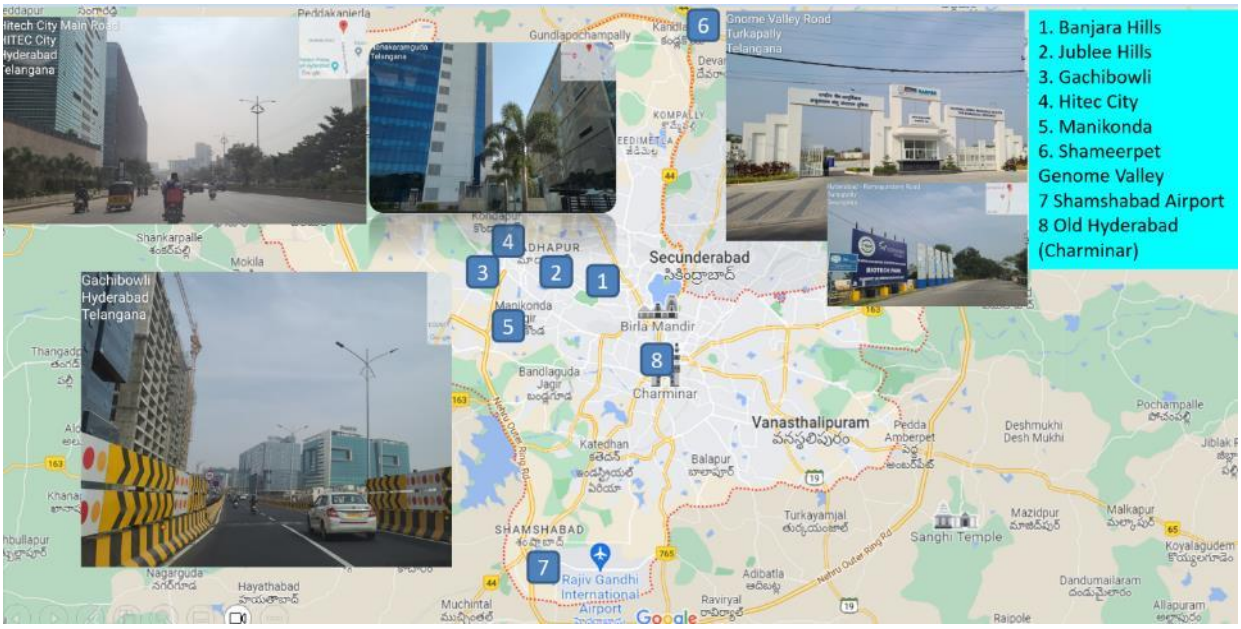


Figure 2-2: Major urban & commercial hubs.

Additionally large number of new commercial and urban centres are in various phase of development around ORR. In fact, ORR has been one of the reasons for developing of these centres. Most of these centres are coming up in northwest corner of Hyderabad in which major commercial and residential centres like Gachibowli. Manikonda, Banjara Hills, Jublee Hills etc have already developed along with Financial District and Hitec City. Following figure shows these locations in context of ORR.

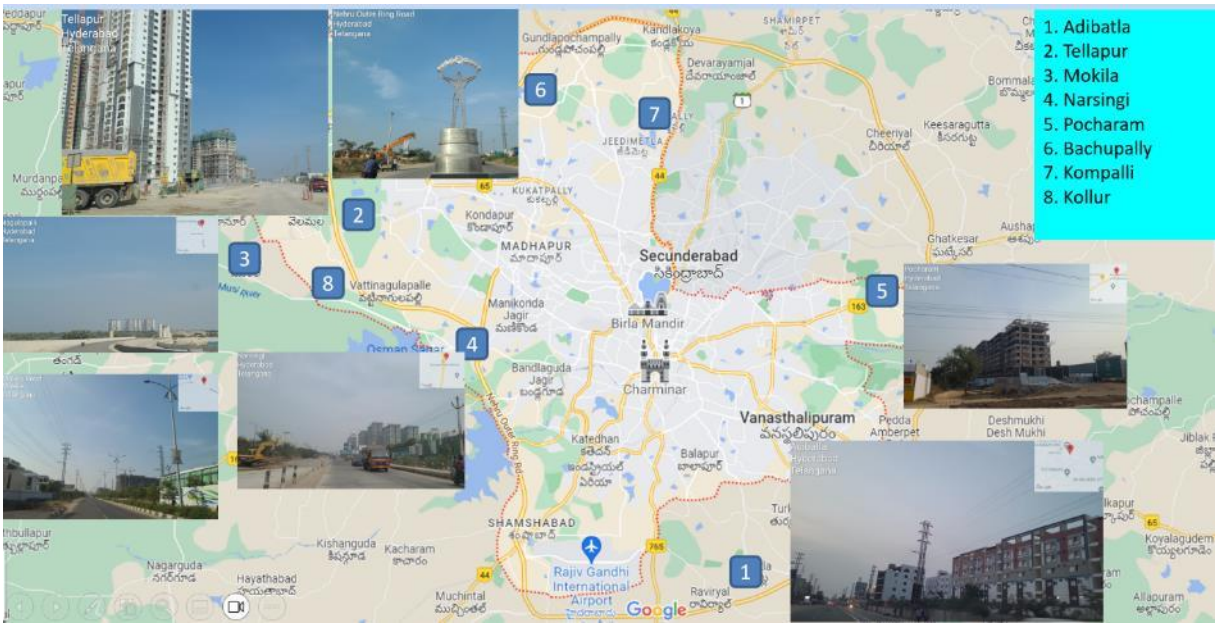


Figure 2-3: Upcoming Development Locations in context of ORR.

Prominent of above are discussed as under.

Tellapur

Being in close proximity to Gachibowli, Kondapur, and Madhapur, Tellapur is an ideal settlement place for IT Professionals. Since it is around 15 km from Hitech city and 9-10 km from Gachibowli, the new investment options in the area are relatively better and easier to settle as well. Tellapur comes in the Medak district.

Narsingi

The western outskirts are home to Narsingi. This area is attracting many potential investors due to the presence of multiple residential options like villas, gated communities, community apartments, and so on. It is the best option for people who are family oriented and would want to settle down there. Housing investment options are available in Narsingi. If you're a modern home buyer, Narsingi is an ideal option.

Adibatla

Adibatla is an area located in Ranga Reddy district and is a fast-upcoming residential area that offers budget-friendly properties starting from 20 lakhs only. The main attraction of the area is ITIR (Information Technology Investment Region) as it is said that there will be many IT Parks as it's SEZ (Special Economic Zone). As a result of IT and aviation companies setting up offices in the area, Adibatla has already transformed into a modern infrastructural hub.

Mokila

Located approximately 35 kilometres away from Hyderabad city, Mokila's biggest advantage is its proximity to HiTech City, IT hubs like Kokapet, and prime neighbourhoods like Gachibowli. Well-connected via the Outer Ring Road (ORR), Mokila has witnessed a consistent increase in prices in recent years. The airport is around 40 kilometres away but takes just under an hour to reach via the ORR while Nagulapalli and Shankarpalli railway stations, and Miyapur metro station are both within a 10-kilometre radius.

Pocharam

The demand for residential real estate in Pocharam soared incredibly after the AP Housing Board set up the Singapore Township in 2005-06, which was a fully integrated and well-planned township comprising 2000 houses. Later, Infosys set up a 440-acre campus and with other IT companies following suit the area has seen increased commercial real estate activity, as well.

In addition to above ORR connects following radial arterial roads which connect Hyderabad to various important parts of state and country. Following figure shows such radial roads in context of ORR.

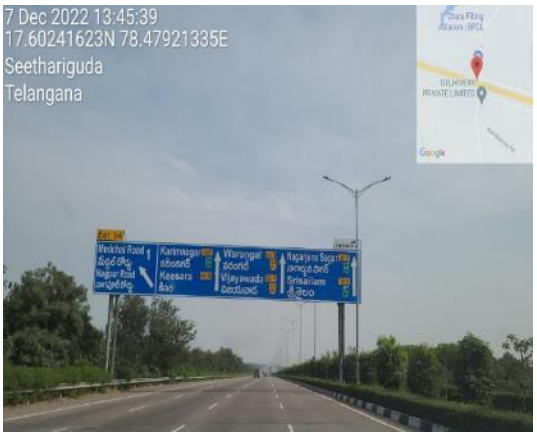
Figure 2-4: Regional context of ORR.

1. **NH-165 –** This is major highway which connects to Maharashtra / Pune / Solapur on western side and Suryapet, Vijayawada and Machilipatnam on eastern side. Interchange and toll plaza is constructed at Patancheru and Pedda Amberpet at crossing locations of ORR and NH-165
2. **NH-44 –** This north south connecting NH connects Hyderabad with Nagpur on north side and Bengaluru on south side. Medchal and Shamshabad interchange and Toll plazas are built at crossing of NH-44 on north and south side respectively.
3. **SH-163** – This connects Hyderabad to Warangal. Ghatshekar toll plaza and interchange is constructed at crossing of SH-163 with ORR
4. **Karimnagar Road** – This road connects city of Karmnagar and Siddipet to Hyderabad. Shamirpet Toll plaza and interchange are entry and exit point for this road.
5. **NH- 765** – It's a new national highway connects Hyderabad to Tokapelle. This highway crosses from very near to Airport. There are some residential and commercial projects coming up on either side of this road in influence zone area of Hyderabad Airport.

2.2 Project Appreciation

Nehru Outer Ring Road of Hyderabad was built in phases and the complete ring was thrown open to public in year 2016. ORR is 8 lane expressway kind of specification. Pavement is flexible except that at toll plazas where rigid pavement is provided. Condition of pavement is good in general in

entire stretch of 158 Km. ORR is fully access controlled road. There is no leakage point and entry / exit can happen from toll plaza location only. Safety items like crash barriers, lighting, delineators, signage and markings etc are well placed and are in good condition. Following photographs show general condition of road.



ORR has 19 locations at which currently toll is in operation. Toll plaza configuration and arrangement of movement is not same at all such locations. Depending on availability of land and other constraints. Following table presents location of toll plaza and type of interchange at such locations.

Table 2-1: Details of Toll plazas locations

Hyderabad Ring Road				
Sr. No	**Name of Interchange**	**Chainage in Km**	**Type of Interchange**	**Number of Toll booths**
1	Kokapet	2+000	Rotary	4
1A	Neopolis	3+700	Single Trumpet (Under Construction)	
2	Idulnagalapalli	13+900	Rotary	4
3	Patancheru	22+500	Double Trumpet	1
4	Sultanpur	31+000	Rotary	4
4A	Mallampet	37+000	Double Trumpet (Under Construction)	
5	Saragudem	42+700	Double Trumpet	1

Hyderabad Ring Road				
Sr. No	**Name of Interchange**	**Chainage in Km**	**Type of Interchange**	**Number of Toll booths**
6	Medchal	52+200	Double Trumpet	1
7	Shamirpet	61+100	Double Trumpet	1
8	Keesara	73+000	Rotary	4
9	Ghatkesar	81+550	Double Trumpet	1
10	Taramatipet	89+750	Rotary	4
11	Pedda Amberpet	96+650	Double Trumpet	1
12	Bongloor	108+900	Double Trumpet	1
13	Ravirayal	116+000	Diamond	4
14	Tukkuguda	121+500	Diamond	4
15	Pedda Golconda	129+750	Rotary	4
16	Shamshabad	136+100	Partial Clover Leaf with directional Ramps	4
17	Rajandranagar-1&2	142+620	Rotary	2
18	TSPA	147+650	Diamond	4
18A	Narsingi (One Entry + One Exit Ramp	152+000	(Under Construction)	
19	Nanakramguda	154+350	Toll Plaza	1

Configuration and movement pattern of above types of toll plaza is shown in following figures.

1. **Rotary Type interchange – with 4 toll booths**

Kokapet, Idulnagalpalli, Sultanpur, Keesara, Taramatipet, Shamsabad, have such type of arrangement. Following image shows typical location (Kokapet) of toll booths and movement pattern for such type of arrangements. All above locations have similar arrangements.

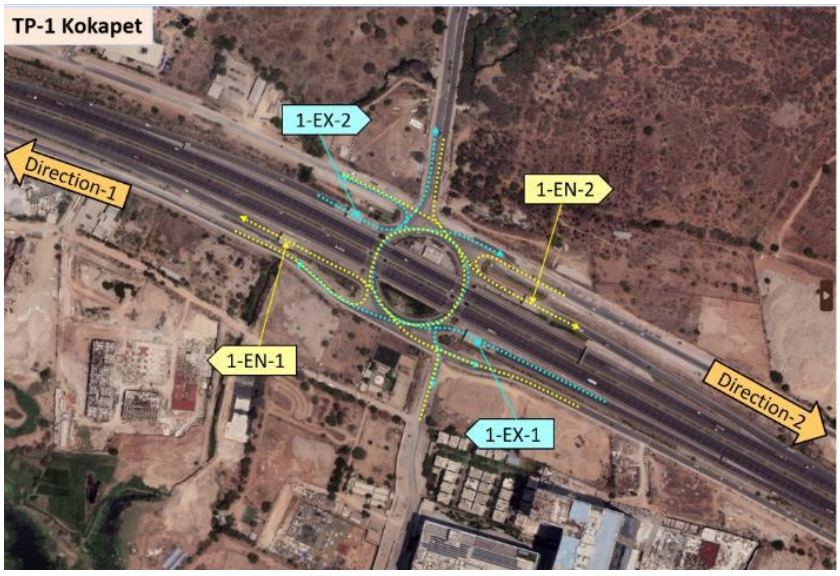


Figure 2-5 : Rotary Type Interchange with 4 toll booths.

2. **Diamond Type interchange – with 4 toll booths**

Ravirayal, Tukkuguda and TSPA have diamond type interchange with four booth arrangement. Following image shows the general arrangement and movement pattern.

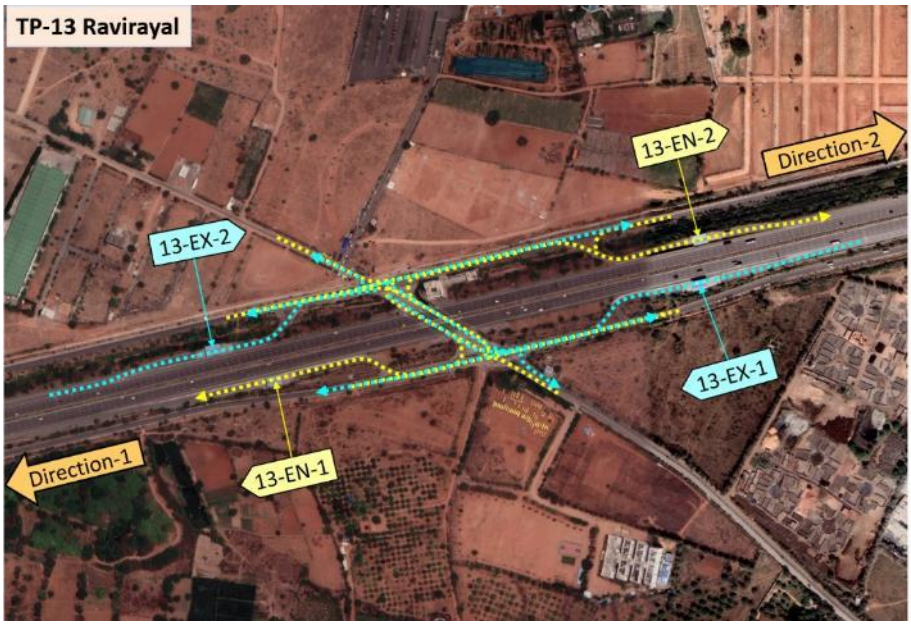


Figure 2-6 : Diamond Type Interchange with 4 toll booths.

3. **Double Trumpet Type Interchange with Single Toll Plaza**

Patancheru, Saragudam, Medchal, Shamirpet, Ghatkesar, Pedda Amberpet, Bongolor and Nanakramguda locations have double trumpet interchange in which all the movements are brough to one location for toll payment.

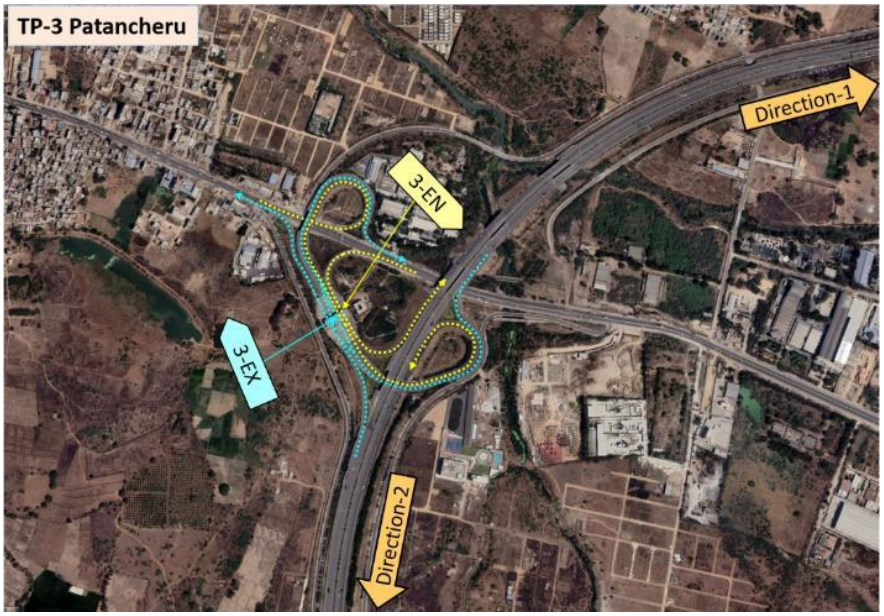


Figure 2-7 : Double Trumpet Type Interchange

4. **Partial Cloverleaf with directional ramps**

Shamshabad interchange is partial cloverleaf type with directional ramps. It also has four tool booths.

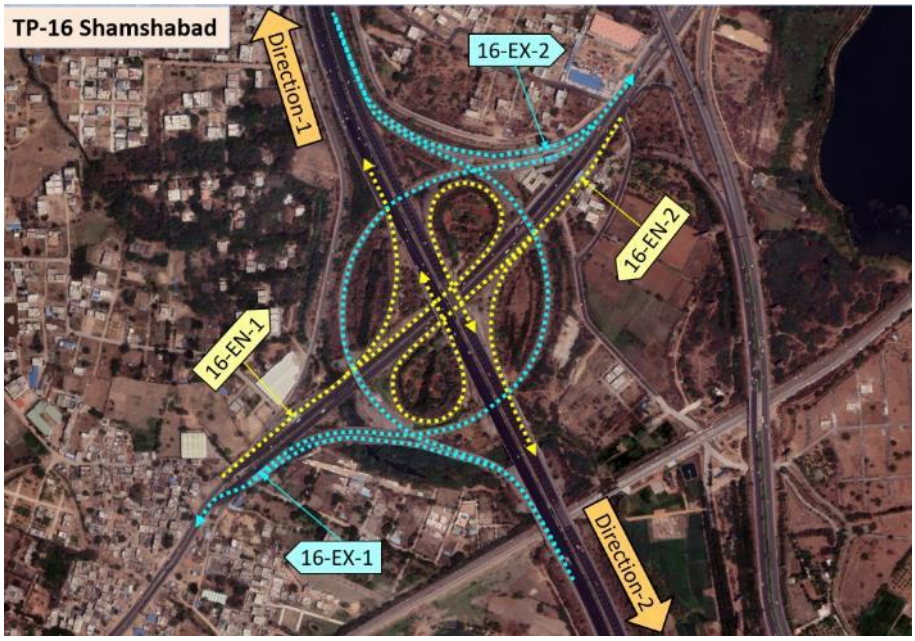


Figure 2-8 : Shamashabad Interchange and Ramps

5. Single Toll Plaza at Nanakramguda

Nanakram Guda has special arrangement. At this location all movement which enter or exit at this location are brough to one side road on which toll plaza is constructed.

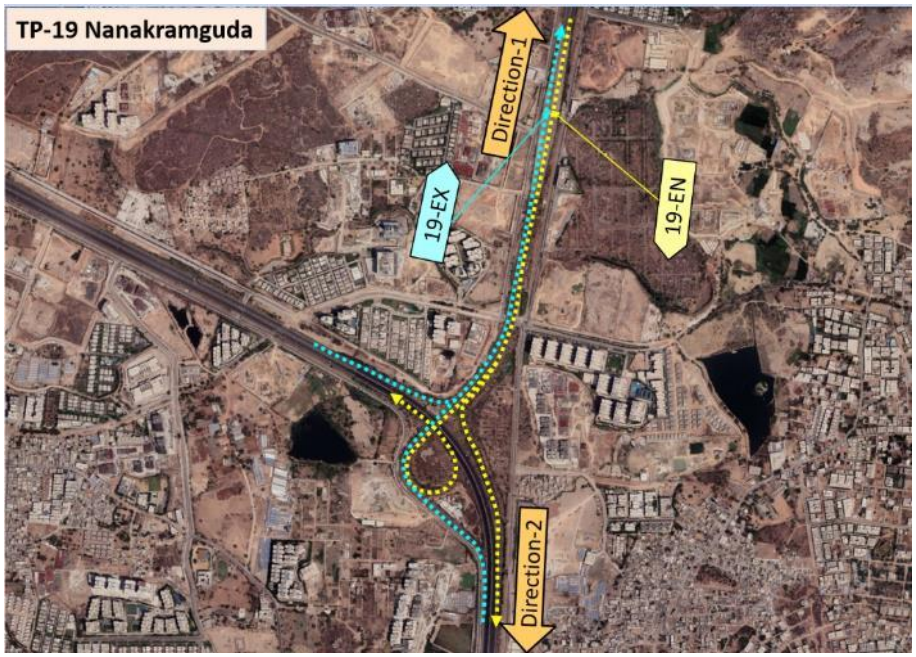


Figure 2-9 : Toll Plaza Nanakramguda and movements.

In addition to above 19 toll plaza locations two are under construction at following locations.

- Neopolis- Single Trumpet
- Narsingi – One Entry and one Exit Ramp

2.3 Project Corridor Illustration

The following photographs illustrate the project section along the corridor.

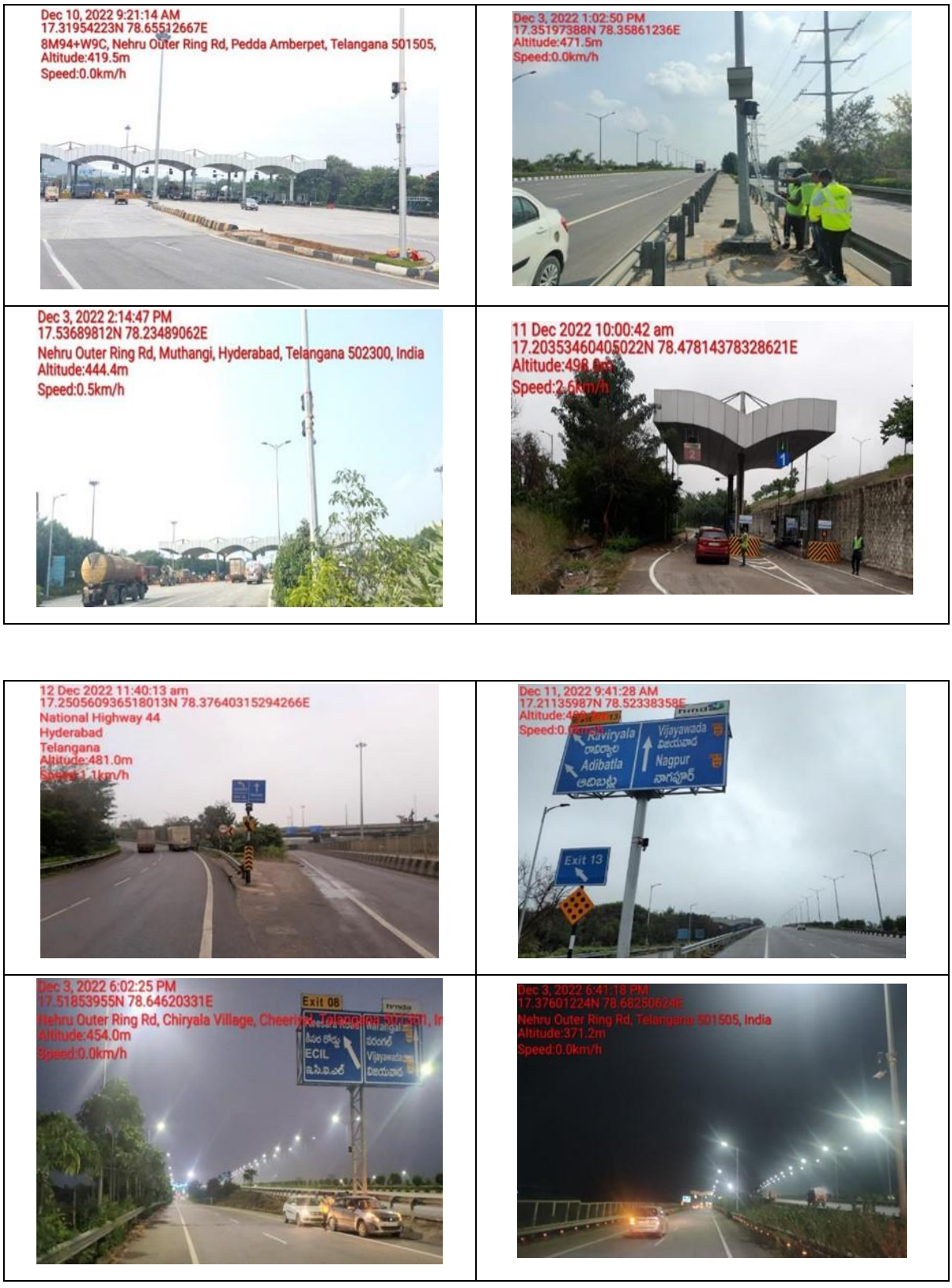


Figure 2-10 : Photographs showing Project Corridor

CHAPTER 3

TRAFFIC SURVEYS AND ANALYSIS

3.1 Traffic Surveys

The Consultants have carried out a reconnaissance survey of the project corridor to understand the general traffic and travel characteristics on the corridor.

Traffic data forecast is one of the important inputs required for a TOT/BOT/DBFO highway/roadway project. In order to arrive at a fair estimate of traffic forecast it is necessary to collect data, analyse, model, validate and then forecast. The Consultants have carried out a reconnaissance survey of the project corridor to understand the general traffic and travel characteristics on the corridor.

The following traffic studies have been carried out for the project.

- Classified traffic volume counts at toll plaza location on 8-lanes ring road expressway encircling Hyderabad for 2023-24,2024-25 and Annual traffic data from April 2025 to February 2026.
- Local Component of traffic
- Component of Return Journey
- Component of Monthly Pass Journey

The main objective of the traffic data analysis is to:

- Determine the existing traffic movement characteristics of the project.
- Establish base year traffic.
- Identification of travel patterns and modal split of project traffic
- Deriving growth factors for traffic forecasting
- Estimation of corridor traffic including traffic diversion if any
- Preparation of revenue model and projection of revenue as per toll policy for various scenarios

Table 3-1 below lists provides details of locations from where traffic details have been collected.

Table 3-1 : Traffic Data Details

SR. No	LOCATION	CTV	Single Journey Traffic	Daily Return Journey	Monthly Pass	Local Pass
1	**Km 158.000 22 Toll Plaza Nehru Outer Ring Road at Hyderabad**	AADT for 2023-24,2024-25 & Annual traffic from April 2025 to February 2026	AADT for 2023-24,2024-25 & Annual traffic from April 2025 to February 2026	AADT for 2023-24,2024-25 & Annual traffic from April 2025 to February 2026	AADT for 2023-24,2024-25 & Annual traffic from April 2025 to February 2026	AADT for 2023-24,2024-25 & Annual traffic from April 2025 to February 2026

3.2 Classified Traffic Volume

The objective of conducting Classified Traffic Volume Count is to understand the traffic flow pattern on a roadway. The Classified Traffic Volume has been provided by the concessionaire of project road actual traffic data gathered at toll plaza locations.

The vehicles can broadly be classified into fast moving / motorized and slow moving / non-motorized vehicles, which can be further classified into specific categories of vehicles. The groupings of vehicles are further segregated to capture the tollable vehicle categories specifically and toll exempted vehicles are counted separately. The detailed vehicle classification system as per IRC: 64-1990 is given in the table below.

Table 3-2 : Vehicles classification system

Vehicle Type	
Auto Rickshaw	
Passenger Car	Car, Jeep, Taxi & Van (Old / new technology)
Bus	Minibus
	Standard Bus
Truck	Light Goods Vehicle (LCV)
	2 – Axle Truck
	3 Axle Truck (HCV)
	Multi Axle Truck (4-6 Axle)
	Oversized Vehicles (7 or more axles)
Other Vehicles	Agriculture Tractor, Tractor & Trailer, Two-Wheeler, Three-Wheeler

Source - IRC: 64 – 1990

However, since project highway is currently under toll operation, the data collected corresponds to category of tollable vehicles. The following are the types of vehicles as per concession agreement.

- Car / Jeep / van
- Min Bus /LCV
- Truck / Bus
- Multi Axle

3.3 Traffic Characteristic

Toll revenue of project highway does not solely depend on traffic volume. There are certain characteristics of traffic which have substantial potential to affect toll collection. Component of local traffic, component of passenger and commercial traffic, portion of return journey traffic, % of monthly pass traffic are some of such characteristics of traffic. These will be discussed in subsequent sections of the report.

3.3.1 Traffic Data

Project concessionaire has provided Traffic data for the years 2023-24,2024-25 and Annual traffic data from April 2025 to February 2026.
Since the traffic data available for this update is for only Annual, from April 2025 to February 2026, it may not represent the whole year traffic. Hence a seasonality factor for balance part of year has been applied to average traffic of the current Eleven months to arrive at Annual Average Daily Traffic of base year 2025-26. Thus, corrected traffic is used for future projections and revenue calculations.

The following table shows historical traffic on project stretch and derived Annual Average Daily Traffic (AADT) for year 2025-26.

Following tables show base traffic matrix of each category of vehicles for each pair of traffic Base year 2025-26

Table 3-3 : Tollable Annual Average Daily Traffic (AADT) Matrix for Car/Jeep/Van

SINGLE JOURNEY
CLASS – 01

F/T	1	1A	2	3	4	4A	5	6	7	8	9	10	11	12	13	14	15	16	17	18	18A	19
1	0	27	550	879	134	271	208	349	318	65	108	18	322	211	60	184	69	2113	1030	865	1	1748
1A	44	0	59	39	8	14	14	24	17	5	4	1	18	13	5	13	5	79	59	23	0	489
2	454	58	0	813	116	179	384	272	246	86	123	6	110	61	20	60	24	424	373	264	0	1298
3	736	41	649	0	263	530	638	824	426	247	332	42	319	128	35	169	32	940	1294	494	22	1874
4	164	12	133	321	0	313	430	433	612	162	287	28	227	21	6	26	7	154	57	57	0	171
4A	366	25	251	801	289	0	299	541	801	227	428	36	393	35	7	40	12	265	44	89	0	353
5	186	17	186	716	276	177	0	649	966	299	606	64	669	83	10	48	16	298	71	88	0	221
6	377	33	293	810	380	455	702	0	767	338	693	113	750	147	28	136	36	653	119	161	0	424
7	289	21	226	467	340	598	839	559	0	309	799	167	632	154	27	388	133	163	49	126	1	356
8	81	6	85	277	133	162	274	365	419	0	559	116	557	140	33	267	116	72	7	39	8	89
9	94	5	113	332	240	352	590	643	945	645	0	253	1028	319	62	563	291	208	23	173	131	416
10	17	1	5	55	28	40	88	152	253	157	458	0	130	69	13	61	40	24	3	20	17	57
11	254	16	99	307	197	364	644	694	717	530	1210	148	0	301	93	689	322	335	37	270	351	1839
12	184	12	52	129	16	30	76	144	167	221	343	68	340	0	129	1140	573	299	27	213	183	849
13	46	3	15	30	5	4	6	19	21	18	263	10	76	91	0	147	121	131	13	71	56	266
14	139	10	51	128	20	29	39	112	283	184	394	94	544	918	133	0	430	594	40	214	200	902
15	54	4	19	38	5	9	11	20	113	84	280	33	637	467	126	272	0	801	29	115	156	327
16	1644	60	286	712	109	176	238	477	166	80	262	32	385	509	167	665	763	0	191	1621	1609	8722
17	932	89	332	1567	57	35	77	131	60	8	30	4	40	31	46	36	32	107	0	1862	837	1833
18	834	35	188	524	46	62	96	143	129	43	228	26	313	263	99	440	145	2063	1331	0	385	4968
18A	1	0	0	91	50	0	0	1	5	12	167	22	395	213	66	242	191	1938	598	178	0	3
19	2012	593	1001	1545	115	107	187	307	312	69	364	52	1742	811	254	1020	372	11343	1618	4491	3	0

Table 3-4 : Tollable Annual Average Daily Traffic (AADT) Matrix for Minibus/LCV

SINGLE JOURNEY
CLASS – 02

F/T	1	1A	2	3	4	4A	5	6	7	8	9	10	11	12	13	14	15	16	17	18	18A	19
1	0	0	18	40	4	6	6	14	3	1	2	0	3	4	3	3	1	21	18	12	0	19
1A	0	0	1	1	0	0	0	0	0	0	0	0	0	1	0	0	0	2	2	0	0	4
2	13	1	0	47	4	4	19	11	3	1	1	0	2	2	0	1	1	13	13	7	0	16
3	27	2	44	0	42	32	118	177	46	31	36	4	118	18	6	20	8	131	73	17	0	23
4	3	0	5	45	0	6	17	18	18	5	4	1	7	1	3	1	1	19	4	2	0	1
4A	3	0	4	37	6	0	11	30	18	5	7	1	11	4	0	1	0	9	2	1	0	0
5	5	0	8	142	19	10	0	69	63	17	24	4	46	11	1	8	3	67	8	6	0	3
6	15	1	13	164	26	39	72	0	38	40	58	8	155	19	4	29	10	231	28	11	0	16
7	4	0	4	38	6	11	34	24	0	19	39	10	71	16	4	29	31	15	3	6	0	2
8	2	0	1	32	7	6	19	40	28	0	12	4	21	6	3	6	13	4	0	1	0	0
9	1	0	1	35	4	5	17	47	44	13	0	11	72	22	12	21	40	14	1	3	1	1
10	0	0	0	6	1	2	4	13	14	5	11	0	5	1	1	4	4	2	0	1	1	1
11	4	1	3	107	6	9	49	162	86	21	70	6	0	19	8	45	64	38	4	12	4	12
12	3	1	2	16	1	2	9	17	18	15	20	1	27	0	2	34	55	12	1	9	3	11
13	6	0	1	4	1	0	1	3	3	1	15	1	5	2	0	2	7	7	1	3	1	23
14	3	1	1	17	1	1	5	26	24	6	22	4	47	24	3	0	35	18	2	5	3	10
15	1	0	1	5	0	0	2	4	16	7	24	3	68	31	7	16	0	12	2	2	2	6
16	25	2	11	102	16	8	50	208	18	7	20	2	44	23	9	21	14	0	8	32	24	142
17	33	2	10	72	5	2	11	25	3	1	2	0	3	1	2	2	3	7	0	52	18	39
18	10	0	3	23	2	1	3	8	5	1	3	1	10	8	6	13	4	38	35	0	5	51
18A	0	0	0	7	2	0	0	0	0	0	1	1	2	2	2	3	8	16	10	2	0	0
19	29	5	10	25	1	1	3	12	2	1	1	0	9	12	29	15	8	140	34	85	0	0

Table 3-5 : Tollable Annual Average Daily Traffic (AADT) Matrix for

***Bus/2-* Axle**

SINGLE JOURNEY

CLASS – 03

F/T	1	1A	2	3	4	4A	5	6	7	8	9	10	11	12	13	14	15	16	17	18	18A	19
1	0	0	4	14	3	5	3	5	1	0	1	0	4	1	1	2	1	12	9	7	0	12
1A	0	0	0	1	0	0	0	0	0	0	0	0	1	1	0	1	0	2	2	0	0	2
2	8	0	0	21	2	6	19	4	1	1	1	0	1	1	0	2	1	7	9	3	0	7
3	17	1	19	0	44	21	133	296	52	44	50	12	319	25	4	40	14	202	116	19	0	29
4	3	0	4	35	0	3	20	13	16	3	2	1	11	1	0	1	2	16	2	2	0	1
4A	1	0	4	26	4	0	12	26	17	3	9	1	18	1	0	1	0	8	1	1	0	1
5	3	0	7	123	16	9	0	67	42	20	21	6	90	6	1	5	2	71	4	4	0	2
6	6	1	8	258	17	24	82	0	24	56	69	10	323	20	7	57	21	635	15	10	0	5
7	2	0	2	43	4	9	32	32	0	14	27	4	65	10	3	20	36	23	2	2	0	3
8	0	0	1	40	4	4	19	56	20	0	12	9	21	3	1	5	12	7	0	0	0	0
9	0	0	1	52	3	6	23	62	38	15	0	15	82	22	12	22	52	19	0	5	1	2
10	0	0	0	12	1	1	8	14	9	8	13	0	12	4	2	4	5	3	0	1	0	1
11	4	1	4	308	8	19	84	360	86	27	72	9	0	22	16	72	102	61	2	12	5	12
12	1	1	1	31	1	1	4	17	10	9	17	2	25	0	2	25	43	12	1	6	3	7
13	1	0	1	4	0	0	0	4	2	0	14	1	6	1	0	2	9	6	1	4	1	7
14	2	1	2	43	2	1	5	38	13	3	14	4	59	27	5	0	25	18	1	6	3	5
15	1	0	1	12	1	0	2	9	27	6	31	3	98	33	13	20	0	14	1	4	2	2
16	17	2	7	198	14	6	62	561	35	10	24	6	78	27	7	23	17	0	10	24	13	305
17	10	1	4	64	2	1	5	14	2	0	1	0	5	1	2	2	3	5	0	28	12	21
18	5	0	1	37	1	0	3	8	2	0	3	0	9	5	3	17	3	24	21	0	2	40
18A	0	0	0	10	3	0	0	0	0	0	1	0	2	2	2	3	11	11	10	1	0	0
19	26	1	3	17	1	0	2	4	1	1	1	0	28	20	7	7	2	255	53	62	0	0

Table 3-6 : Tollable Annual Average Daily Traffic (AADT) Matrix for

3 - Axle

SINGLE JOURNEY

CLASS – 04

F/T	1	1A	2	3	4	4A	5	6	7	8	9	10	11	12	13	14	15	16	17	18	18A	19
1	0	0	6	16	3	2	1	1	0	0	1	0	1	0	0	2	4	25	34	23	0	10
1A	0	0	3	3	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	3
2	20	4	0	85	6	1	9	2	0	1	1	0	1	0	0	0	1	2	8	9	0	13
3	56	8	225	0	32	9	63	144	16	19	28	2	138	11	1	12	5	91	62	7	0	22
4	4	1	11	27	0	1	10	7	7	2	1	0	3	0	0	1	0	6	2	1	0	1
4A	0	0	1	6	1	0	5	16	3	7	2	1	3	0	0	0	0	3	0	0	0	2
5	1	0	4	72	14	4	0	50	14	7	12	2	35	1	0	2	1	30	2	0	0	1
6	1	0	2	105	7	12	59	0	12	29	37	3	188	7	1	9	7	388	19	2	0	1
7	0	0	1	20	5	3	22	9	0	6	10	2	28	6	1	7	11	8	1	1	0	0
8	0	0	1	19	3	6	9	29	10	0	14	4	13	2	0	1	4	4	0	0	0	0
9	0	0	1	35	3	2	14	32	12	6	0	7	33	6	6	19	25	15	1	2	0	2
10	0	0	0	4	1	1	2	4	3	4	9	0	8	5	3	4	2	2	0	3	1	0
11	1	0	1	152	3	6	29	198	36	12	42	4	0	17	8	29	56	34	1	5	1	5
12	0	0	0	13	0	0	1	13	3	5	8	2	10	0	1	5	14	6	1	2	0	0
13	0	0	0	1	0	0	1	1	1	0	8	1	3	4	0	3	4	3	1	1	0	0
14	2	0	1	15	1	1	1	9	5	1	8	2	17	7	2	0	13	14	4	3	2	3
15	1	0	0	6	0	0	0	2	4	3	10	1	43	10	2	7	0	16	3	2	3	2
16	20	1	3	87	6	2	30	370	8	6	16	1	57	14	2	16	14	0	9	17	23	75
17	53	2	6	37	2	2	4	7	0	0	1	0	2	1	2	6	6	10	0	46	49	46
18	10	1	2	21	0	0	0	2	0	0	1	0	3	2	1	6	2	12	25	0	6	36
18A	0	0	0	6	1	0	0	0	0	0	0	0	0	0	0	1	8	26	26	2	0	0
19	53	16	4	7	3	0	1	1	0	0	0	0	7	4	0	2	3	44	49	39	0	0

Table 3-7 : Tollable Annual Average Daily Traffic (AADT) Matrix for

4 to 6 - Axle

SINGLE JOURNEY

CLASS – 05

F/T	1	1A	2	3	4	4A	5	6	7	8	9	10	11	12	13	14	15	16	17	18	18A	19
1	0	0	4	45	5	4	3	5	8	1	3	2	33	4	0	2	2	28	15	19	0	12
1A	0	0	3	5	0	0	0	1	1	0	0	0	3	1	0	0	0	3	1	1	0	4
2	3	1	0	98	9	2	28	6	12	1	3	0	21	2	0	2	2	12	10	4	0	2
3	83	28	257	0	78	20	168	256	96	48	105	15	612	58	5	37	11	284	86	16	1	34
4	7	1	20	47	0	2	15	14	36	2	8	0	21	2	0	1	1	18	1	1	0	3
4A	0	0	1	16	1	0	7	12	14	5	7	0	13	1	0	1	0	4	0	0	0	0
5	1	0	4	145	8	5	0	50	52	16	45	3	90	5	0	4	3	63	1	2	0	0
6	6	1	8	186	12	13	62	0	22	28	101	4	219	20	2	12	16	621	6	9	0	1
7	5	2	23	107	21	15	62	17	0	14	44	5	53	17	3	14	128	62	5	4	0	2
8	0	0	1	33	2	2	37	20	15	0	13	3	25	3	0	2	10	6	0	0	0	5
9	4	0	5	97	12	7	66	80	52	36	0	13	206	30	6	40	75	33	1	8	1	2
10	5	0	0	8	1	0	2	7	12	2	23	0	63	17	12	9	4	16	5	16	4	3
11	56	3	38	563	34	20	145	325	80	31	241	21	0	66	29	114	164	122	17	39	24	33
12	1	0	1	48	1	1	4	19	16	11	20	8	39	0	1	14	45	15	1	6	2	2
13	0	0	0	3	0	0	0	1	1	0	27	1	8	2	0	4	7	5	1	2	1	0
14	2	0	2	31	1	0	3	13	10	2	15	5	55	15	5	0	23	21	17	6	3	4
15	0	0	1	8	0	0	1	5	29	4	39	2	167	32	9	12	0	8	3	2	2	1
16	45	3	21	250	21	5	71	734	117	10	63	13	157	62	7	27	13	0	12	30	24	80
17	15	2	9	27	1	0	2	5	5	0	2	1	11	3	4	6	3	7	0	46	14	21
18	22	1	3	88	1	0	2	6	5	1	9	2	35	8	3	17	3	22	45	0	7	62
18A	0	0	0	18	5	0	0	0	0	0	2	0	7	2	0	1	18	8	6	1	0	0
19	14	2	1	11	1	0	2	1	3	1	1	1	12	2	0	3	1	74	8	46	0	0

Table 3-8 : Tollable Annual Average Daily Traffic (AADT) Matrix for

7 & Above - Axle

SINGLE JOURNEY

CLASS – 06

F/T	1	1A	2	3	4	4A	5	6	7	8	9	10	11	12	13	14	15	16	17	18	18A	19
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	1	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Table 3-9 : Tollable Annual Average Daily Traffic (AADT) Matrix for Car/Jeep/Van

RETURN JOURNEY
CLASS – 01

F/T	1	1A	2	3	4	4A	5	6	7	8	9	10	11	12	13	14	15	16	17	18	18A	19
1	0	4	154	246	62	179	61	120	69	29	25	4	32	74	11	32	8	332	360	370	0	383
1A	3	0	15	8	3	8	3	7	3	1	1	0	2	3	0	1	1	9	20	8	0	185
2	169	10	0	178	33	88	51	84	46	23	20	1	10	13	2	8	3	44	70	53	0	344
3	203	9	316	0	108	362	278	309	136	103	95	16	49	37	5	18	3	119	529	106	0	475
4	29	2	40	57	0	104	86	95	60	36	37	6	17	2	0	3	0	13	14	9	0	36
4A	36	2	51	112	88	0	42	101	124	39	56	9	33	4	0	2	1	18	7	10	0	21
5	64	4	100	176	183	88	0	219	217	96	139	28	96	14	0	7	1	44	22	30	0	66
6	77	5	86	166	150	168	244	0	128	127	180	49	161	31	2	15	3	69	32	31	0	72
7	77	5	86	110	162	273	404	282	0	138	309	94	220	45	2	36	33	16	11	33	0	81
8	10	1	22	57	51	65	98	93	62	0	207	54	125	30	3	22	16	8	1	9	2	13
9	16	1	42	95	100	142	219	237	239	184	0	155	397	111	6	63	88	48	4	63	43	87
10	2	0	1	6	7	7	12	22	30	31	60	0	29	16	1	7	5	5	0	4	4	7
11	37	2	14	73	40	57	124	183	155	154	305	20	0	66	11	107	156	49	4	55	58	244
12	34	2	13	26	4	8	22	40	40	54	107	17	53	0	13	226	116	78	4	64	54	219
13	18	2	6	10	2	2	3	11	8	15	24	3	28	39	0	37	43	52	2	37	25	104
14	51	2	17	33	6	12	11	34	110	83	208	15	244	463	29	0	67	210	7	97	87	426
15	18	1	7	7	1	3	3	4	18	27	56	7	64	190	21	95	0	234	5	48	40	156
16	584	22	125	353	37	62	74	169	25	15	36	4	52	79	19	149	268	0	15	712	605	4607
17	158	10	52	329	9	10	12	19	6	1	3	0	4	4	1	4	3	28	0	323	141	323
18	213	4	57	69	16	26	22	41	22	10	37	4	42	67	12	46	21	445	610	0	19	1978
18A	0	0	0	0	0	0	0	0	0	1	17	2	29	35	6	33	14	275	148	22	0	0
19	436	169	595	622	54	143	63	104	63	20	90	10	231	292	57	214	52	2342	576	2343	0	0

Table 3-10 : Tollable Annual Average Daily Traffic (AADT) Matrix for Minibus/LCV

RETURN JOURNEY
CLASS – 02

F/T	1	1A	2	3	4	4A	5	6	7	8	9	10	11	12	13	14	15	16	17	18	18A	19
1	0	0	7	11	1	1	2	7	2	1	0	0	1	1	1	1	0	8	19	3	0	13
1A	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	2
2	7	0	0	16	2	2	3	6	1	1	0	0	0	1	0	0	0	3	2	1	0	2
3	14	0	16	0	17	17	53	63	11	11	8	1	15	6	1	4	1	26	24	3	0	10
4	0	0	0	18	0	2	8	11	2	4	1	0	1	0	0	0	0	3	1	0	0	0
4A	0	0	1	7	1	0	2	16	3	2	1	1	2	0	0	0	0	1	0	0	0	0
5	1	0	3	39	4	2	0	21	10	7	4	1	12	2	0	1	0	11	3	1	0	0
6	1	0	3	61	3	7	23	0	6	15	11	4	38	5	1	8	1	48	7	1	0	2
7	1	0	1	21	3	11	40	20	0	14	18	5	31	5	1	11	4	2	1	1	0	1
8	0	0	0	10	1	2	5	14	6	0	4	2	5	3	0	1	1	1	0	0	0	0
9	0	0	0	14	1	2	10	23	15	2	0	4	24	9	3	7	6	3	0	0	0	0
10	0	0	0	1	0	0	1	2	3	1	3	0	1	0	0	0	0	0	0	0	0	0
11	0	0	0	15	1	2	10	29	22	4	19	1	0	5	1	12	11	6	0	2	0	1
12	1	0	1	7	0	0	5	6	6	2	8	0	4	0	0	8	10	4	0	3	0	3
13	1	0	0	2	1	0	0	1	1	2	8	1	3	0	0	0	3	5	0	2	1	19
14	1	0	0	8	0	1	3	8	7	1	8	1	13	15	1	0	4	8	0	2	1	7
15	0	0	0	2	0	0	1	1	4	3	9	1	14	20	1	8	0	4	0	1	0	3
16	5	0	4	32	3	1	14	32	1	0	2	0	11	3	2	3	2	0	1	12	3	46
17	2	0	3	25	1	0	2	9	0	0	0	0	0	0	0	0	0	1	0	5	1	6
18	4	0	4	5	1	0	1	4	1	0	1	0	3	4	0	1	1	9	17	0	0	53
18A	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	4	3	0	0	0
19	7	1	8	6	0	0	1	6	1	0	0	0	2	2	8	2	1	44	15	16	0	0

Table 3-11 : Tollable Annual Average Daily Traffic (AADT) Matrix for

***Bus/2-* Axle**

RETURN JOURNEY

CLASS – 03

F/T	1	1A	2	3	4	4A	5	6	7	8	9	10	11	12	13	14	15	16	17	18	18A	19
1	0	0	6	5	2	1	1	2	1	0	0	0	1	0	0	0	0	8	5	2	0	5
1A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	0	1
2	1	0	0	9	2	3	2	3	1	0	1	0	1	0	0	1	0	2	0	0	0	0
3	4	0	5	0	10	7	34	50	8	14	10	3	22	4	0	2	1	28	10	2	0	5
4	1	0	0	20	0	1	7	5	1	2	1	0	1	0	0	0	0	3	0	0	0	0
4A	0	0	3	5	0	0	3	6	3	2	2	0	2	0	0	0	0	1	0	0	0	0
5	0	0	1	44	9	3	0	21	12	9	9	2	23	1	0	1	0	15	1	1	0	0
6	0	0	0	66	1	7	16	0	11	27	25	3	45	3	0	3	1	32	2	2	0	0
7	0	0	0	20	1	9	25	8	0	10	18	4	17	3	1	3	7	2	0	0	0	1
8	0	0	0	10	1	1	8	24	4	0	3	2	6	1	0	1	1	1	0	0	0	0
9	0	0	1	13	0	4	8	25	10	3	0	4	24	7	1	3	13	2	0	1	0	0
10	0	0	0	1	0	0	3	2	1	3	4	0	2	0	0	0	1	0	0	0	0	0
11	0	0	0	20	1	3	7	32	15	2	32	2	0	3	1	9	16	5	0	1	0	1
12	0	0	0	5	0	0	1	5	3	1	10	2	5	0	0	11	15	2	0	1	1	1
13	1	0	0	1	0	0	0	2	2	1	10	2	9	1	0	1	7	3	0	2	1	5
14	0	0	1	14	0	0	1	13	6	2	10	2	22	12	0	0	11	4	0	4	1	3
15	0	0	0	2	1	0	0	4	3	3	17	1	24	11	2	6	0	2	0	0	1	0
16	3	0	3	30	2	1	9	37	1	0	1	0	6	1	1	2	3	0	0	7	3	135
17	1	0	2	18	0	0	1	2	0	0	0	0	0	0	0	0	0	2	0	5	3	4
18	2	0	1	4	1	0	1	5	1	0	3	0	4	2	1	2	1	11	9	0	0	45
18A	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0	1	0	3	4	0	0	0
19	5	1	4	3	0	0	0	2	0	0	1	0	2	1	4	1	0	204	6	24	0	0

Table 3-12 : Tollable Annual Average Daily Traffic (AADT) Matrix for

3- Axle

RETURN JOURNEY

CLASS – 04

F/T	1	1A	2	3	4	4A	5	6	7	8	9	10	11	12	13	14	15	16	17	18	18A	19
1	0	0	13	41	2	0	1	0	0	0	0	0	0	0	0	1	0	12	39	4	0	4
1A	0	0	3	5	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	4
2	3	1	0	181	6	0	2	0	0	1	1	0	0	0	0	0	0	1	1	0	0	1
3	5	1	46	0	8	1	23	12	4	6	8	1	8	4	0	2	0	11	3	0	0	2
4	0	0	2	19	0	0	8	3	2	1	2	1	0	0	0	0	0	1	0	0	0	0
4A	0	0	0	3	0	0	1	4	1	4	1	0	1	0	0	0	0	0	0	0	0	0
5	0	0	0	17	2	1	0	22	7	4	8	1	4	0	0	0	0	4	0	0	0	0
6	0	0	0	26	1	6	18	0	2	15	12	1	13	1	0	1	0	13	0	0	0	0
7	0	0	0	5	0	1	5	4	0	5	5	1	6	0	0	1	1	1	0	0	0	0
8	0	0	0	5	1	3	2	15	2	0	1	2	2	1	0	0	1	0	0	0	0	0
9	0	0	0	10	0	1	4	6	2	7	0	5	15	3	1	3	4	2	0	0	0	0
10	0	0	0	0	0	0	1	0	1	2	3	0	1	1	0	0	0	0	0	0	0	0
11	0	0	0	6	0	0	7	8	4	4	15	1	0	2	1	3	5	4	0	0	0	0
12	0	0	0	2	0	0	0	1	2	1	3	2	6	0	2	2	2	1	1	1	0	0
13	0	0	0	0	0	0	0	0	0	0	5	2	4	0	0	1	1	0	0	0	0	0
14	0	0	0	6	0	0	0	1	1	0	10	2	12	2	1	0	3	4	3	0	0	0
15	2	0	0	2	0	0	0	0	1	0	7	1	11	4	1	7	0	5	4	0	2	1
16	10	0	0	12	0	0	5	9	0	0	1	1	3	1	1	5	7	0	3	2	14	7
17	15	0	1	9	0	0	0	1	0	0	0	0	0	0	0	2	1	1	0	6	9	17
18	10	0	6	3	1	0	0	0	0	0	1	1	2	1	0	2	1	9	15	0	0	24
18A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	10	18	1	0	0
19	4	1	10	7	0	0	1	0	0	0	1	0	1	0	0	0	1	47	27	27	0	0

Table 3-13 : Tollable Annual Average Daily Traffic (AADT) Matrix for

4 to 6 - Axle

RETURN JOURNEY

CLASS – 05

F/T	1	1A	2	3	4	4A	5	6	7	8	9	10	11	12	13	14	15	16	17	18	18A	19
1	0	0	1	61	6	0	0	1	2	0	1	3	24	0	0	1	0	17	10	10	0	8
1A	0	0	0	24	1	0	0	0	1	0	0	0	1	0	0	0	0	1	1	0	0	1
2	0	0	0	214	16	0	1	3	14	0	1	0	18	0	0	1	0	7	1	0	0	0
3	13	2	44	0	7	2	24	23	23	8	8	1	41	3	0	2	0	42	3	2	0	4
4	1	0	5	42	0	0	2	4	11	0	4	0	13	0	0	0	0	5	0	0	0	0
4A	0	0	0	6	0	0	1	4	6	1	2	0	4	0	0	0	0	0	0	0	0	0
5	0	0	1	56	1	1	0	18	26	29	25	1	39	1	0	0	0	17	0	0	0	0
6	0	0	1	53	2	1	9	0	4	3	8	2	52	2	0	1	0	24	0	0	0	0
7	0	0	1	17	1	1	8	2	0	1	8	2	16	1	0	1	3	2	0	0	0	0
8	0	0	1	14	0	2	6	7	4	0	6	1	10	1	0	0	1	1	0	0	0	0
9	0	0	0	21	0	0	6	14	11	3	0	9	46	3	0	5	9	4	0	0	1	0
10	0	0	0	4	0	0	1	0	3	1	4	0	11	5	0	1	0	10	1	1	0	0
11	2	0	1	19	0	0	5	10	8	3	58	8	0	5	1	8	6	6	0	2	0	1
12	0	0	0	4	0	0	0	2	4	0	10	7	25	0	0	2	4	2	0	1	0	0
13	0	0	0	1	0	0	0	0	1	0	4	4	10	0	0	3	4	0	0	1	0	0
14	0	0	0	8	0	0	1	1	5	0	22	4	52	3	2	0	4	6	3	1	0	0
15	0	0	0	2	0	0	0	0	11	0	12	1	27	6	2	6	0	2	1	0	0	0
16	3	0	1	30	1	0	5	11	4	0	2	10	23	2	0	5	1	0	1	4	1	3
17	6	1	1	14	0	0	0	1	3	0	0	3	10	0	0	15	1	2	0	8	2	3
18	8	0	0	4	0	0	0	1	1	0	1	4	12	1	0	1	0	10	6	0	0	30
18A	0	0	0	0	0	0	0	0	0	0	1	1	7	0	0	1	0	5	3	0	0	0
19	6	3	1	13	0	0	0	0	0	5	1	2	15	0	0	2	0	21	14	41	0	0

Table 3-14 : Tollable Annual Average Daily Traffic (AADT) Matrix for

7 & Above - Axle

RETURN JOURNEY

CLASS – 06

F/T	1	1A	2	3	4	4A	5	6	7	8	9	10	11	12	13	14	15	16	17	18	18A	19
1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
1A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
4A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
7	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
11	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
15	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
17	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
18A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

3.4 Traffic Characteristic

3.4.1 Analysis of Traffic Volume Count

Understanding the character of existing traffic forms the basis of the traffic forecast. The various vehicle types having different sizes and characteristics can be converted into a single unit called Passenger Car Unit (PCU). Passenger Car equivalents for various vehicles are adopted based on recommendations of Indian Road Congress prescribed in "IRC-64-1990: Guidelines for Capacity of Roads in Rural areas". The adopted passenger car unit values (PCU) are presented in ***Table 3-1515.***

Table 3-15 : PCU Factors Adopted for Study

Vehicle Type	PCUs
Car	1.0
Minibus	1.5
Standard Bus	3.0
LCV/LGV	1.5
2 Axle Truck	3.0
3 – 6 Axle Truck	4.5
MAV	4.5
Auto Rickshaw	1.0
Van/Tempo	1.0
Agriculture Tractor with Trailer	4.5
Agriculture Tractor without Trailer	1.5

Source: IRC: 64-1990

Traffic volume at each toll plaza was converted to PCU and same is presented as under

Table 3-16 : Traffic in PCU at Project Stretch for Base Year 2024-25

Year	Toll Plaza Location (Km)	Traffic No	PCU	PCU Index
2023-24	Hyderabad ORR at all TP	205075	283848	1.38
2024-25	Hyderabad ORR at all TP	222491	307796	1.38

Year	Toll Plaza Location (Km)	Traffic No	PCU	PCU Index
2025-26	Hyderabad ORR at all TP	264490	358761	1.36

It can be observed from above that project traffic has PCU index less than 1.5 which is an indicator of high proportion of Passenger traffic.

3.4.2 Components of Traffic

As discussed previously, components of total traffic volume play an important role in determining project revenue. Modal spit of total traffic on project corridor is given in table below.

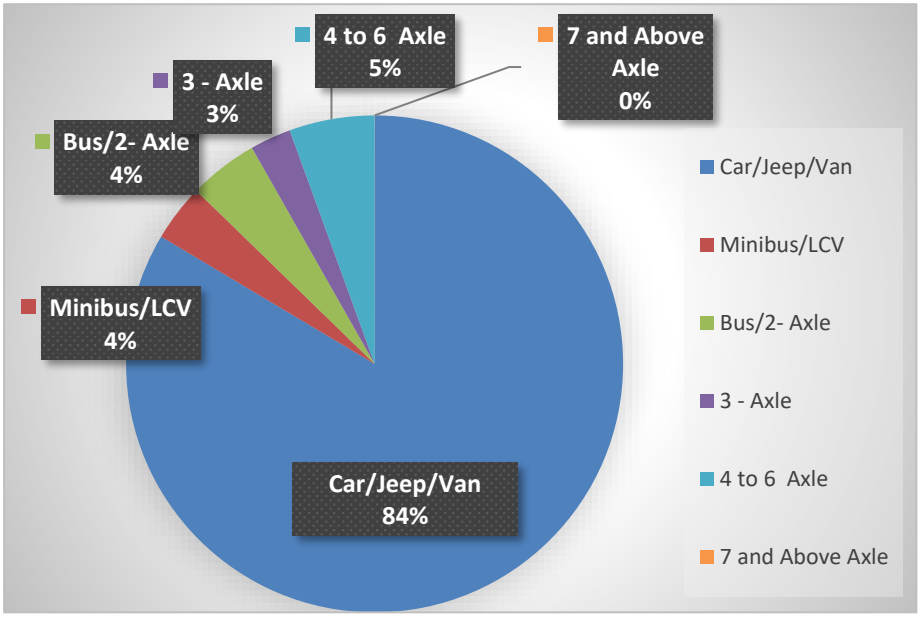


Figure 3-1 : Model Split of Tollable Vehicle

It is observed that car traffic forms about 84% of total traffic at toll plaza locations while multi axle commercial vehicles are about 9% of total traffic. Truck / Bus and LCV share about 3% and 4% of traffic volume respectively.

CHAPTER 4

GROWTH OF TRAFFIC ON PROJECT HIGHWAY

4.1 Introduction

Traffic is generated and grows as a result of the interplay of a number of contributory factors such as National economy, Government policy, socio-economic conditions of the people, and changes in land uses along the project corridor precincts etc. Further these factors have uncertainties associated with them. Forecasts of traffic have, therefore, to be dependent on the forecasts of factors such as population, gross domestic product (GDP), vehicle ownership, per capita income (PCI), agricultural output, fuel consumption etc. Future pattern of change in these factors can be estimated with only a limited degree of accuracy and hence the forecasting of future traffic levels cannot be precise. The success of any road project with private sector participation hinges on the accuracy and robustness with which the future traffic and revenues are estimated.

Further, future traffic forms the basis of the design of the transportation infrastructure facility and also determines the viability of the project. The following section deals with different methods, techniques, and considerations used in traffic forecast for the project under study.

4.2 Secondary Data Collection

In addition to the above-mentioned traffic surveys, secondary data was also collected from the sources wherever the data available. This data is effectively used to determine and estimate past trends of growth and future pattern. Following secondary data was collected for study:

1. Vehicle registration data of Andhra Pradesh, Telangana, Karnataka and Maharashtra as these are the state which make most of the influence om traffic.
2. Data of Indian national GDP (Gross Domestic Product), NSDP (Net State Domestic Product) of Andhra Pradesh, Telangana, Karnataka and Maharashtra.
3. Estimated population data of Andhra Pradesh, Telangana, Karnataka and Maharashtra.

This data is utilized in the study to estimate the growth factors along the project corridor. Relevant part of secondary data is placed at Annexure.

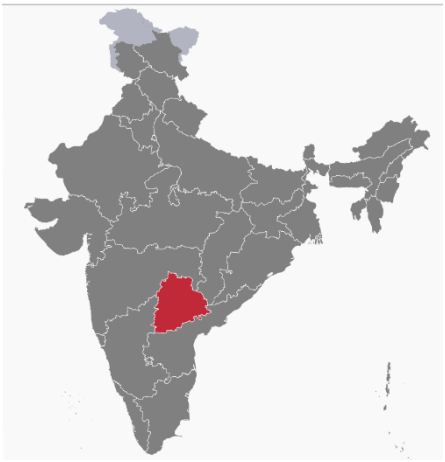
4.3 Development in the Project Influence Area

The **Outer Ring Road**, officially as, **Jawaharlal Nehru Outer Ring Road** and abbreviated as, **O.R.R.**, is a 158 kilometre, 8-lanes ring road expressway encircling Hyderabad, capital of the Indian state of Telangana. The expressway is designed for speeds up to 100 km/h. A large part, 124 km (covering urban nodes viz., Hi- Tech city, Nanakramguda Financial District, Rajiv Gandhi International Airport, IKP Knowledge park, Hardware Park, Telangana State Police Academy, Singapore Financial District, and Games village) of the 158-km was opened by December 2012. Rest of the stretch was opened by 2016. Thus from 2016 onwards ORR is under operation and has contributed to great extent not only to ease out traffic flow but also has influenced the development of Hyderabad around ORR. Most of the development which are happening on periphery of Hyderabad take positioning with respect to NORR into account. It

gives an easy connectivity between NH 44, NH 65, NH 161, NH 765 and NH 163 from Hyderabad to Vijayawada and Warangal as well as state highways leading to Vikarabad Nagarjuna Sagar and Karimnagar /Mancherial. The Outer Ring Road also helps in reducing the travel time from Rajiv Gandhi International Airport to cities like Nizamabad & Adilabad as it connects to NH44. The expressway is fenced, and 33 radial roads connect it with the Inner Ring Road.

Telangana State

Telangana is one of the fastest-growing states in India posing average annual growth rate of 13.90% over the last five years. Telangana's nominal gross state domestic product for the year 2020-21 stands at ₹12.05 lakh crore (US$170 billion).



Service sector is the largest contributor to the Telangana's economy with a share of about 65% in the year 2018-19. Growth in services has largely been fuelled by IT services with the State holding leading position in IT & ITeS in the country in terms of production and exports.

Traffic growth on NORR would be synonym with growth of Hyderabad. Hence various aspects of Growth of Hyderabad are relevant and discussed as under.

Hyderabad.

Hyderabad is among the top 10 fastest growing cities in the world, according to the World Economic Forum (WEF). Interestingly, all 10 of the fastest-growing cities in the world are in India. And, going by Gross Domestic Product (GDP) growth, this is likely to be the case till 2035, says research institute Oxford Economics. Hyderabad, with an 8.47% GDP growth, holds the second place among metropolitan cities in India.

By some estimates Hyderabad will be the second-fastest growing city in the world. It is just marginally behind Bengaluru, and should become number one (in India), since the projections are on a time-series trajectory, and Hyderabad's actual growth has been geometrically exponential.

A city with rich history and magnificent olden structures is slowly became host to some of the most modern buildings, a blend of both the bygone kingdoms and the new corporate revolution. To boost Hyderabad's development, the then Chief Minister of Andhra Pradesh Chandrababu Naidu successfully bid for the National Games in 2002 and the Afro Asian games in 2003, along with a strong bid to create a Formula One circuit in the state. These endeavours led to the

development of efficient sports infrastructure in Hyderabad. The Indian School of Business (ISB) and IIT were also established in a similar endeavour to boost modern education.
The resulting urban agglomeration now has an area of over eight hundred square kilometres and consists of Hyderabad and other municipal entities surrounding it. The city population is expected to exceed one hundred and thirty-six lakhs in 2021.

As development picked up pace at the end of the nineties, the old city has declined, and the newer peripheral regions started to gain prominence. By 2001, the city was the sixth largest urban agglomeration in India; and during the last decade it registered a growth of 32%.

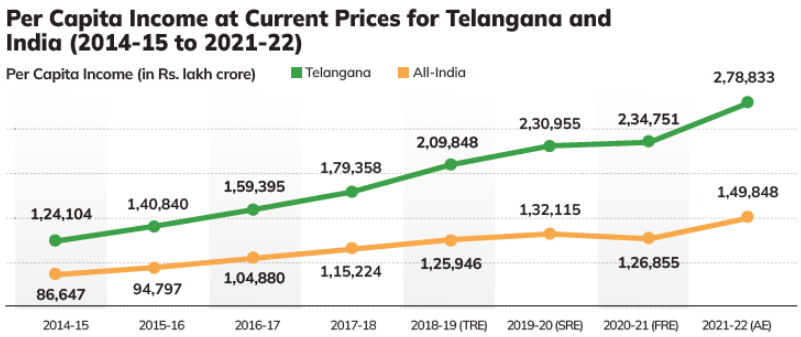
Developed land on the outskirts of Hyderabad has been utilised for large scale development just outside the Cybercity. The city itself is on its way to become the leader in e-governance. It has been predicted about Hyderabad that it would become a leading information-based society in the next two decades.

Rapid industrialisation has led to the increase in land prices while simultaneously driving the demand for infrastructure development. Commercial growth, therefore, has been concentrated in the Municipal Corporation of Hyderabad area while the metropolis has experienced pressure in residential growth. As workers prefer proximity to the workplace, their daily commute has resulted in the improvement of the road networks as well.

Growth of IT Sector

Ever since the 1990s, Andhra Pradesh had been promoting itself as a world class IT location and Hyderabad City, as a result, has managed to attract investment from companies such as IBM, Oracle, and Microsoft. The Hyderabad Technology Park has seen hundreds of IT companies registering themselves as soon as spaces are available. The objective of this elaborate promotional program has been to attract the right number of companies which

together would form a critical mass for the city to develop as a high-tech city which would rub shoulders with Silicon Valley and Malaysia's Multimedia Super Corridor. During the nineties, several initiatives were taken up by the state government towards promotion of IT sector. These included setting up of IT training institutes, initiatives in e-governance, development of a Hi-Tech city and promoting the Software Technology Park as a preferred destination for private sector companies. Steps were then taken even further to allow the development of a Hardware Park, creation of a knowledge Park, and establishment of a financial district. The state government started tapping resources to invest in the biotechnology sector and, as a first step towards making the region specialized, a Biotech Park was introduced.



The result of these efforts can be seen in the form of various parks. One called Gnome Valley has been set up to focus on research and training in biomedicine for industrial production. Within this valley are also established the IKP Knowledge Park and Alexandria Knowledge Park with areas of two hundred acres and three hundred acres respectively. These parks cover Ameerpet, Medchal, Uppal, and a number of other parts of the Hyderabad Metropolitan region. The thrust areas of research here include vaccines, bioinformatics, seeds etc. Some of the biggest global pharmaceutical and research firms have setup their offices here. Similarly, a Hardware Park of one thousand seven hundred acres in area is also being developed.

The economic activities particularly related to manufacturing and associated activities, are concentrated in Ramachandrapuram, Patancheru, Balanagar, Uppal, Cherlapalli, Jeedimetla, and Moula Ali. These developments, on one hand, contributed to the economic growth of the city and, on the other hand, are responsible for the spatial growth, particularly the growth of the surrounding areas.

Development of Relevant Infrastructure

With expansion in infrastructure capabilities and progressive state policy framework, Hyderabad is not only providing strong impetus to its leading industries: IT/ITES, pharmaceuticals but also laying strong foundation for its growth sectors: aerospace, automotive and electric vehicle, textiles and emerging technologies. I strongly believe that the metropolis is on an ambitious journey to become one of the most diverse business hubs of the world by 2035.

The city's infrastructure is providing for evolving needs of massive commercial growth. Hyderabad's metro rail is India's second longest operational metro network after the Delhi Metro. In phase 1, 67 kilometers (kms) are operational of planned 72 kms. The route covers three major traffic corridors through 60 stations. The next phase aims to connect airport at Shamshabad with major economic zones of the greater Hyderabad region. Another groundwork

capability worth mentioning is logistics parks. The Hyderabad Metropolitan Development Authority has developed 6 logistics parks in last 5 years and 8 more to come by 2025. The facilities are catering to over 340 logistics companies and 100 major manufacturing firms, making Hyderabad one of the largest logistics hubs of the country. In addition to the above, the metropolitan offers second cheapest office rentals amongst the major cities of India, adding to cost effectiveness of doing business in the city. In 2021, Hyderabad accounted for 36% country's share of office spaces.

It also holds the badge of most liveable city in the country for last five consecutive years as per Mercer's quality of living index. The city attracts talent pool from across the nation as well as from other world economies due to its notable social infrastructure: healthcare, education, housing, recreation, and personal freedom.

Telangana is a state known for its robust economic initiatives and trade friendly policies since its inception in 2014. A key example is state's TS I-pass industrial policy that is best in the country. It provides single window application clearance process capped at 15 days for all capital investment projects. This policy enabled Amazon to get clearance in just 11 days for its largest campus in the world to be built in Hyderabad. The state is poised to keep pace with technological advancements and thus first in India to launch actionable framework for AI and other emerging technologies. It has partnered with NASSCOM to formulate and execute the strategy. Telangana has taken many sectors specific initiatives that has improved ease of doing business and garnered foreign direct investments in the metro. Telangana's Electric vehicle and energy storage policy has aided Fiat Chrysler to set up global digital hub in Hyderabad. With availability of largest commercial land bank in the country, Telangana offers 1.45 lakhs acres of land to investors. This has enabled aerospace companies to set up production facilities in the city. Boeing and Safran have announced new manufacturing lines in Hyderabad. Airbus is setting up helicopter manufacturing plant in Shamshabad and committed to investment of INR 2500 Crores. The city ranked first in the Aerospace cities of the future in 2020-21.

The city's primary sectors, IT and pharma, continue to grow and bring in public and private investments. Google is investing INR 1000 Crores in its biggest facility outside US. This commercial space is set to be functional in Hyderabad by early 2023 and will be home to 13000 employees. The metro's Genome Valley is witnessing Biopharma scale-up facility, a public-private partnership between the state and Cytiva life sciences. The state is also developing 800-acre new pharma park in Rangareddy district.

Though Hyderabad faced the heat in 2020, the pandemic and subsequent lockdown compelled considerable layoffs in IT and SME sectors. Office space absorption rate declined, strongly

indicating many firms shutting shops or reducing operations in the city. Few economic experts questioned Hyderabad's potential as a growing business hub. However, I find the argument short sighted and reactive. The city strongly stood the test of time, India's first ICMR approved RT-PCR kits and first indigenously developed vaccine for COVID-19 came from Hyderabad. In 2021, the city's economy started showing green shoots. It contributed to 30% of the pharmaceutical production of the country. It also gained momentum as the "Vaccine capital of the world" with 4 out of 5 leading vaccine manufacturers in India already present in Genome Valley. The same year, the city also had the highest net office absorption rate (of existing stock) at 20% and highest office completion rate in the country. It also witnessed lowest office space vacancies: 7.1% in comparison to its other metro counterparts.

Hyderabad's strong economic fundamentals with respect to infrastructure, social capital and economic policies, equip it to meet future challenges of global economies. It is poised for long-term growth and on a progressive path to become world's prominent commercial hub. With current GDP of $74 billion, it is projected to move forward with 8.47% CAGR and set to deliver as $201.4 billion economy by 2035.

IT INCUBATION CENTERS – HYDERABAD

Hyderabad has witnessed a very growth of IT incubation centers. Some are summarized below.

- Hyderabad is recognised as the leading IT hubs globally; the city houses more than 1500 IT and ITES companies.
- IT SEZs -53
- State contributes 11.6% of India's IT exports in 2019-20
- Accounts for 23.5% of India's IT export growth 2019-20
- T-HUB Phase-II, Hyderabad Built-up Area: 3.72 L sft; India's Largest start-up Incubator
- Plug & play facility in E city Built-up Area: 1.8 lakh sft with an integrated testing & training facility.
- T-Works, Hyderabad Built-up Area: 78,000 sft – Phase 1; India's largest prototyping facility
- Image Tower, Hyderabad Built-up Area: 460,000 sft A one of its kind plugs & Play Facility for Animation and Gaming companies. Expected completion: March 2023
- Incubation Centre, Warangal(U) Built-up Area: 15000 sft Plug & Play Facility for startups.

LIFE SCIENCES - HYDERABAD

Life Sciences sector continues to continue to consolidate the position of the State as one of the most important life sciences hubs in the world.

International Companies including **Sandoz Research and Development Laboratories**, **Chemo India Formulations**, **Jamp India Pharmaceutical**, **Ferring Laboratories** and **Tokyo Chemical Industry**, among others have established their footprint in the State.

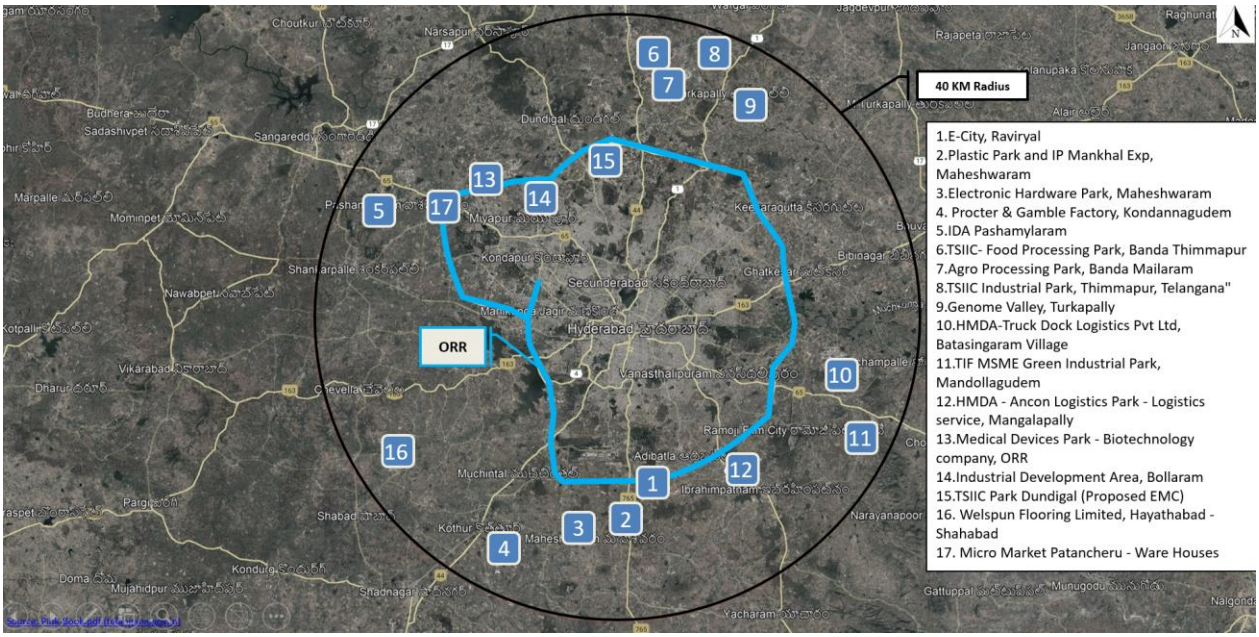
Telangana is the leading contributor of Pharma Exports from the Country since 2015-16 (28% share in FY 2020-21)

Hyderabad Pharma City: world's largest integrated pharma cluster spread over approx 19,333 acres. The cluster has been recognized as National Investment and Manufacturing Zone (NIMZ) by Government of India, given its national and international importance.

Genome Valley: Built over 1200 acres in three phases, more land is being added to the cluster along with more ready built labspace (more than 2 million square foot) Genome Valley houses more than 200 companies with a scientific workforce of about 15,000 professionals.

Medical Devices Park: Spread across 302 acres, 105 acres have already been allotted (more than 60 percent of the allottable land) to 40 companies. The park will house Asia's largest Stent manufacturing facility established by Sahajanand Medical Technologies

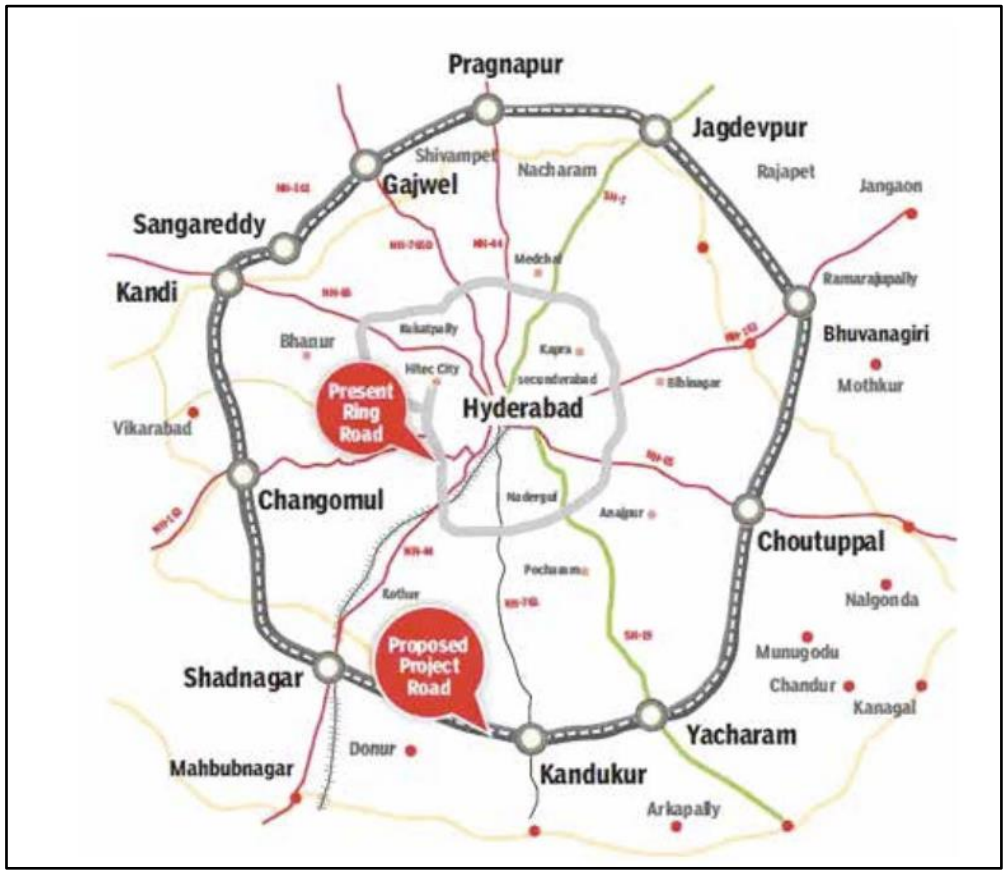
There is considerable industrial development on peripheries of Hyderabad as well. ORR being a fast connectivity has provided boost to such development. Following figure marks such developments on periphery of Hyderabad.



All above discussion indicates that Hyderabad is going to witness a good growth in near decade and would sustain on that.

Proposed Regional Ring Road (RRR)- Hyderabad

- An 8-lane expressway stretched over 340 km of length with a project cost Rs 17,000 crore is proposed to strengthen the existing roads connecting major national highways passing through Telangana, easing the regional road connectivity.
- The road will be developed at par with international standards over a stretch from Sangareddy to Kandi via Narsapur, Toopran, Gajwel, Jagdevpur, Bhongir, Choutuppal, Ibrahimpatnam, Chevella and Shankarapalli
- The RRR will have amenities such as parking, food courts, toilets, parks, children play area, malls, and drinking water facilities.
- The RRR will connect the surrounding districts with Hyderabad and to the Industrial Clusters, covering 40 of the region's population and will link 20 towns with National Highways.



Source: Pink-Book.pdf (telangana.gov.in)

As Proposed Regional Ring Road (RRR) would have faster connectivity to all important urban/commercial establishment, development of RRR has potential to alter focus of growth around Hyderabad Metropolitan Region.

4.4 Trend Analysis

Time series data of vehicle Registered in state of concerned states is taken from respective authorized websites and the same is used as the base data for analysis of growth.

Growth of vehicle traffic depends on type of vehicle. Traffic growth on any highway typically depends on number of economic parameters like

- Per Capita Income
- Net State Domestic Product (NSDP)
- Population

Elasticity model of growth projection is one of the most widely acceptable methods for traffic forecast. Same is recommended in IRC: 108-2015-Guidelines for Traffic Prediction on Rural Highways.

Following can be pair of vehicle type and independent variable for elasticity modelling of growth.

- Car / Jeep – Par Capita Income
- Bus / Minibus – Population
- Goods Vehicle – NSDP

Same is used in analysis below.

Vehicle Registered at the end of financial year in the state of Delhi, Haryana and Uttar Pradesh is given in tables below and also compared with the growth rate achieved in terms of vehicle registered on all India bases.

4.5 Estimation of Traffic Demand Elasticity

Elasticity of traffic demand is defined as the rate at which traffic intensity varies due to change in the corresponding indicator selected. Hence, in order to estimate the elasticity of traffic demand, it is necessary to establish the relationship between the growth in number of given categories of vehicle with one of the economic variables considered, such as NSDP, per capita income and population growth.

As per IRC: 108-1996 the model for estimating elasticity index for the project corridor is of the following form and is as given below:

$$Log\ (P) = k\ x\ Log\ (EI) + A$$

Where,

P = *Number of Vehicles (Mode wise)*

EI = *Economic Indicator*

A = *Regression constant*

k = *Elasticity coefficient (Regression coefficient)*

The elasticity for car and bus (passenger vehicles) is calculated based on the Population and Per Capita Domestic Product (PCDP) and the elasticity for trucks is calculated based on the Net State Domestic Product (NSDP). The graphical presentation of the elasticity is presented in figures below:

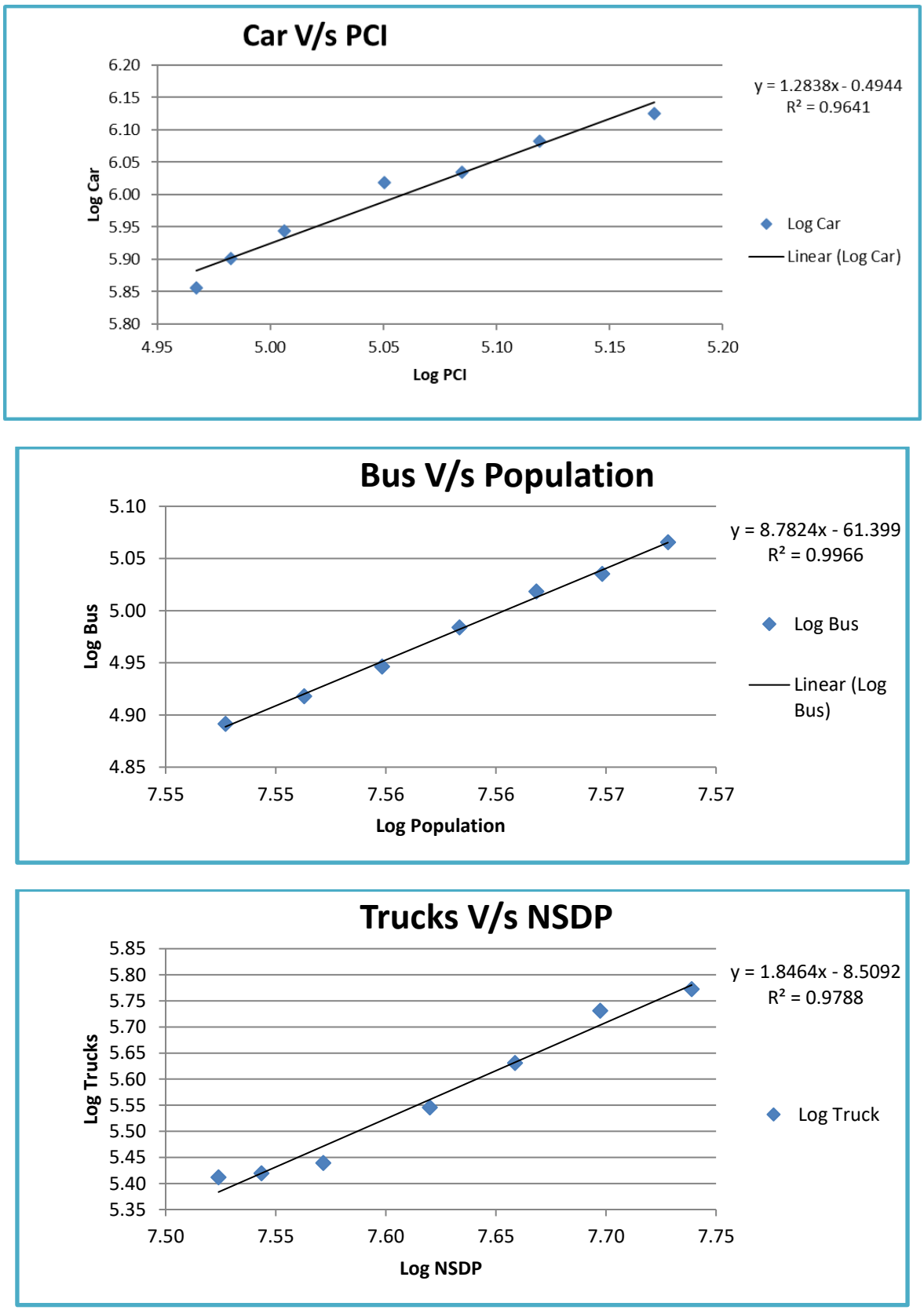
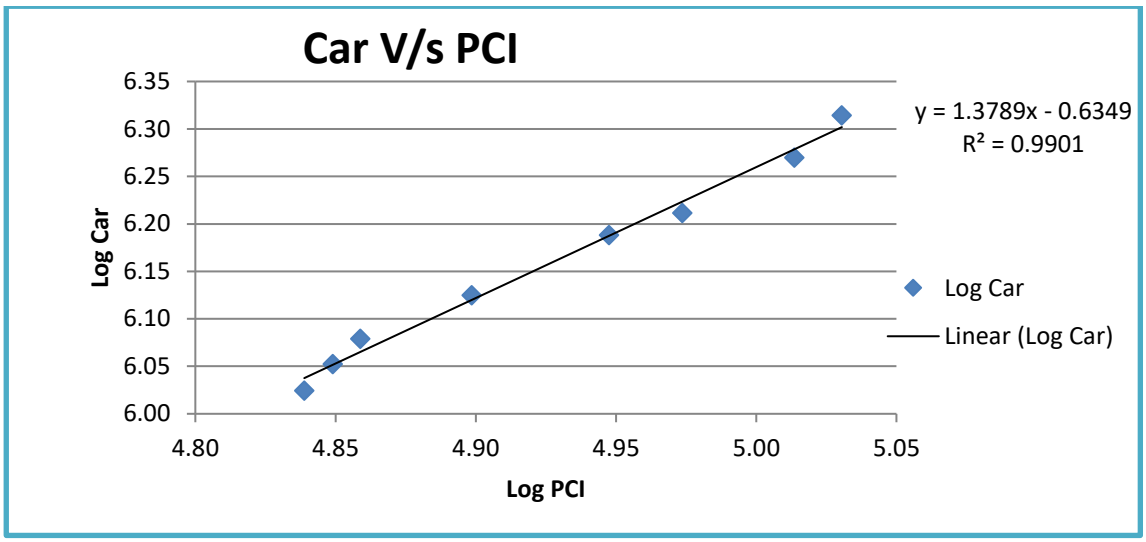
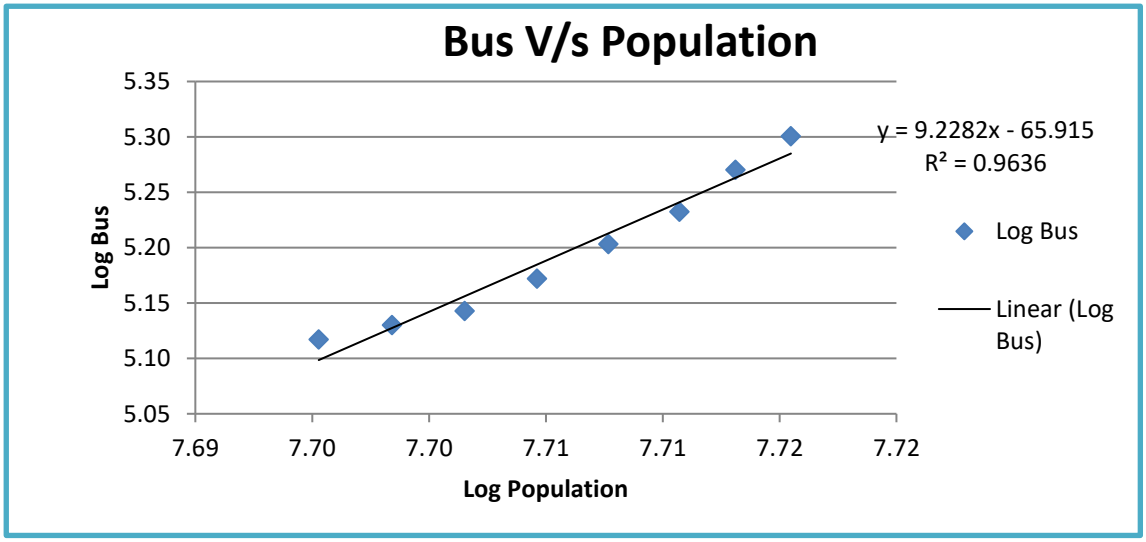


Figure 4-1: Elasticity by Graphical Extrapolation for Telangana





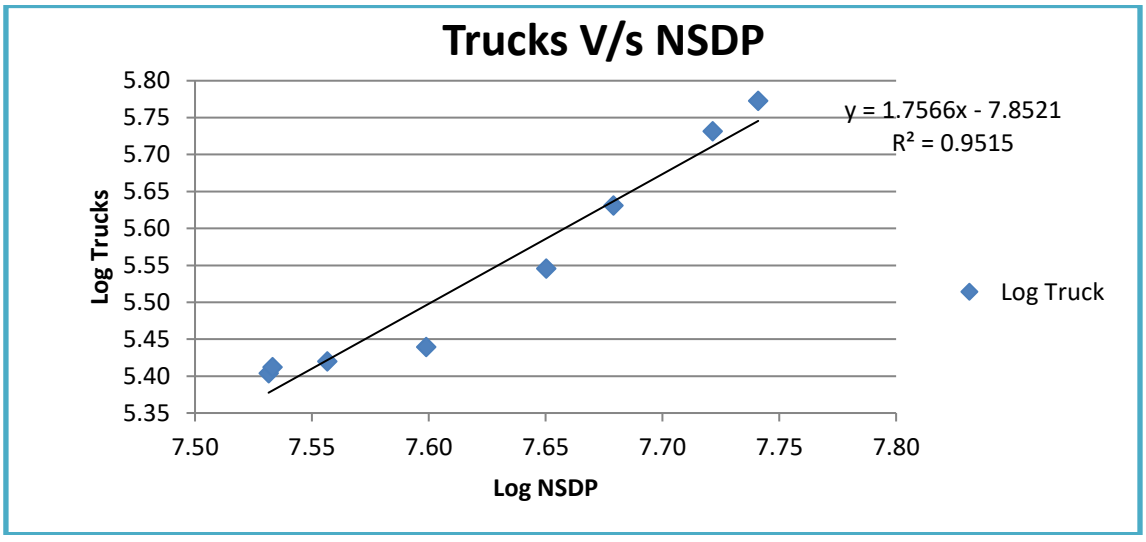
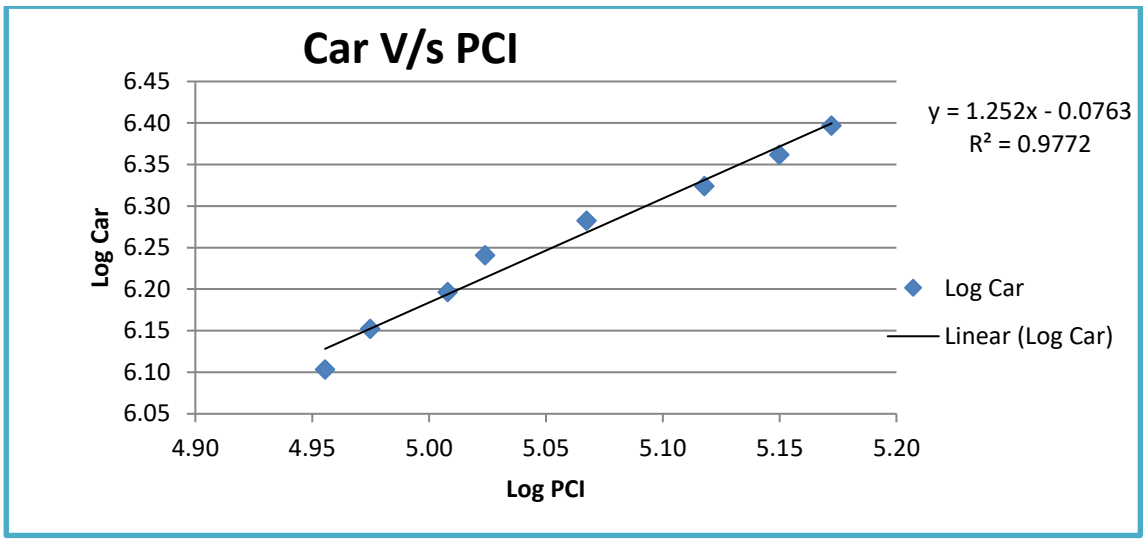
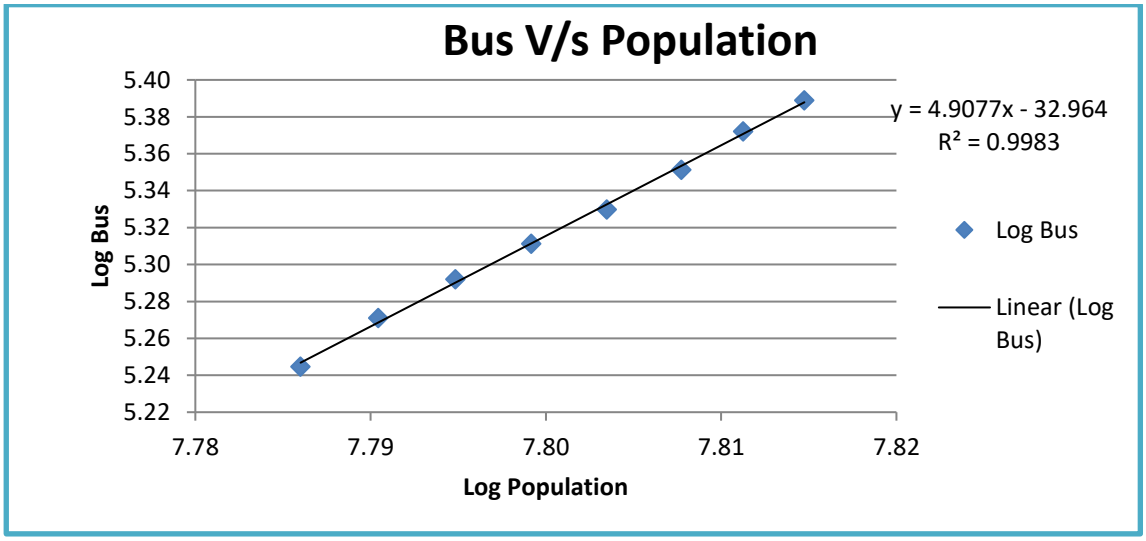


Figure 4-2: Elasticity by Graphical Extrapolation for Andra Pradesh





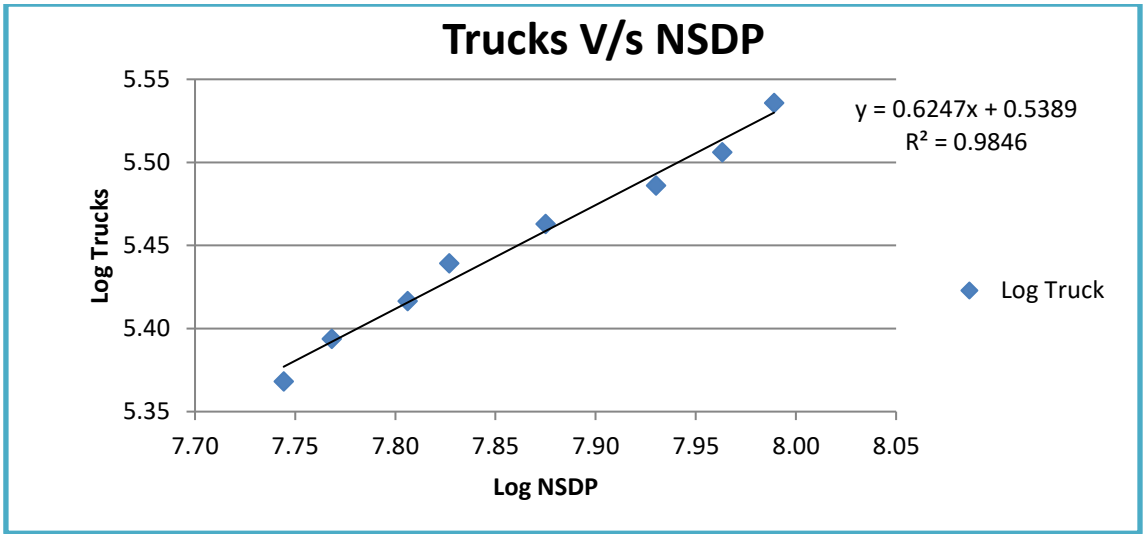


Figure 4-3: Elasticity by Graphical Extrapolation for Karnataka

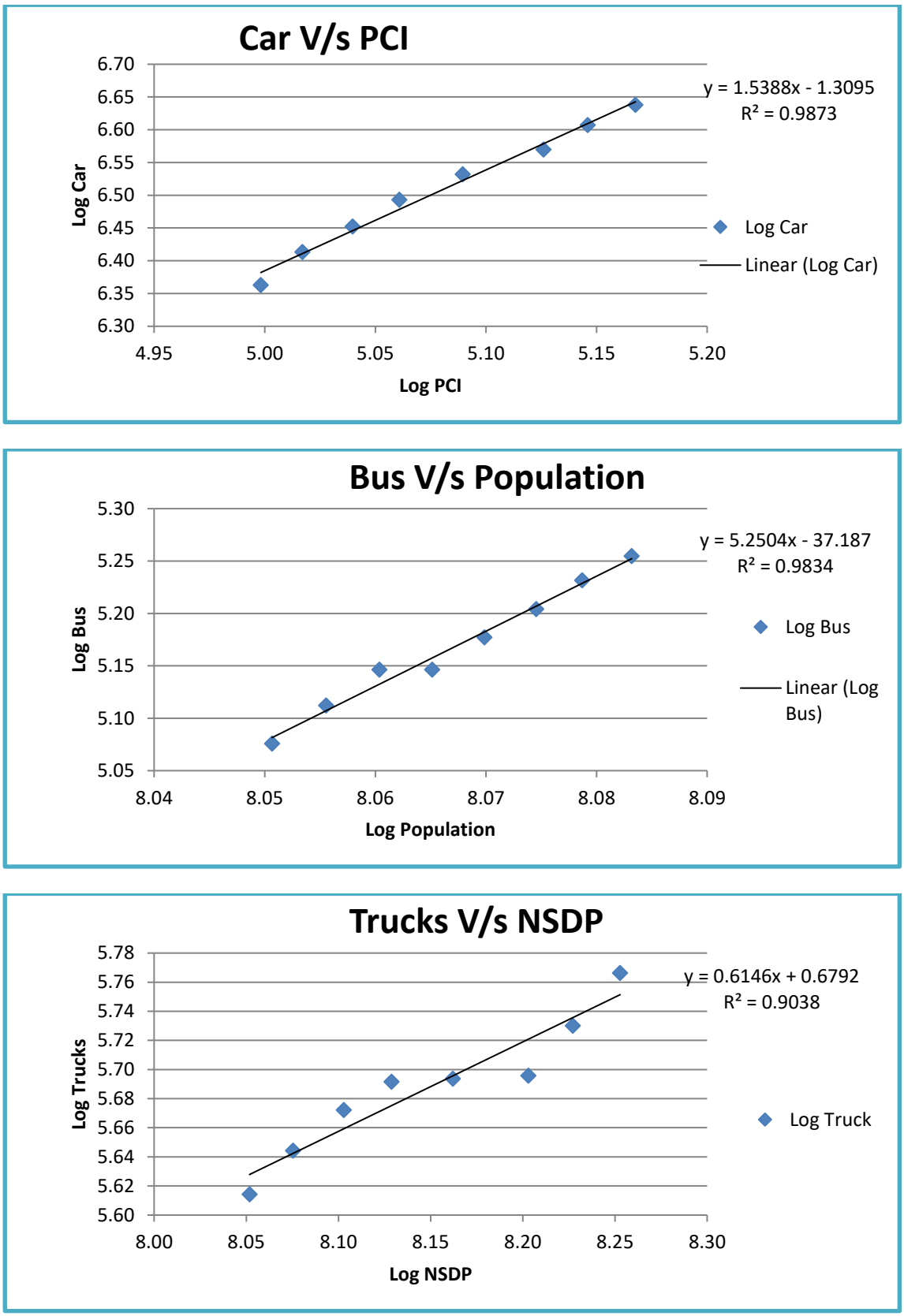


Figure 4-4: Elasticity by Graphical Extrapolation for Maharashtra

It shall be noted that the growth rates for various modes are not same as they are influenced by different parameters. In other words, whilst the growth of the passenger vehicles (cars, Jeeps, two wheelers and even buses) could be attributed to the growth in the per capita income,

population growth and vehicle registration growth, the growth of the LCV, Trucks, Multi Axle Trucks are found to be influenced with factors including the industrial production and growth of the National or state Domestic products.

For establishing the elasticity equations, details regarding NSDP/GDP, per capita income, population growth and registered vehicles in the state have been collected for the past few years and are presented in the Annexure. Based on this data, Log-Log regression curve fits have been developed for each type of vehicle with the most suitable parameters and the elasticity values obtained.

The results of these analyses for the good fit as reflected by R^2 values are presented in the table below.

Table 4-1 : Results of Regression analysis

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient
TELANGANA	Car/Jeep	PCI	y = 1.2838x - - 0.4944	R² = 0.9641	1.2838
	Bus	Population	y = 8.7824x - - 61.3985	R² = 0.9966	8.7824
	Truck	NSDP	y = 1.8464x - - 8.5092	R² = 0.9788	1.8464
ANDRAPRADESH	Car/Jeep	PCI	y = 1.3789x - - 0.6349	R² = 0.9901	1.3789
	Bus	Population	y = 9.2282x - - 65.9151	R² = 0.9636	9.2282
	Truck	NSDP	y = 1.7566x - - 7.8521	R² = 0.9515	1.7566
KARNATAKA	Car/Jeep	PCI	y = 1.252x - - 0.0763	R² = 0.9772	1.252
	Bus	Population	y = 4.9077x - - 32.9642	R² = 0.9983	4.9077
	Truck	NSDP	y = 0.6247x - 0.5389	R² = 0.9846	0.6247
MAHARASHTRA	Car/Jeep	PCI	y = 1.5388x - - 1.3095	R² = 0.9873	1.5388
	Bus	Population	y = 5.2504x - - 37.1874	R² = 0.9834	5.2504
	Truck	NSDP	y = 0.6146x - 0.6792	R² = 0.9038	0.6146

However, considering factors such as proposed developments and other influencing economic factors moderated growth factors as listed below are considered. Change all tables.

4.6 Basis for arriving at growth rates.

Arriving at growth rates for each mode on particular road stretch is always a complex issue. Transportation planners before arriving at such growth rates have to have a comprehensive understanding of the various disciplines such as land use, economy, automobile industry, anticipated changes in the region, traffic, and other related issues.

Giving due consideration to all the factors elaborated in the previous sections, three growth scenarios are suggested with a wide range of growth rates which are resilient and ready to respond to the changes in socio-economic conditions which are likely to influence the project corridor.

4.7 Growth of Economy and Projection of GDP in India and States

ECONOMY

After witnessing a slowdown during 2011-12, the economy recovered in 2013-14, and a high growth rate of GDP was recorded up to 2018-19. Pandemic of COVID-19 impacted all economies of world including India up to year 2021-22. Following figure show trend of GDP growth in India.

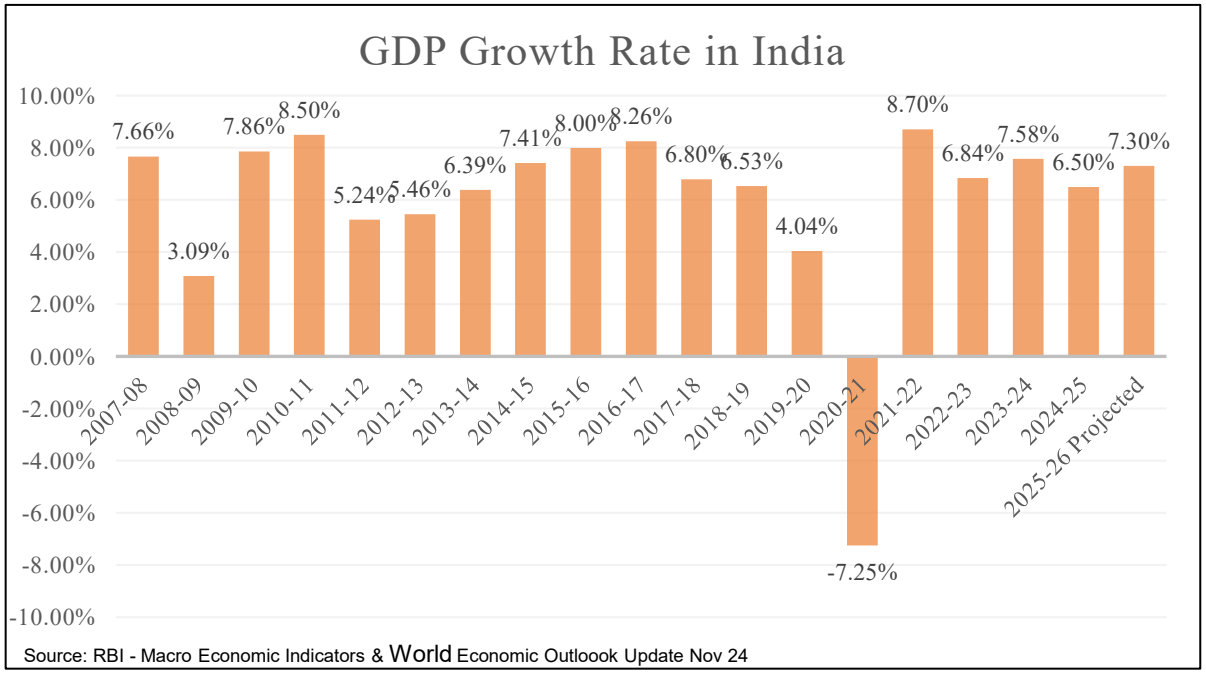


Figure 4-5 : Growth of GDP in India

FY 2017-18 recorded a growth of 6.7% which had a slight impact of GST and demonetization. Indian economy appears on recovery path with estimated growth of 6.8% in FY 2018-19. The government took major policy decisions including tax infrastructure reforming, banking sector improvement and ease of doing business.

In post COVID-19 scenario, in year 2022-23 and 2023-24 India registered an impressive growth of 7% to 7.5%. In last year despite global slow down due to Russia-Ukraine war and Gaza crises, India grew at good rate of 7%(Estimated).

Indian economy is now on good growth path and all major institutions including IMF / ADB have estimated growth of Indian Economy to peg around 6.5% to 7% in coming years.

Table 4-2 : Growth of Independent Variables

Assumed Growth Rate of Independent Indicators							
Indicator	**2026-2028**	**2029-2033**	**2034-2038**	**2039-2043**	**2044-2048**	**2049-2053**	**2054-2058**
PCI	7.71%	6.71%	5.00%	4.50%	4.00%	3.50%	3.50%
Population	0.76%	0.71%	0.66%	0.61%	0.56%	0.51%	0.51%
NSDP	8.15%	6.15%	4.15%	3.15%	2.15%	1.15%	1.15%

4.7.1 Recommended Growth Rates of Traffic

Based on the above analysis and after giving due consideration to the entire listed factors, the following overall growth rates are recommended for each category of vehicle are as under.

Table 4-3: Recommended Growth Rates Pessimistic case

Category / Year	FY 2026-2028	FY 2029-2033	FY 2034-2038	FY 2039-2043	FY 2044-2048	FY 2049-2053	FY 2054-2058
Car/Jeep/Van	7.06%	5.93%	3.88%	3.02%	2.26%	1.61%	1.61%
Bus	4.92%	4.51%	4.12%	3.74%	3.37%	3.01%	3.01%
Minibus	4.92%	4.51%	4.12%	3.74%	3.37%	3.01%	3.01%
LCV	3.27%	2.28%	1.16%	0.73%	0.35%	0.04%	0.04%
2- Axle	3.27%	2.28%	1.16%	0.73%	0.35%	0.04%	0.04%
3 - Axle	4.35%	3.04%	1.64%	1.05%	0.55%	0.13%	0.13%
4 to6 Axle	4.35%	3.04%	1.64%	1.05%	0.55%	0.13%	0.13%
7 and Above Axle	4.35%	3.04%	1.64%	1.05%	0.55%	0.13%	0.13%

Table 4-4: Recommended Growth Rates Most likely case

Category / Year	FY 2026-2028	FY 2029-2033	FY 2034-2038	FY 2039-2043	FY 2044-2048	FY 2049-2053	FY 2054-2058
Car/Jeep/Van	7.31%	6.18%	4.13%	3.27%	2.51%	1.86%	1.86%
Bus	5.17%	4.76%	4.37%	3.99%	3.62%	3.26%	3.26%
Minibus	5.17%	4.76%	4.37%	3.99%	3.62%	3.26%	3.26%
LCV	3.52%	2.53%	1.41%	0.98%	0.60%	0.29%	0.29%
2- Axle	3.52%	2.53%	1.41%	0.98%	0.60%	0.29%	0.29%
3 - Axle	4.60%	3.29%	1.89%	1.30%	0.80%	0.38%	0.38%
4 to6 Axle	4.60%	3.29%	1.89%	1.30%	0.80%	0.38%	0.38%
7 and Above Axle	4.60%	3.29%	1.89%	1.30%	0.80%	0.38%	0.38%

Table 4-5: Recommended Growth Rates Optimistic case

Category / Year	FY 2026-2028	FY 2029-2033	FY 2034-2038	FY 2039-2043	FY 2044-2048	FY 2049-2053	FY 2054-2058
Car/Jeep/Van	7.56%	6.43%	4.38%	3.52%	2.76%	2.11%	2.11%
Bus	5.42%	5.01%	4.62%	4.24%	3.87%	3.51%	3.51%
Minibus	5.42%	5.01%	4.62%	4.24%	3.87%	3.51%	3.51%
LCV	3.77%	2.78%	1.66%	1.23%	0.85%	0.54%	0.54%
2- Axle	3.77%	2.78%	1.66%	1.23%	0.85%	0.54%	0.54%
3 - Axle	4.85%	3.54%	2.14%	1.55%	1.05%	0.63%	0.63%
4 to6 Axle	4.85%	3.54%	2.14%	1.55%	1.05%	0.63%	0.63%
7 and Above Axle	4.85%	3.54%	2.14%	1.55%	1.05%	0.63%	0.63%

Traffic and revenue have been worked out on the basis of the above growth, and some are presented in subsequent chapters of the report.

CHAPTER 5

FORECAST OF TOLL REVENUE

5.1 General

This chapter presents the estimates of traffic forecast, tolling categories, tolling rate calculations and toll revenue of the project.

5.2 Toll Rate Guidelines

Toll rates at NORR are governed by "Nehru Outer Ring Road Hyderabad (Toll) Rules -2012 issued by Municipal Administration and Urban Development Department / Hyderabad Metropolitan Area Development Authority and Hyderabad Growth Corridor Limited. This policy was recently amended by circular dated 12th January 2023.

The policy is similar to NHAI toll rate policy. Basic rate and rate revision policy same as NHAI Policy. The basic per km rate however have been enhanced for categories as under.

Sl. No.	Vehicle types	Enhancement factor
1.	Cars/ Jeep/ Van/ LMV/ SUV/ MPV	50%
2.	LCV/ Mini Bus	50%
3.	Bus/ 2-axle Truck	27%
4.	3-axle commercial vehicles	50%
5.	Heavy Construction Machinery/ Earth Moving Equipment/ 4/5/6 axle trucks	50%
6.	Oversized vehicles (7 or more axles)	50%

Figure 5-1: Base Rate (Per Km) enhancement as per NORR amendment Policy.

In amendment of policy provision of penalty for entering to fast tag lane without having valid fast tag and also for overloading of vehicles has been added. Penalty for fast tag lane violation is double the normal fee and overloaded vehicles would have to pay 10 times the toll rate for category. These are similar to NHAI policy.

5.4 Discounts

As per the Fee Notification (Schedule-R) fee discounts shall be provided to project users as under

- Local discount for non-commercial vehicle owner with in 20 km of toll plaza is not included in schedule M.

5.4 Travel Passes

As per the Fee Notification (Schedule-R) fee discounts shall be provided to project users as under

1. Monthly Pass: For frequent user's monthly pass would have not more than 50 trips per month at 2/3rd rate

2. Daily Pass (for Return Trip): A 75% discount will be offered on the return trip.
3. Single Journey: Full single journey toll would be charged to this category of vehicles who are infrequent travellers or whose frequency does not yield any discount from the above categories.

5.2 Segmentation of traffic

Journet type traffic segmentation has been provided by Concessionaire for all toll plazas. Same has been used for future revenue working as well.

5.2 Estimation of Toll Rates

As per the notification issued for toll policy the following Base rate of fee for the categories mentioned are applicable as base rate.

Table 5-1 : Base Toll Rates 2007 - 08

Type of Vehicle	Base Rate of Fee / Km (in Rs.)
Car, Jeep, Van or Light Motor Vehicle	0.65
Light Commercial Vehicle, Light Goods Vehicle or Minibus	1.05
Bus or Truck (2 Axle)	2.2
Three Axle commercial vehicles	2.4
Heavy Construction Machinery (HCM) or Earth Moving Equipment (EME) or Multi Axle Vehicle (MAV) (4-6 axles)	3.45
Oversized Vehicle (seven or more axles)	4.2

These rates are then modified for as per procedure provided in guidelines of notification taking into account factors listed below.

- These base rates have been enhanced by factors as mentioned in amendment to NORR Toll Policy dated 12th January 2023.
- Annual revision of fee rate - @3%
- Application of WPI
- Factors of inflation / growth have been incorporated as per Schedule R. WPI are available up to the year 2025-26.

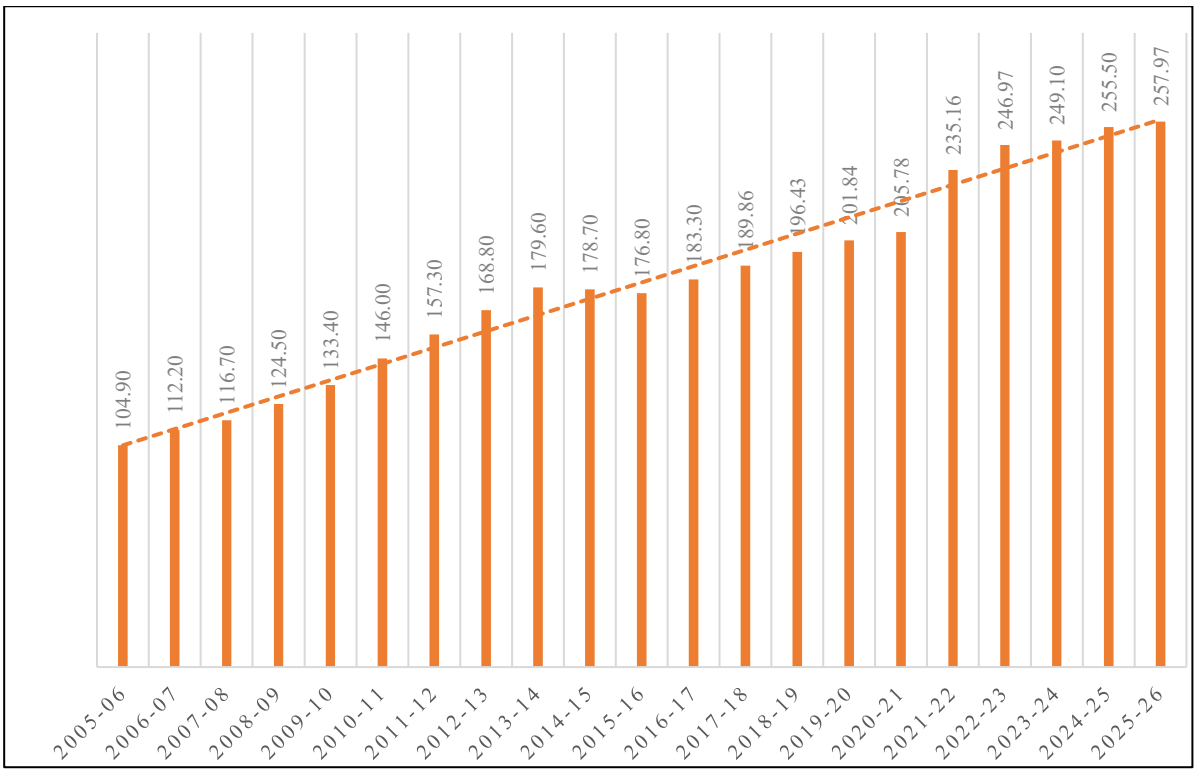


Figure 5-2: Historical Rate of WPI Inflation in India

The wholesale price index (WPI) and the inflation rate in the past are presented in Table below.

Table 5-2 : Historical WPI value and Growth Inflation

December of year	2021	2022	2023	2024	2025	Avg.
WPI	235.2	247.0	249.1	255.5	257.97	
Inflation	14.27%	5.02%	0.86%	2.57%	0.96%	4.74%

WPI of December 2025 is posted on ministry site which is shows 0.96% inflation from the previous year. Same has been applied for FY 2026-27.
The average WPI inflation over the period FY 2021 to FY 2025 works out to approximately 4.74%, reflecting inflationary cycles across both high and low inflation years. Based on this analysis, an annual escalation factor of 4.5% has been adopted for the remaining concession period.

- As fee for structures is included in equivalent length at each toll plaza same shall not be considered separately

Applicable length for journey type at each toll plaza as per schedule M is given as under

Table 5-3 : Tollable Length

Name of IC		Kokapet	Neopolis	Edula nagulapally	Patancheru	Sultanpur	Mallampet	Dindigal/ Saragudem	Medchal	Shamirpet	Keesara	Ghatkesar	Taramptipet	Pedda Amberpet	Bonguluru	Raviryal	Tukkuguda	Pedda Golconda	Shamshabad	Rajendra Nagar	TSPA	Narsingi	Nanakramguda
	F/T	**1**	**1A**	**2**	**3**	**4**	**4A**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**18A**	**19**
Kokapet	**1**	0.000	1.700	11.900	20.500	29.000	35.000	40.700	50.200	59.100	71.000	74.112	65.862	58.962	46.712	39.612	34.112	25.862	19.512	11.262	7.962	3.612	7.252
Neopolis	**1A**	1.700	0.000	10.200	18.800	27.300	33.300	39.000	48.500	57.400	69.300	75.760	67.562	60.662	48.412	41.312	35.812	27.562	21.212	12.962	9.662	5.312	8.952
Edula nagulapally	**2**	11.900	10.200	0.000	8.600	17.100	23.100	28.800	38.300	47.200	59.100	67.650	75.850	70.862	58.612	51.512	46.012	37.762	31.412	23.162	19.862	15.512	19.152
Patancheru	**3**	20.500	18.800	8.600	0.000	8.500	14.500	20.200	29.700	38.600	50.500	59.050	67.250	74.150	67.212	60.112	54.612	46.362	40.012	31.762	28.462	24.112	27.752
Sultanpur	**4**	29.000	27.300	17.100	8.500	0.000	6.000	11.700	21.200	30.100	42.000	50.550	58.750	65.650	75.712	68.612	63.112	54.862	48.512	40.262	36.962	32.612	36.252
Mallampet	**4A**	35.000	33.300	23.100	14.500	6.000	0.000	5.700	15.200	24.100	36.000	44.550	52.750	59.650	71.900	74.612	69.112	60.862	54.512	46.262	42.962	38.612	42.252
Dindigal/ Saragudem	**5**	40.700	39.000	28.800	20.200	11.700	5.700	0.000	9.500	18.400	30.300	38.850	47.050	53.950	66.200	73.300	74.812	66.562	60.212	51.962	48.662	44.312	47.952
Medchal	**6**	50.200	48.500	38.300	29.700	21.200	15.200	9.500	0.000	8.900	20.800	29.350	37.550	44.450	56.700	63.800	69.300	76.062	69.712	61.462	58.162	53.812	57.452
Shamirpet	**7**	59.100	57.400	47.200	38.600	30.100	24.100	18.400	8.900	0.000	11.900	20.450	28.650	35.550	47.800	54.900	60.400	68.650	75.000	70.362	67.062	62.712	66.352
Keesara	**8**	71.000	69.300	59.100	50.500	42.000	36.000	30.300	20.800	11.900	0.000	8.550	16.750	23.650	35.900	43.000	48.500	56.750	63.100	71.350	74.650	74.612	78.252
Ghatkesar	**9**	74.112	75.760	67.650	59.050	50.550	44.550	38.850	29.350	20.450	8.550	0.000	8.200	15.100	27.350	34.450	39.950	48.200	54.550	62.800	66.100	70.450	76.610
Taramptipet	**10**	65.862	67.562	75.850	67.250	58.750	52.750	47.050	37.550	28.650	16.750	8.200	0.000	6.900	19.150	26.250	31.750	40.000	46.350	54.600	57.900	62.250	68.410
Pedda Amberpet	**11**	58.962	60.662	70.862	74.150	65.650	59.650	53.950	44.450	35.550	23.650	15.100	6.900	0.000	12.250	19.350	24.850	33.100	39.450	47.700	51.000	55.350	61.510
Bonguluru	**12**	46.712	48.412	58.612	67.212	75.712	71.900	66.200	56.700	47.800	35.900	27.350	19.150	12.250	0.000	7.100	12.600	20.850	27.200	35.450	38.750	43.100	49.260
Raviryal	**13**	39.612	41.312	51.512	60.112	68.612	74.612	73.300	63.800	54.900	43.000	34.450	26.250	19.350	7.100	0.000	5.500	13.750	20.100	28.350	31.650	36.000	42.160
Tukkuguda	**14**	34.112	35.812	46.012	54.612	63.112	69.112	74.812	69.300	60.400	48.500	39.950	31.750	24.850	12.600	5.500	0.000	8.250	14.600	22.850	26.150	30.500	36.660
Pedda Golconda	**15**	25.862	27.562	37.762	46.362	54.862	60.862	66.562	76.062	68.650	56.750	48.200	40.000	33.100	20.850	13.750	8.250	0.000	6.350	14.600	17.900	22.250	28.410
Shamshabad	**16**	19.512	21.212	31.412	40.012	48.512	54.512	60.212	69.712	75.000	63.100	54.550	46.350	39.450	27.200	20.100	14.600	6.350	0.000	8.250	11.550	15.900	22.060
Rajendra Nagar	**17**	11.262	12.962	23.162	31.762	40.262	46.262	51.962	61.462	70.362	71.350	62.800	54.600	47.700	35.450	28.350	22.850	14.600	8.250	0.000	3.300	7.650	13.810
TSPA	**18**	7.962	9.662	19.862	28.462	36.962	42.962	48.662	58.162	67.062	74.650	66.100	57.900	51.000	38.750	31.650	26.150	17.900	11.550	3.300	0.000	4.350	10.510
Narsingi	**18A**	3.612	5.312	15.512	24.112	32.612	38.612	44.312	53.812	62.712	74.612	70.450	62.250	55.350	43.100	36.000	30.500	22.250	15.900	7.650	4.350	0.000	6.160
Nanakramguda	**19**	7.252	8.952	19.152	27.752	36.252	42.252	47.952	57.452	66.352	78.252	76.610	68.410	61.510	49.260	42.160	36.660	28.410	22.060	13.810	10.510	6.160	0.000

Accordingly on the basis of above tollable lengths, toll rates of various categories of vehicle at different toll plaza locations are calculated. The adopted Toll Rates for all categories of vehicles for base year are given tables below.

Single Journey

Table 5-4: Car/Jeep/Van Toll Rates for Year 2025-2026 (Rs. Rupees)

F/T	1	1A	2	3	4	4A	5	6	7	8	9	10	11	12	13	14	15	16	17	18	18A	19
1	0	10	30	50	70	80	100	120	140	170	170	150	140	110	90	80	60	50	30	20	10	20
1A	10	0	20	40	60	80	90	110	130	160	180	160	140	110	100	80	60	50	30	20	10	20
2	30	20	0	20	40	50	70	90	110	140	160	180	170	140	120	110	90	70	50	50	40	40
3	50	40	20	0	20	30	50	70	90	120	140	160	170	160	140	130	110	90	70	70	60	60
4	70	60	40	20	0	10	30	50	70	100	120	140	150	180	160	150	130	110	90	90	80	80
4A	80	80	50	30	10	0	10	40	60	80	100	120	140	170	170	160	140	130	110	100	90	100
5	100	90	70	50	30	10	0	20	40	70	90	110	130	150	170	170	160	140	120	110	100	110
6	120	110	90	70	50	40	20	0	20	50	70	90	100	130	150	160	180	160	140	140	130	130
7	140	130	110	90	70	60	40	20	0	30	50	70	80	110	130	140	160	180	160	160	150	160
8	170	160	140	120	100	80	70	50	30	0	20	40	60	80	100	110	130	150	170	170	170	180
9	170	180	160	140	120	100	90	70	50	20	0	20	40	60	80	90	110	130	150	150	160	180
10	150	160	180	160	140	120	110	90	70	40	20	0	20	40	60	70	90	110	130	140	150	160
11	140	140	170	170	150	140	130	100	80	60	40	20	0	30	50	60	80	90	110	120	130	140
12	110	110	140	160	180	170	150	130	110	80	60	40	30	0	20	30	50	60	80	90	100	120
13	90	100	120	140	160	170	170	150	130	100	80	60	50	20	0	10	30	50	70	70	80	100
14	80	80	110	130	150	160	170	160	140	110	90	70	60	30	10	0	20	30	50	60	70	90
15	60	60	90	110	130	140	160	180	160	130	110	90	80	50	30	20	0	10	30	40	50	70
16	50	50	70	90	110	130	140	160	180	150	130	110	90	60	50	30	10	0	20	30	40	50
17	30	30	50	70	90	110	120	140	160	170	150	130	110	80	70	50	30	20	0	10	20	30
18	20	20	50	70	90	100	110	140	160	170	150	140	120	90	70	60	40	30	10	0	10	20
18A	10	10	40	60	80	90	100	130	150	170	160	150	130	100	80	70	50	40	20	10	0	10
19	20	20	40	60	80	100	110	130	160	180	180	160	140	120	100	90	70	50	30	20	10	0

Table 5-5: Minibus/LCV Toll Rates for Year 2024-2025 (Rs. Rupees)

F/T	1	1A	2	3	4	4A	5	6	7	8	9	10	11	12	13	14	15	16	17	18	18A	19
1	0	10	40	80	110	130	150	190	220	270	280	250	220	180	150	130	100	70	40	30	10	30
1A	10	0	40	70	100	130	150	180	220	260	290	250	230	180	160	140	100	80	50	40	20	30
2	40	40	0	30	60	90	110	140	180	220	260	290	270	220	190	170	140	120	90	70	60	70
3	80	70	30	0	30	50	80	110	150	190	220	250	280	250	230	210	170	150	120	110	90	100
4	110	100	60	30	0	20	40	80	110	160	190	220	250	290	260	240	210	180	150	140	120	140
4A	130	130	90	50	20	0	20	60	90	140	170	200	230	270	280	260	230	210	170	160	150	160
5	150	150	110	80	40	20	0	40	70	110	150	180	200	250	280	280	250	230	200	180	170	180
6	190	180	140	110	80	60	40	0	30	80	110	140	170	210	240	260	290	260	230	220	200	220
7	220	220	180	150	110	90	70	30	0	40	80	110	130	180	210	230	260	280	270	250	240	250
8	270	260	220	190	160	140	110	80	40	0	30	60	90	140	160	180	210	240	270	280	280	300
9	280	290	260	220	190	170	150	110	80	30	0	30	60	100	130	150	180	210	240	250	270	290
10	250	250	290	250	220	200	180	140	110	60	30	0	30	70	100	120	150	170	210	220	230	260
11	220	230	270	280	250	230	200	170	130	90	60	30	0	50	70	90	120	150	180	190	210	230
12	180	180	220	250	290	270	250	210	180	140	100	70	50	0	30	50	80	100	130	150	160	190
13	150	160	190	230	260	280	280	240	210	160	130	100	70	30	0	20	50	80	110	120	140	160
14	130	140	170	210	240	260	280	260	230	180	150	120	90	50	20	0	30	60	90	100	120	140
15	100	100	140	170	210	230	250	290	260	210	180	150	120	80	50	30	0	20	60	70	80	110
16	70	80	120	150	180	210	230	260	280	240	210	170	150	100	80	60	20	0	30	40	60	80
17	40	50	90	120	150	170	200	230	270	270	240	210	180	130	110	90	60	30	0	10	30	50
18	30	40	70	110	140	160	180	220	250	280	250	220	190	150	120	100	70	40	10	0	20	40
18A	10	20	60	90	120	150	170	200	240	280	270	230	210	160	140	120	80	60	30	20	0	20
19	30	30	70	100	140	160	180	220	250	300	290	260	230	190	160	140	110	80	50	40	20	0

Table 5-6: Bus/2-Axle Toll Rates for Year 2024-2025 (Rs. Rupees)

F/T	1	1A	2	3	4	4A	5	6	7	8	9	10	11	12	13	14	15	16	17	18	18A	19
1	0	10	80	140	190	230	270	340	400	480	500	440	390	310	270	230	170	130	80	50	20	50
1A	10	0	70	130	180	220	260	320	380	460	510	450	410	320	280	240	180	140	90	60	40	60
2	80	70	0	60	110	150	190	260	320	400	450	510	470	390	340	310	250	210	160	130	100	130
3	140	130	60	0	60	100	140	200	260	340	400	450	500	450	400	370	310	270	210	190	160	190
4	190	180	110	60	0	40	80	140	200	280	340	390	440	510	460	420	370	320	270	250	220	240
4A	230	220	150	100	40	0	40	100	160	240	300	350	400	480	500	460	410	360	310	290	260	280
5	270	260	190	140	80	40	0	60	120	200	260	310	360	440	490	500	450	400	350	330	300	320
6	340	320	260	200	140	100	60	0	60	140	200	250	300	380	430	460	510	470	410	390	360	380
7	400	380	320	260	200	160	120	60	0	80	140	190	240	320	370	400	460	500	470	450	420	440
8	480	460	400	340	280	240	200	140	80	0	60	110	160	240	290	320	380	420	480	500	500	520
9	500	510	450	400	340	300	260	200	140	60	0	50	100	180	230	270	320	370	420	440	470	510
10	440	450	510	450	390	350	310	250	190	110	50	0	50	130	180	210	270	310	370	390	420	460
11	390	410	470	500	440	400	360	300	240	160	100	50	0	80	130	170	220	260	320	340	370	410
12	310	320	390	450	510	480	440	380	320	240	180	130	80	0	50	80	140	180	240	260	290	330
13	270	280	340	400	460	500	490	430	370	290	230	180	130	50	0	40	90	130	190	210	240	280
14	230	240	310	370	420	460	500	460	400	320	270	210	170	80	40	0	60	100	150	180	200	250
15	170	180	250	310	370	410	450	510	460	380	320	270	220	140	90	60	0	40	100	120	150	190
16	130	140	210	270	320	360	400	470	500	420	370	310	260	180	130	100	40	0	60	80	110	150
17	80	90	160	210	270	310	350	410	470	480	420	370	320	240	190	150	100	60	0	20	50	90
18	50	60	130	190	250	290	330	390	450	500	440	390	340	260	210	180	120	80	20	0	30	70
18A	20	40	100	160	220	260	300	360	420	500	470	420	370	290	240	200	150	110	50	30	0	40
19	50	60	130	190	240	280	320	380	440	520	510	460	410	330	280	250	190	150	90	70	40	0

Table 5-7: 3-Axle Toll Rates for Year 2024-2025 (Rs. Rupees)

F/T	1	1A	2	3	4	4A	5	6	7	8	9	10	11	12	13	14	15	16	17	18	18A	19
1	0	10	100	180	250	300	350	430	510	610	640	570	510	400	340	290	220	170	100	70	30	60
1A	10	0	90	160	240	290	340	420	500	600	650	580	520	420	360	310	240	180	110	80	50	80
2	100	90	0	70	150	200	250	330	410	510	580	650	610	510	440	400	330	270	200	170	130	170
3	180	160	70	0	70	130	170	260	330	440	510	580	640	580	520	470	400	350	270	250	210	240
4	250	240	150	70	0	50	100	180	260	360	440	510	570	650	590	540	470	420	350	320	280	310
4A	300	290	200	130	50	0	50	130	210	310	380	450	510	620	640	600	520	470	400	370	330	360
5	350	340	250	170	100	50	0	80	160	260	340	410	470	570	630	650	570	520	450	420	380	410
6	430	420	330	260	180	130	80	0	80	180	250	320	380	490	550	600	660	600	530	500	460	500
7	510	500	410	330	260	210	160	80	0	100	180	250	310	410	470	520	590	650	610	580	540	570
8	610	600	510	440	360	310	260	180	100	0	70	140	200	310	370	420	490	540	620	640	640	670
9	640	650	580	510	440	380	340	250	180	70	0	70	130	240	300	340	420	470	540	570	610	660
10	570	580	650	580	510	450	410	320	250	140	70	0	60	170	230	270	350	400	470	500	540	590
11	510	520	610	640	570	510	470	380	310	200	130	60	0	110	170	210	290	340	410	440	480	530
12	400	420	510	580	650	620	570	490	410	310	240	170	110	0	60	110	180	230	310	330	370	420
13	340	360	440	520	590	640	630	550	470	370	300	230	170	60	0	50	120	170	240	270	310	360
14	290	310	400	470	540	600	650	600	520	420	340	270	210	110	50	0	70	130	200	230	260	320
15	220	240	330	400	470	520	570	660	590	490	420	350	290	180	120	70	0	50	130	150	190	250
16	170	180	270	350	420	470	520	600	650	540	470	400	340	230	170	130	50	0	70	100	140	190
17	100	110	200	270	350	400	450	530	610	620	540	470	410	310	240	200	130	70	0	30	70	120
18	70	80	170	250	320	370	420	500	580	640	570	500	440	330	270	230	150	100	30	0	40	90
18A	30	50	130	210	280	330	380	460	540	640	610	540	480	370	310	260	190	140	70	40	0	50
19	60	80	170	240	310	360	410	500	570	670	660	590	530	420	360	320	250	190	120	90	50	0

Table 5-8: 4 to 6 Axle Toll Rates for Year 2024-2025 (Rs. Rupees)

F/T	1	1A	2	3	4	4A	5	6	7	8	9	10	11	12	13	14	15	16	17	18	18A	19
1	0	20	150	250	360	430	500	620	730	880	920	820	730	580	490	420	320	240	140	100	40	90
1A	20	0	130	230	340	410	480	600	710	860	940	840	750	600	510	440	340	260	160	120	70	110
2	150	130	0	110	210	290	360	470	590	730	840	940	880	730	640	570	470	390	290	250	190	240
3	250	230	110	0	110	180	250	370	480	630	730	830	920	830	750	680	570	500	390	350	300	340
4	360	340	210	110	0	70	150	260	370	520	630	730	810	940	850	780	680	600	500	460	400	450
4A	430	410	290	180	70	0	70	190	300	450	550	650	740	890	930	860	750	680	570	530	480	520
5	500	480	360	250	150	70	0	120	230	380	480	580	670	820	910	930	830	750	640	600	550	590
6	620	600	470	370	260	190	120	0	110	260	360	470	550	700	790	860	940	860	760	720	670	710
7	730	710	590	480	370	300	230	110	0	150	250	360	440	590	680	750	850	930	870	830	780	820
8	880	860	730	630	520	450	380	260	150	0	110	210	290	450	530	600	700	780	880	930	930	970
9	920	940	840	730	630	550	480	360	250	110	0	100	190	340	430	500	600	680	780	820	870	950
10	820	840	940	830	730	650	580	470	360	210	100	0	90	240	330	390	500	570	680	720	770	850
11	730	750	880	920	810	740	670	550	440	290	190	90	0	150	240	310	410	490	590	630	690	760
12	580	600	730	830	940	890	820	700	590	450	340	240	150	0	90	160	260	340	440	480	530	610
13	490	510	640	750	850	930	910	790	680	530	430	330	240	90	0	70	170	250	350	390	450	520
14	420	440	570	680	780	860	930	860	750	600	500	390	310	160	70	0	100	180	280	320	380	450
15	320	340	470	570	680	750	830	940	850	700	600	500	410	260	170	100	0	80	180	220	280	350
16	240	260	390	500	600	680	750	860	930	780	680	570	490	340	250	180	80	0	100	140	200	270
17	140	160	290	390	500	570	640	760	870	880	780	680	590	440	350	280	180	100	0	40	90	170
18	100	120	250	350	460	530	600	720	830	930	820	720	630	480	390	320	220	140	40	0	50	130
18A	40	70	190	300	400	480	550	670	780	930	870	770	690	530	450	380	280	200	90	50	0	80
19	90	110	240	340	450	520	590	710	820	970	950	850	760	610	520	450	350	270	170	130	80	0

Table 5-9: 7 & above Axle Toll Rates for Year 2024-2025 (Rs. Rupees)

F/T	1	1A	2	3	4	4A	5	6	7	8	9	10	11	12	13	14	15	16	17	18	18A	19
1	0	30	180	310	440	530	610	760	890	1070	1120	990	890	710	600	510	390	290	170	120	50	110
1A	30	0	150	280	410	500	590	730	870	1050	1140	1020	920	730	620	540	420	320	200	150	80	140
2	180	150	0	130	260	350	430	580	710	890	1020	1140	1070	880	780	690	570	470	350	300	230	290
3	310	280	130	0	130	220	300	450	580	760	890	1020	1120	1010	910	820	700	600	480	430	360	420
4	440	410	260	130	0	90	180	320	450	630	760	890	990	1140	1040	950	830	730	610	560	490	550
4A	530	500	350	220	90	0	90	230	360	540	670	800	900	1090	1130	1040	920	820	700	650	580	640
5	610	590	430	300	180	90	0	140	280	460	590	710	810	1000	1110	1130	1000	910	780	730	670	720
6	760	730	580	450	320	230	140	0	130	310	440	570	670	860	960	1050	1150	1050	930	880	810	870
7	890	870	710	580	450	360	280	130	0	180	310	430	540	720	830	910	1040	1130	1060	1010	950	1000
8	1070	1050	890	760	630	540	460	310	180	0	130	250	360	540	650	730	860	950	1080	1130	1130	1180
9	1120	1140	1020	890	760	670	590	440	310	130	0	120	230	410	520	600	730	820	950	1000	1060	1160
10	990	1020	1140	1020	890	800	710	570	430	250	120	0	100	290	400	480	600	700	820	870	940	1030
11	890	920	1070	1120	990	900	810	670	540	360	230	100	0	180	290	380	500	600	720	770	840	930
12	710	730	880	1010	1140	1090	1000	860	720	540	410	290	180	0	110	190	310	410	540	580	650	740
13	600	620	780	910	1040	1130	1110	960	830	650	520	400	290	110	0	80	210	300	430	480	540	640
14	510	540	690	820	950	1040	1130	1050	910	730	600	480	380	190	80	0	120	220	340	390	460	550
15	390	420	570	700	830	920	1000	1150	1040	860	730	600	500	310	210	120	0	100	220	270	340	430
16	290	320	470	600	730	820	910	1050	1130	950	820	700	600	410	300	220	100	0	120	170	240	330
17	170	200	350	480	610	700	780	930	1060	1080	950	820	720	540	430	340	220	120	0	50	120	210
18	120	150	300	430	560	650	730	880	1010	1130	1000	870	770	580	480	390	270	170	50	0	70	160
18A	50	80	230	360	490	580	670	810	950	1130	1060	940	840	650	540	460	340	240	120	70	0	90
19	110	140	290	420	550	640	720	870	1000	1180	1160	1030	930	740	640	550	430	330	210	160	90	0

Return Journey

Table 5-10: Car/Jeep/Van Toll Rates for Year 2024-2025 (Rs. Rupees)

F/T	1	1A	2	3	4	4A	5	6	7	8	9	10	11	12	13	14	15	16	17	18	18A	19
1	0	5	15	25	35	40	50	60	70	85	85	75	70	55	45	40	30	25	15	10	5	10
1A	5	0	10	20	30	40	45	55	65	80	90	80	70	55	50	40	30	25	15	10	5	10
2	15	10	0	10	20	25	35	45	55	70	80	90	85	70	60	55	45	35	25	25	20	20
3	25	20	10	0	10	15	25	35	45	60	70	80	85	80	70	65	55	45	35	35	30	30
4	35	30	20	10	0	5	15	25	35	50	60	70	75	90	80	75	65	55	45	45	40	40
4A	40	40	25	15	5	0	5	20	30	40	50	60	70	85	85	80	70	65	55	50	45	50
5	50	45	35	25	15	5	0	10	20	35	45	55	65	75	85	85	80	70	60	55	50	55
6	60	55	45	35	25	20	10	0	10	25	35	45	50	65	75	80	90	80	70	70	65	65
7	70	65	55	45	35	30	20	10	0	15	25	35	40	55	65	70	80	90	80	80	75	75
8	85	80	70	60	50	40	35	25	15	0	10	20	30	40	50	55	65	75	85	85	85	90
9	85	90	80	70	60	50	45	35	25	10	0	10	20	30	40	45	55	65	75	75	80	90
10	75	80	90	80	70	60	55	45	35	20	10	0	10	20	30	35	45	55	65	70	75	80
11	70	70	85	85	75	70	65	50	40	30	20	10	0	15	25	30	40	45	55	60	65	70
12	55	55	70	80	90	85	75	65	55	40	30	20	15	0	10	15	25	30	40	45	50	60
13	45	50	60	70	80	85	85	75	65	50	40	30	25	10	0	5	15	25	35	35	40	50
14	40	40	55	65	75	80	85	80	70	55	45	35	30	15	5	0	10	15	25	30	35	45
15	30	30	45	55	65	70	80	90	80	65	55	45	40	25	15	10	0	5	15	20	25	35
16	25	25	35	45	55	65	70	80	90	75	65	55	45	30	25	15	5	0	10	15	20	25
17	15	15	25	35	45	55	60	70	80	85	75	65	55	40	35	25	15	10	0	5	10	15
18	10	10	25	35	45	50	55	70	80	85	75	70	60	45	35	30	20	15	5	0	5	10
18A	5	5	20	30	40	45	50	65	75	85	80	75	65	50	40	35	25	20	10	5	0	5
19	10	10	20	30	40	50	55	65	75	90	90	80	70	60	50	45	35	25	15	10	5	0

Table 5-11: Minibus/LCV Toll Rates for Year 2024-2025 (Rs. Rupees)

F/T	1	1A	2	3	4	4A	5	6	7	8	9	10	11	12	13	14	15	16	17	18	18A	19
1	0	5	20	40	55	65	75	95	110	135	140	125	110	90	75	65	50	35	20	15	5	15
1A	5	0	20	35	50	65	75	90	110	130	145	125	115	90	80	70	50	40	25	20	10	15
2	20	20	0	15	30	45	55	70	90	110	130	145	135	110	95	85	70	60	45	35	30	35
3	40	35	15	0	15	25	40	55	75	95	110	125	140	125	115	105	85	75	60	55	45	50
4	55	50	30	15	0	10	20	40	55	80	95	110	125	145	130	120	105	90	75	70	60	70
4A	65	65	45	25	10	0	10	30	45	70	85	100	115	135	140	130	115	105	85	80	75	80
5	75	75	55	40	20	10	0	20	35	55	75	90	100	125	140	140	125	115	100	90	85	90
6	95	90	70	55	40	30	20	0	15	40	55	70	85	105	120	130	145	130	115	110	100	110
7	110	110	90	75	55	45	35	15	0	20	40	55	65	90	105	115	130	140	135	125	120	125
8	135	130	110	95	80	70	55	40	20	0	15	30	45	70	80	90	105	120	135	140	140	150
9	140	145	130	110	95	85	75	55	40	15	0	15	30	50	65	75	90	105	120	125	135	145
10	125	125	145	125	110	100	90	70	55	30	15	0	15	35	50	60	75	85	105	110	115	130
11	110	115	135	140	125	115	100	85	65	45	30	15	0	25	35	45	60	75	90	95	105	115
12	90	90	110	125	145	135	125	105	90	70	50	35	25	0	15	25	40	50	65	75	80	95
13	75	80	95	115	130	140	140	120	105	80	65	50	35	15	0	10	25	40	55	60	70	80
14	65	70	85	105	120	130	140	130	115	90	75	60	45	25	10	0	15	30	45	50	60	70
15	50	50	70	85	105	115	125	145	130	105	90	75	60	40	25	15	0	10	30	35	40	55
16	35	40	60	75	90	105	115	130	140	120	105	85	75	50	40	30	10	0	15	20	30	40
17	20	25	45	60	75	85	100	115	135	135	120	105	90	65	55	45	30	15	0	5	15	25
18	15	20	35	55	70	80	90	110	125	140	125	110	95	75	60	50	35	20	5	0	10	20
18A	5	10	30	45	60	75	85	100	120	140	135	115	105	80	70	60	40	30	15	10	0	10
19	15	15	35	50	70	80	90	110	125	150	145	130	115	95	80	70	55	40	25	20	10	0

Table 5-12: Bus/2-Axle Toll Rates for Year 2024-2025 (Rs. Rupees)

F/T	1	1A	2	3	4	4A	5	6	7	8	9	10	11	12	13	14	15	16	17	18	18A	19
1	0	5	40	70	95	115	135	170	200	240	250	220	195	155	135	115	85	65	40	25	10	25
1A	5	0	35	65	90	110	130	160	190	230	255	225	205	160	140	120	90	70	45	30	20	30
2	40	35	0	30	55	75	95	130	160	200	225	255	235	195	170	155	125	105	80	65	50	65
3	70	65	30	0	30	50	70	100	130	170	200	225	250	225	200	185	155	135	105	95	80	95
4	95	90	55	30	0	20	40	70	100	140	170	195	220	255	230	210	185	160	135	125	110	120
4A	115	110	75	50	20	0	20	50	80	120	150	175	200	240	250	230	205	180	155	145	130	140
5	135	130	95	70	40	20	0	30	60	100	130	155	180	220	245	250	225	200	175	165	150	160
6	170	160	130	100	70	50	30	0	30	70	100	125	150	190	215	230	255	235	205	195	180	190
7	200	190	160	130	100	80	60	30	0	40	70	95	120	160	185	200	230	250	235	225	210	220
8	240	230	200	170	140	120	100	70	40	0	30	55	80	120	145	160	190	210	240	250	250	260
9	250	255	225	200	170	150	130	100	70	30	0	25	50	90	115	135	160	185	210	220	235	255
10	220	225	255	225	195	175	155	125	95	55	25	0	25	65	90	105	135	155	185	195	210	230
11	195	205	235	250	220	200	180	150	120	80	50	25	0	40	65	85	110	130	160	170	185	205
12	155	160	195	225	255	240	220	190	160	120	90	65	40	0	25	40	70	90	120	130	145	165
13	135	140	170	200	230	250	245	215	185	145	115	90	65	25	0	20	45	65	95	105	120	140
14	115	120	155	185	210	230	250	230	200	160	135	105	85	40	20	0	30	50	75	90	100	125
15	85	90	125	155	185	205	225	255	230	190	160	135	110	70	45	30	0	20	50	60	75	95
16	65	70	105	135	160	180	200	235	250	210	185	155	130	90	65	50	20	0	30	40	55	75
17	40	45	80	105	135	155	175	205	235	240	210	185	160	120	95	75	50	30	0	10	25	45
18	25	30	65	95	125	145	165	195	225	250	220	195	170	130	105	90	60	40	10	0	15	35
18A	10	20	50	80	110	130	150	180	210	250	235	210	185	145	120	100	75	55	25	15	0	20
19	25	30	65	95	120	140	160	190	220	260	255	230	205	165	140	125	95	75	45	35	20	0

Table 5-13: 3-Axle Toll Rates for Year 2024-2025 (Rs. Rupees)

F/T	1	1A	2	3	4	4A	5	6	7	8	9	10	11	12	13	14	15	16	17	18	18A	19
1	0	5	50	90	125	150	175	215	255	305	320	285	255	200	170	145	110	85	50	35	15	30
1A	5	0	45	80	120	145	170	210	250	300	325	290	260	210	180	155	120	90	55	40	25	40
2	50	45	0	35	75	100	125	165	205	255	290	325	305	255	220	200	165	135	100	85	65	85
3	90	80	35	0	35	65	85	130	165	220	255	290	320	290	260	235	200	175	135	125	105	120
4	125	120	75	35	0	25	50	90	130	180	220	255	285	325	295	270	235	210	175	160	140	155
4A	150	145	100	65	25	0	25	65	105	155	190	225	255	310	320	300	260	235	200	185	165	180
5	175	170	125	85	50	25	0	40	80	130	170	205	235	285	315	325	285	260	225	210	190	205
6	215	210	165	130	90	65	40	0	40	90	125	160	190	245	275	300	330	300	265	250	230	250
7	255	250	205	165	130	105	80	40	0	50	90	125	155	205	235	260	295	325	305	290	270	285
8	305	300	255	220	180	155	130	90	50	0	35	70	100	155	185	210	245	270	310	320	320	335
9	320	325	290	255	220	190	170	125	90	35	0	35	65	120	150	170	210	235	270	285	305	330
10	285	290	325	290	255	225	205	160	125	70	35	0	30	85	115	135	175	200	235	250	270	295
11	255	260	305	320	285	255	235	190	155	100	65	30	0	55	85	105	145	170	205	220	240	265
12	200	210	255	290	325	310	285	245	205	155	120	85	55	0	30	55	90	115	155	165	185	210
13	170	180	220	260	295	320	315	275	235	185	150	115	85	30	0	25	60	85	120	135	155	180
14	145	155	200	235	270	300	325	300	260	210	170	135	105	55	25	0	35	65	100	115	130	160
15	110	120	165	200	235	260	285	330	295	245	210	175	145	90	60	35	0	25	65	75	95	125
16	85	90	135	175	210	235	260	300	325	270	235	200	170	115	85	65	25	0	35	50	70	95
17	50	55	100	135	175	200	225	265	305	310	270	235	205	155	120	100	65	35	0	15	35	60
18	35	40	85	125	160	185	210	250	290	320	285	250	220	165	135	115	75	50	15	0	20	45
18A	15	25	65	105	140	165	190	230	270	320	305	270	240	185	155	130	95	70	35	20	0	25
19	30	40	85	120	155	180	205	250	285	335	330	295	265	210	180	160	125	95	60	45	25	0

Table 5-14: 4 to 6 Axle Toll Rates for Year 2024-2025 (Rs. Rupees)

F/T	1	1A	2	3	4	4A	5	6	7	8	9	10	11	12	13	14	15	16	17	18	18A	19
1	0	10	75	125	180	215	250	310	365	440	460	410	365	290	245	210	160	120	70	50	20	45
1A	10	0	65	115	170	205	240	300	355	430	470	420	375	300	255	220	170	130	80	60	35	55
2	75	65	0	55	105	145	180	235	295	365	420	470	440	365	320	285	235	195	145	125	95	120
3	125	115	55	0	55	90	125	185	240	315	365	415	460	415	375	340	285	250	195	175	150	170
4	180	170	105	55	0	35	75	130	185	260	315	365	405	470	425	390	340	300	250	230	200	225
4A	215	205	145	90	35	0	35	95	150	225	275	325	370	445	465	430	375	340	285	265	240	260
5	250	240	180	125	75	35	0	60	115	190	240	290	335	410	455	465	415	375	320	300	275	295
6	310	300	235	185	130	95	60	0	55	130	180	235	275	350	395	430	470	430	380	360	335	355
7	365	355	295	240	185	150	115	55	0	75	125	180	220	295	340	375	425	465	435	415	390	410
8	440	430	365	315	260	225	190	130	75	0	55	105	145	225	265	300	350	390	440	465	465	485
9	460	470	420	365	315	275	240	180	125	55	0	50	95	170	215	250	300	340	390	410	435	475
10	410	420	470	415	365	325	290	235	180	105	50	0	45	120	165	195	250	285	340	360	385	425
11	365	375	440	460	405	370	335	275	220	145	95	45	0	75	120	155	205	245	295	315	345	380
12	290	300	365	415	470	445	410	350	295	225	170	120	75	0	45	80	130	170	220	240	265	305
13	245	255	320	375	425	465	455	395	340	265	215	165	120	45	0	35	85	125	175	195	225	260
14	210	220	285	340	390	430	465	430	375	300	250	195	155	80	35	0	50	90	140	160	190	225
15	160	170	235	285	340	375	415	470	425	350	300	250	205	130	85	50	0	40	90	110	140	175
16	120	130	195	250	300	340	375	430	465	390	340	285	245	170	125	90	40	0	50	70	100	135
17	70	80	145	195	250	285	320	380	435	440	390	340	295	220	175	140	90	50	0	20	45	85
18	50	60	125	175	230	265	300	360	415	465	410	360	315	240	195	160	110	70	20	0	25	65
18A	20	35	95	150	200	240	275	335	390	465	435	385	345	265	225	190	140	100	45	25	0	40
19	45	55	120	170	225	260	295	355	410	485	475	425	380	305	260	225	175	135	85	65	40	0

Table 5-15: 7 & above Axle Toll Rates for Year 2024-2025 (Rs. Rupees)

F/T	1	1A	2	3	4	4A	5	6	7	8	9	10	11	12	13	14	15	16	17	18	18A	19
1	0	15	90	155	220	265	305	380	445	535	560	495	445	355	300	255	195	145	85	60	25	55
1A	15	0	75	140	205	250	295	365	435	525	570	510	460	365	310	270	210	160	100	75	40	70
2	90	75	0	65	130	175	215	290	355	445	510	570	535	440	390	345	285	235	175	150	115	145
3	155	140	65	0	65	110	150	225	290	380	445	510	560	505	455	410	350	300	240	215	180	210
4	220	205	130	65	0	45	90	160	225	315	380	445	495	570	520	475	415	365	305	280	245	275
4A	265	250	175	110	45	0	45	115	180	270	335	400	450	545	565	520	460	410	350	325	290	320
5	305	295	215	150	90	45	0	70	140	230	295	355	405	500	555	565	500	455	390	365	335	360
6	380	365	290	225	160	115	70	0	65	155	220	285	335	430	480	525	575	525	465	440	405	435
7	445	435	355	290	225	180	140	65	0	90	155	215	270	360	415	455	520	565	530	505	475	500
8	535	525	445	380	315	270	230	155	90	0	65	125	180	270	325	365	430	475	540	565	565	590
9	560	570	510	445	380	335	295	220	155	65	0	60	115	205	260	300	365	410	475	500	530	580
10	495	510	570	510	445	400	355	285	215	125	60	0	50	145	200	240	300	350	410	435	470	515
11	445	460	535	560	495	450	405	335	270	180	115	50	0	90	145	190	250	300	360	385	420	465
12	355	365	440	505	570	545	500	430	360	270	205	145	90	0	55	95	155	205	270	290	325	370
13	300	310	390	455	520	565	555	480	415	325	260	200	145	55	0	40	105	150	215	240	270	320
14	255	270	345	410	475	520	565	525	455	365	300	240	190	95	40	0	60	110	170	195	230	275
15	195	210	285	350	415	460	500	575	520	430	365	300	250	155	105	60	0	50	110	135	170	215
16	145	160	235	300	365	410	455	525	565	475	410	350	300	205	150	110	50	0	60	85	120	165
17	85	100	175	240	305	350	390	465	530	540	475	410	360	270	215	170	110	60	0	25	60	105
18	60	75	150	215	280	325	365	440	505	565	500	435	385	290	240	195	135	85	25	0	35	80
18A	25	40	115	180	245	290	335	405	475	565	530	470	420	325	270	230	170	120	60	35	0	45
19	55	70	145	210	275	320	360	435	500	590	580	515	465	370	320	275	215	165	105	80	45	0

Single Journey

Table 5-16: Car/Jeep/Van Toll Rates for Year 2026-2027 (Rs. Rupees)

F/T	1	1A	2	3	4	4A	5	6	7	8	9	10	11	12	13	14	15	16	17	18	18A	19
1	0	10	30	50	70	90	100	130	150	180	190	170	150	120	100	90	70	50	30	20	10	20
1A	10	0	30	50	70	80	100	120	150	180	190	170	150	120	100	90	70	50	30	20	10	20
2	30	30	0	20	40	60	70	100	120	150	170	190	180	150	130	120	100	80	60	50	40	50
3	50	50	20	0	20	40	50	80	100	130	150	170	190	170	150	140	120	100	80	70	60	70
4	70	70	40	20	0	20	30	50	80	110	130	150	170	190	170	160	140	120	100	90	80	90
4A	90	80	60	40	20	0	10	40	60	90	110	130	150	180	190	170	150	140	120	110	100	110
5	100	100	70	50	30	10	0	20	50	80	100	120	140	170	190	190	170	150	130	120	110	120
6	130	120	100	80	50	40	20	0	20	50	70	100	110	140	160	180	190	180	160	150	140	150
7	150	150	120	100	80	60	50	20	0	30	50	70	90	120	140	150	170	190	180	170	160	170
8	180	180	150	130	110	90	80	50	30	0	20	40	60	90	110	120	140	160	180	190	190	200
9	190	190	170	150	130	110	100	70	50	20	0	20	40	70	90	100	120	140	160	170	180	190
10	170	170	190	170	150	130	120	100	70	40	20	0	20	50	70	80	100	120	140	150	160	170
11	150	150	180	190	170	150	140	110	90	60	40	20	0	30	50	60	80	100	120	130	140	160
12	120	120	150	170	190	180	170	140	120	90	70	50	30	0	20	30	50	70	90	100	110	120
13	100	100	130	150	170	190	190	160	140	110	90	70	50	20	0	10	30	50	70	80	90	110
14	90	90	120	140	160	170	190	180	150	120	100	80	60	30	10	0	20	40	60	70	80	90
15	70	70	100	120	140	150	170	190	170	140	120	100	80	50	30	20	0	20	40	50	60	70
16	50	50	80	100	120	140	150	180	190	160	140	120	100	70	50	40	20	0	20	30	40	60
17	30	30	60	80	100	120	130	160	180	180	160	140	120	90	70	60	40	20	0	10	20	30
18	20	20	50	70	90	110	120	150	170	190	170	150	130	100	80	70	50	30	10	0	10	30
18A	10	10	40	60	80	100	110	140	160	190	180	160	140	110	90	80	60	40	20	10	0	20
19	20	20	50	70	90	110	120	150	170	200	190	170	160	120	110	90	70	60	30	30	20	0

Table 5-17: Minibus/LCV Toll Rates for Year 2025-2026 (Rs. Rupees)

F/T	1	1A	2	3	4	4A	5	6	7	8	9	10	11	12	13	14	15	16	17	18	18A	19
1	0	10	50	80	120	140	170	210	240	290	300	270	240	190	160	140	110	80	50	30	10	30
1A	10	0	40	80	110	140	160	200	230	280	310	280	250	200	170	150	110	90	50	40	20	40
2	50	40	0	40	70	90	120	160	190	240	280	310	290	240	210	190	150	130	90	80	60	80
3	80	80	40	0	30	60	80	120	160	210	240	280	300	270	250	220	190	160	130	120	100	110
4	120	110	70	30	0	20	50	90	120	170	210	240	270	310	280	260	220	200	160	150	130	150
4A	140	140	90	60	20	0	20	60	100	150	180	220	240	290	310	280	250	220	190	180	160	170
5	170	160	120	80	50	20	0	40	80	120	160	190	220	270	300	310	270	250	210	200	180	200
6	210	200	160	120	90	60	40	0	40	90	120	150	180	230	260	280	310	290	250	240	220	230
7	240	230	190	160	120	100	80	40	0	50	80	120	150	200	220	250	280	310	290	270	260	270
8	290	280	240	210	170	150	120	90	50	0	30	70	100	150	180	200	230	260	290	310	310	320
9	300	310	280	240	210	180	160	120	80	30	0	30	60	110	140	160	200	220	260	270	290	310
10	270	280	310	280	240	220	190	150	120	70	30	0	30	80	110	130	160	190	220	240	250	280
11	240	250	290	300	270	240	220	180	150	100	60	30	0	50	80	100	140	160	200	210	230	250
12	190	200	240	270	310	290	270	230	200	150	110	80	50	0	30	50	90	110	140	160	180	200
13	160	170	210	250	280	310	300	260	220	180	140	110	80	30	0	20	60	80	120	130	150	170
14	140	150	190	220	260	280	310	280	250	200	160	130	100	50	20	0	30	60	90	110	120	150
15	110	110	150	190	220	250	270	310	280	230	200	160	140	90	60	30	0	30	60	70	90	120
16	80	90	130	160	200	220	250	290	310	260	220	190	160	110	80	60	30	0	30	50	70	90
17	50	50	90	130	160	190	210	250	290	290	260	220	200	140	120	90	60	30	0	10	30	60
18	30	40	80	120	150	180	200	240	270	310	270	240	210	160	130	110	70	50	10	0	20	40
18A	10	20	60	100	130	160	180	220	260	310	290	250	230	180	150	120	90	70	30	20	0	30
19	30	40	80	110	150	170	200	230	270	320	310	280	250	200	170	150	120	90	60	40	30	0

Table 5-18: Bus/2-Axle Toll Rates for Year 2025-2026 (Rs. Rupees)

F/T	1	1A	2	3	4	4A	5	6	7	8	9	10	11	12	13	14	15	16	17	18	18A	19
1	0	10	90	150	210	250	300	360	430	520	540	480	430	340	290	250	190	140	80	60	30	50
1A	10	0	70	140	200	240	280	350	420	500	550	490	440	350	300	260	200	150	90	70	40	60
2	90	70	0	60	120	170	210	280	340	430	490	550	510	430	370	330	270	230	170	140	110	140
3	150	140	60	0	60	110	150	220	280	370	430	490	540	490	440	400	340	290	230	210	170	200
4	210	200	120	60	0	40	80	150	220	300	370	430	480	550	500	460	400	350	290	270	240	260
4A	250	240	170	110	40	0	40	110	170	260	320	380	430	520	540	500	440	400	340	310	280	310
5	300	280	210	150	80	40	0	70	130	220	280	340	390	480	530	540	480	440	380	350	320	350
6	360	350	280	220	150	110	70	0	60	150	210	270	320	410	460	500	550	510	450	420	390	420
7	430	420	340	280	220	170	130	60	0	90	150	210	260	350	400	440	500	540	510	490	460	480
8	520	500	430	370	300	260	220	150	90	0	60	120	170	260	310	350	410	460	520	540	540	570
9	540	550	490	430	370	320	280	210	150	60	0	60	110	200	250	290	350	400	460	480	510	560
10	480	490	550	490	430	380	340	270	210	120	60	0	50	140	190	230	290	340	400	420	450	500
11	430	440	510	540	480	430	390	320	260	170	110	50	0	90	140	180	240	290	350	370	400	450
12	340	350	430	490	550	520	480	410	350	260	200	140	90	0	50	90	150	200	260	280	310	360
13	290	300	370	440	500	540	530	460	400	310	250	190	140	50	0	40	100	150	210	230	260	310
14	250	260	330	400	460	500	540	500	440	350	290	230	180	90	40	0	60	110	170	190	220	270
15	190	200	270	340	400	440	480	550	500	410	350	290	240	150	100	60	0	50	110	130	160	210
16	140	150	230	290	350	400	440	510	540	460	400	340	290	200	150	110	50	0	60	80	120	160
17	80	90	170	230	290	340	380	450	510	520	460	400	350	260	210	170	110	60	0	20	60	100
18	60	70	140	210	270	310	350	420	490	540	480	420	370	280	230	190	130	80	20	0	30	80
18A	30	40	110	170	240	280	320	390	460	540	510	450	400	310	260	220	160	120	60	30	0	40
19	50	60	140	200	260	310	350	420	480	570	560	500	450	360	310	270	210	160	100	80	40	0

Table 5-19: 3-Axle Toll Rates for Year 2025-2026 (Rs. Rupees)

F/T	1	1A	2	3	4	4A	5	6	7	8	9	10	11	12	13	14	15	16	17	18	18A	19
1	0	20	110	190	270	330	380	470	550	660	690	620	550	440	370	320	240	180	110	70	30	70
1A	20	0	100	180	260	310	360	450	540	650	710	630	570	450	390	330	260	200	120	90	50	80
2	110	100	0	80	160	220	270	360	440	550	630	710	660	550	480	430	350	290	220	190	150	180
3	190	180	80	0	80	140	190	280	360	470	550	630	690	630	560	510	430	370	300	270	230	260
4	270	260	160	80	0	60	110	200	280	390	470	550	610	710	640	590	510	450	380	350	300	340
4A	330	310	220	140	60	0	50	140	230	340	420	490	560	670	700	650	570	510	430	400	360	390
5	380	360	270	190	110	50	0	90	170	280	360	440	500	620	690	700	620	560	490	450	410	450
6	470	450	360	280	200	140	90	0	80	190	270	350	420	530	600	650	710	650	570	540	500	540
7	550	540	440	360	280	230	170	80	0	110	190	270	330	450	510	560	640	700	660	630	590	620
8	660	650	550	470	390	340	280	190	110	0	80	160	220	340	400	450	530	590	670	700	700	730
9	690	710	630	550	470	420	360	270	190	80	0	80	140	260	320	370	450	510	590	620	660	720
10	620	630	710	630	550	490	440	350	270	160	80	0	60	180	250	300	370	430	510	540	580	640
11	550	570	660	690	610	560	500	420	330	220	140	60	0	110	180	230	310	370	450	480	520	580
12	440	450	550	630	710	670	620	530	450	340	260	180	110	0	70	120	190	250	330	360	400	460
13	370	390	480	560	640	700	690	600	510	400	320	250	180	70	0	50	130	190	270	300	340	390
14	320	330	430	510	590	650	700	650	560	450	370	300	230	120	50	0	80	140	210	240	290	340
15	240	260	350	430	510	570	620	710	640	530	450	370	310	190	130	80	0	60	140	170	210	270
16	180	200	290	370	450	510	560	650	700	590	510	430	370	250	190	140	60	0	80	110	150	210
17	110	120	220	300	380	430	490	570	660	670	590	510	450	330	270	210	140	80	0	30	70	130
18	70	90	190	270	350	400	450	540	630	700	620	540	480	360	300	240	170	110	30	0	40	100
18A	30	50	150	230	300	360	410	500	590	700	660	580	520	400	340	290	210	150	70	40	0	60
19	70	80	180	260	340	390	450	540	620	730	720	640	580	460	390	340	270	210	130	100	60	0

Table 5-20: 4 to 6 Axle Toll Rates for Year 2025-2026 (Rs. Rupees)

F/T	1	1A	2	3	4	4A	5	6	7	8	9	10	11	12	13	14	15	16	17	18	18A	19
1	0	20	160	280	390	470	550	670	790	950	1000	890	790	630	530	460	350	260	150	110	50	100
1A	20	0	140	250	370	450	520	650	770	930	1020	910	820	650	560	480	370	290	170	130	70	120
2	160	140	0	120	230	310	390	510	630	790	910	1020	950	790	690	620	510	420	310	270	210	260
3	280	250	120	0	110	190	270	400	520	680	790	900	1000	900	810	730	620	540	430	380	320	370
4	390	370	230	110	0	80	160	280	400	560	680	790	880	1020	920	850	740	650	540	500	440	490
4A	470	450	310	190	80	0	80	200	320	480	600	710	800	970	1000	930	820	730	620	580	520	570
5	550	520	390	270	160	80	0	130	250	410	520	630	720	890	990	1010	890	810	700	650	600	640
6	670	650	510	400	280	200	130	0	120	280	390	500	600	760	860	930	1020	940	830	780	720	770
7	790	770	630	520	400	320	250	120	0	160	270	390	480	640	740	810	920	1010	950	900	840	890
8	950	930	790	680	560	480	410	280	160	0	110	230	320	480	580	650	760	850	960	1000	1000	1050
9	1000	1020	910	790	680	600	520	390	270	110	0	110	200	370	460	540	650	730	840	890	950	1030
10	890	910	1020	900	790	710	630	500	390	230	110	0	90	260	350	430	540	620	730	780	840	920
11	790	820	950	1000	880	800	720	600	480	320	200	90	0	160	260	330	440	530	640	690	740	830
12	630	650	790	900	1020	970	890	760	640	480	370	260	160	0	100	170	280	370	480	520	580	660
13	530	560	690	810	920	1000	990	860	740	580	460	350	260	100	0	70	180	270	380	430	480	570
14	460	480	620	730	850	930	1010	930	810	650	540	430	330	170	70	0	110	200	310	350	410	490
15	350	370	510	620	740	820	890	1020	920	760	650	540	440	280	180	110	0	90	200	240	300	380
16	260	290	420	540	650	730	810	940	1010	850	730	620	530	370	270	200	90	0	110	160	210	300
17	150	170	310	430	540	620	700	830	950	960	840	730	640	480	380	310	200	110	0	40	100	190
18	110	130	270	380	500	580	650	780	900	1000	890	780	690	520	430	350	240	160	40	0	60	140
18A	50	70	210	320	440	520	600	720	840	1000	950	840	740	580	480	410	300	210	100	60	0	80
19	100	120	260	370	490	570	640	770	890	1050	1030	920	830	660	570	490	380	300	190	140	80	0

Table 5-21: 7 & above Axle Toll Rates for Year 2025-2026 (Rs. Rupees)

F/T	1	1A	2	3	4	4A	5	6	7	8	9	10	11	12	13	14	15	16	17	18	18A	19
1	0	30	190	340	470	570	670	820	970	1160	1210	1080	960	760	650	560	420	320	180	130	60	120
1A	30	0	170	310	450	540	640	790	940	1130	1240	1110	990	790	680	590	450	350	210	160	90	150
2	190	170	0	140	280	380	470	630	770	970	1110	1240	1160	960	840	750	620	510	380	320	250	310
3	340	310	140	0	140	240	330	490	630	830	970	1100	1210	1100	980	890	760	650	520	470	390	450
4	470	450	280	140	0	100	190	350	490	690	830	960	1070	1240	1120	1030	900	790	660	600	530	590
4A	570	540	380	240	100	0	90	250	390	590	730	860	980	1180	1220	1130	1000	890	760	700	630	690
5	670	640	470	330	190	90	0	160	300	500	640	770	880	1080	1200	1220	1090	990	850	800	720	780
6	820	790	630	490	350	250	160	0	150	340	480	610	730	930	1040	1130	1240	1140	1010	950	880	940
7	970	940	770	630	490	390	300	150	0	190	330	470	580	780	900	990	1120	1230	1150	1100	1030	1090
8	1160	1130	970	830	690	590	500	340	190	0	140	270	390	590	700	790	930	1030	1170	1220	1220	1280
9	1210	1240	1110	970	830	730	640	480	330	140	0	130	250	450	560	650	790	890	1030	1080	1150	1250
10	1080	1110	1240	1100	960	860	770	610	470	270	130	0	110	310	430	520	650	760	890	950	1020	1120
11	960	990	1160	1210	1070	980	880	730	580	390	250	110	0	200	320	410	540	650	780	830	910	1010
12	760	790	960	1100	1240	1180	1080	930	780	590	450	310	200	0	120	210	340	440	580	630	710	810
13	650	680	840	980	1120	1220	1200	1040	900	700	560	430	320	120	0	90	220	330	460	520	590	690
14	560	590	750	890	1030	1130	1220	1130	990	790	650	520	410	210	90	0	130	240	370	430	500	600
15	420	450	620	760	900	1000	1090	1240	1120	930	790	650	540	340	220	130	0	100	240	290	360	460
16	320	350	510	650	790	890	990	1140	1230	1030	890	760	650	440	330	240	100	0	130	190	260	360
17	180	210	380	520	660	760	850	1010	1150	1170	1030	890	780	580	460	370	240	130	0	50	130	230
18	130	160	320	470	600	700	800	950	1100	1220	1080	950	830	630	520	430	290	190	50	0	70	170
18A	60	90	250	390	530	630	720	880	1030	1220	1150	1020	910	710	590	500	360	260	130	70	0	100
19	120	150	310	450	590	690	780	940	1090	1280	1250	1120	1010	810	690	600	460	360	230	170	100	0

Return Journey

Table 5-22: Car/Jeep/Van Toll Rates for Year 2025-2026 (Rs. Rupees)

F/T	1	1A	2	3	4	4A	5	6	7	8	9	10	11	12	13	14	15	16	17	18	18A	19
1	0	5	15	25	35	45	50	65	75	90	95	85	75	60	50	45	35	25	15	10	5	10
1A	5	0	15	25	35	40	50	60	75	90	95	85	75	60	50	45	35	25	15	10	5	10
2	15	15	0	10	20	30	35	50	60	75	85	95	90	75	65	60	50	40	30	25	20	25
3	25	25	10	0	10	20	25	40	50	65	75	85	95	85	75	70	60	50	40	35	30	35
4	35	35	20	10	0	10	15	25	40	55	65	75	85	95	85	80	70	60	50	45	40	45
4A	45	40	30	20	10	0	5	20	30	45	55	65	75	90	95	85	75	70	60	55	50	55
5	50	50	35	25	15	5	0	10	25	40	50	60	70	85	95	95	85	75	65	60	55	60
6	65	60	50	40	25	20	10	0	10	25	35	50	55	70	80	90	95	90	80	75	70	75
7	75	75	60	50	40	30	25	10	0	15	25	35	45	60	70	75	85	95	90	85	80	85
8	90	90	75	65	55	45	40	25	15	0	10	20	30	45	55	60	70	80	90	95	95	100
9	95	95	85	75	65	55	50	35	25	10	0	10	20	35	45	50	60	70	80	85	90	95
10	85	85	95	85	75	65	60	50	35	20	10	0	10	25	35	40	50	60	70	75	80	85
11	75	75	90	95	85	75	70	55	45	30	20	10	0	15	25	30	40	50	60	65	70	80
12	60	60	75	85	95	90	85	70	60	45	35	25	15	0	10	15	25	35	45	50	55	60
13	50	50	65	75	85	95	95	80	70	55	45	35	25	10	0	5	15	25	35	40	45	55
14	45	45	60	70	80	85	95	90	75	60	50	40	30	15	5	0	10	20	30	35	40	45
15	35	35	50	60	70	75	85	95	85	70	60	50	40	25	15	10	0	10	20	25	30	35
16	25	25	40	50	60	70	75	90	95	80	70	60	50	35	25	20	10	0	10	15	20	30
17	15	15	30	40	50	60	65	80	90	90	80	70	60	45	35	30	20	10	0	5	10	15
18	10	10	25	35	45	55	60	75	85	95	85	75	65	50	40	35	25	15	5	0	5	15
18A	5	5	20	30	40	50	55	70	80	95	90	80	70	55	45	40	30	20	10	5	0	10
19	10	10	25	35	45	55	60	75	85	100	95	85	80	60	55	45	35	30	15	15	10	0

Table 5-23: Minibus/LCV Toll Rates for Year 2025-2026 (Rs. Rupees)

F/T	1	1A	2	3	4	4A	5	6	7	8	9	10	11	12	13	14	15	16	17	18	18A	19
1	0	5	25	40	60	70	85	105	120	145	150	135	120	95	80	70	55	40	25	15	5	15
1A	5	0	20	40	55	70	80	100	115	140	155	140	125	100	85	75	55	45	25	20	10	20
2	25	20	0	20	35	45	60	80	95	120	140	155	145	120	105	95	75	65	45	40	30	40
3	40	40	20	0	15	30	40	60	80	105	120	140	150	135	125	110	95	80	65	60	50	55
4	60	55	35	15	0	10	25	45	60	85	105	120	135	155	140	130	110	100	80	75	65	75
4A	70	70	45	30	10	0	10	30	50	75	90	110	120	145	155	140	125	110	95	90	80	85
5	85	80	60	40	25	10	0	20	40	60	80	95	110	135	150	155	135	125	105	100	90	100
6	105	100	80	60	45	30	20	0	20	45	60	75	90	115	130	140	155	145	125	120	110	115
7	120	115	95	80	60	50	40	20	0	25	40	60	75	100	110	125	140	155	145	135	130	135
8	145	140	120	105	85	75	60	45	25	0	15	35	50	75	90	100	115	130	145	155	155	160
9	150	155	140	120	105	90	80	60	40	15	0	15	30	55	70	80	100	110	130	135	145	155
10	135	140	155	140	120	110	95	75	60	35	15	0	15	40	55	65	80	95	110	120	125	140
11	120	125	145	150	135	120	110	90	75	50	30	15	0	25	40	50	70	80	100	105	115	125
12	95	100	120	135	155	145	135	115	100	75	55	40	25	0	15	25	45	55	70	80	90	100
13	80	85	105	125	140	155	150	130	110	90	70	55	40	15	0	10	30	40	60	65	75	85
14	70	75	95	110	130	140	155	140	125	100	80	65	50	25	10	0	15	30	45	55	60	75
15	55	55	75	95	110	125	135	155	140	115	100	80	70	45	30	15	0	15	30	35	45	60
16	40	45	65	80	100	110	125	145	155	130	110	95	80	55	40	30	15	0	15	25	35	45
17	25	25	45	65	80	95	105	125	145	145	130	110	100	70	60	45	30	15	0	5	15	30
18	15	20	40	60	75	90	100	120	135	155	135	120	105	80	65	55	35	25	5	0	10	20
18A	5	10	30	50	65	80	90	110	130	155	145	125	115	90	75	60	45	35	15	10	0	15
19	15	20	40	55	75	85	100	115	135	160	155	140	125	100	85	75	60	45	30	20	15	0

Table 5-24: Bus/2-Axle Toll Rates for Year 2025-2026 (Rs. Rupees)

F/T	1	1A	2	3	4	4A	5	6	7	8	9	10	11	12	13	14	15	16	17	18	18A	19
1	0	5	45	75	105	125	150	180	215	260	270	240	215	170	145	125	95	70	40	30	15	25
1A	5	0	35	70	100	120	140	175	210	250	275	245	220	175	150	130	100	75	45	35	20	30
2	45	35	0	30	60	85	105	140	170	215	245	275	255	215	185	165	135	115	85	70	55	70
3	75	70	30	0	30	55	75	110	140	185	215	245	270	245	220	200	170	145	115	105	85	100
4	105	100	60	30	0	20	40	75	110	150	185	215	240	275	250	230	200	175	145	135	120	130
4A	125	120	85	55	20	0	20	55	85	130	160	190	215	260	270	250	220	200	170	155	140	155
5	150	140	105	75	40	20	0	35	65	110	140	170	195	240	265	270	240	220	190	175	160	175
6	180	175	140	110	75	55	35	0	30	75	105	135	160	205	230	250	275	255	225	210	195	210
7	215	210	170	140	110	85	65	30	0	45	75	105	130	175	200	220	250	270	255	245	230	240
8	260	250	215	185	150	130	110	75	45	0	30	60	85	130	155	175	205	230	260	270	270	285
9	270	275	245	215	185	160	140	105	75	30	0	30	55	100	125	145	175	200	230	240	255	280
10	240	245	275	245	215	190	170	135	105	60	30	0	25	70	95	115	145	170	200	210	225	250
11	215	220	255	270	240	215	195	160	130	85	55	25	0	45	70	90	120	145	175	185	200	225
12	170	175	215	245	275	260	240	205	175	130	100	70	45	0	25	45	75	100	130	140	155	180
13	145	150	185	220	250	270	265	230	200	155	125	95	70	25	0	20	50	75	105	115	130	155
14	125	130	165	200	230	250	270	250	220	175	145	115	90	45	20	0	30	55	85	95	110	135
15	95	100	135	170	200	220	240	275	250	205	175	145	120	75	50	30	0	25	55	65	80	105
16	70	75	115	145	175	200	220	255	270	230	200	170	145	100	75	55	25	0	30	40	60	80
17	40	45	85	115	145	170	190	225	255	260	230	200	175	130	105	85	55	30	0	10	30	50
18	30	35	70	105	135	155	175	210	245	270	240	210	185	140	115	95	65	40	10	0	15	40
18A	15	20	55	85	120	140	160	195	230	270	255	225	200	155	130	110	80	60	30	15	0	20
19	25	30	70	100	130	155	175	210	240	285	280	250	225	180	155	135	105	80	50	40	20	0

Table 5-25: 3-Axle Toll Rates for Year 2025-2026 (Rs. Rupees)

F/T	1	1A	2	3	4	4A	5	6	7	8	9	10	11	12	13	14	15	16	17	18	18A	19
1	0	10	55	95	135	165	190	235	275	330	345	310	275	220	185	160	120	90	55	35	15	35
1A	10	0	50	90	130	155	180	225	270	325	355	315	285	225	195	165	130	100	60	45	25	40
2	55	50	0	40	80	110	135	180	220	275	315	355	330	275	240	215	175	145	110	95	75	90
3	95	90	40	0	40	70	95	140	180	235	275	315	345	315	280	255	215	185	150	135	115	130
4	135	130	80	40	0	30	55	100	140	195	235	275	305	355	320	295	255	225	190	175	150	170
4A	165	155	110	70	30	0	25	70	115	170	210	245	280	335	350	325	285	255	215	200	180	195
5	190	180	135	95	55	25	0	45	85	140	180	220	250	310	345	350	310	280	245	225	205	225
6	235	225	180	140	100	70	45	0	40	95	135	175	210	265	300	325	355	325	285	270	250	270
7	275	270	220	180	140	115	85	40	0	55	95	135	165	225	255	280	320	350	330	315	295	310
8	330	325	275	235	195	170	140	95	55	0	40	80	110	170	200	225	265	295	335	350	350	365
9	345	355	315	275	235	210	180	135	95	40	0	40	70	130	160	185	225	255	295	310	330	360
10	310	315	355	315	275	245	220	175	135	80	40	0	30	90	125	150	185	215	255	270	290	320
11	275	285	330	345	305	280	250	210	165	110	70	30	0	55	90	115	155	185	225	240	260	290
12	220	225	275	315	355	335	310	265	225	170	130	90	55	0	35	60	95	125	165	180	200	230
13	185	195	240	280	320	350	345	300	255	200	160	125	90	35	0	25	65	95	135	150	170	195
14	160	165	215	255	295	325	350	325	280	225	185	150	115	60	25	0	40	70	105	120	145	170
15	120	130	175	215	255	285	310	355	320	265	225	185	155	95	65	40	0	30	70	85	105	135
16	90	100	145	185	225	255	280	325	350	295	255	215	185	125	95	70	30	0	40	55	75	105
17	55	60	110	150	190	215	245	285	330	335	295	255	225	165	135	105	70	40	0	15	35	65
18	35	45	95	135	175	200	225	270	315	350	310	270	240	180	150	120	85	55	15	0	20	50
18A	15	25	75	115	150	180	205	250	295	350	330	290	260	200	170	145	105	75	35	20	0	30
19	35	40	90	130	170	195	225	270	310	365	360	320	290	230	195	170	135	105	65	50	30	0

Table 5-26: 4 to 6 Axle Toll Rates for Year 2025-2026 (Rs. Rupees)

F/T	1	1A	2	3	4	4A	5	6	7	8	9	10	11	12	13	14	15	16	17	18	18A	19
1	0	10	80	140	195	235	275	335	395	475	500	445	395	315	265	230	175	130	75	55	25	50
1A	10	0	70	125	185	225	260	325	385	465	510	455	410	325	280	240	185	145	85	65	35	60
2	80	70	0	60	115	155	195	255	315	395	455	510	475	395	345	310	255	210	155	135	105	130
3	140	125	60	0	55	95	135	200	260	340	395	450	500	450	405	365	310	270	215	190	160	185
4	195	185	115	55	0	40	80	140	200	280	340	395	440	510	460	425	370	325	270	250	220	245
4A	235	225	155	95	40	0	40	100	160	240	300	355	400	485	500	465	410	365	310	290	260	285
5	275	260	195	135	80	40	0	65	125	205	260	315	360	445	495	505	445	405	350	325	300	320
6	335	325	255	200	140	100	65	0	60	140	195	250	300	380	430	465	510	470	415	390	360	385
7	395	385	315	260	200	160	125	60	0	80	135	195	240	320	370	405	460	505	475	450	420	445
8	475	465	395	340	280	240	205	140	80	0	55	115	160	240	290	325	380	425	480	500	500	525
9	500	510	455	395	340	300	260	195	135	55	0	55	100	185	230	270	325	365	420	445	475	515
10	445	455	510	450	395	355	315	250	195	115	55	0	45	130	175	215	270	310	365	390	420	460
11	395	410	475	500	440	400	360	300	240	160	100	45	0	80	130	165	220	265	320	345	370	415
12	315	325	395	450	510	485	445	380	320	240	185	130	80	0	50	85	140	185	240	260	290	330
13	265	280	345	405	460	500	495	430	370	290	230	175	130	50	0	35	90	135	190	215	240	285
14	230	240	310	365	425	465	505	465	405	325	270	215	165	85	35	0	55	100	155	175	205	245
15	175	185	255	310	370	410	445	510	460	380	325	270	220	140	90	55	0	45	100	120	150	190
16	130	145	210	270	325	365	405	470	505	425	365	310	265	185	135	100	45	0	55	80	105	150
17	75	85	155	215	270	310	350	415	475	480	420	365	320	240	190	155	100	55	0	20	50	95
18	55	65	135	190	250	290	325	390	450	500	445	390	345	260	215	175	120	80	20	0	30	70
18A	25	35	105	160	220	260	300	360	420	500	475	420	370	290	240	205	150	105	50	30	0	40
19	50	60	130	185	245	285	320	385	445	525	515	460	415	330	285	245	190	150	95	70	40	0

Table 5-27: 7 & above Axle Toll Rates for Year 2025-2026 (Rs. Rupees)

F/T	1	1A	2	3	4	4A	5	6	7	8	9	10	11	12	13	14	15	16	17	18	18A	19
1	0	15	95	170	235	285	335	410	485	580	605	540	480	380	325	280	210	160	90	65	30	60
1A	15	0	85	155	225	270	320	395	470	565	620	555	495	395	340	295	225	175	105	80	45	75
2	95	85	0	70	140	190	235	315	385	485	555	620	580	480	420	375	310	255	190	160	125	155
3	170	155	70	0	70	120	165	245	315	415	485	550	605	550	490	445	380	325	260	235	195	225
4	235	225	140	70	0	50	95	175	245	345	415	480	535	620	560	515	450	395	330	300	265	295
4A	285	270	190	120	50	0	45	125	195	295	365	430	490	590	610	565	500	445	380	350	315	345
5	335	320	235	165	95	45	0	80	150	250	320	385	440	540	600	610	545	495	425	400	360	390
6	410	395	315	245	175	125	80	0	75	170	240	305	365	465	520	565	620	570	505	475	440	470
7	485	470	385	315	245	195	150	75	0	95	165	235	290	390	450	495	560	615	575	550	515	545
8	580	565	485	415	345	295	250	170	95	0	70	135	195	295	350	395	465	515	585	610	610	640
9	605	620	555	485	415	365	320	240	165	70	0	65	125	225	280	325	395	445	515	540	575	625
10	540	555	620	550	480	430	385	305	235	135	65	0	55	155	215	260	325	380	445	475	510	560
11	480	495	580	605	535	490	440	365	290	195	125	55	0	100	160	205	270	325	390	415	455	505
12	380	395	480	550	620	590	540	465	390	295	225	155	100	0	60	105	170	220	290	315	355	405
13	325	340	420	490	560	610	600	520	450	350	280	215	160	60	0	45	110	165	230	260	295	345
14	280	295	375	445	515	565	610	565	495	395	325	260	205	105	45	0	65	120	185	215	250	300
15	210	225	310	380	450	500	545	620	560	465	395	325	270	170	110	65	0	50	120	145	180	230
16	160	175	255	325	395	445	495	570	615	515	445	380	325	220	165	120	50	0	65	95	130	180
17	90	105	190	260	330	380	425	505	575	585	515	445	390	290	230	185	120	65	0	25	65	115
18	65	80	160	235	300	350	400	475	550	610	540	475	415	315	260	215	145	95	25	0	35	85
18A	30	45	125	195	265	315	360	440	515	610	575	510	455	355	295	250	180	130	65	35	0	50
19	60	75	155	225	295	345	390	470	545	640	625	560	505	405	345	300	230	180	115	85	50	0

Above rates are applicable for year 2026-27. Toll rates for future years have been worked out as per applicable rate revision policy. These rates have been used for calculating revenue of future years.

5.2 Traffic Forecast

Growth rates recommended in the previous section of the report are used to arrive at traffic projections for future years.

These projections have been done for the following three cases of growth up to concession period.

1. Optimistic Scenario
2. Pessimistic Scenario
3. Most Likely Scenario

Traffic of horizon years has been worked out on the basis of growth as discussed previously. Traffic forecast of total volume (all category) is given in tables below.

Table 5-28: Total Tollable Traffic (Pessimistic Growth Scenario)

Year/ Types of vehicles	Car/Jeep/Van	Minibus /LCV	Bus/ 2- Axle	3 - Axle	4 to 6 Axle	7 and Above Axle	Total Tollable Traffic (No.)	PCU (Including Exempted)
2026-27	229969	10316	12326	7334	15299	5	**275249**	**373291**
2027-28	246196	10787	12703	7632	15937	5	**293260**	**395121**
2028-29	260786	11247	12968	7838	16402	5	**309246**	**413906**
2029-30	276244	11719	13236	8045	16878	5	**326127**	**433639**
2030-31	292603	12200	13507	8258	17364	5	**343937**	**454359**
2031-32	309935	12707	13785	8478	17859	5	**362769**	**476173**
2032-33	328286	13233	14067	8701	18369	5	**382661**	**499123**
2033-34	341040	13740	14195	8813	18643	5	**396436**	**514590**
2034-35	354274	14264	14324	8926	18922	5	**410715**	**530592**
2035-36	368024	14805	14455	9041	19204	5	**425534**	**547160**
2036-37	382313	15369	14588	9157	19489	5	**440921**	**564325**
2037-38	397148	15953	14721	9274	19776	5	**456877**	**582077**
2038-39	409153	16510	14804	9352	19957	5	**469781**	**596215**
2039-40	421512	17083	14887	9431	20139	5	**483057**	**610739**
2040-41	434250	17669	14970	9510	20324	5	**496728**	**625674**
2041-42	447372	18271	15053	9589	20510	5	**510800**	**641022**

Year/ Types of vehicles	Car/Jeep/Van	Minibus /LCV	Bus/ 2- Axle	3 - Axle	4 to 6 Axle	7 and Above Axle	Total Tollable Traffic (No.)	PCU (Including Exempted)
2042-43	460880	18900	15136	9669	20697	5	**525287**	**656804**
2043-44	471317	19489	15167	9700	20786	5	**536464**	**668711**
2044-45	481982	20091	15198	9731	20875	5	**547882**	**680866**
2045-46	492887	20718	15229	9762	20964	5	**559565**	**693298**
2046-47	504046	21360	15260	9793	21053	5	**571517**	**706006**
2047-48	515468	22031	15291	9824	21142	5	**583761**	**719021**
2048-49	523794	22656	15291	9828	21155	5	**592729**	**728355**
2049-50	532250	23293	15291	9832	21168	5	**601839**	**737837**
2050-51	540841	23939	15291	9836	21181	5	**611093**	**747468**
2051-52	549580	24613	15291	9840	21194	5	**620523**	**757288**
2052-53	558459	25308	15291	9844	21207	5	**630114**	**767280**
2053-54	567002	26022	15291	9848	21220	5	**639388**	**776965**

Table 5-29: Total Tollable Traffic (Most likely Growth Scenario)

Year/ Types of vehicles	Car/Jeep/Van	Minibus /LCV	Bus/ 2- Axle	3 - Axle	4 to 6 Axle	7 and Above Axle	Total Tollable Traffic (No.)	PCU (Including Exempted)
2026-27	230517	10341	12350	7354	15341	5	**275908**	**374198**
2027-28	247365	10837	12752	7667	16019	5	**294645**	**396986**
2028-29	262633	11325	13050	7894	16525	5	**311432**	**416838**
2029-30	278845	11824	13354	8124	17046	5	**329198**	**437745**
2030-31	296057	12348	13665	8361	17581	5	**348017**	**459794**
2031-32	314324	12893	13982	8605	18136	5	**367945**	**483059**
2032-33	333714	13463	14306	8852	18705	5	**389045**	**507578**
2033-34	347498	14010	14478	8991	19047	5	**404029**	**524654**
2034-35	361847	14580	14651	9132	19390	5	**419605**	**542344**

Year/ Types of vehicles	Car/Jeep/Van	Minibus /LCV	Bus/ 2- Axle	3 - Axle	4 to 6 Axle	7 and Above Axle	Total Tollable Traffic (No.)	PCU (Including Exempted)
2035-36	376796	15167	14826	9275	19738	5	**435807**	**560693**
2036-37	392350	15782	15002	9420	20089	5	**452648**	**579712**
2037-38	408554	16419	15179	9567	20442	5	**470166**	**599432**
2038-39	421912	17033	15294	9668	20684	5	**484596**	**615448**
2039-40	435708	17665	15409	9769	20926	5	**499482**	**631929**
2040-41	449962	18316	15524	9871	21170	5	**514848**	**648909**
2041-42	464685	18998	15641	9973	21415	5	**530717**	**666414**
2042-43	479881	19715	15758	10075	21662	5	**547096**	**684454**
2043-44	491958	20384	15832	10135	21804	5	**560118**	**698576**
2044-45	504322	21075	15906	10196	21946	5	**573450**	**713020**
2045-46	517014	21795	15980	10257	22089	5	**587140**	**727841**
2046-47	530025	22533	16054	10318	22232	5	**601167**	**743007**
2047-48	543362	23308	16128	10380	22377	5	**615560**	**758567**
2048-49	553492	24028	16149	10399	22442	5	**626515**	**770190**
2049-50	563809	24766	16170	10418	22508	5	**637676**	**782031**
2050-51	574321	25537	16191	10437	22574	5	**649065**	**794116**
2051-52	585006	26322	16213	10456	22640	5	**660642**	**806399**
2052-53	595903	27127	16235	10475	22706	5	**672451**	**818923**
2053-54	606408	27954	16257	10494	22772	5	**683890**	**831089**

Table 5-30: Total Tollable Traffic (Optimistic Growth Scenario)

Year/ Types of vehicles	Car/Jeep/Van	Minibus /LCV	Bus/ 2- Axle	3 - Axle	4 to 6 Axle	7 and Above Axle	Total Tollable Traffic (No.)	PCU (Including Exempted)
2026-27	231076	10368	12383	7374	15377	5	**276583**	**375118**
2027-28	248546	10892	12820	7701	16102	5	**296066**	**398929**
2028-29	264526	11409	13160	7950	16654	5	**313704**	**419935**
2029-30	281517	11940	13506	8203	17222	5	**332393**	**442076**
2030-31	299600	12498	13861	8465	17805	5	**352234**	**465470**
2031-32	318837	13086	14221	8737	18405	5	**373291**	**490185**
2032-33	339318	13694	14589	9017	19022	5	**395645**	**516299**
2033-34	354183	14287	14808	9189	19417	5	**411889**	**535004**
2034-35	369713	14897	15028	9363	19822	5	**428828**	**554453**
2035-36	385899	15530	15252	9540	20234	5	**446460**	**574646**
2036-37	402811	16193	15476	9719	20649	5	**464853**	**595629**
2037-38	420450	16891	15705	9899	21075	5	**484025**	**617459**
2038-39	435262	17557	15872	10030	21390	5	**500116**	**635581**
2039-40	450590	18255	16040	10162	21707	5	**516759**	**654283**
2040-41	466459	18980	16209	10294	22029	5	**533976**	**673591**
2041-42	482874	19735	16380	10426	22358	5	**551778**	**693528**
2042-43	499865	20519	16554	10561	22694	5	**570198**	**714134**
2043-44	513702	21270	16665	10652	22909	5	**585203**	**730671**
2044-45	527906	22047	16777	10744	23125	5	**600604**	**747625**
2045-46	542522	22849	16889	10836	23346	5	**616447**	**765050**
2046-47	557515	23680	17001	10930	23567	5	**632698**	**782902**
2047-48	572938	24537	17114	11025	23788	5	**649407**	**801229**
2048-49	585063	25350	17182	11073	23908	5	**662581**	**815462**
2049-50	597430	26191	17250	11122	24028	5	**676026**	**829981**
2050-51	610073	27050	17318	11171	24148	5	**689765**	**844804**
2051-52	622978	27945	17386	11220	24269	5	**703803**	**859947**
2052-53	636155	28875	17454	11269	24390	5	**718148**	**875414**

Year/ Types of vehicles	Car/Jeep/Van	Minibus /LCV	Bus/ 2- Axle	3 - Axle	4 to 6 Axle	7 and Above Axle	Total Tollable Traffic (No.)	PCU (Including Exempted)
2053-54	648877	29829	17522	11318	24511	5	**732062**	**890463**

5.2 Toll Revenue at all toll plazas

Toll revenue has been worked out for concession period as per projected traffic and worked out rates.

5.4 Revenue Forecast

Revenue forecast with traffic numbers as per above analysis and rates worked out is given in following table.

Table 5-31: Total Toll Revenue – Rs. Cr (Pessimistic)

Year /TP no.	1	1A	2	3	4	4A	5	6	7	8	9	10	11	12	13	14	15	16	17	18	18A	19	Total
2026-27	27.63	2.60	20.14	116.27	15.21	17.35	41.78	113.14	49.02	21.46	53.07	8.11	127.04	29.24	7.08	33.11	29.58	142.60	21.75	27.39	11.47	90.93	**1,005.96**
2027-28	30.40	2.88	22.19	128.99	17.21	19.41	46.58	125.39	54.46	23.99	59.62	9.01	141.02	32.87	7.80	37.40	33.28	156.58	25.07	30.20	12.70	100.49	**1,117.55**
2028-29	34.32	3.42	24.47	141.30	18.73	21.65	51.41	137.11	60.53	26.45	65.53	9.78	154.51	36.79	8.65	41.04	35.99	171.10	27.13	32.59	14.64	109.88	**1,226.99**
2029-30	36.83	3.73	27.86	155.83	20.88	23.81	57.12	150.18	67.14	29.49	72.90	10.80	170.40	40.64	9.51	45.46	39.49	190.04	29.39	35.16	16.03	124.58	**1,357.26**
2030-31	41.63	4.04	30.29	171.25	23.08	26.82	62.34	164.50	73.62	32.68	80.20	11.90	188.61	45.21	10.30	50.90	43.83	208.00	32.39	39.38	17.54	137.17	**1,495.69**
2031-32	46.49	4.37	33.90	188.80	25.31	29.69	68.97	181.16	81.56	35.90	89.32	13.21	207.12	49.92	11.56	55.38	48.01	226.98	37.19	46.27	19.68	153.20	**1,653.98**
2032-33	51.53	4.87	37.28	206.50	27.98	32.80	76.27	198.09	90.80	39.49	98.03	14.27	227.42	55.14	12.66	61.51	52.42	254.09	39.85	50.10	22.68	175.12	**1,828.93**
2033-34	56.06	5.22	40.86	224.06	30.22	36.10	83.17	214.94	98.26	43.41	107.88	15.58	247.22	60.59	13.90	68.10	57.19	272.28	43.39	53.94	24.42	187.03	**1,983.83**
2034-35	62.10	5.99	44.86	243.89	33.34	39.66	90.78	233.41	107.31	46.82	117.57	16.89	269.37	65.91	15.16	74.02	62.06	301.58	48.63	58.66	26.08	210.44	**2,174.53**
2035-36	67.12	6.49	48.89	267.83	36.72	43.13	99.48	253.69	117.71	52.15	128.83	18.38	293.25	72.00	16.55	81.65	68.19	325.62	52.95	63.32	29.49	226.05	**2,369.49**
2036-37	73.92	7.00	53.52	288.82	40.08	48.03	107.37	274.16	127.77	56.81	140.83	20.12	319.26	78.34	17.94	89.32	73.68	356.93	55.93	71.94	31.67	254.74	**2,588.17**
2037-38	80.06	7.49	58.46	313.81	43.38	52.41	118.96	297.92	140.59	61.84	153.13	21.78	347.46	85.95	19.75	97.36	80.27	392.62	63.29	79.91	36.28	281.35	**2,834.08**
2038-39	89.11	8.53	63.99	338.25	47.41	56.87	127.99	323.07	151.67	67.16	166.83	23.73	375.90	93.10	21.52	105.25	86.77	419.30	68.58	85.06	38.38	301.12	**3,059.61**
2039-40	97.07	9.11	69.83	368.66	51.63	62.33	138.84	349.54	165.84	73.43	181.82	25.64	407.11	102.10	23.38	115.81	93.31	460.06	73.75	94.57	42.52	333.61	**3,339.95**
2040-41	105.02	9.70	75.56	397.72	55.87	67.50	150.65	376.96	180.71	80.03	197.71	27.98	441.19	110.26	25.35	124.93	101.88	499.06	79.99	102.33	45.77	363.66	**3,619.84**

Year /TP no.	1	1A	2	3	4	4A	5	6	7	8	9	10	11	12	13	14	15	16	17	18	18A	19	Total
2041-42	114.77	10.41	82.51	430.64	60.87	73.92	163.73	407.59	195.86	87.26	214.82	30.16	478.65	120.85	27.46	137.63	110.15	544.09	87.03	109.38	50.82	398.84	3,937.46
2042-43	126.60	11.66	91.12	467.11	66.87	81.18	177.97	441.90	213.40	95.02	233.52	32.96	518.44	131.04	30.41	148.89	119.47	583.57	95.64	122.73	54.35	433.43	4,277.29
2043-44	137.63	12.50	97.64	505.52	72.32	88.17	193.92	476.93	231.89	102.42	254.21	35.75	562.59	142.71	32.75	162.65	129.07	631.57	104.49	131.09	59.47	470.47	4,635.75
2044-45	147.08	13.93	105.44	545.42	77.87	95.47	208.97	513.27	250.74	111.06	273.89	38.37	605.23	153.04	35.28	174.69	138.96	681.76	112.43	144.60	65.25	513.56	5,006.30
2045-46	161.26	14.77	114.43	587.27	84.94	103.55	226.52	552.58	271.24	120.48	297.05	41.50	654.40	167.05	38.32	191.15	149.91	736.51	123.17	154.72	71.04	556.57	5,418.45
2046-47	174.03	16.38	123.94	633.46	91.59	112.43	244.18	596.61	292.53	130.12	322.45	45.19	705.31	181.26	41.68	207.07	162.52	804.48	133.28	171.57	75.83	615.26	5,881.17
2047-48	192.56	17.52	135.68	687.06	99.69	123.62	266.31	647.11	320.64	142.35	350.30	48.84	764.67	196.70	45.28	223.65	175.82	871.41	143.44	182.44	83.23	667.00	6,385.33
2048-49	207.35	19.07	145.49	736.10	107.33	132.97	286.31	693.60	345.21	152.66	375.82	52.58	821.05	212.04	48.75	241.56	188.55	932.80	154.81	198.91	89.22	718.81	6,860.99
2049-50	221.98	20.33	158.39	792.79	116.68	144.64	309.33	745.39	372.03	165.50	406.39	56.70	882.10	229.80	52.92	261.12	202.39	1012.43	166.94	216.40	96.97	785.16	7,416.35
2050-51	240.79	22.24	170.56	853.53	125.75	156.07	332.71	802.16	401.12	178.87	438.28	61.45	950.20	248.83	57.17	282.84	218.77	1085.98	182.75	232.77	104.64	842.88	7,990.38
2051-52	261.66	23.75	185.12	922.50	136.40	169.53	360.14	865.82	434.31	193.67	476.56	66.64	1027.37	268.98	61.81	306.49	235.89	1177.14	197.79	251.57	113.58	920.03	8,656.76
2052-53	281.93	25.75	200.74	989.69	146.52	182.47	389.27	929.34	468.10	209.61	512.51	71.83	1102.94	290.41	66.82	331.30	254.00	1259.57	211.98	272.26	123.89	987.31	9,308.25
2053-54	307.44	28.08	215.84	1066.80	158.73	197.89	420.80	999.85	506.41	226.15	554.56	77.51	1190.68	313.56	72.44	357.96	273.89	1360.20	229.54	296.47	133.47	1076.51	10064.83

Table 5-32: Total Toll Revenue – Rs. Cr (Most Likely)

Year /TP no.	1	1A	2	3	4	4A	5	6	7	8	9	10	11	12	13	14	15	16	17	18	18A	19	Total
2026-27	27.70	2.60	20.17	116.63	15.23	17.43	41.88	113.39	49.14	21.51	53.20	8.13	127.33	29.30	7.12	33.21	29.63	142.90	21.85	27.45	11.49	91.15	1,008.45
2027-28	30.54	2.89	22.27	129.69	17.27	19.53	46.74	125.95	54.80	24.13	59.89	9.04	141.68	33.02	7.88	37.61	33.45	157.31	25.24	30.34	12.74	100.97	1,122.99
2028-29	34.57	3.43	24.62	142.36	18.83	21.85	51.74	138.03	61.02	26.66	66.06	9.83	155.62	37.03	8.74	41.38	36.32	172.28	27.36	32.82	14.73	110.67	1,235.94
2029-30	37.19	3.76	28.07	157.38	21.03	24.11	57.62	151.50	67.81	29.78	73.65	10.87	172.10	41.00	9.63	45.97	39.93	191.83	29.71	35.49	16.15	125.76	1,370.34
2030-31	42.11	4.07	30.61	173.35	23.29	27.22	63.08	166.31	74.53	33.08	81.17	11.98	190.89	45.71	10.46	51.60	44.39	210.43	32.79	39.85	17.71	138.76	1,513.41
2031-32	47.13	4.41	34.31	191.56	25.58	30.22	69.97	183.59	82.76	36.42	90.58	13.32	210.11	50.57	11.76	56.29	48.69	230.23	37.73	46.96	19.92	155.32	1,677.43
2032-33	52.34	4.92	37.90	210.00	28.35	33.49	77.60	201.22	92.35	40.15	99.66	14.42	231.35	55.99	12.89	62.67	53.25	258.38	40.51	51.01	23.00	177.93	1,859.39
2033-34	57.06	5.29	41.69	228.42	30.71	36.99	84.89	218.87	100.18	44.18	110.00	15.77	252.16	61.69	14.16	69.50	58.18	277.49	44.18	55.03	24.82	190.51	2,021.78
2034-35	63.32	6.09	45.92	249.24	34.01	40.80	92.93	238.27	109.63	47.69	120.22	17.11	275.41	67.27	15.46	75.69	63.25	308.12	49.63	59.99	26.57	214.89	2,221.50
2035-36	68.55	6.59	50.24	274.37	37.59	44.52	102.14	259.56	120.56	53.22	132.10	18.67	300.57	73.68	16.88	83.62	69.64	333.56	54.17	64.92	30.13	231.39	2,426.69
2036-37	75.68	7.12	55.23	296.58	41.15	49.72	110.50	281.19	131.11	58.09	144.83	20.49	328.10	80.38	18.32	91.64	75.34	366.62	57.31	73.90	32.43	261.39	2,657.12
2037-38	82.17	7.63	60.51	323.18	44.68	54.44	122.75	306.38	144.60	63.33	157.98	22.25	357.98	88.43	20.22	100.08	82.19	404.28	64.98	82.26	37.25	289.43	2,916.98
2038-39	91.66	8.73	66.35	349.38	48.92	59.19	132.42	333.09	156.40	68.99	172.53	24.29	388.21	95.99	22.08	108.43	89.01	432.80	70.58	87.72	39.49	310.53	3,156.77
2039-40	100.07	9.37	72.53	381.99	53.36	65.02	144.06	361.31	171.42	75.63	188.51	26.27	421.51	105.49	24.03	119.54	95.87	476.04	76.07	97.72	43.86	344.90	3,454.56

Year /TP no.	1	1A	2	3	4	4A	5	6	7	8	9	10	11	12	13	14	15	16	17	18	18A	19	Total
2040-41	108.49	10.02	78.61	413.45	57.84	70.57	156.75	390.66	187.31	82.65	205.52	28.70	458.02	114.17	26.10	129.25	104.88	517.68	82.72	106.00	47.32	376.97	3,753.67
2041-42	118.80	10.78	86.04	449.06	63.14	77.42	170.80	423.42	203.55	90.37	223.83	30.98	498.22	125.37	28.31	142.68	113.62	565.74	90.24	113.56	52.67	414.54	4,093.14
2042-43	131.32	12.12	95.23	488.61	69.50	85.18	186.11	460.18	222.35	98.74	243.90	33.90	540.98	136.23	31.41	154.71	123.44	608.30	99.44	127.73	56.45	451.71	4,457.54
2043-44	143.19	13.00	102.28	530.08	75.31	92.75	203.31	497.73	242.08	106.66	266.19	36.85	588.69	148.77	33.89	169.31	133.71	660.09	108.90	136.76	61.90	491.45	4,842.88
2044-45	153.46	14.49	110.72	573.20	81.23	100.64	219.60	536.85	262.28	115.94	287.54	39.64	635.12	159.96	36.58	182.20	144.33	714.48	117.46	151.22	68.07	537.76	5,242.76
2045-46	168.79	15.38	120.41	618.69	88.77	109.44	238.61	579.30	284.32	126.12	312.68	42.95	688.72	175.08	39.82	199.78	156.12	773.85	129.00	162.19	74.25	584.20	5,688.47
2046-47	182.70	17.08	130.68	668.86	95.89	119.09	257.86	626.90	307.30	136.59	340.25	46.86	744.49	190.50	43.42	216.85	169.72	847.54	139.90	180.26	79.45	647.35	6,189.55
2047-48	202.76	18.29	143.37	727.01	104.57	131.22	281.90	681.45	337.46	149.88	370.49	50.75	809.50	207.26	47.31	234.74	184.12	920.53	150.88	192.09	87.41	703.44	6,736.45
2048-49	218.77	19.96	154.04	780.90	112.80	141.53	303.65	732.01	364.22	161.03	398.36	54.70	871.28	223.85	51.07	254.09	197.87	987.67	163.18	209.94	93.92	759.92	7,254.74
2049-50	234.71	21.32	168.04	843.12	122.83	154.36	328.70	788.40	393.51	174.94	431.73	59.05	938.30	243.11	55.56	275.28	212.85	1074.44	176.34	228.96	102.32	832.05	7,859.91
2050-51	255.17	23.37	181.36	909.95	132.62	166.96	354.21	850.29	425.35	189.45	466.69	64.07	1013.21	263.78	60.18	298.93	230.61	1155.13	193.49	246.85	110.69	895.39	8,487.77
2051-52	277.91	25.02	197.25	986.00	144.14	181.83	384.22	919.75	461.58	205.56	508.64	69.56	1098.04	285.70	65.23	324.75	249.26	1255.00	209.88	267.38	120.45	979.64	9,216.81
2052-53	300.10	27.17	214.38	1060.44	155.16	196.14	416.17	989.31	498.58	222.92	548.19	75.14	1181.57	309.05	70.71	351.89	269.08	1346.00	225.42	289.99	131.72	1053.80	9,932.93
2053-54	327.95	29.69	231.03	1145.89	168.43	213.19	450.79	1066.56	540.56	240.94	594.45	81.24	1278.67	334.39	76.87	381.04	290.86	1456.96	244.66	316.45	142.30	1151.71	10764.62

Table 5-33: Total Toll Revenue –Rs. Cr (Optimistic)

Year /TP no.	1	1A	2	3	4	4A	5	6	7	8	9	10	11	12	13	14	15	16	17	18	18A	19	Total
2026-27	27.79	2.60	20.22	116.91	15.29	17.46	41.96	113.63	49.23	21.56	53.33	8.13	127.68	29.35	7.14	33.31	29.67	143.23	21.89	27.51	11.51	91.36	1,010.76
2027-28	30.69	2.90	22.37	130.32	17.38	19.60	46.95	126.55	55.03	24.26	60.13	9.06	142.37	33.13	7.90	37.80	33.58	158.00	25.34	30.46	12.80	101.42	1,128.04
2028-29	34.81	3.45	24.77	143.43	18.99	21.97	52.10	139.13	61.46	26.82	66.47	9.89	156.79	37.23	8.78	41.71	36.51	173.46	27.53	33.04	14.81	111.41	1,244.59
2029-30	37.53	3.78	28.35	158.91	21.24	24.31	58.19	153.14	68.52	30.00	74.32	10.98	173.83	41.29	9.70	46.49	40.24	193.62	29.96	35.83	16.27	126.88	1,383.39
2030-31	42.61	4.11	31.00	175.44	23.58	27.51	63.81	168.64	75.49	33.37	82.16	12.16	193.36	46.13	10.55	52.37	44.84	212.91	33.20	40.32	17.88	140.34	1,531.79
2031-32	47.80	4.45	34.88	194.39	25.96	30.62	70.94	186.69	84.04	36.81	91.93	13.58	213.30	51.12	11.88	57.29	49.33	233.49	38.31	47.61	20.16	157.46	1,702.04
2032-33	53.24	4.98	38.58	213.60	28.83	34.01	78.84	205.21	94.01	40.65	101.41	14.76	235.35	56.74	13.05	63.98	54.05	262.63	41.26	51.83	23.33	180.82	1,891.17
2033-34	58.19	5.34	42.54	232.90	31.28	37.65	86.42	223.79	102.21	44.86	112.16	16.16	257.18	62.78	14.34	71.10	59.25	282.77	45.16	56.03	25.24	194.05	2,061.43
2034-35	64.78	6.17	46.96	254.70	34.70	41.60	94.79	244.27	112.12	48.57	122.85	17.57	281.61	68.74	15.68	77.59	64.58	314.75	50.86	61.22	27.08	219.39	2,270.60
2035-36	70.38	6.70	51.47	281.02	38.43	45.50	104.40	266.79	123.53	54.33	135.28	19.20	308.16	75.57	17.16	85.91	71.30	341.49	55.66	66.38	30.77	236.77	2,486.19
2036-37	77.91	7.25	56.67	304.65	42.14	50.93	113.18	289.78	134.68	59.42	148.59	21.08	337.24	82.77	18.67	94.36	77.34	376.21	59.08	75.74	33.18	268.11	2,728.99
2037-38	84.82	7.79	62.22	332.74	45.84	55.86	125.95	316.38	148.90	64.93	162.39	22.91	368.97	91.39	20.64	103.27	84.57	415.87	67.22	84.50	38.18	297.56	3,002.92
2038-39	94.77	8.94	68.46	360.55	50.35	60.85	136.23	344.76	161.51	70.85	177.71	25.04	401.17	99.38	22.56	112.09	91.93	446.30	73.19	90.32	40.66	320.12	3,257.72

Year /TP no.	1	1A	2	3	4	4A	5	6	7	8	9	10	11	12	13	14	15	16	17	18	18A	19	Total
2039-40	103.66	9.61	75.09	394.98	55.13	66.95	148.57	374.79	177.54	77.84	194.56	27.15	436.67	109.42	24.59	123.83	99.38	491.99	79.07	100.83	45.34	356.48	**3,573.45**
2040-41	112.61	10.29	81.68	428.36	59.94	72.82	162.05	406.17	194.46	85.23	212.55	29.73	475.61	118.68	26.74	134.12	109.07	536.33	86.17	109.57	49.09	390.58	**3,891.84**
2041-42	123.57	11.09	89.63	466.17	65.64	80.06	176.98	441.32	211.76	93.35	231.97	32.15	518.57	130.58	29.05	148.40	118.60	587.60	94.18	117.63	54.85	430.53	**4,253.70**
2042-43	136.89	12.51	99.47	508.31	72.48	88.29	193.30	480.86	231.91	102.16	253.37	35.24	564.49	142.17	32.34	161.31	129.32	633.40	103.99	132.58	58.99	470.27	**4,643.66**
2043-44	149.55	13.45	107.13	553.00	78.75	96.34	211.62	521.27	253.26	110.65	277.27	38.38	615.83	155.57	34.94	177.19	140.31	689.00	114.12	142.32	64.82	512.98	**5,057.77**
2044-45	160.58	15.03	116.26	599.67	85.21	104.76	229.06	563.44	275.23	120.64	300.32	41.35	666.05	167.61	37.78	191.40	151.75	747.46	123.39	157.81	71.44	562.77	**5,489.02**
2045-46	176.92	15.99	126.83	649.16	93.39	114.17	249.43	609.30	299.24	131.61	327.41	44.87	723.94	183.86	41.20	210.64	164.46	811.54	135.83	169.72	78.14	612.92	**5,970.57**
2046-47	191.86	17.81	138.05	703.87	101.17	124.53	270.16	660.83	324.36	142.94	357.24	49.01	784.35	200.47	44.99	229.40	179.08	891.03	147.69	189.18	83.77	680.94	**6,512.73**
2047-48	213.36	19.10	151.91	767.28	110.67	137.50	296.03	720.02	357.29	157.30	390.06	53.17	854.94	218.62	49.07	249.12	194.58	970.20	159.64	202.13	92.38	741.88	**7,106.22**
2048-49	230.88	20.86	163.52	825.91	119.63	148.66	319.75	775.27	386.31	169.37	420.30	57.44	922.49	236.76	53.07	270.23	209.64	1043.52	173.13	221.36	99.44	803.40	**7,670.94**
2049-50	248.40	22.28	178.75	893.67	130.55	162.50	347.05	837.05	418.20	184.37	456.58	62.16	995.98	257.80	57.89	293.42	226.05	1138.08	187.59	241.94	108.54	881.85	**8,330.71**
2050-51	270.81	24.45	193.30	966.61	141.29	176.19	375.01	905.01	453.06	200.03	494.71	67.64	1078.12	280.50	62.87	319.24	245.46	1226.63	206.34	261.36	117.62	951.28	**9,017.52**
2051-52	295.80	26.19	210.70	1049.75	153.88	192.29	407.94	981.41	492.75	217.41	540.36	73.63	1171.45	304.67	68.30	347.50	265.89	1336.01	224.36	283.66	128.27	1043.34	**9,815.55**
2052-53	320.31	28.48	229.45	1131.65	165.96	207.95	443.08	1058.50	533.60	236.26	583.76	79.66	1263.94	330.52	74.20	377.23	287.59	1436.50	241.59	308.33	140.58	1125.02	**10,604.18**
2053-54	351.06	31.17	247.73	1225.70	180.55	226.55	481.34	1143.95	579.94	255.92	634.56	86.31	1371.28	358.52	80.84	409.31	311.49	1558.71	262.85	337.17	152.17	1232.51	**11519.65**

5.4 Modification in concession period.

Modification in concession period is analysed as per provisions of DCA and same is summarised in table below for all scenarios.

Pessimistic Case

Target Point 1- April 2033									
Target Month - March 2029	**Target Revenue (Rs. Crores)**	**Calculated Revenue (Rs. Crores)**	**Difference %**	**If qualifies for Modification in Concession Period**	**Qualifying increment or shortfall**	**Change in Concession period %**	**Original Concession Period**	**Change in Concession period**	**Modified Concession Period**
NORR	173.18	166.31	-3.96%	No	-	0.00%	30.00	0.00	

Target Point 2- April 2043											
Target Month - March 2036	Target Revenue (Rs. Crores)	Calculated Revenue (Rs. Crores)	Difference %	If qualifies for Modification in Concession Period	Qualifying increment or shortfall	Change in Concession period %	Original Concession Period	Change in Concession period	Total Change in Concession period	Calculated Modified Concession Period	Final Concession Period subject to Cap
NORR	448.25	386.65	-13.74%	No	-	0.00%	30.00	0.00	0.00	30.00	

Most Likely Case

Target Point 1- April 2033									
Target Month - March 2029	Target Revenue (Rs. Crores)	Calculated Revenue (Rs. Crores)	Difference %	If qualifies for Modification in Concession Period	Qualifying increment or shortfall	Change in Concession period %	Original Concession Period	Change in Concession period	Modified Concession Period
NORR	173.18	169.52	-2.11%	No	-	0.00%	30.00	0.00	

Target Point 2- April 2043											
Target Month - March 2036	Target Revenue (Rs. Crores)	Calculated Revenue (Rs. Crores)	Difference %	If qualifies for Modification in Concession Period	Qualifying increment or shortfall	Change in Concession period %	Original Concession Period	Change in Concession period	Total Change in Concession period	Calculated Modified Concession Period	Final Concession Period subject to Cap
NORR	448.25	403.98	-9.88%	No	-	0.00%	30.00	0.00	0.00	30.00	

Optimistic Case

Target Point 1- April 2033									
Target Month - March 2029	**Target Revenue (Rs. Crores)**	**Calculated Revenue (Rs. Crores)**	**Difference %**	**If qualifies for Modification in Concession Period**	**Qualifying increment or shortfall**	**Change in Concession period %**	**Original Concession Period**	**Change in Concession period**	**Modified Concession Period**
NORR	173.18	172.87	-0.18%	No	-	0.00%	30.00	0.00	

Target Point 2- April 2043											
Target Month - March 2036	**Target Revenue (Rs. Crores)**	**Calculated Revenue (Rs. Crores)**	**Difference %**	**If qualifies for Modification in Concession Period**	**Qualifying increment or shortfall**	**Change in Concession period %**	**Original Concession Period**	**Change in Concession period**	**Total Change in Concession period**	**Calculated Modified Concession Period**	**Final Concession Period subject to Cap**
NORR	448.25	409.98	-8.54%	No	-	0.00%	30.00	0.00	0.00	30.00	

Hyderabad NORR-Modification in Concession Period						
Types of Scenarios	**Pessimistic Case**		**Most likely Case**		**Optimistic Case**	
Target Month	**April 2033**	**April 2043**	**April 2033**	**April 2043**	**April 2033**	**April 2043**
Target Revenue (Rs. Crores)	173.18	448.25	173.18	448.25	173.18	448.25
Calculated Revenue (Rs. Crores)	166.31	386.65	169.52	403.98	172.87	409.98
Difference %	-3.96%	-13.74%	-2.11%	-9.88%	-0.18%	-8.54%
If qualifies for Modification in Concession Period	No	No	No	No	No	No
Qualifying Increment or shortfall	-	-	-	-	-	-
Change in Concession period %	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Original Concession Period	30.00	30.00	30.00	30.00	30.00	30.00
Change in Concession period	0.00	0.00	0.00	0.00	0.00	0.00
Total Change in Concession period	0.00		0.00		0.00	
Calculated Modified Concession Period	30.00		30.00		30.00	
Final Concession Period subject to Cap	0.00		0.00		0.00	

Thus, there is no modification expected in concession period due to variation in revenue as per above estimates in all scenarios.

CHAPTER 6

CONCLUSION & RECOMMENDATIONS

6.1 Conclusion & Recommendations

The Outer Ring Road, officially as, Jawaharlal Nehru Outer Ring Road and abbreviated as, O.R.R., is a 158 kilometer, 8-lanes ring road expressway encircling Hyderabad, capital of the Indian state of Telangana. ORR is one of the most important infrastructural developments which has complimented growth of Hyderabad as major metro of India. On Eastern side it has provided express connectivity to major commercial and upscale residential centres of Gachibowli, Banjara Hills, Jublee Hills, Hitec- City, Manikonda, Nanakramguda. As a result, large number of residential and commercial projects have come up on this north-east part of ORR. Tellapur, Mokila, Kollur, Narsingi can be named as few of these. On north and western side ORR connects to Shamirpet and Genome Valley.

ORR also provides fast connectivity to various radial state and national highways connecting to Mumbai, Nagpur, Karimnagar, Warangal, Suryapet, Vijayawada, Bengaluru. Regional traffic now does not need to go into congested network of Hyderabad.
All above indicates that Hyderabad Ring Road or Nehru Outer Ring Road (NORR) has potential of good traffic growth on sustainable basis, and it can be considered as a stable healthy project from the traffic and revenue point of view.

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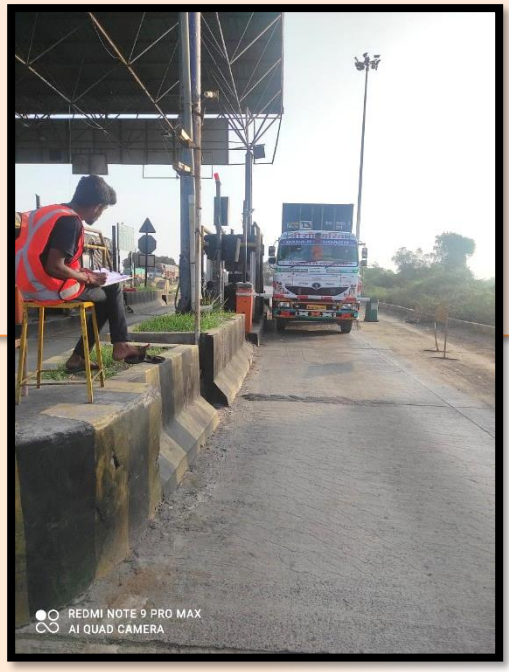
Six Laning of Santalpur – Samakhiyali Section of NH-27 from Km 339.200 to km 430.100 in State of Gujarat



MAY 2026

TRAFFIC STUDY & REVENUE PROJECTION REPORT (FINAL)

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Six Laning of Santalpur – Samakhiyali Section of NH-27 from Km 339.200 to km 430.100 in State of Gujarat

TRAFFIC STUDY & REVENUE
PROJECTION REPORT
(FINAL)

MAY 2026

GMD CONSULTANTS
NAVI MUMBAI

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ABBREVIATIONS

AADT	-	Annual Average Daily Traffic	**NHAI**	-	National Highway Authority of India
BOT	-	Build Operate Transfer	**NHDP**	-	National Highways Development Project
CAGR	-	Compound Annual Growth Rate	**NSDP**	-	Net State Domestic Product
CTV	-	Classified traffic volume	**O&M**	-	Operation & Maintenance
DBFOT	-	Design, Build, Finance, Operate & Transfer	**PCDP**	-	Per Capita Domestic Product
EME	-	Earth Moving Equipment	**PCI**	-	Per Capita Income
GDP	-	Gross Domestic Product	**PCU**	-	Passenger Car Unit
GSDP	-	Gross State Domestic Product	**PSC**	-	Pre-stressed Concrete
HCM	-	Heavy Construction Machinery	**RCC**	-	Reinforced cement concrete
HCV	-	Heavy Commercial Vehicle	**RHS**	-	Right Hand Side
HTMS	-	Highway Traffic Management System	**SH**	-	State Highway
IRC	-	Indian Road Congress	**TP**	-	Toll Plaza
IRR	-	Internal Rate of Return	**WPI**	-	Wholesale Price Index
LCV	-	Light Commercial Vehicle	**SIR**	-	Special Investment Region
LHS	-	Left Hand Side	**c.**	-	Circa
LGV	-	Light Goods Vehicle	**ROB**	-	Railway Over Bridge
MAV	-	Multi Axle Vehicle	**MDR**	-	Major District Road
MORTH	-	Ministry of Road Transport and Highways	**ODR**	-	Other District Road
NH	-	National Highway	**CA**	-	Concession Agreement
PCC	-	Plain Cement Concrete	**RMT**	-	Running Meter
CR	-	Coarse Rubble			

CHAPTER 1
INTRODUCTION

1.1 Background

Project stretch from Santalpur to Samakhiyali (Km 339.200 to km 430.100) is a 90.90 km long 4-lane National Highway Section on NH-27 in the state of Gujarat. NH-27 which is basically the east west connector of country.

Project stretch is gateway link to both Kandla and Mundra ports and also to region of Saurashtra from northern part of India. Stretch is also part of Jamnagar – Amritsar Expressway which will boost the connectivity of Saurashtra and both ports from north Indian sates of Punjab, Haryana, Rajasthan, and part of Uttar Pradesh.

The Government of India had entrusted National Highways Authority of India (NHAI) with developing of road infrastructure to match growing transportation demands of expanding economy. The Authority had resolved to undertake the six laning of existing four lane highway section from Santalpur to Samakhiyali (Km 339.200 to km 430.100) on BOT basis. This report is part of the traffic and revenue assessment of stretch including future growth projections. Project Highway alignment is depicted in the following figure.

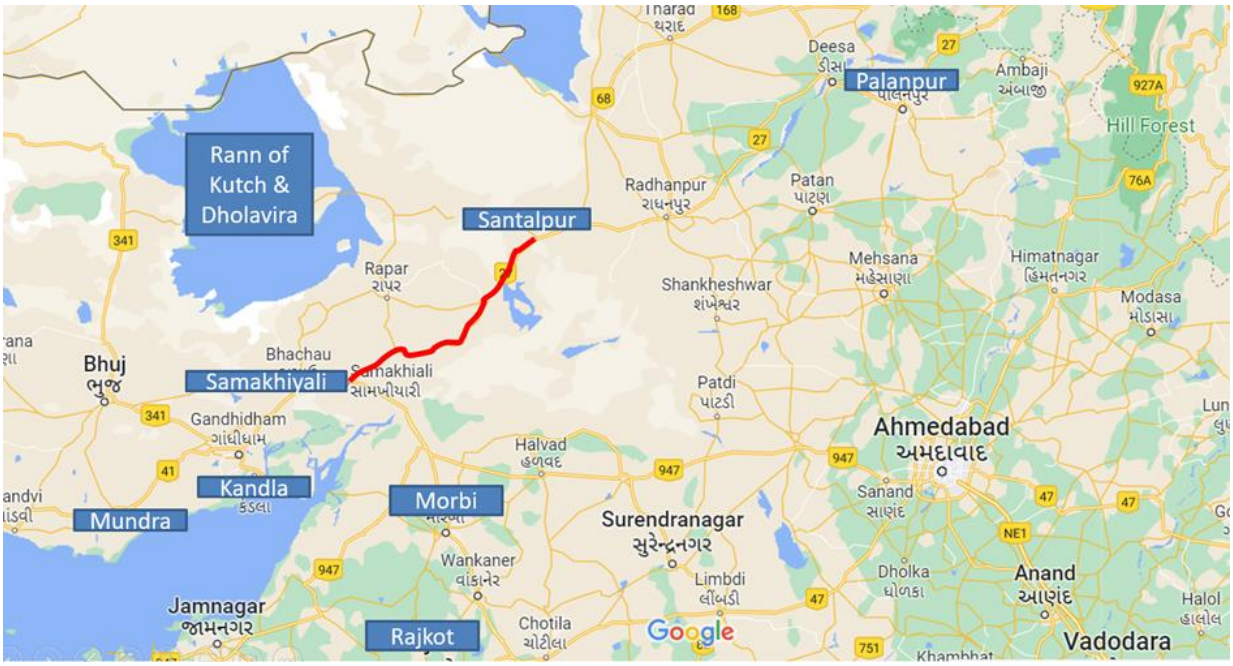


Figure 1-1 : Alignment of Project Stretch

1.2 Objective of the Study

M/s IRB Infrastructure Developers Limited (IRB) intends to participate in bidding for Six Laning of Santalpur- Samakhiyali section of NH-27 on BOT basis.
This report named as **"Traffic Study & *Toll Revenue Projection Report*"** mainly focuses on traffic and revenue aspects of the project. Other parameters like competing road, area developments etc. have been considered from a traffic development point of view.

1.2.1 Scope of Services

The broad scope of work covered in the assignment is as follows.

a) Analysis of Traffic Growth
b) Toll Rate Growth
c) Revenue Forecasting

The Concessionaire has provided basic traffic data and other project details on the basis of which the above analysis has been carried out.

CHAPTER 2
PROJECT DETAILS

2.1 Project Stretch Description

Project stretch from Santalpur to Samakhiyali is gateway link for both the ports of Mundra and Kandla and also of Saurashtra region. The stretch is having combined traffic of NH-27 which is coming from Palanpur / Radhanpur Abu Road and northern link from north Indian states via NH-68 and small section of SH-127 from Suigaon to Sidhadha on project highway. The following figure shows this the alignment of the project highway in the above context.

Figure 2-1 : Project Alignment with Toll Plaza

As discussed previously, the project stretch is gateway link to both ports of Kandla and Mundra and also area of Saurashtra. On the north of the project stretch lies the great Rann of Kutch which is also emerging as an important tourist destination of area. The presence of the historical Harrapan site of Dholavira in Rann of Kutch adds value to historical tourism.

2.2 Project Corridor Illustration

Project stretch has one Toll Plaza at Makhel. It has six lanes on either side including an oversized lane. As observed and inquired, Toll Operations are running smoothly and there no significant violations or forced exemption on toll plaza.

Figure 2-2 : Photographs showing Project Corridor

CHAPTER 3

TRAFFIC SURVEYS AND ANALYSIS

3.1 Traffic Surveys

The Consultants have collected the required information for project corridor to understand the general traffic and travel characteristics on the corridor.

The following traffic data has been collected from a client for a project.

- Classified traffic volume counts at toll plaza location on Samkhayali–Santalpur section of NH-27 for year 2024-2025 and Annual traffic data from April 2025 to February 2026.
- Local Component of traffic
- Component of Return Journey
- Component of Monthly Pass Journey

The main objective of the traffic data analysis is to:

- Determine the existing traffic movement characteristics of the project.
- Establish base year traffic.
- Identification of travel patterns and modal split of project traffic
- Deriving growth factors for traffic forecasting
- Estimation of corridor traffic including traffic diversion if any
- Preparation of revenue model and projection of revenue as per toll policy for various scenarios

Table 3-1 below lists provides details of locations from where traffic details have been collected.

Table 3-1 : Traffic Data Details

SR. No	LOCATION	CTV	Single Journey Traffic	Daily Return Journey	Monthly Pass	Local Pass
1	**Km 394.200 Toll Plaza at Makhel**	AADT for Year 2024-2025 & Eleven months from April 2025 to February 2026	AADT for Year 2024-2025 & Eleven months from April 2025 to February 2026	AADT for Year 2024-2025 & Eleven months from April 2025 to February 2026	AADT for Year 2024-2025 & Eleven months from April 2025 to February 2026	AADT for Year 2024-2025 & Eleven months from April 2025 to February 2026

3.2 Classified traffic Volume

The objective of conducting a Classified Traffic Volume Count is to understand the traffic flow pattern including modal split on a roadway. The Classified Traffic Volume Count survey has been provided by the concessionaire of project highway from actual traffic data gathered at toll plaza locations based on monthly data shared with NHAI.

The vehicles can broadly be classified into fast moving / motorized and slow moving / non-motorized vehicles, which can be further classified into specific categories of vehicles. The groupings of vehicles are further segregated to capture the tollable vehicle categories specifically and toll exempted vehicles are counted separately. The detailed vehicle classification system as per IRC: 64-1990 is given in the table below.

Table 3-2 : Vehicle Classification System

Vehicle Type	
Auto Rickshaw	
Passenger Car	Car, Jeep, Taxi & Van (Old / new technology)
Bus	Minibus
	Standard Bus
Truck	Light Goods Vehicle (LCV)
	2 – Axle Truck
	3 Axle Truck (HCV)
	Multi Axle Truck (4-6 Axle)
	Oversized Vehicles (7 or more axles)
Other Vehicles	Agriculture Tractor, Tractor & Trailer

Source - IRC: 64 – 1990

However, since the project highway is currently under toll operation, the data collected corresponds to the category of tollable vehicles. The following are the types of vehicles as per concession agreement.

- Car / Jeep / van
- Min Bus /LCV
- Truck / Bus
- Multi Axle

3.3 Traffic Characteristic

Toll revenue of project highway does not solely depend on traffic volume. There are certain characteristics of traffic which have substantial potential to affect toll collection. Component of local traffic, component of passenger and commercial traffic, portion of return journey traffic, % of monthly pass traffic are some of such characteristics of traffic. These will be discussed in subsequent sections of the report.

3.3.1 Traffic Data

Project concessionaire has provided Traffic data for the years 2024- 25 & traffic data from April 2025 to February 2026.

Since the traffic data available for this update is for only Annual, from April 2025 to February 2026, it may not represent the whole year traffic. Hence a seasonality factor for balance part of

year has been applied to average traffic of the current Eleven months to arrive at Annual Average Daily Traffic of base year 2025-26. Thus, corrected traffic is used for future projections and revenue calculations. The following table shows historical traffic on project stretch and derived Annual Average Daily Traffic (AADT) for year 2025-26.

Table 3-3 : Traffic Data at Makhel Toll Plaza at Km 394+200

Sr. No	Type of Vehicle	Annual Average Daily Traffic (Nos.)-2024-25	Annual Average Daily Traffic (Nos.)-2025-26
1	Car	1530	1923
2	LCV	84	108
3	Bus	208	307
4	Truck	260	334
5	3-Axle	201	234
6	Multi Axle	6939	7456
7	Oversized Vehicle	10	12
	Total	**9232**	**10375**

3.4 Data Analysis

3.4.1 Analysis of Traffic Volume Count

Understanding the character of existing traffic forms the basis of the traffic forecast. The various vehicle types having different sizes and characteristics can be converted into a single unit called Passenger Car Unit (PCU). Passenger Car equivalents for various vehicles are adopted based on recommendations of Indian Road Congress prescribed in "IRC-64-1990: Guidelines for Capacity of Roads in Rural areas". The adopted passenger car unit values (PCU) are presented in ***Table*** 3-4.

Table 3-4 : PCU Factors Adopted for Study

Vehicle Type	PCUs
Car	1.0
Minibus	1.5
Standard Bus	3.0
LCV/LGV	1.5
2 Axle Truck	3.0
3 – 6 Axle Truck	4.5
MAV	4.5
Auto Rickshaw	1.0

Vehicle Type	PCUs
Van/Tempo	1.0
Agriculture Tractor with Trailer	4.5
Agriculture Tractor without Trailer	1.5

Source: IRC: 64-1990

Traffic volume at each toll plaza was converted to PCU and same is presented as below

Table 3-5 : Traffic in PCU at Project Stretch Base Year 2024-25

Year	Toll Plaza Location (Km)	Traffic No	PCU	PCU Index
2024-25	Makhel at Km 394.200	9232	34934	3.78
2025-26	Makhel at Km 394.200	10375	38318	3.69

It can be observed from above that project traffic has PCU index more than 3.5 which is an indicator of high proportion of commercial traffic in traffic mix in project corridor.

3.4.2 Components of Traffic

As discussed previously, components of traffic volume play an important role in determining project revenue. A larger component of commercial traffic with higher axle configuration adds to project revenue positively. Similarly, a larger component of local traffic affects the project revenue potential negatively.

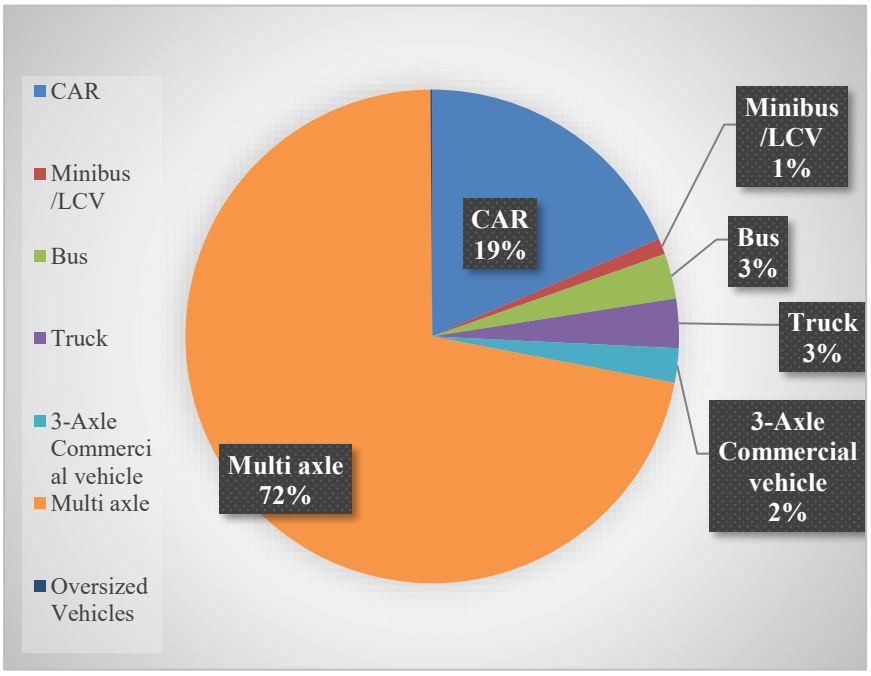


Figure 3-1 : Model Split of Tollable Vehicle

It is observed that car traffic forms about 19% of total traffic at toll plaza locations while multi axle commercial vehicles are about 74% of total traffic. Truck / Bus and LCV share about 6% and 1% of traffic volume respectively.

Another important bifurcation of traffic is components of traffic with respect to various type of toll ticketing like

1. Single Journey
2. Multi Journey
3. Local Commercial Single Journey
4. Monthly Pass Local
5. Monthly Pass
6. Annual Pass Car

The following table provides numbers of vehicles falling in each of above category on base year 2025-26

Table 3-6 : Journey Type Bifurcation of Traffic at Makhel TP KM 394.200

Sr. No	Type	Traffic Volume (Nos.) 2025-26
1	Single Journey	8813
2	Return Journey	1108
3	Local Commercial Single Journey	190
4	Monthly Pass Local	2
5	Monthly Pass	0
6	Annual Pass Car	262

Most dominant part of the above is the single journey type followed by return journey at project stretch. Monthly pass commuters are a very low fraction of the total traffic on the project corridor.

The single journey component in total traffic numbers is as high as 85%. Return journey component is 11%. The number of monthly pass Local is 0% and Local Commercial Single journey is 2% and Annual Pass Car is 1% at Makhel toll plaza.

It is observed that the project corridor demonstrates a pattern of single journey dominated mix of traffic which is typical of major national highways having more long-distance traffic.

3.5 Secondary Data Collection

There are several other factors which have a substantial impact on traffic patterns and growth on any project corridor. The following are some of such important factors.

- Industrial development around project corridor and its catchment
- Educational infrastructure along project corridor
- Demographic pattern
- Urban area development
- Tourism potential
- Upcoming major infrastructural or Industrial projects
- Special Industry in project corridor
- Overall trends of economic growth local as well as national / regional

Hence in addition to traffic details on the project site, secondary data was also collected from various other sources. Typical secondary data includes the following:

1. Vehicle registration data of regional and national level.
2. Economic Data
   a) GDP
   b) NSDP
   c) Population Growth
   d) Per Capita Income growth
   e) Industrial Growth
   f) Special Industry Potential
   g) Regional and National development vision / plan
   h) Any other relevant data
3. Competing road network

We have collected and utilized such underlying data in the study to estimate the growth and risk factors for traffic along the project corridor.

CHAPTER 4

INFLUENCE ZONE TRANSPORT NETWORK ANALYSIS

4.1 Introduction

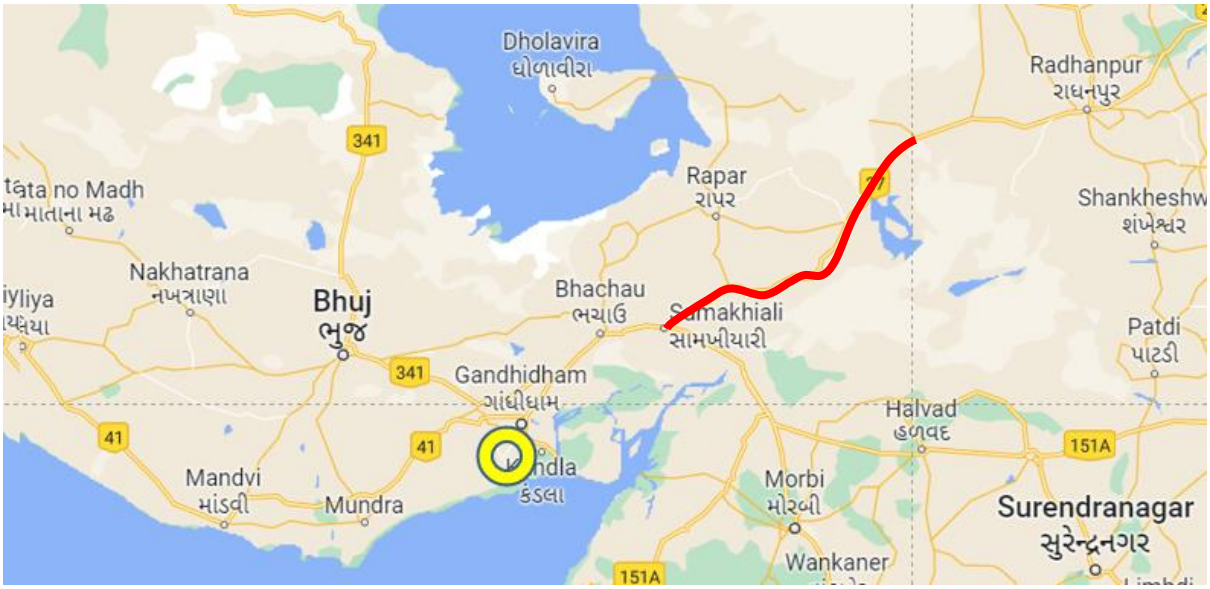
Highway corridors behave like integrated circuit networks and more often than not every road is connected to various networks having different origins and destinations. Traffic running on these networks behaves like fluid and flow on network on alignment of least friction.

The following Factors can be considered as major contributors to friction on transportation networks.

- Travel Speed / Travel Time
- Geometric deficiencies like blind horizontal curves and steep vertical gradients etc.,
- Configuration of road
- Riding quality
- Traffic delays,
- Length of road,
- Passing through built up or Urban Area,
- Terrain,
- Facilities,

4.2 Development in the Project Influence Area

The Project Highway acts as gateway for the traffic of northern, western and part of central India leading to the major western ports of Kandla and Mundra in Gujarat. The Project Highway would majorly cater to the export and import traffic. The contribution of Kandla and Mundra port is about 60% of total traffic at project stretch. Hence, growth and expansion at port will have a major positive impact on project traffic.



Brief details of key influencing establishments around the project corridor are as summarized below:

a. Kandla Port

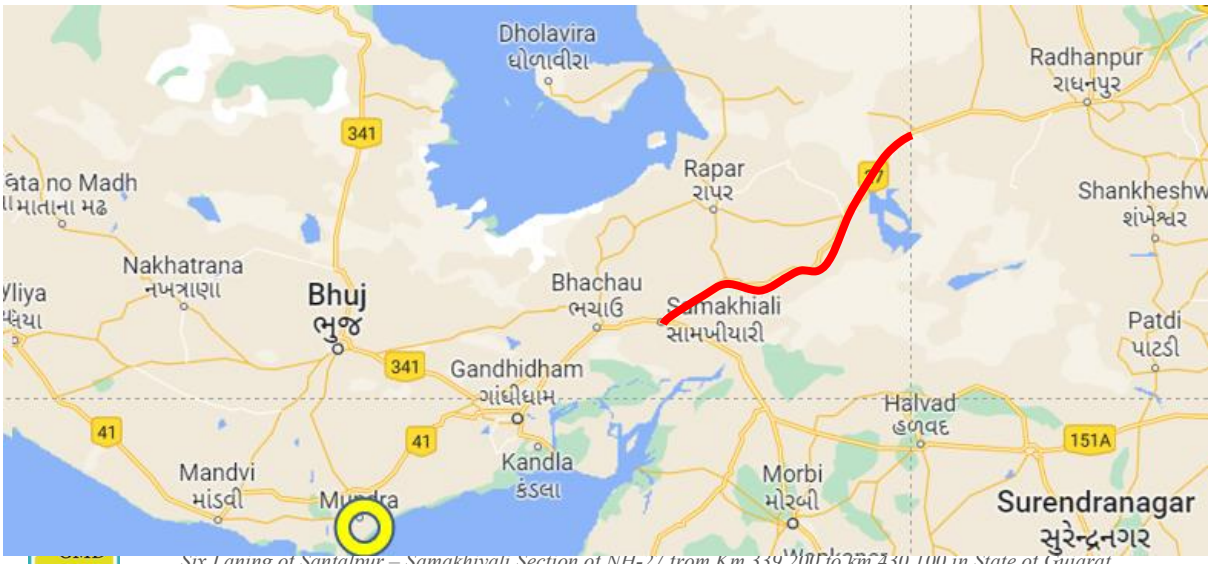
- Kandla is the largest Cargo handling major government port with a capacity of approximately 120 MMTA. It shares about 15% of all major port traffic. The port has shown good consistent growth over past years.
- Kandla Port handles a variety of cargo ranging from Bulk Cargo like Coal, Grain, Fertilizer, Minerals, Ores, Steel, Edible Oils, Chemicals, and Petroleum Products to Container Cargo, Automobiles and Crude Oil.
- Petroleum Oil Lubricants ("POL") is about 64% of total cargo handled by the Port.
- At present Kandla has a Container Terminal with a capacity of 0.75 MTEU.
- The Government of India has recently approved the development of two new mega container terminals at Tuna-Tekra in Kandla Port at an estimated cost of ~ Rs 6,000 crores. This would result in an increase in capacity of dry cargo from 60MMTA to about 79 MMTA and increase in container cargo capacity from 6 lakh TEU to 26 lakh TEU.

- The Container Terminal and Multipurpose Cargo Terminal are expected to be completed in ~FY25 / FY26 at a total expenditure of ~Rs. 6000 Cr. The development of the two mega terminals of Container & Multipurpose Cargo is expected to induce migration of some of the traffic from JNPT, Mumbai to Kandla and Mundra port in Gujarat.

- The above development of two major terminals is expected to give high traffic growth on Project Highway.
- **DP World wins bid for development of a mega-container terminal at India's Deendayal Port**
  - DP World has won a major concession to develop, operate and maintain the mega-container terminal at Deendayal port in Gujarat, on the western coast of India.
  - The project involves the construction of a mega-container terminal at Tuna-Tekra through a Public-Private Partnership (PPP). Once complete, the terminal will include a 1,100-metre berth and will be capable of handling vessels carrying more than 18,000 TEUs. Total capacity will be 2.19 million TEUs.
  - The contract was awarded by the Deendayal Port Authority under on a Build-Operate-Transfer (BOT) basis.
  - Once complete, the terminal will help unlock future container traffic growth in India, catering to exports and imports from Northern, Western and Central India, reducing logistics cost and enhancing efficiencies across supply chains. The project will complement initiatives of the Government of India, such as the PM Gati Shakti Master Plan and National Logistics Policy, which has been introduced to provide greater focus on developing multimodal logistics infrastructure promoting economic growth.
  - DP World's strategic investments in ports and terminals in the country is aligned with the Indian Government's Vision 2047, which aims to quadruple the country's port handling capacity.

    Development of mega container terminal would have positive impact on project traffic as it would enhance the hinterland logistic relations and volume of export / import with Kandla port.

b. Mundra Port



- Mundra port is located further to Kandla port and is the largest private port in India with about 330 MMTA capacity, 24 berths & 10 Terminals. The port is owned by Adani Group having 12 ports in total. The mega port at Mundra is a major economic gateway that caters to the northern hinterland of India with multimodal connectivity.
- Mundra port has handled 144 MMT in year 20-21 which is highest by any India port.
- The port handles multiple products – coal, POL, Liquid, Dry Bulk. The Mundra port has expansion plans for various products including Waterfront Development, Multi- Purpose cargo and Liquid/ Gas/ Cryogenic Cargo handling quay development.
- The container handling capacity at Mundra port has shown a very impressive growth of over 15% in past 12 years starting with 0.92 MTEU in FY10 to 6.94 MTEU expected in FY23. The total Container handling capacity at Mundra port is 7.5 MTEU and would be operating at over 90% Capacity Utilization by end of FY23.

- Mundra port is coming up with expansion of Container Terminal of 1.2 MTEU at estimated expense of R. 1239 Cr. The expansion work of Container Terminal is under progress and is expected to be operational by FY24.
- Other growth drivers in long term at ports of Kandla and Mundra Ports will be increasingly adoption of China+1 policy by Europe and US market. The diversification of manufacturing facilities to India in addition to other emerging Asian economies is expected to boost exports consistently over next 10 years.
- China decision to cap its steel production and no export of steel from Russia would help India steel export.
- Coal import has also seen a surge due to domestic shortage of Coal.
- Defence Corridor at Jhansi and also Tata Aircraft manufacturing plant at Vadodara would have some add on to port traffic.
- As per an ICRA report, the port traffic is expected to grow by 6-8% per year.
- The above development of major terminal is expected to give high traffic growth on Project Highway.
-

c. Barmer Refinery

- A 9 MTA capacity refinery and a 2 MTPA Petrochemical Complex is under construction at Pachpadra near Barmer. The complex is a 74:26 Venture between HPCL & Govt. of Rajasthan being developed across 4400 acres at a cost of Rs. 5000 Cr.

- This refinery will relate to Jamnagar Refinery and Bathinda Refinery through Amritsar Jamnagar Expressway
- The refinery is likely to be commissioned by FY25.
- About 6.5 MTA crude will be transported from Gujarat for processing
- RIICO (Rajasthan State Industrial Development & Investment Corporation Limited) to develop PCPIR - Petroleum, Chemical and Petrochemical Investment Region in vicinity of Refinery cum Petrochemical Complex (area ~100km)

- Development of a third refinery enroute Jamnagar to Amritsar, viz; Bhatinda, Barmer and Jamnagar will lead to Petrochemical based traffic growth along Project Highway (via Amritsar Jamnagar Expressway).

d. Ceramic Cluster at Morbi

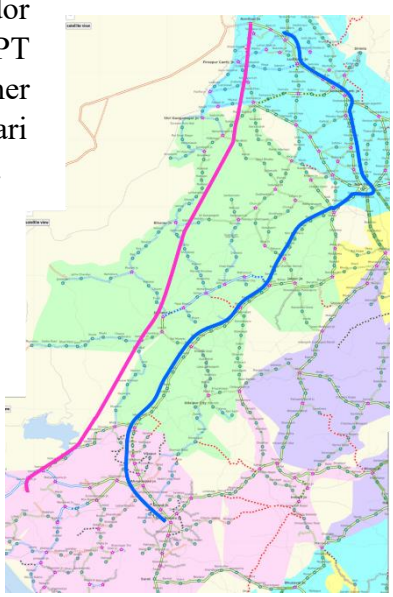
- Morbi accounts for 70% of total ceramic production in India and 2nd largest ceramic tile producing cluster in world.
- The cluster houses ~ 1,000 ceramic units, catering to 18 % of global demand and earns Rs 15,000 crore from exports.
- The ceramic cluster provides 10 Lakhs plus employment and produces over 14000 SQM tiles per day. The tiles are exported through Kandla and Mundra Port.
- The tiles are exported to more than 160 countries through Kandla and Mundra Port which are within 180 km from Morbi. This results in competitive pricing of the tiles in the international market due to savings in transportation costs. Domestic brands like Kajaria, HR Johnson, AGL, Somani outsource from Morbi. Global brands housed in Morbi include Daltile, Portobello, Emser, RAK, etc.

- Rajasthan has the highest proven reserves of China Clay followed by Gujarat. China clay mining is in Nagaur, Bikaner, Jaisalmer, Jodhpur, Bhilwara, and Chittorgarh.

- The Project highway is enroute to supply raw material to Morbi and finished products to domestic market in north India.
- The ceramic industry in India is expected to grow annually at a rate of ~9-10%.

Western DFCC -

Western DFCC is 1500 km plus dedicated freight corridor of railway which connects Dadri in Uttar Pradesh to JNPT in Mumbai. It is designed to carry double stack, higher capacity trains at higher speed. The section from Rewari to Palanpur is already operational since March 2021. The balance section from Palanpur-Makarpura-Sachin-Vaitarna-JNPT is expected to be commissioned in stages by end of FY24.



The Kandla and Mudra ports are connected to Palanpur by an operational western railway line. Since rail movement from Rewari to Palanpur and Palanpur to Kandla / Mundra are operational since long, the modal shift of traffic from road to rail has already taken place and no diversion is expected going forward.

Further, only the traffic originating and destined within 50-75 kms of the DFCC will find rail mode of transport logistically viable. It is also to be noted that the cargo originating from Punjab, Himachal, Haryana will have to travel from Sahnewal to Dadri, Rewari

along Eastern DFCC from where it will have to take Western DFCC to reach Palanpur which is connected to Ports via Western Railway.

The traffic originating from the northern hinterland has to take rail route via. Eastern DFCC by 450 kms from Sahnewal upto Dadri and then take Western DFCC from Dadri to Palanpur by 786 kms and further Palanpur to Gandhidham/Kandla by western rail which is 300 kms. Thus, the total rail route will be over 1500 kms which is ~25% longer as compared to alternative road network via. upcoming Jamnagar-Amritsar Expressway having a length of ~ 1200 kms.

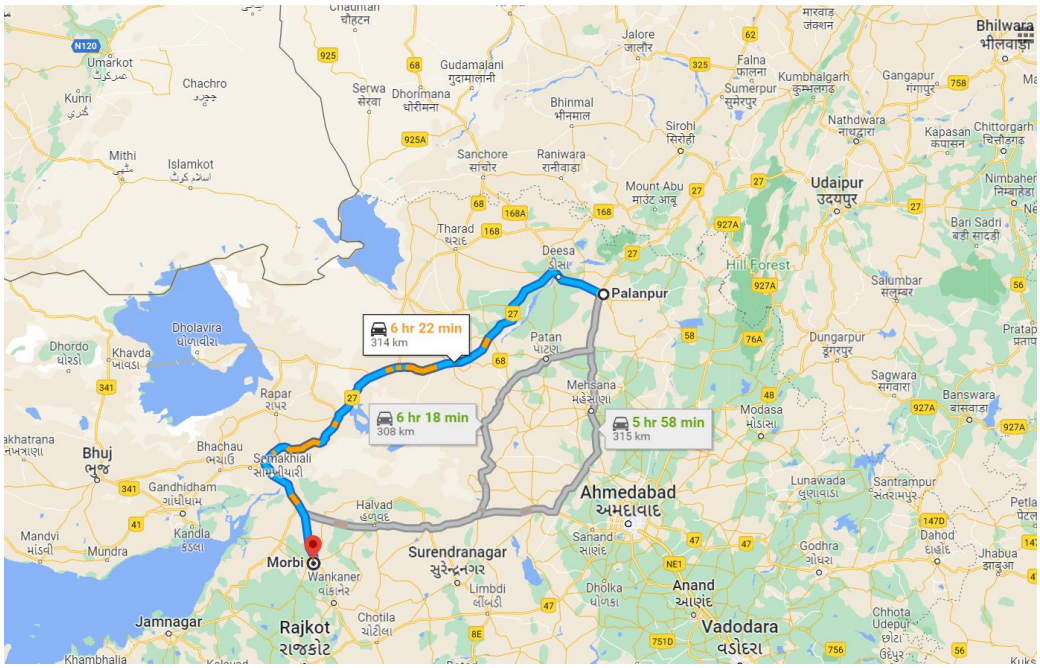
Thus, we do not see the material impact of DFC on the Project and no further diversion of good traffic to DFCC is envisaged.

e. Amritsar – Jamnagar Expressway

The Amritsar – Jamnagar Expressway (AJE) is an access controlled 1300 km long partly greenfield / brownfield expressway. The AJE which is 4-lane up to PB/HR border and then 6-lane up to Jamnagar is under execution and is likely to be commissioned in FY25. The AJE will not only act as port connectivity expressway but will also have induced traffic due to connectivity of 3 refineries enroute, the Bhatinda refinery, Barmer refinery and Jamnagar refinery. Further all the major cities enroute the AJE are developing bypass / ring roads which will facilitate diversion of long-distance traffic. Thus, the long-distance traffic will have a better level of service and shorter turnaround time for port bound traffic which will be comparable to Freight movement by rail.

f. Morbi – Rajasthan via Mehsana: Divergence

There is some traffic originating from Morbi, Rajkot and travelling towards Punjab, Himachal, Haryana, Rajasthan and are taking alternate route via. Mehsana, Palanpur. Once the AJE is commissioned, the distance to the northern states via. AJE will be shorter by ~5-7%.



We have conducted an OD survey along this alternate route near Mehsana and have worked out a total impact of divergence from alternate routes and the development of AJE together will be nearly +2% for all categories of commercial vehicles.

Summary of impact as estimated is given in table below.

Sr. No	Development Factor	Impact	Action
1	Amritsar Jamnagar Expressway	Reduces travel time substantially. Connects Rajasthan, Haryana, UP & Punjab with faster connectivity. New fast connectivity may add to growth in the initial years of its commissioning. May also add new development area around its greenfield corridor	4% additional traffic including divergence may be taken in year 2025-26, expected commissioning of full stretch
2	Barmer Refinery	New refinery. About 70% of crude is expected to come from Gujarat and also Amritsar – Jamnagar Expressway would provide fast access to ports for export / import,	It will add to traffic growth on the project road once Expressway is commissioned. No additional impact separately
3	Kandla Mundra Ports	About 30% of the traffic on project stretch has Kandla Mundra connection. Both ports are doing good in terms of growth. These basically serve to northern hinterland of Rajasthan, Gujarat, Haryana, Punjab and UP	Capacity and facility expansion of both ports would support traffic growth on the project stretch. No additional impact on traffic
4	Morbi Tile Industry	90% of India's Ceramic is produced in Morbi. Over 1000 Ceramic factories. Domestic supplies to	It would support traffic growth on project stretch. Would be part of

Sr. No	Development Factor	Impact	Action
		northern India through project stretch.	growth
5	Road Network	No Competing Road Network	No Impact
6	DFCC	Kandla to Palanpur is existing rail line and Palnpur to Rewari is operational since last year. DFCC stretches from Rewari to Palanpur are already operational. Most of the traffic has already been shifted. Lack of last mile connectivity from DFCC hub to final destination of Goods will keep dependability of road network for goods transport.	No additional diversion is envisaged.

CHAPTER 5

GROWTH OF TRAFFIC ON PROJECT HIGHWAY

5.1 Introduction

Traffic growth is a function of the interplay of a number of contributory factors such as National economy, Government policy, socio-economic conditions of the people, and changes in land uses along the project corridor precincts etc. As these factors have a number of uncertainties associated with them, forecasts of traffic are dependent on the projections of other factors such as population, gross domestic product (GDP), vehicle ownership, per capita income (PCI), agricultural output, fuel consumption etc. Future patterns of change in these factors can be estimated with only a reasonable degree of accuracy and hence the resultant traffic forecast levels may not be precise.

Traffic growth forecast for project corridor Udaipur to Gujarat Border section of NH-8 has been done taking the above factors into consideration. "*IRC: 108-2015-Guidelines for Traffic Prediction on Rural Highways*" is established best practice and has been used for traffic growth forecast.

5.2 Trend Analysis

One of the methods of estimation of future rate of growth is to assume the same rate of growth as in the past. Although such a method is more suitable for projects of short durations say 5-10 years, however for long term projections it would be erroneous to assume that the past rate of growth will continue to prevail for a long time in future. Economic conditions, which are major influencing factors, are bound to change over a long period of time. Thus, it would be necessary to modify the past trends of growth suitably.

Elasticity model of growth projection is one of the most widely acceptable methods for traffic forecast. The same is recommended in *IRC: 108-2015-Guidelines for Traffic Prediction on Rural Highways.*

In this method the past trend of vehicular data is paired with an economic indicator and a regression analysis is done to yield the economic model of growth. Growth of vehicle traffic varies for different types of vehicles. It is a proven fact that the growth pattern for passenger and goods vehicle is different. Traffic growth on any highway typically depends on a number of economic parameters. Most important and direct parameters are given as under

- Per Capita Income
- Net State Domestic Product (NSDP)
- Population

It can be observed that the ownership of a car is more closely related to affordability; hence per capita is the index which closely fits the growth of car traffic among other criteria. In a similar fashion, the following can be pairs of vehicle type and independent variable for elasticity modeling of growth.

- Car / Jeep – Par Capita Income
- Bus / Minibus – Population
- Goods Vehicle – NSDP

5.3 Estimation of Traffic Demand Elasticity

Elasticity of traffic demand is defined as the rate at which traffic intensity varies due to a change in the corresponding indicator selected. Hence, in order to estimate the elasticity of traffic demand, it is necessary to establish relationship between the growth in number of given category of vehicles with the relevant economic variable considered, such as NSDP, per capita income and population growth. Latest available data for vehicle registration, per capita income, NSDP and population is used in analysis.

As per IRC: 108-1996 the model for estimating elasticity index for the project corridor is of the following form and is given as below:

$Log (P) = k \times Log (EI) + A$

Where,

P = *Number of Vehicles (Mode wise)*

EI = *Economic Indicator*

A = *Regression constant*

k = *Elasticity coefficient (Regression coefficient)*

The elasticity for cars and bus (passenger vehicles) is calculated based on the Population and Per Capita Domestic Product (PCDP) and the elasticity for trucks is calculated based on the Net State Domestic Product (NSDP).

The project corridor spreads across the state of Gujrat. Toll plazas at Makhel is in the state of Gujrat but the traffic on project stretch has certain contribution from other states as well. For elasticity calculations, working data from such states in addition to Gujrat has been analyzed.

The following tables and graphs depict regression and elasticity of growth model for stretch falling in Rajasthan State.

Table 5-1 : Per Capita Income Vs Car Rajasthan

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2011	57192	591069	4.76	5.77		
2012	58441	659542	4.77	5.82	2%	
2013	61053	733916	4.79	5.87	4%	
2014	64496	814079	4.81	5.91	6%	
2015	68565	899307	4.84	5.95	6%	
2016	71324	988391	4.85	5.99	4%	
2017	73109	1095526	4.86	6.04	3%	
2018	75555	1204005	4.88	6.08	3%	4.1%

Regression analysis of same is given in figure below.

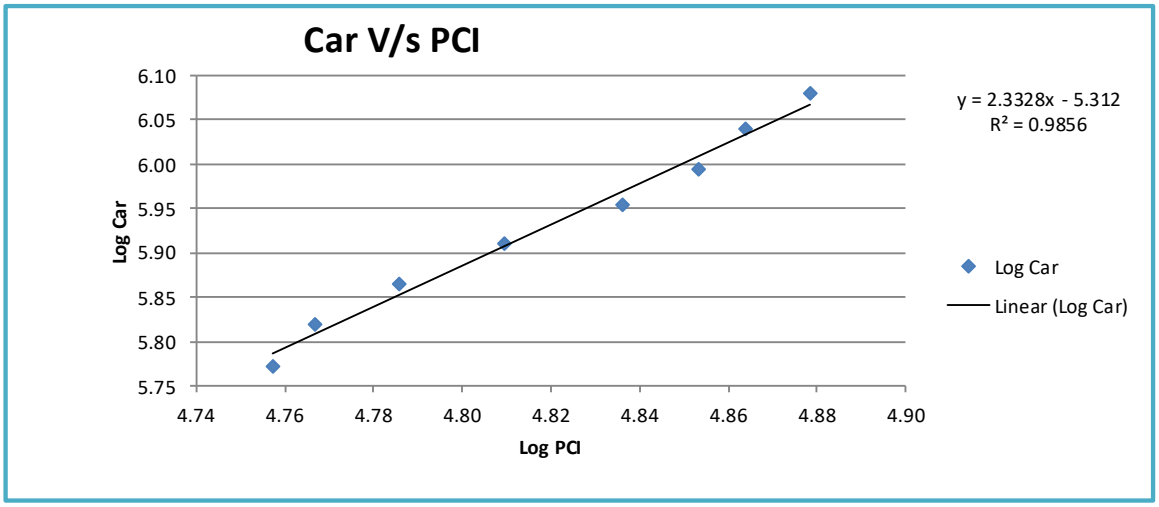


Figure 5-1 : Regression and Elasticity PCI vs. Car – Extrapolation Rajasthan

Table 5-2 : Population Vs Bus Rajasthan

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth
2011	68548000	83345	7.84	4.92		
2012	69687000	88616	7.84	4.95	2%	
2013	70825000	93892	7.85	4.97	2%	
2014	71963000	97650	7.86	4.99	2%	
2015	73102000	102818	7.86	5.01	2%	
2016	74240000	108680	7.87	5.04	2%	
2017	75248000	113964	7.88	5.06	1%	
2018	76256000	118301	7.88	5.07	1%	1.5%

Regression analysis of same is given in figure below.

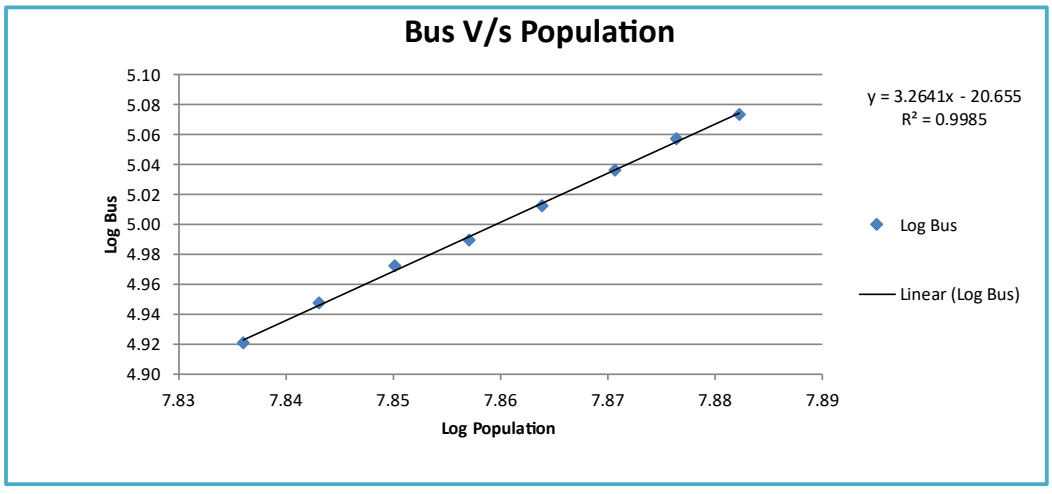


Figure 5-2 : Regression and Elasticity Population vs. Bus – Extrapolation Rajasthan

Elasticity of LCV has been worked out by regression analysis with NSDP. The following table represents the data and details.

Table 5-3 : Trucks Vs NSDP Rajasthan

Year	NSDP	Trucks	Log NSDP	Log LCV	NSDP Growth	Average Growth
2011	39533093	362028	7.60	5.56		
2012	40980249	401983	7.61	5.60	4%	
2013	43429222	434379	7.64	5.64	6%	
2014	46540773	472365	7.67	5.67	7%	
2015	50192151	517604	7.70	5.71	8%	
2016	52965038	561158	7.72	5.75	6%	
2017	55442912	613055	7.74	5.79	5%	
2018	58059438	665926	7.76	5.82	5%	5.7%

The following figure depicts regression analysis and extrapolation.

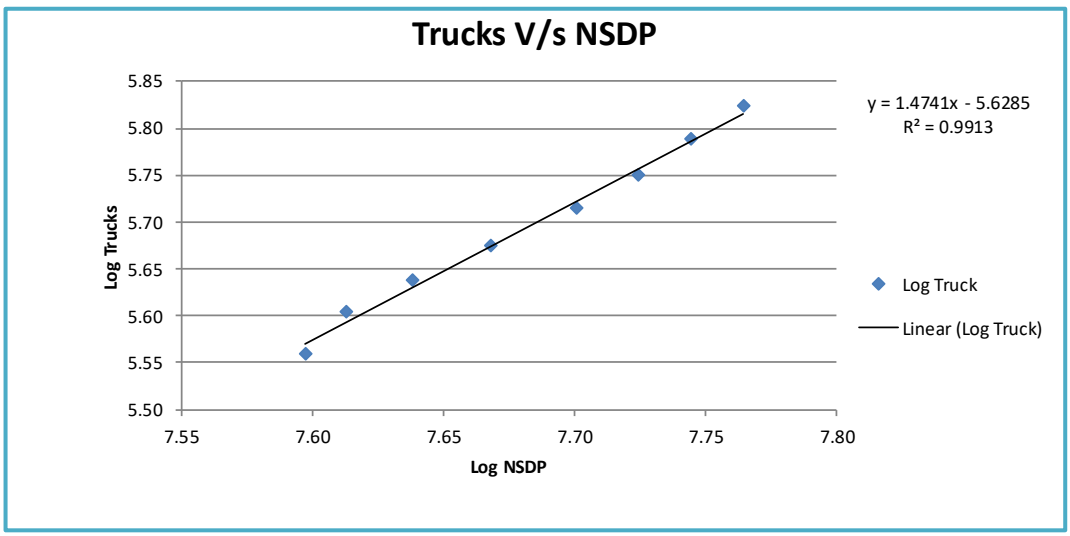


Figure 5-3 : Regression and Elasticity NSDP vs. LCV Traffic - extrapolation Rajasthan.

Elasticity of Goods Traffic has been worked out by regression analysis with NSDP. The following table represents the data and details.

Using the regression analysis above, we have arrived at the elasticity of traffic demand for each class of vehicle to a given change in relevant economic indicators. Average traffic growth of a vehicle class is multiplied by the corresponding elasticity coefficient to arrive at traffic growth. R2 statistical measure of how close the data are to the fitted regression line. It varies from 0 to 1. The higher the value of R2 more representative is the regression model of data.

The results of these analyses for *the good fit* regression as reflected by R^2 values are presented in the Table below.

Table 5-4 : Summary Regression Analysis Rajasthan

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average IV Growth	Growth Elastic Model	Remarks
Rajasthan	Car/Jeep	PCI	y = 2.3328x - - 5.312	R^2 = 0.9856	2.3328	4.07%	9.49%	Good Regression
	Bus	Population	y = 3.2641x - - 20.6548	R^2 = 0.9985	3.2641	1.53%	5.01%	Good Regression
	Truck	NSDP	y = 1.4741x - - 5.6285	R^2 = 0.9913	1.4741	5.65%	8.33%	Good Regression

The following tables and graphs depict regression and elasticity of growth model for stretch falling in Rajasthan State.

Table 5-5 : Per Capita Income Vs Car Gujarat

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2012	96683	1602129	4.99	6.20		
2013	96039	1771298	4.98	6.25	-1%	
2014	101424	2008748	5.01	6.30	6%	
2015	112267	2260084	5.05	6.35	11%	
2016	121512	2527537	5.08	6.40	8%	
2017	131503	2794957	5.12	6.45	8%	
2018	147787	3011656	5.17	6.48	12%	7.4%

Regression analysis of same is given in figure below.

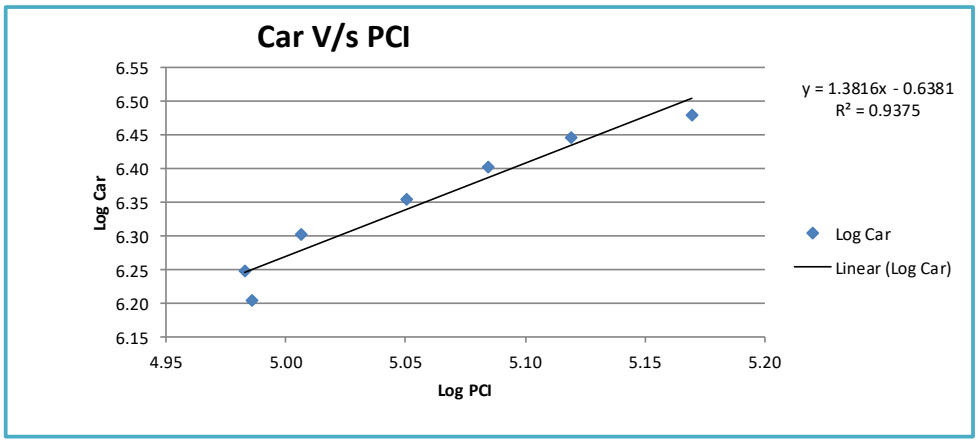


Figure 5-4 : Regression and Elasticity PCI vs. Car – Extrapolation Gujarat

Table 5-6 : Population Vs Bus Gujarat

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth
2012	61383000	70615	7.79	4.85		
2013	62327000	72998	7.79	4.86	2%	
2014	63271000	76435	7.80	4.88	2%	
2015	64214000	82734	7.81	4.92	1%	
2016	65158000	84734	7.81	4.93	1%	
2017	66084000	88734	7.82	4.95	1%	
2018	67010000	92734	7.83	4.97	1%	1.5%

Regression analysis of same is given in figure below.

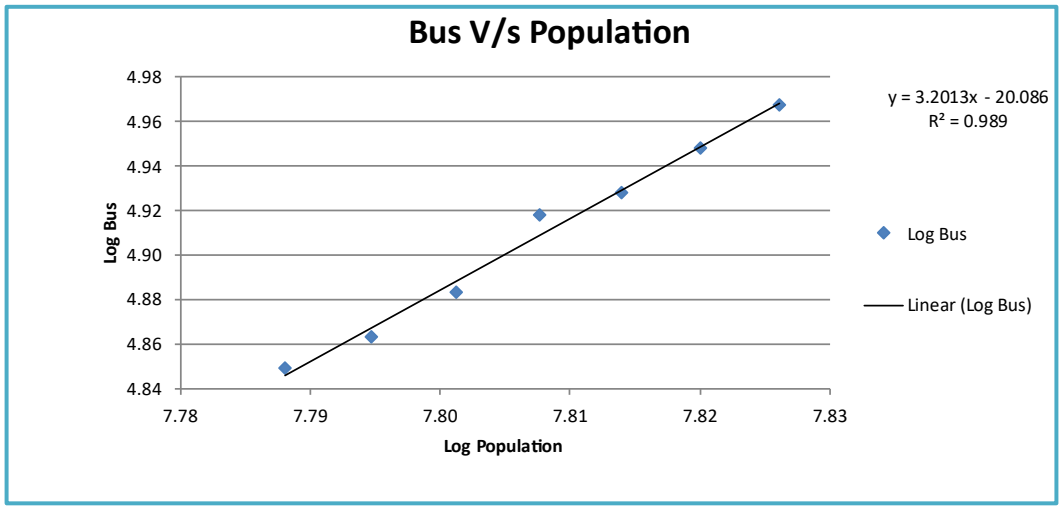


Figure 5-5 : Regression and Elasticity Population vs. Bus – Extrapolation Gujarat

Elasticity of Trucks has been worked out by regression analysis with NSDP. The following table represents the data and details.

Table 5-7 : Truck Vs NSDP Gujarat

Year	NSDP	Trucks	Log NSDP	Log LCV	NSDP Growth	Average Growth
2012	59665883	319207	7.78	5.50		
2013	64148881	332185	7.81	5.52	8%	
2014	70562884	352225	7.85	5.55	10%	
2015	77477522	375265	7.89	5.57	10%	
2016	84393034	396061	7.93	5.60	9%	
2017	94651119	425799	7.98	5.63	12%	

Year	NSDP	Trucks	Log NSDP	Log LCV	NSDP Growth	Average Growth
2018	103439901	457299	8.01	5.66	9%	9.6%

The following figure depicts regression analysis and extrapolation.

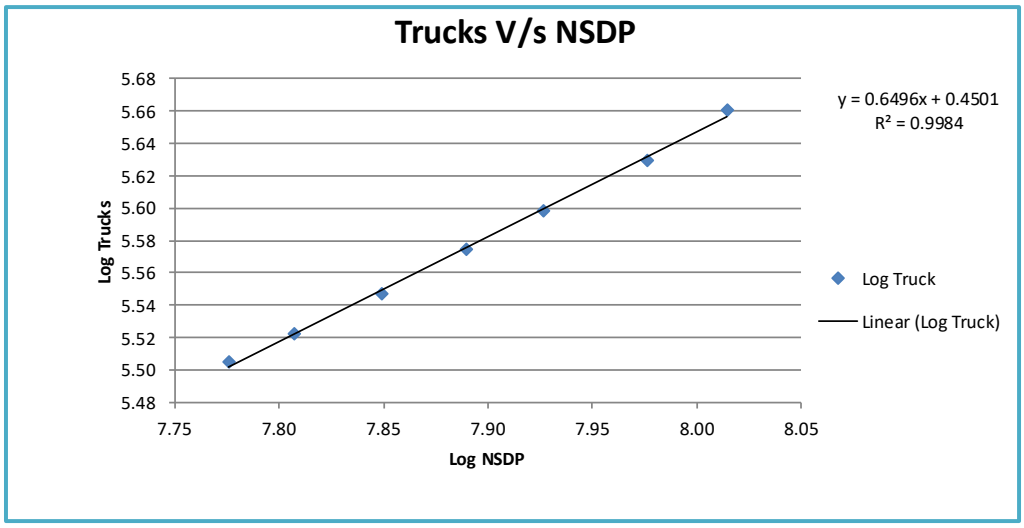


Figure 5-6 : Regression and Elasticity NSDP vs. Trucks Traffic - extrapolation Gujarat.

Using the regression analysis above, we have arrived at the elasticity of traffic demand for each class of vehicle to a given change in relevant economic indicators. Average traffic growth of a vehicle class is multiplied by the corresponding elasticity coefficient to arrive at traffic growth. R2 statistical measure of how close the data are to the fitted regression line. It varies from 0 to 1. The higher the value of R2 more representative is the regression model of data.

The results of these analyses for *the good fit* regression as reflected by R^2 values are presented in the Table below.

Table 5-8 : Summary Regression Analysis Gujarat

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average IV Growth	Growth Elastic Model	Remarks
Gujarat	Car/Jeep	PCI	y = 1.3816x - - 0.6381	R^2 = 0.9375	1.4	7%	10.24%	Good Regression
	Bus	Population	y = 3.2013x - - 20.0857	R^2 = 0.989	3.2	1%	4.71%	Good Regression
	Truck	NSDP	y = 0.6496x - 0.4501	R^2 = 0.9984	0.6	10%	6.24%	Good Regression

The following tables and graphs depict regression and elasticity of growth model for stretch falling in Haryana & Punjab State.

Table 5-9 : Per Capita Income Vs Car Haryana & Punjab

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2011	106085	989519	5.03	6.00		
2012	111780	1134616	5.05	6.05	5%	
2013	119791	1278272	5.08	6.11	7%	
2014	125032	1420621	5.10	6.15	4%	
2015	137833	1711692	5.14	6.23	10%	
2016	150259	1851788	5.18	6.27	9%	
2017	158039	1976788	5.20	6.30	5%	
2018	164976	2106788	5.22	6.32	4%	6.5%

Regression analysis of same is given in figure below.

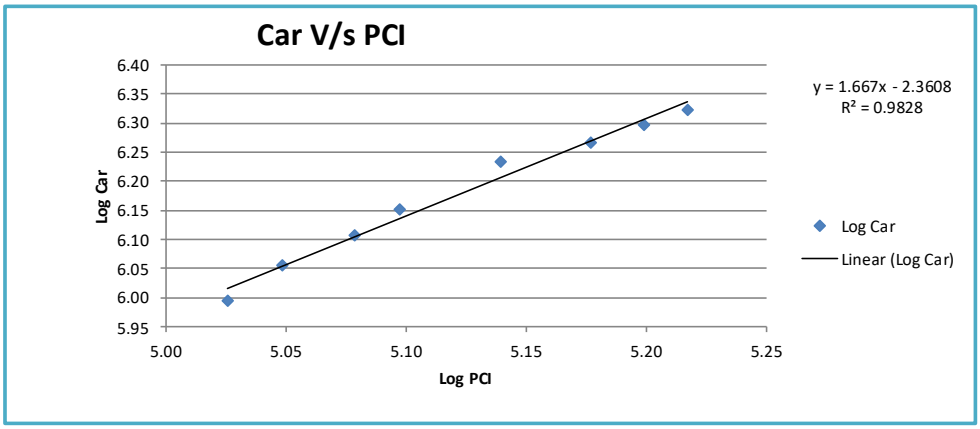


Figure 5-7 : Regression and Elasticity PCI vs. Car – Extrapolation Haryana & Punjab

Table 5-10 : Population Vs Bus Haryana & Punjab

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth
2011	25351000	39153	7.40	4.59		
2012	25772000	43456	7.41	4.64	2%	
2013	26193000	46558	7.42	4.67	2%	
2014	26614000	52640	7.43	4.72	2%	
2015	27034000	55781	7.43	4.75	2%	
2016	27455000	60129	7.44	4.78	2%	

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth
2017	27861000	63129	7.44	4.80	1%	
2018	28266000	67629	7.45	4.83	1%	1.6%

Regression analysis of same is given in figure below.

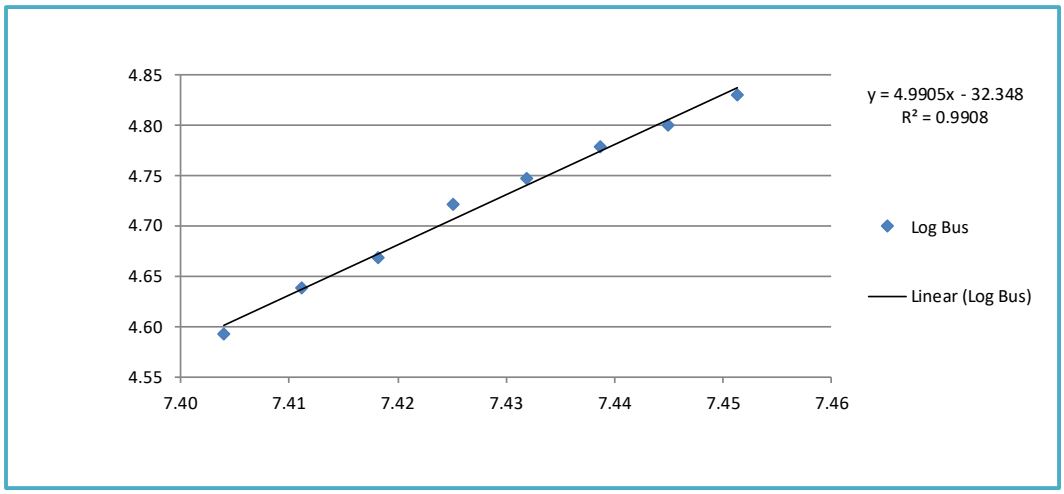


Figure 5-8 : Regression and Elasticity Population vs. Bus – Extrapolation Haryana & Punjab

Elasticity of Trucks has been worked out by regression analysis with NSDP. The following table represents the data and details.

Table 5-11 : Truck Vs NSDP Haryana & Punjab

Year	NSDP	Trucks	Log NSDP	Log LCV	NSDP Growth	Average Growth
2011	27115248	292735	7.43	5.47		
2012	28975622	307509	7.46	5.49	7%	
2013	31493120	327882	7.50	5.52	9%	
2014	33335925	348732	7.52	5.54	6%	
2015	37270025	367730	7.57	5.57	12%	
2016	41205461	390321	7.61	5.59	11%	
2017	43952345	425321	7.64	5.63	7%	
2018	46533095	455321	7.67	5.66	6%	8.0%

The following figure depicts regression analysis and extrapolation.

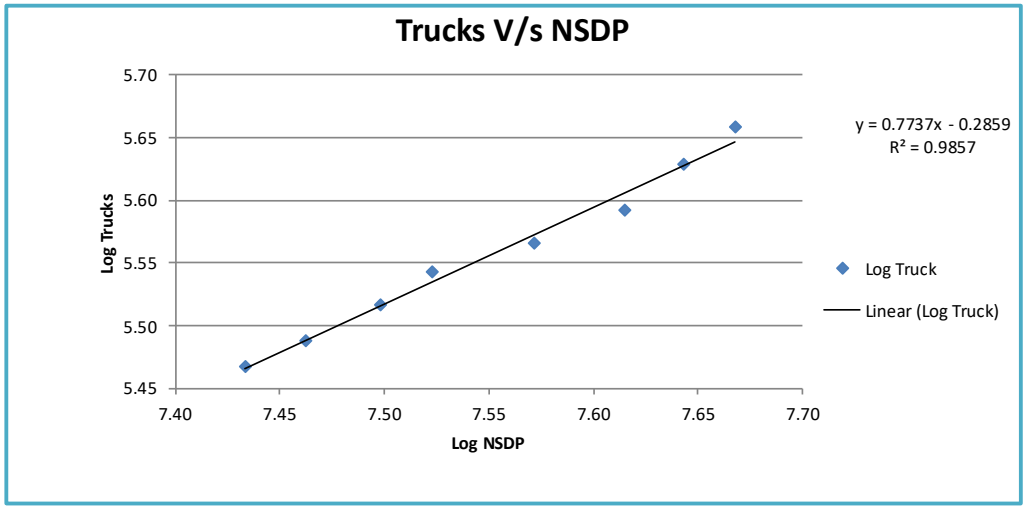


Figure 5-9 : Regression and Elasticity NSDP vs. Trucks Traffic - extrapolation Haryana & Punjab.

Using the regression analysis above, we have arrived at the elasticity of traffic demand for each class of vehicle to a given change in relevant economic indicators. Average traffic growth of a vehicle class is multiplied by the corresponding elasticity coefficient to arrive at traffic growth. R2 statistical measure of how close the data are to the fitted regression line. It varies from 0 to 1. The higher the value of R2 more representative is the regression model of data.

The results of these analyses for *the good fit* regression as reflected by R^2 values are presented in the Table below.

Table 5-12 : Summary Regression Analysis Haryana & Punjab

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average IV Growth	Growth Elastic Model	Remarks
Haryana & Punjab	Car/Jeep	PCI	y = 1.667x - -2.3608	R² = 0.9828	1.6670	6.53%	10.89%	Good Regression
	Bus	Population	y = 4.9905x - -32.348	R² = 0.9908	4.9905	1.57%	7.82%	Good Regression
	Truck	NSDP	y = 0.7737x - -0.2859	R² = 0.9857	0.7737	8.04%	6.22%	Good Regression

The following tables and graphs depict regression and elasticity of growth model for stretch falling in Uttar Pradesh State.

Table 5-13 : Per Capita Income Vs Car Uttar Pradesh

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2011	32002	1108100	4.51	6.04		
2012	32908	1205374	4.52	6.08	3%	
2013	34044	1423020	4.53	6.15	3%	
2014	34583	1572217	4.54	6.20	2%	
2015	36973	1746117	4.57	6.24	7%	
2016	40847	2027972	4.61	6.31	10%	
2017	41832	2195783	4.62	6.34	2%	
2018	43670	2439845	4.64	6.39	4%	4.6%

Regression analysis of same is given in figure below.

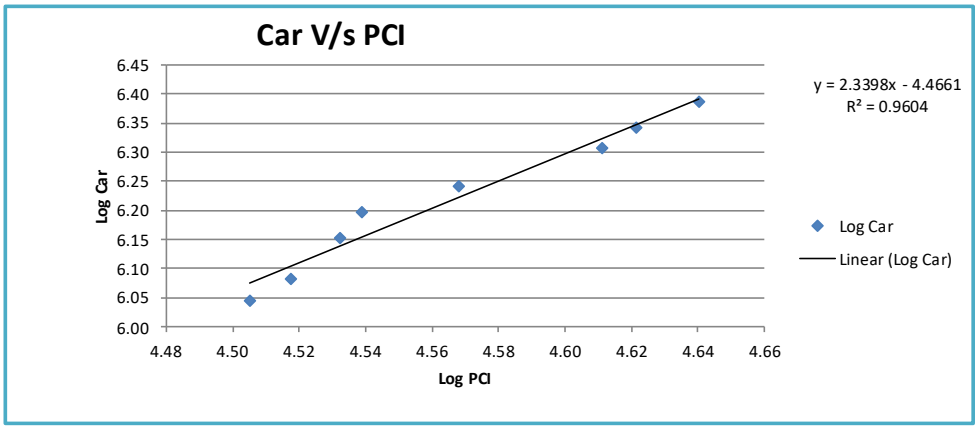


Figure 5-10 : Regression and Elasticity PCI vs. Car – Extrapolation Uttar Pradesh

Table 5-14 : Population Vs Bus Uttar Pradesh

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth
2011	199812000	57901	8.30	4.76		
2012	203670000	64147	8.31	4.81	2%	
2013	206322000	74389	8.31	4.87	1%	
2014	209577000	80460	8.32	4.91	2%	
2015	212832000	89127	8.33	4.95	2%	
2016	216870000	112020	8.34	5.05	2%	

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth
2017	219510000	112766	8.34	5.05	1%	
2018	222150000	121975	8.35	5.09	1%	1.5%

Regression analysis of same is given in figure below.

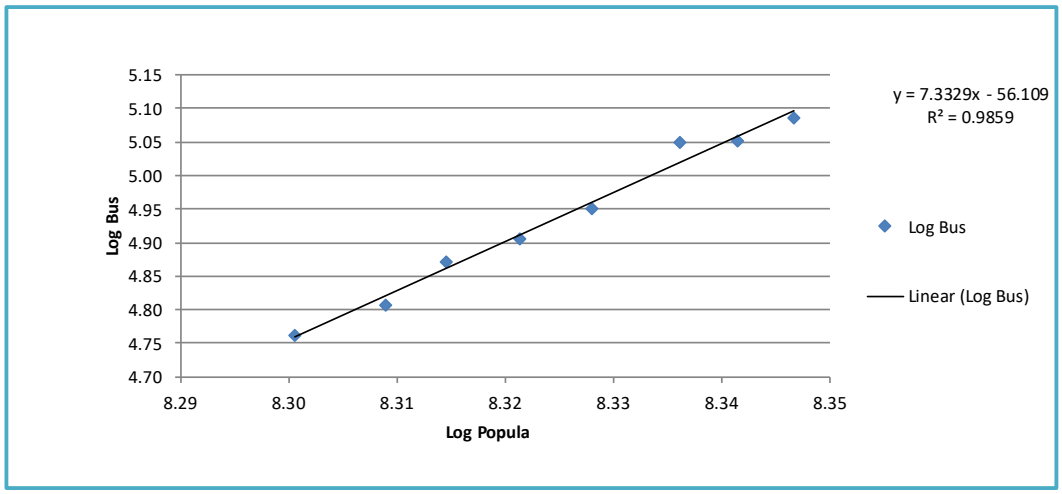


Figure 5-11 : Regression and Elasticity Population vs. Bus – Extrapolation Uttar Pradesh

Elasticity of Trucks has been worked out by regression analysis with NSDP. The following table represents the data and details.

Table 5-15 : Truck Vs NSDP Uttar Pradesh

Year	NSDP	Trucks	Log NSDP	Log LCV	NSDP Growth	Average Growth
2011	64513155	162813	7.81	5.21		
2012	67355218	186404	7.83	5.27	4%	
2013	70746910	202761	7.85	5.31	5%	
2014	72968630	217609	7.86	5.34	3%	
2015	79204874	245688	7.90	5.39	9%	
2016	88845325	265167	7.95	5.42	12%	
2017	92380571	307096	7.97	5.49	4%	
2018	97915937	356828	7.99	5.55	6%	6.2%

The following figure depicts regression analysis and extrapolation.

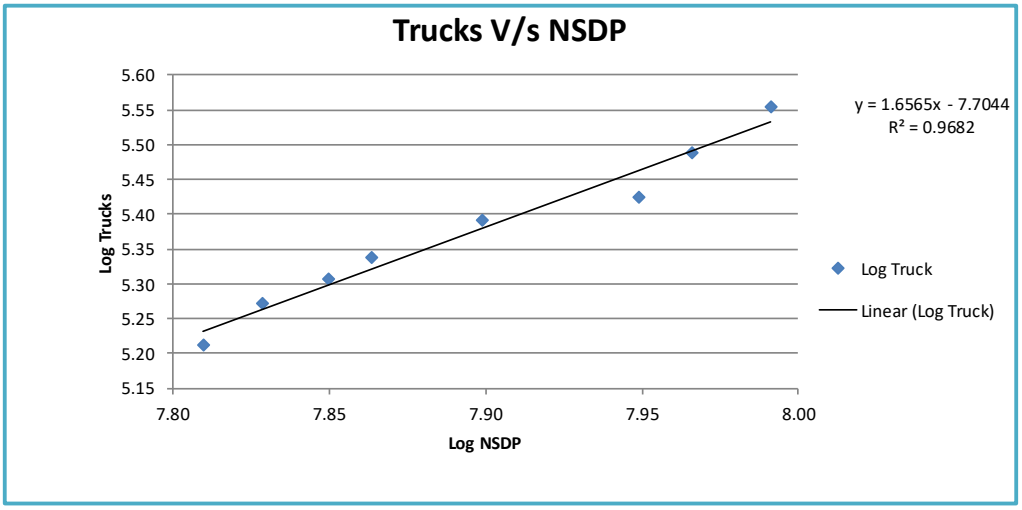


Figure 5-12 : Regression and Elasticity NSDP vs. Trucks Traffic - extrapolation Uttar Pradesh.

Using the regression analysis above, we have arrived at the elasticity of traffic demand for each class of vehicle to a given change in relevant economic indicators. Average traffic growth of a vehicle class is multiplied by the corresponding elasticity coefficient to arrive at traffic growth. R2 statistical measure of how close the data are to the fitted regression line. It varies from 0 to 1. The higher the value of R2 more representative is the regression model of data.

The results of these analyses for *the good fit* regression as reflected by R^2 values are presented in the Table below.

Table 5-16 : Summary Regression Analysis Uttar Pradesh

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average IV Growth	Growth Elastic Model	Remarks
Uttar Pradesh	Car/Jeep	PCI	y = 2.3398x - - 4.4661	R² = 0.9604	2.3398	4.58%	10.72%	Good Regression
	Bus	Population	y = 7.3329x - - 56.1092	R² = 0.9859	7.3329	1.53%	11.19%	Good Regression
	Truck	NSDP	y = 1.6565x - - 7.7044	R² = 0.9682	1.6565	6.18%	10.24%	Good Regression

Table 5-17 : Results of Regression Analysis

Results of Regression Analysis					
State	**Vehicle Category**	**Independent Variable**	**Regression Equation**	**R Square**	**Elasticity Coefficient**
GUJRAT	Car/Jeep	PCI	y = 1.3816x - - 0.6381	R^2 = 0.9375	1.3816
	Bus	Population	y = 3.2013x - - 20.0857	R^2 = 0.989	3.2013
	Truck	NSDP	y = 0.6496x - 0.4501	R^2 = 0.9984	0.6496
UTTAR PRADESH	Car/Jeep	PCI	y = 2.3398x - - 4.4661	R^2 = 0.9604	2.3398
	Bus	Population	y = 7.3329x - - 56.1092	R^2 = 0.9859	7.3329
	Truck	NSDP	y = 1.6565x - - 7.7044	R^2 = 0.9682	1.6565
RAJASTHAN	Car/Jeep	PCI	y = 2.3328x - - 5.312	R^2 = 0.9856	2.3328
	Bus	Population	y = 3.2641x - - 20.6548	R^2 = 0.9985	3.2641
	Truck	NSDP	y = 1.4741x - - 5.6285	R^2 = 0.9913	1.4741
HARYANA & PUNJAB	Car/Jeep	PCI	y = 1.667x - - 2.3608	R^2 = 0.9828	1.667
	Bus	Population	y = 4.9905x - - 32.348	R^2 = 0.9908	4.9905
	Truck	NSDP	y = 0.7737x - - 0.2859	R^2 = 0.9857	0.7737

The economic model for predicting growth is a good tool, however other local, regional, and national factors should also be considered before finalizing growth factors. Considering factors such as proposed developments and other influencing economic factors, moderated growth should be considered. These factors are discussed in subsequent sections.

5.4 Analysis of Historic Traffic Data

Historical traffic data forms useful information for any highway project. It provides useful information for establishing past trends of growth. Project stretch of Udaipur to Gujarat on NH-8 is under tolling operation with current concessionaire and has three years of tolling history from 2017-18 (Part year). As traffic data available with the project concessionaire is of less than three years, we do not have sufficient data points to be able to establish a reliable past trend of traffic growth. A minimum of about 5 -6 years' traffic data is required for establishing a reliable past trend.

5.5 Other Factors Influencing Growth

There are many factors which have an impact on traffic growth. As discussed previously these factors can be economical, social, educational, and industrial.

Potentiality of such factors for project highway is discussed as under.

ECONOMY

After witnessing a slowdown during 2011-12, the economy recovered in 2013-14, and a high growth rate of GDP was recorded up to 2018-19. Pandemic of COVID-19 impacted all economies of world including India up to year 2021-22. Following figure show trend of GDP growth in India.

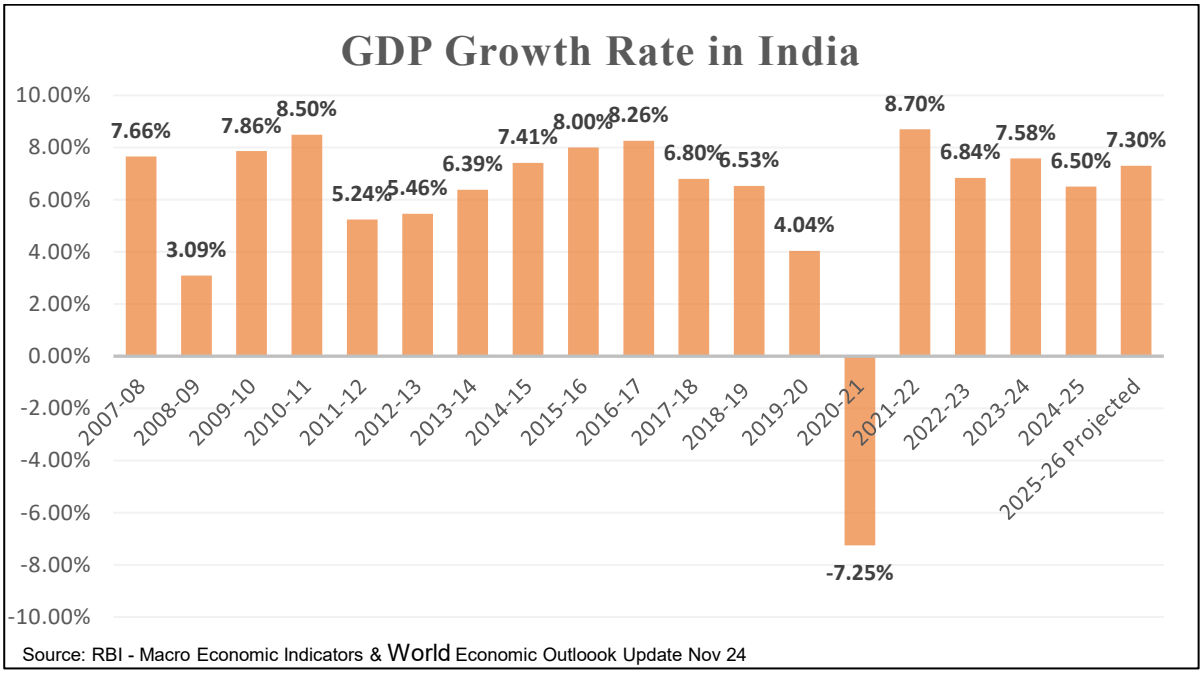


Figure 5-13 : Growth of GDP in India

FY 2017-18 recorded a growth of 6.7% which had a slight impact of GST and demonetization. Indian economy appears on recovery path with estimated growth of 6.8% in FY 2018-19. The government took major policy decisions including tax infrastructure reforming, banking sector improvement and ease of doing business.

In post COVID-19 scenario, in year 2022-23 and 2023-24 India registered an impressive growth of 7% to 7.5%. In last year despite global slow down due to Russia-Ukraine war and Gaza crises, India grew at good rate of 7%(Estimated).
Indian economy is now on good growth path and all major institutions including IMF / ADB have estimated growth of Indian Economy to peg around 6.5% to 7% in coming years.

5.5.1 Recommended Growth Rates of Traffic for Project Stretch

Based on the above analysis and after giving due consideration to the entire listed factors, the following overall growth rates are recommended for each category of vehicle as below. The rate of growth is moderate in light of overall regional trends. Growth of multi-Axle is kept slightly higher as trend of technological advances in logistic industry favors multi-axle over 2/3 axle carriage. It is also expected that as the economy moves from developing to developed, the rate of growth diminishes. The same growth rate is not sustainable for long. Traffic growth is suitably stepped down for future years.

Growth rates are recommended for three scenarios for sensitivity analysis namely **Optimistic, Pessimistic** and **Most Likely** with a positive and negative variation 0.5% from Most Likely case for corridors in both states.

Table 5-18 : Recommended Growth Rates Optimistic

Category / Year	FY 2027-2028	FY 2029-2033	FY 2034-2038	FY 2039-2043	FY 2044-2048
Car/Jeep/Van	8.06%	7.16%	6.13%	5.57%	5.57%
Bus	3.29%	2.84%	2.41%	2.21%	2.21%
Minibus	3.29%	2.84%	2.41%	2.23%	2.23%
LCV	3.30%	2.91%	2.59%	2.25%	2.25%
2- Axle	2.83%	2.45%	2.19%	2.06%	2.06%
3 - Axle	7.06%	6.28%	5.45%	4.81%	4.81%
4 to 6 Axle	7.86%	6.93%	6.00%	5.43%	5.43%
7 and Above Axle	7.06%	6.28%	5.45%	4.81%	4.81%

Table 5-19 : Recommended Growth Rates Pessimistic

Category / Year	FY 2027-2028	FY 2029-2033	FY 2034-2038	FY 2039-2043	FY 2044-2048
Car/Jeep/Van	7.56%	6.66%	5.63%	5.07%	5.07%
Bus	2.79%	2.34%	1.91%	1.71%	1.71%
LCV	2.80%	2.72%	2.35%	1.75%	1.75%
2- Axle	2.33%	1.95%	1.69%	1.56%	1.56%
3 - Axle	6.56%	5.78%	4.95%	4.31%	4.31%
4 to 6 Axle	7.36%	6.43%	5.50%	4.93%	4.93%
7 and Above Axle	6.56%	5.78%	4.95%	4.31%	4.31%

Table 5-20 : Recommended Growth Rates Most Likely

Category / Year	FY 2027-2028	FY 2029-2033	FY 2034-2038	FY 2039-2043	FY 2044-2048
Car/Jeep/Van	7.81%	6.91%	5.88%	5.32%	5.32%
Bus	3.04%	2.59%	2.16%	1.96%	1.96%
Minibus	3.04%	2.59%	2.16%	1.98%	1.98%
LCV	3.05%	2.66%	2.34%	2.00%	2.00%
2- Axle	2.58%	2.20%	1.94%	1.81%	1.81%
3 - Axle	6.81%	6.03%	5.20%	4.56%	4.56%
4 to 6 Axle	7.61%	6.68%	5.75%	5.18%	5.18%
7 and Above Axle	6.81%	6.03%	5.20%	4.56%	4.56%

Traffic and revenue have been worked out on the basis of the above growth, and some are presented in subsequent chapters of the report.

CHAPTER 6

TRAFFIC FORECAST

6.1 Traffic Projections

The growth rates recommended in the previous section of the report are used to arrive at traffic projections for future years. Toll plaza wise futuristic traffic projection is given in tables below.

These projections have been done for the following three cases of growth up to the concession period.

1. Optimistic Scenario
2. Pessimistic Scenario
3. Most Likely Scenario

Table 6-1 : Total Tollable Traffic @ Toll Plaza – Chainage 394+200 KM (Optimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	2078	305	317	343	251	8042	13	**11349**	**42008**
2027-28	2366	349	364	394	286	9160	15	**12934**	**49807**
2028-29	2556	360	376	405	306	9880	16	**13899**	**53169**
2029-30	2739	370	386	415	326	10565	17	**14818**	**56762**
2030-31	2909	381	396	425	347	11298	18	**15774**	**60603**
2031-32	3117	392	408	435	369	12081	19	**16821**	**64707**
2032-33	3311	403	420	445	393	12919	20	**17911**	**69093**
2033-34	3547	414	432	455	418	13815	21	**19102**	**73146**
2034-35	3737	425	442	465	440	14643	22	**20174**	**77441**
2035-36	3965	436	452	475	464	15521	23	**21336**	**81991**
2036-37	4180	447	462	485	489	16452	24	**22539**	**86812**
2037-38	4436	458	474	495	516	17439	25	**23843**	**91920**
2038-39	4678	470	486	505	544	18485	26	**25194**	**96816**
2039-40	4939	480	496	515	570	19488	27	**26515**	**101491**
2040-41	5163	489	504	523	595	20448	28	**27750**	**106395**
2041-42	5424	498	512	531	621	21455	29	**29070**	**111539**
2042-43	5671	507	521	539	648	22511	30	**30427**	**116935**
2043-44	5958	516	530	547	676	23620	31	**31878**	**123180**
2044-45	6258	527	542	558	708	24901	32	**33526**	**129761**
2045-46	6606	539	554	569	742	26252	33	**35295**	**136698**
2046-47	6940	551	566	580	777	27676	34	**37124**	**144009**

Table 6-2 : Total Tollable Traffic @ Toll Plaza - Chainage 394+200 KM (Pessimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	2069	303	316	342	249	8004	13	**11296**	**41821**
2027-28	2357	348	362	391	285	9123	14	**12880**	**49377**

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2028-29	2535	358	372	400	304	9795	15	**13779**	**52461**
2029-30	2703	368	381	408	322	10425	16	**14623**	**55742**
2030-31	2858	378	390	416	341	11095	17	**15495**	**59231**
2031-32	3049	388	399	424	361	11808	18	**16447**	**62942**
2032-33	3226	398	408	432	382	12567	19	**17432**	**66891**
2033-34	3441	409	418	440	404	13374	20	**18506**	**70483**
2034-35	3611	419	426	448	424	14110	21	**19459**	**74270**
2035-36	3814	429	434	456	445	14886	22	**20486**	**78265**
2036-37	4003	439	442	464	467	15705	23	**21543**	**82478**
2037-38	4227	449	450	472	491	16569	24	**22682**	**86920**
2038-39	4438	459	458	480	516	17480	25	**23856**	**91115**
2039-40	4663	467	466	488	538	18341	26	**24989**	**95515**
2040-41	4874	475	474	496	562	19245	27	**26153**	**100130**
2041-42	5121	483	482	504	587	20193	28	**27398**	**104971**
2042-43	5355	492	490	512	612	21187	29	**28677**	**110049**
2043-44	5626	501	498	520	638	22231	30	**30044**	**115376**
2044-45	5883	510	506	528	665	23326	31	**31449**	**120964**
2045-46	6182	519	514	536	693	24475	32	**32951**	**126825**
2046-47	6466	528	523	544	723	25681	33	**34498**	**132973**

Traffic projections for Most Likely scenario is given as under

Table 6-3 : Total Tollable Traffic @ Toll Plaza - Chainage 394+200 KM (Most Likely Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	2073	304	316	343	249	8023	13	**11321**	**41913**
2027-28	2362	348	363	393	286	9141	14	**12907**	**49590**
2028-29	2546	358	373	403	306	9836	15	**13837**	**52814**
2029-30	2722	367	383	412	325	10494	16	**14719**	**56251**
2030-31	2884	377	393	421	345	11196	17	**15633**	**59916**
2031-32	3084	387	403	430	366	11944	18	**16632**	**63823**
2032-33	3270	397	413	439	388	12743	19	**17669**	**67990**
2033-34	3495	407	423	448	412	13595	20	**18800**	**71809**
2034-35	3676	416	432	457	433	14376	21	**19811**	**75846**
2035-36	3891	426	441	466	455	15202	22	**20903**	**80113**
2036-37	4093	436	451	475	479	16075	23	**22032**	**84623**
2037-38	4333	446	461	484	504	16999	24	**23251**	**89391**
2038-39	4560	456	471	493	530	17976	25	**24511**	**93929**
2039-40	4802	465	480	502	555	18907	26	**25737**	**98465**
2040-41	5019	473	488	510	579	19839	27	**26935**	**103223**
2041-42	5272	481	496	518	604	20816	28	**28215**	**108213**
2042-43	5512	490	504	526	630	21842	29	**29533**	**113448**
2043-44	5792	499	512	534	657	22918	30	**30942**	**119223**
2044-45	6070	509	522	543	687	24104	31	**32466**	**125296**
2045-46	6392	519	532	553	718	25352	32	**34098**	**131680**
2046-47	6700	529	542	563	750	26664	33	**35781**	**138394**

6.2 Modification in Concession Period

Modification is a concession period due to variation in traffic is worked out as per procedure given in RFP. There are three milestones for traffic testing in the years 2028, 2033 and 2038. The working of modification in concession period is given as under for all scenarios.

- Appointed date – 28th December 2023
- Concession Period (Days) – 7300 (For 20 Years)
- Hence, Original Concession end date is – 22nd December 2043

Pessimistic Case

Sr. No	Target Date	Target Traffic	Actual Traffic	Variation in CP as per CA %	Change in CP (Days	Total Variation in CP Years
1	01-Oct-28	58741	50919	8.32%	462	**1.3**
2	01-Oct-33	68736	68687	0.00%	0	
3	01-Oct-38	87724	89018	0.00%	0	

Optimistic Case

Sr. No	Target Date	Target Traffic	Actual Traffic	Variation in CP as per CA %	Change in CP (Days	Total Variation in CP Years
1	01-Oct-28	58741	51488	7.35%	409	**1.0**
2	01-Oct-33	69463	71119	0.00%	0	
3	01-Oct-38	88651	94368	-1.45%	-34	

Most Likely Case

Sr. No	Target Date	Target Traffic	Actual Traffic	Variation in CP as per CA %	Change in CP (Days	Total Variation in CP Years
1	01-Oct-28	58741	51202	7.83%	436	
2	01-Oct-33	69098	69900	0.00%	0	**1.2**
3	01-Oct-38	88185	91660	0.00%	0	

Hence a negative variation of about **462 days** in the concession period is expected as per traffic projections in *Pessimistic case*.

375 days in concession period are expected as per traffic projections in *Optimistic case* and **436 days** in concession period are expected as per traffic projections in *Most likely case*.

CHAPTER 7

FORECAST OF TOLL REVENUE

7.1 General

This chapter presents the toll rate calculations, categories and toll revenue of the project.

7.2 Discount Categories

The fee schedule in the CA of Udaipur- Gujarat Border section of NH-8 is based on the old toll policy. As per the Toll Notification (Schedule - G), the discounts and special provisions have been considered. In addition to discounts as per the Fee Notification concessionaire has declared special category rates also. Salient features of toll rate structure are given as below

1. Monthly Pass: For frequent user's monthly pass would be issued at fee 30 time the single journey fee.
2. Multiple Journeys (for Return Trip): Will be charged at 1.5 times single journey.
3. Single Journey: Full single journey toll would be charged to this category of vehicles who are infrequent travelers or whose frequency does not yield any discount from the above categories.
4. Local Discounts: There are several categories of local discounts.
    a) Local Car Jeep Van I - Rs. 350 per month
    b) Other local Commercial at 50% of the regular single journey toll fee

Building of inflation and escalation of rate on the basis of WPI are done as per toll notification (Schedule G) as given under as extract from concession agreement.

The formula for determining the applicable rate of fee shall be as follows:-

$$\text{Applicable rate of fee} = \text{base rate} + \text{base rate} \times \left\{ \frac{\text{WPI A-WPI B}}{\text{WPI B}} \right\} \times 0.4$$

Factors of inflation / growth have been incorporated as per Schedule R. WPI are available up to the year 2025-26.

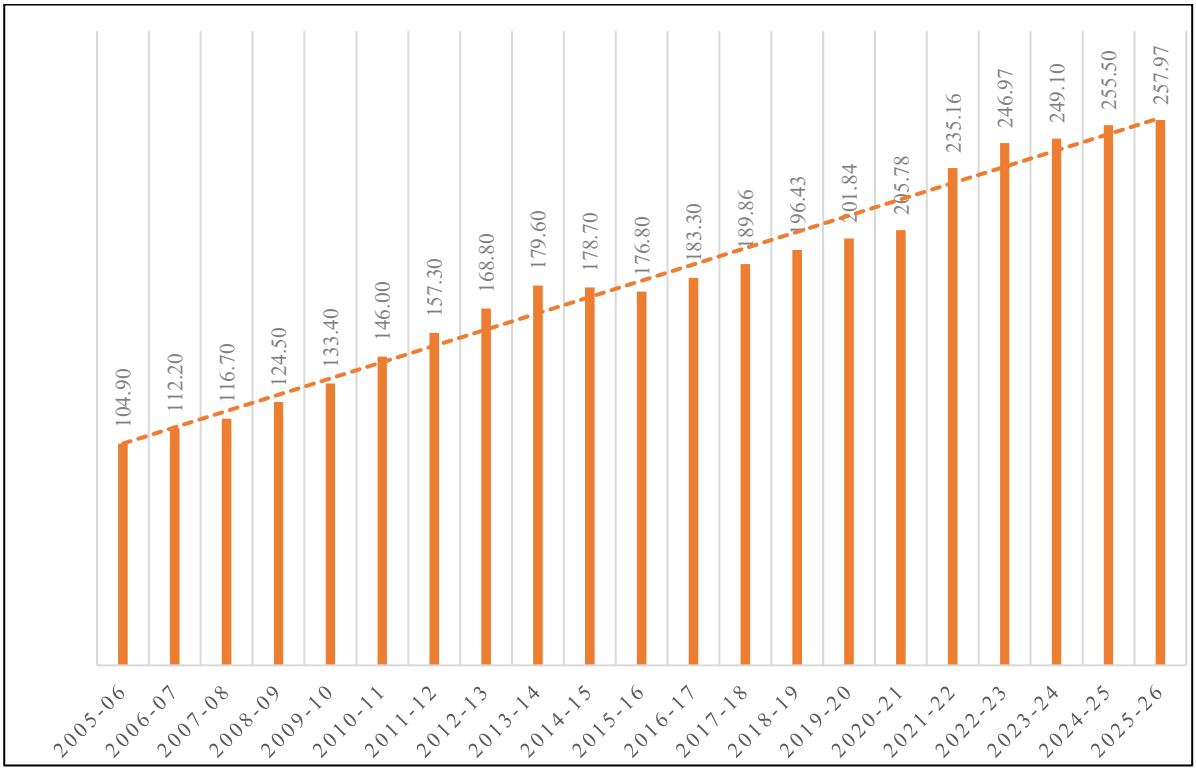


Figure 7-1 : Historical Rate of WPI Inflation in India

The wholesale price index (WPI) and the inflation rate in the past are presented in Table below.

Table 7-1 : Historical WPI value and Growth Inflation

December of year	2021	2022	2023	2024	2025	Avg.
WPI	235.2	247.0	249.1	255.5	257.97	
Inflation	14.27%	5.02%	0.86%	2.57%	0.96%	4.74%

WPI of December 2025 is posted on ministry site which is shows 0.96% inflation from the previous year. Same has been applied for FY 2026-27.

The average WPI inflation over the period FY 2021 to FY 2025 works out to approximately 4.74%, reflecting inflationary cycles across both high and low inflation years. Based on this analysis, an annual escalation factor of 4.5% has been adopted for the remaining concession period.

7.3 Estimation of Toll Rates

As per the applicable MORTH notification and Schedule R of contract agreement, the following Base rate of fee for the categories mentioned in the table stands true in the National Highways Fee Rules applicable for contract.

Table 7-2 : Base Toll Rates June 2007-08

Type of Vehicle	Base Rate of Fee / Km (in Rs.)
Car, Jeep, Van or Light Motor Vehicle	0.65
Light Commercial Vehicle, Light Goods Vehicle or Minibus	1.05
Bus or Truck (Two Axles)	2.20
Three Axle Commercial Vehicles	2.40
Heavy Construction Machinery (HCM) or Earth Moving Equipment (EME) or Multi Axle Vehicle (MAV) (4 to 6 axles)	3.45
Oversized Vehicles (7 or more Axles)	4.20

There is no bypass or structure to be factored in for rates calculations.

Toll rates are calculated as per guidelines provided in schedule R (rounded to nearest Rs.) for the concession period and are given below.

Thus, worked out rates for various categories of vehicles and discounts are given as under

Table 7-3 : Toll Rates for Single Journey @ Km TP-394+200 KM

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial Vehicle	Multi Axle	Oversized Vehicle
2026-27	100	160	335	335	365	520	635
2026-27	145	235	490	490	535	765	935
2027-28	150	245	505	505	550	790	965
2028-29	160	255	530	530	575	830	1010
2029-30	165	265	555	555	605	870	1055
2030-31	175	280	580	580	635	910	1105
2031-32	180	290	610	610	665	955	1160
2032-33	190	305	640	640	695	1000	1215
2033-34	200	320	670	670	730	1045	1275
2034-35	210	335	700	700	765	1095	1335
2035-36	220	350	735	735	800	1150	1400
2036-37	230	370	770	770	840	1205	1465
2037-38	240	385	805	805	880	1265	1535
2038-39	255	405	845	845	925	1325	1610
2039-40	265	425	890	890	970	1390	1690
2040-41	280	445	930	930	1015	1460	1775
2041-42	290	470	975	975	1065	1530	1860
2042-43	305	490	1025	1025	1120	1605	1950
2043-44	320	515	1075	1075	1175	1685	2050
2044-45	335	540	1130	1130	1230	1765	2150
2045-46	355	570	1185	1185	1290	1855	2255
2046-47	370	595	1245	1245	1355	1945	2370

Table 7-4 : Toll Rates for Return Journey @ TP-394+200 KM

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial Vehicle	Multi Axle	Oversized Vehicle
2026-27	150	245	510	510	560	805	980
2026-27	215	350	735	735	800	1150	1400
2027-28	225	365	760	760	825	1185	1445
2028-29	240	380	795	795	865	1245	1510
2029-30	250	400	830	830	905	1300	1585
2030-31	260	420	870	870	950	1365	1660
2031-32	275	440	915	915	995	1430	1740
2032-33	285	460	955	955	1045	1495	1820
2033-34	300	480	1000	1000	1095	1570	1910
2034-35	315	505	1050	1050	1145	1645	2000
2035-36	330	530	1100	1100	1200	1725	2100
2036-37	345	555	1155	1155	1260	1805	2200
2037-38	360	580	1210	1210	1320	1895	2305
2038-39	380	610	1270	1270	1385	1985	2420
2039-40	400	640	1330	1330	1450	2085	2535
2040-41	415	670	1395	1395	1525	2185	2660
2041-42	435	705	1465	1465	1600	2295	2790
2042-43	460	735	1535	1535	1675	2405	2930
2043-44	480	775	1615	1615	1760	2525	3075
2044-45	505	810	1695	1695	1845	2650	3225
2045-46	530	850	1775	1775	1940	2780	3385
2046-47	555	895	1865	1865	2035	2920	3555

Table 7-5 : Toll Rates for Monthly Pass Local @ TP-394+200 KM

Year	Car	Minibus /LCV
2026-27	330	330
2026-27	360	360
2027-28	370	370
2028-29	385	385
2029-30	405	405
2030-31	425	425
2031-32	445	445
2032-33	465	465
2033-34	490	490
2034-35	510	510
2035-36	535	535
2036-37	565	565
2037-38	590	590
2038-39	620	620
2039-40	650	650
2040-41	680	680
2041-42	715	715
2042-43	750	750
2043-44	785	785
2044-45	825	825
2045-46	865	865

Year	Car	Minibus /LCV
2046-47	910	910

Table 7-6 : Toll Rates for Monthly Pass @ TP-394+200 KM

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial Vehicle	Multi Axle	Oversized Vehicle
2026-27	3280	5300	11105	11105	12115	17410	21200
2026-27	4820	7785	16315	16315	17795	25580	31140
2027-28	5045	8095	16855	16855	18375	26375	32085
2028-29	5285	8475	17650	17650	19245	27625	33605
2029-30	5530	8875	18485	18485	20160	28935	35200
2030-31	5795	9295	19365	19365	21115	30310	36875
2031-32	6070	9740	20290	20290	22125	31755	38635
2032-33	6360	10205	21260	21260	23180	33275	40485
2033-34	6660	10690	22275	22275	24290	34870	42425
2034-35	6980	11205	23350	23350	25460	36545	44465
2035-36	7315	11745	24475	24475	26685	38310	46615
2036-37	7665	12310	25655	25655	27975	40165	48870
2037-38	8035	12905	26900	26900	29335	42115	51240
2038-39	8425	13530	28210	28210	30760	44160	53735
2039-40	8835	14190	29585	29585	32260	46320	56360
2040-41	9265	14885	31035	31035	33840	48585	59120
2041-42	9720	15615	32555	32555	35505	50970	62020
2042-43	10195	16380	34160	34160	37250	53480	65075
2043-44	10700	17190	35845	35845	39090	56125	68290
2044-45	11225	18040	37620	37620	41025	58905	71675
2045-46	11785	18935	39490	39490	43065	61830	75235
2046-47	12370	19875	41455	41455	45205	64910	78985

7.4 Toll Revenue

As indicated earlier, toll revenue on the Project Road has been calculated in all three scenarios based on above rates and projected traffic. The estimates of toll revenue under ***Optimistic***, ***Pessimistic*** and ***Most Likely*** growth scenarios are presented in the following section.

7.5 Toll Revenue at all toll plazas under Scenarios

Toll Revenue estimates under all scenarios at each of the toll plaza up to 2046-47 years starting from the year 2026-27 are shown in tables below.
The management expects construction of the project to be completed by December 31, 2026

Table 7-7 : Toll Revenue Optimistic Scenario

(Rs. Crores)

Location / Year	Makhel Toll	Total
2026-27	195.44	**195.44**
2027-28	312.47	**312.47**
2028-29	349.63	**349.63**
2029-30	390.91	**390.91**
2030-31	436.84	**436.84**
2031-32	490.43	**490.43**
2032-33	546.86	**546.86**
2033-34	605.29	**605.29**
2034-35	671.45	**671.45**
2035-36	748.32	**748.32**
2036-37	827.77	**827.77**
2037-38	919.64	**919.64**
2038-39	1015.09	**1015.09**
2039-40	1119.10	**1119.10**
2040-41	1228.63	**1228.63**
2041-42	1349.31	**1349.31**
2042-43	1483.89	**1483.89**
2043-44	1645.28	**1645.28**
2044-45	1810.77	**1810.77**
2045-46	2004.83	**2004.83**
2046-47	2214.19	**2214.19**

Table 7-8 : Toll Revenue Pessimistic Scenario

(Rs. Crores)

Location / Year	Makhel Toll	Total
2026-27	194.58	**194.58**
2027-28	309.77	**309.77**
2028-29	344.99	**344.99**
2029-30	383.90	**383.90**
2030-31	426.95	**426.95**
2031-32	477.08	**477.08**
2032-33	529.51	**529.51**
2033-34	583.28	**583.28**
2034-35	644.01	**644.01**
2035-36	714.40	**714.40**
2036-37	786.54	**786.54**
2037-38	869.83	**869.83**
2038-39	955.54	**955.54**

Location / Year	Makhel Toll	Total
2039-40	1053.46	**1053.46**
2040-41	1156.58	**1156.58**
2041-42	1270.11	**1270.11**
2042-43	1396.76	**1396.76**
2043-44	1541.34	**1541.34**
2044-45	1688.29	**1688.29**
2045-46	1860.39	**1860.39**
2046-47	2044.84	**2044.84**

Table 7-9 : Toll Revenue Most Likely Scenario

(Rs. Crores)

Location / Year	Makhel Toll	Total
2026-27	195.00	**195.00**
2027-28	311.11	**311.11**
2028-29	347.32	**347.32**
2029-30	387.45	**387.45**
2030-31	431.96	**431.96**
2031-32	483.82	**483.82**
2032-33	538.28	**538.28**
2033-34	594.43	**594.43**
2034-35	657.92	**657.92**
2035-36	731.58	**731.58**
2036-37	807.36	**807.36**
2037-38	894.85	**894.85**
2038-39	985.45	**985.45**
2039-40	1086.42	**1086.42**
2040-41	1192.72	**1192.72**
2041-42	1309.82	**1309.82**
2042-43	1440.49	**1440.49**
2043-44	1593.38	**1593.38**
2044-45	1749.52	**1749.52**
2045-46	1932.45	**1932.45**
2046-47	2129.13	**2129.13**

CHAPTER 8

CONCLUSION & RECOMMENDATIONS

8.1 Conclusion & Recommendations

Project stretch of Samakhiyali to Santalpur of NH-27 in state of Gujarat is a four-lane national highway which is being upgraded to six lanes. Project corridor is main feeder road from North India and other parts sof Gujarat and Rajasthan to major ports of Kandla and Mundra. Due to this there is considerable volume of heavy commercial vehicles on stretch. Jamnagar – Amrtisar Expressway would also add good value to projecst traffic as will provide faster connectivity to north India to Jamnagar refinery and also to Mundra and Kandla port. Morbi tile Industry is also a good contributor to traffic of project road. As Indian economy is poised to grow at good rate, the project corridor is expected to pick up the same trend in terms of traffic flow. All these developments have potential to give a positive impact to traffic flow on the project. The following can be considered as major outcomes of the study.

a) There is a good amount of tollable traffic running on the project.

b) Project corridor has potential to witness traffic growth @ 6-8% annually in near future due to various development in area and overall development of economy.

c) The Project corridor has committed traffic as long route traffic and does not run a risk of traffic leakage due to quality competing road.

Based on the above it can be considered a stable healthy project from the traffic and revenue point of view.

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(TOT BUNDLE-12)

TRAFFIC STUDY & REVENUE PROJECTION REPORT (FINAL)

MAY 2026

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GMD CONSULTANTS ★ NAVI MUMBAI ★

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ABBREVIATIONS

AADT	-	Annual Average Daily Traffic	**NHAI**	-	National Highway Authority of India
BOT	-	Build Operate Transfer	**NHDP**	-	National Highways Development Project
CAGR	-	Compound Annual Growth Rate	**NSDP**	-	Net State Domestic Product
CTV	-	Classified traffic volume	**O&M**	-	Operation & Maintenance
DBFOT	-	Design, Build, Finance, Operate & Transfer	**PCDP**	-	Per Capita Domestic Product
EME	-	Earth Moving Equipment	**PCI**	-	Per Capita Income
GDP	-	Gross Domestic Product	**PCU**	-	Passenger Car Unit
GSDP	-	Gross State Domestic Product	**PSC**	-	Pre-stressed Concrete
HCM	-	Heavy Construction Machinery	**RCC**	-	Reinforced cement concrete
HCV	-	Heavy Commercial Vehicle	**RHS**	-	Right Hand Side
HTMS	-	Highway Traffic Management System	**SH**	-	State Highway
IRC	-	Indian Road Congress	**TP**	-	Toll Plaza
IRR	-	Internal Rate of Return	**WPI**	-	Wholesale Price Index
LCV	-	Light Commercial Vehicle	**SIR**	-	Special Investment Region
LHS	-	Left Hand Side	**c.**	-	Circa
LGV	-	Light Goods Vehicle	**ROB**	-	Railway Over Bridge
MAV	-	Multi Axle Vehicle	**MDR**	-	Major District Road
MORTH	-	Ministry of Road Transport and Highways	**ODR**	-	Other District Road
NH	-	National Highway	**CA**	-	Concession Agreement
PCC	-	Plain Cement Concrete	**RMT**	-	Running Meter
CR	-	Coarse Rubble			

CHAPTER 1

INTRODUCTION

1.1 Background

The National Highways Authority of India (NHAI) introduced the Toll, Operate and Transfer (TOT) model for partnership with private developers in the road sector. Under this model, NHAI passes on the toll collection rights and operation and maintenance obligations for 20 years to the private developer against payment of upfront, one-time, lump sum concession fees quoted by the private developer as part of the comprehensive bidding process. Projects under this model are awarded as a bundle of operational national highways, which allows the investor to offset the risks of one project against another. Since existing and operational roads are auctioned under the TOT model.

Under the Toll Operate and Transfer (ToT) 12 bundle, NHAI had invited tenders for selection of concessionaire for maintenance of the National Highway stretch Lalitpur-Sagar-Lakhnadon from Km 99.00 to Km 415.089 section of NH-44 (old NH26).

M/s. IRB Infrastructure Developers Limited., has been declared as the selected bidder for the project. This report is for ToT bundle 12 "Lalitpur-Sagar- Lakhnadon from Km 99.00 to Km 415.089 section of NH-44 spanning in the states of Uttar Pradesh and Madhya Pradesh. Project Highway alignment is depicted in the following figure.

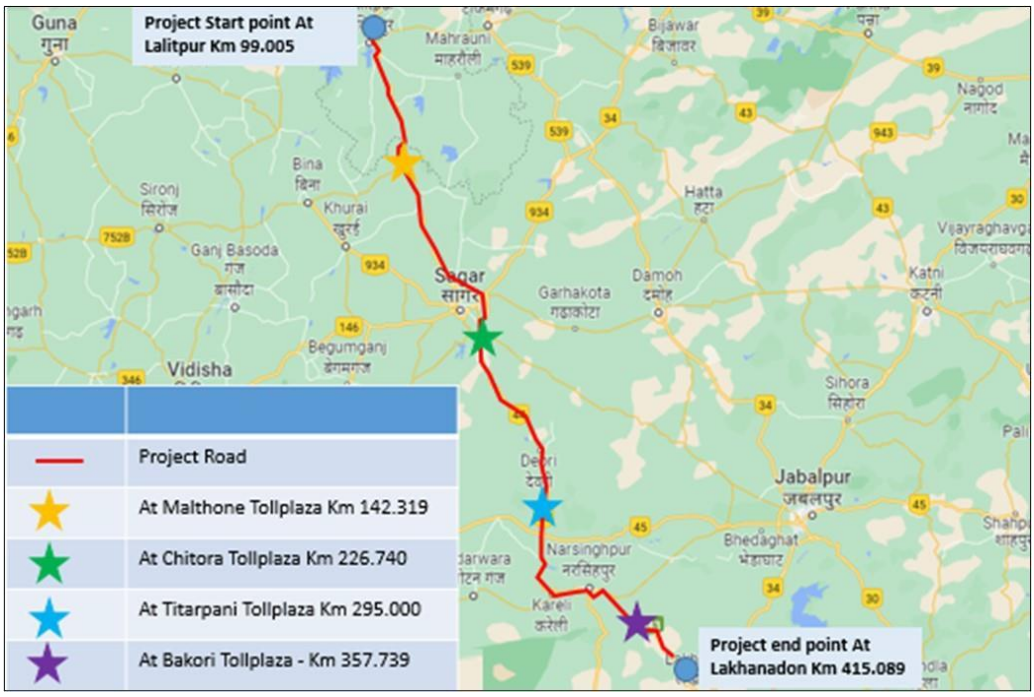

Figure 1-1: Project Stretch of TOT Bundle 12

1.2 Objective of the Study

M/s IRB Infrastructure Developers Limited (IRB) intends to develop a traffic study report for Four Laning of Lalitpur-Sagar- Lakhnadon from Km 99.00 to Km 415.089 section of NH-44 on BOT basis. GMD Consultants have been assigned the work of conducting traffic study and developing revenue model based on traffic projections and forecasts.

The year 2025-26 has been taken as the base year for projections and forecasting of traffic in the horizon year. This report fulfils part of the requirements of the assignment.

1.3 Scope of Services

The following may be referred to as broad scope of Traffic Study of Four Laning of Lalitpur-Sagar- Lakhnadon from Km 99.00 to Km 415.089 section of NH-44.

- Classified Traffic Volume Count at main toll plaza location at Toll Plaza locations. This data was supplied by the Concessionaire.
- Establishment of traffic pattern
- Working our traffic demand elasticity and growth
- Traffic forecast up to concession period.
- Preparation of revenue model up to concession period
- Any other analysis relevant to scope

CHAPTER 2

PROJECT DETAILS

2.1 Project Corridor

The project stretch is a section of NH-44, which is the longest National Highway in the country, running through North, Central and South India. It starts from Jammu & Kashmir and passes through the states of Punjab, Haryana, Delhi, Uttar Pradesh, Rajasthan, Madhya Pradesh, Maharashtra, Telangana, Andhra Pradesh, Karnataka and Tamil Nadu.

Project Stretch Description

The project stretch under this study starts from km 99.005 of NH-44 at Lalitpur in the state of Uttar Pradesh and ends at km 415.089 of NH-44 at Lakhnadon in the state of Madhya Pradesh. The length of project stretch is 316.084 km and has 4-lane configuration with four number of Toll Plazas (Malthone at ch.142+319, Chitora at Ch. 226+740, Titarpani at 295+000 and Bakori (Bachai at ch.357+739).

The following figure shows the alignment of the project highway in the above context.

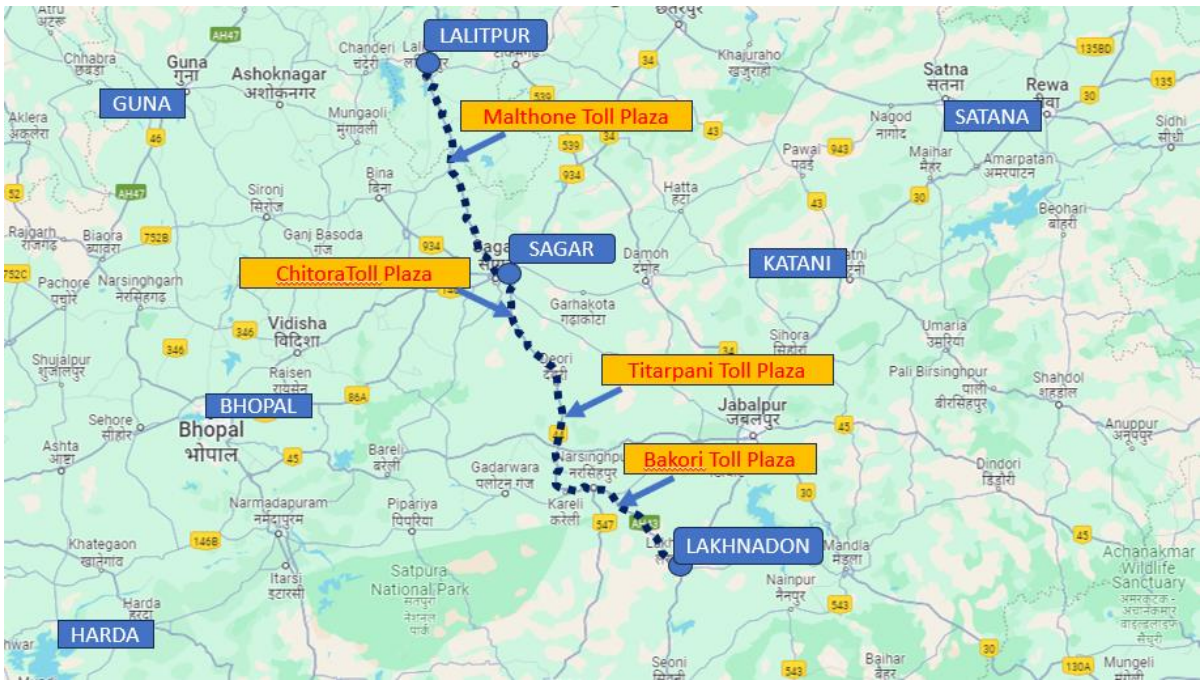

Figure 2-1 : Project Alignment with Toll Plaza

CHAPTER 3

TRAFFIC SURVEYS AND ANALYSIS

3.1 Traffic Surveys

The Consultants have collected the required information for project corridor to understand the general traffic and travel characteristics on the corridor.

The following traffic data has been collected from a client for a project.

- Classified traffic volume counts at toll plaza locations on Lalitpur – Sagar - Lakhnadon section of NH-44- Provided by Concessionaire for year 2025-26 and Annual traffic data from April 2025 to February 2026.
- Local Component of traffic
- Component of Return Journey
- Component of Monthly Pass Journey

The main objective of the traffic data analysis is to:

- Determine the existing traffic movement characteristics of the project
- Establish base year traffic
- Identification of travel patterns and modal split of project traffic
- Deriving growth factors for traffic forecasting
- Estimation of corridor traffic including traffic diversion if any
- Preparation of revenue model and projection of revenue as per toll policy for various scenarios

Table 3-1 below lists provides details of locations from where traffic details have been collected.

Table 3-1 : Traffic Data Details

SR. NO	LOCATION	CTV	Single Journey Traffic	Daily Return Journey	Monthly Pass	Local Pass
1	**Km 142.319 Toll Plaza at Malthone**	AADT from previous traffic study report for year 2024-25 & Eleven months from April 2025 to February 2026	AADT from previous traffic study report for year 2024-25 & Eleven months from April 2025 to February 2026	AADT from previous traffic study report for year 2024-25 & Eleven months from April 2025 to February 2026	AADT from previous traffic study report for year 2024-25 & Eleven months from April 2025 to February 2026	AADT from previous traffic study report for year 2024-25 & Eleven months from April 2025 to February 2026
2	**Km 226.740 Toll Plaza at Chitora**	AADT from previous traffic study report for year 2024-25 & Eleven months from April 2025 to February 2026	AADT from previous traffic study report for year 2024-25 & Eleven months from April 2025 to February 2026	AADT from previous traffic study report for year 2024-25 & Eleven months from April 2025 to February 2026	AADT from previous traffic study report for year 2024-25 & Eleven months from April 2025 to February 2026	AADT from previous traffic study report for year 2024-25 & Eleven months from April 2025 to February 2026
3	**Km 295.000 Toll Plaza at Titarpani**	AADT from previous traffic study report for year 2024-25 & Eleven months from April 2025 to February 2026	AADT from previous traffic study report for year 2024-25 & Eleven months from April 2025 to February 2026	AADT from previous traffic study report for year 2024-25 Eleven months from April 2025 to February 2026	AADT from previous traffic study report for year 2024-25 & Eleven months from April 2025 to February 2026	AADT from previous traffic study report for year 2024-25 & Eleven months from April 2025 to February 2026
4	**Km 357.739 Toll Plaza at Bakori**	AADT from previous traffic study report for year 2024-25 & Eleven months from April 2025 to February 2026	AADT from previous traffic study report for year 2024-25 & Eleven months from April 2025 to February 2026	AADT from previous traffic study report for year 2024-25 & Eleven months from April 2025 to February 2026	AADT from previous traffic study report for year 2024-25 & Eleven months from April 2025 to February 2026	AADT from previous traffic study report for year 2024-25 & Eleven months from April 2025 to February 2026

All toll plazas are located in Madhya Pradesh.

3.2 Classified Traffic Volume

The objective of conducting a Classified Traffic Volume Count is to understand the traffic flow pattern including modal split on a roadway. The Classified Traffic Volume Count survey has been provided by the concessionaire of project highway from actual traffic data gathered at toll plaza locations-based traffic survey done at project stretch.

The vehicles can broadly be classified into fast moving / motorized and slow moving / non-motorized vehicles, which can be further classified into specific categories of vehicles. The groupings of vehicles are further segregated to capture the tollable vehicle categories specifically and toll exempted vehicles are counted separately. The detailed vehicle classification system as per IRC: 64-1990 is given in table below .

Table 3-2 : Vehicle Classification System

Vehicle Type	
Auto Rickshaw	
Passenger Car	Car, Jeep, Taxi & Van (Old / new technology)
Bus	Minibus
	Standard Bus
Truck	Light Goods Vehicle (LCV)
	2 – Axle Truck
	3 Axle Truck (HCV)
	Multi Axle Truck (4-6 Axle)
	Oversized Vehicles (7 or more axles)
Other Vehicles	Agriculture Tractor, Tractor & Trailer

Source - IRC: 64 – 1990

However, since the project highway is currently under toll operation, the data collected corresponds to the category of tollable vehicles. The following are the types of vehicles as per concession agreement.

- Car / Jeep / van
- Minibus /LCV
- Bus
- Truck /
- 3 Axle commercial vehicle
- Multi Axle

3.3 Traffic Characteristic

Toll revenue of project highway does not solely depend on traffic volume. There are certain characteristics of traffic which have substantial potential to affect toll collection. Component of local traffic, component of passenger and commercial traffic, portion of return journey traffic, % of monthly pass traffic are some of such characteristics of traffic. These will be discussed in subsequent sections of report.

3.3.1 Traffic Data

Project concessionaire has provided Traffic data for the year 2025- 26 & traffic data from April 2025 to February 2026.

Since the traffic data available for this update is for only Annual, from April 2025 to February 2026 it may not represent the whole year traffic. Hence a seasonality factor for balance part of year has been applied to average traffic of the current eleven months to arrive at Annual Average Daily Traffic of base year 2025-26. Thus, corrected traffic is used for future projections and revenue calculations. The following table shows historical traffic on project stretch and derived Annual Average Daily Traffic (AADT) for year 2025-26.

Table 3-3 : Traffic Data at Malthone Toll Plaza at Km 142.319

Sr. No	Type of Vehicle	Annual Average Daily Traffic (Nos.) 2024-25	Annual Average Daily Traffic (Nos.) 2025-26
1	Car	1346	1579
2	Minibus /LCV	276	301
3	Bus	113	115
4	Truck	1295	1479
5	3-Axle Commercial vehicle	1299	1404
6	Multi axle	1587	1623
7	Oversize Vehicle	4	6
	Total	**5920**	**6507**

Table 3-4 : Traffic Data at Chitora Toll Plaza at Km 226.740

Sr. No	Type of Vehicle	Annual Average Daily Traffic (Nos.) 2024-25	Annual Average Daily Traffic (Nos.) 2025-26
1	Car	1401	1721
2	Minibus /LCV	400	427
3	Bus	100	106
4	Truck	1420	1607
5	3-Axle Commercial vehicle	1365	1453
6	Multi axle	1794	1805
7	Oversize Vehicle	5	6
	Total	**6485**	**7124**

Table 3-5 : Traffic Data at Titarpani Toll Plaza at Km 295.000

Sr. No	Type of Vehicle	Annual Average Daily Traffic (Nos.) 2024-25	Annual Average Daily Traffic (Nos.) 2025-26
1	Car	1487	1940
2	Minibus /LCV	367	392
3	Bus	108	109
4	Truck	1450	1614
5	3-Axle Commercial vehicle	1414	1454
6	Multi axle	1946	1907
7	Oversize Vehicle	6	5
	Total	**6778**	**7422**

Table 3-6 : Traffic Data at Bakori Toll Plaza at Km 357.739

Sr. No	Type of Vehicle	Annual Average Daily Traffic (Nos.) 2024-25	Annual Average Daily Traffic (Nos.) 2025-26
1	Car	851	947
2	Minibus /LCV	319	319
3	Bus	87	89
4	Truck	1272	1443
5	3-Axle Commercial vehicle	1232	1300
6	Multi axle	1609	1568
7	Oversize Vehicle	7	7
	Total	**5377**	**5674**

3.4 Data Analysis

3.4.1 Analysis of Traffic Volume Count

Understanding the character of existing traffic forms the basis of the traffic forecast. The various vehicle types having different sizes and characteristics can be converted into a single unit called Passenger Car Unit (PCU). Passenger Car equivalents for various vehicles are adopted based on recommendations of Indian Road Congress prescribed in "IRC-64-1990: Guidelines for Capacity of Roads in Rural areas". The adopted passenger car unit values (PCU) are presented in Table 3-7.

Table 3-7 : PCU Factors Adopted for Study

Vehicle Type	PCUs
Car	1.0
Minibus	1.5
Standard Bus	3.0
LCV/LGV	1.5

Vehicle Type	PCUs
2 Axle Truck	3.0
3 – 6 Axle Truck	4.5
MAV	4.5
Auto Rickshaw	1.0
Van/Tempo	1.0
Agriculture Tractor with Trailer	4.5
Agriculture Tractor without Trailer	1.5

Source: IRC: 64-1990

Traffic volume at each toll plaza was converted to PCU and same is presented as under

Table 3-8 : Traffic in PCU at Project Stretch

Year	Toll Plaza Location (Km)	Traffic No	PCU	PCU Index
2024 – 2025	Km 142.319 Toll Plaza at Malthone	5920	17041	2.88
	Km 226.740 Toll Plaza at Chitora	6485	18752	2.89
	Km 295.000 Toll Plaza at Titarpani	6778	19736	2.91
	Km 357.739 Toll Plaza at Bakori	5377	16375	3.05
2025 – 2026	Km 142.319 Toll Plaza at Malthone	6507	18357	2.82
	Km 226.740 Toll Plaza at Chitora	7124	20009	2.81
	Km 295.000 Toll Plaza at Titarpani	7422	20666	2.78
	Km 357.739 Toll Plaza at Bakori	5674	17012	3.00

It can be observed from above that project traffic has PCU index 2.5 to 3.5 which is an indicator of high proportion of commercial traffic in traffic mix in project corridors. The following figure illustrates variation of PCU index at four toll plaza locations.

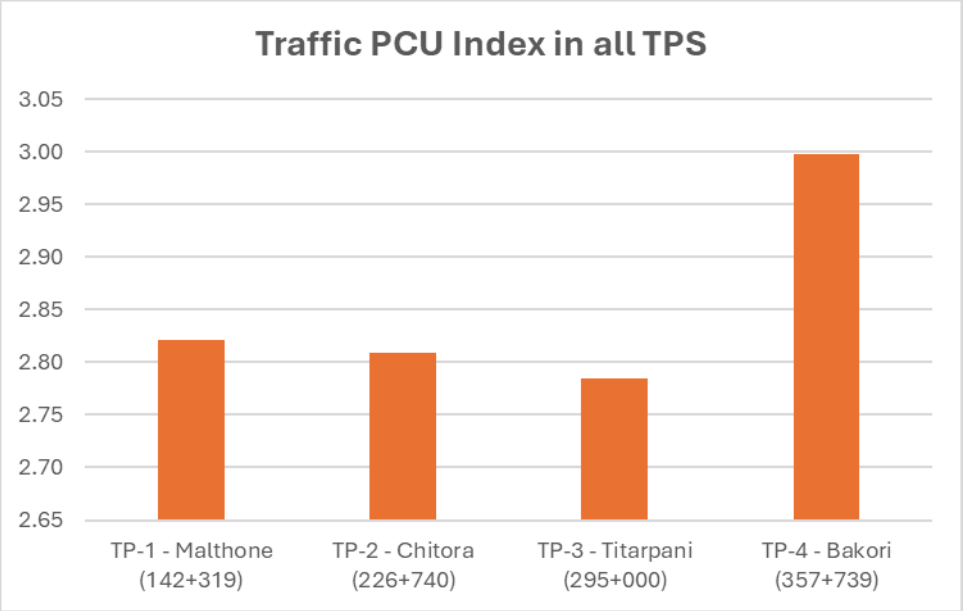

Figure 3-1 : Comparison of PCU Index

3.4.2 Components of Traffic

As discussed previously, components of traffic volume play an important role in determining project revenue. A larger component of commercial traffic with higher axle configuration adds to project revenue positively. Similarly, a larger component of local traffic affects the project revenue potential negatively.

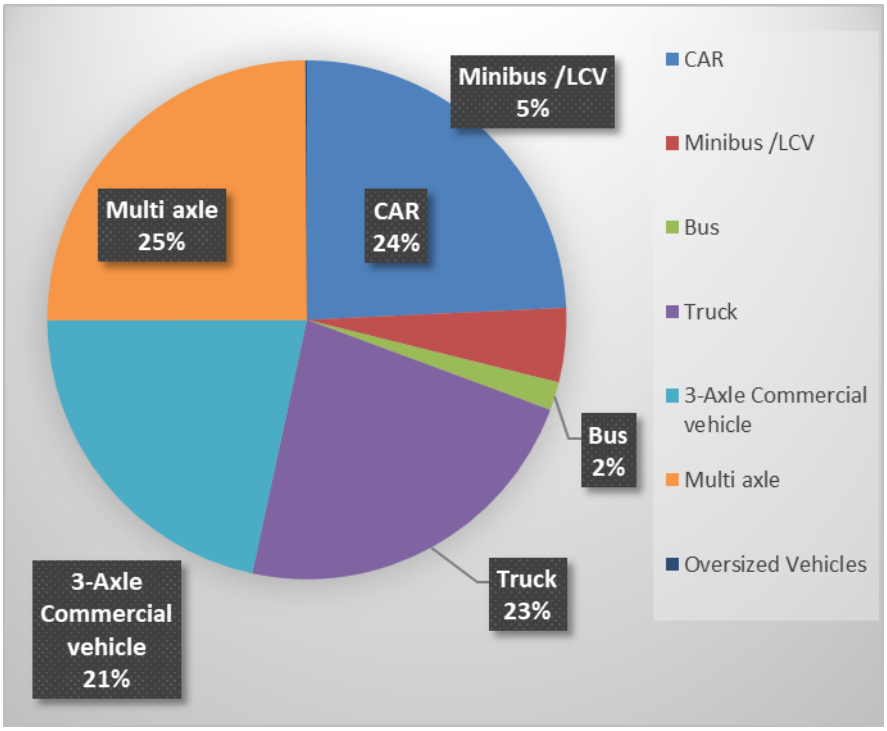

Figure 3-2: Model split of tollable vehicle @ Km 142.319

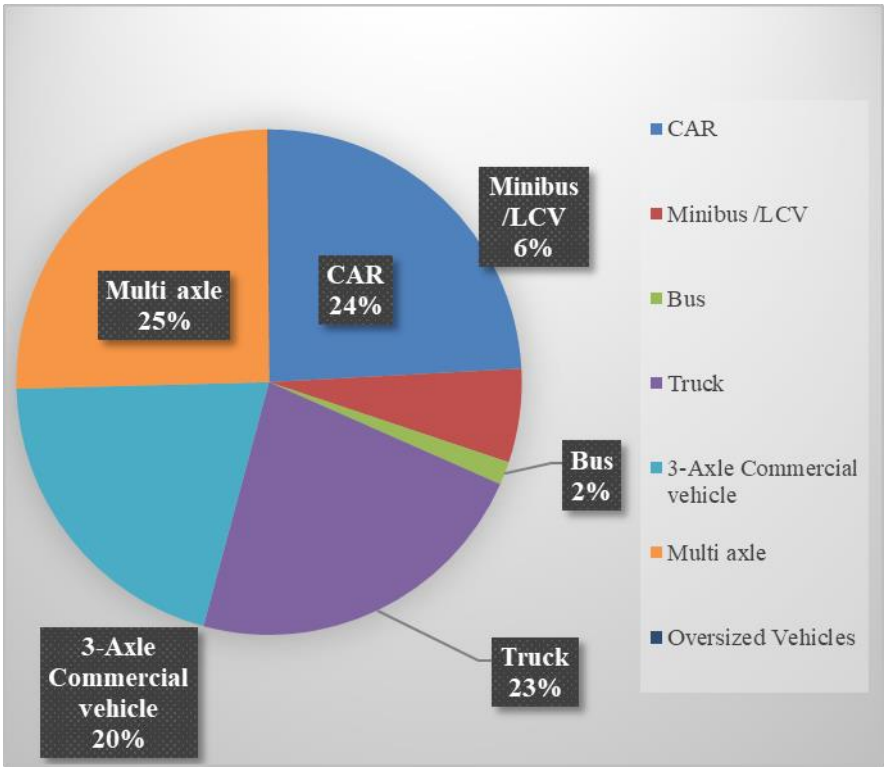

Figure 3-3: Model split of tollable vehicle @ Km 226.740

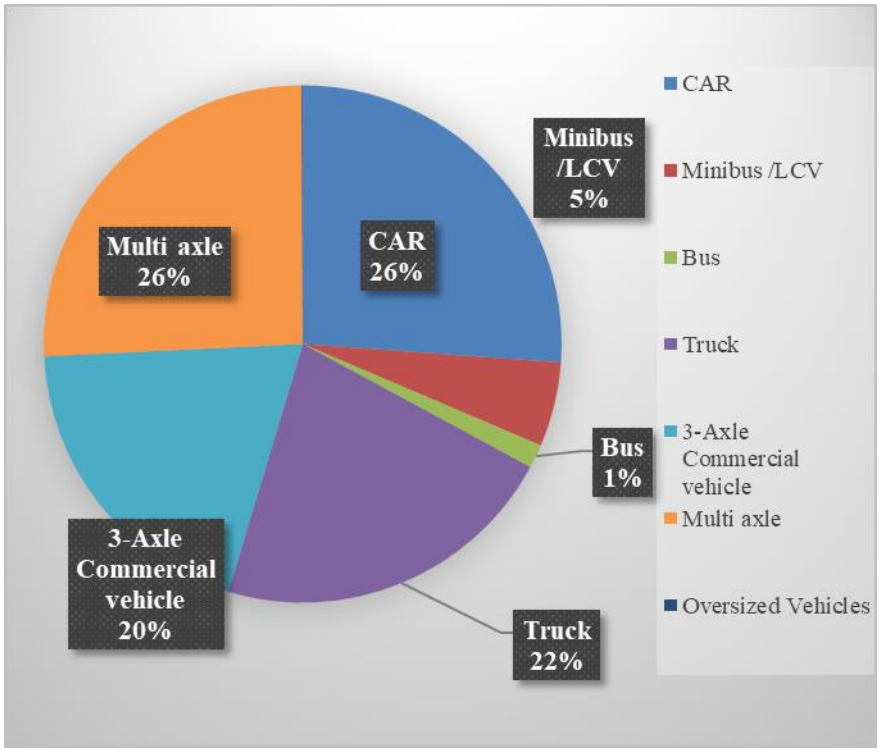

Figure 3-4: Model split of tollable vehicle @ Km 295.000

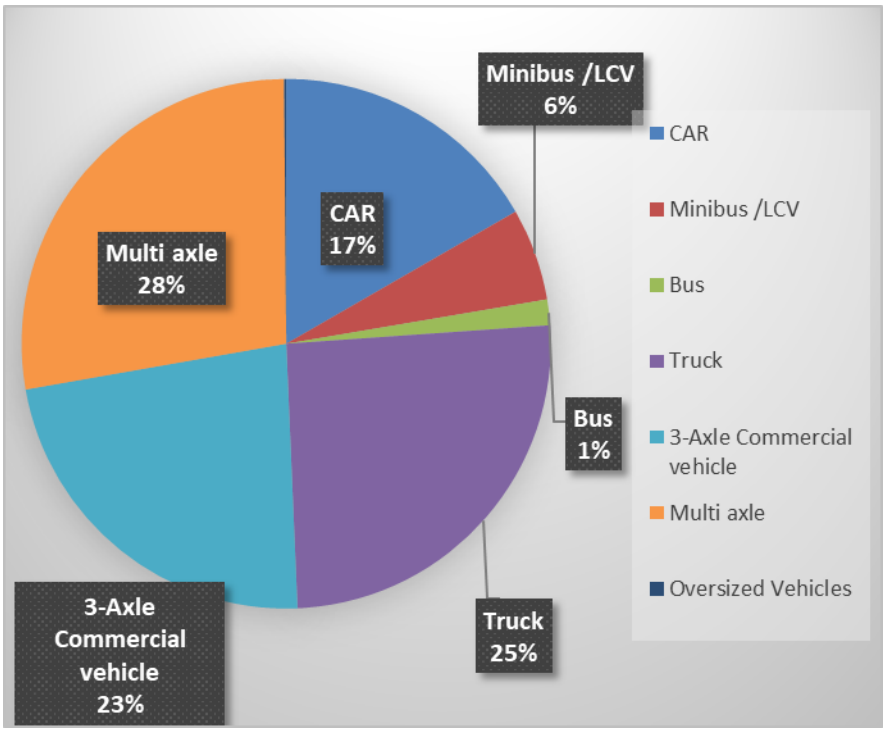

Figure 3-5: Model split of tollable vehicle @ Km 357+739

It is observed that car traffic forms about 24% of total traffic at toll plaza location KM 142.319 while multi axle commercial vehicles are about 46% of total traffic. Truck / Bus and LCV share about 25% and 5% of traffic volume respectively.

It is observed that car traffic forms about 24% of total traffic at toll plaza location KM 226.740 while multi axle commercial vehicles are about 45% of total traffic. Truck / Bus and LCV share about 25% and 6% of traffic volume respectively.

It is observed that car traffic forms about 26% of total traffic at toll plaza location KM 295.000 while multi axle commercial vehicles are about 46% of total traffic. Truck / Bus and LCV share about 23% and 5% of traffic volume respectively.

It is observed that car traffic forms about 17% of total traffic at toll plaza location KM 357.739 while multi axle commercial vehicles are about 51% of total traffic. Truck / Bus and LCV share about 26% and 6% of traffic volume respectively.

Another important bifurcation of traffic is components of traffic with respect to various type of toll ticketing like

1. Single Journey
2. Multi Journey
3. Local Commercial Single Journey
4. Monthly Pass Local
5. Monthly Pass
6. Annual Pass Car

The following table provides numbers of vehicles falling in each of above category on base year 2025-26

Table 3-9 : Journey Type Bifurcation of Traffic at Malthone Toll Plaza KM 142.319

Sr. No	Type	Traffic Volume (Nos.)
		2025-26
1	Single Journey	5504
2	Return Journey	569
3	Local Commercial Single Journey	35
4	Monthly Pass Local	5
5	Monthly Pass	0
6	Annual Pass Car	395

Table 3-10 : Journey Type Bifurcation of Traffic at Chitora Toll Plaza KM 226.740

Sr. No	Type	Traffic Volume (Nos.)
		2025-26
1	Single Journey	5620
2	Return Journey	796
3	Local Commercial Single Journey	204
4	Monthly Pass Local	26
5	Monthly Pass	0
6	Annual Pass Car	479

Table 3-11 : Journey Type Bifurcation of Traffic at Titarpani Toll Plaza KM 295.000

Sr. No	Type	Traffic Volume (Nos.)
		2025-26
1	Single Journey	5776
2	Return Journey	1058
3	Local Commercial Single Journey	143
4	Monthly Pass Local	5
5	Monthly Pass	0
6	Annual Pass Car	440

Table 3-12 : Journey Type Bifurcation of Traffic at Bakori Toll Plaza KM 357.739

Sr. No	Type	Traffic Volume (Nos.)
		2025-26
1	Single Journey	5025
2	Return Journey	368
3	Local Commercial Single Journey	55
4	Monthly Pass Local	9
5	Monthly Pass	0
6	Annual Pass Car	217

3.5 Secondary Data Collection

There are several other factors which have a substantial impact on traffic patterns and growth on any project corridor. The following are some of such important factors.

- Industrial development around project corridor and its catchment
- Educational infrastructure along project corridor
- Demographic pattern
- Urban area development
- Tourism potential
- Upcoming major infrastructural or Industrial projects
- Special Industry in project corridor
- Overall trends of economic growth local as well as national / regional

Hence in addition to traffic details on the project site, secondary data was also collected from various other sources. Typical secondary data includes the following:

1. Vehicle registration data of regional and national level.
2. Economic Data
   a) GDP
   b) NSDP
   c) Population Growth
   d) Per Capita Income growth
   e) Industrial Growth
   f) Special Industry Potential
   g) Regional and National development vision / plan
   h) Any other relevant data
3. Competing road network

We have collected and utilized such underlying data in the study to estimate the growth and risk factors for traffic along the project corridor. Same is discussed in subsequent chapters.

CHAPTER 4

INFLUENCE ZONE TRANSPORT NETWORK ANALYSIS

4.1 Introduction

Highway corridors behave like integrated circuit networks and more often than not every road is connected to various networks having different origins and destinations. Traffic running on these networks behaves like fluid and flow on network on alignment of least friction.

The following Factors can be considered as major contributors to friction on transportation networks.

- Travel Speed / Travel Time
- Geometric deficiencies like blind horizontal curves and steep vertical gradients etc.
- Configuration of road
- Riding quality
- Traffic delays,
- Length of road,
- Passing through built up or Urban Area,
- Terrain,
- Facilities,

4.2 Regional Network

Project road is in existence for long and traffic is almost settled. However, there are a few upcoming corridors which may have interest in project road catchments. These are discussed below.

Delhi – Mumbai Expressway - The access controlled greenfield expressway connects Delhi and Mumbai (up to Jawaharlal Nehru Port Trust) and passes through states of Haryana, Rajasthan, Madhya Pradesh, Gujarat and Maharashtra. DME alignment will largely cater to traffic between North of India and Gujarat/Western Maharashtra and is not likely to affect traffic on the project road which caters to traffic on NH-44 which is north south highway. Hence it is not likely to impact project road traffic.

Surat – Chennai Expressway - The alignment will largely cater to traffic between states of Gujarat and Central Maharashtra /Andhra Pradesh/ Telangana/Karnataka/Tamilnadu and is not parallel to Project Road. Therefore, it is not likely to affect traffic on the project road.

Pune – Bangalore Expressway – Entire catchment of this proposed expressway falls south of project road. It is not likely to affect the project road traffic.

All other major highways in the region exist and traffic is settled in the region. On the local level also, there is no formidable competing route network. Hence it is not envisaged that there will be any major impact on project road traffic in the near future due to regional or local network developments.

CHAPTER 5

GROWTH OF TRAFFIC ON PROJECT HIGHWAY

5.1 Introduction

Traffic growth is a function of the interplay of a number of contributory factors such as National economy, Government policy, socio-economic conditions of the people, and changes in land uses along the project corridor precincts etc. As these factors have a number of uncertainties associated with them, forecasts of traffic are dependent on the projections of other factors such as population, gross domestic product (GDP), vehicle ownership, per capita income (PCI), agricultural output, fuel consumption etc. Future patterns of change in these factors can be estimated with only a reasonable degree of accuracy and hence the resultant traffic forecast levels may not be precise.

Traffic growth forecast for project corridor of Lalitpur-Sagar- Lakhnadon from Km 99.00 to Km 415.089 section of NH-44 has been done taking the above factors into consideration. "**IRC: 108-2015-Guidelines for Traffic Prediction on Rural Highways**" is established best practice and has been used for traffic growth forecast.

5.2 Trend Analysis

One of the methods of estimation of future rate of growth is to assume the same rate of growth as in the past. Although such a method is more suitable for projects of short durations say 5-10 years, however for long term projections it would be erroneous to assume that the past rate of growth will continue to prevail for a long time in future. Economic conditions, which are major influencing factors, are bound to change over a long period of time. Thus, it would be necessary to modify the past trends of growth suitably.

Elasticity model of growth projection is one of the most widely acceptable methods for traffic forecast. The same is recommended in **IRC: 108-12015-Guidelines for Traffic Prediction on Rural Highways**.

In this method the past trend of vehicular data is paired with an economic indicator and a regression analysis is done to yield the economic model of growth. Growth of vehicle traffic varies for different types of vehicles. It is a proven fact that the growth pattern for passengers and goods vehicle is different. Traffic growth on any highway typically depends on a number of economic parameters. Most important and direct parameters are given as under

- Per Capita Income
- Net State Domestic Product (NSDP)
- Population

It can be observed that the ownership of a car is more closely related to affordability; hence per capita is the index which closely fits the growth of car traffic among other criteria. In a similar fashion, the following can be pairs of vehicle type and independent variable for elasticity modeling of growth.

- Car / Jeep – Par Capita Income
- Bus / Minibus – Population
- Goods Vehicle – NSDP

5.3 Estimation of Traffic Demand Elasticity

Elasticity of traffic demand is defined as the rate at which traffic intensity varies due to a change in the corresponding indicator selected. Hence, In order to estimate the elasticity of traffic demand, it is necessary to establish relationship between the growth in number of given category of vehicles with the relevant economic variable considered, such as NSDP, per capita income and population growth. Latest available data for vehicle registration, per capita income, NSDP and population is used in analysis.

As per IRC: 108-1996 the model for estimating elasticity index for the project corridor is of the following form and is given as below:

$Log\ (P) = k \times Log\ (EI) + A$

Where,

P = *Number of Vehicles (Mode wise)*

EI = *Economic Indicator*

A = *Regression constant*

k = *Elasticity coefficient (Regression coefficient)*

The elasticity for car and bus (passenger vehicles) is calculated based on the Population and Per Capita Domestic Product (PCDP) and the elasticity for trucks is calculated based on the Net State Domestic Product (NSDP).

The project corridor spreads across state of Madhya Pradesh & Uttar Pradesh. Toll plazas at Malthone, Chitora, Titarpani and Bakori are in the state of Madhya Pradesh. Project traffic has share of majorly states like Madhya Pradesh, Uttar Pradesh and Rajasthan. For elasticity calculations, working data from these states also has been analysed.

Following tables and graphs depict regression and elasticity of growth model for stretch falling in Maharashtra State.

Table 5-1 : Per Capita Income Vs Car Madhya Pradesh

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth (8 Year)
2011	38497	424644	4.59	5.63		
2012	41142	493412	4.61	5.69	7%	
2013	42548	555461	4.63	5.74	3%	
2014	44027	637626	4.64	5.80	3%	
2015	47351	820391	4.68	5.91	8%	
2016	52782	869777	4.72	5.94	11%	
2017	54829	982124	4.74	5.99	4%	
2018	57401	1087124	4.76	6.04	5%	5.9%

Regression analysis of same is given in figure below

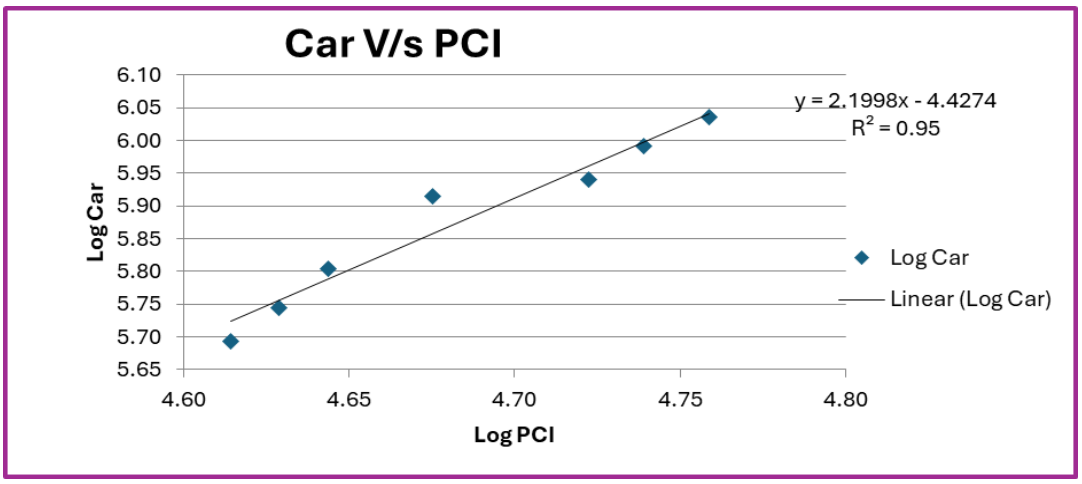

Figure 5-1 : Regression and Elasticity PCI vs. Car – Extrapolation Madhya Pradesh

Table 5-2 : Population Vs Bus Madhya Pradesh

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth (8 Year)
2011	72627000	181770	7.86	5.26		
2012	73863000	208530	7.87	5.32	2%	
2013	75099000	233569	7.88	5.37	2%	
2014	76334000	277898	7.88	5.44	2%	
2015	77570000	322227	7.89	5.51	2%	
2016	78806000	347227	7.90	5.54	2%	
2017	79948000	382227	7.90	5.58	1%	
2018	81090000	402227	7.91	5.60	1%	1.6%

Regression analysis of same is given in figure below

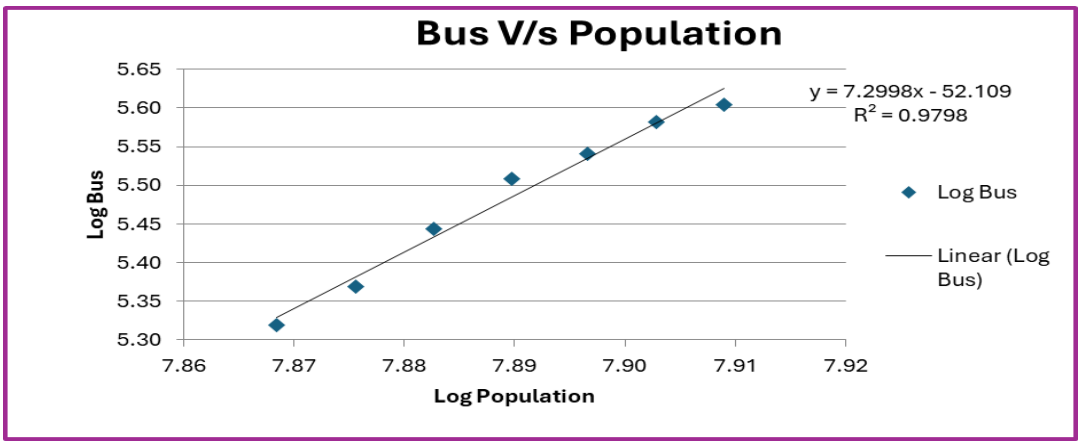

Figure 5-2 : Regression and Elasticity Population vs. Bus – Extrapolation Madhya Pradesh

Elasticity of goods traffic has been worked out by regression analysis with NSDP. Following table represents the data and details.

Table 5-3 : Trucks Traffic Vs NSDP Madhya Pradesh

Year	NSDP	Trucks	Log NDSP	Log Truck	NSDP Growth	Average Growth (8 Year)
2011	28237104	121916	7.45	5.09		
2012	30685334	131098	7.49	5.12	9%	
2013	32259760	137815	7.51	5.14	5%	
2014	33924690	150921	7.53	5.18	5%	
2015	37071567	177352	7.57	5.25	9%	
2016	41946525	233553	7.62	5.37	13%	
2017	44200243	289754	7.65	5.46	5%	
2018	46928896	326291	7.67	5.51	6%	7.6%

Following figure depict regression analysis and extrapolation.

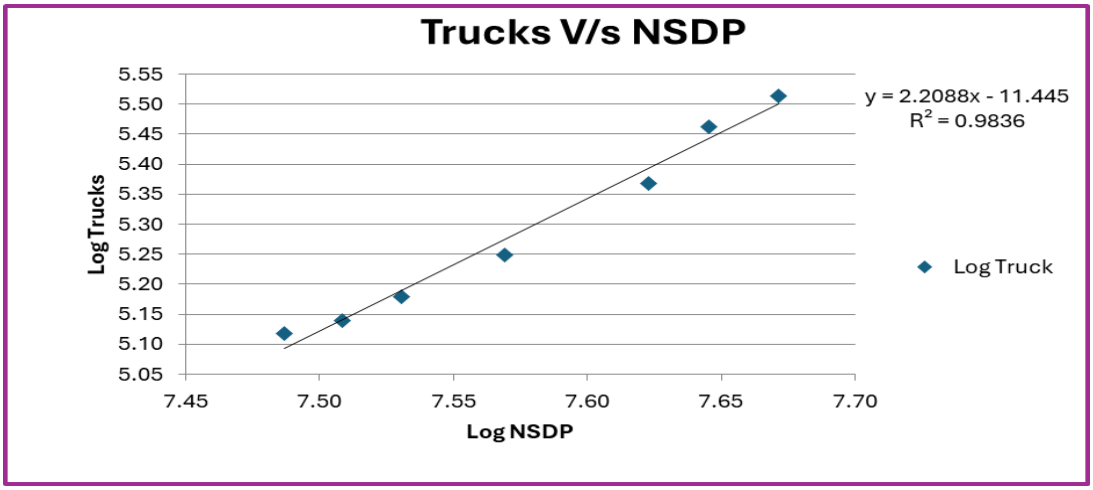

Figure 5-3 : Regression and Elasticity Trucks vs. NSDP – Extrapolation Madhya Pradesh

Using the regression analysis above, we have arrived at the elasticity of traffic demand for each class of vehicle to a given change in relevant economic indicators. Average traffic growth of a vehicle class is multiplied by the corresponding elasticity coefficient to arrive at traffic growth. R2 statistical measure of how close the data are to the fitted regression line. It varies from 0 to 1. Higher the value of R2 more representative is the regression model of data.

The results of these analyses for *the good fit* regression as reflected by R^2 values are presented in the Table below.

Table 5-4 : Summary Regression Analysis Madhya Pradesh

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average Growth (8yrs)	Growth Elastic Model	Remarks
MADHYA PRADESH	**Car/Jeep**	PCI	y = 2.2965x - - 4.8829	R^2 = 0.9634	2.3	6%	13.57%	Good Regression
	Bus	Population	y = 7.4978x - - 53.6722	R^2 = 0.9862	7.5	2%	11.90%	Good Regression
	Truck	NSDP	y = 2.2088x - - 11.4451	R^2 = 0.9694	2.2	8%	16.70%	Good Regression

Following tables and graphs depict regression and elasticity of growth model for stretch falling in Uttar Pradesh State.

Table 5-5 : Per Capita Income Vs Car Uttar Pradesh

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth (8 Year)
2011	32002	1108100	4.51	6.04		
2012	32908	1205374	4.52	6.08	3%	
2013	34044	1423020	4.53	6.15	3%	
2014	34583	1572217	4.54	6.20	2%	
2015	36973	1746117	4.57	6.24	7%	
2016	40847	2027972	4.61	6.31	10%	
2017	41832	2195783	4.62	6.34	2%	
2018	43670	2439845	4.64	6.39	4%	4.6%

Regression analysis of same is given in figure below

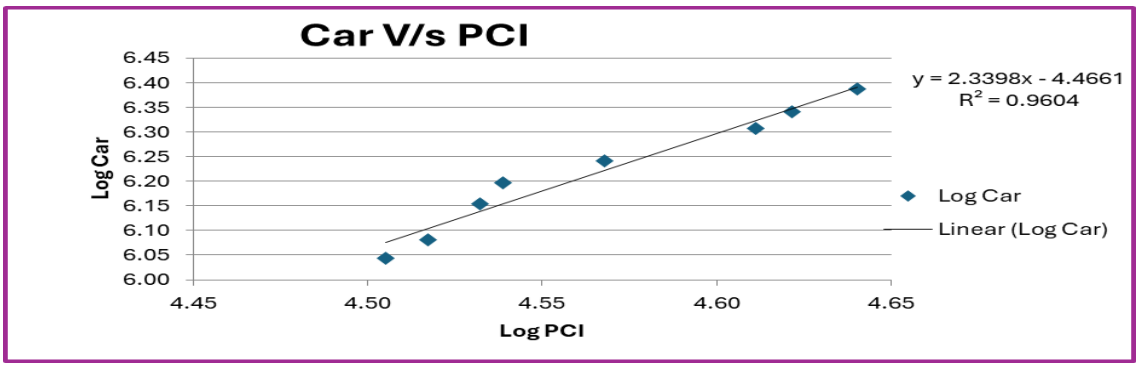

Figure 5-4 : Regression and Elasticity PCI vs. Car – Extrapolation Uttar Pradesh

Table 5-6 : Population Vs Bus Uttar Pradesh

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth (8 Year)
2011	199812000	57901	8.30	4.76		
2012	203670000	64147	8.31	4.81	2%	
2013	206322000	74389	8.31	4.87	1%	
2014	209577000	80460	8.32	4.91	2%	
2015	212832000	89127	8.33	4.95	2%	
2016	216870000	112020	8.34	5.05	2%	
2017	219510000	112766	8.34	5.05	1%	
2018	222150000	121975	8.35	5.09	1%	1.5%

Regression analysis of same is given in figure below

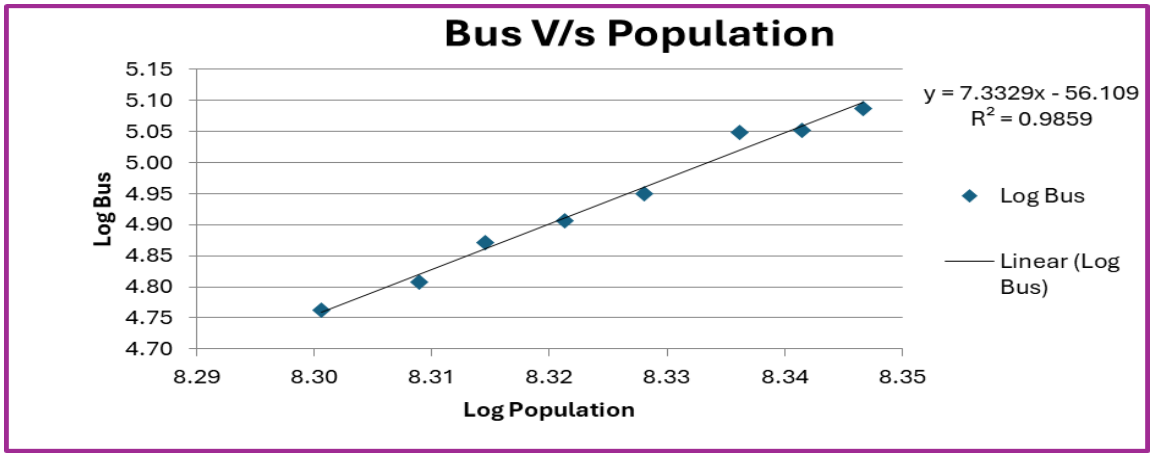

Figure 5-5 : Regression and Elasticity Population vs. Bus – Extrapolation Uttar Pradesh

Elasticity of goods traffic has been worked out by regression analysis with NSDP. Following table represents the data and details.

Table 5-7 : Trucks Traffic Vs NSDP Uttar Pradesh

Year	NSDP	Trucks	Log NDSP	Log Truck	NSDP Growth	Average Growth (8 Year)
2011	64513155	162813	7.81	5.21		
2012	67355218	186404	7.83	5.27	4%	
2013	70746910	202761	7.85	5.31	5%	
2014	72968630	217609	7.86	5.34	3%	
2015	79204874	245688	7.90	5.39	9%	
2016	88845325	265167	7.95	5.42	12%	

Year	NSDP	Trucks	Log NDSP	Log Truck	NSDP Growth	Average Growth (8 Year)
2017	92380571	307096	7.97	5.49	4%	
2018	97915937	356828	7.99	5.55	6%	6.2%

Following figure depict regression analysis and extrapolation.

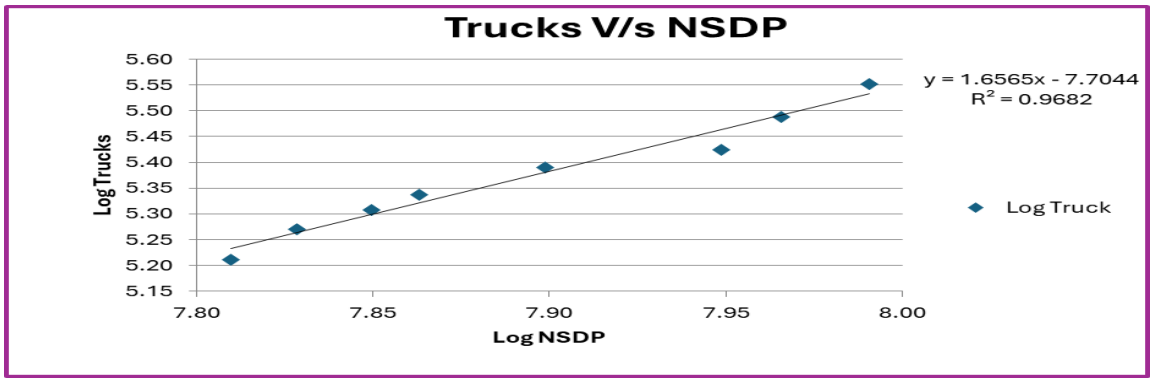

Figure 5-6 : Regression and Elasticity NSDP vs. Truck Traffic - extrapolation Uttar Pradesh.

Using the regression analysis above, we have arrived at the elasticity of traffic demand for each class of vehicle to a given change in relevant economic indicators. Average traffic growth of a vehicle class is multiplied by the corresponding elasticity coefficient to arrive at traffic growth. R2 statistical measure of how close the data are to the fitted regression line. It varies from 0 to 1. Higher the value of R2 more representative is the regression model of data.

The results of these analyses for *the good fit* regression as reflected by R^2 values are presented in the Table below

Table 5-8 : Summary Regression Analysis Uttar Pradesh

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average Growth (8yrs)	Growth Elastic Model	Remarks
UTTAR PRADESH	**Car/Jeep**	PCI	y = 2.3398x - -4.4661	R² = 0.9604	2.3398	4.58%	10.72%	Good Regression
	Bus	Population	y = 7.3329x - -56.1092	R² = 0.9859	7.3329	1.53%	11.19%	Good Regression
	Truck	NSDP	y = 1.6565x - -7.7044	R² = 0.9682	1.6565	6.18%	10.24%	Good Regression

Following tables and graphs depict regression and elasticity of growth model for stretch falling in Rajasthan State.

Table 5-9 : Per Capita Income Vs Car Rajasthan

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth (8 Year)
2011	57192	591069	4.76	5.77		
2012	58441	659542	4.77	5.82	2%	
2013	61053	733916	4.79	5.87	4%	
2014	64496	814079	4.81	5.91	6%	
2015	68565	899307	4.84	5.95	6%	
2016	71324	988391	4.85	5.99	4%	
2017	73109	1095526	4.86	6.04	3%	
2018	75555	1204005	4.88	6.08	3%	4.1%

Regression analysis of same is given in figure below

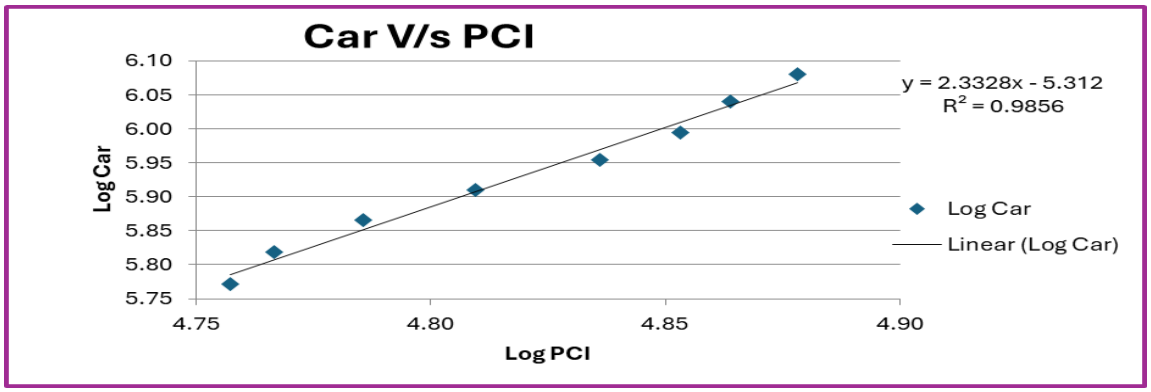

Figure 5-7 : Regression and Elasticity PCI vs. Car – Extrapolation Rajasthan

Table 5-10 : Population Vs Bus Rajasthan

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth (8 Year)
2011	68548000	83345	7.84	4.92		
2012	69687000	88616	7.84	4.95	2%	
2013	70825000	93892	7.85	4.97	2%	
2014	71963000	97650	7.86	4.99	2%	
2015	73102000	102818	7.86	5.01	2%	
2016	74240000	108680	7.87	5.04	2%	
2017	75248000	113964	7.88	5.06	1%	
2018	76256000	118301	7.88	5.07	1%	1.5%

Regression analysis of same is given in figure below

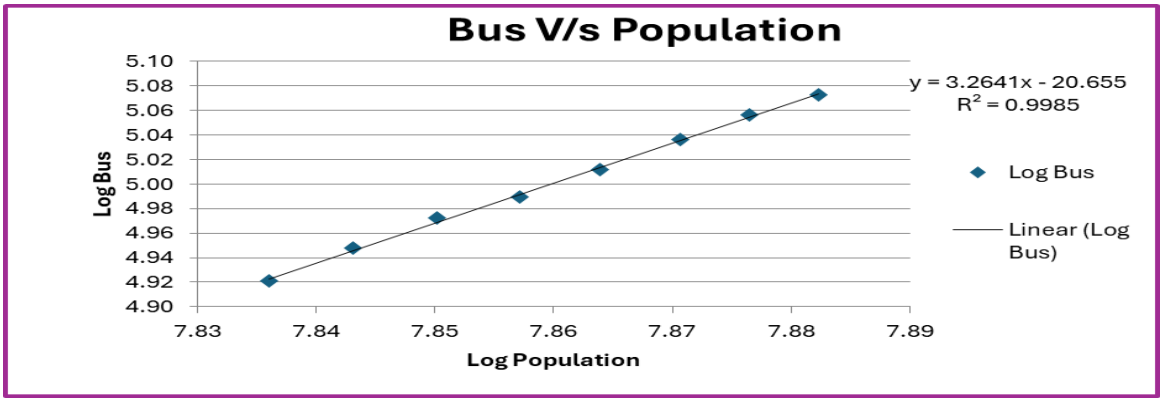

Figure 5-8 : Regression and Elasticity Population vs. Bus – Extrapolation Rajasthan

Elasticity of goods traffic has been worked out by regression analysis with NSDP. Following table represents the data and details.

Table 5-11 : Trucks Traffic Vs NSDP Rajasthan

Year	NSDP	Trucks	Log NDSP	Log Truck	NSDP Growth	Average Growth (8 Year)
2011	39533093	362028	7.60	5.56		
2012	40980249	401983	7.61	5.60	4%	
2013	43429222	434379	7.64	5.64	6%	
2014	46540773	472365	7.67	5.67	7%	
2015	50192151	517604	7.70	5.71	8%	
2016	52965038	561158	7.72	5.75	6%	
2017	55442912	613055	7.74	5.79	5%	
2018	58059438	665926	7.76	5.82	5%	5.7%

Following figure depict regression analysis and extrapolation.

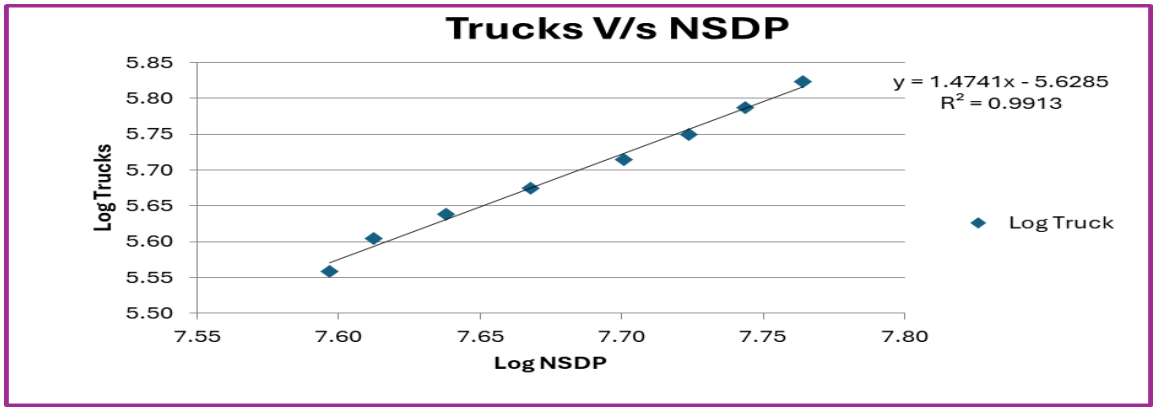

Figure 5-9 : Regression and Elasticity NSDP vs. Trucks – Extrapolation Rajasthan

Using the regression analysis above, we have arrived at the elasticity of traffic demand for each class of vehicle to a given change in relevant economic indicators. Average traffic growth of a vehicle class is multiplied by the corresponding elasticity coefficient to arrive at traffic growth. R2 statistical measure of how close the data are to the fitted regression line. It varies from 0 to 1. Higher the value of R2 more representative is the regression model of data.

The results of these analyses for *the good fit* regression as reflected by R^2 values are presented in the Table below

Table 5-12 : Summary Regression Analysis Rajasthan

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average Growth (8yrs)	Growth Elastic Model	Remarks
RAJASTHAN	**Car/Jeep**	PCI	y = 2.3328x - -5.312	R^2 = 0.9856	2.3328	4.07%	9.49%	Good Regression
	Bus	Population	y = 3.2641x - -20.6548	R^2 = 0.9985	3.2641	1.53%	5.01%	Good Regression
	Truck	NSDP	y = 1.4741x - -5.6285	R^2 = 0.9913	1.4741	5.65%	8.33%	Good Regression

Economical model for predicting growth is good tool, however other local, regional, national factors should also be considered before finalizing growth factors. Considering factors such as proposed developments and other influencing economic factors, moderated growth should be considered. These factors are discussed in subsequent sections.

5.4 Other Factors Influencing Growth

There are many factors which have an impact on traffic growth. As discussed previously these factors can be economical, social, educational, and industrial.

Potentiality of such factors for project highway is discussed as under.

ECONOMY

After witnessing a slowdown during 2011-12, the economy recovered in 2013-14, and a high growth rate of GDP was recorded up to 2018-19. Pandemic of COVID-19 impacted all economies of world including India up to year 2021-22. Following figure show trend of GDP growth in India.

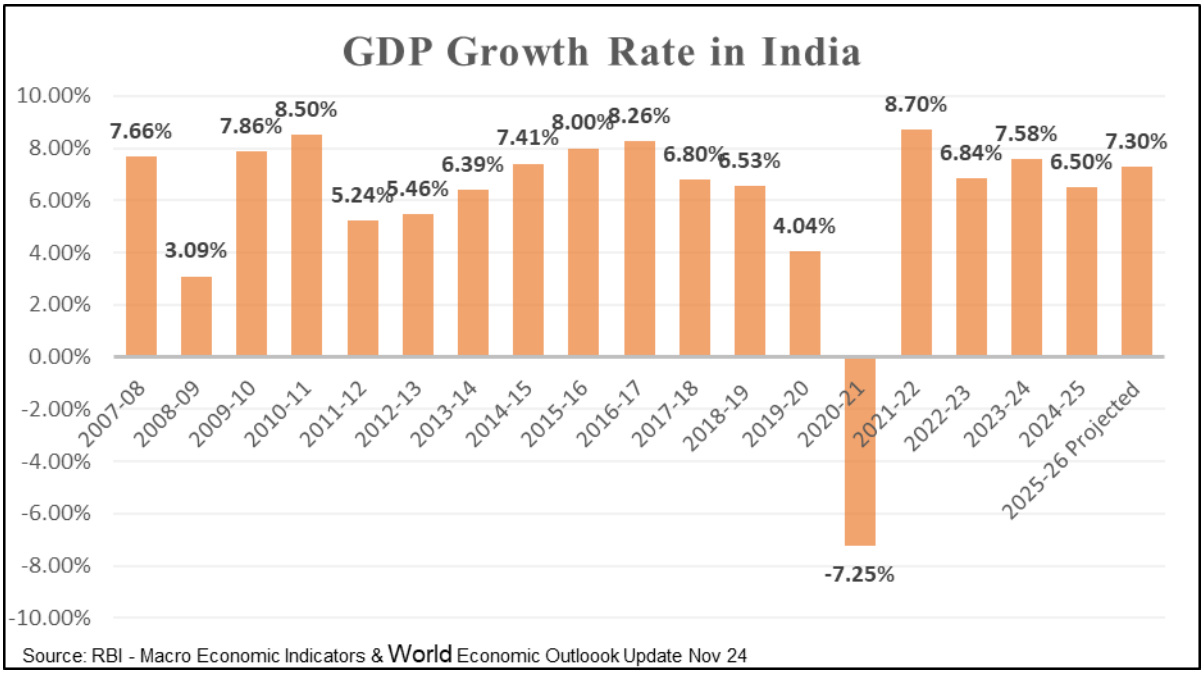

Figure 5-10 : Growth of GDP in India

FY 2017-18 recorded a growth of 6.7% which had a slight impact of GST and demonetization. Indian economy appears on recovery path with estimated growth of 6.8% in FY 2018-19. The government took major policy decisions including tax infrastructure reforming, banking sector improvement and ease of doing business.

In post COVID-19 scenario, in year 2022-23 and 2023-24 India registered an impressive growth of 7% to 7.5%. In last year despite global slow down due to Russia-Ukraine war and Gaza crises, India grew at good rate of 7%(Estimated).
Indian economy is now on good growth path and all major institutions including IMF / ADB have estimated growth of Indian Economy to peg around 6.5% to 7% in coming years.

5.5 Developments along and around the Project Corridor & State

MADHYA PRADESH: Madhya Pradesh state, which is located in central India is bound on the north by Uttar Pradesh, on the east by Chhattisgarh, on the south by Maharashtra, and on the west by Gujarat and Rajasthan. It is the second largest Indian state and one of the fastest growing states in the country. At current prices, the Gross State Domestic Product (GSDP) of Madhya Pradesh is estimated at Rs.1,151,049 crore trillion (US$ 150.74 billion) in 2022-23, registering an annual growth of 10% over FY21. Between 2015-16 and 2021-22, The GSDP increased at a CAGR (in Rs.) of 13.09% from 2015-16 to 2021-22. Net State Domestic Product (NSDP) of Madhya Pradesh was about Rs. 8.27 trillion (US$ 113.94 billion) in 2020-21. Between 2015-16 and 2020-21, state's NSDP grew at a CAGR of around 11.22%

UTTAR PRADESH: The state has an area of 240,928 sq kms and is the most populous state in India, with population of 199.8 million as per 2011 census with an average population density of 828 persons per sq. km. The economy of Uttar Pradesh is the third largest of all the states in India. Nominal GDP of the state for the year 2022-23 is Rs. 21.74 trillion.

It is reported that the economy of Uttar Pradesh is growing at a faster rate than the national economy at about 9%. In terms of traffic and transportation as well Uttar Pradesh is one of the leader states in India now.

- Air Connectivity: Major national & international airports connecting the rest of India, Middle East & Southeast Asian countries; Only state to have 05 International Airports (03 existing & 02 upcoming at Jewar (G. Noida & Ayodhya)
- Railway Network: Largest railway network in the country spanning over 8,949 km; 05 Railway Zones
- Inland Waterway: India's 1st Inland Waterway is operational in UP (1100 km Haldia - Varanasi tract
- Expressways: Uttar Pradesh boasts state-of-art expressways ensuring seamless connectivity; 13 Expressways (existing & upcoming)
- Road Network: Largest Road Network in India; 4 Lakh Km Total Road Length 11,737 Km Total National Highway

Logistics hubs emerging across UP: MMLH Dadri, MMTH Boraki, MMT Varanasi etc.

From the above it can be expected that the project corridor would serve as one of the important transportation links in the area and would contribute to the growth of the region.

5.6 Recommended Growth Rates of Traffic

Based on the above analysis and after giving due consideration to the entire listed factors, the following overall growth rates are recommended for each category of vehicle as under. Rate of growth is moderated in light of overall regional trend. Growth of Multi-Axle is kept slightly higher as trend of technological advances in logistic industry Favors multi-axle over 2/3 axle carriage. It is also expected that as the economy moves from developing to developed, rate of growth diminishes. Same growth rate is not sustainable for long. Traffic growth has been suitably stepped down for future years.

Growth rates are recommended for three scenarios for sensitivity analysis namely **Optimistic, Pessimistic** and **Most Likely** with a positive and negative variation 0.25% from Most Likely case for corridor in both states.

5.6.1 Recommended Growth Rates of Traffic for Madhya Pradesh Part of Stretch

Table 5-13 : Recommended Growth Rates Optimistic

Category / Year	FY 2027-2029	FY 2030-2034	FY 2035-2039	FY 2040-2045	FY 2046-2050
Car/Jeep/Van	6.64%	5.57%	5.25%	5.03%	4.41%
LCV	4.92%	4.05%	2.38%	2.01%	2.86%
Minibus	4.18%	3.53%	2.95%	2.68%	2.43%
Bus	4.18%	3.53%	2.95%	2.68%	2.43%
2- Axle	4.92%	4.64%	3.27%	2.75%	2.47%
3 - Axle	4.92%	4.64%	3.27%	2.75%	2.47%
4 to 6 Axle	4.53%	4.34%	3.09%	2.60%	2.34%
7 and Above Axle	4.53%	4.34%	3.09%	2.60%	2.34%

Table 5-14 : Recommended Growth Rates Pessimistic

Category / Year	FY 2027-2029	FY 2030-2034	FY 2035-2039	FY 2040-2045	FY 2046-2050
Car/Jeep/Van	6.14%	5.07%	4.75%	4.53%	3.91%
LCV	4.42%	3.55%	1.88%	1.51%	2.36%
Minibus	3.68%	3.03%	2.45%	2.18%	1.93%
Bus	3.68%	3.03%	2.45%	2.18%	1.93%
2- Axle	4.42%	4.14%	2.77%	2.25%	1.97%
3 - Axle	4.42%	4.14%	2.77%	2.25%	1.97%
4 to 6 Axle	4.03%	3.84%	2.59%	2.10%	1.84%
7 and Above Axle	4.03%	3.84%	2.59%	2.10%	1.84%

Table 5-15 : Recommended Growth Rates Most Likely

Category / Year	FY 2027-2029	FY 2030-2034	FY 2035-2039	FY 2040-2045	FY 2046-2050
Car/Jeep/Van	6.39%	5.32%	5.00%	4.78%	4.16%
LCV	4.67%	3.80%	2.13%	1.76%	2.61%
Minibus	3.93%	3.28%	2.70%	2.43%	2.18%
Bus	3.93%	3.28%	2.70%	2.43%	2.18%
2- Axle	4.67%	4.39%	3.02%	2.50%	2.22%
3 - Axle	4.67%	4.39%	3.02%	2.50%	2.22%
4 to 6 Axle	4.28%	4.09%	2.84%	2.35%	2.09%
7 and Above Axle	4.28%	4.09%	2.84%	2.35%	2.09%

Traffic and revenue have been worked out on the basis of the above growth, and some are presented in subsequent chapters of the report.

CHAPTER 6

TRAFFIC FORECAST

6.1 Traffic Projections

Growth rates recommended in the previous section of the report are used to arrive at traffic projections for future years. Toll plaza wise futuristic traffic projection is given in tables below.

These projections have been done for the following three cases of growth up to concession period.

1. Optimistic Scenario
2. Pessimistic Scenario
3. Most Likely Scenario

Table 6-1 : Total Tollable Traffic @ Toll Plaza 1- Chainage 142.319 KM (Optimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	1683	316	120	1551	1473	1697	7	**6847**	**19410**
2027-28	1794	332	125	1627	1546	1774	7	**7205**	**20361**
2028-29	1914	349	130	1707	1622	1855	7	**7584**	**21361**
2029-30	2020	364	135	1786	1697	1936	7	**7945**	**22337**
2030-31	2133	379	140	1869	1776	2020	7	**8324**	**23359**
2031-32	2252	395	145	1955	1858	2108	7	**8720**	**24428**
2032-33	2377	411	150	2045	1944	2200	7	**9134**	**25546**
2033-34	2510	428	155	2139	2034	2295	7	**9568**	**26716**
2034-35	2641	438	160	2209	2101	2367	7	**9923**	**27614**
2035-36	2780	448	165	2281	2170	2441	7	**10292**	**28545**
2036-37	2926	458	170	2355	2241	2517	7	**10674**	**29507**
2037-38	3079	468	175	2432	2314	2595	7	**11070**	**30503**
2038-39	3239	479	180	2511	2390	2675	7	**11481**	**31534**
2039-40	3402	488	185	2580	2456	2745	7	**11863**	**32454**
2040-41	3573	497	190	2651	2524	2817	7	**12259**	**33403**
2041-42	3753	507	195	2724	2593	2891	7	**12670**	**34381**
2042-43	3941	517	200	2799	2664	2967	7	**13095**	**35389**

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2043-44	4139	527	205	2876	2737	3045	7	**13536**	**36429**

Table 6-2 : Total Tollable Traffic @ Toll Plaza 2- Chainage 226.740 KM

(Optimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	1834	448	110	1687	1524	1887	7	**7497**	**21456**
2027-28	1956	471	115	1769	1599	1973	7	**7890**	**22513**
2028-29	2087	495	120	1855	1677	2063	7	**8304**	**23623**
2029-30	2203	515	125	1940	1755	2153	7	**8698**	**24705**
2030-31	2325	536	130	2029	1836	2246	7	**9109**	**25838**
2031-32	2454	557	135	2122	1921	2343	7	**9539**	**27023**
2032-33	2590	580	140	2220	2010	2444	7	**9991**	**28262**
2033-34	2734	604	145	2322	2103	2549	7	**10464**	**29559**
2034-35	2878	618	150	2398	2172	2628	7	**10851**	**30560**
2035-36	3029	632	155	2476	2243	2709	7	**11251**	**31596**
2036-37	3187	647	160	2557	2316	2792	7	**11666**	**32668**
2037-38	3354	662	165	2640	2392	2879	7	**12099**	**33778**
2038-39	3530	677	170	2726	2470	2968	7	**12548**	**34928**
2039-40	3708	691	175	2801	2538	3045	7	**12965**	**35956**
2040-41	3894	705	180	2878	2608	3124	7	**13396**	**37017**
2041-42	4090	719	185	2957	2680	3205	7	**13843**	**38112**
2042-43	4295	733	190	3038	2754	3288	7	**14305**	**39241**
2043-44	4510	748	195	3121	2830	3374	7	**14785**	**40406**

Table 6-3 : Total Tollable Traffic @ Toll Plaza 3- Chainage 295.000 KM

(Optimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	2068	412	114	1694	1525	1994	5	**7812**	**21660**
2027-28	2205	432	118	1777	1599	2084	5	**8220**	**22721**
2028-29	2351	454	122	1863	1677	2178	5	**8650**	**23835**
2029-30	2482	472	126	1949	1754	2272	5	**9060**	**24924**
2030-31	2619	491	130	2038	1835	2371	5	**9489**	**26063**

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2031-32	2765	511	134	2132	1919	2474	5	**9940**	**27255**
2032-33	2919	531	138	2231	2007	2582	5	**10413**	**28501**
2033-34	3082	553	142	2334	2099	2694	5	**10909**	**29805**
2034-35	3243	566	146	2410	2167	2778	5	**11315**	**30807**
2035-36	3413	580	150	2488	2238	2864	5	**11738**	**31844**
2036-37	3590	594	154	2569	2311	2953	5	**12176**	**32917**
2037-38	3778	608	158	2652	2386	3044	5	**12631**	**34028**
2038-39	3975	622	162	2738	2464	3138	5	**13104**	**35178**
2039-40	4175	635	166	2813	2532	3220	5	**13546**	**36204**
2040-41	4383	648	170	2890	2601	3304	5	**14001**	**37262**
2041-42	4604	661	174	2969	2672	3390	5	**14475**	**38353**
2042-43	4836	674	178	3050	2745	3478	5	**14966**	**39478**
2043-44	5079	688	182	3133	2820	3568	5	**15475**	**40638**

Table 6-4 : Total Tollable Traffic @ Toll Plaza 4- Chainage 357.739 KM

(Optimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	1010	335	92	1513	1364	1639	8	**5961**	**18177**
2027-28	1076	352	96	1587	1431	1713	8	**6263**	**19062**
2028-29	1149	369	100	1665	1502	1790	8	**6583**	**19991**
2029-30	1212	384	104	1742	1572	1867	8	**6889**	**20901**
2030-31	1280	400	108	1822	1645	1948	8	**7211**	**21852**
2031-32	1350	416	112	1906	1721	2032	8	**7545**	**22848**
2032-33	1425	433	116	1994	1801	2120	8	**7897**	**23889**
2033-34	1505	450	120	2086	1885	2211	8	**8265**	**24977**
2034-35	1584	461	124	2154	1947	2279	8	**8557**	**25806**
2035-36	1667	472	128	2224	2011	2349	8	**8859**	**26663**
2036-37	1754	483	132	2297	2077	2421	8	**9172**	**27550**
2037-38	1846	494	136	2372	2145	2496	8	**9497**	**28467**
2038-39	1942	506	140	2449	2215	2573	8	**9833**	**29415**
2039-40	2040	516	144	2516	2276	2640	8	**10140**	**30257**
2040-41	2142	527	148	2585	2339	2709	8	**10458**	**31124**
2041-42	2250	538	152	2656	2404	2779	8	**10787**	**32017**
2042-43	2363	549	156	2729	2470	2851	8	**11126**	**32937**
2043-44	2481	560	160	2804	2538	2925	8	**11476**	**33886**

Table 6-5 : Total Tollable Traffic @ Toll Plaza 1- Chainage 142.319 KM (Pessimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	1675	314	119	1544	1466	1689	6	**6813**	**19317**
2027-28	1778	328	124	1612	1530	1758	6	**7136**	**20168**
2028-29	1887	343	129	1683	1597	1830	6	**7475**	**21057**
2029-30	1983	356	132	1753	1662	1901	6	**7793**	**21914**
2030-31	2083	369	135	1825	1730	1975	6	**8123**	**22807**
2031-32	2188	382	138	1900	1801	2051	6	**8466**	**23737**
2032-33	2299	396	143	1978	1875	2130	6	**8827**	**24704**
2033-34	2415	410	148	2060	1952	2212	6	**9203**	**25712**
2034-35	2530	417	151	2117	2006	2269	6	**9496**	**26448**
2035-36	2650	424	154	2176	2061	2328	6	**9799**	**27207**
2036-37	2775	432	157	2236	2118	2388	6	**10112**	**27988**
2037-38	2906	440	160	2298	2176	2450	6	**10436**	**28794**
2038-39	3044	448	163	2362	2236	2514	6	**10773**	**29623**
2039-40	3182	454	166	2415	2286	2567	6	**11076**	**30339**
2040-41	3326	461	169	2469	2337	2621	6	**11389**	**31074**
2041-42	3475	468	172	2525	2389	2676	6	**11711**	**31829**
2042-43	3632	475	175	2582	2442	2732	6	**12044**	**32603**
2043-44	3795	482	178	2640	2497	2789	6	**12387**	**33398**

Table 6-6 : Total Tollable Traffic @ Toll Plaza 2- Chainage 226.740 KM (Pessimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	1826	445	109	1679	1517	1877	6	**7459**	**21354**
2027-28	1939	465	114	1753	1584	1953	6	**7814**	**22299**
2028-29	2058	486	119	1830	1654	2031	6	**8184**	**23286**
2029-30	2163	503	123	1905	1723	2109	6	**8532**	**24237**
2030-31	2274	521	127	1983	1794	2190	6	**8895**	**25227**
2031-32	2390	539	131	2065	1868	2274	6	**9273**	**26258**
2032-33	2512	559	135	2150	1945	2362	6	**9669**	**27331**
2033-34	2639	579	139	2238	2025	2453	6	**10079**	**28449**
2034-35	2764	590	143	2300	2081	2517	6	**10401**	**29270**
2035-36	2894	601	147	2364	2139	2583	6	**10734**	**30115**
2036-37	3031	612	151	2429	2199	2650	6	**11078**	**30987**
2037-38	3175	623	155	2496	2260	2719	6	**11434**	**31885**
2038-39	3325	634	159	2565	2323	2790	6	**11802**	**32811**
2039-40	3475	644	163	2622	2376	2848	6	**12134**	**33613**
2040-41	3633	654	167	2680	2430	2908	6	**12478**	**34437**
2041-42	3797	664	171	2741	2485	2970	6	**12834**	**35283**
2042-43	3968	674	175	2803	2541	3033	6	**13200**	**36152**
2043-44	4149	684	179	2866	2598	3097	6	**13579**	**37045**

Table 6-7 : Total Tollable Traffic @ Toll Plaza 3- Chainage 295.000 KM (Pessimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	2059	409	114	1685	1517	1984	5	**7773**	**21557**
2027-28	2185	427	118	1759	1584	2065	5	**8143**	**22505**
2028-29	2320	446	122	1836	1654	2149	5	**8532**	**23496**
2029-30	2437	462	125	1911	1722	2232	5	**8894**	**24452**
2030-31	2560	479	128	1989	1793	2318	5	**9272**	**25447**
2031-32	2690	496	131	2071	1867	2407	5	**9667**	**26484**
2032-33	2826	514	135	2156	1944	2499	5	**10079**	**27562**
2033-34	2969	532	139	2244	2024	2594	5	**10507**	**28685**
2034-35	3110	542	142	2306	2080	2661	5	**10846**	**29506**
2035-36	3257	552	145	2370	2138	2730	5	**11197**	**30352**
2036-37	3411	562	148	2436	2197	2800	5	**11559**	**31223**
2037-38	3572	572	151	2503	2258	2872	5	**11933**	**32121**
2038-39	3741	582	154	2572	2320	2946	5	**12320**	**33046**
2039-40	3910	591	157	2630	2372	3008	5	**12673**	**33844**
2040-41	4087	600	160	2689	2425	3072	5	**13038**	**34664**
2041-42	4271	609	163	2750	2480	3137	5	**13415**	**35506**
2042-43	4463	618	166	2812	2536	3203	5	**13803**	**36370**
2043-44	4664	627	169	2875	2593	3270	5	**14203**	**37257**

Table 6-8 : Total Tollable Traffic @ Toll Plaza 4- Chainage 357.739 KM (Pessimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	1005	333	92	1506	1358	1631	8	**5933**	**18091**
2027-28	1067	348	96	1572	1417	1696	8	**6204**	**18881**
2028-29	1133	364	100	1641	1479	1764	8	**6489**	**19706**
2029-30	1191	378	103	1709	1540	1832	8	**6761**	**20505**
2030-31	1251	392	106	1780	1603	1902	8	**7042**	**21336**
2031-32	1314	406	109	1853	1669	1975	8	**7334**	**22201**
2032-33	1381	421	112	1929	1737	2051	8	**7639**	**23101**
2033-34	1451	436	116	2008	1808	2129	8	**7956**	**24039**
2034-35	1520	444	119	2064	1858	2184	8	**8197**	**24716**
2035-36	1592	452	122	2121	1909	2241	8	**8445**	**25414**
2036-37	1667	460	125	2180	1961	2299	8	**8700**	**26132**
2037-38	1747	468	128	2240	2015	2358	8	**8964**	**26871**
2038-39	1830	476	131	2302	2070	2419	8	**9236**	**27632**
2039-40	1913	483	134	2354	2116	2470	8	**9478**	**28284**
2040-41	1999	490	137	2407	2163	2522	8	**9726**	**28953**
2041-42	2089	497	140	2461	2211	2575	8	**9981**	**29640**
2042-43	2183	504	143	2516	2260	2629	8	**10243**	**30343**
2043-44	2281	511	146	2573	2311	2684	8	**10514**	**31065**

Traffic projections for Most Likely scenario is given as under

Table 6-9 : Total Tollable Traffic @ Toll Plaza 1- Chainage 142.319 KM (Most Likely Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	1679	315	120	1548	1469	1693	6	**6830**	**19363**
2027-28	1786	330	125	1620	1538	1766	6	**7171**	**20265**
2028-29	1899	346	130	1696	1610	1842	6	**7529**	**21208**
2029-30	2000	360	135	1770	1681	1918	6	**7870**	**22125**
2030-31	2106	374	140	1848	1755	1997	6	**8226**	**23082**
2031-32	2218	389	145	1929	1832	2079	6	**8598**	**24080**
2032-33	2336	404	150	2013	1912	2164	6	**8985**	**25122**
2033-34	2460	420	155	2101	1996	2253	6	**9391**	**26210**
2034-35	2583	429	160	2164	2056	2318	6	**9716**	**27026**
2035-36	2711	438	165	2229	2118	2385	6	**10052**	**27869**
2036-37	2846	447	170	2296	2182	2453	6	**10400**	**28739**
2037-38	2987	456	175	2365	2248	2523	6	**10760**	**29637**
2038-39	3136	465	180	2436	2316	2595	6	**11134**	**30565**
2039-40	3285	473	185	2497	2374	2657	6	**11477**	**31380**
2040-41	3442	481	190	2559	2434	2720	6	**11832**	**32219**
2041-42	3605	489	195	2623	2495	2785	6	**12198**	**33082**
2042-43	3777	497	200	2689	2558	2851	6	**12578**	**33969**
2043-44	3957	505	205	2756	2622	2919	6	**12970**	**34883**

Table 6-10 : Total Tollable Traffic @ Toll Plaza 2- Chainage 226.740 KM (Most Likely Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	1830	446	109	1683	1520	1882	6	**7476**	**21405**
2027-28	1947	467	114	1761	1591	1962	6	**7848**	**22406**
2028-29	2071	489	119	1843	1665	2045	6	**8238**	**23454**
2029-30	2182	508	123	1923	1738	2128	6	**8608**	**24470**
2030-31	2298	528	127	2007	1814	2216	6	**8996**	**25531**
2031-32	2420	548	132	2094	1893	2307	6	**9400**	**26638**
2032-33	2549	569	137	2185	1976	2401	6	**9823**	**27793**
2033-34	2684	590	142	2280	2062	2499	6	**10263**	**28999**
2034-35	2817	603	146	2349	2125	2570	6	**10616**	**29909**
2035-36	2957	616	150	2420	2189	2643	6	**10981**	**30847**
2036-37	3105	629	154	2493	2255	2718	6	**11360**	**31817**
2037-38	3260	643	159	2568	2323	2795	6	**11754**	**32819**
2038-39	3422	657	164	2645	2393	2874	6	**12161**	**33854**
2039-40	3586	668	168	2711	2453	2942	6	**12534**	**34766**
2040-41	3758	679	172	2779	2515	3011	6	**12920**	**35705**
2041-42	3938	691	177	2848	2578	3082	6	**13320**	**36672**

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2042-43	4127	703	182	2919	2643	3155	6	**13735**	**37667**
2043-44	4325	716	187	2992	2709	3229	6	**14164**	**38691**

Table 6-11 : Total Tollable Traffic @ Toll Plaza 3- Chainage 295.000 KM (Most Likely Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	2064	410	114	1689	1521	1989	5	**7792**	**21608**
2027-28	2196	429	118	1767	1592	2074	5	**8181**	**22613**
2028-29	2336	449	122	1849	1666	2163	5	**8590**	**23665**
2029-30	2460	466	126	1929	1739	2252	5	**8977**	**24687**
2030-31	2590	484	130	2013	1815	2344	5	**9381**	**25754**
2031-32	2728	502	134	2101	1894	2439	5	**9803**	**26867**
2032-33	2873	521	138	2192	1977	2539	5	**10245**	**28028**
2033-34	3024	540	142	2288	2063	2643	5	**10705**	**29241**
2034-35	3175	551	146	2357	2125	2717	5	**11076**	**30151**
2035-36	3333	562	150	2428	2189	2794	5	**11461**	**31090**
2036-37	3499	573	154	2501	2255	2873	5	**11860**	**32060**
2037-38	3674	585	158	2576	2323	2955	5	**12276**	**33062**
2038-39	3857	597	162	2653	2393	3039	5	**12706**	**34096**
2039-40	4041	607	166	2719	2453	3110	5	**13101**	**35006**
2040-41	4232	617	170	2787	2514	3183	5	**13508**	**35941**
2041-42	4434	628	174	2857	2577	3257	5	**13932**	**36903**
2042-43	4645	639	178	2928	2641	3334	5	**14370**	**37894**
2043-44	4867	650	182	3001	2707	3412	5	**14824**	**38913**

Table 6-12 : Total Tollable Traffic @ Toll Plaza 4- Chainage 357.739 KM (Most Likely Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	1007	334	92	1510	1361	1636	8	**5948**	**18134**
2027-28	1072	350	96	1580	1425	1706	8	**6237**	**18971**
2028-29	1141	366	100	1653	1492	1779	8	**6539**	**19848**
2029-30	1201	380	103	1725	1558	1851	8	**6826**	**20702**
2030-31	1264	395	107	1800	1627	1926	8	**7127**	**21593**
2031-32	1332	410	111	1879	1699	2004	8	**7443**	**22522**
2032-33	1402	426	115	1961	1774	2086	8	**7772**	**23492**
2033-34	1476	442	119	2047	1852	2171	8	**8115**	**24504**
2034-35	1550	452	122	2109	1908	2233	8	**8382**	**25256**

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2035-36	1627	462	125	2173	1966	2296	8	**8657**	**26032**
2036-37	1708	472	129	2239	2026	2361	8	**8943**	**26832**
2037-38	1792	482	133	2306	2087	2428	8	**9236**	**27658**
2038-39	1882	492	137	2375	2150	2497	8	**9541**	**28511**
2039-40	1971	501	140	2434	2204	2556	8	**9814**	**29255**
2040-41	2065	510	144	2495	2259	2616	8	**10097**	**30020**
2041-42	2163	519	148	2557	2316	2677	8	**10388**	**30807**
2042-43	2267	528	152	2621	2374	2740	8	**10690**	**31615**
2043-44	2374	538	156	2686	2434	2804	8	**11000**	**32447**

CHAPTER 7
FORECAST OF TOLL REVENUE

7.1 General

This chapter presents the tolling rate calculations, categories and toll revenue of the project.

7.2 Discount Categories

As per the Toll Notification (Schedule - G) the discounts and special provisions have been considered. In addition to discounts as per Fee Notification concessionaire has declared special category rates also. Salient features of toll rate structure are given as under

1. Monthly Pass: For frequent users monthly pass would be issued at fee at 2/3rd rate for 50 single journey trips.
2. Multiple Journeys (for Return Trip): Will be charged at 1.5 times single journey.
3. Single Journey: Full single journey toll would be charged to this category of vehicles who are infrequent travellers or whose frequency does not yield any discount from the above categories.
4. Local Discounts: There are several categories of local discounts.
    a) Local Car Jeep Van - Rs. 350per month (for locals residing within a radius of 20 kms from toll plaza)

Building of inflation and escalation of rate on the basis of WPI are done as per toll notification (Schedule G) as given under as extract from concession agreement.

The formula for determining the applicable rate of fee shall be as follows:-

$$\text{Applicable rate of fee} = \text{base rate} + \text{base rate} \times \left\{ \frac{\text{WPI A-WPI B}}{\text{WPI B}} \right\} \times 0.4$$

Factors of inflation / growth have been incorporated as per Schedule R. WPI are available up to the year 2025-26.

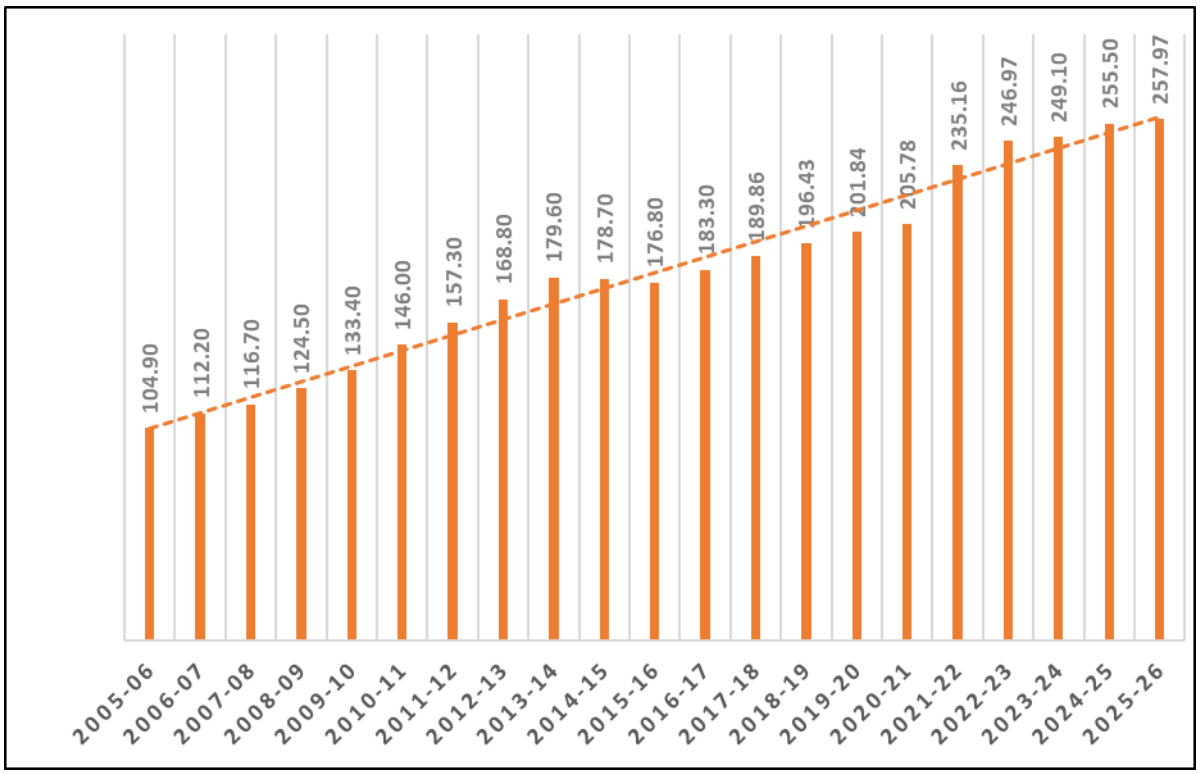

Figure 7-1 : Historical Rate of WPI Inflation in India

The wholesale price index (WPI) and the inflation rate in the past are presented in Table below.

Table 7-1 : Historical WPI value and Growth Inflation

December of year	2021	2022	2023	2024	2025	Avg.
WPI	235.2	247.0	249.1	255.5	257.97	
Inflation	14.27%	5.02%	0.86%	2.57%	0.96%	4.74%

WPI of December 2025 is posted on ministry site which is shows 0.96% inflation from the previous year. Same has been applied for FY 2026-27.
The average WPI inflation over the period FY 2021 to FY 2025 works out to approximately 4.74%, reflecting inflationary cycles across both high and low inflation years. Based on this analysis, an annual escalation factor of 4.5% has been adopted for the remaining concession period.

7.3 Estimation of Toll Rates

As per the applicable MORTH notification and Schedule R of contract agreement, the following Base rate of fee for the categories mentioned in the table stands true in the National Highways Fee Rules applicable for contract.

Table 7-2 : Base Toll Rates June 2007-08

Type of Vehicle	Base Rate of Fee / Km (in Rs.)
Car, Jeep, Van or Light Motor Vehicle	0.65
Light Commercial Vehicle, Light Goods Vehicle or Minibus	1.05
Bus or Truck (Two Axles)	2.20
Three Axle Commercial Vehicles	2.40
Heavy Construction Machinery (HCM) or Earth Moving Equipment (EME) or Multi Axle Vehicle (MAV) (4 to 6 axles)	3.45
Oversized Vehicles (7 or more Axles)	4.20

These rates are then modified as per procedure provided in guidelines of notification considering factors listed below.

- Annual revision of fee rate - @3%
- Application of WPI

Base rates have been worked out to map the current rates.

Table 7-3 : Toll Rates for Forecasting Year Single Journey @ Km 142.319

Year	Car	Minibus /LCV	Bus	Truck	3 axles	Multi axle	Oversized Vehicles
2026-27	130	215	445	445	490	700	855
2027-28	140	225	470	470	510	735	895
2028-29	145	235	490	490	535	770	935
2029-30	150	245	515	515	560	805	980
2030-31	160	255	540	540	585	845	1025
2031-32	165	270	565	565	615	885	1075
2032-33	175	280	590	590	645	925	1125
2033-34	185	295	620	620	675	970	1180
2034-35	190	310	650	650	705	1015	1235
2035-36	200	325	680	680	740	1065	1295
2036-37	210	340	710	710	775	1115	1360
2037-38	220	355	745	745	815	1170	1425
2038-39	230	375	780	780	855	1225	1495
2039-40	240	390	820	820	895	1285	1565
2040-41	255	410	860	860	940	1350	1640

Year	Car	Minibus /LCV	Bus	Truck	3 axles	Multi axle	Oversized Vehicles
2041-42	265	430	900	900	985	1415	1720
2042-43	280	450	945	945	1030	1485	1805
2043-44	295	475	995	995	1085	1555	1895

Table 7-4 : Toll Rates for Forecasting Year Single Journey (Rs. Rupees) @ Km 226.740

Year	Car	Minibus /LCV	Bus	Truck	3 axle	Multi axle	Oversized Vehicles
2026-27	175	280	585	585	640	915	1115
2027-28	180	290	610	610	670	960	1170
2028-29	190	305	640	640	700	1005	1225
2029-30	200	320	670	670	730	1050	1280
2030-31	210	335	705	705	765	1100	1340
2031-32	215	350	735	735	805	1155	1405
2032-33	230	370	770	770	840	1210	1470
2033-34	240	385	810	810	880	1265	1540
2034-35	250	405	845	845	925	1330	1615
2035-36	260	425	885	885	970	1390	1695
2036-37	275	445	930	930	1015	1460	1775
2037-38	290	465	975	975	1065	1530	1860
2038-39	300	490	1020	1020	1115	1605	1950
2039-40	315	510	1070	1070	1170	1680	2045
2040-41	330	535	1125	1125	1225	1765	2145
2041-42	350	565	1180	1180	1285	1850	2250
2042-43	365	590	1235	1235	1350	1940	2360
2043-44	385	620	1300	1300	1415	2035	2475

Table 7-5 : Toll Rates for Forecasting Year Single Journey (Rs. Rupees) @ Km 295.000

Year	Car	Minibus /LCV	Bus	Truck	3 axle	Multi axle	Oversized Vehicles
2026-27	130	210	445	445	485	695	845
2027-28	135	220	465	465	505	725	885
2028-29	145	230	485	485	530	760	925
2029-30	150	245	510	510	555	795	970
2030-31	155	255	530	530	580	835	1015
2031-32	165	265	560	560	610	875	1065

Year	Car	Minibus /LCV	Bus	Truck	3 axle	Multi axle	Oversized Vehicles
2032-33	175	280	585	585	635	915	1115
2033-34	180	290	610	610	670	960	1170
2034-35	190	305	640	640	700	1005	1225
2035-36	200	320	670	670	735	1055	1285
2036-37	210	335	705	705	770	1105	1345
2037-38	220	350	740	740	805	1160	1410
2038-39	230	370	775	775	845	1215	1480
2039-40	240	385	810	810	885	1275	1550
2040-41	250	405	850	850	930	1335	1625
2041-42	265	425	895	895	975	1400	1705
2042-43	275	445	935	935	1020	1470	1790
2043-44	290	470	985	985	1070	1540	1875

Table 7-6 : Toll Rates for Forecasting Year Single Journey (Rs. Rupees) @ Km 357.739

Year	Car	Minibus /LCV	Bus	Truck	3 axle	Multi axle	Oversized Vehicles
2026-27	160	260	550	550	600	860	1045
2027-28	170	275	575	575	625	900	1095
2028-29	180	285	600	600	655	945	1150
2029-30	185	300	630	630	685	990	1200
2030-31	195	315	660	660	720	1035	1260
2031-32	205	330	690	690	755	1085	1320
2032-33	215	345	725	725	790	1135	1380
2033-34	225	360	760	760	825	1190	1450
2034-35	235	380	795	795	865	1245	1515
2035-36	245	395	835	835	910	1305	1590
2036-37	260	415	875	875	950	1370	1665
2037-38	270	435	915	915	1000	1435	1745
2038-39	285	460	960	960	1045	1505	1830
2039-40	295	480	1005	1005	1095	1580	1920
2040-41	310	505	1055	1055	1150	1655	2015
2041-42	325	530	1105	1105	1205	1735	2115
2042-43	345	555	1160	1160	1265	1820	2215
2043-44	360	580	1220	1220	1330	1910	2325

Table 7-7 : Toll Rates for Forecasting Year Return Journey @ Km 142.319

Year	Car	Minibus /LCV	Bus	Truck	3 axle	Multi axle	Oversized Vehicles
2026-27	200	320	670	670	730	1050	1280
2027-28	210	335	700	700	765	1100	1340
2028-29	215	350	735	735	800	1155	1405
2029-30	230	370	770	770	840	1210	1470
2030-31	240	385	805	805	880	1265	1540
2031-32	250	405	845	845	920	1325	1615
2032-33	260	420	885	885	965	1390	1690
2033-34	275	440	925	925	1010	1455	1770
2034-35	285	465	970	970	1060	1525	1855
2035-36	300	485	1020	1020	1110	1595	1945
2036-37	315	510	1065	1065	1165	1675	2035
2037-38	330	535	1120	1120	1220	1755	2135
2038-39	345	560	1175	1175	1280	1840	2240
2039-40	365	585	1230	1230	1340	1930	2350
2040-41	380	615	1290	1290	1405	2025	2460
2041-42	400	645	1355	1355	1475	2120	2585
2042-43	420	675	1420	1420	1550	2225	2710
2043-44	440	710	1490	1490	1625	2335	2845

Table 7-8 : Toll Rates for Forecasting Year Return Journey (Rs. Rupees) @ Km 226.740

Year	Car	Minibus /LCV	Bus	Truck	3 axle	Multi axle	Oversized Vehicles
2026-27	260	420	875	875	955	1375	1675
2027-28	270	440	920	920	1000	1440	1755
2028-29	285	460	960	960	1050	1505	1835
2029-30	295	480	1005	1005	1100	1580	1920
2030-31	310	505	1055	1055	1150	1655	2010
2031-32	325	525	1105	1105	1205	1730	2110
2032-33	340	550	1155	1155	1260	1815	2210
2033-34	360	580	1210	1210	1320	1900	2315
2034-35	375	605	1270	1270	1385	1990	2425
2035-36	395	635	1330	1330	1450	2085	2540
2036-37	410	665	1395	1395	1520	2185	2665
2037-38	430	700	1460	1460	1595	2295	2790
2038-39	455	730	1535	1535	1670	2405	2925
2039-40	475	765	1610	1610	1755	2520	3070

Year	Car	Minibus /LCV	Bus	Truck	3 axle	Multi axle	Oversized Vehicles
2040-41	500	805	1685	1685	1840	2645	3220
2041-42	525	845	1770	1770	1930	2775	3375
2042-43	550	885	1855	1855	2025	2910	3540
2043-44	575	930	1945	1945	2125	3055	3715

Table 7-9 : Toll Rates for Forecasting Year Return Journey (Rs. Rupees) @ Km 295.000

Year	Car	Minibus /LCV	Bus	Truck	3 axle	Multi axle	Oversized Vehicles
2026-27	195	315	665	665	725	1040	1270
2027-28	205	330	695	695	760	1090	1325
2028-29	215	345	730	730	795	1140	1390
2029-30	225	365	760	760	830	1195	1455
2030-31	235	380	800	800	870	1250	1525
2031-32	245	400	835	835	910	1310	1595
2032-33	260	420	875	875	955	1375	1670
2033-34	270	440	920	920	1000	1440	1750
2034-35	285	460	960	960	1050	1510	1835
2035-36	300	480	1010	1010	1100	1580	1925
2036-37	310	505	1055	1055	1150	1655	2015
2037-38	325	530	1105	1105	1210	1735	2115
2038-39	345	555	1160	1160	1265	1820	2215
2039-40	360	580	1220	1220	1330	1910	2325
2040-41	375	610	1275	1275	1395	2005	2440
2041-42	395	640	1340	1340	1460	2100	2555
2042-43	415	670	1405	1405	1535	2205	2685
2043-44	435	705	1475	1475	1610	2310	2815

Table 7-10 : Toll Rates for Forecasting Year Return Journey (Rs. Rupees) @ Km 357.739

Year	Car	Minibus /LCV	Bus	Truck	3 axle	Multi axle	Oversized Vehicles
2026-27	245	395	825	825	900	1290	1570
2027-28	255	410	860	860	940	1350	1645
2028-29	265	430	900	900	985	1415	1720
2029-30	280	450	945	945	1030	1480	1805
2030-31	290	470	990	990	1080	1550	1890

Year	Car	Minibus /LCV	Bus	Truck	3 axle	Multi axle	Oversized Vehicles
2031-32	305	495	1035	1035	1130	1625	1980
2032-33	320	520	1085	1085	1185	1705	2075
2033-34	335	545	1135	1135	1240	1785	2170
2034-35	350	570	1190	1190	1300	1870	2275
2035-36	370	595	1250	1250	1365	1960	2385
2036-37	385	625	1310	1310	1430	2055	2500
2037-38	405	655	1370	1370	1495	2150	2620
2038-39	425	685	1440	1440	1570	2255	2745
2039-40	445	720	1510	1510	1645	2365	2880
2040-41	470	755	1585	1585	1725	2480	3020
2041-42	490	790	1660	1660	1810	2605	3170
2042-43	515	830	1740	1740	1900	2730	3325
2043-44	540	870	1825	1825	1995	2865	3490

Table 7-11 : Toll Rates for Monthly Pass Local@ Km 142.319

Year	Car	Minibus /LCV
2026-27	360	360
2027-28	375	375
2028-29	395	395
2029-30	415	415
2030-31	430	430
2031-32	455	455
2032-33	475	475
2033-34	495	495
2034-35	520	520
2035-36	545	545
2036-37	570	570
2037-38	600	600
2038-39	630	630
2039-40	660	660
2040-41	690	690
2041-42	725	725
2042-43	760	760
2043-44	800	800

Table 7-12 : Toll Rates for Monthly Pass Local@ Km 226.740

Year	Car	Minibus /LCV
2026-27	360	360
2027-28	375	375

Year	Car	Minibus /LCV
2028-29	395	395
2029-30	415	415
2030-31	430	430
2031-32	455	455
2032-33	475	475
2033-34	495	495
2034-35	520	520
2035-36	545	545
2036-37	570	570
2037-38	600	600
2038-39	630	630
2039-40	660	660
2040-41	690	690
2041-42	725	725
2042-43	760	760
2043-44	800	800

Table 7-13 : Toll Rates for Monthly Pass Local@ Km 295.000

Year	Car	Minibus /LCV
2026-27	360	360
2027-28	375	375
2028-29	395	395
2029-30	415	415
2030-31	430	430
2031-32	455	455
2032-33	475	475
2033-34	495	495
2034-35	520	520
2035-36	545	545
2036-37	570	570
2037-38	600	600
2038-39	630	630
2039-40	660	660
2040-41	690	690
2041-42	725	725
2042-43	760	760
2043-44	800	800

Table 7-14 : Toll Rates for Monthly Pass Local@ Km 357.739

Year	Car	Minibus /LCV
2026-27	360	360
2027-28	375	375
2028-29	395	395
2029-30	415	415
2030-31	430	430
2031-32	455	455
2032-33	475	475
2033-34	495	495
2034-35	520	520
2035-36	545	545
2036-37	570	570
2037-38	600	600
2038-39	630	630
2039-40	660	660
2040-41	690	690
2041-42	725	725
2042-43	760	760
2043-44	800	800

Table 7-15 : Toll Rates for Monthly Pass @ Km 142.319

Year	Car	Minibus /LCV	Bus	Truck	3 -Axle	Multi axle	Oversized Vehicles
2026-27	4405	7115	14905	14905	16260	23375	28460
2027-28	4610	7450	15605	15605	17025	24475	29795
2028-29	4830	7800	16340	16340	17825	25625	31195
2029-30	5055	8165	17110	17110	18670	26835	32670
2030-31	5295	8555	17920	17920	19550	28105	34215
2031-32	5545	8960	18770	18770	20480	29435	35835
2032-33	5810	9385	19665	19665	21450	30835	37540
2033-34	6085	9835	20600	20600	22475	32310	39330
2034-35	6380	10305	21590	21590	23550	33855	41215
2035-36	6685	10800	22625	22625	24680	35480	43190
2036-37	7005	11320	23715	23715	25870	37185	45270
2037-38	7345	11865	24860	24860	27120	38985	47460
2038-39	7700	12440	26065	26065	28435	40875	49760
2039-40	8075	13045	27330	27330	29815	42860	52175
2040-41	8470	13680	28665	28665	31270	44950	54720
2041-42	8885	14350	30065	30065	32800	47150	57400
2042-43	9320	15055	31540	31540	34410	49460	60215
2043-44	9775	15795	33095	33095	36100	51895	63180

Table 7-16 : Toll Rates for Monthly Pass @ Km 226.740

Year	Car	Minibus /LCV	Bus	Truck	3 -Axle	Multi axle	Oversized Vehicles
2026-27	4405	7115	14905	14905	16260	23375	28460
2027-28	4610	7450	15605	15605	17025	24475	29795
2028-29	4830	7800	16340	16340	17825	25625	31195
2029-30	5055	8165	17110	17110	18670	26835	32670
2030-31	5295	8555	17920	17920	19550	28105	34215
2031-32	5545	8960	18770	18770	20480	29435	35835
2032-33	5810	9385	19665	19665	21450	30835	37540
2033-34	6085	9835	20600	20600	22475	32310	39330
2034-35	6380	10305	21590	21590	23550	33855	41215
2035-36	6685	10800	22625	22625	24680	35480	43190
2036-37	7005	11320	23715	23715	25870	37185	45270
2037-38	7345	11865	24860	24860	27120	38985	47460
2038-39	7700	12440	26065	26065	28435	40875	49760
2039-40	8075	13045	27330	27330	29815	42860	52175
2040-41	8470	13680	28665	28665	31270	44950	54720
2041-42	8885	14350	30065	30065	32800	47150	57400
2042-43	9320	15055	31540	31540	34410	49460	60215
2043-44	9775	15795	33095	33095	36100	51895	63180

Table 7-17 : Toll Rates for Monthly Pass @ Km 295.000

Year	Car	Minibus /LCV	Bus	Truck	3 -Axle	Multi axle	Oversized Vehicles
2026-27	4360	7045	14760	14760	16100	23145	28175
2027-28	4565	7375	15450	15450	16855	24230	29495
2028-29	4780	7720	16180	16180	17650	25370	30885
2029-30	5005	8085	16940	16940	18480	26565	32340
2030-31	5240	8470	17740	17740	19355	27825	33870
2031-32	5490	8870	18585	18585	20275	29145	35480
2032-33	5750	9290	19470	19470	21235	30530	37165
2033-34	6025	9735	20395	20395	22250	31985	38940
2034-35	6315	10200	21370	21370	23315	33515	40800
2035-36	6620	10690	22400	22400	24435	35125	42760
2036-37	6935	11205	23475	23475	25610	36815	44820
2037-38	7270	11745	24610	24610	26850	38595	46985
2038-39	7625	12315	25805	25805	28150	40465	49260
2039-40	7995	12915	27060	27060	29520	42430	51655
2040-41	8385	13545	28375	28375	30955	44500	54175
2041-42	8795	14205	29765	29765	32470	46675	56825
2042-43	9225	14905	31225	31225	34065	48970	59615
2043-44	9680	15635	32760	32760	35740	51375	62545

Table 7-18 : Toll Rates for Monthly Pass @ Km 357.739

Year	Car	Minibus /LCV	Bus	Truck	3 -Axle	Multi axle	Oversized Vehicles
2026-27	5405	8730	18290	18290	19950	28680	34915
2027-28	5655	9140	19150	19150	20890	30030	36555
2028-29	5925	9570	20050	20050	21870	31440	38275
2029-30	6205	10020	20995	20995	22905	32925	40080
2030-31	6495	10495	21985	21985	23985	34480	41975
2031-32	6805	10990	23030	23030	25125	36115	43965
2032-33	7130	11515	24125	24125	26320	37835	46060
2033-34	7470	12065	25275	25275	27575	39640	48255
2034-35	7825	12640	26485	26485	28895	41535	50565
2035-36	8200	13250	27760	27760	30280	43530	52990
2036-37	8595	13885	29095	29095	31740	45625	55545
2037-38	9010	14555	30500	30500	33270	47830	58225
2038-39	9450	15260	31980	31980	34885	50145	61050
2039-40	9905	16005	33530	33530	36580	52585	64015
2040-41	10390	16785	35165	35165	38365	55150	67135
2041-42	10900	17605	36885	36885	40240	57845	70420
2042-43	11435	18470	38695	38695	42215	60685	73875
2043-44	11995	19380	40600	40600	44295	63670	77510

7.4 Toll Revenue

As indicated earlier, toll revenue on the Project Road has been calculated in all three scenarios based on above rates and projected traffic. The estimates of toll revenue under ***Optimistic***, ***Pessimistic*** and ***Most Likely*** growth scenarios are presented in the following section.

7.5 Toll Revenue at all toll plazas under Scenarios

Toll Revenue estimates under all scenarios at each of the toll plaza up to 2043-44 years starting from the year 2026-27 are shown in tables below.

Table 7-19 : Toll Revenue Optimistic Scenario

(Rs. Crores)

Location / Year	TP-1 - Malthone (142+319)	TP-2 - Chitora (226+740)	TP-3 - Titarpani (295+000)	TP-4 - Bakori (357+739)	Total
2026-27	105.84	149.17	116.16	121.47	**492.65**
2027-28	116.92	163.88	127.49	133.50	**541.80**
2028-29	127.87	179.53	139.81	146.16	**593.36**
2029-30	139.98	196.17	153.04	159.97	**649.17**
2030-31	153.50	215.11	167.24	175.19	**711.04**
2031-32	168.54	236.06	184.35	192.35	**781.30**
2032-33	183.91	257.76	201.08	210.03	**852.78**
2033-34	201.64	282.30	220.16	229.78	**933.87**
2034-35	217.83	305.85	238.26	248.41	**1010.34**
2035-36	236.75	331.49	259.03	269.92	**1097.19**
2036-37	255.34	358.47	279.93	291.39	**1185.13**

Location / Year	TP-1 - Malthone (142+319)	TP-2 - Chitora (226+740)	TP-3 - Titarpani (295+000)	TP-4 - Bakori (357+739)	Total
2037-38	276.95	388.49	303.18	315.28	**1283.90**
2038-39	299.80	420.19	328.56	341.35	**1389.90**
2039-40	324.13	454.21	354.98	368.66	**1501.98**
2040-41	349.40	489.16	381.57	396.54	**1616.66**
2041-42	376.43	527.91	412.37	427.09	**1743.80**
2042-43	406.32	569.25	444.22	460.94	**1880.73**
2043-44	440.30	616.34	481.06	498.99	**2036.69**

Table 7-20 : Toll Revenue Pessimistic Scenario

(Rs. Crores)

Location / Year	TP-1 - Malthone (142+319)	TP-2 - Chitora (226+740)	TP-3 - Titarpani (295+000)	TP-4 - Bakori (357+739)	Total
2026-27	105.30	148.36	115.60	120.95	**490.20**
2027-28	115.76	162.26	126.24	132.24	**536.51**
2028-29	125.99	176.92	137.77	144.06	**584.75**
2029-30	137.24	192.41	150.03	156.94	**636.62**
2030-31	149.76	210.02	163.12	171.01	**693.90**
2031-32	163.60	229.44	178.92	186.86	**758.83**
2032-33	177.67	249.37	194.24	203.02	**824.29**
2033-34	193.89	271.81	211.66	221.02	**898.38**
2034-35	208.38	292.93	227.94	237.78	**967.04**
2035-36	225.37	315.91	246.66	257.12	**1045.06**
2036-37	241.89	339.90	265.19	276.19	**1123.17**
2037-38	261.11	366.48	285.79	297.31	**1210.69**
2038-39	281.29	394.46	308.14	320.31	**1304.21**
2039-40	302.63	424.25	331.29	344.24	**1402.41**
2040-41	324.61	454.64	354.42	368.39	**1502.07**
2041-42	348.01	488.25	381.25	394.79	**1612.31**
2042-43	373.78	523.85	408.77	423.97	**1730.37**
2043-44	403.04	564.34	440.48	456.73	**1864.57**

Table 7-21 : Toll Revenue Most Likely Scenario

(Rs. Crores)

Location / Year	TP-1 - Malthone (142+319)	TP-2 - Chitora (226+740)	TP-3 - Titarpani (295+000)	TP-4 - Bakori (357+739)	Total
2026-27	105.56	148.72	115.87	121.23	**491.39**
2027-28	116.35	162.99	126.84	132.94	**539.12**
2028-29	126.95	178.14	138.76	145.20	**589.04**
2029-30	138.65	194.16	151.53	158.52	**642.86**
2030-31	151.70	212.45	165.23	173.17	**702.55**
2031-32	166.18	232.62	181.73	189.73	**770.27**
2032-33	180.89	253.41	197.77	206.70	**838.77**
2033-34	197.91	276.87	216.05	225.64	**916.47**
2034-35	213.25	299.23	233.24	243.37	**989.09**

Location / Year	TP-1 - Malthone (142+319)	TP-2 - Chitora (226+740)	TP-3 - Titarpani (295+000)	TP-4 - Bakori (357+739)	Total
2035-36	231.21	323.52	253.00	263.81	**1071.54**
2036-37	248.76	349.00	272.70	284.15	**1154.61**
2037-38	269.17	377.34	294.63	306.68	**1247.81**
2038-39	290.69	407.18	318.46	331.25	**1347.58**
2039-40	313.56	438.98	343.25	356.88	**1452.66**
2040-41	337.19	471.58	368.12	382.90	**1559.79**
2041-42	362.42	507.74	396.95	411.38	**1678.49**
2042-43	390.27	546.26	426.67	442.96	**1806.16**
2043-44	421.89	590.07	460.94	478.39	**1951.28**

7.6 Modification in Concession Period

Modification of the concession period shall be done on the basis of Revenue targets given in the contract for milestones 1 & 2.

Modification in concession period as per provisions of DCA and same is summarized in table for all scenarios.

Pessimistic Case

Target Point 1- March 2031									
Target Month - March 2029	Target Revenue (Rs. Crores)	Calculated Revenue (Rs. Crores)	Difference %	If qualifies for Modification in Concession Period	Qualifying increment or shortfall	Change in Concession period %	Original Concession Period	Change in Concession period	Modified Concession Period
TOT-12	70	58.04	-17.09%	No	-	0.00%	20.00	0.00	

Target Point 2- March 2038											
Target Month - March 2036	Target Revenue (Rs. Crores)	Calculated Revenue (Rs. Crores)	Difference %	If qualifies for Modification in Concession Period	Qualifying increment or short fall	Change in Concession period %	Original Concession Period	Change in Concession period	Total Change in Concession period	Calculated Modified Concession Period	Final Concession Period subject to Cap
TOT-12	123	101.06	-17.84 %	No	-	0.00%	20.00	0.00	0.00	20.00	

Most likely Case

Target Point 1- March 2031									
Target Month - March 2029	Target Revenue (Rs. Crores)	Calculated Revenue (Rs. Crores)	Difference %	If qualifies for Modification in Concession Period	Qualifying increment or shortfall	Change in Concession period %	Original Concession Period	Change in Concession period	Modified Concession Period
TOT-12	70	58.77	-16.04 %	No	-	0.00%	20.00	0.00	

Target Point 2- March 2038

Target Month - March 2036	Target Revenue (Rs. Crores)	Calculated Revenue (Rs. Crores)	Difference %	If qualifies for Modification in Concession Period	Qualifying increment or short fall	Change in Concession period %	Original Concession Period	Change in Concession period	Total Change in Concession period	Calculated Modified Concession Period	Final Concession Period subject to Cap
TOT-12	123	104.17	-15.31 %	No	-	0.00%	20.00	0.00	0.00	20.00	

Optimistic Case

Target Point 1- March 2031									
Target Month - March 2029	Target Revenue (Rs. Crores)	Calculated Revenue (Rs. Crores)	Difference %	If qualifies for Modification in Concession Period	Qualifying increment or shortfall	Change in Concession period %	Original Concession Period	Change in Concession period	Modified Concession Period
TOT-12	70	59.49	-15.02 %	No	-	0.00%	20.00	0.00	

Target Point 2- March 2038											
Target Month - March 2036	Target Revenue (Rs. Crores)	Calculated Revenue (Rs. Crores)	Difference %	If qualifies for Modification in Concession Period	Qualifying increment or short fall	Change in Concession period %	Original Concession Period	Change in Concession period	Total Change in Concession period	Calculated Modified Concession Period	Final Concession Period subject to Cap
TOT-12	123	107.19	-12.85 %	No	-	0.00%	20.00	0.00	0.00	20.00	

TOT-12 (Lalitpur to Lakhadon)-Modification in Concession Period						
Types of Scenarios	**Pessimistic Case**		**Most likely Case**		**Optimistic Case**	
Target Month	**Mar-31**	**Mar-38**	**Mar-31**	**Mar-38**	**Mar-31**	**Mar-38**
Target Revenue (Rs. Crores)	70	123.00	70	123	70.00	123.00
Calculated Revenue (Rs. Crores)	58.04	101.06	58.77	104.17	59.49	107.19
Differences %	-17.09%	-17.84%	-16.04%	-15.31%	-15.02%	-12.85%
If qualifies for Modification in Concession Period	No	No	No	No	No	No
Qualifying Increment or shortfall	-	-	-	-	-	-
Change in Concession period %	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Original Concession Period	20.00	20.00	20.00	20.00	20.00	20.00
Change in Concession period	0.00	0.00	0.00	0.00	0.00	0.00
Total Change in Concession period	0.00		0.00		0.00	
Calculated Modified Concession Period	20.00		20.00		20.00	
Final Concession Period subject to Cap	0.00		0.00		0.00	

Thus, there is no modification expected in concession period due to variation in revenue as per above estimates in all scenarios.

CHAPTER 8

CONCLUSION & RECOMMENDATIONS

8.1 Conclusion & Recommendations

Project stretch of Lalitpur-Sagar- Lakhnadon from Km 99.00 to Km 415.089 section of NH-44 in state of Madhya Pradesh and Uttar Pradesh is currently four lane road. The road is in sound condition and serves healthy traffic volumes. Project corridor is a part of the important regional network connecting Uttar Pradesh, Madhya Pradesh to Southern States and vice-versa. There are large number of townships, industrial corridors and other business establishment coming up along project corridor. As discussed, dominant portion of traffic is long route traffic, which is more sensitive towards the growth of national economy. As Indian economy is poised to grow at 7%+ post COVID-19, the project corridor is expected to pick up the same trend in terms of traffic flow. All these developments have potential to give positive impact to traffic flow on project. The following can be considered as major outcomes of the study

a) There is good amount of tollable traffic running on project

b) Project corridor has potential to witness traffic growth @ 6-8% annually in near future due to various development in area and overall development of economy

c) Project corridor has committed traffic as long route traffic and does not run a risk of traffic leakage due to quality competing road

Based on above it can be considered a stable healthy project from traffic and revenue point of view.

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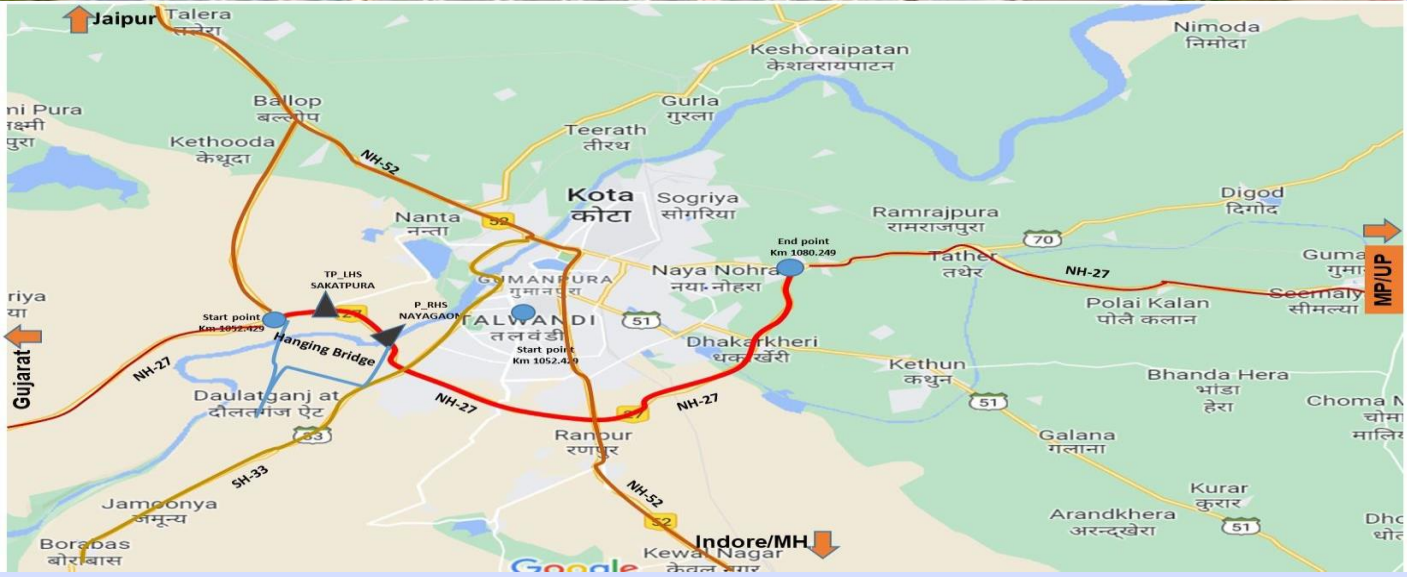
IRB INFRASTRUCTURE TRUST

KOTA BYPASS SECTION OF NH-76 (new NH-27) IN THE STATE OF RAJASTHAN UNDER (TOT Bundle-13)



TRAFFIC STUDY & REVENUE PROJECTION REPORT (FINAL)

MAY 2026

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GMD CONSULTANTS ★ NAVI MUMBAI ★

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ABBREVIATIONS

AADT	-	Annual Average Daily Traffic	**NHAI**	-	National Highway Authority of India
BOT	-	Build Operate Transfer	**NHDP**	-	National Highways Development Project
CAGR	-	Compound Annual Growth Rate	**NSDP**	-	Net State Domestic Product
CTV	-	Classified traffic volume	**O&M**	-	Operation & Maintenance
DBFOT	-	Design, Build, Finance, Operate & Transfer	**PCDP**	-	Per Capita Domestic Product
EME	-	Earth Moving Equipment	**PCI**	-	Per Capita Income
GDP	-	Gross Domestic Product	**PCU**	-	Passenger Car Unit
GSDP	-	Gross State Domestic Product	**PSC**	-	Pre-stressed Concrete
HCM	-	Heavy Construction Machinery	**RCC**	-	Reinforced cement concrete
HCV	-	Heavy Commercial Vehicle	**RHS**	-	Right Hand Side
HTMS	-	Highway Traffic Management System	**SH**	-	State Highway
IRC	-	Indian Road Congress	**TP**	-	Toll Plaza
IRR	-	Internal Rate of Return	**WPI**	-	Wholesale Price Index
LCV	-	Light Commercial Vehicle	**SIR**	-	Special Investment Region
LHS	-	Left Hand Side	**c.**	-	Circa
LGV	-	Light Goods Vehicle	**ROB**	-	Railway Over Bridge
MAV	-	Multi Axle Vehicle	**MDR**	-	Major District Road
MORTH	-	Ministry of Road Transport and Highways	**ODR**	-	Other District Road
NH	-	National Highway	**CA**	-	Concession Agreement
PCC	-	Plain Cement Concrete	**RMT**	-	Running Meter
CR	-	Coarse Rubble			

CHAPTER 1

INTRODUCTION

1.1 Background

The National Highways Authority of India (NHAI) introduced the Toll, Operate and Transfer (TOT) model for partnership with private developers in the road sector. Under this model, NHAI passes on the toll collection rights and operation and maintenance obligations for 20 years to the private developer against payment of upfront, one-time, lump sum concession fees quoted by the private developer as part of the comprehensive bidding process. Projects under this model are awarded as a bundle of operational national highways, which allows the investor to offset the risks of one project against another. Since existing and operational roads are auctioned under the TOT model.

Under the Toll Operate and Transfer (ToT) 13 bundle, NHAI had invited tenders for selection of concessionaire for maintenance of the National Highway stretch Kota Bypass section NH-27 in the state of Rajasthan.

M/s. IRB Infrastructure Developers Limited., has been declared as the selected bidder for the project. This report is for Part Section ToT bundle 13 “Kota Bypass section NH-27 spanning in the state of Rajasthan. Project Highway alignment is depicted in the following figure.

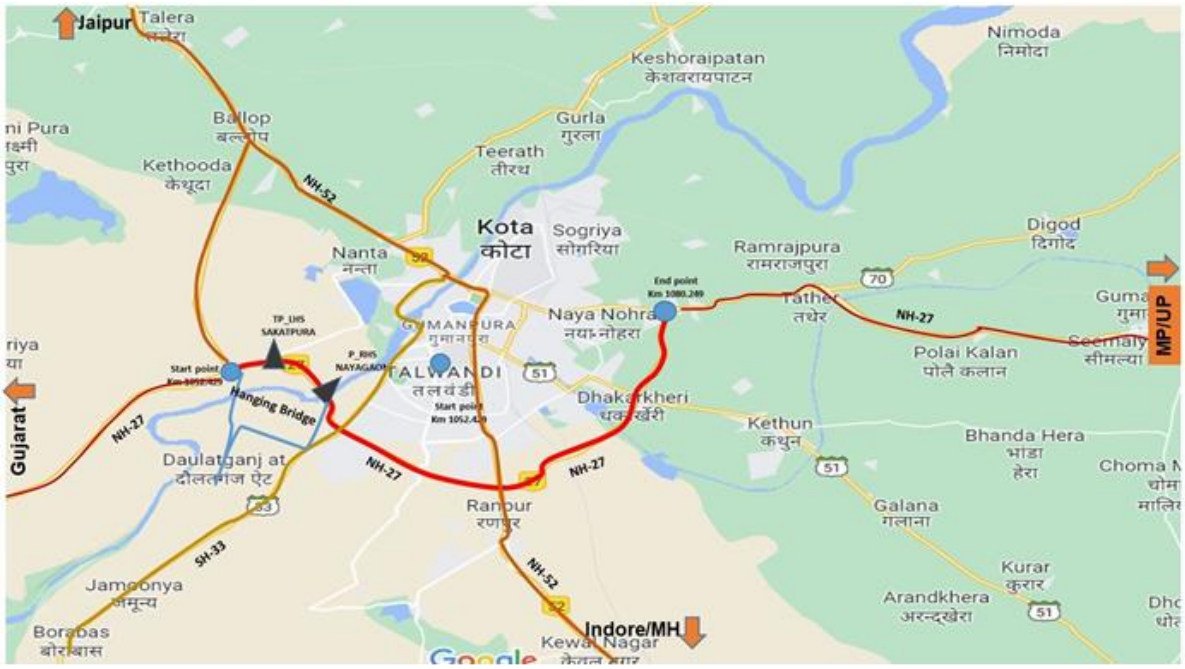


Figure 1-1: Project Stretch of ToT Bundle 13 (Part)

1.2 Objective of the Study

M/s IRB Infrastructure Developers Limited (IRB) intends to develop a traffic study report for Four Laning of Kota Bypass section NH-27 on BOT basis. GMD Consultants have been assigned the work of conducting traffic study and developing revenue model based on traffic projections and forecasts.

1.3 Scope of Services

The following may be referred to as broad scope of Traffic Study of Four Laning of Kota Bypass section NH-27

Classified Traffic Volume Count at the main toll plaza location at Toll Plaza locations. This data was supplied by the Concessionaire.

- Establishment of traffic pattern
- Working our traffic demand elasticity and growth
- Traffic forecast up to concession period.
- Preparation of revenue model up to concession period
- Any other analysis relevant to scope

CHAPTER 2

PROJECT DETAILS

2.1 Project Corridor

The project stretch is a section of NH-44, which is the longest National Highway in the country, running through North, Central and South India. The Kota Bypass section is located along the Project Stretch starting from Km 1052+429 of NH-27 and ends at Km 1080+249 of NH-27 including a Cable-Stayed Bridge on the Chambal River in the State of Rajasthan.

Project Stretch Description

The project stretch under this study starts from Km 1052+429 of NH-27 and ends at Km 1080+249 of NH-27 at Jhansi in the state of Rajasthan. The length of project stretch is 27.820 km and has 4-lane configuration with single staggered of Toll Plaza (Sakatpura (LHS) at ch.1055+217 KM and Nayagaon (RHS) at ch.1058+837 KM).

The following figure shows this the alignment of the project highway in the above context.

Figure 2-1 : Project Alignment with Toll Plaza

CHAPTER 3

TRAFFIC SURVEYS AND ANALYSIS

3.1 Traffic Surveys

The Consultants have collected the required information for the project corridor to understand the general traffic and travel characteristics on the corridor.

The following traffic data has been collected from a client for a project.

- Classified traffic volume counts at toll plaza locations on Kota Bypass section of NH-27- Provided by Concessionaire for year 2023-24,2024-25 and Annual traffic data from April 2025 to February 2026.
- Local Component of traffic
- Component of Return Journey
- Component of Monthly Pass Journey

The main objective of the traffic data analysis is to:

- Determine the existing traffic movement characteristics of the project
- Establish base year traffic
- Identification of travel patterns and modal split of project traffic
- Deriving growth factors for traffic forecasting
- Estimation of corridor traffic including traffic diversion if any
- Preparation of revenue model and projection of revenue as per toll policy for various scenarios

Table 3-1 below lists provides details of locations from where traffic details have been collected.

Table 3-1 : Traffic Data Details

SR. NO	LOCATION	CTV	Single Journey Traffic	Daily Return Journey	Monthly Pass	Local Pass
1	**Km 1055+217 Toll Plaza at Sakatpura (LHS Carriageway), Km 1058+837 Toll Plaza at Nayagaon (RHS Carriageway)**	AADT from previous traffic study report for Year 2023-24 2024-25 & Eleven months from April 2025 to February	AADT from previous traffic study report for Year 2023-24 & Eleven months from April 2025 to February	AADT from previous traffic study report for Year 2023-24 & Eleven months from April 2025 to February	AADT from previous traffic study report for Year 2023-24 & Eleven months from April 2025 to February	AADT from previous traffic study report for Year 2023-24 & Eleven months from April 2025 to February

Toll plaza is located in Rajasthan.

3.2 Classified Traffic Volume

The objective of conducting a Classified Traffic Volume Count is to understand the traffic flow pattern including modal split on a roadway. The Classified Traffic Volume Count survey has been provided by the concessionaire of project highway from actual traffic data gathered at toll plaza locations-based traffic survey done at project stretch.

The vehicles can broadly be classified into fast moving / motorized and slow moving / non-motorized vehicles, which can be further classified into specific categories of vehicles. The groupings of vehicles are further segregated to capture the tollable vehicle categories specifically and toll exempted vehicles are counted separately. The detailed vehicle classification system as per IRC: 64-1990 is given in table below .

Table 3-2 : Vehicle Classification System

Vehicle Type	
Auto Rickshaw	
Passenger Car	Car, Jeep, Taxi & Van (Old / new technology)
Bus	Minibus
	Standard Bus
Truck	Light Goods Vehicle (LCV)
	2 – Axle Truck
	3 Axle Truck (HCV)
	Multi Axle Truck (4-6 Axle)
	Oversized Vehicles (7 or more axles)

Vehicle Type	
Other Vehicles	Agriculture Tractor, Tractor & Trailer

Source - IRC: 64 – 1990

However, since the project highway is currently under toll operation, the data collected corresponds to the category of tollable vehicles. The following are the types of vehicles as per concession agreement.

- Car / Jeep / van
- Minibus /LCV
- Bus
- Truck /
- 3 Axle commercial vehicle
- Multi Axle

3.3 Traffic Characteristic

Toll revenue of project highway does not solely depend on traffic volume. There are certain characteristics of traffic which have substantial potential to affect toll collection. Component of local traffic, component of passenger and commercial traffic, portion of return journey traffic, % of monthly pass traffic are some of such characteristics of traffic. These will be discussed in subsequent sections of report.

3.3.1 Traffic Data

Project concessionaire has provided Annual traffic data from 2024- 25 & traffic data from April 2025 to February 2026.
Since the traffic data available for this update is for only Annual, from April 2025 to February 2026, it may not represent the whole year traffic. Hence a seasonality factor for balance part of year has been applied to average traffic of the current Eleven months to arrive at Annual Average Daily Traffic of base year 2025-26. Thus, corrected traffic is used for future projections and revenue calculations. The following table shows historical traffic on project stretch and derived Annual Average Daily Traffic (AADT) for year 2025-26.

Table 3-3 : Traffic Data at Toll Plaza Sakatpura (Km 1055+217) / Nayagaon (Km 1058+837)

Sr. No	Type of Vehicle	Annual Average Daily Traffic (Nos.) - 2023-24	Annual Average Daily Traffic (Nos.) - 2024-25	Annual Average Daily Traffic (Nos.) - 2025-26
1	Car	3733	2604	3684
2	Minibus /LCV	68	631	767

Sr. No	Type of Vehicle	Annual Average Daily Traffic (Nos.) - 2023-24	Annual Average Daily Traffic (Nos.) - 2024-25	Annual Average Daily Traffic (Nos.) - 2025-26
3	Bus	513	122	195
4	Truck	538	1151	1067
5	3-Axle Commercial vehicle	745	1190	818
6	Multi axle	2493	2880	3018
7	Oversized Vehicles	0	6	7
	Total	**8090**	**8584**	**9555**

3.4 Data Analysis

3.4.1 Analysis of Traffic Volume Count

Understanding the character of existing traffic forms the basis of the traffic forecast. The various vehicle types having different sizes and characteristics can be converted into a single unit called Passenger Car Unit (PCU). Passenger Car equivalents for various vehicles are adopted based on recommendations of Indian Road Congress prescribed in "IRC-64-1990: Guidelines for Capacity of Roads in Rural areas". The adopted passenger car unit values (PCU) are presented in Table 3-4.

Table 3-4 : PCU Factors Adopted for Study

Vehicle Type	PCUs
Car	1.0
Minibus	1.5
Standard Bus	3.0
LCV/LGV	1.5
2 Axle Truck	3.0
3 – 6 Axle Truck	4.5
MAV	4.5

Vehicle Type	PCUs
Auto Rickshaw	1.0
Van/Tempo	1.0
Agriculture Tractor with Trailer	4.5
Agriculture Tractor without Trailer	1.5

Source: IRC: 64-1990

Traffic volume at each toll plaza was converted to PCU and same is presented as under

Table 3-5 : Traffic in PCU at Project Stretch

Year	Toll Plaza Location (Km)	Traffic No.	PCU	PCU Index
2023-2024	Km 1055+217 Toll Plaza at Sakatpura Km 1058+837 Toll Plaza at Nayagaon	8090	19753	2.44
2024-2025	Km 1055+217 Toll Plaza at Sakatpura Km 1058+837 Toll Plaza at Nayagaon	8584	23927	2.79
2025-2026	Km 1055+217 Toll Plaza at Sakatpura Km 1058+837 Toll Plaza at Nayagaon	9555	24684	2.58

It can be observed from above that project traffic has PCU index 2 to 2.6 which is an indicator of high proportion of commercial traffic in traffic mix in project corridors. The following figure illustrates variation of PCU index at four toll plaza locations.

3.4.2 Components of Traffic

As discussed previously, components of traffic volume play an important role in determining project revenue. A larger component of commercial traffic with higher axle configuration adds to project revenue positively. Similarly, a larger component of local traffic affects the project revenue potential negatively.

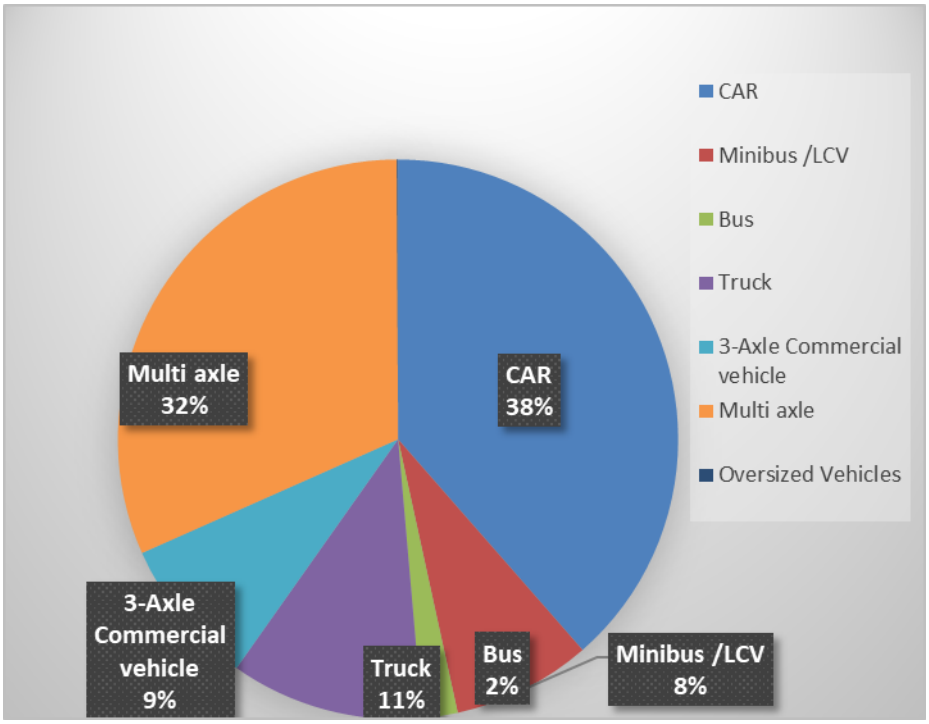


Figure 3-2: Model split of tollable vehicle @ Km 1055+217/ Km 1058+837

It is observed that car traffic forms about 38% of total traffic at toll plaza location KM 1055+217/ Km 1058+837 while multi axle commercial vehicles are about 41% of total traffic. Truck / Bus and LCV share about 13% and 8% of traffic volume respectively.

Another important bifurcation of traffic is components of traffic with respect to various types of toll ticketing like,

1. Single Journey
2. Multi Journey
3. Local Commercial Single Journey
4. Monthly Pass Local
5. Monthly Pass
6. Annual Pass Car

The following table provides numbers of vehicles falling in each of the above categories on base year 2025-26.

Table 3-6 : Journey Type Bifurcation of Traffic at Sakatpura/Nayagaon Toll Plaza KM 1055+217/ Km 1058+837

Sr. No	Type	Traffic Volume (Nos.)
		2025-26
1	Single Journey	5869

Sr. No	Type	Traffic Volume (Nos.)
		2025-26
2	Return Journey	2216
3	Local Commercial Single Journey	108
4	Monthly Pass Local	2
5	Monthly Pass	0
6	Annual Pass Car	1361

3.5 Secondary Data Collection

There are several other factors which have a substantial impact on traffic patterns and growth on any project corridor. The following are some of such important factors.

- Industrial development around project corridor and its catchment
- Educational infrastructure along project corridor
- Demographic pattern
- Urban area development
- Tourism potential
- Upcoming major infrastructural or Industrial projects
- Special Industry in project corridor
- Overall trends of economic growth local as well as national / regional

Hence in addition to traffic details on the project site, secondary data was also collected from various other sources. Typical secondary data includes the following:

1. Vehicle registration data of regional and national level.
2. Economic Data
   a) GDP
   b) NSDP
   c) Population Growth
   d) Per Capita Income growth
   e) Industrial Growth
   f) Special Industry Potential
   g) Regional and National development vision / plan
   h) Any other relevant data
3. Competing road network

We have collected and utilized such underlying data in the study to estimate the growth and risk factors for traffic along the project corridor. The same is discussed in subsequent chapter.

CHAPTER 4

INFLUENCE ZONE TRANSPORT NETWORK ANALYSIS

4.1 Introduction

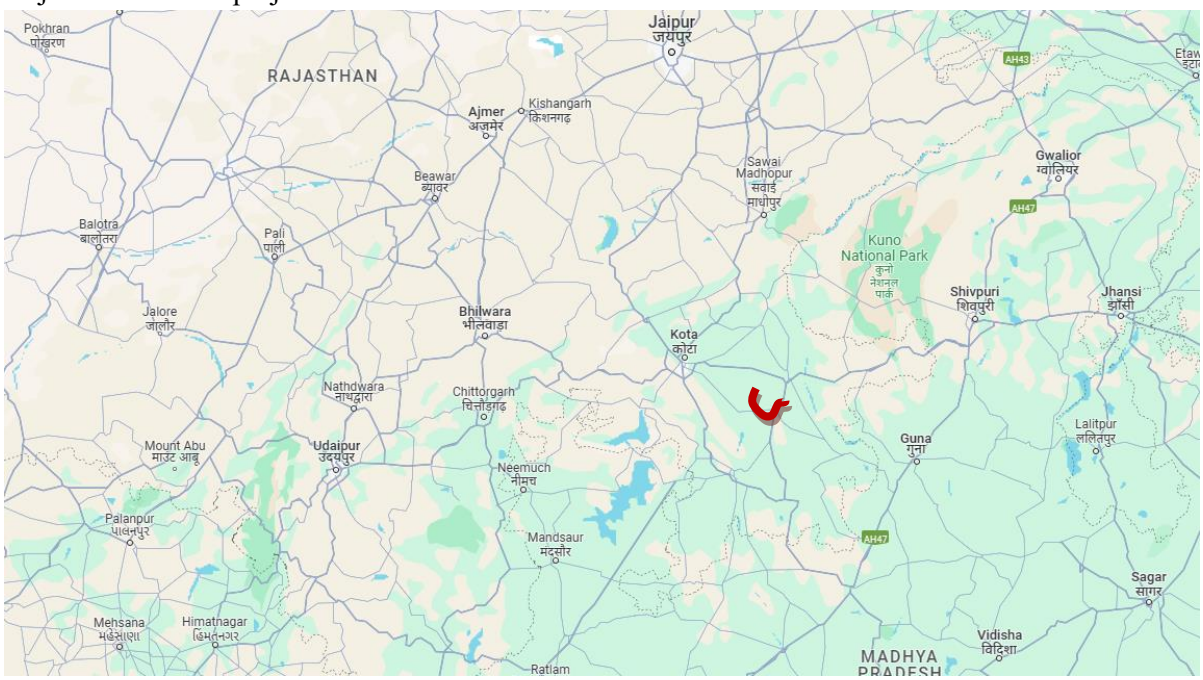
Highway corridors behave like integrated circuit networks and more often than not every road is connected to various networks having different origins and destinations. Traffic running on these networks behaves like fluid and flow on network on alignment of least friction.

The following Factors can be considered as major contributors to friction on transportation network.

- Travel Speed / Travel Time
- Geometric deficiencies like blind horizontal curves and steep vertical gradients etc.
- Configuration of road
- Riding quality
- Traffic delays,
- Length of road,
- Passing through built up or Urban Area,
- Terrain,
- Facilities,

4.2 Regional Network

Kota Bypass is part of NH-27 which is major East – West connectivity in India. As can be seen from the data made available that most of the traffic on Kota Bypass is either local in nature or is part of the East – West connectivity corridor. Gwalior, Chittorgarh, Jhalawar, Bhilwara areas have major influence on project traffic.



In such a case upcoming corridors like Delhi Mumbai Expressway or Mumbai Vadodara Expressway or DFCC which basically cater for North -South connectivity, are not expected to have any substantial impact on project road traffic.

Delhi – Mumbai Expressway - The access controlled greenfield expressway connects Delhi and Mumbai (up to Jawaharlal Nehru Port Trust) and passes through states of Haryana, Rajasthan, Madhya Pradesh, Gujarat and Maharashtra. DME alignment will largely cater to traffic between North of India and Gujarat/Western Maharashtra and is not likely to affect traffic on the project road which caters to traffic on East – West connectivity and local traffic.

CHAPTER 5

GROWTH OF TRAFFIC ON PROJECT HIGHWAY

5.1 Introduction

Traffic growth is a function of the interplay of a number of contributory factors such as National economy, Government policy, socio-economic conditions of the people, and changes in land uses along the project corridor precincts etc. As these factors have a number of uncertainties associated with them, forecasts of traffic are dependent on the projections of other factors such as population, gross domestic product (GDP), vehicle ownership, per capita income (PCI), agricultural output, fuel consumption etc. Future patterns of change in these factors can be estimated with only a reasonable degree of accuracy and hence the resultant traffic forecast levels may not be precise.

Traffic growth forecast for project corridor of Kota Bypass from Km 1052+429 to Km 1080+249 section of NH-27 has been done taking the above factors into consideration. "**IRC: 108-2015-Guidelines for Traffic Prediction on Rural Highways**" is established best practice and has been used for traffic growth forecast.

5.2 Trend Analysis

One of the methods of estimation of future rate of growth is to assume the same rate of growth as in the past. Although such a method is more suitable for projects of short durations say 5-10 years, however for long term projections it would be erroneous to assume that the past rate of growth will continue to prevail for a long time in future. Economic conditions, which are major influencing factors, are bound to change over a long period of time. Thus, it would be necessary to modify the past trends of growth suitably.

Elasticity model of growth projection is one of the most widely acceptable methods for traffic forecast. The same is recommended in **IRC: 108-12015-Guidelines for Traffic Prediction on Rural Highways**.

In this method the past trend of vehicular data is paired with an economic indicator and a regression analysis is done to yield the economic model of growth. Growth of vehicle traffic varies for different types of vehicles. It is a proven fact that the growth pattern for passenger and goods vehicle is different. Traffic growth on any highway typically depends on a number of economic parameters. Most important and direct parameters are given as under

- Per Capita Income
- Net State Domestic Product (NSDP)
- Population

It can be observed that the ownership of a car is more closely related to affordability; hence per capita is the index which closely fits the growth of car traffic among other criteria. In a similar fashion, the following can be pairs of vehicle type and independent variable for elasticity modeling of growth.

- Car / Jeep – Par Capita Income
- Bus / Minibus – Population
- Goods Vehicle – NSDP

5.3 Estimation of Traffic Demand Elasticity

Elasticity of traffic demand is defined as the rate at which traffic intensity varies due to a change in the corresponding indicator selected. Hence, In order to estimate the elasticity of traffic demand, it is necessary to establish relationship between the growth in number of given category of vehicles with the relevant economic variable considered, such as NSDP, per capita income and population growth. Latest available data for vehicle registration, per capita income, NSDP and population is used in analysis.

As per IRC: 108-1996 the model for estimating elasticity index for the project corridor is of the following form and is given as below:

Log (P) = k x Log (EI) + A

Where,

P = Number of Vehicles (Mode wise)

EI = Economic Indicator

A = Regression constant

k = Elasticity coefficient (Regression coefficient)

The elasticity for car and bus (passenger vehicles) is calculated based on the Population and Per Capita Domestic Product (PCDP) and the elasticity for trucks is calculated based on the Net State Domestic Product (NSDP).

The project corridor spreads across state of Rajasthan. Toll plazas at Sakatpura and Nayagaon in the state of Rajasthan. Project traffic has share of majorly states like Rajasthan, Madhya Pradesh, Uttar Pradesh, Gujrat and Delhi. For elasticity calculations, working data from these states also has been analysed.

The following tables and graphs depict regression and elasticity of growth model for stretch falling in Rajasthan State.

Table 5-1 : Per Capita Income Vs Car Rajasthan

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth (8 Year)
2011	57192	591069	4.76	5.77		
2012	58441	659542	4.77	5.82	2%	
2013	61053	733916	4.79	5.87	4%	
2014	64496	814079	4.81	5.91	6%	
2015	68565	899307	4.84	5.95	6%	
2016	71324	988391	4.85	5.99	4%	
2017	73109	1095526	4.86	6.04	3%	
2018	75555	1204005	4.88	6.08	3%	4.1%

Regression analysis of same is given in figure below.

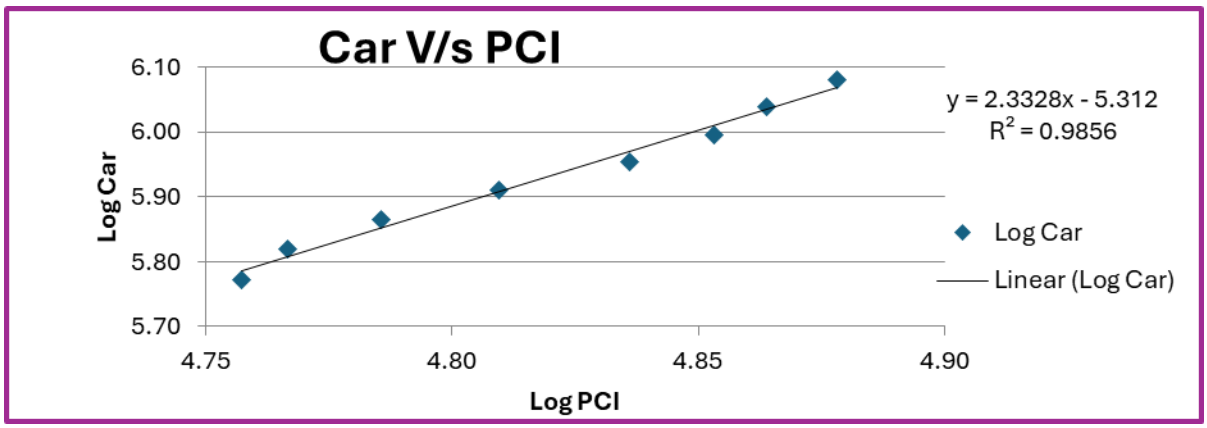


Figure 5-1 : Regression and Elasticity PCI vs. Car – Extrapolation Rajasthan

Table 5-2 : Population Vs Bus Rajasthan

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth (8 Year)
2011	68548000	83345	7.84	4.92		
2012	69687000	88616	7.84	4.95	2%	
2013	70825000	93892	7.85	4.97	2%	
2014	71963000	97650	7.86	4.99	2%	
2015	73102000	102818	7.86	5.01	2%	
2016	74240000	108680	7.87	5.04	2%	
2017	75248000	113964	7.88	5.06	1%	
2018	76256000	118301	7.88	5.07	1%	1.5%

Regression analysis of same is given in figure below.

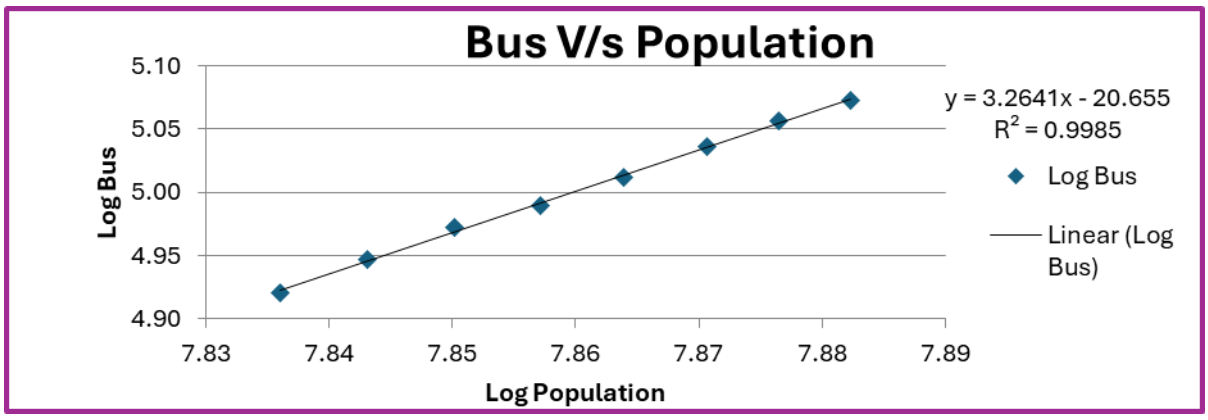


Figure 5-2 : Regression and Elasticity Population vs. Bus – Extrapolation Rajasthan

Elasticity of Trucks has been worked out by regression analysis with NSDP. The following table represents the data and details.

Table 5-3 : Trucks Vs NSDP Rajasthan

Year	NSDP	Trucks	Log NDSP	Log Truck	NSDP Growth	Average Growth (8 Year)
2011	39533093	362028	7.60	5.56		
2012	40980249	401983	7.61	5.60	4%	
2013	43429222	434379	7.64	5.64	6%	
2014	46540773	472365	7.67	5.67	7%	
2015	50192151	517604	7.70	5.71	8%	
2016	52965038	561158	7.72	5.75	6%	
2017	55442912	613055	7.74	5.79	5%	
2018	58059438	665926	7.76	5.82	5%	5.7%

The following figure depicts regression analysis and extrapolation.

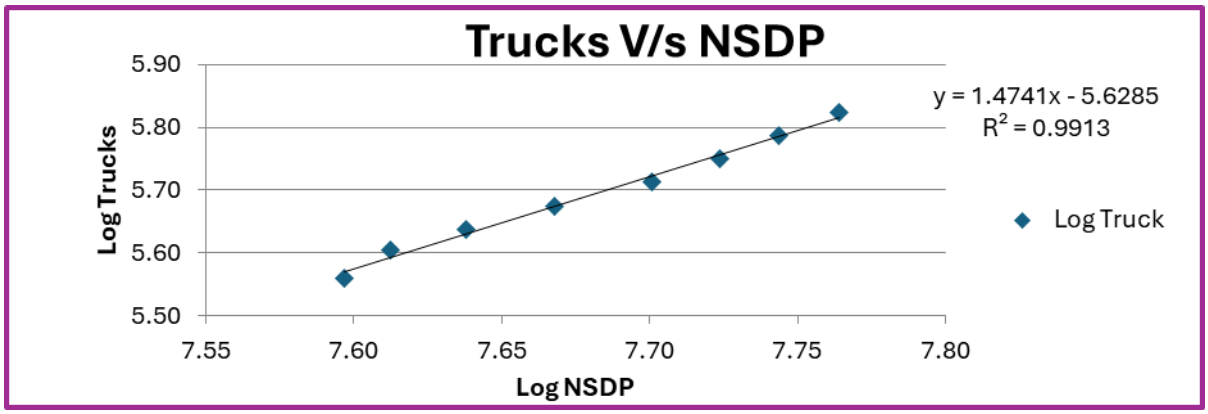


Figure 5-3 : Regression and Elasticity NSDP vs. Trucks Traffic - extrapolation Rajasthan.

Using the regression analysis above, we have arrived at the elasticity of traffic demand for each class of vehicle to a given change in relevant economic indicators. Average traffic growth of a vehicle class is multiplied by the corresponding elasticity coefficient to arrive at traffic growth. R2 statistical measure of how close the data are to the fitted regression line. It varies from 0 to 1. The higher the value of R2 more representative is the regression model of data.

The results of these analyses for *the good fit* regression as reflected by R^2 values are presented in the Table below.

Table 5-4 : Summary Regression Analysis Rajasthan

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average Growth (8yrs)	Growth Elastic Model	Remarks
RAJASTHAN	**Car/Jeep**	PCI	y = 2.3328x - - 5.312	R^2 = 0.9856	2.3328	4.07%	9.49%	Good Regression
	Bus	Population	y = 3.2641x - - 20.6548	R^2 = 0.9985	3.2641	1.53%	5.01%	Good Regression
	Truck	NSDP	y = 1.4741x - - 5.6285	R^2 = 0.9913	1.4741	5.65%	8.33%	Good Regression

The following tables and graphs depict regression and elasticity of growth model for stretch falling in Madhya Pradesh State.

Table 5-5 : Per Capita Income Vs Car Madhya Pradesh

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth (8 Year)
2011	38497	424644	4.59	5.63		
2012	41142	493412	4.61	5.69	7%	
2013	42548	555461	4.63	5.74	3%	
2014	44027	637626	4.64	5.80	3%	
2015	47351	820391	4.68	5.91	8%	
2016	52782	869777	4.72	5.94	11%	
2017	54829	982124	4.74	5.99	4%	
2018	57401	1087124	4.76	6.04	5%	5.9%

Regression analysis of same is given in figure below.

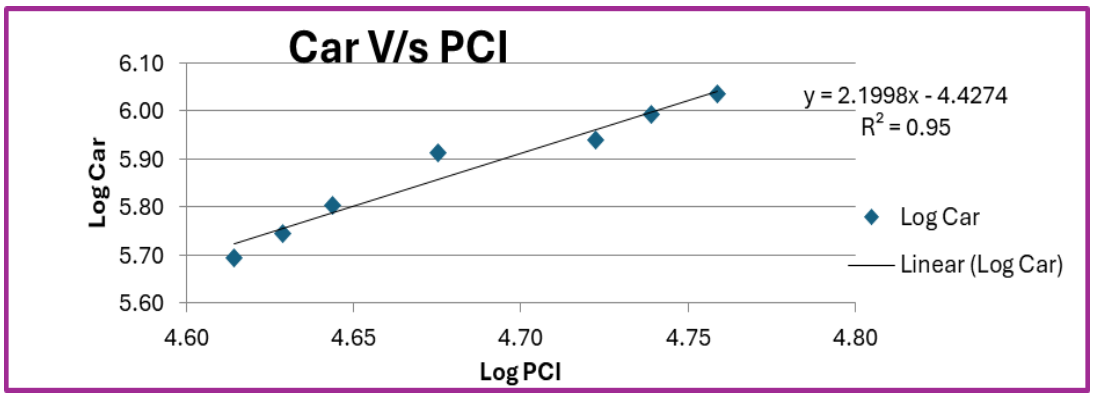


Figure 5-4 : Regression and Elasticity PCI vs. Car – Extrapolation Madhya Pradesh

Table 5-6 : Population Vs Bus Madhya Pradesh

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth (8 Year)
2011	72627000	181770	7.86	5.26		
2012	73863000	208530	7.87	5.32	2%	
2013	75099000	233569	7.88	5.37	2%	
2014	76334000	277898	7.88	5.44	2%	
2015	77570000	322227	7.89	5.51	2%	
2016	78806000	347227	7.90	5.54	2%	
2017	79948000	382227	7.90	5.58	1%	
2018	81090000	402227	7.91	5.60	1%	1.6%

Regression analysis of same is given in figure below.

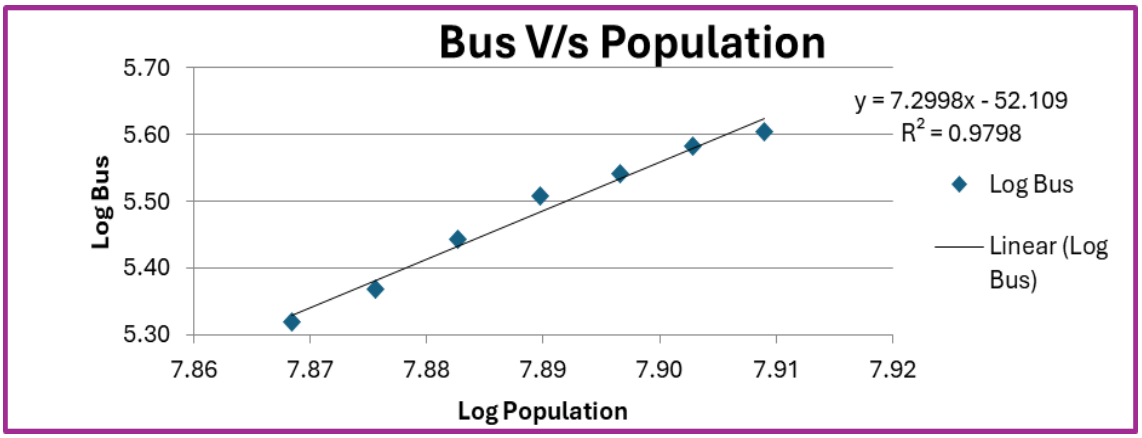


Figure 5-5 : Regression and Elasticity Population vs. Bus – Extrapolation Madhya Pradesh

Elasticity of Trucks has been worked out by regression analysis with NSDP. The following table represents the data and details.

Table 5-7 : Trucks Vs NSDP Madhya Pradesh

Year	NSDP	Trucks	Log NDSP	Log Truck	NSDP Growth	Average Growth (8 Year)
2011	28237104	121916	7.45	5.09		
2012	30685334	131098	7.49	5.12	9%	
2013	32259760	137815	7.51	5.14	5%	
2014	33924690	150921	7.53	5.18	5%	
2015	37071567	177352	7.57	5.25	9%	
2016	41946525	233553	7.62	5.37	13%	
2017	44200243	289754	7.65	5.46	5%	
2018	46928896	326291	7.67	5.51	6%	7.6%

The following figure depicts regression analysis and extrapolation.

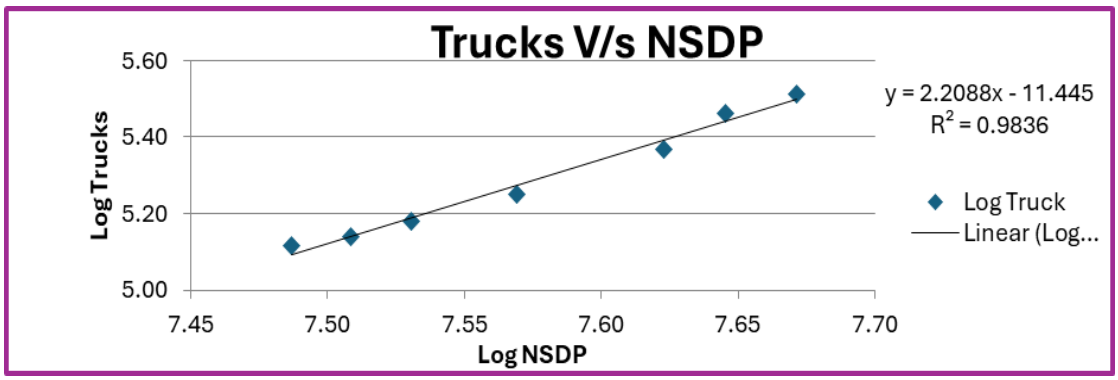


Figure 5-6 : Regression and Elasticity NSDP vs. Trucks Traffic - extrapolation Madhya Pradesh.

Using the regression analysis above, we have arrived at the elasticity of traffic demand for each class of vehicle to a given change in relevant economic indicators. Average traffic growth of a vehicle class is multiplied by the corresponding elasticity coefficient to arrive at traffic growth. R2 statistical measure of how close the data are to the fitted regression line. It varies from 0 to 1. The higher the value of R2 more representative is the regression model of data.

The results of these analyses for *the good fit* regression as reflected by R^2 values are presented in the Table below.

Table 5-8 : Summary Regression Analysis Madhya Pradesh

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average Growth (8yrs)	Growth Elastic Model	Remarks
MADHYA PRADESH	**Car/Jeep**	PCI	y = 2.2965x - - 4.8829	R^2 = 0.9634	2.3	6%	13.57%	Good Regression
	Bus	Population	y = 7.4978x - - 53.6722	R^2 = 0.9862	7.5	2%	11.90%	Good Regression
	Truck	NSDP	y = 2.2088x - - 11.4451	R^2 = 0.9694	2.2	8%	16.70%	Good Regression

The following tables and graphs depict regression and elasticity of growth model for stretch falling in Uttar Pradesh State.

Table 5-9 : Per Capita Income Vs Car Uttar Pradesh

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth (8 Year)
2011	32002	1108100	4.51	6.04		
2012	32908	1205374	4.52	6.08	3%	
2013	34044	1423020	4.53	6.15	3%	
2014	34583	1572217	4.54	6.20	2%	
2015	36973	1746117	4.57	6.24	7%	
2016	40847	2027972	4.61	6.31	10%	
2017	41832	2195783	4.62	6.34	2%	
2018	43670	2439845	4.64	6.39	4%	4.6%

Regression analysis of same is given in figure below.

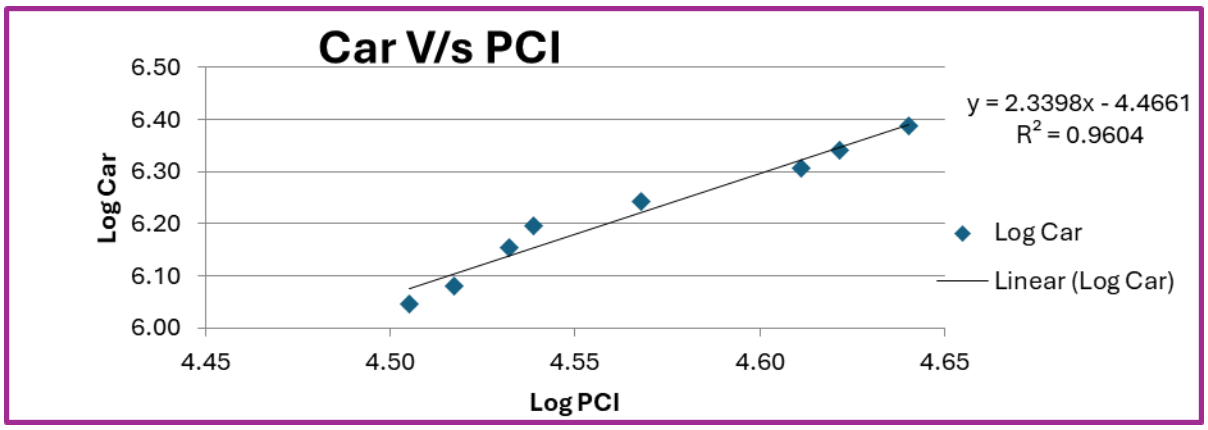


Figure 5-7 : Regression and Elasticity PCI vs. Car – Extrapolation Uttar Pradesh

Table 5-10 : Population Vs Bus Uttar Pradesh

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth (8 Year)
2011	199812000	57901	8.30	4.76		
2012	203670000	64147	8.31	4.81	2%	
2013	206322000	74389	8.31	4.87	1%	
2014	209577000	80460	8.32	4.91	2%	
2015	212832000	89127	8.33	4.95	2%	
2016	216870000	112020	8.34	5.05	2%	
2017	219510000	112766	8.34	5.05	1%	
2018	222150000	121975	8.35	5.09	1%	1.5%

Regression analysis of same is given in figure below.

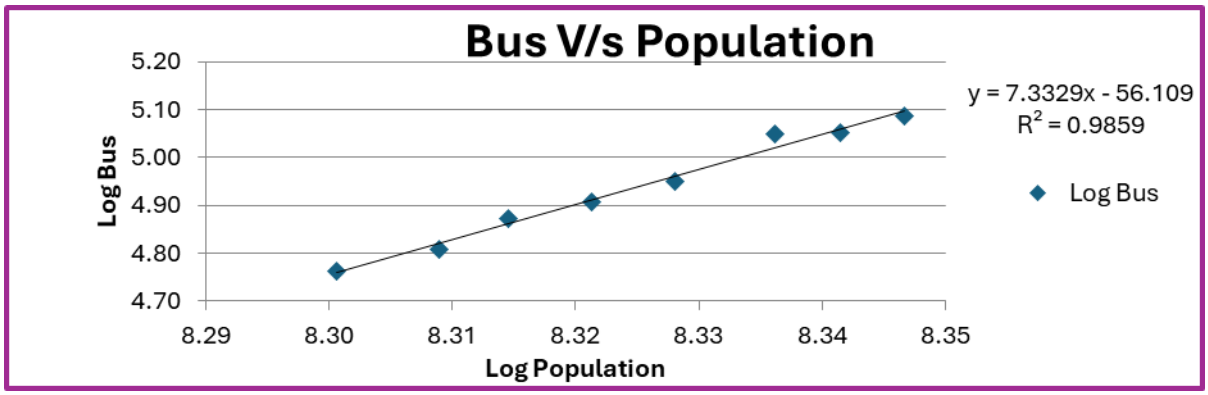


Figure 5-8 : Regression and Elasticity Population vs. Bus – Extrapolation Uttar Pradesh

Elasticity of Trucks has been worked out by regression analysis with NSDP. The following table represents the data and details.

Table 5-11 : Trucks Vs NSDP Uutar Pradesh

Year	NSDP	Trucks	Log NDSP	Log Truck	NSDP Growth	Average Growth (8 Year)
2011	64513155	162813	7.81	5.21		
2012	67355218	186404	7.83	5.27	4%	
2013	70746910	202761	7.85	5.31	5%	
2014	72968630	217609	7.86	5.34	3%	
2015	79204874	245688	7.90	5.39	9%	
2016	88845325	265167	7.95	5.42	12%	
2017	92380571	307096	7.97	5.49	4%	
2018	97915937	356828	7.99	5.55	6%	6.2%

The following figure depicts regression analysis and extrapolation.

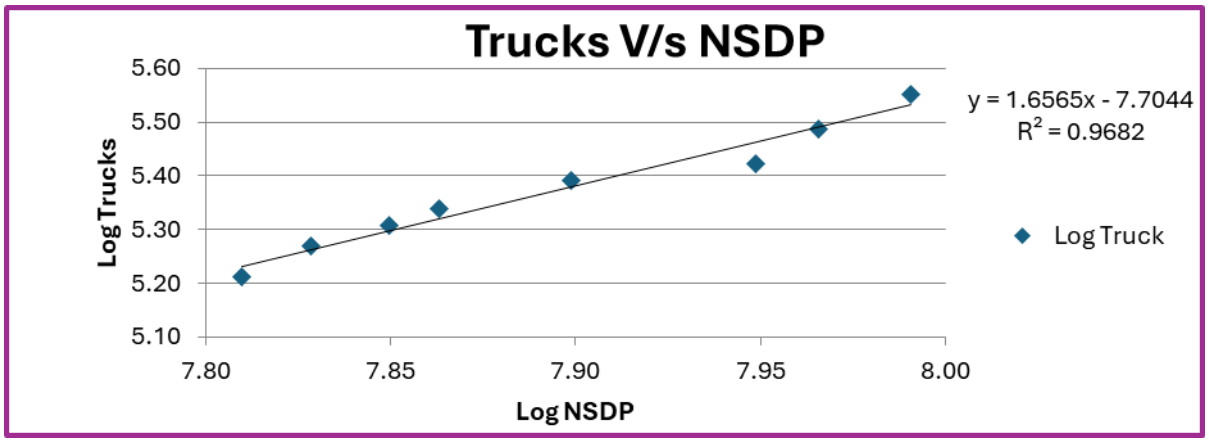


Figure 5-9 : Regression and Elasticity NSDP vs. Trucks Traffic - extrapolation Uttar Pradesh.

Using the regression analysis above, we have arrived at the elasticity of traffic demand for each class of vehicle to a given change in relevant economic indicators. Average traffic growth of a vehicle class is multiplied by the corresponding elasticity coefficient to arrive at traffic growth. R2 statistical measure of how close the data are to the fitted regression line. It varies from 0 to 1. The higher the value of R2 more representative is the regression model of data.

The results of these analyses for *the good fit* regression as reflected by R^2 values are presented in the Table below.

Table 5-12 : Summary Regression Analysis Uttar Pradesh

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average Growth (8yrs)	Growth Elastic Model	Remarks
UTTAR PRADESH	**Car/Jeep**	PCI	y = 2.3398x - - 4.4661	R^2 = 0.9604	2.3398	4.58%	10.72%	Good Regression
	Bus	Population	y = 7.3329x - - 56.1092	R^2 = 0.9859	7.3329	1.53%	11.19%	Good Regression
	Truck	NSDP	y = 1.6565x - - 7.7044	R^2 = 0.9682	1.6565	6.18%	10.24%	Good Regression

The following tables and graphs depict regression and elasticity of growth model for stretch falling in Gujrat State.

Table 5-13 : Per Capita Income Vs Car Gujrat

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth (8 Year)
2011	87481	1411898	4.94	6.15		
2012	96683	1602129	4.99	6.20	11%	
2013	102589	1771298	5.01	6.25	6%	
2014	111370	2008748	5.05	6.30	9%	
2015	120683	2260084	5.08	6.35	8%	
2016	129738	2527537	5.11	6.40	8%	
2017	143604	2794957	5.16	6.45	11%	
2018	154887	3011656	5.19	6.48	8%	8.5%

Regression analysis of same is given in figure below.

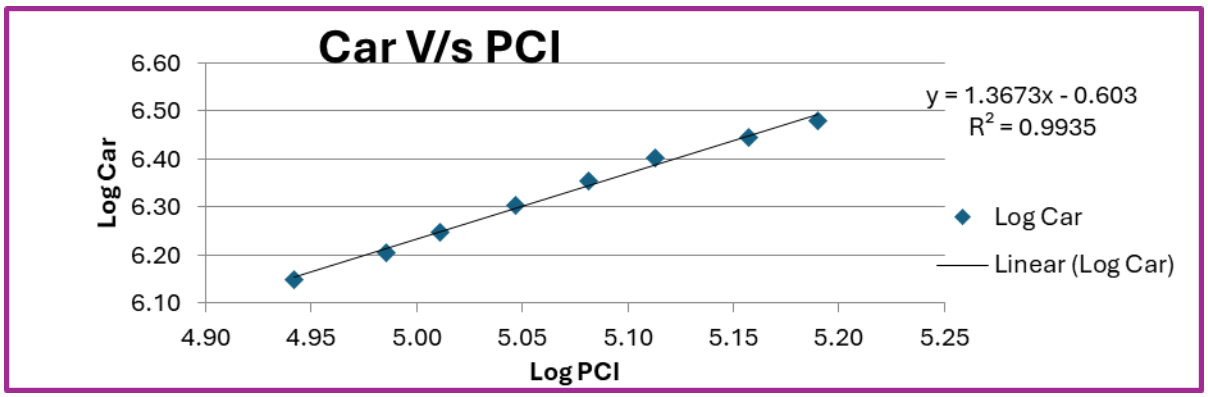


Figure 5-10 : Regression and Elasticity PCI vs. Car – Extrapolation Gujrat

Table 5-14 : Population Vs Bus Gujrat

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth (8 Year)
2011	60440000	67546	7.78	4.83		
2012	61383000	70615	7.79	4.85	2%	
2013	62327000	72998	7.79	4.86	2%	
2014	63271000	76435	7.80	4.88	2%	
2015	64214000	82734	7.81	4.92	1%	
2016	65158000	81911	7.81	4.91	1%	
2017	66084000	81087	7.82	4.91	1%	
2018	67010000	86156	7.83	4.94	1%	1.5%

Regression analysis of same is given in figure below.

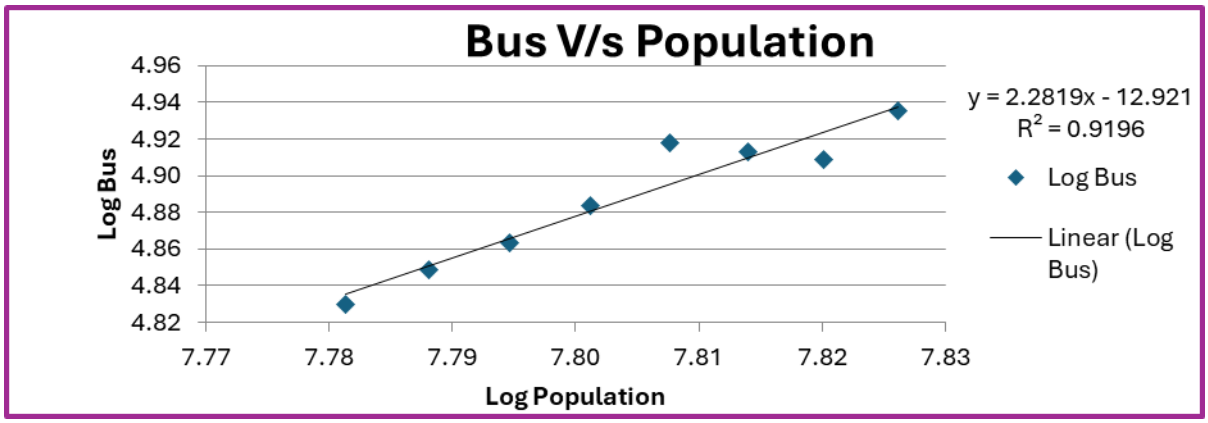


Figure 5-11 : Regression and Elasticity Population vs. Bus – Extrapolation Gujrat

Elasticity of Trucks has been worked out by regression analysis with NSDP. The following table represents the data and details.

Table 5-15 : Trucks Vs NSDP Gujrat

Year	NSDP	Trucks	Log NDSP	Log Truck	NSDP Growth	Average Growth (8 Year)
2011	53280946	301533	7.73	5.48		
2012	59665883	319207	7.78	5.50	12%	
2013	64148881	332185	7.81	5.52	8%	
2014	70562884	352225	7.85	5.55	10%	
2015	77477522	375265	7.89	5.57	10%	
2016	84393034	396061	7.93	5.60	9%	

Year	NSDP	Trucks	Log NDSP	Log Truck	NSDP Growth	Average Growth (8 Year)
2017	94651119	425799	7.98	5.63	12%	
2018	103439901	457299	8.01	5.66	9%	10.0%

The following figure depicts regression analysis and extrapolation.

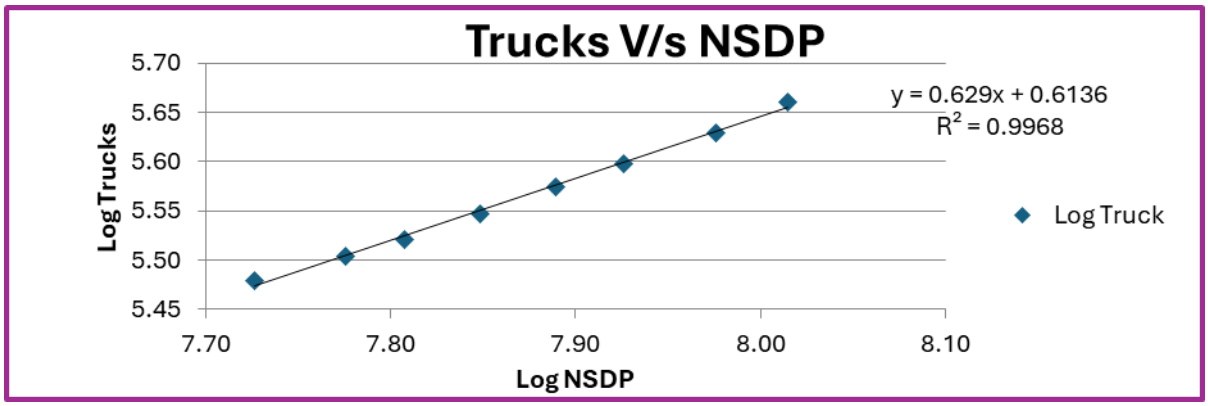


Figure 5-12 : Regression and Elasticity NSDP vs. Trucks Traffic - extrapolation Gujrat.

Using the regression analysis above, we have arrived at the elasticity of traffic demand for each class of vehicle to a given change in relevant economic indicators. Average traffic growth of a vehicle class is multiplied by the corresponding elasticity coefficient to arrive at traffic growth. R2 statistical measure of how close the data are to the fitted regression line. It varies from 0 to 1. The higher the value of R2 more representative is the regression model of data.

The results of these analyses for *the good fit* regression as reflected by R^2 values are presented in the Table below.

Table 5-16 : Summary Regression Analysis Gujrat

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average Growth (8yrs)	Growth Elastic Model	Remarks
GUJRAT	**Car/Jeep**	PCI	y = 1.3673x - - 0.603	R^2 = 0.9935	1.3673	8.51%	11.64%	Good Regression
	Bus	Population	y = 2.2819x - - 12.9206	R^2 = 0.9196	2.2819	1.49%	3.39%	Good Regression
	Truck	NSDP	y = 0.629x - 0.6136	R^2 = 0.9968	0.6290	9.95%	6.26%	Good Regression

The following tables and graphs depict regression and elasticity of growth model for stretch falling in Delhi State.

Table 5-17 : Per Capita Income Vs Car Delhi

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth (8 Year)
2011	185001	2172069	5.27	6.34		
2012	192220	2416974	5.28	6.38	4%	
2013	200702	2568380	5.30	6.41	4%	
2014	213669	2730071	5.33	6.44	6%	
2015	233115	2986579	5.37	6.48	9%	
2016	244255	3061817	5.39	6.49	5%	
2017	252960	3087309	5.40	6.49	4%	
2018	260967	3249670	5.42	6.51	3%	5.1%

Regression analysis of same is given in figure below.

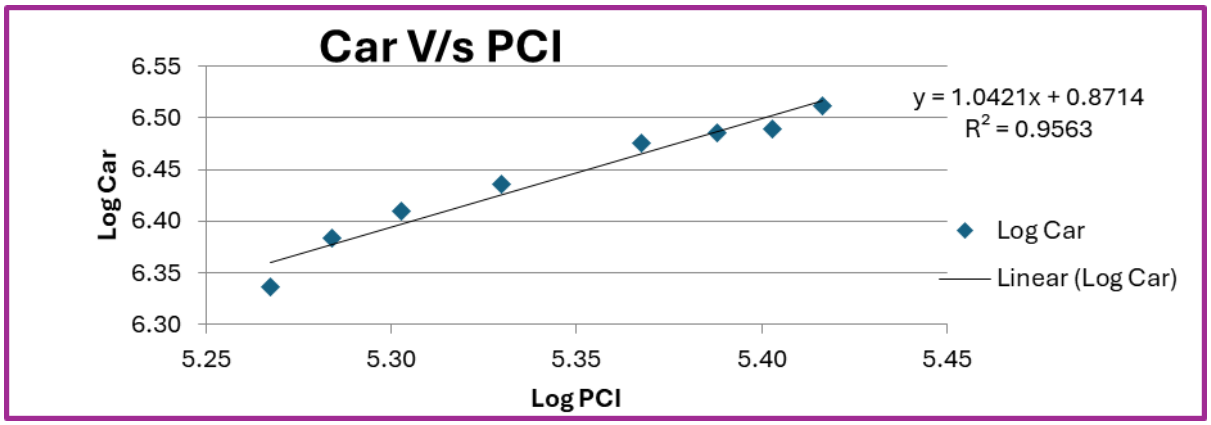


Figure 5-13 : Regression and Elasticity PCI vs. Car – Extrapolation Delhi

Table 5-18 : Population Vs Bus Delhi

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth (8 Year)
2011	16788000	20142	7.22	4.30		
2012	17166000	24642	7.23	4.39	2%	
2013	17544000	28142	7.24	4.45	2%	
2014	17921000	33342	7.25	4.52	2%	
2015	18299000	43723	7.26	4.64	2%	
2016	18677000	51823	7.27	4.71	2%	
2017	19056000	61023	7.28	4.79	2%	
2018	19435000	71043	7.29	4.85	2%	2.1%

Regression analysis of same is given in figure below.

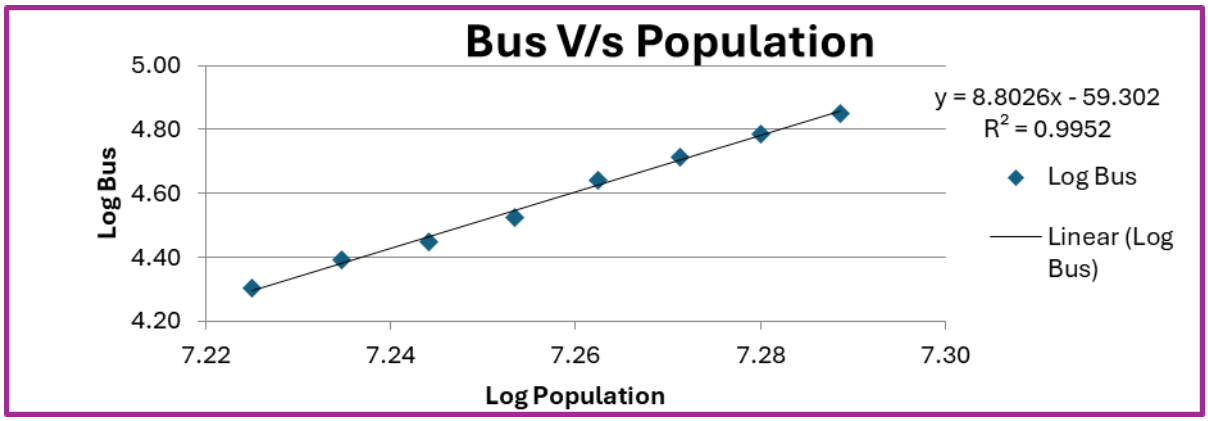


Figure 5-14 : Regression and Elasticity Population vs. Bus – Extrapolation Delhi

Elasticity of Trucks has been worked out by regression analysis with NSDP. The following table represents the data and details.

Table 5-19 : Trucks Vs NSDP Delhi

Year	NSDP	Trucks	Log NDSP	Log Truck	NSDP Growth	Average Growth (8 Year)
2011	31465002	149277	7.50	5.17		
2012	33419330	157277	7.52	5.20	6%	
2013	35652751	165477	7.55	5.22	7%	
2014	38763874	174577	7.59	5.24	9%	
2015	43172959	185027	7.64	5.27	11%	
2016	46159238	196527	7.66	5.29	7%	
2017	48763115	208417	7.69	5.32	6%	
2018	51295715	220417	7.71	5.34	5%	7.2%

The following figure depicts regression analysis and extrapolation.

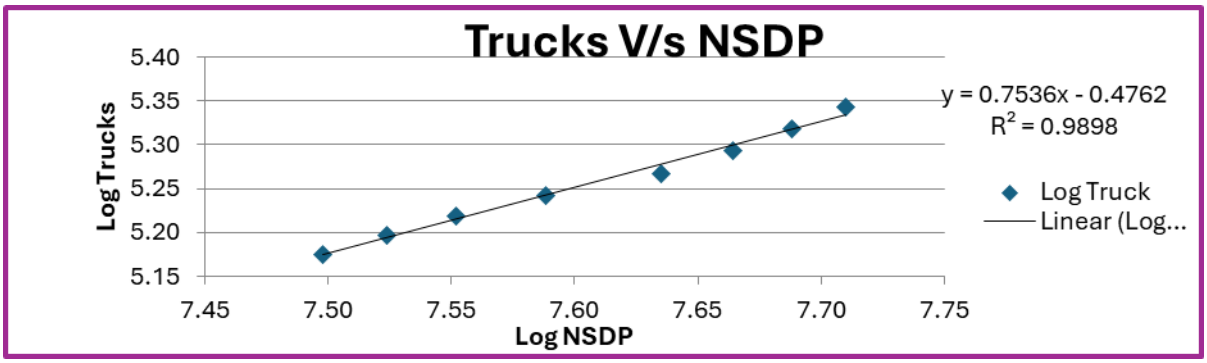


Figure 5-15 : Regression and Elasticity NSDP vs. Trucks Traffic - extrapolation Delhi.

Using the regression analysis above, we have arrived at the elasticity of traffic demand for each class of vehicle to a given change in relevant economic indicators. Average traffic growth of a vehicle class is multiplied by the corresponding elasticity coefficient to arrive at traffic growth. R2 statistical measure of how close the data are to the fitted regression line. It varies from 0 to 1. The higher the value of R2 more representative is the regression model of data.

The results of these analyses for *the good fit* regression as reflected by R^2 values are presented in the Table below.

Table 5-20 : Summary Regression Analysis Delhi

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average Growth (8yrs)	Growth Elastic Model	Remarks
DELHI	**Car/Jeep**	PCI	y = 1.0421x - 0.8714	R^2 = 0.9563	1.0421	5.05%	5.27%	Good Regression
	Bus	Population	y = 8.8026x - - 59.3021	R^2 = 0.9952	8.8026	2.11%	18.61%	Good Regression
	Truck	NSDP	y = 0.7536x - - 0.4762	R^2 = 0.9898	0.7536	7.25%	5.46%	Good Regression

Economical model for predicting growth is good tool, however other local, regional, national factors should also be considered before finalizing growth factors. Considering factors such as proposed developments and other influencing economic factors, moderated growth should be considered. These factors are discussed in subsequent sections.

5.4 Analysis of Historic Traffic Data

Historical traffic data forms useful information for any highway project. It provides useful information for establishing past trend of growth. Project stretch of Kota Bypass has recently been awarded to Concessionaire. Hence credible historical traffic data is currently not available.

5.5 Other Factors Influencing Growth

There are many factors which have an impact on traffic growth. As discussed previously these factors can be economical, social, educational, and industrial.

Potentiality of such factors for project highway is discussed as under.

ECONOMY

After witnessing a slowdown during 2011-12, the economy recovered in 2013-14, and a high growth rate of GDP was recorded up to 2018-19. Pandemic of COVID-19 impacted all economies of world including India up to year 2021-22. Following figure show trend of GDP growth in India.

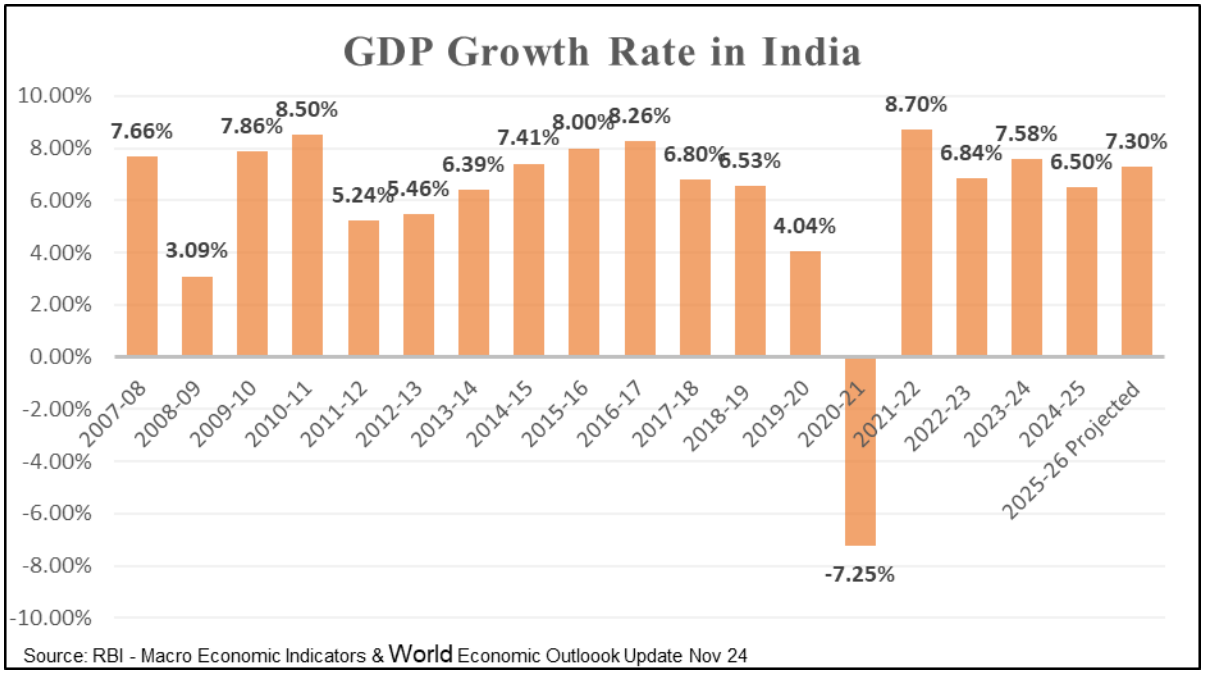


Figure 5-16 : Growth of GDP in India

FY 2017-18 recorded a growth of 6.7% which had a slight impact of GST and demonetization. Indian economy appears on recovery path with estimated growth of 6.8% in FY 2018-19. The government took major policy decisions including tax infrastructure reforming, banking sector improvement and ease of doing business.

In post COVID-19 scenario, in year 2022-23 and 2023-24 India registered an impressive growth of 7% to 7.5%. In last year despite global slow down due to Russia-Ukraine war and Gaza crises, India grew at good rate of 7%(Estimated).
Indian economy is now on good growth path and all major institutions including IMF / ADB have estimated growth of Indian Economy to peg around 6.5% to 7% in coming years.

5.6 Developments along and around the Project Corridor & State

RAJASTHAN: Rajasthan is a state where tradition and glory meet in the midst of colours. It is endowed with magnificent forts, palaces, havellies, natural resources, heritage, beauty and culture. With the lofty hills of Aravali-one of the oldest mountain ranges of the world and the golden sand dunes of the Great Indian Desert, Rajasthan is the only desert of the sub-continent. Rajasthan is located in the north-western region of India. It is the largest State in the Republic of India. It forms a corridor between the northern and the western states in the country.

KOTA DISTRICT: Kota district is one of the fifty districts of Rajasthan state. Kota is also the educational headquarters of this state. The town is considered as the Coaching Centre Hub of India.

Overall Rajasthan has 11th rank in India in terms of GDP. The state economy has shown promising growth in the past year in the range of 8-9% and it is expected that this would continue to grow in the same pattern and would contribute to growth of economy of country and region.

From the above it can be expected that the project corridor would serve as one of the important transportation links in the area and would contribute to the growth of the region.

5.7 Recommended Growth Rates of Traffic

Based on the above analysis and after giving due consideration to the entire listed factors, the following overall growth rates are recommended for each category of vehicle as under. Rate of growth is moderated in light of overall regional trend. Growth of Multi-Axle is kept slightly higher as trend of technological advances in logistic industry Favors multi-axle over 2/3 axle carriage. It is also expected that as the economy moves from developing to developed, rate of growth diminishes. Same growth rate is not sustainable for long. Traffic growth has been suitably stepped down for future years.

Growth rates are recommended for three scenarios for sensitivity analysis namely **Optimistic, Pessimistic** and **Most Likely** with a positive and negative variation 0.25% from Most Likely case for corridor in both states.

5.7.1 Recommended Growth Rates of Stretch

Table 5-21 : Recommended Growth Rates Optimistic

Category / Year	FY 2027-2029	FY 2030-2034	FY 2035-2039	FY 2040-2045	FY 2046-2050
Car/Jeep/Van	8.48%	7.48%	6.62%	6.39%	5.51%
Bus	4.09%	2.58%	2.36%	2.14%	1.94%
Minibus	4.09%	2.58%	2.36%	2.14%	1.94%
LCV	4.78%	3.29%	2.38%	2.01%	1.82%
2- Axle	4.43%	3.29%	2.38%	2.01%	1.82%
3 - Axle	4.43%	3.29%	2.38%	2.01%	1.82%
4 to 6 Axle	5.82%	4.31%	3.09%	2.60%	2.34%
7 and Above Axle	4.43%	3.29%	2.38%	2.01%	1.82%

Table 5-22 : Recommended Growth Rates Pessimistic

Category / Year	FY 2027-2029	FY 2030-2034	FY 2035-2039	FY 2040-2045	FY 2046-2050
Car/Jeep/Van	7.98%	6.98%	6.12%	5.89%	5.01%
Bus	3.59%	2.08%	1.86%	1.64%	1.44%
Minibus	3.59%	2.08%	1.86%	1.64%	1.44%
LCV	4.28%	2.79%	1.88%	1.51%	1.32%
2- Axle	3.93%	2.79%	1.88%	1.51%	1.32%
3 - Axle	3.93%	2.79%	1.88%	1.51%	1.32%
4 to 6 Axle	5.32%	3.81%	2.59%	2.10%	1.84%
7 and Above Axle	3.93%	2.79%	1.88%	1.51%	1.32%

Table 5-23 : Recommended Growth Rates Most Likely

Category / Year	FY 2027-2029	FY 2030-2034	FY 2035-2039	FY 2040-2045	FY 2046-2050
Car/Jeep/Van	8.23%	7.23%	6.37%	6.14%	5.26%
Bus	3.84%	2.33%	2.11%	1.89%	1.69%
Minibus	3.84%	2.33%	2.11%	1.89%	1.69%
LCV	4.53%	3.04%	2.13%	1.76%	1.57%
2- Axle	4.18%	3.04%	2.13%	1.76%	1.57%
3 - Axle	4.18%	3.04%	2.13%	1.76%	1.57%
4 to 6 Axle	5.57%	4.06%	2.84%	2.35%	2.09%
7 and Above Axle	4.18%	3.04%	2.13%	1.76%	1.57%

Traffic and revenue have been worked out on the basis of above growths and same is presented in subsequent chapter of report.

CHAPTER 6

TRAFFIC FORECAST

6.1 Traffic Projections

The growth rates recommended in the previous section of the report are used to arrive at traffic projections for future years. Toll plaza wise futuristic traffic projection is given in tables below.

These projections have been done for the following three cases of growth up to the concession period.

1. Optimistic Scenario
2. Pessimistic Scenario
3. Most Likely Scenario

Table 6-1 : Total Tollable Traffic Toll Plaza - Chainage 1055+217 KM/1058+837 KM (Optimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	3996	803	202	1113	855	3194	7	**10170**	**25744**
2027-28	4335	841	210	1163	893	3380	7	**10829**	**27294**
2028-29	4702	881	219	1215	932	3577	7	**11533**	**28941**
2029-30	5053	910	224	1256	963	3730	7	**12143**	**30312**
2030-31	5431	940	229	1298	995	3890	7	**12790**	**31754**
2031-32	5837	971	234	1341	1028	4058	7	**13476**	**33272**
2032-33	6273	1003	240	1386	1062	4233	7	**14204**	**34870**
2033-34	6743	1036	246	1432	1097	4415	7	**14976**	**36553**
2034-35	7189	1061	251	1465	1124	4552	7	**15649**	**37942**
2035-36	7665	1086	257	1500	1151	4693	7	**16359**	**39394**
2036-37	8172	1111	263	1535	1179	4838	7	**17105**	**40912**
2037-38	8713	1137	269	1571	1207	4987	7	**17891**	**42499**
2038-39	9289	1164	275	1608	1236	5140	7	**18719**	**44160**
2039-40	9881	1188	281	1640	1261	5274	7	**19532**	**45728**
2040-41	10512	1212	287	1672	1286	5411	7	**20387**	**47365**
2041-42	11183	1236	293	1705	1313	5552	7	**21289**	**49076**
2042-43	11897	1261	299	1738	1340	5696	7	**22238**	**50865**
2043-44	12657	1286	305	1773	1367	5844	7	**23239**	**52736**

Table 6-2 : Total Tollable Traffic @ Toll Plaza 1 - Chainage 1055+217 KM/1058+837 KM

(Pessimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	3978	800	202	1108	851	3178	7	**10124**	**25623**
2027-28	4296	834	209	1152	884	3348	7	**10730**	**27037**
2028-29	4638	869	217	1198	919	3526	7	**11374**	**28534**
2029-30	4962	893	221	1231	944	3660	7	**11918**	**29743**
2030-31	5308	918	225	1265	971	3800	7	**12494**	**31009**
2031-32	5679	943	230	1300	998	3945	7	**13102**	**32336**
2032-33	6074	969	235	1336	1026	4095	7	**13742**	**33728**
2033-34	6498	996	240	1373	1055	4251	7	**14420**	**35187**
2034-35	6896	1015	244	1399	1075	4361	7	**14997**	**36349**
2035-36	7318	1034	248	1425	1096	4473	7	**15601**	**37558**
2036-37	7765	1053	252	1452	1117	4588	7	**16234**	**38818**
2037-38	8241	1072	257	1479	1138	4706	7	**16900**	**40131**
2038-39	8745	1092	262	1506	1159	4828	7	**17599**	**41499**
2039-40	9259	1108	266	1529	1177	4929	7	**18275**	**42766**
2040-41	9805	1124	270	1552	1195	5032	7	**18985**	**44084**
2041-42	10381	1141	274	1575	1214	5137	7	**19729**	**45457**
2042-43	10992	1159	278	1598	1233	5245	7	**20512**	**46888**
2043-44	11639	1177	282	1622	1252	5355	7	**21334**	**48379**

Traffic projections for Most Likely scenario is given as under

Table 6-3 : Total Tollable Traffic @ Toll Plaza 1 - Chainage 1055+217 KM/1055+217 KM/1058+837 KM

(Most Likely Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	3987	802	202	1111	852	3186	7	**10147**	**25684**
2027-28	4315	838	210	1158	888	3364	7	**10780**	**27165**
2028-29	4670	876	218	1206	925	3551	7	**11453**	**28737**
2029-30	5008	903	223	1242	953	3695	7	**12031**	**30026**
2030-31	5370	931	228	1279	982	3844	7	**12641**	**31380**
2031-32	5758	959	233	1317	1012	4000	7	**13286**	**32801**
2032-33	6174	988	238	1357	1043	4162	7	**13969**	**34295**
2033-34	6621	1018	243	1398	1075	4331	7	**14693**	**35864**
2034-35	7043	1040	248	1427	1098	4454	7	**15317**	**37138**
2035-36	7492	1062	253	1457	1122	4581	7	**15974**	**38466**
2036-37	7969	1084	258	1488	1146	4711	7	**16663**	**39853**

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2037-38	8476	1107	263	1519	1171	4845	7	**17388**	**41300**
2038-39	9017	1131	268	1551	1196	4983	7	**18153**	**42811**
2039-40	9570	1150	273	1578	1217	5101	7	**18896**	**44224**
2040-41	10157	1171	278	1605	1238	5221	7	**19677**	**45697**
2041-42	10780	1192	283	1633	1260	5344	7	**20499**	**47234**
2042-43	11442	1213	288	1661	1283	5470	7	**21364**	**48838**
2043-44	12143	1234	293	1690	1306	5599	7	**22272**	**50513**

CHAPTER 7

FORECAST OF TOLL REVENUE

7.1 General

This chapter presents the tolling rate calculations, categories and toll revenue of the project.

7.2 Discount Categories

As per the Toll Notification (Schedule - G) the discounts and special provisions have been considered. In addition to discounts as per Fee Notification concessionaire has declared special category rates also. Salient features of toll rate structure are given as under

1. Monthly Pass: For frequent users monthly pass would be issued at fee at 2/3rd rate for 50 single journey trips.
2. Multiple Journeys (for Return Trip): Will be charged at 1.5 times single journey.
3. Single Journey: Full single journey toll would be charged to this category of vehicles who are infrequent travellers or whose frequency does not yield any discount from the above categories.
4. Local Discounts: There are several categories of local discounts.
    a) Local Car Jeep Van - Rs. 350 per month (for locals residing within a radius of 20 kms from toll plaza)

Building of inflation and escalation of rate on the basis of WPI are done as per toll notification (Schedule G) as given under as extract from concession agreement.

The formula for determining the applicable rate of fee shall be as follows:-

$$\text{Applicable rate of fee} = \text{base rate} + \text{base rate} \times \left\{ \frac{\text{WPI A-WPI B}}{\text{WPI B}} \right\} \times 0.4$$

Factors of inflation / growth have been incorporated as per Schedule R. WPI are available up to the year 2025-26.

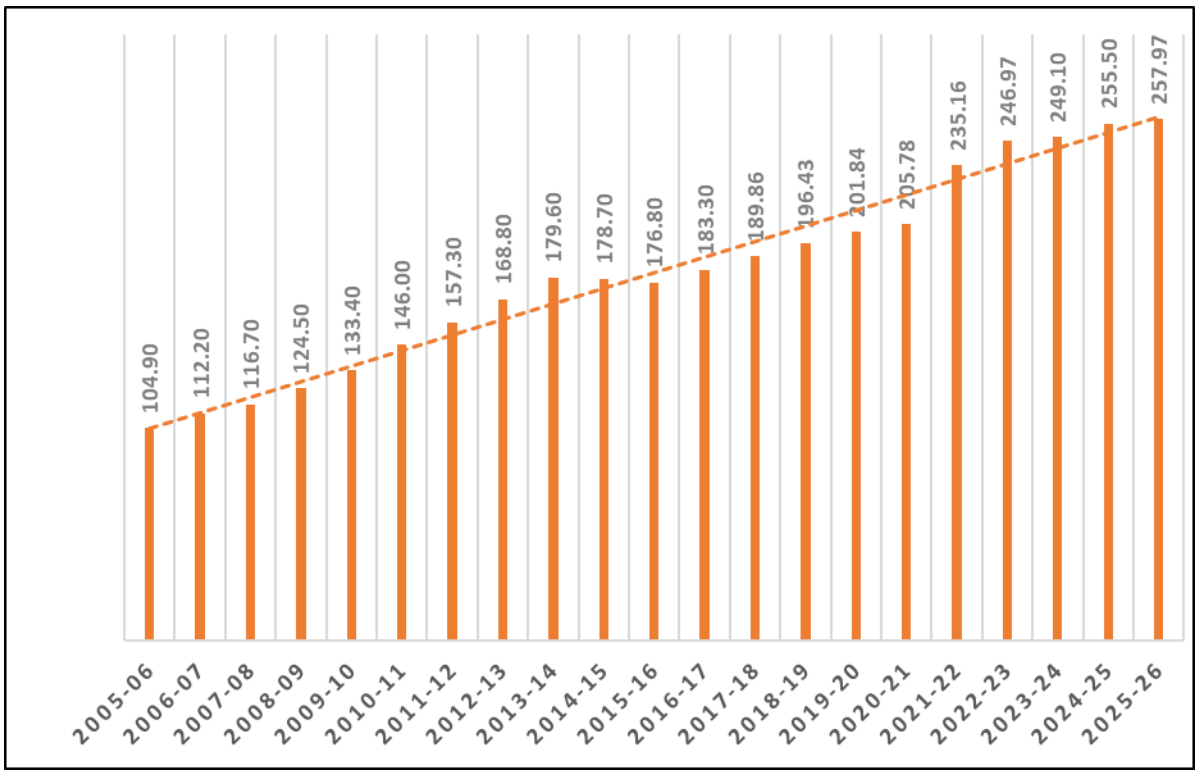


Figure 7-1 : Historical Rate of WPI Inflation in India

The wholesale price index (WPI) and the inflation rate in the past are presented in Table below.

Table 7-1 : Historical WPI value and Growth Inflation

December of year	2021	2022	2023	2024	2025	Avg.
WPI	235.2	247.0	249.1	255.5	257.97	
Inflation	14.27%	5.02%	0.86%	2.57%	0.96%	4.74%

WPI of December 2025 is posted on ministry site which is shows 0.96% inflation from the previous year. Same has been applied for FY 2026-27.

The average WPI inflation over the period FY 2021 to FY 2025 works out to approximately 4.74%, reflecting inflationary cycles across both high and low inflation years. Based on this analysis, an annual escalation factor of 4.5% has been adopted for the remaining concession period.

7.3 Estimation of Toll Rates

As per the applicable MORTH notification and Schedule R of contract agreement, the following Base rate of fee for the categories mentioned in the table stands true in the National Highways Fee Rules applicable for contract.

Table 7-2 : Base Toll Rates June 2007-08

Type of Vehicle	Base Rate of Fee / Km (in Rs.)
Car, Jeep, Van or Light Motor Vehicle	0.65
Light Commercial Vehicle, Light Goods Vehicle or Minibus	1.05
Bus or Truck (Two Axles)	2.20
Three Axle Commercial Vehicles	2.40
Heavy Construction Machinery (HCM) or Earth Moving Equipment (EME) or Multi Axle Vehicle (MAV) (4 to 6 axles)	3.45
Oversized Vehicles (7 or more Axles)	4.20

These rates are then modified for as per procedure provided in guidelines of notification considering factors listed below.

- Annual revision of fee rate - @3%
- Application of WPI

Base rates have been worked out to map the current rates. These shall be updated when more details come in. Base toll rates are given below.

Above rates are applicable for base year 2025-26. These rates have been escalated for future. year as NHAI policy and MORTH guideline for future revenue working

Table 7-3 : Toll Rates for Single Journey @ Toll Plaza 1 - Chainage 1055+217 KM/1055+217 KM/1058+837 KM

Year	Car	Minibus /LCV	Bus	Truck	3 axles	Multi axle	Oversized Vehicles
2026-27	85	135	285	285	310	450	545
2027-28	90	145	300	300	325	470	570
2028-29	95	150	315	315	340	490	600
2029-30	95	155	330	330	360	515	625
2030-31	100	165	345	345	375	540	655
2031-32	105	170	360	360	395	565	685

Year	Car	Minibus /LCV	Bus	Truck	3 axles	Multi axle	Oversized Vehicles
2032-33	110	180	375	375	410	590	720
2033-34	115	190	395	395	430	620	755
2034-35	120	200	415	415	450	650	790
2035-36	130	205	435	435	475	680	830
2036-37	135	215	455	455	495	715	870
2037-38	140	225	475	475	520	745	910
2038-39	150	240	500	500	545	785	955
2039-40	155	250	525	525	570	820	1000
2040-41	160	260	550	550	600	860	1050
2041-42	170	275	575	575	630	905	1100
2042-43	180	290	605	605	660	950	1155
2043-44	185	305	635	635	690	995	1210

Table 7-4 : Toll Rates for Return Journey @ Toll Plaza 1 - Chainage 1055+217 KM/1055+217 KM/1058+837 KM

Year	Car	Minibus /LCV	Bus	Truck	3 axle	Multi axle	Oversized Vehicles
2026-27	125	205	430	430	470	670	820
2027-28	135	215	450	450	490	705	855
2028-29	140	225	470	470	515	735	895
2029-30	145	235	490	490	535	770	940
2030-31	150	245	515	515	560	810	985
2031-32	160	260	540	540	590	845	1030
2032-33	165	270	565	565	615	885	1080
2033-34	175	285	595	595	645	930	1130
2034-35	185	295	620	620	675	975	1185
2035-36	190	310	650	650	710	1020	1240
2036-37	200	325	680	680	745	1070	1300
2037-38	210	340	715	715	780	1120	1365
2038-39	220	360	750	750	820	1175	1430
2039-40	230	375	785	785	855	1235	1500
2040-41	245	395	825	825	900	1295	1575
2041-42	255	415	865	865	945	1355	1650
2042-43	270	435	905	905	990	1425	1730
2043-44	280	455	950	950	1040	1495	1815

Table 7-5: Toll Rates for Monthly Pass Local @ Toll Plaza 1 - Chainage 1055+217 KM/1055+217 KM/1058+837 KM

Year	Car	Minibus/LCV
2026-27	375	375
2027-28	395	395
2028-29	415	415
2029-30	430	430
2030-31	455	455
2031-32	475	475
2032-33	495	495
2033-34	520	520
2034-35	545	545
2035-36	570	570
2036-37	600	600
2037-38	630	630
2038-39	660	660
2039-40	690	690
2040-41	725	725
2041-42	760	760
2042-43	800	800
2043-44	835	835

Table 7-6: Toll Rates for Monthly Pass @ Toll Plaza 1 - Chainage 1055+217 KM/1055+217 KM/1058+837 KM

Year	Car	Minibus /LCV	Bus	Truck	3 - Axle	Multi axle	Oversized Vehicles
2026-27	2815	4545	9525	9525	10395	14940	18190
2027-28	2945	4760	9975	9975	10880	15640	19040
2028-29	3085	4985	10445	10445	11395	16380	19940
2029-30	3230	5220	10935	10935	11930	17150	20880
2030-31	3385	5465	11455	11455	12495	17960	21865
2031-32	3545	5725	11995	11995	13085	18815	22905
2032-33	3715	6000	12565	12565	13710	19710	23990
2033-34	3890	6285	13165	13165	14365	20650	25135
2034-35	4075	6585	13795	13795	15050	21635	26340
2035-36	4270	6900	14460	14460	15775	22675	27605
2036-37	4480	7235	15155	15155	16535	23765	28935
2037-38	4695	7585	15890	15890	17330	24915	30330
2038-39	4920	7950	16660	16660	18170	26120	31800
2039-40	5160	8335	17465	17465	19055	27390	33345
2040-41	5410	8745	18320	18320	19985	28730	34975
2041-42	5675	9170	19215	19215	20960	30135	36685
2042-43	5955	9620	20160	20160	21990	31610	38485
2043-44	6250	10095	21150	21150	23075	33165	40375

7.4 Toll Revenue

As indicated earlier, toll revenue on the Project Road has been calculated in all three scenarios based on above rates and projected traffic. The estimates of toll revenue under ***Optimistic***, ***Pessimistic*** and ***Most Likely*** growth scenarios are presented in the following section.

7.5 Toll Revenue at all toll plazas under Scenarios

Toll Revenue estimates under all scenarios at each of the toll plaza up to 2043-44 years starting from the year 2026-27 are shown in tables below.

Table 7-7 : Toll Revenue Optimistic Scenario

(Rs. Crores)

Location / Year	TP-01	Total
2026-27	85.40	**85.40**
2027-28	95.12	**95.12**
2028-29	104.89	**104.89**
2029-30	114.26	**114.26**
2030-31	125.18	**125.18**
2031-32	137.34	**137.34**
2032-33	149.09	**149.09**
2033-34	163.74	**163.74**
2034-35	177.52	**177.52**
2035-36	193.78	**193.78**
2036-37	209.60	**209.60**
2037-38	226.43	**226.43**
2038-39	247.55	**247.55**
2039-40	267.46	**267.46**
2040-41	288.08	**288.08**
2041-42	312.92	**312.92**
2042-43	339.95	**339.95**
2043-44	366.63	**366.63**

Table 7-8 : Toll Revenue Pessimistic Scenario

(Rs. Crores)

Location / Year	TP-01	Total
2026-27	85.00	**85.00**
2027-28	94.25	**94.25**
2028-29	103.44	**103.44**
2029-30	112.13	**112.13**
2030-31	122.27	**122.27**

Location / Year	TP-01	Total
2031-32	133.46	**133.46**
2032-33	144.17	**144.17**
2033-34	157.60	**157.60**
2034-35	170.05	**170.05**
2035-36	184.70	**184.70**
2036-37	198.84	**198.84**
2037-38	213.79	**213.79**
2038-39	232.59	**232.59**
2039-40	250.07	**250.07**
2040-41	268.05	**268.05**
2041-42	289.74	**289.74**
2042-43	313.28	**313.28**
2043-44	336.26	**336.26**

Table 7-9 : Toll Revenue Most Likely Scenario

(Rs. Crores)

Location / Year	TP-01	Total
2026-27	85.18	**85.18**
2027-28	94.67	**94.67**
2028-29	104.15	**104.15**
2029-30	113.17	**113.17**
2030-31	123.68	**123.68**
2031-32	135.35	**135.35**
2032-33	146.55	**146.55**
2033-34	160.58	**160.58**
2034-35	173.69	**173.69**
2035-36	189.15	**189.15**
2036-37	204.11	**204.11**
2037-38	219.99	**219.99**
2038-39	239.94	**239.94**
2039-40	258.61	**258.61**
2040-41	277.86	**277.86**
2041-42	301.12	**301.12**
2042-43	326.34	**326.34**
2043-44	351.10	**351.10**

7.6 Modification in Concession Period

Modification of the concession period shall be done on the basis of Revenue targets given in the contract for milestones 1 & 2.

Modification in concession period as per provisions of DCA and same is summarized in table for all scenarios.

Pessimistic Case

Target Point 1- March 2031									
Target Month - March 2031	**Target Revenue (Rs. Crores)**	**Calculated Revenue (Rs. Crores)**	**Difference %**	**If qualifies for Modification in Concession Period**	**Qualifying increment or shortfall**	**Change in Concession period %**	**Original Concession Period (Year)**	**Change in Concession period (Year)**	**Modified Concession Period**
TOT-13 - Kota	9.11	10.22	12.17 %	No	-	0.00%	20.00	0.00	

Target Point 2- March 2038											
Target Month - March 2038	**Target Revenue (Rs. Crores)**	**Calculated Revenue (Rs. Crores)**	**Difference %**	**If qualifies for Modification in Concession Period**	**Qualifying increment or shortfall**	**Change in Concession period %**	**Original Concession Period (Year)**	**Change in Concession period**	**Total Change in Concession period (Year)**	**Calculated Modified Concession Period**	**Final Concession Period subject to Cap**
TOT-13 - Kota	16.81	17.92	6.62%	No	-	0.00%	20.00	0.00	0.00	20.00	

Most likely Case

Target Point 1- March 2031									
Target Month - March 2031	**Target Revenue (Rs. Crores)**	**Calculated Revenue (Rs. Crores)**	**Difference %**	**If qualifies for Modification in Concession Period**	**Qualifying increment or shortfall**	**Change in Concession period %**	**Original Concession Period (Year)**	**Change in Concession period (Year)**	**Modified Concession Period**
TOT-13 - Kota	9.11	10.34	13.49 %	No	-	0.00%	20.00	0.00	

Target Point 2- March 2038											
Target Month - March 2038	Target Revenue (Rs. Crores)	Calculated Revenue (Rs. Crores)	Difference %	If qualifies for Modification in Concession Period	Qualifying increment or short fall	Change in Concession period %	Original Concession Period (Year)	Change in Concession period	Total Change in Concession period (Year)	Calculated Modified Concession Period	Final Concession Period subject to Cap
TOT-13 - Kota	16.81	18.45	9.73%	No	-	0.00%	20.00	0.00	0.00	20.00	

Optimistic Case

Target Point 1- March 2031									
Target Month - March 2031	Target Revenue (Rs. Crores)	Calculated Revenue (Rs. Crores)	Difference %	If qualifies for Modification in Concession Period	Qualifying increment or shortfall	Change in Concession period %	Original Concession Period (Year)	Change in Concession period (Year)	Modified Concession Period
TOT-13 - Kota	9.11	10.47	14.89 %	No	-	0.00%	20.00	0.00	

Target Point 2- March 2038											
Target Month - March 2038	Target Revenue (Rs. Crores)	Calculated Revenue (Rs. Crores)	Difference %	If qualifies for Modification in Concession Period	Qualifying increment or short fall	Change in Concession period %	Original Concession Period (Year)	Change in Concession period	Total Change in Concession period (Year)	Calculated Modified Concession Period	Final Concession Period subject to Cap
TOT-13 - Kota	16.81	18.99	12.96 %	No	-	0.00%	20.00	0.00	0.00	20.00	

TOT-13 (Kota bypass)-Modification in Concession Period						
Types of Scenarios	Pessimistic Case		Most likely Case		Optimistic Case	
Target Month	Mar-31	Mar-38	Mar-31	Mar-38	Mar-31	Mar-38
Target Revenue (Rs. Crores)	9.11	16.81	9.11	16.81	9.11	16.81
Calculated Revenue (Rs. Crores)	10.22	17.92	10.34	18.45	10.47	18.99
Differences %	12.17%	6.62%	13.49%	9.73%	14.89%	12.96%
If qualifies for Modification in Concession Period	No	No	No	No	No	No
Qualifying Increment or shortfall	-	-	-	-	-	-
Change in Concession period %	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Original Concession Period	20.00	20.00	20.00	20.00	20.00	20.00
Change in Concession period	0.00	0.00	0.00	0.00	0.00	0.00
Total Change in Concession period	0.00		0.00		0.00	
Calculated Modified Concession Period	20.00		20.00		20.00	
Final Concession Period subject to Cap	0.00		0.00		0.00	

Thus, there is no modification expected in concession period due to variation in revenue as per above estimates in all scenarios

CHAPTER 8

CONCLUSION & RECOMMENDATIONS

8.1 Conclusion & Recommendations

Project stretch of Kota Bypass from Km 1052+429 to Km 1080+249 section of NH-27 in state of Rajasthan is currently four lane road. The road is in sound condition and serves healthy traffic volumes. Project corridor is a part of the important regional network East-West connectivity. Kota Bypass is part of Silchar – Porbandar East – West Corridor. There are large number of townships, industrial corridors and other business establishment coming up along project corridor. As discussed, dominant portion of traffic is long route traffic, which is more sensitive towards the growth of national economy. As Indian economy is poised to grow at 7%+ post COVID-19, the project corridor is expected to pick up the same trend in terms of traffic flow. All these developments have potential to give positive impact to traffic flow on project. The following can be considered as major outcomes of the study

a) There is good amount of tollable traffic running on project

b) Project corridor has potential to witness traffic growth @ 6-8% annually in near future due to various development in area and overall development of economy

c) Project corridor has committed traffic as long route traffic and does not run a risk of traffic leakage due to quality competing road

Based on above it can be considered a stable healthy project from traffic and revenue point of view.

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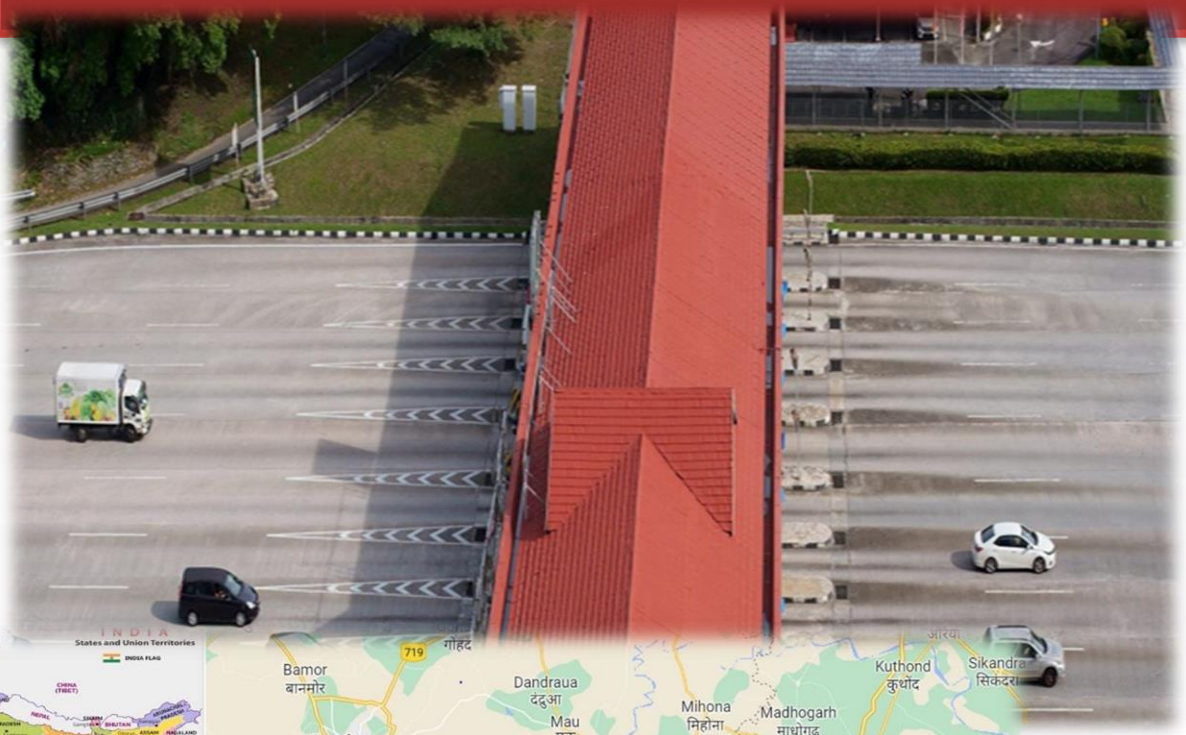
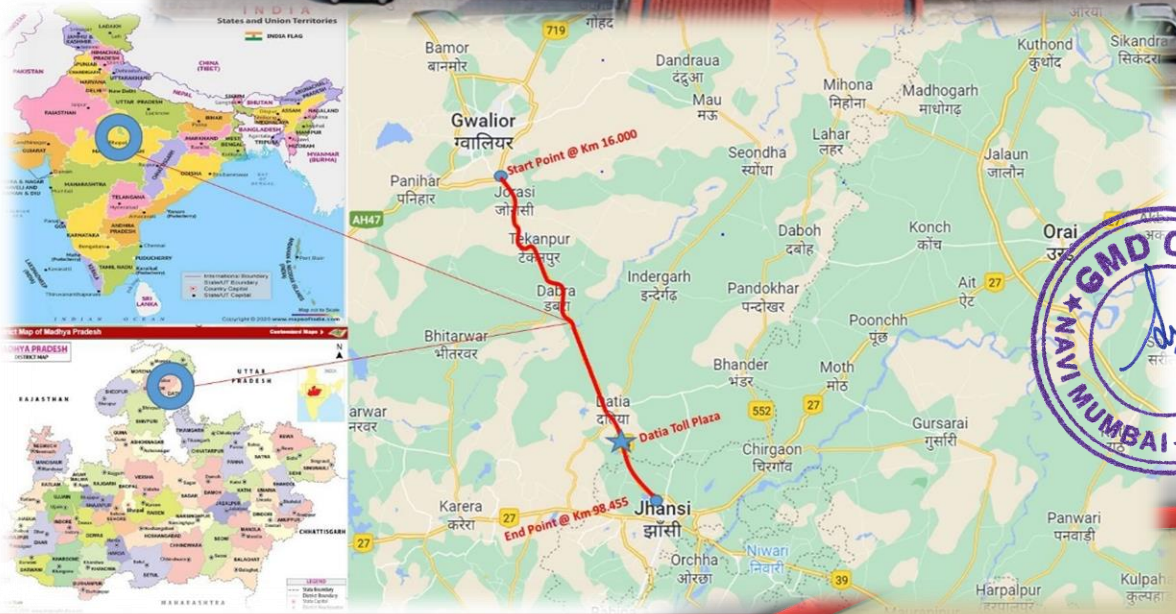
IRB INFRASTRUCTURE TRUST

Gwalior -Jhansi section from km 0.000 to km 103.000 (revised section km 16.000 to km 98.455) of NH-75 (New NH-44) in the state of Madhya Pradesh and Uttar Pradesh (TOT Bundle -13)





GMD CONSULTANTS NAVI MUMBAI

TRAFFIC STUDY & REVENUE PROJECTION REPORT (FINAL)

MAY 2026

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GMD Adding Value

Gwalior -Jhansi section from 0.000 to km 103.000 (revised section km 16.000 to km 98.455) of NH-75 (New NH-44) in the state of Madhya Pradesh and Uttar Pradesh

(TOT Bundle -13)

TRAFFIC STUDY & REVENUE PROJECTION REPORT (FINAL)

GMD CONSULTANTS ★ NAVI MUMBAI ★

MAY 2026

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ABBREVIATIONS

AADT	-	Annual Average Daily Traffic	**NHAI**	-	National Highway Authority of India
BOT	-	Build Operate Transfer	**NHDP**	-	National Highways Development Project
CAGR	-	Compound Annual Growth Rate	**NSDP**	-	Net State Domestic Product
CTV	-	Classified traffic volume	**O&M**	-	Operation & Maintenance
DBFOT	-	Design, Build, Finance, Operate & Transfer	**PCDP**	-	Per Capita Domestic Product
EME	-	Earth Moving Equipment	**PCI**	-	Per Capita Income
GDP	-	Gross Domestic Product	**PCU**	-	Passenger Car Unit
GSDP	-	Gross State Domestic Product	**PSC**	-	Pre-stressed Concrete
HCM	-	Heavy Construction Machinery	**RCC**	-	Reinforced cement concrete
HCV	-	Heavy Commercial Vehicle	**RHS**	-	Right Hand Side
HTMS	-	Highway Traffic Management System	**SH**	-	State Highway
IRC	-	Indian Road Congress	**TP**	-	Toll Plaza
IRR	-	Internal Rate of Return	**WPI**	-	Wholesale Price Index
LCV	-	Light Commercial Vehicle	**SIR**	-	Special Investment Region
LHS	-	Left Hand Side	**c.**	-	Circa
LGV	-	Light Goods Vehicle	**ROB**	-	Railway Over Bridge
MAV	-	Multi Axle Vehicle	**MDR**	-	Major District Road
MORTH	-	Ministry of Road Transport and Highways	**ODR**	-	Other District Road
NH	-	National Highway	**CA**	-	Concession Agreement
PCC	-	Plain Cement Concrete	**RMT**	-	Running Meter
CR	-	Coarse Rubble			

CHAPTER 1

INTRODUCTION

1.1 Background

The National Highways Authority of India (NHAI) introduced the Toll, Operate and Transfer (TOT) model for partnership with private developers in the road sector. Under this model, NHAI passes on the toll collection rights and operation and maintenance obligations for 20 years to the private developer against payment of upfront, one-time, lump sum concession fees quoted by the private developer as part of the comprehensive bidding process. Projects under this model are awarded as a bundle of operational national highways, which allows the investor to offset the risks of one project against another. Existing and operational roads are auctioned under the TOT model.

Under the Toll Operate and Transfer (ToT) 13 bundle, NHAI had invited tenders for selection of concessionaire for maintenance of the National Highway stretch from km 0.000 to km 103.000 (revised section km 16.000 to km 98.455) of NH-75 (New NH-44) in the state of Madhya Pradesh and Uttar Pradesh.

M/s. IRB Infrastructure Developers Limited., has been declared as the selected bidder for the project. This report is for part section of ToT bundle 13 "Gwalior to Jhansi from km 0.000 to km 103.000 (revised section km 16.000 to km 98.455) of NH-75 (New NH-44) in the state of Madhya Pradesh and Uttar Pradesh. Project Highway alignment is depicted in the following figure.

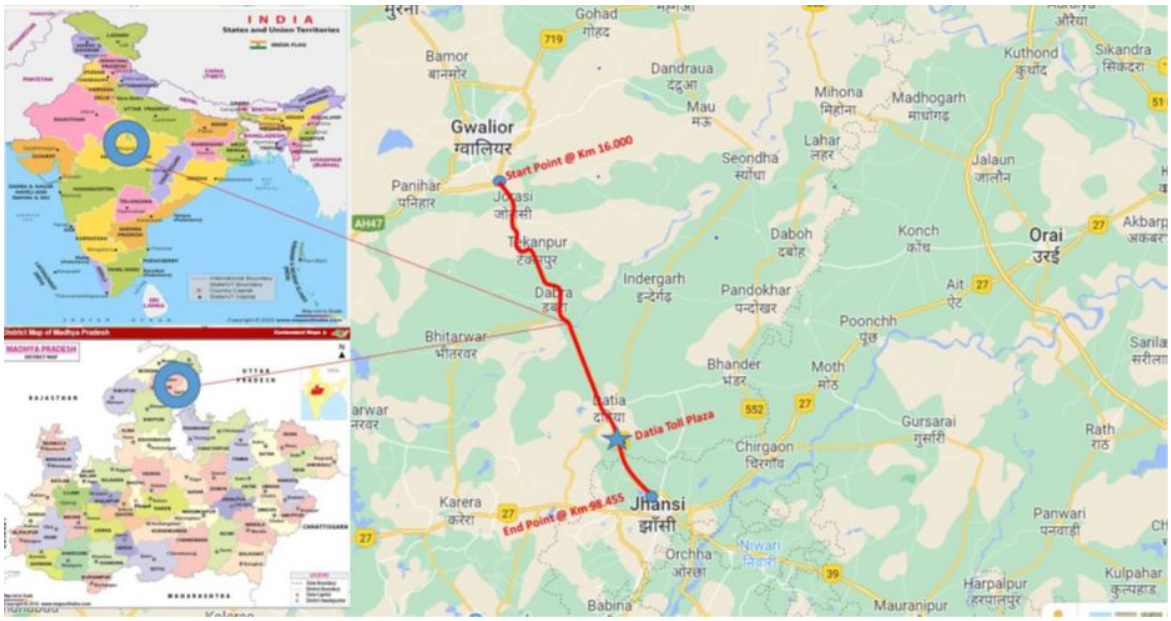

Figure 1-1: Project Stretch of ToT Bundle 13 (Part)

1.2 Objective of the Study

M/s IRB Infrastructure Developers Limited (IRB) intends to develop a traffic study report for Four Laning of Gwalior to Jhansi from km 0.000 to km 103.000 (revised section km 16.000 to km 98.455) of NH-75 (New NH-44) in the state of Madhya Pradesh and Uttar Pradesh on BOT basis. GMD Consultants have been assigned the work of conducting traffic study and developing revenue model based on traffic projections and forecasts.

1.3 Scope of Services

The following may be referred to as broad scope of Traffic Study of Four Laning of Gwalior to Jhansi from km 0.000 to km 103.000 (revised section km 16.000 to km 98.455) of NH-75 (New NH-44) in the state of Madhya Pradesh and Uttar Pradesh.

Classified Traffic Volume Count at the main toll plaza location at Toll Plaza locations. This data was supplied by the Concessionaire.

- Establishment of traffic pattern
- Working our traffic demand elasticity and growth
- Traffic forecast up to concession period.
- Preparation of revenue model up to concession period
- Any other analysis relevant to scope

CHAPTER 2

PROJECT DETAILS

2.1 Project Corridor

The project stretch is a section of NH-44, which is the longest National Highway in the country, running through North, Central and South India. A major part of the project section from Gwalior to Jhansi Road lies in Gwalior and Datia district of Madhya Pradesh followed by Jhansi district. The major towns along the project corridor are Gwalior, Tekampur, Dabra, Datia and Jhansi.

Project Stretch Description

The project stretches under this study starts from km 0.000 to km 103.000 (revised section km 16.000 to km 98.455) of NH-75 (New NH-44) in the state of Madhya Pradesh and Uttar Pradesh. The length of project stretch is 82.455 km and has 4-lane configuration with single Toll Plaza (Dagrai village at ch.97.900 KM).

The following figure shows the alignment of the project highway in the above context.

Figure 2-1 : Project Alignment with Toll Plaza

CHAPTER 3

TRAFFIC SURVEYS AND ANALYSIS

3.1 Traffic Surveys

The Consultants have collected the required information for the project corridor to understand the general traffic and travel characteristics on the corridor.

The following traffic data has been collected from a client for a project.

- Classified traffic volume counts at toll plaza locations on Gwalior- Jhansi section km 0.000 to km 103.000 (revised section km 16.000 to km 98.455) of NH-75 (New NH-44), provided by Concessionaire for year 2023-24,2024-25 and Annual traffic data from April 2025 to February 2026.
- Local Component of traffic
- Component of Return Journey
- Component of Monthly Pass Journey

The main objective of the traffic data analysis is to:

- Determine the existing traffic movement characteristics of the project
- Establish base year traffic
- Identification of travel patterns and modal split of project traffic
- Deriving growth factors for traffic forecasting
- Estimation of corridor traffic including traffic diversion if any
- Preparation of revenue model and projection of revenue as per toll policy for various scenarios

Table 3-1 below lists provides details of locations from where traffic details have been collected.

Table 3-1 : Traffic Data Details

SR. NO	LOCATION	CTV	Single Journey Traffic	Daily Return Journey	Monthly Pass	Local Pass
1	**Km 97.900 Toll Plaza at Dagrai Village**	AADT from previous traffic study report for Year 2023-24, 2024-25 & Eleven months from April 2025 to February 2026	AADT from previous traffic study report for Year 2023-24, 2024-25 & Eleven months from April 2025 to February 2026	AADT from previous traffic study report for Year 2023-24, 2024-25 & Eleven months from April 2025 to February 2026	AADT from previous traffic study report for Year 2023-24, 2024-25 & Eleven months from April 2025 to February 2026	AADT from previous traffic study report for Year 2023-24, 2024-25 & Eleven months from April 2025 to February 2026

Toll plaza is located in Uttar Pradesh.

3.2 Classified Traffic Volume

The objective of conducting a Classified Traffic Volume Count is to understand the traffic flow pattern including modal split on a roadway. The Classified Traffic Volume Count survey has been provided by the concessionaire of project highway from actual traffic data gathered at toll plaza locations-based traffic survey done at project stretch.

The vehicles can broadly be classified into fast moving / motorized and slow moving / non-motorized vehicles, which can be further classified into specific categories of vehicles. The groupings of vehicles are further segregated to capture the tollable vehicle categories specifically and toll exempted vehicles are counted separately. The detailed vehicle classification system as per IRC: 64-1990 is given in table below.

Table 3-2 : Vehicle Classification System

Vehicle Type	
Auto Rickshaw	
Passenger Car	Car, Jeep, Taxi & Van (Old / new technology)
Bus	Minibus
	Standard Bus
Truck	Light Goods Vehicle (LCV)
	2 – Axle Truck

Vehicle Type	
	3 Axle Truck (HCV)
	Multi Axle Truck (4-6 Axle)
	Oversized Vehicles (7 or more axles)
Other Vehicles	Agriculture Tractor, Tractor & Trailer

Source - IRC: 64 – 1990

However, since the project highway is currently under toll operation, the data collected corresponds to the category of tollable vehicles. The following are the types of vehicles as per concession agreement.

- Car / Jeep / van
- Minibus /LCV
- Bus
- Truck /
- 3 Axle commercial vehicle
- Multi Axle

3.3 Traffic Characteristic

Toll revenue of project highway does not solely depend on traffic volume. There are certain characteristics of traffic which have substantial potential to affect toll collection. Component of local traffic, component of passenger and commercial traffic, portion of return journey traffic, % of monthly pass traffic are some of such characteristics of traffic. These will be discussed in subsequent sections of report.

3.3.1 Traffic Data

Project concessionaire has provided Annual traffic data for 2025- 26 & traffic data from April 2025 to February 2026.

Since the traffic data available for this update is for only Annual, from April 2025 to February 2026, it may not represent the whole year traffic. Hence a seasonality factor for balance part of year has been applied to average traffic of the current Eleven months to arrive at Annual Average Daily Traffic of base year 2025-26. Thus, corrected traffic is used for future projections and revenue calculations. The following table shows historical traffic on project stretch and derived Annual Average Daily Traffic (AADT) for year 2025-26.

Table 3-3 : Traffic Data at Dagrai Village Toll Plaza at Km 97.900

Sr. No	Type of Vehicle	Annual Average Daily Traffic (Nos.)- 2023-24	Annual Average Daily Traffic (Nos.)- 2024-25	Annual Average Daily Traffic (Nos.)- 2025-26
1	Car	4865	4176	5189
3	Minibus /LCV	558	377	401
4	Bus	210	171	185
6	Truck	1026	1413	1541
7	3-Axle Commercial vehicle	1253	1322	1386
8	Multi axle	1393	1753	1809
9	Oversized Vehicles	0	4	6
	Total	**9,305**	**9215**	**10518**

3.4 Data Analysis

3.4.1 Analysis of Traffic Volume Count

Understanding the character of existing traffic forms the basis of the traffic forecast. The various vehicle types having different sizes and characteristics can be converted into a single unit called Passenger Car Unit (PCU). Passenger Car equivalents for various vehicles are adopted based on recommendations of Indian Road Congress prescribed in "IRC-64-1990: Guidelines for Capacity of Roads in Rural areas". The adopted passenger car unit values (PCU) are presented in Table 3-4.

Table 3-4 : PCU Factors Adopted for Study

Vehicle Type	PCUs
Car	1.0
Minibus	1.5
Standard Bus	3.0
LCV/LGV	1.5

Vehicle Type	PCUs
2 Axle Truck	3.0
3 – 6 Axle Truck	4.5
MAV	4.5
Auto Rickshaw	1.0
Van/Tempo	1.0
Agriculture Tractor with Trailer	4.5
Agriculture Tractor without Trailer	1.5

Source: IRC: 64-1990

Traffic volume at each toll plaza was converted to PCU and same is presented as under

Table 3-5 : Traffic in PCU at Project Stretch

Year	Toll Plaza Location (Km)	Traffic No.	PCU	PCU Index
2023-2024	Km 97.900 Toll Plaza at Dagrai Village	9305	19438	2.09
2024-2025	Km 97.900 Toll Plaza at Dagrai Village	9215	21364	2.32
2025-2026	Km 97.900 Toll Plaza at Dagrai Village	10518	23295	2.21

It can be observed from above that project traffic has PCU index 2 to 2.5 which is an indicator of high proportion of commercial traffic in traffic mix in project corridor. The following figure illustrates variation of PCU index at four toll plaza locations.

3.4.2 Components of Traffic

As discussed previously, components of traffic volume play an important role in determining project revenue. A larger component of commercial traffic with higher axle configuration adds to project revenue positively. Similarly, a larger component of local traffic affects the project revenue potential negatively.

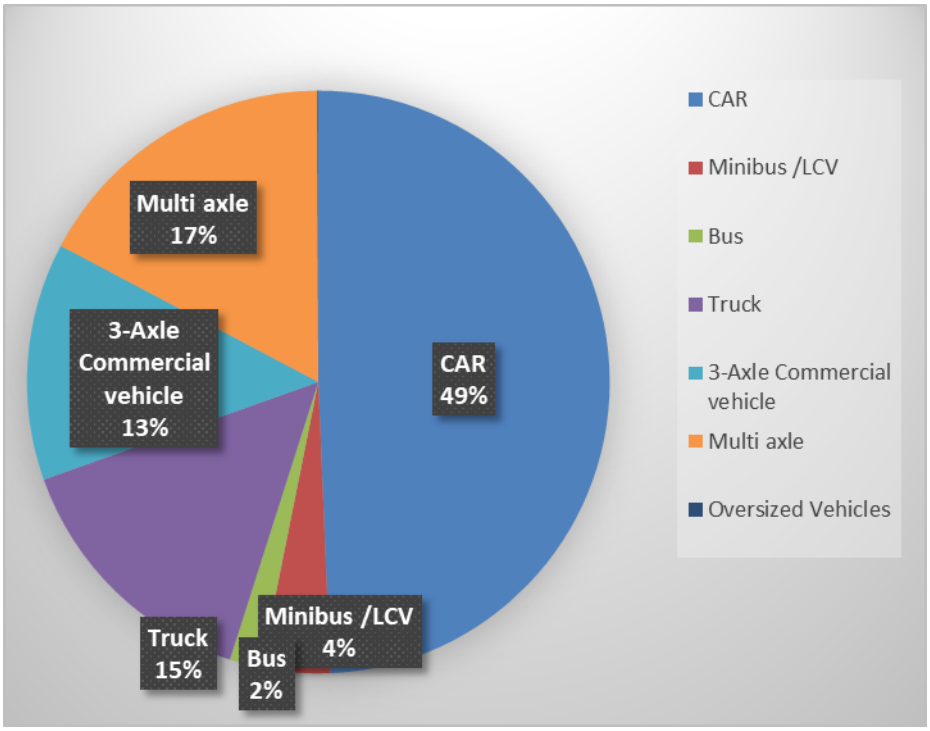

Figure 3-2: Model split of tollable vehicle @ Km 97.900

It is observed that car traffic forms about 49% of total traffic at toll plaza location KM 134.000 while multi axle commercial vehicles are about 30% of total traffic. Truck / Bus and LCV share about 17% and 4% of traffic volume respectively.

Another important bifurcation of traffic is components of traffic with respect to various type of toll ticketing like

1. Single Journey
2. Multi Journey
3. Local Commercial Single Journey
4. Monthly Pass Local
5. Monthly Pass
6. Annual Pass Car

The following table provides numbers of vehicles falling in each of the above categories on base year 2025-26.

Table 3-6 : Journey Type Bifurcation of Traffic at Dagrai Village Toll Plaza KM 97.900

Sr. No	Type	Traffic Volume (Nos.)
		2025-26
1	Single Journey	6337
2	Return Journey	2365

Sr. No	Type	Traffic Volume (Nos.)
		2025-26
3	Local Commercial Single Journey	73
4	Monthly Pass Local	53
5	Monthly Pass	2
6	Annual Pass Car	1688

It is observed that the project corridor demonstrates a similar pattern of single journey dominating mix of traffic across the entire stretch which is typical of major national highways.

3.5 Secondary Data Collection

There are several other factors which have a substantial impact on traffic patterns and growth on any project corridor. The following are some of such important factors.

- Industrial development around project corridor and its catchment
- Educational infrastructure along project corridor
- Demographic pattern
- Urban area development
- Tourism potential
- Upcoming major infrastructural or Industrial projects
- Special Industry in project corridor
- Overall trends of economic growth local as well as national / regional

Hence in addition to traffic details on the project site, secondary data was also collected from various other sources. Typical secondary data includes the following:

1. Vehicle registration data of regional and national level.
2. Economic Data
   a) GDP
   b) NSDP
   c) Population Growth
   d) Per Capita Income growth
   e) Industrial Growth
   f) Special Industry Potential
   g) Regional and National development vision / plan
   h) Any other relevant data
3. Competing road network

We have collected and utilized such underlying data in the study to estimate the growth and risk factors for traffic along the project corridor. The same is discussed in subsequent chapter.

CHAPTER 4

INFLUENCE ZONE TRANSPORT NETWORK ANALYSIS

4.1 Introduction

Highway corridors behave like integrated circuit networks and more often than not every road is connected to various networks having different origins and destinations. Traffic running on these networks behaves like fluid and flow on network on alignment of least friction.

The following Factors can be considered as major contributors to friction on transportation networks.

- Travel Speed / Travel Time
- Geometric deficiencies like blind horizontal curves and steep vertical gradients etc.
- Configuration of road
- Riding quality
- Traffic delays,
- Length of road,
- Passing through built up or Urban Area,
- Terrain,
- Facilities,

4.2 Regional Network

Project road has been in existence for a long time and traffic is almost settled. However, there are few upcoming corridors which may have interest in project road catchments. These are discussed below.

Delhi – Mumbai Expressway - The access controlled greenfield expressway connects Delhi and Mumbai (up to Jawaharlal Nehru Port Trust) and passes through states of Haryana, Rajasthan, Madhya Pradesh, Gujarat and Maharashtra. DME alignment will largely cater to traffic between North of India and Gujarat/Western Maharashtra and is not likely to affect traffic on the project road which caters to traffic on NH-44 which is north south highway. Hence it is not likely to impact project road traffic.

Surat – Chennai Expressway - The alignment will largely cater to traffic between states of Gujarat and Central Maharashtra /Andhra Pradesh/ Telangana/Karnataka/Tamilnadu and is not parallel to Project Road. Therefore, it is not likely to affect traffic on the project road.

Pune – Bangalore Expressway – Entire catchment of this proposed expressway falls south of project road. It is not likely to affect the project road traffic.

All other major highways in the region exist and traffic is settled in the region. On the local level also, there is no formidable competing route network. Hence it is not envisaged that there will be any major impact on project road traffic in the near future due to regional or local network developments.

CHAPTER 5

GROWTH OF TRAFFIC ON PROJECT HIGHWAY

5.1 Introduction

Traffic growth is a function of the interplay of a number of contributory factors such as National economy, Government policy, socio-economic conditions of the people, and changes in land uses along the project corridor precincts etc. As these factors have a number of uncertainties associated with them, forecasts of traffic are dependent on the projections of other factors such as population, gross domestic product (GDP), vehicle ownership, per capita income (PCI), agricultural output, fuel consumption etc. Future patterns of change in these factors can be estimated with only a reasonable degree of accuracy and hence the resultant traffic forecast levels may not be precise.

The traffic growth forecast for the project corridor of Gwalior-Jhansi from km 0.000 to km 103.000 (revised section km 16.000 to km 98.455) of NH-75 (New NH-44) has been done taking the above factors into consideration. "**IRC: 108-2015-Guidelines for Traffic Prediction on Rural Highways**" is established best practice and has been used for traffic growth forecast.

5.2 Trend Analysis

One of the methods of estimation of future rate of growth is to assume the same rate of growth as in the past. Although such a method is more suitable for projects of short durations say 5-10 years, however for long term projections it would be erroneous to assume that the past rate of growth will continue to prevail for a long time in future. Economic conditions, which are major influencing factors, are bound to change over a long period of time. Thus, it would be necessary to modify the past trends of growth suitably.

Elasticity model of growth projection is one of the most widely acceptable methods for traffic forecast. The same is recommended in **IRC: 108-12015-Guidelines for Traffic Prediction on Rural Highways**.

In this method the past trend of vehicular data is paired with an economic indicator and a regression analysis is done to yield the economic model of growth. Growth of vehicle traffic varies for different types of vehicles. It is a proven fact that the growth pattern for passenger and goods vehicle is different. Traffic growth on any highway typically depends on a number of economic parameters. Most important and direct parameters are given as under

- Per Capita Income
- Net State Domestic Product (NSDP)
- Population

It can be observed that the ownership of a car is more closely related to affordability; hence per capita is the index which closely fits the growth of car traffic among other criteria. In a similar fashion, the following can be pairs of vehicle type and independent variable for elasticity modeling of growth.

- Car / Jeep – Par Capita Income
- Bus / Minibus – Population

- Goods Vehicle – NSDP

5.3 Estimation of Traffic Demand Elasticity

Elasticity of traffic demand is defined as the rate at which traffic intensity varies due to a change in the corresponding indicator selected. Hence, In order to estimate the elasticity of traffic demand, it is necessary to establish relationship between the growth in number of given category of vehicles with the relevant economic variable considered, such as NSDP, per capita income and population growth. Latest available data for vehicle registration, per capita income, NSDP and population is used in analysis.

As per IRC: 108-1996 the model for estimating elasticity index for the project corridor is of the following form and is given as below:

$Log (P) = k \times Log (EI) + A$

Where,

P = *Number of Vehicles (Mode wise)*
EI = *Economic Indicator*
A = *Regression constant*
k = *Elasticity coefficient (Regression coefficient)*

The elasticity for car and bus (passenger vehicles) is calculated based on the Population and Per Capita Domestic Product (PCDP) and the elasticity for trucks is calculated based on the Net State Domestic Product (NSDP).

The project corridor spreads across state of Madhya Pradesh & Uttar Pradesh. Toll plaza at Dagrai Village in the state of Uttar Pradesh. Project traffic has share of majorly states like Madhya Pradesh, Uttar Pradesh, Delhi, Haryana and Rajasthan. For elasticity calculations, working data from these states also has been analysed.

Following tables and graphs depict regression and elasticity of growth model for stretch falling in Madhya Pradesh State.

Table 5-1 : Per Capita Income Vs Car Madhya Pradesh

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth (8 Year)
2011	38497	424644	4.59	5.63		
2012	41142	493412	4.61	5.69	7%	
2013	42548	555461	4.63	5.74	3%	
2014	44027	637626	4.64	5.80	3%	
2015	47351	820391	4.68	5.91	8%	
2016	52782	869777	4.72	5.94	11%	
2017	54829	982124	4.74	5.99	4%	
2018	57401	1087124	4.76	6.04	5%	5.9%

Regression analysis of same is given in figure below.

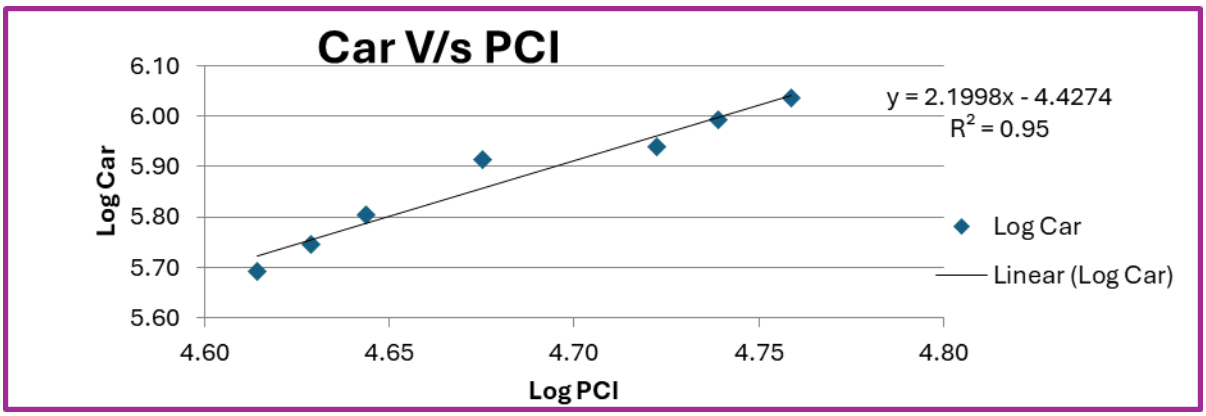

Figure 5-1 : Regression and Elasticity PCI vs. Car – Extrapolation Madhya Pradesh

Table 5-2 : Population Vs Bus Madhya Pradesh

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth (8 Year)
2011	72627000	181770	7.86	5.26		
2012	73863000	208530	7.87	5.32	2%	
2013	75099000	233569	7.88	5.37	2%	
2014	76334000	277898	7.88	5.44	2%	
2015	77570000	322227	7.89	5.51	2%	
2016	78806000	347227	7.90	5.54	2%	
2017	79948000	382227	7.90	5.58	1%	
2018	81090000	402227	7.91	5.60	1%	1.6%

Regression analysis of same is given in figure below.

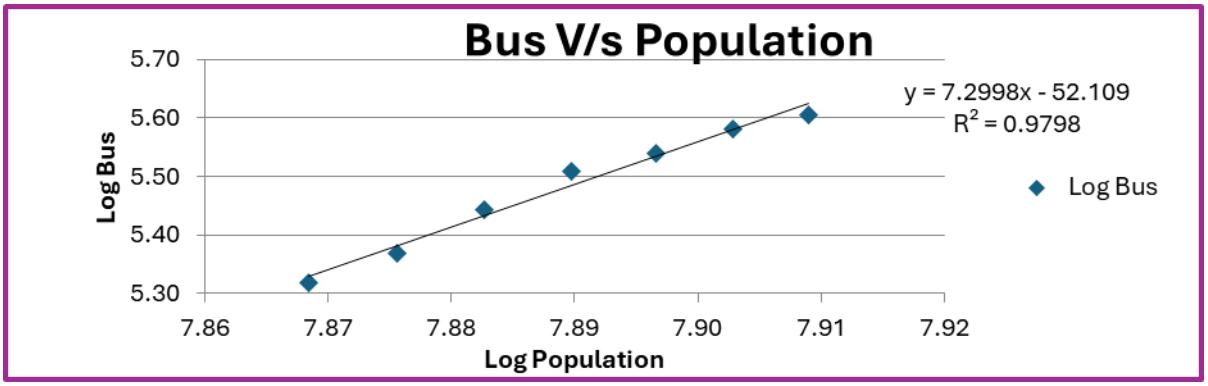

Figure 5-2 : Regression and Elasticity Population vs. Bus – Extrapolation Madhya Pradesh

Elasticity of Trucks has been worked out by regression analysis with NSDP. The following table represents the data and details.

Table 5-3 : LCV Vs NSDP Madhya Pradesh

Year	NSDP	Trucks	Log NDSP	Log Truck	NSDP Growth	Average Growth (8 Year)
2011	28237104	121916	7.45	5.09		
2012	30685334	131098	7.49	5.12	9%	
2013	32259760	137815	7.51	5.14	5%	
2014	33924690	150921	7.53	5.18	5%	
2015	37071567	177352	7.57	5.25	9%	
2016	41946525	233553	7.62	5.37	13%	
2017	44200243	289754	7.65	5.46	5%	
2018	46928896	326291	7.67	5.51	6%	7.6%

The following figure depicts regression analysis and extrapolation.

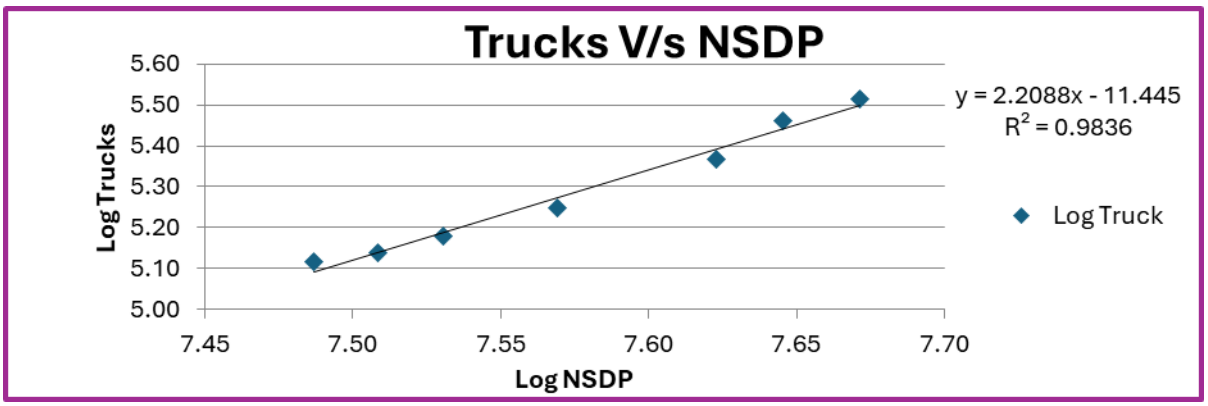

Figure 5-3 : Regression and Elasticity NSDP vs. Trucks Traffic - extrapolation Madhya Pradesh.

Using the regression analysis above, we have arrived at the elasticity of traffic demand for each class of vehicle to a given change in relevant economic indicators. Average traffic growth of a vehicle class is multiplied by the corresponding elasticity coefficient to arrive at traffic growth. R2 statistical measure of how close the data are to the fitted regression line. It varies from 0 to 1. The higher the value of R2 more representative is the regression model of data.

The results of these analyses for *the good fit* regression as reflected by R^2 values are presented in the Table below.

Table 5-4 : Summary Regression Analysis Madhya Pradesh

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average Growth (8yrs)	Growth Elastic Model	Remarks
MADHYA PRADESH	**Car/Jeep**	PCI	y = 2.2965x - - 4.8829	R^2 = 0.9634	2.3	6%	13.57%	Good Regression
	Bus	Population	y = 7.4978x - - 53.6722	R^2 = 0.9862	7.5	2%	11.90%	Good Regression
	Truck	NSDP	y = 2.2088x - - 11.4451	R^2 = 0.9694	2.2	8%	16.70%	Good Regression

The following tables and graphs depict regression and elasticity of growth model for stretch falling in Uttar Pradesh State.

Table 5-5 : Per Capita Income Vs Car Uttar Pradesh

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth (8 Year)
2011	32002	1108100	4.51	6.04		
2012	32908	1205374	4.52	6.08	3%	
2013	34044	1423020	4.53	6.15	3%	
2014	34583	1572217	4.54	6.20	2%	
2015	36973	1746117	4.57	6.24	7%	
2016	40847	2027972	4.61	6.31	10%	
2017	41832	2195783	4.62	6.34	2%	
2018	43670	2439845	4.64	6.39	4%	4.6%

Regression analysis of same is given in figure below.

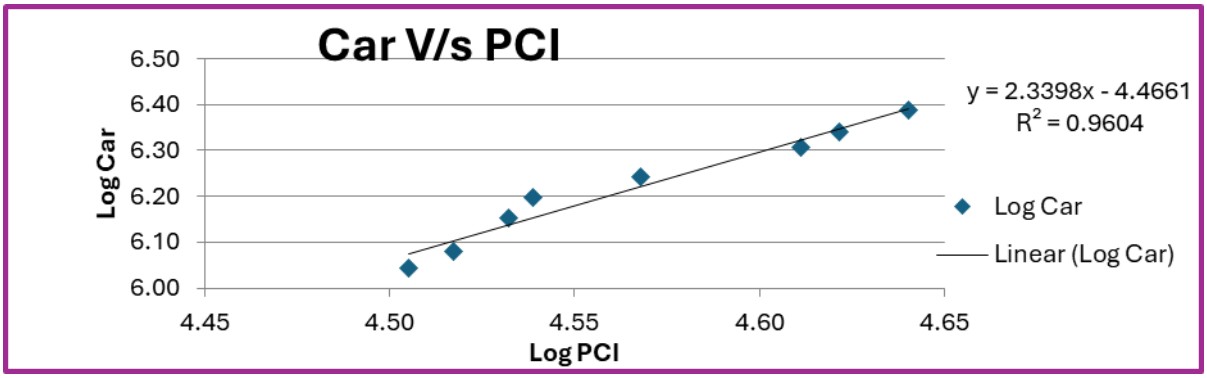

Figure 5-4 : Regression and Elasticity PCI vs. Car – Extrapolation Uttar Pradesh

Table 5-6 : Population Vs Bus Uttar Pradesh

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth (8 Year)
2011	199812000	57901	8.30	4.76		
2012	203670000	64147	8.31	4.81	2%	
2013	206322000	74389	8.31	4.87	1%	
2014	209577000	80460	8.32	4.91	2%	
2015	212832000	89127	8.33	4.95	2%	
2016	216870000	112020	8.34	5.05	2%	
2017	219510000	112766	8.34	5.05	1%	
2018	222150000	121975	8.35	5.09	1%	1.5%

Regression analysis of same is given in figure below.

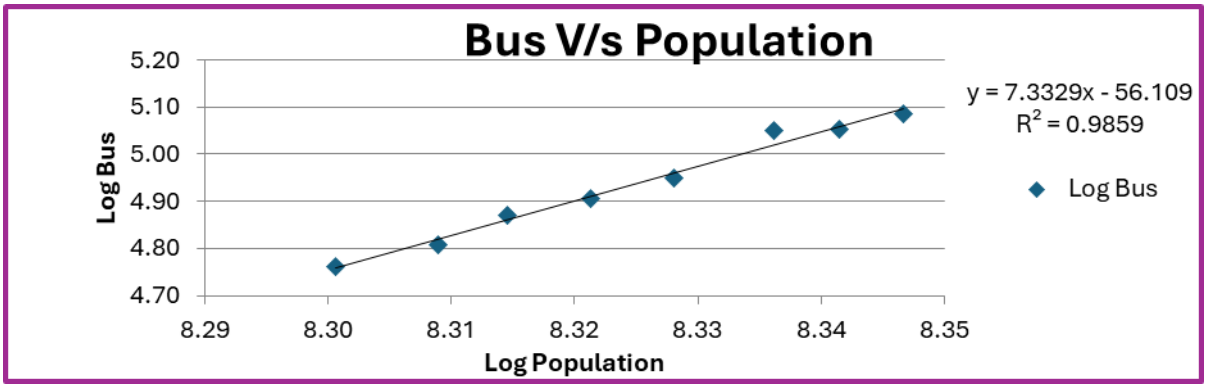

Figure 5-5 : Regression and Elasticity Population vs. Bus – Extrapolation Uttar Pradesh

Elasticity of Trucks has been worked out by regression analysis with NSDP. The following table represents the data and details.

Table 5-7 Trucks Vs NSDP Uttar Pradesh

Year	NSDP	Trucks	Log NDSP	Log Truck	NSDP Growth	Average Growth (8 Year)
2011	64513155	162813	7.81	5.21		
2012	67355218	186404	7.83	5.27	4%	
2013	70746910	202761	7.85	5.31	5%	
2014	72968630	217609	7.86	5.34	3%	
2015	79204874	245688	7.90	5.39	9%	
2016	88845325	265167	7.95	5.42	12%	
2017	92380571	307096	7.97	5.49	4%	
2018	97915937	356828	7.99	5.55	6%	6.2%

The following figure depicts regression analysis and extrapolation.

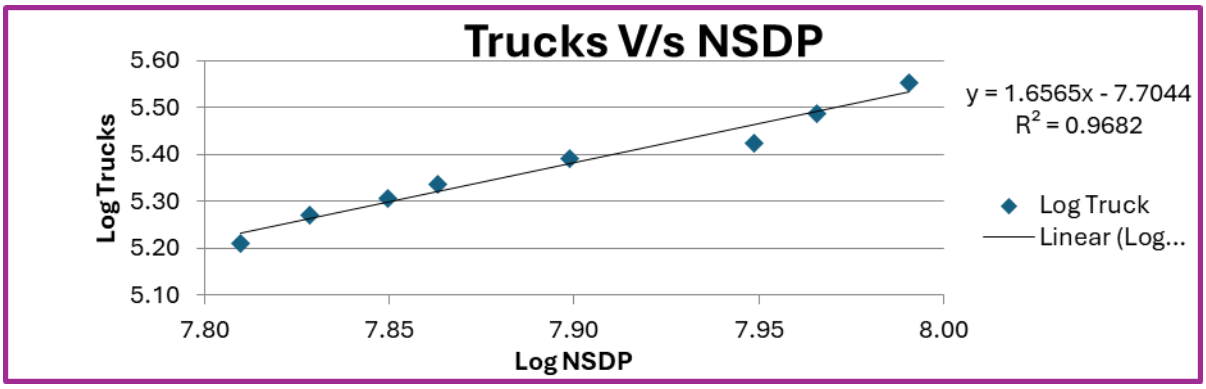

Figure 5-6 : Regression and Elasticity NSDP vs. Trucks Traffic - extrapolation Uttar Pradesh.

Using the regression analysis above, we have arrived at the elasticity of traffic demand for each class of vehicle to a given change in relevant economic indicators. Average traffic growth of a vehicle class is multiplied by the corresponding elasticity coefficient to arrive at traffic growth. R2 statistical measure of how close the data are to the fitted regression line. It varies from 0 to 1. The higher the value of R2 more representative is the regression model of data.

The results of these analyses for *the good fit* regression as reflected by R^2 values are presented in the Table below.

Table 5-8 : Summary Regression Analysis Uttar Pradesh

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average Growth (8yrs)	Growth Elastic Model	Remarks
UTTAR PRADESH	**Car/Jeep**	PCI	y = 2.3398x - - 4.4661	R^2 = 0.9604	2.3398	4.58%	10.72%	Good Regression
	Bus	Population	y = 7.3329x - - 56.1092	R^2 = 0.9859	7.3329	1.53%	11.19%	Good Regression
	Truck	NSDP	y = 1.6565x - - 7.7044	R^2 = 0.9682	1.6565	6.18%	10.24%	Good Regression

The following tables and graphs depict regression and elasticity of growth model for stretch falling in Delhi State.

Table 5-9 : Per Capita Income Vs Car Delhi

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth (8 Year)
2011	185001	2172069	5.27	6.34		
2012	192220	2416974	5.28	6.38	4%	
2013	200702	2568380	5.30	6.41	4%	
2014	213669	2730071	5.33	6.44	6%	
2015	233115	2986579	5.37	6.48	9%	
2016	244255	3061817	5.39	6.49	5%	
2017	252960	3087309	5.40	6.49	4%	
2018	260967	3249670	5.42	6.51	3%	5.1%

Regression analysis of same is given in figure below.

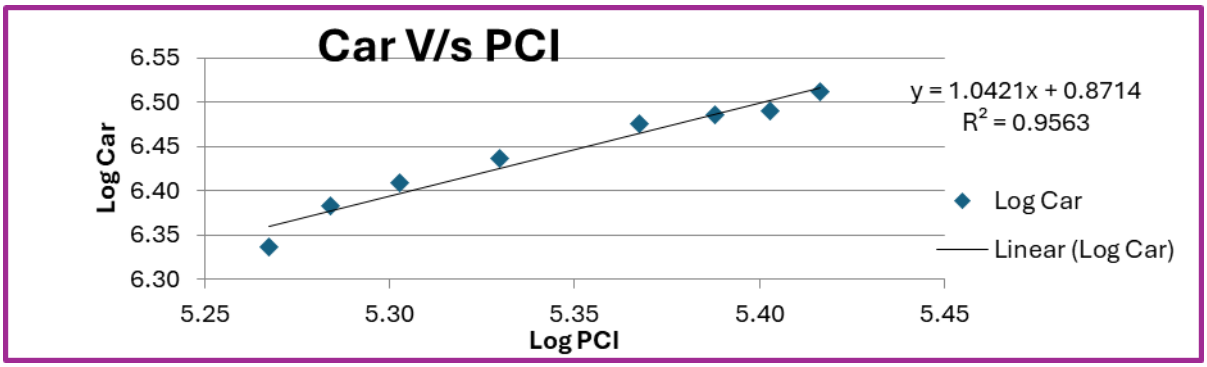

Figure 5-7 : Regression and Elasticity PCI vs. Car – Extrapolation Delhi

Table 5-10 : Population Vs Bus Delhi

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth (8 Year)
2011	16788000	20142	7.22	4.30		
2012	17166000	24642	7.23	4.39	2%	
2013	17544000	28142	7.24	4.45	2%	
2014	17921000	33342	7.25	4.52	2%	
2015	18299000	43723	7.26	4.64	2%	
2016	18677000	51823	7.27	4.71	2%	
2017	19056000	61023	7.28	4.79	2%	
2018	19435000	71043	7.29	4.85	2%	2.1%

Regression analysis of same is given in figure below.

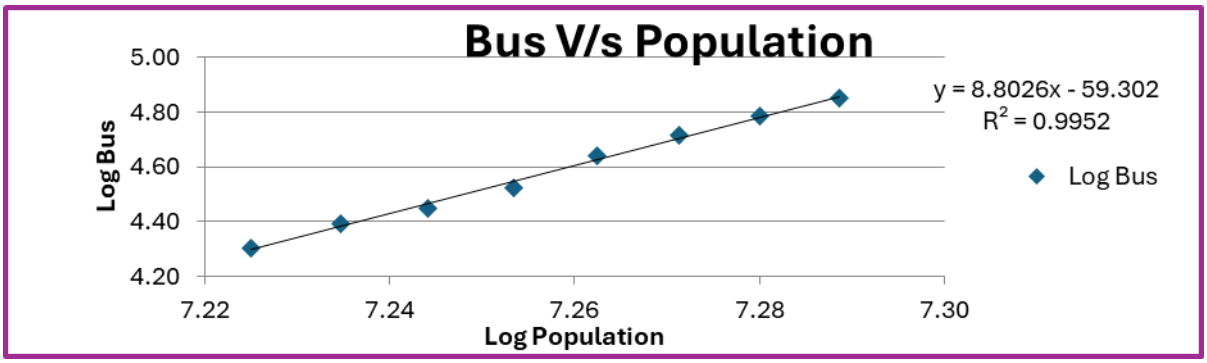

Figure 5-8 : Regression and Elasticity Population vs. Bus – Extrapolation Delhi

Elasticity of Trucks has been worked out by regression analysis with NSDP. The following table represents the data and details.

Table 5-11 Trucks Vs NSDP Delhi

Year	NSDP	Trucks	Log NDSP	Log Truck	NSDP Growth	Average Growth (8 Year)
2011	31465002	149277	7.50	5.17		
2012	33419330	157277	7.52	5.20	6%	
2013	35652751	165477	7.55	5.22	7%	
2014	38763874	174577	7.59	5.24	9%	
2015	43172959	185027	7.64	5.27	11%	
2016	46159238	196527	7.66	5.29	7%	
2017	48763115	208417	7.69	5.32	6%	

Year	NSDP	Trucks	Log NDSP	Log Truck	NSDP Growth	Average Growth (8 Year)
2018	51295715	220417	7.71	5.34	5%	7.2%

The following figure depicts regression analysis and extrapolation.

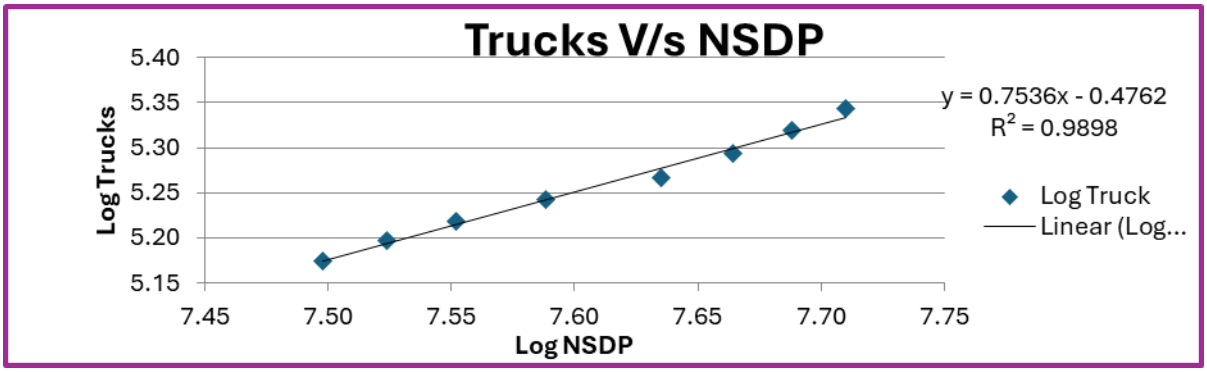

Figure 5-9 : Regression and Elasticity NSDP vs. Trucks Traffic - extrapolation Delhi.

Using the regression analysis above, we have arrived at the elasticity of traffic demand for each class of vehicle to a given change in relevant economic indicators. Average traffic growth of a vehicle class is multiplied by the corresponding elasticity coefficient to arrive at traffic growth. R2 statistical measure of how close the data are to the fitted regression line. It varies from 0 to 1. The higher the value of R2 more representative is the regression model of data.

The results of these analyses for *the good fit* regression as reflected by R^2 values are presented in the Table below.

Table 5-12 : Summary Regression Analysis Delhi

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average Growth (8yrs)	Growth Elastic Model	Remarks
DELHI	**Car/Jeep**	PCI	y = 1.0421x - 0.8714	R^2 = 0.9563	1.0421	5.05%	5.27%	Good Regression
	Bus	Population	y = 8.8026x - - 59.3021	R^2 = 0.9952	8.8026	2.11%	18.61%	Good Regression
	Truck	NSDP	y = 0.7536x - - 0.4762	R^2 = 0.9898	0.7536	7.25%	5.46%	Good Regression

The following tables and graphs depict regression and elasticity of growth model for stretch falling in Haryana State.

Table 5-13 : Per Capita Income Vs Car Haryana

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth (8 Year)
2011	106085	989519	5.03	6.00		
2012	111780	1602129	5.05	6.20	5%	
2013	119791	1771298	5.08	6.25	7%	
2014	125032	2008748	5.10	6.30	4%	
2015	137833	2260084	5.14	6.35	10%	
2016	150259	2527537	5.18	6.40	9%	
2017	158039	2794957	5.20	6.45	5%	
2018	164976	3011656	5.22	6.48	4%	6.5%

Regression analysis of same is given in figure below.

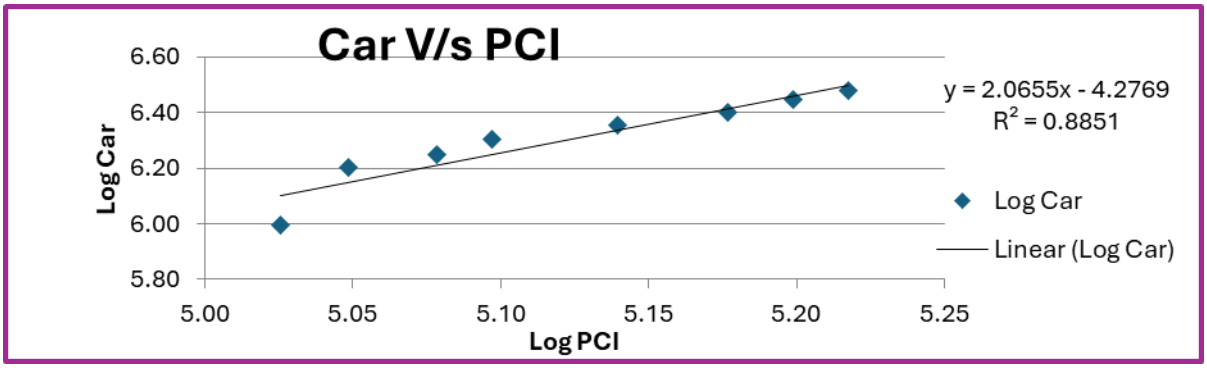

Figure 5-10 : Regression and Elasticity PCI vs. Car – Extrapolation Haryana

Table 5-14 : Population Vs Bus Haryana

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth (8 Year)
2011	25351000	39153	7.40	4.59		
2012	25772000	43456	7.41	4.64	2%	
2013	26193000	46558	7.42	4.67	2%	
2014	26614000	52640	7.43	4.72	2%	
2015	27034000	55781	7.43	4.75	2%	
2016	27455000	60129	7.44	4.78	2%	
2017	27861000	64629	7.44	4.81	1%	
2018	28266000	70229	7.45	4.85	1%	1.6%

Regression analysis of same is given in figure below.

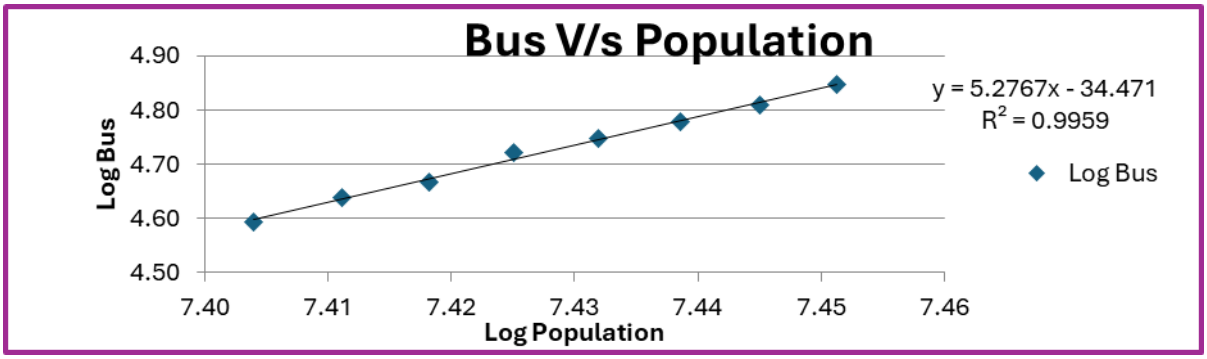

Figure 5-11 : Regression and Elasticity Population vs. Bus – Extrapolation Haryana

Elasticity of Trucks has been worked out by regression analysis with NSDP. The following table represents the data and details.

Table 5-15 Trucks Vs NSDP Haryana

Year	NSDP	Trucks	Log NDSP	Log Truck	NSDP Growth	Average Growth (8 Year)
2011	27115248	292735	7.43	5.47		
2012	28975622	307509	7.46	5.49	7%	
2013	31493120	327882	7.50	5.52	9%	
2014	33335925	348732	7.52	5.54	6%	
2015	37270025	367730	7.57	5.57	12%	
2016	41205461	390321	7.61	5.59	11%	
2017	43952345	455321	7.64	5.66	7%	
2018	46533095	550321	7.67	5.74	6%	8.0%

The following figure depicts regression analysis and extrapolation.

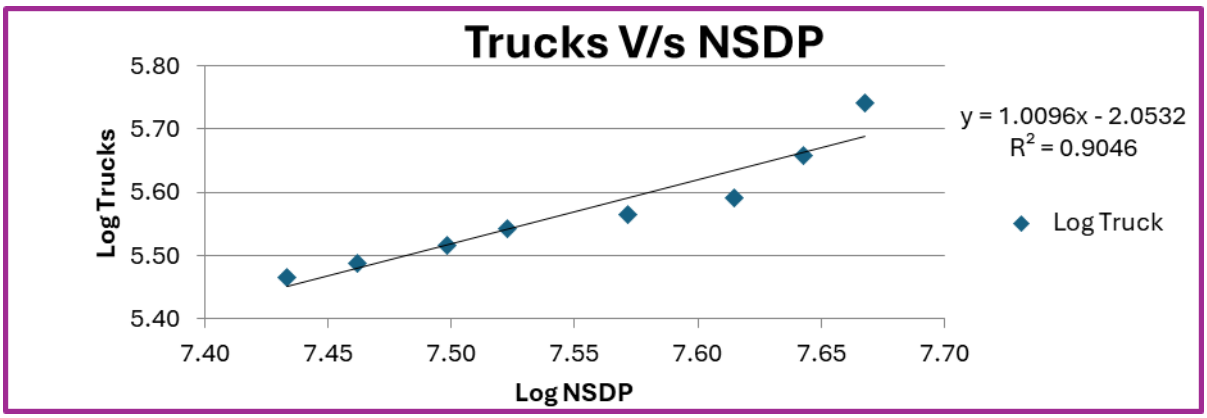

Figure 5-12 : Regression and Elasticity NSDP vs. Trucks Traffic - extrapolation Haryana.

Using the regression analysis above, we have arrived at the elasticity of traffic demand for each class of vehicle to a given change in relevant economic indicators. Average traffic growth of a vehicle class is multiplied by the corresponding elasticity coefficient to arrive at traffic growth. R2 statistical measure of how close the data are to the fitted regression line. It varies from 0 to 1. The higher the value of R2 more representative is the regression model of data.

The results of these analyses for *the good fit* regression as reflected by R^2 values are presented in the Table below.

Table 5-16 : Summary Regression Analysis Haryana

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average Growth (8yrs)	Growth Elastic Model	Remarks
HARYANA	**Car/Jeep**	PCI	y = 2.0655x - - 4.2769	R^2 = 0.8851	2.0655	6.53%	13.49%	Good Regression
	Bus	Population	y = 5.2767x - - 34.4708	R^2 = 0.9959	5.2767	1.57%	8.27%	Good Regression
	Truck	NSDP	y = 1.0096x - - 2.0532	R^2 = 0.9046	1.0096	8.04%	8.12%	Good Regression

The following tables and graphs depict regression and elasticity of growth model for stretch falling in Rajasthan State.

Table 5-17 : Per Capita Income Vs Car Rajasthan

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth (8 Year)
2011	57192	591069	4.76	5.77		
2012	58441	659542	4.77	5.82	2%	
2013	61053	733916	4.79	5.87	4%	
2014	64496	814079	4.81	5.91	6%	
2015	68565	899307	4.84	5.95	6%	
2016	71324	988391	4.85	5.99	4%	
2017	73109	1095526	4.86	6.04	3%	
2018	75555	1204005	4.88	6.08	3%	4.1%

Regression analysis of same is given in figure below.

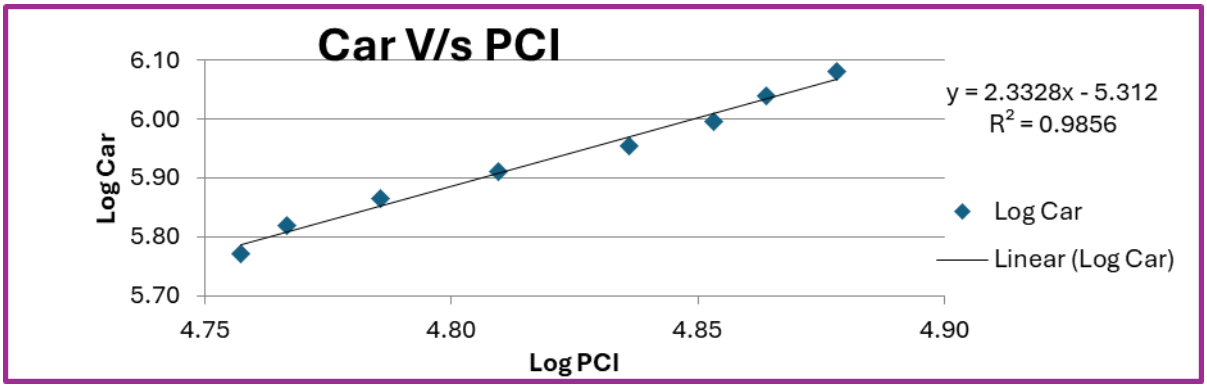

Figure 5-13 : Regression and Elasticity PCI vs. Car – Extrapolation Rajasthan

Table 5-18 : Population Vs Bus Rajasthan

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth (8 Year)
2011	68548000	83345	7.84	4.92		
2012	69687000	88616	7.84	4.95	2%	
2013	70825000	93892	7.85	4.97	2%	
2014	71963000	97650	7.86	4.99	2%	
2015	73102000	102818	7.86	5.01	2%	
2016	74240000	108680	7.87	5.04	2%	
2017	75248000	113964	7.88	5.06	1%	
2018	76256000	118301	7.88	5.07	1%	1.5%

Regression analysis of same is given in figure below.

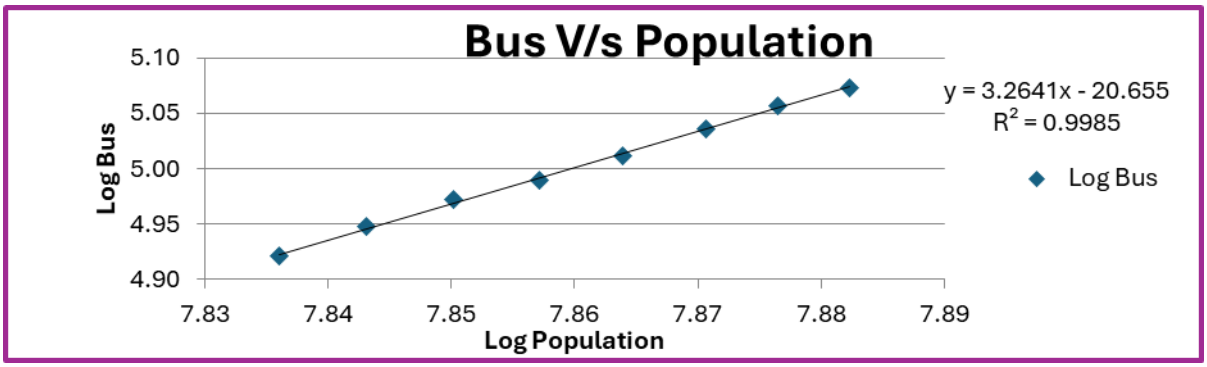

Figure 5-14 : Regression and Elasticity Population vs. Bus – Extrapolation Rajasthan

Elasticity of Trucks has been worked out by regression analysis with NSDP. The following table represents the data and details.

Table 5-19 Trucks Vs NSDP Rajasthan

Year	NSDP	Trucks	Log NDSP	Log Truck	NSDP Growth	Average Growth (8 Year)
2011	39533093	362028	7.60	5.56		
2012	40980249	401983	7.61	5.60	4%	
2013	43429222	434379	7.64	5.64	6%	
2014	46540773	472365	7.67	5.67	7%	
2015	50192151	517604	7.70	5.71	8%	
2016	52965038	561158	7.72	5.75	6%	
2017	55442912	613055	7.74	5.79	5%	
2018	58059438	665926	7.76	5.82	5%	5.7%

The following figure depicts regression analysis and extrapolation.

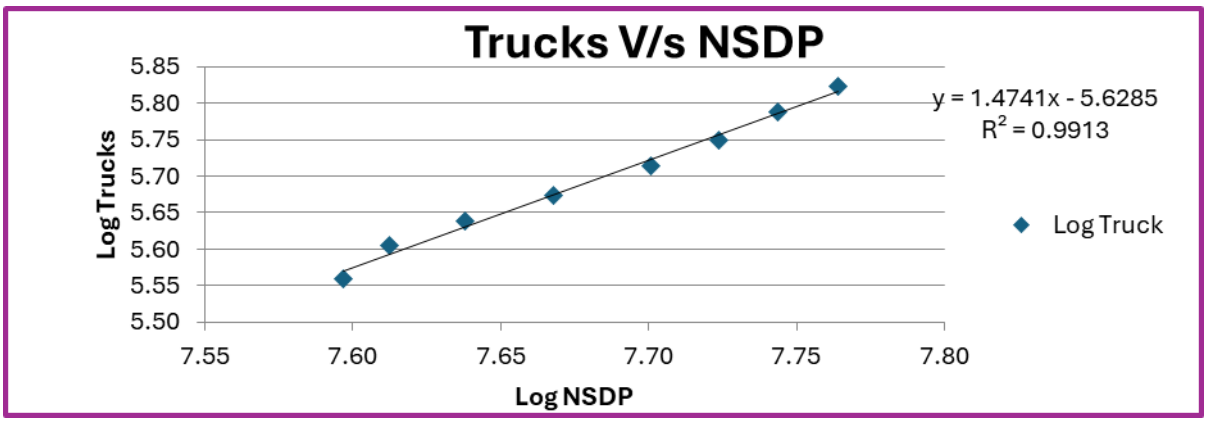

Figure 5-15 : Regression and Elasticity NSDP vs. Trucks Traffic - extrapolation Rajasthan.

Using the regression analysis above, we have arrived at the elasticity of traffic demand for each class of vehicle to a given change in relevant economic indicators. Average traffic growth of a vehicle class is multiplied by the corresponding elasticity coefficient to arrive at traffic growth. R2 statistical measure of how close the data are to the fitted regression line. It varies from 0 to 1. The higher the value of R2 more representative is the regression model of data.

The results of these analyses for *the good fit* regression as reflected by R^2 values are presented in the Table below.

Table 5-20 : Summary Regression Analysis Rajasthan

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average Growth (8yrs)	Growth Elastic Model	Remarks
RAJASTHAN	**Car/Jeep**	PCI	y = 2.3328x - - 5.312	R^2 = 0.9856	2.3328	4.07%	9.49%	Good Regression
	Bus	Population	y = 3.2641x - - 20.6548	R^2 = 0.9985	3.2641	1.53%	5.01%	Good Regression
	Truck	NSDP	y = 1.4741x - - 5.6285	R^2 = 0.9913	1.4741	5.65%	8.33%	Good Regression

Economical model for predicting growth is good tool, however other local, regional, national factors should also be considered before finalizing growth factors. Considering factors such as proposed developments and other influencing economic factors, moderated growth should be considered. These factors are discussed in subsequent sections.

5.4 Analysis of Historic Traffic Data

Historical traffic data forms useful information for any highway project. It provides useful information for establishing past trend of growth. Project stretch of Gwalior_ Jhansi has recently been awarded to Concessionaire. Hence credible historical data on project traffic is not available.

5.5 Other Factors Influencing Growth

There are many factors which have an impact on traffic growth. As discussed previously these factors can be economical, social, educational, and industrial.

Potentiality of such factors for project highway is discussed as under.

ECONOMY

After witnessing a slowdown during 2011-12, the economy recovered in 2013-14, and a high growth rate of GDP was recorded up to 2018-19. Pandemic of COVID-19 impacted all economies of world including India up to year 2021-22. Following figure show trend of GDP growth in India.

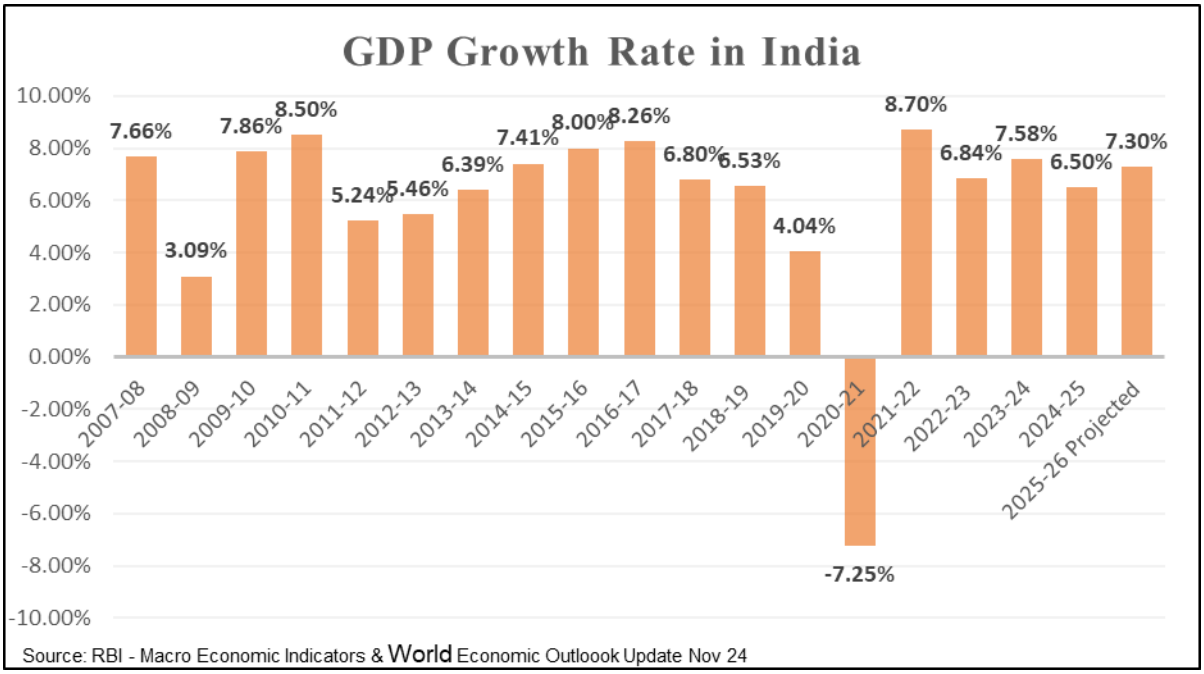

Figure 5-16 : Growth of GDP in India

FY 2017-18 recorded a growth of 6.7% which had a slight impact of GST and demonetization. Indian economy appears on recovery path with estimated growth of 6.8% in FY 2018-19. The government took major policy decisions including tax infrastructure reforming, banking sector improvement and ease of doing business.

In post COVID-19 scenario, in year 2022-23 and 2023-24 India registered an impressive growth of 7% to 7.5%. In last year despite global slow down due to Russia-Ukraine war and Gaza crises, India grew at good rate of 7%(Estimated).

Indian economy is now on good growth path and all major institutions including IMF / ADB have estimated growth of Indian Economy to peg around 6.5% to 7% in coming years.

5.6 Developments along and around the Project Corridor & State

MADHYA PRADESH: Madhya Pradesh state, which is located in central India is bound on the north by Uttar Pradesh, on the east by Chhattisgarh, on the south by Maharashtra, and on the west by Gujarat and Rajasthan. It is the second largest Indian state and one of the fastest growing states in the country. At current prices, the Gross State Domestic Product (GSDP) of Madhya Pradesh is estimated at Rs.1,151,049 crore trillion (US$ 150.74 billion) in 2022-23, registering an annual growth of 10% over FY21. Between 2015-16 and 2021-22, The GSDP increased at a CAGR (in Rs.) of 13.09% from 2015-16 to 2021-22. Net State Domestic Product (NSDP) of Madhya Pradesh was about Rs. 8.27 trillion (US$ 113.94 billion) in 2020-21. Between 2015-16 and 2020-21, state's NSDP grew at a CAGR of around 11.22%

GWALIOR DISTRICT: Gwalior district is one of the fifty-two- districts of Madhya Pradesh state. Gwalior is also the administrative headquarters of this district. The population density in the district is 446 people per sq. Km. In the year 2020 the number of live births in the district was 61265 out of which 34162 where male and 27102 were females.

INDUSTRIAL PROFILE OF GWALIOR DISTRICT: The economy of the district is basically based on various Industrial sectors. It comprises 3 prominent industrial areas namely Sitholi, Banmore and Malanpur. Earlier the place had two main big manufacturing industries, such as Gwalior Grasim and J.C. Mills of Birlanagar.

DATIA DISTRICT: Datia district is the one of the fifty-two districts in the state of Madhya Pradesh with its admistrative headquarter located at Datia city. According to the census of the district has population of 7,86,754 out of which 420,157, are males and 3,66,597 are females.

The chief agriculture products in the district are all food grains and cotton.

UTTAR PRADESH: The state has an area of 240,928 sq kms and is the most populous state in India, with population of 199.8 million as per 2011 census with an average population density of 828 persons per sq. km. The economy of Uttar Pradesh is the third largest of all the states in India. Nominal GDP of the state for the year 2022-23 is Rs. 21.74 trillion.

It is reported that the economy of Uttar Pradesh is growing at a faster rate than the national economy at about 9%. In terms of traffic and transportation as well Uttar Pradesh is one of the leader states in India now.

- Air Connectivity: Major national & international airports connecting the rest of India, Middle East & Southeast Asian countries; Only state to have 05 International Airports (03 existing & 02 upcoming at Jewar (G. Noida & Ayodhya)
- Railway Network: Largest railway network in the country spanning over 8,949 km; 05 Railway Zones
- Inland Waterway: India's 1st Inland Waterway is operational in UP (1100 km Haldia - Varanasi tract
- Expressways: Uttar Pradesh boasts state of art expressways ensuring seamless connectivity; 13 Expressways (existing & upcoming)
- Road Network: Largest Road Network in India; 4 Lakh Km Total Road Length 11,737 Km Total National Highway

Logistics hubs emerging across UP: MMLH Dadri, MMTH Boraki, MMT Varanasi etc.

From the above it can be expected that the project corridor would serve as one of the important transportation links in the area and would contribute to the growth of the region.

JHANSI DISTRICT: Jhansi district is a district of Uttar Pradesh state with its headquarters located at Jhansi city. The district is named Jhansi after the headquarter city Jhansi. According to 2011 census the district has a population of 1998603 out of which 1057436 are males and 941167 are females. To some extent the economy of the district is based on agriculture some of its chief agriculture products are wheat, barley. pea, gram, paddy, groundnut, and different types of pulses. The foremost industries of the district are BHEL Jhansi, Heidelberg cement factory, Baidyanth factory, government cotton mill, Paricha thermal power plant, Indian hume pipe Co.Ltd. its silk material and industries are not only famous in the country but also in the world.

5.7 Recommended Growth Rates of Traffic

Based on the above analysis and after giving due consideration to the entire listed factors, the following overall growth rates are recommended for each category of vehicle as under. Rate of growth is moderated in light of overall regional trend. Growth of Multi-Axle is kept slightly higher as trend of technological advances in logistic industry Favors multi-axle over 2/3 axle carriage. It is also expected that as the economy moves from developing to developed, rate of growth diminishes. Same growth rate is not sustainable for long. Traffic growth has been suitably stepped down for future years.

Growth rates are recommended for three scenarios for sensitivity analysis namely **Optimistic, Pessimistic** and **Most Likely** with a positive and negative variation 0.25% from Most Likely case for corridor in both states.

5.7.1 Recommended Growth Rates of Stretch

Table 5-21 : Recommended Growth Rates Optimistic

Category / Year	FY 2027-2029	FY 2030-2034	FY 2035-2039	FY 2040-2045	FY 2046-2050
Car/Jeep/Van	7.90%	6.76%	5.15%	4.96%	4.29%
LCV	4.87%	3.09%	2.38%	2.01%	3.22%
Bus	4.97%	3.91%	2.67%	2.45%	2.23%
2- Axle	4.87%	3.56%	2.38%	2.01%	1.82%
3 - Axle	4.87%	3.56%	2.38%	2.01%	1.82%
4 to 6 Axle	5.53%	4.03%	3.09%	2.60%	2.34%
7 and Above Axle	5.53%	4.03%	3.09%	2.60%	2.34%

Table 5-22 : Recommended Growth Rates Pessimistic

Category / Year	FY 2027-2029	FY 2030-2034	FY 2035-2039	FY 2040-2045	FY 2046-2050
Car/Jeep/Van	7.40%	6.26%	4.65%	4.46%	3.79%
LCV	4.37%	2.59%	1.88%	1.51%	2.72%
Bus	4.47%	3.41%	2.17%	1.95%	1.73%
2- Axle	4.37%	3.06%	1.88%	1.51%	1.32%
3 - Axle	4.37%	3.06%	1.88%	1.51%	1.32%
4 to 6 Axle	5.03%	3.53%	2.59%	2.10%	1.84%
7 and Above Axle	5.03%	3.53%	2.59%	2.10%	1.84%

Table 5-23 : Recommended Growth Rates Most Likely

Category / Year	FY 2027-2029	FY 2030-2034	FY 2035-2039	FY 2040-2045	FY 2046-2050
Car/Jeep/Van	7.65%	6.51%	4.90%	4.71%	4.04%
LCV	4.62%	2.84%	2.13%	1.76%	2.97%
Bus	4.72%	3.66%	2.42%	2.20%	1.98%
2- Axle	4.62%	3.31%	2.13%	1.76%	1.57%
3 - Axle	4.62%	3.31%	2.13%	1.76%	1.57%
4 to 6 Axle	5.28%	3.78%	2.84%	2.35%	2.09%
7 and Above Axle	5.28%	3.78%	2.84%	2.35%	2.09%

Traffic and revenue have been worked out on the basis of above growths and same is presented in subsequent chapter of report.

CHAPTER 6

TRAFFIC FORECAST

6.1 Traffic Projections

Growth rates recommended in the previous section of the report are used to arrive at traffic projections for future years. Toll plaza wise futuristic traffic projection is given in tables below.

These projections have been done for the following three cases of growth up to concession period.

1. Optimistic Scenario
2. Pessimistic Scenario
3. Most Likely Scenario

Table 6-1 : Total Tollable Traffic @ Toll Plaza - Chainage 97.900 KM

(Optimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	5599	421	194	1615	1453	1909	7	**11198**	**26146**
2027-28	6042	441	204	1693	1523	2015	7	**11925**	**27681**
2028-29	6519	462	214	1776	1597	2126	7	**12701**	**29311**
2029-30	6960	476	223	1839	1653	2212	7	**13370**	**30650**
2030-31	7430	491	232	1905	1711	2301	7	**14077**	**32056**
2031-32	7931	506	241	1973	1771	2394	7	**14823**	**33532**
2032-33	8467	521	250	2043	1833	2490	7	**15611**	**35082**
2033-34	9040	537	260	2115	1898	2591	7	**16448**	**36710**
2034-35	9506	549	267	2165	1943	2671	7	**17108**	**37972**
2035-36	9995	561	274	2217	1989	2754	7	**17797**	**39282**
2036-37	10509	575	281	2270	2036	2840	7	**18518**	**40642**
2037-38	11051	589	289	2324	2084	2928	7	**19272**	**42055**
2038-39	11621	603	297	2379	2133	3019	7	**20059**	**43522**
2039-40	12197	615	304	2427	2176	3097	7	**20823**	**44896**
2040-41	12800	627	311	2476	2220	3177	7	**21618**	**46320**
2041-42	13436	639	319	2526	2265	3260	7	**22452**	**47797**
2042-43	14101	651	327	2577	2311	3345	7	**23319**	**49328**
2043-44	14800	664	336	2629	2357	3432	7	**24225**	**50916**

Table 6-2 : Total Tollable Traffic @ Toll Plaza - Chainage 97.900 KM (Pessimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	5573	418	193	1608	1446	1900	7	**11145**	**26022**
2027-28	5985	436	202	1678	1509	1996	7	**11813**	**27420**
2028-29	6427	455	211	1751	1574	2096	7	**12521**	**28898**
2029-30	6830	466	218	1804	1622	2170	7	**13117**	**30074**
2030-31	7257	478	226	1859	1671	2247	7	**13745**	**31303**
2031-32	7711	490	234	1916	1722	2326	7	**14406**	**32588**
2032-33	8193	502	243	1974	1774	2408	7	**15101**	**33931**
2033-34	8706	514	252	2034	1828	2494	7	**15835**	**35336**
2034-35	9111	524	257	2072	1863	2558	7	**16392**	**36374**
2035-36	9535	534	262	2111	1898	2625	7	**16972**	**37448**
2036-37	9978	544	267	2150	1934	2694	7	**17574**	**38557**
2037-38	10442	554	272	2190	1970	2764	7	**18199**	**39705**
2038-39	10927	564	277	2231	2007	2836	7	**18849**	**40892**
2039-40	11414	573	282	2265	2038	2896	7	**19475**	**41979**
2040-41	11923	582	287	2299	2069	2957	7	**20124**	**43101**
2041-42	12455	591	292	2334	2101	3019	7	**20799**	**44260**
2042-43	13011	600	297	2369	2133	3082	7	**21499**	**45458**
2043-44	13592	609	302	2405	2165	3147	7	**22227**	**46695**

Traffic projections for Most Likely scenario is given as under

Table 6-3 : Total Tollable Traffic @ Toll Plaza - Chainage 97.900 KM (Most Likely Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	5587	420	194	1612	1450	1905	7	**11175**	**26084**
2027-28	6014	439	203	1686	1516	2006	7	**11871**	**27551**
2028-29	6474	459	213	1763	1585	2112	7	**12613**	**29104**
2029-30	6895	471	222	1821	1637	2192	7	**13245**	**30361**
2030-31	7344	485	231	1881	1691	2276	7	**13915**	**31678**
2031-32	7821	499	240	1943	1747	2363	7	**14620**	**33057**
2032-33	8330	513	249	2008	1804	2453	7	**15364**	**34503**
2033-34	8873	528	258	2075	1863	2546	7	**16150**	**36018**
2034-35	9308	539	265	2119	1903	2619	7	**16760**	**37166**
2035-36	9764	550	272	2164	1944	2694	7	**17395**	**38355**
2036-37	10242	561	279	2210	1985	2771	7	**18055**	**39587**
2037-38	10743	573	286	2257	2027	2850	7	**18743**	**40864**
2038-39	11270	585	293	2305	2070	2931	7	**19461**	**42188**

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2039-40	11801	595	300	2345	2107	3000	7	**20155**	**43415**
2040-41	12358	605	307	2386	2144	3071	7	**20878**	**44684**
2041-42	12940	616	314	2428	2182	3144	7	**21631**	**45997**
2042-43	13549	627	321	2470	2221	3218	7	**22413**	**47356**
2043-44	14186	638	328	2513	2260	3294	7	**23226**	**48762**

CHAPTER 7
FORECAST OF TOLL REVENUE

7.1 General

This chapter presents the tolling rate calculations, categories and toll revenue of the project.

7.2 Discount Categories

As per the Toll Notification (Schedule - G) the discounts and special provisions have been considered. In addition to discounts as per Fee Notification concessionaire has declared special category rates also. Salient features of toll rate structure are given as under

1. Monthly Pass: For frequent users monthly pass would be issued at fee at 2/3rd rate for 50 single journey trips.
2. Multiple Journeys (for Return Trip): Will be charged at 1.5 times single journey.
3. Single Journey: Full single journey toll would be charged to this category of vehicles who are infrequent travellers or whose frequency does not yield any discount from the above categories.
4. Local Discounts: There are several categories of local discounts.
    a) Local Car Jeep Van - Rs. 350 per month (for locals residing within a radius of 20 kms from toll plaza)

Building of inflation and escalation of rate on the basis of WPI are done as per toll notification (Schedule G) as given under as extract from concession agreement.

The formula for determining the applicable rate of fee shall be as follows:-

$$\text{Applicable rate of fee} = \text{base rate} + \text{base rate} \times \left\{ \frac{\text{WPI A-WPI B}}{\text{WPI B}} \right\} \times 0.4$$

Factors of inflation / growth have been incorporated as per Schedule R. WPI are available up to the year 2025-26.

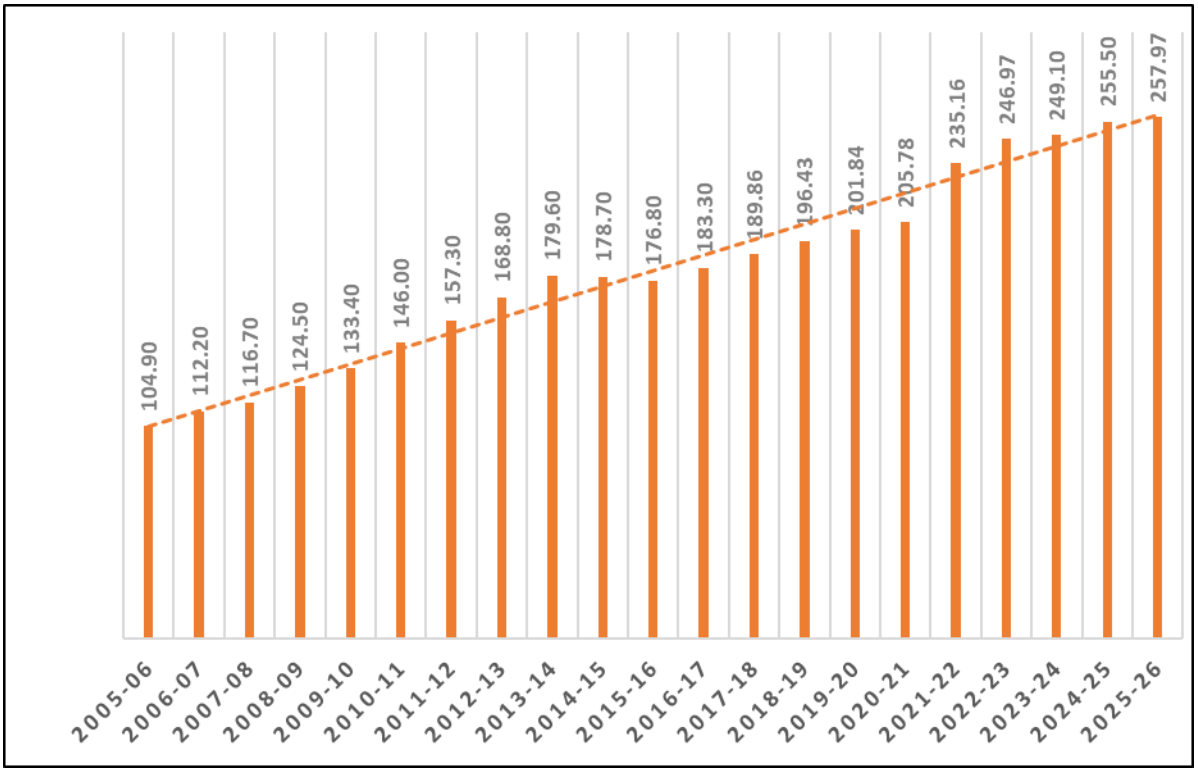

Figure 7-1 : Historical Rate of WPI Inflation in India

The wholesale price index (WPI) and the inflation rate in the past are presented in Table below.

Table 7-1 : Historical WPI value and Growth Inflation

December of year	2021	2022	2023	2024	2025	Avg.
WPI	235.2	247.0	249.1	255.5	257.97	
Inflation	14.27%	5.02%	0.86%	2.57%	0.96%	4.74%

WPI of December 2025 is posted on ministry site which is shows 0.96% inflation from the previous year. Same has been applied for FY 2026-27.

The average WPI inflation over the period FY 2021 to FY 2025 works out to approximately 4.74%, reflecting inflationary cycles across both high and low inflation years. Based on this analysis, an annual escalation factor of 4.5% has been adopted for the remaining concession period.

7.3 Estimation of Toll Rates

As per the applicable MORTH notification and Schedule R of contract agreement, the following Base rate of fee for the categories mentioned in the table stands true in the National Highways Fee Rules applicable for contract.

Table 7-2 : Base Toll Rates June 2007-08

Type of Vehicle	Base Rate of Fee / Km (in Rs.)
Car, Jeep, Van or Light Motor Vehicle	0.65
Light Commercial Vehicle, Light Goods Vehicle or Minibus	1.05
Bus or Truck (Two Axles)	2.20
Three Axle Commercial Vehicles	2.40
Heavy Construction Machinery (HCM) or Earth Moving Equipment (EME) or Multi Axle Vehicle (MAV) (4 to 6 axles)	3.45
Oversized Vehicles (7 or more Axles)	4.20

These rates are then modified for as per procedure provided in guidelines of notification considering factors listed below.

- Annual revision of fee rate - @3%
- Application of WPI

Base rates have been worked out to map the current rates. These shall be updated when more details come in. Base toll rates are given below.

Table 7-3 : Toll Rates for Forecasting Year (Rs. Rupees) Single Journey @ Toll Plaza 1 – KM 97.900

Year	Car	Minibus /LCV	Bus	Truck	3 axles	Multi axle	Oversized Vehicles
2026-27	150	245	515	515	565	810	985
2027-28	160	260	540	540	590	845	1030
2028-29	165	270	565	565	615	885	1080
2029-30	175	285	590	590	645	930	1130
2030-31	185	295	620	620	675	975	1185
2031-32	190	310	650	650	710	1020	1240
2032-33	200	325	680	680	745	1065	1300
2033-34	210	340	715	715	780	1120	1360
2034-35	220	355	745	745	815	1170	1425
2035-36	230	375	785	785	855	1230	1495
2036-37	245	390	820	820	895	1285	1565
2037-38	255	410	860	860	940	1350	1645

Year	Car	Minibus /LCV	Bus	Truck	3 axles	Multi axle	Oversized Vehicles
2038-39	265	430	900	900	985	1415	1720
2039-40	280	450	945	945	1030	1485	1805
2040-41	295	475	990	990	1080	1555	1895
2041-42	305	495	1040	1040	1135	1630	1985
2042-43	325	520	1090	1090	1190	1710	2085
2043-44	340	545	1145	1145	1250	1795	2185

Table 7-4 : Toll Rates for Forecasting Year (Rs. Rupees) Return Journey @ Toll Plaza 1 – KM 97.900

Year	Car	Minibus /LCV	Bus	Truck	3 axle	Multi axle	Oversized Vehicles
2026-27	230	370	775	775	845	1215	1480
2027-28	240	385	810	810	885	1270	1545
2028-29	250	405	850	850	925	1330	1620
2029-30	265	425	890	890	970	1395	1695
2030-31	275	445	930	930	1015	1460	1775
2031-32	290	465	975	975	1065	1530	1860
2032-33	300	485	1020	1020	1115	1600	1950
2033-34	315	510	1070	1070	1165	1680	2040
2034-35	330	535	1120	1120	1225	1760	2140
2035-36	345	560	1175	1175	1280	1840	2245
2036-37	365	590	1230	1230	1345	1930	2350
2037-38	380	615	1290	1290	1410	2025	2465
2038-39	400	645	1355	1355	1475	2120	2585
2039-40	420	675	1420	1420	1550	2225	2710
2040-41	440	710	1490	1490	1625	2335	2840
2041-42	460	745	1560	1560	1705	2450	2980
2042-43	485	780	1640	1640	1785	2570	3125
2043-44	510	820	1720	1720	1875	2695	3280

Table 7-5: Toll Rates for Monthly Pass Local @ Toll Plaza 1 – KM 97.900

Year	Car	Minibus /LCV
2026-27	360	360
2027-28	375	375
2028-29	395	395
2029-30	415	415
2030-31	430	430

Year	Car	Minibus /LCV
2031-32	455	455
2032-33	475	475
2033-34	495	495
2034-35	520	520
2035-36	545	545
2036-37	570	570
2037-38	600	600
2038-39	630	630
2039-40	660	660
2040-41	690	690
2041-42	725	725
2042-43	760	760
2043-44	800	800

Table 7-6: Toll Rates for Monthly Pass @ Toll Plaza 1 – KM 97.900

Year	Car	Minibus /LCV	Bus	Truck	3 axles	Multi axle	Oversized Vehicles
2026-27	5080	8210	17200	17200	18765	26975	32840
2027-28	5320	8595	18010	18010	19645	28240	34380
2028-29	5570	9000	18855	18855	20570	29570	35995
2029-30	5835	9425	19745	19745	21540	30965	37695
2030-31	6110	9870	20680	20680	22560	32430	39475
2031-32	6400	10335	21660	21660	23630	33965	41350
2032-33	6705	10830	22690	22690	24750	35580	43315
2033-34	7025	11345	23770	23770	25935	37280	45385
2034-35	7360	11890	24910	24910	27175	39065	47555
2035-36	7715	12460	26105	26105	28480	40940	49835
2036-37	8085	13060	27360	27360	29850	42910	52235
2037-38	8475	13690	28685	28685	31290	44980	54760
2038-39	8885	14355	30075	30075	32810	47160	57415
2039-40	9315	15050	31535	31535	34405	49455	60205
2040-41	9770	15785	33075	33075	36080	51865	63140
2041-42	10250	16555	34690	34690	37845	54405	66230
2042-43	10755	17370	36395	36395	39700	57070	69480
2043-44	11280	18225	38185	38185	41655	59880	72900

7.4 Toll Revenue

As indicated earlier, toll revenue on the Project Road has been calculated in all three scenarios based on above rates and projected traffic. The estimates of toll revenue under ***Optimistic***, ***Pessimistic*** and ***Most Likely*** growth scenarios are presented in the following section.

7.5 Toll Revenue at all toll plazas under Scenarios

Toll Revenue estimates under all scenarios at each of the toll plaza up to 2043-44 years starting from the year 2026-27 are shown in tables below.

Table 7-7 : Toll Revenue Optimistic Scenario

(Rs. Crores)

Location / Year	TP-01	Total
2026-27	147.73	**147.73**
2027-28	164.08	**164.08**
2028-29	180.49	**180.49**
2029-30	197.95	**197.95**
2030-31	216.20	**216.20**
2031-32	236.67	**236.67**
2032-33	257.83	**257.83**
2033-34	282.77	**282.77**
2034-35	304.56	**304.56**
2035-36	331.17	**331.17**
2036-37	357.96	**357.96**
2037-38	386.84	**386.84**
2038-39	418.35	**418.35**
2039-40	452.80	**452.80**
2040-41	487.72	**487.72**
2041-42	525.60	**525.60**
2042-43	568.80	**568.80**
2043-44	616.64	**616.64**

Table 7-8 : Toll Revenue Pessimistic Scenario

(Rs. Crores)

Location / Year	TP-01	Total
2026-27	147.04	**147.04**
2027-28	162.62	**162.62**
2028-29	178.08	**178.08**
2029-30	194.37	**194.37**
2030-31	211.32	**211.32**
2031-32	230.25	**230.25**
2032-33	249.61	**249.61**
2033-34	272.45	**272.45**
2034-35	292.07	**292.07**
2035-36	316.09	**316.09**
2036-37	340.02	**340.02**
2037-38	365.65	**365.65**
2038-39	393.52	**393.52**
2039-40	423.97	**423.97**

Location / Year	TP-01	Total
2040-41	454.51	**454.51**
2041-42	487.49	**487.49**
2042-43	525.00	**525.00**
2043-44	566.48	**566.48**

Table 7-9 : Toll Revenue Most Likely Scenario

(Rs. Crores)

Location / Year	TP-01	Total
2026-27	147.42	**147.42**
2027-28	163.36	**163.36**
2028-29	179.28	**179.28**
2029-30	196.21	**196.21**
2030-31	213.86	**213.86**
2031-32	233.58	**233.58**
2032-33	253.84	**253.84**
2033-34	277.73	**277.73**
2034-35	298.46	**298.46**
2035-36	323.81	**323.81**
2036-37	349.12	**349.12**
2037-38	376.35	**376.35**
2038-39	406.01	**406.01**
2039-40	438.39	**438.39**
2040-41	471.07	**471.07**
2041-42	506.45	**506.45**
2042-43	546.75	**546.75**
2043-44	591.32	**591.32**

7.6 Modification in Concession Period

Modification of the concession period shall be done on the basis of Revenue targets given in the contract for milestones 1 & 2.

Modification in concession period as per provisions of DCA and same is summarized in table for all scenarios.

Pessimistic Case

Target Point 1- March 2031									
Target Month - March 2031	**Target Revenue (Rs. Crores)**	**Calculated Revenue (Rs. Crores)**	**Difference %**	**If qualifies for Modification in Concession Period**	**Qualifying increment or shortfall**	**Change in Concession period %**	**Original Concession Period (Years)**	**Change in Concession period (Years)**	**Modified Concession Period**
TOT-13 - Gwalior to Jhansi	17	17.66	3.91%	No	-	0.00%	20.00	0.00	

Target Point 2- March 2038											
Target Month - March 2038	**Target Revenue (Rs. Crores)**	**Calculated Revenue (Rs. Crores)**	**Difference %**	**If qualifies for Modification in Concession Period**	**Qualifying increment or shortfall**	**Change in Concession period %**	**Original Concession Period (Years)**	**Change in Concession period**	**Total Change in Concession period (Years)**	**Calculated Modified Concession Period**	**Final Concession Period subject to Cap**
TOT-13 - Gwalior to Jhansi	31	30.53	-1.51 %	No	-	0.00%	20.00	0.00	0.00	31	

Most likely Case

Target Point 1- March 2031									
Target Month - March 2031	**Target Revenue (Rs. Crores)**	**Calculated Revenue (Rs. Crores)**	**Difference %**	**If qualifies for Modification in Concession Period**	**Qualifying increment or shortfall**	**Change in Concession period %**	**Original Concession Period (Years)**	**Change in Concession period (Years)**	**Modified Concession Period**
TOT-13 - Gwalior to Jhansi	17	17.88	5.17%	No	-	0.00%	20.00	0.00	

Target Point 2- March 2038											
Target Month - March 2038	Target Revenue (Rs. Crores)	Calculated Revenue (Rs. Crores)	Difference %	If qualifies for Modification in Concession Period	Qualifying increment or shortfall	Change in Concession period %	Original Concession Period (Year)	Change in Concession period	Total Change in Concession period (Year)	Calculated Modified Concession Period	Final Concession Period subject to Cap
TOT-13 - Gwalior to Jhansi	31	31.43	1.39 %	No	-	0.00%	20.00	0.00	0.00	20.00	

Optimistic Case

Target Point 1- March 2031									
Target Month - March 2031	Target Revenue (Rs. Crores)	Calculated Revenue (Rs. Crores)	Difference %	If qualifies for Modification in Concession Period	Qualifying increment or shortfall	Change in Concession period %	Original Concession Period (Year)	Change in Concession period (Year)	Modified Concession Period
TOT-13 - Gwalior to Jhansi	17	18.08	6.34%	No	-	0.00%	20.00	0.00	

Target Point 2- March 2038											
Target Month - March 2038	Target Revenue (Rs. Crores)	Calculated Revenue (Rs. Crores)	Difference %	If qualifies for Modification in Concession Period	Qualifying increment or shortfall	Change in Concession period %	Original Concession Period (Year)	Change in Concession period	Total Change in Concession period (Year)	Calculated Modified Concession Period	Final Concession Period subject to Cap
TOT-13 - Gwalior to Jhansi	31	32.31	4.22 %	No	-	0.00%	20.00	0.00	0.00	20.00	

TOT-13 (Gwalior to Jhansi)-Modification in Concession Period						
Types of Scenarios	Pessimistic Case		Most likely Case		Optimistic Case	
Target Month	Mar-31	Mar-38	Mar-31	Mar-38	Mar-31	Mar-38
Target Revenue (Rs. Crores)	17	31	17	31	17	31
Calculated Revenue (Rs. Crores)	17.66	30.53	17.88	31.43	18.08	32.31
Differences %	3.91%	-1.51%	5.17%	1.39%	6.34%	4.22%
If qualifies for Modification in Concession Period	No	No	No	No	No	No
Qualifying Increment or shortfall	-	-	-	-	-	-
Change in Concession period %	0.00%	0.00%	0.00%	0.00%	0.00%	0.00%
Original Concession Period	20.00	20.00	20.00	20.00	20.00	20.00
Change in Concession period	0.00	0.00	0.00	0.00	0.00	0.00
Total Change in Concession period	0.00		0.00		0.00	
Calculated Modified Concession Period	20.00		20.00		20.00	
Final Concession Period subject to Cap	0.00		0.00		0.00	

Thus, there is no modification expected in concession period due to variation in revenue as per above estimates in all scenarios.

CHAPTER 8

CONCLUSION & RECOMMENDATIONS

8.1 Conclusion & Recommendations

Project stretch of Gwalior-Jhansi from km 0.000 to km 103.000 (revised section km 16.000 to km 98.455) of NH-75 (New NH-44) in the state of Madhya Pradesh and Uttar Pradesh is currently four lane road. The road is in sound condition and serves healthy traffic volumes. Project corridor is a part of the important regional network connecting Uttar Pradesh, Madhya Pradesh to Southern States and vice-versa. There are large number of townships, industrial corridors and other business establishment coming up along project corridor. As discussed, dominant portion of traffic is long route traffic, which is more sensitive towards the growth of national economy. As Indian economy is poised to grow at 7%+ post COVID-19, the project corridor is expected to pick up the same trend in terms of traffic flow. All these developments have potential to give positive impact to traffic flow on project. The following can be considered as major outcomes of the study

a) There is good amount of tollable traffic running on project

b) Project corridor has potential to witness traffic growth @ 6-8% annually in near future due to various development in area and overall development of economy

c) Project corridor has committed traffic as long route traffic and does not run a risk of traffic leakage due to quality competing road

Based on above it can be considered a stable healthy project from traffic and revenue point of view.

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Lucknow-Ayodhya Section of NH-28 (New NH-27) from km 15+400 to km 137.970, Ayodhya-Gorakhpur Section (Km. 137.970 to Km. 252.860) stretch of NH-28 (New NH-27) and Lucknow-Sultanpur Section of NH-56 (Now NH-731) from Km. 11.500 (Design Chainage 11.500) to km. 134.700 (Design Chainage 138.925) in the state of Uttar Pradesh

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TRAFFIC STUDY & REVENUE PROJECTION REPORT (FINAL)

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Lucknow-Ayodhya Section of NH-28 (New NH-27) from km 15+400 to km 137.970, Ayodhya-Gorakhpur Section (Km. 137.970 to Km. 252.860) stretch of NH-28 (New NH-27) and Lucknow-Sultanpur Section of NH-56 (Now NH-731) from Km. 11.500 (Design Chainage 11.500) to km. 134.700 (Design Chainage 138.925) in the state of Uttar Pradesh

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ABBREVIATIONS

AADT	-	Annual Average Daily Traffic	**NHAI**	-	National Highway Authority of India
BOT	-	Build Operate Transfer	**NHDP**	-	National Highways Development Project
CAGR	-	Compound Annual Growth Rate	**NSDP**	-	Net State Domestic Product
CTV	-	Classified traffic volume	**O&M**	-	Operation & Maintenance
DBFOT	-	Design, Build, Finance, Operate & Transfer	**PCDP**	-	Per Capita Domestic Product
EME	-	Earth Moving Equipment	**PCI**	-	Per Capita Income
GDP	-	Gross Domestic Product	**PCU**	-	Passenger Car Unit
GSDP	-	Gross State Domestic Product	**PSC**	-	Pre-stressed Concrete
HCM	-	Heavy Construction Machinery	**RCC**	-	Reinforced cement concrete
HCV	-	Heavy Commercial Vehicle	**RHS**	-	Right Hand Side
HTMS	-	Highway Traffic Management System	**SH**	-	State Highway
IRC	-	Indian Road Congress	**TP**	-	Toll Plaza
IRR	-	Internal Rate of Return	**WPI**	-	Wholesale Price Index
LCV	-	Light Commercial Vehicle	**SIR**	-	Special Investment Region
LHS	-	Left Hand Side	**c.**	-	Circa
LGV	-	Light Goods Vehicle	**ROB**	-	Railway Over Bridge
MAV	-	Multi Axle Vehicle	**MDR**	-	Major District Road
MORTH	-	Ministry of Road Transport and Highways	**ODR**	-	Other District Road
NH	-	National Highway	**CA**	-	Concession Agreement
PCC	-	Plain Cement Concrete	**RMT**	-	Running Meter
CR	-	Coarse Rubble			

CHAPTER 1

INTRODUCTION

1.1 Background

The National Highways Authority of India (NHAI) introduced the Toll, Operate and Transfer (TOT) model for partnership with private developers in the road sector. Under this model, NHAI passes on the toll collection rights and operation and maintenance obligations for 20 years to the private developer against payment of upfront, one-time, lump sum concession fees quoted by the private developer as part of the comprehensive bidding process. Projects under this model are awarded as a bundle of operational national highways, which allows the investor to offset the risks of one project against another. Since existing and operational roads are auctioned under the TOT model.

Under the Toll Operate and Transfer (ToT) 17 bundle, NHAI had invited tenders for selection of concessionaire for maintenance of the National Highway stretch TOT-17 comprises of basically two separate sections. The first section from Lucknow – Ayodhya -Gorakhpur on NH-27. Second section of project road Lucknow – Sultanpur stretch is basically part of Lucknow – Varanasi- Kolkata route.

M/s. IRB Infrastructure Developers Limited., has been declared as the selected bidder for the project. This report is for ToT bundle 17 comprises basically two separate sections. The first section from Lucknow-Ayodhya-Gorakhpur on NH-27 is basically part of NHAI important transportation link of East- West connectivity from Porbandar in Gujarat to Silchar in Assam. Thus, this stretch connects Northern India, western UP, Gujarat and part of Rajasthan to Eastern part of India i.e. Eastern UP, Bihar, Assam, and part of Jharkhand and Odisha, second section of project road Lucknow – Sultanpur stretch is basically part of Lucknow – Varanasi- Kolkata route. This section can be taken as a major transportation link between western UP (Bareilly) – Lucknow – Varanasi – Kolkata.

Project Highway alignment is depicted in the following figure.

Figure 1-1: Project Stretch of TOT Bundle 17

1.2 Objective of the Study

M/s IRB Infrastructure Developers Limited (IRB) intends to develop a traffic study report for Four toll plazas are in Lucknow- Gorakhpur section on NH-27 and two are in Lucknow – Sultanpur section of NH-731.on TOT basis. GMD Consultants have been assigned the work of conducting traffic study and developing revenue model based on traffic projections and forecasts.

The year 2025-26 has been taken as the base year for projections and forecasting of traffic in the horizon year. This report fulfils part of the requirements of the assignment.

1.3 Scope of Services

The following may be referred to as broad scope of Traffic Study of four lane of Lucknow- Ayodhya – Gorakhpur section of NH-27 and Lucknow – Sultanpur section of NH-731 on Toll Operate and Transfer (TOT) basis.

- Classified Traffic Volume Count at main toll plaza location at Toll Plaza locations. This data was supplied by the Concessionaire.
- Establishment of traffic pattern
- Working our traffic demand elasticity and growth
- Traffic forecast up to concession period.
- Preparation of revenue model up to concession period
- Any other analysis relevant to scope

CHAPTER 2

PROJECT DETAILS

2.1 Project Corridor

The project stretch consists of two major sections-Lucknow to Ayodhya on NH-27, forming a key part of the national East–West link between Porbandar and Silchar, and Lucknow to Sultanpur, forming an important segment of the Lucknow-Varanasi-Kolkata route-together serving as vital regional and long-distance transportation links connecting western Uttar Pradesh to the eastern states.

2.2 Project Strech description

Project stretch is currently four lanes. As discussed previously, the total project road can be divided into three separate sections.

A. Lucknow – Ayodhya section

Lucknow – Ayodhya section starts from km 15.400 at Kala Gaon at Outer Ring Road and ends at km 137.970 near Village Manjiha Kala near Hotel Surya Palace on Ayodhya end.

The section is four lanes and has two toll plazas at Ahmedpur at Km 52.460 and at Raunahi at km 107.250. The following photographs show the general road section and Toll Plaza configuration as exciting.

Figure 2-1 **: Road & Toll Plaza condition of Lucknow to Ayodhya section of project road**

B. Ayodhya – Gorakhpur section

Ayodhya – Gorakhpur section starts from km 136.759 at Ayodhya end and ends at km 252.860 near Gorakhpur Bypass.

Section is four lane and has two toll plazas at Chaukadi at Km 163.350 and at Madwanagar at km 198.100 as existing. Second toll plaza at Madwanagar falls inside Basti city. A new toll plaza at Km 223.900 towards Gorakhpur is proposed to avoid local leakage of vehicles through local roads in Basti. The following photographs show the general road section and Toll Plaza configuration as existing.

Figure 2-2 **: Road & Toll Plaza condition of Ayodhya to Gorakhpur section of project road**

C. Lucknow - Sultanpur section

Third section Lucknow – Sultanpur section is a different alignment. It is part of NH-731. Lucknow – Sultanpur section starts from km 90.370 at Sultanpur end and ends at km 217.795 near Lucknow. Section is four lane and has two toll plazas at Asroga at Km 105.925 and at Bara at km 178.185 as existing. The following photographs show the general road section and Toll Plaza configuration as exiting.

***Figure 2-3* : Road & Toll Plaza condition of Lucknow to Sultanpur section of project road**

Thus, there are a total of six Toll Plazas in project stretches of TOT-17 as given in table below.

Road Stretch	Chainage	Lane configuration	Nos. & Name of Toll Plaza*
Lucknow- Ayodhya (NH-27)	Km. 15.400 to Km. 121.600	4 lanes divided	2 TPs (Ahmadpur & Raunahi)
Ayodhya- Gorakhpur (NH-27)	Km. 137.970 to Km. 252.860	4 lanes divided	2 TPs (Chaukadi & Mandawnagar)
Lucknow- Sultanpur (NH-731)	Km. 11.500 to Km. 134.700	4 lanes divided	2 TPs (Bara & Asroga)

*Toll Plaza at Mandwanagar is proposed to be re-located to new location near Kheendiah which is between Basti and Gorakhpur at Chainage Km. 223.900 approximately

CHAPTER 3

TRAFFIC SURVEYS AND ANALYSIS

3.1 Traffic Surveys

The Consultants have collected the required information for project corridor to understand the general traffic and travel characteristics in the corridor.

The following traffic data has been collected from a client for a project.

- Classified traffic volume counts at toll plaza locations on Lucknow to Ayodhya on NH-27 and Lucknow to Sultanpur on NH-731. Traffic data from January to February 2026 for the year 2025–26, as provided by the concessionaire.
- Local Component of traffic
- Component of Return Journey
- Component of Monthly Pass Journey

The main objective of the traffic data analysis is to:

- Determine the existing traffic movement characteristics of the project
- Establish base year traffic
- Identification of travel patterns and modal split of project traffic
- Deriving growth factors for traffic forecasting
- Estimation of corridor traffic including traffic diversion if any
- Preparation of revenue model and projection of revenue as per toll policy for various scenarios

Table 3-1 below lists provides details of locations from where traffic details have been collected.

Table 3-1 : Traffic Data Details

SR. NO	LOCATION	CTV	Single Journey Traffic	Daily Return Journey	Monthly Pass	Local Pass
1	**Ahmadpur Toll Plaza at Km.53+000**	AADT from months (January 2026 to February 2026)	AADT from months (January 2026 to February 2026)	AADT from months (January 2026 to February 2026)	AADT from months (January 2026 to February 2026)	AADT from months (January 2026 to February 2026)
2	**Raunahi Toll Plaza at Km 107+000**	AADT from months (January 2026 to February 2026)	AADT from months (January 2026 to February 2026)	AADT from months (January 2026 to February 2026)	AADT from months (January 2026 to February 2026)	AADT from months (January 2026 to February 2026)
3	**Chaukadi Toll Plaza at Km 163+000**	AADT from months (January 2026 to February 2026)	AADT from months (January 2026 to February 2026)	AADT from months (January 2026 to February 2026)	AADT from months (January 2026 to February 2026)	AADT from months (January 2026 to February 2026)
4	**Mandawnagr Toll Plaza at Km 198+000**	AADT from months (January 2026 to February 2026)	AADT from months (January 2026 to February 2026)	AADT from months (January 2026 to February 2026)	AADT from months (January 2026 to February 2026)	AADT from months (January 2026 to February 2026)
5	**Bara Toll Plaza at Km 178+135**	AADT from months (January 2026 to February 2026)	AADT from months (January 2026 to February 2026)	AADT from months (January 2026 to February 2026)	AADT from months (January 2026 to February 2026)	AADT from months (January 2026 to February 2026)
6	**Asroga Toll Plaza at Km 101+925**	AADT from months (January 2026 to February 2026)	AADT from months (January 2026 to February 2026)	AADT from months (January 2026 to February 2026)	AADT from months (January 2026 to February 2026)	AADT from months (January 2026 to February 2026)

All toll plazas are located in Uttar Pradesh.

3.2 Classified Traffic Volume

The objective of conducting a Classified Traffic Volume Count is to understand the traffic flow pattern including modal split on a roadway. The Classified Traffic Volume Count survey has been provided by the concessionaire of project highway from actual traffic data gathered at toll plaza locations-based traffic survey done at project stretch.

The vehicles can broadly be classified into fast moving / motorized and slow moving / non-motorized vehicles, which can be further classified into specific categories of vehicles. The groupings of vehicles are further segregated to capture the tollable vehicle categories specifically and toll exempted vehicles are counted separately. The detailed vehicle classification system as per IRC: 64-1990 is given in table below .

Table 3-2 : Vehicle Classification System

Vehicle Type	
Auto Rickshaw	
Passenger Car	Car, Jeep, Taxi & Van (Old / new technology)
Bus	Minibus
	Standard Bus
Truck	Light Goods Vehicle (LCV)
	2 – Axle Truck
	3 Axle Truck (HCV)
	Multi Axle Truck (4-6 Axle)
	Oversized Vehicles (7 or more axles)
Other Vehicles	Agriculture Tractor, Tractor & Trailer

Source - IRC: 64 – 1990

However, since the project highway is currently under toll operation, the data collected corresponds to the category of tollable vehicles. The following are the types of vehicles as per concession agreement.

- Car / Jeep / van
- Minibus /LCV
- Bus
- Truck /
- 3 Axle commercial vehicle
- Multi Axle

3.3 Traffic Characteristic

Toll revenue of project highway does not solely depend on traffic volume. There are certain characteristics of traffic which have substantial potential to affect toll collection. Component of local traffic, component of passenger and commercial traffic, portion of return journey traffic, % of monthly pass traffic are some of such characteristics of traffic. These will be discussed in subsequent sections of report.

3.3.1 Traffic Data

Project concessionaire has provided traffic data from January 2026 to February 2026. Since the traffic data available for this update is for only Annual, from January 2026 to February 2026, it may not represent the whole year traffic. Hence a seasonality factor for balance part of year has been applied to average traffic of the current two months to arrive at Annual Average Daily Traffic of base year 2025-26. Thus, corrected traffic is used for future projections and revenue calculations. The following table shows historical traffic on project stretch and derived Annual Average Daily Traffic (AADT) for year 2025-26.

Table 3-3 : Traffic Data at Ahmadpur Toll Plaza at Km 53.000

Sr. No	Type of Vehicle	Annual Average Daily Traffic (Nos.) 2025-26
1	Car	13500
2	Minibus /LCV	1038
3	Bus	1086
4	Truck	1312
5	3-Axle Commercial vehicle	785
6	Multi axle	2363
7	Oversize Vehicle	4
	Total	**20089**

Table 3-4 : Traffic Data at Raunahi Toll Plaza at Km 107+000

Sr. No	Type of Vehicle	Annual Average Daily Traffic (Nos.) 2025-26
1	Car	12798
2	Minibus /LCV	1161

Sr. No	Type of Vehicle	Annual Average Daily Traffic (Nos.) 2025-26
3	Bus	1126
4	Truck	1391
5	3-Axle Commercial vehicle	833
6	Multi axle	2914
7	Oversize Vehicle	6
	Total	**20229**

Table 3-5 : Traffic Data at Chaukadi Toll Plaza at Km 163.000

Sr. No	Type of Vehicle	Annual Average Daily Traffic (Nos.) 2025-26
1	Car	6265
2	Minibus /LCV	818
3	Bus	1022
4	Truck	1269
5	3-Axle Commercial vehicle	769
6	Multi axle	3219
7	Oversize Vehicle	4
	Total	**13366**

Table 3-6 : Traffic Data at Mandawnagar Toll Plaza at Km 198.000

Sr. No	Type of Vehicle	Annual Average Daily Traffic (Nos.) 2025-26
1	Car	3916
2	Minibus /LCV	621
3	Bus	764
4	Truck	1060
5	3-Axle Commercial vehicle	697
6	Multi axle	2155
7	Oversize Vehicle	3
	Total	**9216**

Table 3-7 : Traffic Data at Bara Toll Plaza at Km 178.135

Sr. No	Type of Vehicle	Annual Average Daily Traffic (Nos.) 2025-26
1	Car	8006
2	Minibus /LCV	569
3	Bus	517
4	Truck	1009
5	3-Axle Commercial vehicle	509
6	Multi axle	1508
7	Oversize Vehicle	2
	Total	**12120**

Table 3-8 : Traffic Data at Asroga Toll Plaza at Km 101+925

Sr. No	Type of Vehicle	Annual Average Daily Traffic (Nos.) 2025-26
1	Car	5927
2	Minibus /LCV	483
3	Bus	428
4	Truck	944
5	3-Axle Commercial vehicle	506
6	Multi axle	1450
7	Oversize Vehicle	1
	Total	**9739**

3.4 Data Analysis

3.4.1 Analysis of Traffic Volume Count

Understanding the character of existing traffic forms the basis of the traffic forecast. The various vehicle types having different sizes and characteristics can be converted into a single unit called Passenger Car Unit (PCU). Passenger Car equivalents for various vehicles are adopted based on recommendations of Indian Road Congress prescribed in "IRC-64-1990: Guidelines for Capacity of Roads in Rural areas". The adopted passenger car unit values (PCU) are presented in Table 3-9.

Table 3-9 : PCU Factors Adopted for Study

Vehicle Type	PCUs
Car	1.0
Minibus	1.5

Vehicle Type	PCUs
Standard Bus	3.0
LCV/LGV	1.5
2 Axle Truck	3.0
3 – 6 Axle Truck	4.5
MAV	4.5
Auto Rickshaw	1.0
Van/Tempo	1.0
Agriculture Tractor with Trailer	4.5
Agriculture Tractor without Trailer	1.5

Source: IRC: 64-1990

Traffic volume at each toll plaza was converted to PCU and same is presented as under

Table 3-10 : Traffic in PCU at Project Stretch

Year	Toll Plaza Location (Km)	Traffic No	PCU	PCU Index
2025 – 2026	**Ahmadpur Toll Plaza at Km.53+000**	20089	35261	1.76
	Raunahi Toll Plaza at Km 107+000	20229	37733	1.87
	Chaukadi Toll Plaza at Km 163+000	13366	31178	2.33
	Mandawnagr Toll Plaza at Km 198+000	9216	22124	2.40
	Bara Toll Plaza at Km 178+135	12120	21759	1.80
	Asroga Toll Plaza at Km 101+925	9739	18814	1.93

It can be observed from above that project traffic has PCU index 2.5 to 3.5 which is an indicator of high proportion of commercial traffic in traffic mix in project corridors. The following figure illustrates variation of PCU index at four toll plaza locations.

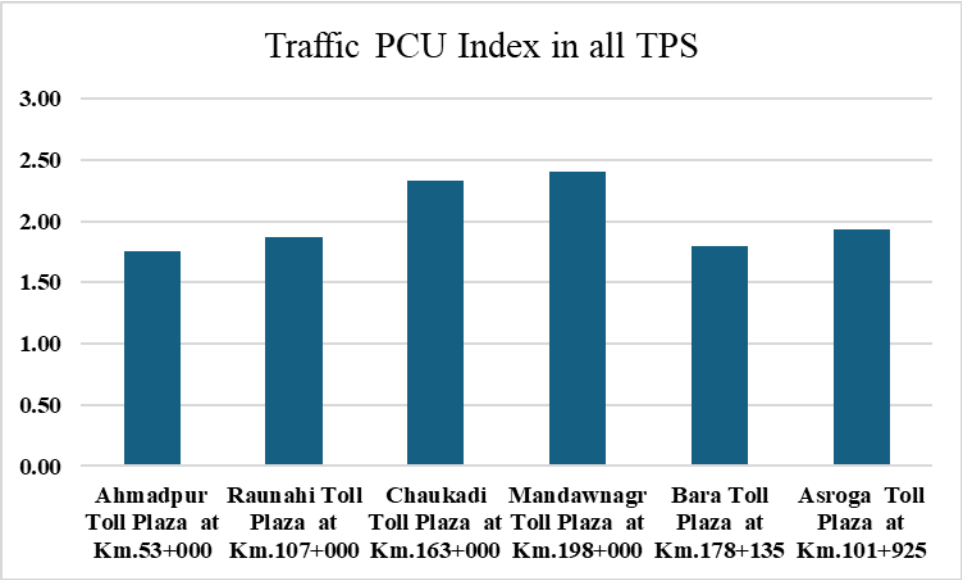


Figure 3-1 : Comparison of PCU Index

3.4.2 Components of Traffic

As discussed previously, components of traffic volume play an important role in determining project revenue. A larger component of commercial traffic with higher axle configuration adds to project revenue positively. Similarly, a larger component of local traffic affects the project revenue potential negatively.

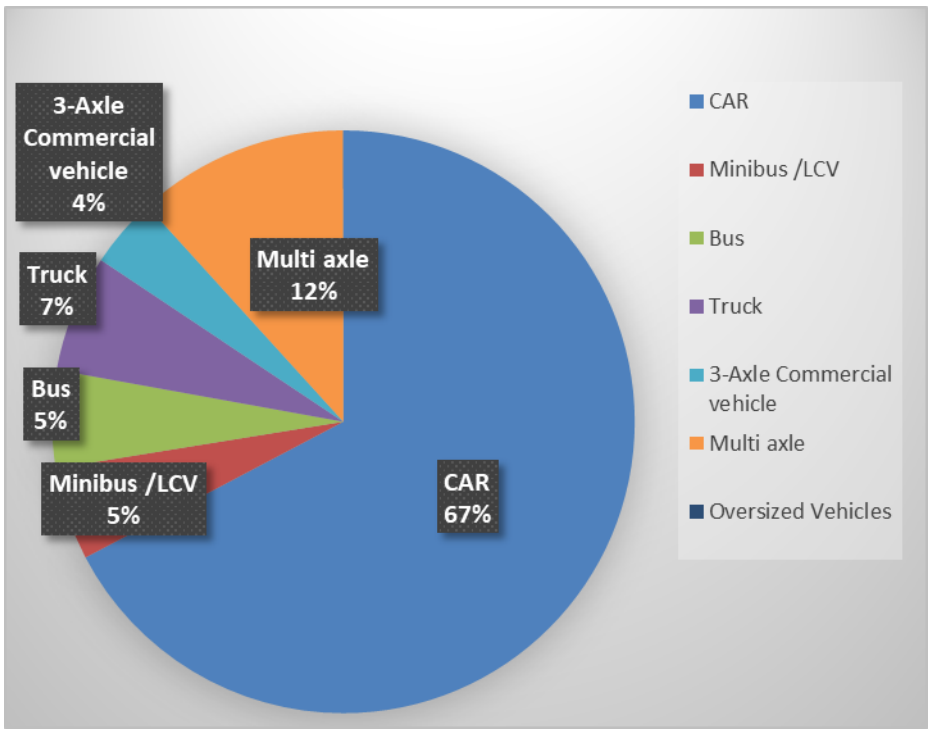


Figure 3-2: Model split of tollable vehicle @ Km.53+000

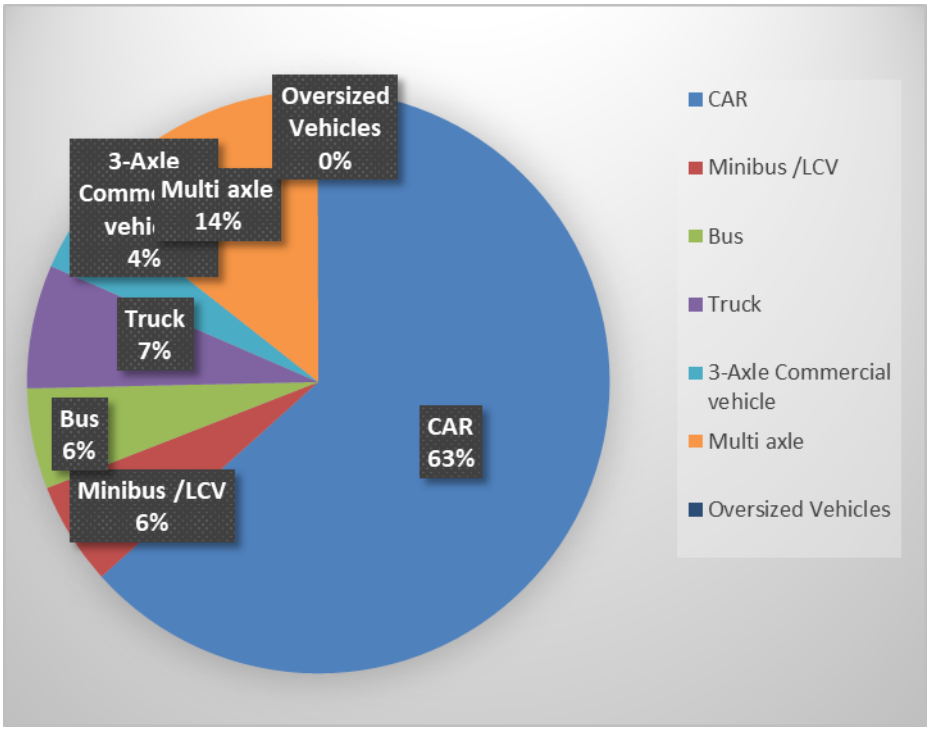


Figure 3-3: Model split of tollable vehicle @ Km. 107.000

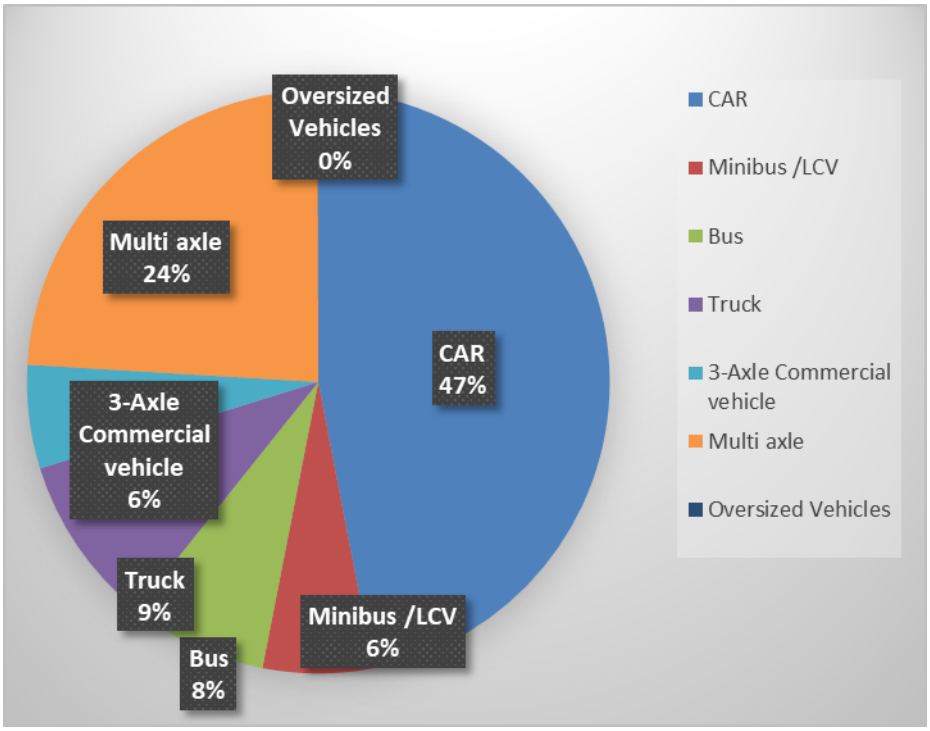


Figure 3-4: Model split of tollable vehicle @ Km. 163.000

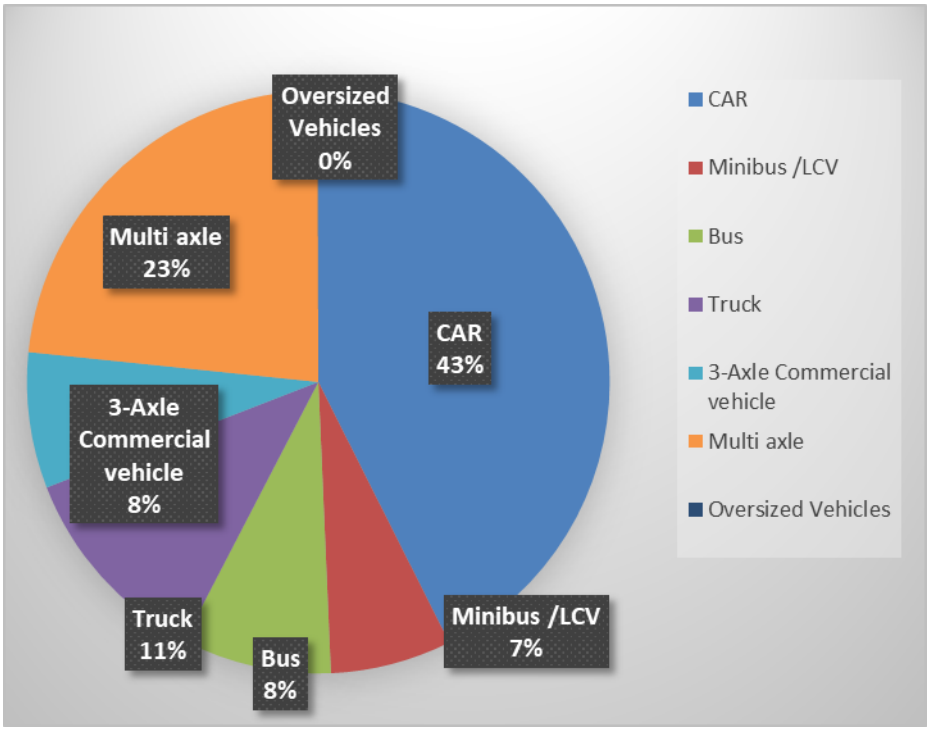


Figure 3-5: Model split of tollable vehicle @ Km. 198.000

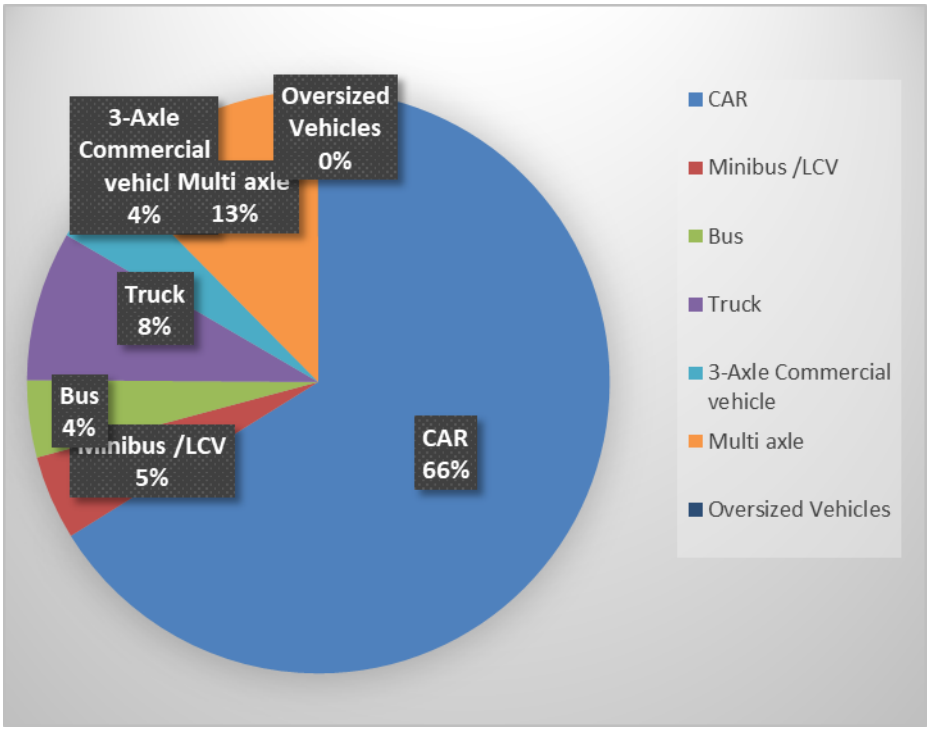


Figure 3-5: Model split of tollable vehicle @ Km. 178.135

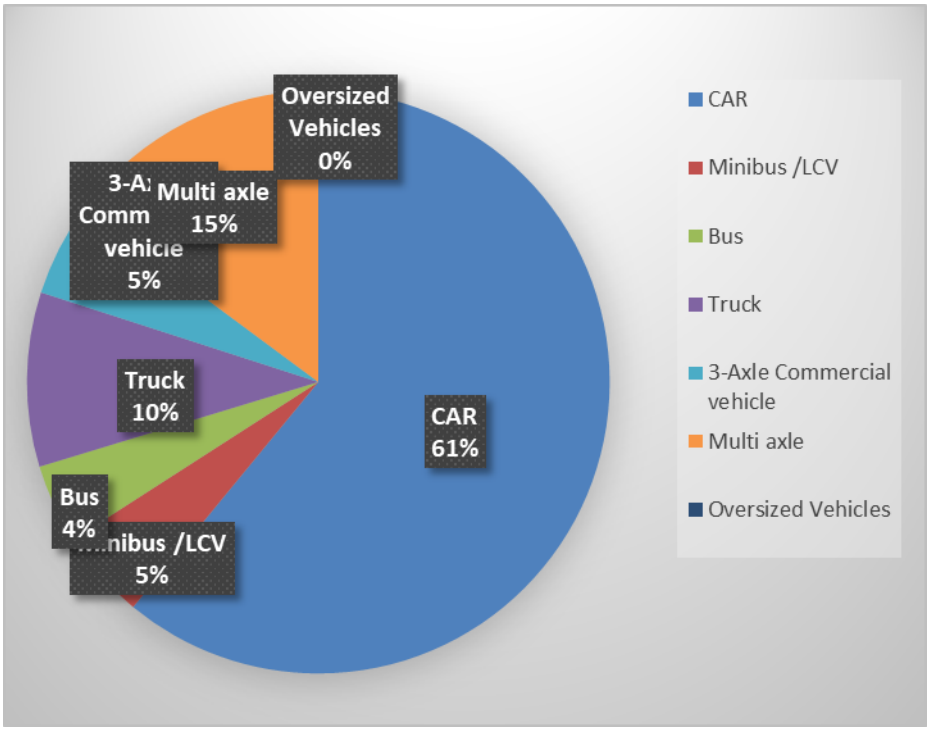


Figure 3-5: Model split of tollable vehicle @ Km. 101.925

It is observed that car traffic forms about 67% of total traffic at toll plaza location at Km.53+000 (Ahmadpur)while multi axle commercial vehicles are about 12% of total traffic. Truck / Bus and LCV share about 12% and 5% of traffic volume respectively.

It is observed that car traffic forms about 63% of total traffic at toll plaza location at Km 107+000 (Raunahi) while multi axle commercial vehicles are about 14% of total traffic. Truck / Bus and LCV share about 13% and 6% of traffic volume respectively.

It is observed that car traffic forms about 47% of total traffic at toll plaza location at Km.163+000 (Chaukadi) while multi axle commercial vehicles are about 24% of total traffic. Truck / Bus and LCV share about 17% and 6% of traffic volume respectively.

It is observed that car traffic forms about 43% of total traffic at toll plaza location at Km.198+000 (Mandawnagar) while multi axle commercial vehicles are about 23% of total traffic. Truck / Bus and LCV share about 19% and 7% of traffic volume respectively.

It is observed that car traffic forms about 66% of total traffic at toll plaza location at Km.178+135 (Bara) while multi axle commercial vehicles are about 13% of total traffic. Truck / Bus and LCV share about 12% and 5% of traffic volume respectively.

It is observed that car traffic forms about 61% of total traffic at toll plaza location at Km.101+925 (Asroga) while multi axle commercial vehicles are about 15% of total traffic. Truck / Bus and LCV share about 14% and 5% of traffic volume respectively.

Another important bifurcation of traffic is components of traffic with respect various type of toll ticketing like

1. Single Journey
2. Multi Journey
3. Local Commercial Single Journey
4. Monthly Pass Local
5. Monthly Pass
6. Annual Pass

The following table provides numbers of vehicles falling in each of above categories on base year 2025-26

Table 3-11 : Journey Type Bifurcation of Traffic at Ahmadpur Toll Plaza KM 53+000

Sr. No	Type	Traffic Volume (Nos.)
		2025-26
1	Single Journey	8166
2	Return Journey	8031
3	Local Commercial Single Journey	86
4	Monthly Pass Local	0
5	Monthly Pass	0
6	Annual Pass Car	4033

Table 3-12 : Journey Type Bifurcation of Traffic at Raunahi Toll Plaza KM 107.000

Sr. No	Type	Traffic Volume (Nos.)
		2025-26
1	Single Journey	8222
2	Return Journey	8324
3	Local Commercial Single Journey	122
4	Monthly Pass Local	0

Sr. No	Type	Traffic Volume (Nos.)
		2025-26
5	Monthly Pass	0
6	Annual Pass Car	3771

Table 3-13 : Journey Type Bifurcation of Traffic at Chaukadi Toll Plaza KM 163.000

Sr. No	Type	Traffic Volume (Nos.)
		2025-26
1	Single Journey	6691
2	Return Journey	5213
3	Local Commercial Single Journey	79
4	Monthly Pass Local	0
5	Monthly Pass	0
6	Annual Pass Car	1616

Table 3-14 : Journey Type Bifurcation of Traffic at Mandawnagar Toll Plaza KM 198.000

Sr. No	Type	Traffic Volume (Nos.)
		2025-26
1	Single Journey	5008
2	Return Journey	3077
3	Local Commercial Single Journey	38
4	Monthly Pass Local	0

Sr. No	Type	Traffic Volume (Nos.)
		2025-26
5	Monthly Pass	0
6	Annual Pass Car	1258

Table 3-15 : Journey Type Bifurcation of Traffic at Bara Toll Plaza KM 178+135

Sr. No	Type	Traffic Volume (Nos.)
		2025-26
1	Single Journey	5450
2	Return Journey	4184
3	Local Commercial Single Journey	25
4	Monthly Pass Local	0
5	Monthly Pass	0
6	Annual Pass Car	2460

Table 3-16 : Journey Type Bifurcation of Traffic at Asroga Toll Plaza KM 101+925

Sr. No	Type	Traffic Volume (Nos.)
		2025-26
1	Single Journey	4862
2	Return Journey	3085
3	Local Commercial Single Journey	32
4	Monthly Pass Local	0

Sr. No	Type	Traffic Volume (Nos.)
		2025-26
5	Monthly Pass	0
6	Annual Pass Car	1759

3.5 Secondary Data Collection

There are several other factors which have a substantial impact on traffic patterns and growth on any project corridor. The following are some of such important factors.

- Industrial development around project corridor and its catchment
- Educational infrastructure along project corridor
- Demographic pattern
- Urban area development
- Tourism potential
- Upcoming major infrastructural or Industrial projects
- Special Industry in project corridor
- Overall trends of economic growth local as well as national / regional

Hence in addition to traffic details on the project site, secondary data was also collected from various other sources. Typical secondary data includes the following:

1. Vehicle registration data of regional and national level.
2. Economic Data
   a) GDP
   b) NSDP
   c) Population Growth
   d) Per Capita Income growth
   e) Industrial Growth
   f) Special Industry Potential
   g) Regional and National development vision / plan
   h) Any other relevant data
3. Competing road network

We have collected and utilized such underlying data in the study to estimate the growth and risk factors for traffic along the project corridor. Same is discussed in subsequent chapter.

CHAPTER 4

INFLUENCE ZONE TRANSPORT NETWORK ANALYSIS

4.1 Introduction

Highway corridors behave like integrated circuit networks and more often than not every road is connected to various networks having different origins and destinations. Traffic running on these networks behaves like fluid and flow on network on alignment of least friction.

The following Factors can be considered as major contributors to friction on transportation network.

- Travel Speed / Travel Time
- Geometric deficiencies like blind horizontal curves and steep vertical gradients etc.
- Configuration of road
- Riding quality
- Traffic delays,
- Length of road,
- Passing through built up or Urban Area,
- Terrain,
- Facilities,

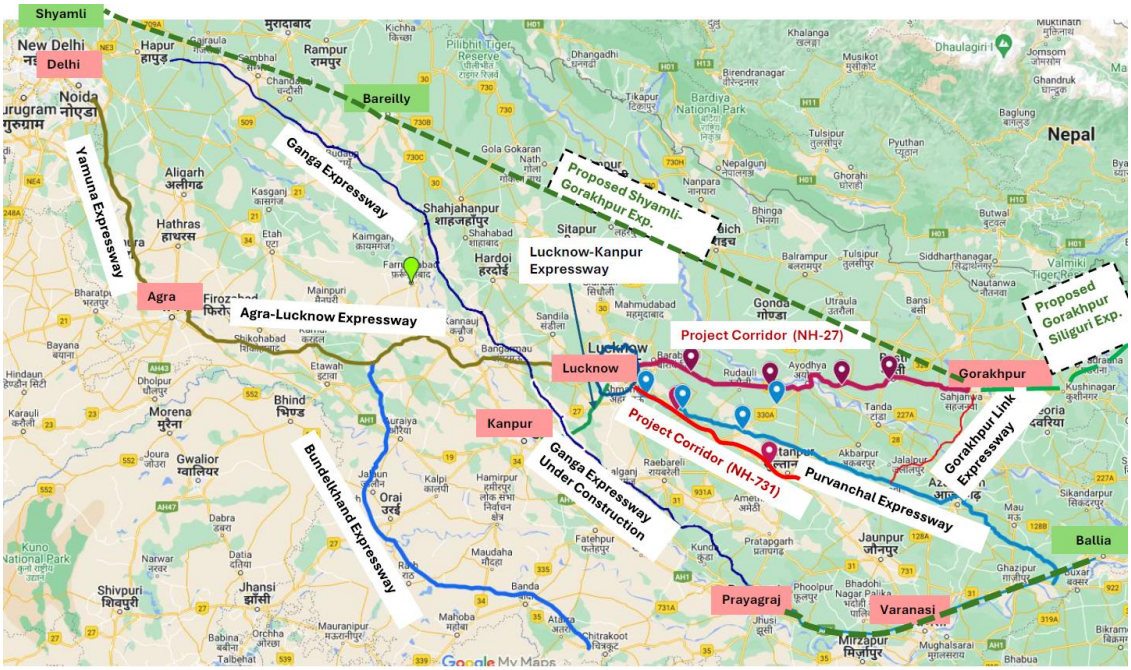
4.2 Regional Network

Project road has a number of existing and upcoming competing roads. These roads and their impact are discussed below.

The following are the roads and expressways both existing and upcoming which have impact of project highway.

- Purvanchal Expressway
- Gorakhpur Link Expressway
- Ganga Expressway
- Kanpur Lucknow Expressway

The following figure shows such roads with project route



Source: NHAI Traffic Study Report

Figure 4-1 : Existing and upcoming Expressways in vicinity of Project Road

1. Purvanchal Expressway

Purvanchal Expressway is a 340.8 km long, 6-lane wide (expandable to 8) access-controlled expressway in the state of Uttar Pradesh, India. The expressway connects Chand Saray village near Gosainganj in Lucknow district with Haydaria village on NH-31 in Ghazipur district. It is developed by the Uttar Pradesh Expressways Industrial Development Authority (UPEIDA). The Purvanchal Expressway has a 3.2 km long airstrip at Akhalkiri Karwat village near Kurebhar in Sultanpur district for emergency landing of aircraft. The construction work was started by the UPEIDA on 10 October 2018 and was inaugurated and opened to the public on 16 November 2021.

The following figure shows the alignment of Purvanchal Expressway.

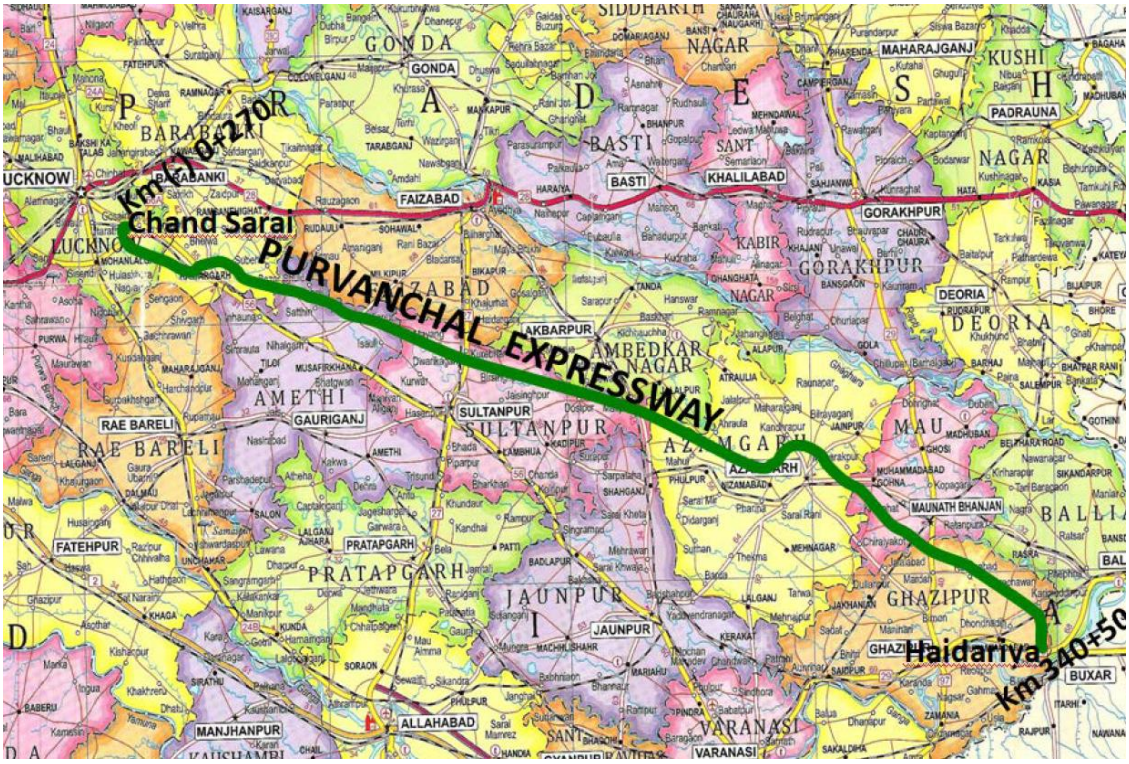


Figure 4-2 : Alignment of Purvanchal Expressways in vicinity of Project Road

Currently Phase-I of Purvanchal Expressway is operational. This expressway is operational since 2021 and has emerged good connectivity between Azajamgarh, Gorakhpur and Lucknow. This is a competing road to project road between Gorakhpur and Lucknow. Since Purvanchal Expressway has been in operation since many years the diversion and traffic on this has settled. Hence no extra impact is envisaged on the project road due to Purvanchal Expressway.

2. Gorakhpur Link Expressway

The Gorakhpur Link Expressway project is currently under construction by the Uttar Pradesh Expressways Industrial Development Authority (UPEIDA). Spanning a total length of 91.352 km, the expressway will feature four fully access-controlled lanes. It begins near Jaitpur village in the Gorakhpur district and connects to the Purvanchal Expressway at Salarpur village in the Azamgarh district. Link expressway being a faster connection to Purvanchal Expressway will further attract traffic from Project Road to Purvanchal Expressway. Following figure shows alignment of Gorakhpur Link Expressway

Figure 4-3 : Alignment of Gorakhpur Link Expressways in vicinity of Project Road

It can be observed that major part of this alternate route is Purvanchal expressway which is in existence since last 3 years. There are good connections from project road (NH-27) to Purvanchal Expressway from Gorakhpur, Basti and Ayodhya. Hence, already traffic having such influence zones has been diverted to Purvanchal Expressway.

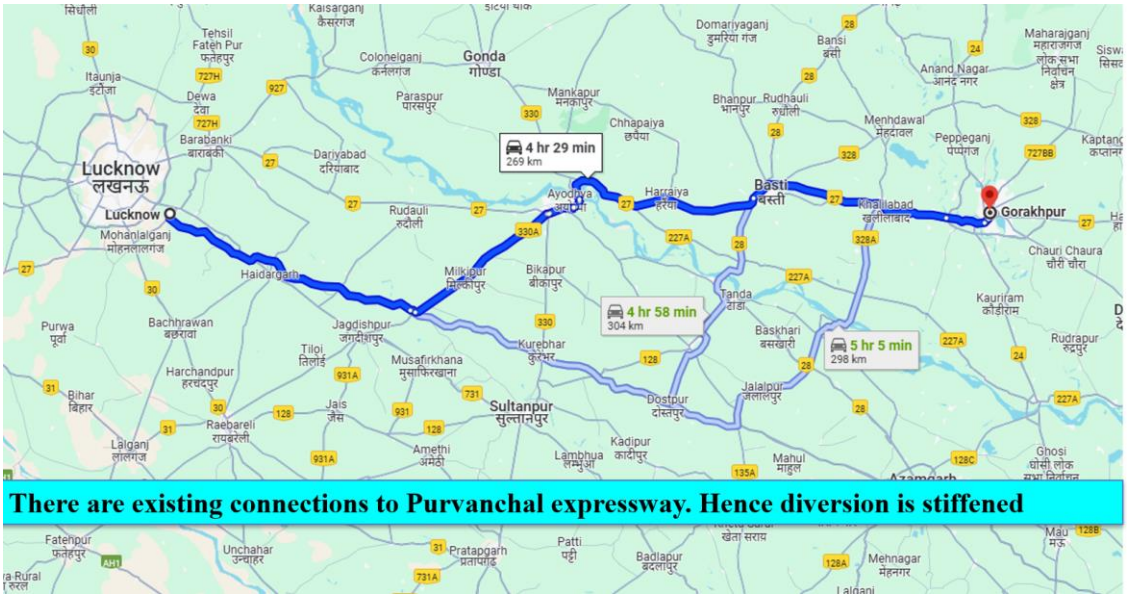


Figure 4-4 : Existing Connectors of Purvanchal Expressway with Project Road

In other words, the Gorakhpur Link expressway is not the first link between NH-27 and Purvanchal Expressway. In such case existing traffic which is running on project road has strong logistic affiliation with project road and will have resistance to diversion. This has been factored in arriving at diversion numbers at each toll plaza.

3. Ganga Expressway

Uttar Pradesh Expressways Industrial Development Authority (UPEIDA) is constructing **Ganga Expressway** which is a greenfield expressway connecting Meerut and Prayagraj. The project is awarded, and it is expected that it will be put into commercial operation in the year 2026-27.

The following Figure shows alignment of Ganga Expressway in comparison to project stretch.

Figure 4-5 : Alignment of Ganga Expressway

Figure 4-6 : Competing route of Ganga Expressway

.

5. Kanpur - Lucknow Expressway

As explained and discussed in previous sections, certain heavy commercial traffic has been temporarily diverted from project route due to poor condition and congestion on Kanpur – Lucknow Road due to construction of Kanpur – Lucknow

Expressway. This traffic bypasses the toll plaza at Ahmedpur and joins the project road before the second toll plaza at Raunahi. This is the main reason for the difference of commercial traffic at Raunahi Toll Plaza and Ahmedpur Toll Plaza. It is expected that some part of this temporary diverted traffic will come back to project road once Kanpur Lucknow Expressway is constructed. The category of 4-6 axle trucks has been considered for such traffic.

Table 4-1 :% of Diversion Impact on all Toll Plaza

Traffic Diversion	Year	TP-1 (Ahmadpur)	TP-2 (Raunahi)	TP-3 (Chaukadi)	TP-4 (Mandawnagar)	*TP-4A (Kheendiah)	TP-5 (Bara)	TP-7 (Asroga)
Paranuchal Expressway (Gorakhpur connection)								
Car / Jeep / Van	31-Mar-26	-3%	-3%	-1%	-1%	-1%		
Mini LCV	31-Mar-26	-7%	-5%	-8%	-4%	-4%		
Bus	31-Mar-26							
Truck - 2 Axle	31-Mar-26	-2%	-2%	-4%	-4%	-4%		
3 - Axle	31-Mar-26	-2%	-3%	-5%	-4%	-4%		
4 - 6 Axle	31-Mar-26	-3%	-3%	-5%	-5%	-5%		
7 & above Axle	31-Mar-26							
Ganga Expressway								
Car / Jeep / Van	31-Mar-28						-5%	-10%
Mini LCV	31-Mar-28						-6%	-19%
Bus	31-Mar-28							
Truck - 2 Axle	31-Mar-28						-3%	-5%
3 - Axle	31-Mar-28						-6%	-12%
4 - 6 Axle	31-Mar-28						-9%	-15%
7 & above Axle	31-Mar-28							
Kanpur-Lucknow Expressway								
Car / Jeep / Van	31-Mar-28							
Mini LCV	31-Mar-28							
Bus	31-Mar-28							
Truck - 2 Axle	31-Mar-28							
3 - Axle	31-Mar-28	5%						
4 - 6 Axle	31-Mar-28	5%						
7 & above Axle	31-Mar-28							

Note: *from 01 February 2027 Includes Kheendiah TP in place of Mandwanagar

CHAPTER 5

GROWTH OF TRAFFIC ON PROJECT HIGHWAY

5.1 Introduction

Traffic growth is a result of the interplay of a number of contributory factors such as National economy, Government policy, socio-economic conditions of the people, and changes in land uses along the project corridor precincts etc. Further these factors have uncertainties associated with them. Forecasts of traffic have, therefore, to be dependent on the forecasts of factors such as population, gross domestic product (GDP), vehicle ownership, per capita income (PCI), agricultural output, fuel consumption etc. Future patterns of change in these factors can be estimated with only a limited degree of accuracy and hence the forecasting of future traffic levels cannot be precise.

The following section deals with methods, techniques, and considerations used in traffic forecasts for the project under study.

5.2 Trend Analysis

Time series data of vehicle Registered in state of concerned states is taken from respective authorized websites and the same is used as the base data for analysis of growth.

The growth of vehicle traffic depends on the type of vehicle. Traffic growth on any highway typically depends on the number of economic parameters like

- Per Capita Income
- Net State Domestic Product (NSDP)
- Population

The elasticity model of growth projection is one of the most widely acceptable methods for traffic forecasts. The same is recommended in **IRC: 108-2015-Guidelines for Traffic Prediction on Rural Highways**.

The following can be pair of vehicle type and independent variable for elasticity modeling of growth.

- Car / Jeep – Par Capita Income
- Bus / Minibus – Population
- Goods Vehicle – NSDP

The same is used in the analysis below.

5.3 Estimation of Traffic Demand Elasticity

The elasticity of traffic demand is defined as the rate at which traffic intensity varies due to change in the corresponding indicator selected. Hence, in order to estimate the elasticity of traffic demand, it is necessary to establish the relationship between the

growth in number of given categories of vehicle with one of the economic variables considered, such as NSDP, per capita income and population growth.

As per **IRC: 108-2015** the model for estimating elasticity index for the project corridor is of the following form and is as given below:

Log (P) = k x Log (EI) + A

Where,

P = Number of Vehicles (Mode wise)

EI = Economic Indicator

A = Regression constant

k = Elasticity coefficient (Regression coefficient)

The elasticity for cars and bus (passenger vehicles) is calculated based on the Population and Per Capita Domestic Product (PCDP) and the elasticity for trucks is calculated based on the Net State Domestic Product (NSDP).

As observed in OD analysis, the project stretch has a share of traffic from mainly two states of Uttar Pradesh, Bihar and some traffic from Punjab, Delhi, Haryana, Rajasthan, Gujarat, Madhya Pradesh, West Bengal and Maharashtra. Hence regression of dependent variable and traffic has been done for these five states. The following tables and graphs present a summary of elasticity model of growth for project corridors.

Table 5-1 : Per Capita Income Vs. Car- Uttar Pradesh

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2011	32002	1108100	4.51	6.04		
2012	32908	1205374	4.52	6.08	3%	
2013	34044	1423020	4.53	6.15	3%	
2014	34583	1572217	4.54	6.20	2%	
2015	36973	1746117	4.57	6.24	7%	
2016	40847	2027972	4.61	6.31	10%	
2017	41832	2195783	4.62	6.34	2%	
2018	43670	2439845	4.64	6.39	4%	
2019	44618	27,94,390	4.65	6.45	2%	4.3%

Regression analysis of above is given in following figure.

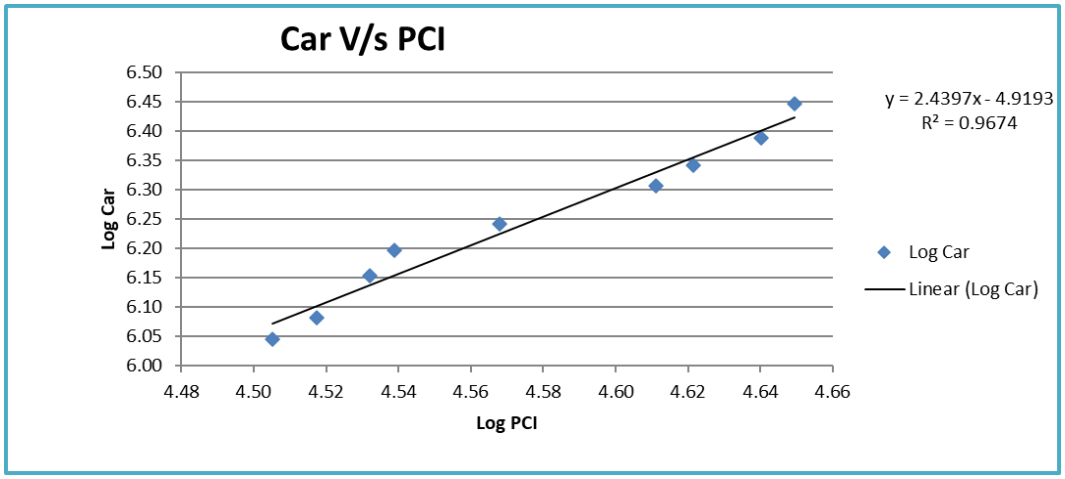


Figure 5-1 : Regression Analysis Car Vs. PCI Uttar Pradesh

Table 5-2 : Population Vs. Bus- Uttar Pradesh

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth
2011	199812000	57901	8.30	4.76		
2012	203670000	64147	8.31	4.81	2%	
2013	206322000	74389	8.31	4.87	1%	
2014	209577000	80460	8.32	4.91	2%	
2015	212832000	89127	8.33	4.95	2%	
2016	216870000	112020	8.34	5.05	2%	
2017	219510000	112766	8.34	5.05	1%	
2018	222150000	121975	8.35	5.09	1%	
2019	224979000	131775	8.35	5.12	1%	1.5%

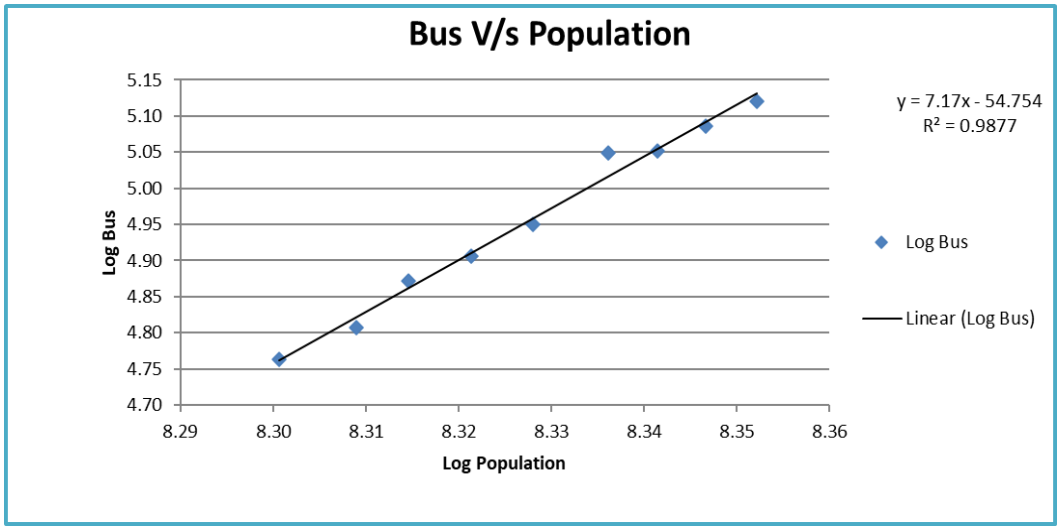


Figure 5-2 : Regression Analysis Population Vs. Bus Uttar Pradesh

Table 5-3 : NSDP Vs. Truck- Uttar Pradesh

Year	NSDP	Trucks	Log NDSP	Log Truck	NSDP Growth	Average Growth (5 Year)
2011	64513155	162813	7.81	5.21		
2012	67355218	186404	7.83	5.27	4%	
2013	70746910	202761	7.85	5.31	5%	
2014	72968630	217609	7.86	5.34	3%	
2015	79204874	245688	7.90	5.39	9%	
2016	88845325	265167	7.95	5.42	12%	
2017	92380571	307096	7.97	5.49	4%	
2018	97915937	356828	7.99	5.55	6%	
2019	101573466	376828	8.01	5.58	4%	5.9%

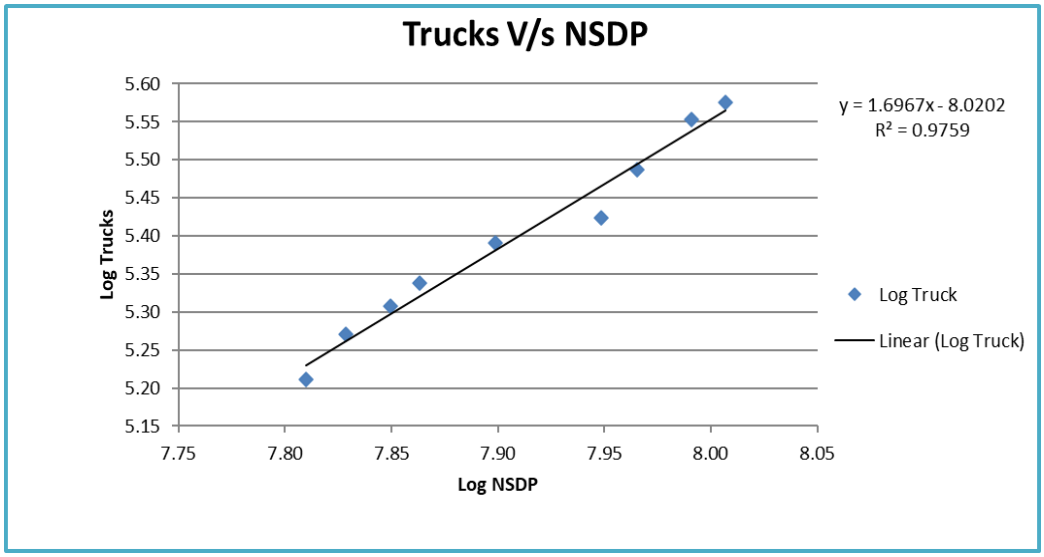


Figure 5-3 : Regression Analysis NSDP Vs. Truck Uttar Pradesh

Summary of regression analysis for elasticity and growth estimation for Uttar Pradesh are given in following table.

Table 5-4 : Summary Regression Analysis- Uttar Pradesh

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average IV Growth (5yrs)	Growth Elastic Model	Remarks
UTTAR PRADESH	**Car/Jeep**	PCI	y = 2.4397x - -4.9193	R² = 0.9674	2.4	4.3%	10.44%	Good Regression
	Bus	Population	y = 7.17x - -54.7542	R² = 0.9877	7.2	1.5%	10.71%	Good Regression
	Truck	NSDP	y = 1.6967x - -8.0202	R² = 0.9759	1.7	5.9%	9.97%	Good Regression

Similarly, regression tables and graphs of economic model for Rajasthan are given as below.

Table 5-5 : Per Capita Income Vs. Car- Rajasthan

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2011	57192	591069	4.76	5.77		
2012	58441	659542	4.77	5.82	2%	
2013	61053	733916	4.79	5.87	4%	

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2014	64496	814079	4.81	5.91	6%	
2015	68565	899307	4.84	5.95	6%	
2016	71324	988391	4.85	5.99	4%	
2017	73109	1095526	4.86	6.04	3%	
2018	75555	1204005	4.88	6.08	3%	
2019	78390	13,07,579	4.89	6.12	4%	4.0%

Regression analysis of above is given in following figure.

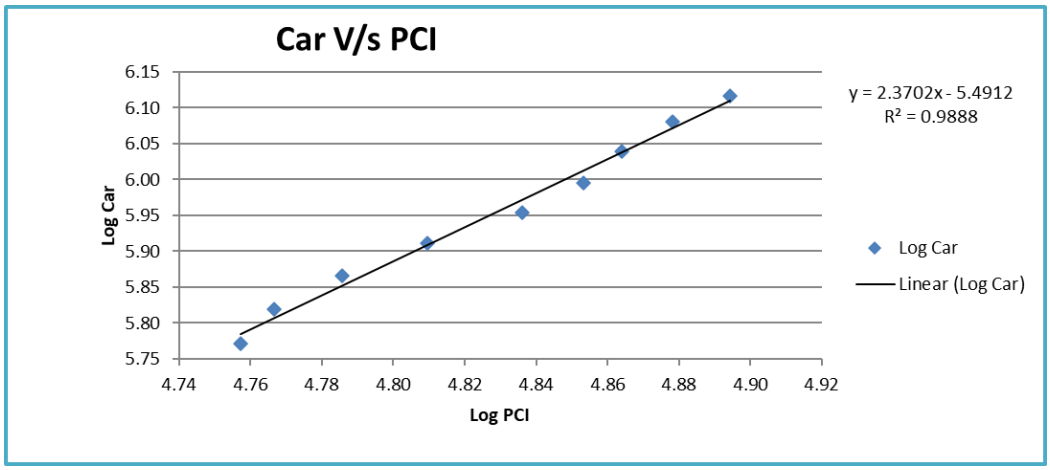


Figure 5-4 : Regression Analysis Car Vs. PCI Rajasthan

Table 5-6 : Population Vs. Bus- Rajasthan

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth
2011	68548000	83345	7.84	4.92		
2012	69687000	88616	7.84	4.95	2%	
2013	70825000	93892	7.85	4.97	2%	
2014	71963000	97650	7.86	4.99	2%	
2015	73102000	102818	7.86	5.01	2%	
2016	74240000	108680	7.87	5.04	2%	
2017	75248000	113964	7.88	5.06	1%	
2018	76256000	118301	7.88	5.07	1%	
2019	77264000	123601	7.89	5.09	1%	1.5%

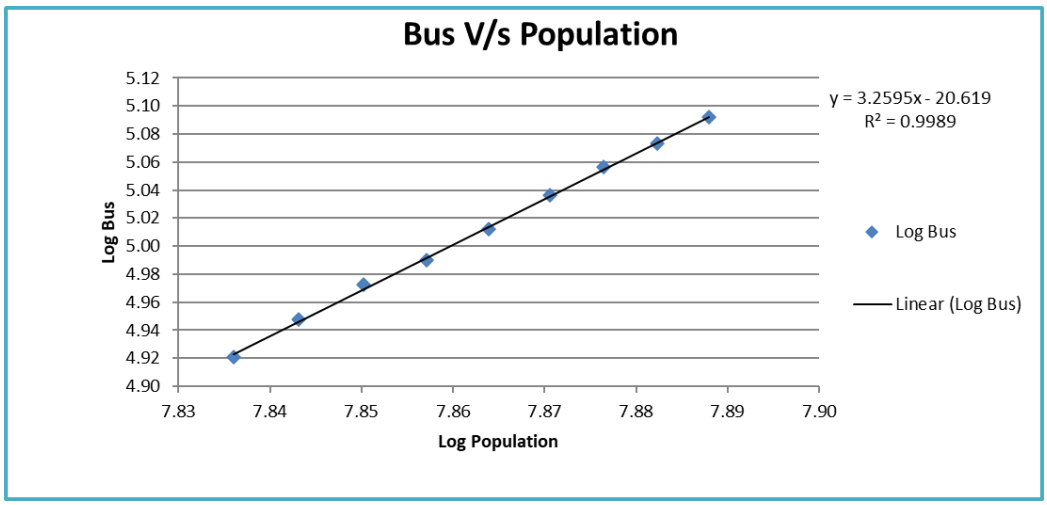


Figure 5-5 : Regression Analysis Population Vs. Bus Rajasthan

Table 5-7 : NSDP Vs. Truck- Rajasthan

Year	NSDP	Trucks	Log NDSP	Log Truck	NSDP Growth	Average Growth (5 Year)
2011	39533093	362028	7.60	5.56		
2012	40980249	401983	7.61	5.60	4%	
2013	43429222	434379	7.64	5.64	6%	
2014	46540773	472365	7.67	5.67	7%	
2015	50192151	517604	7.70	5.71	8%	
2016	52965038	561158	7.72	5.75	6%	
2017	55442912	613055	7.74	5.79	5%	
2018	58059438	665926	7.76	5.82	5%	
2019	61029221	740926	7.79	5.87	5%	5.6%

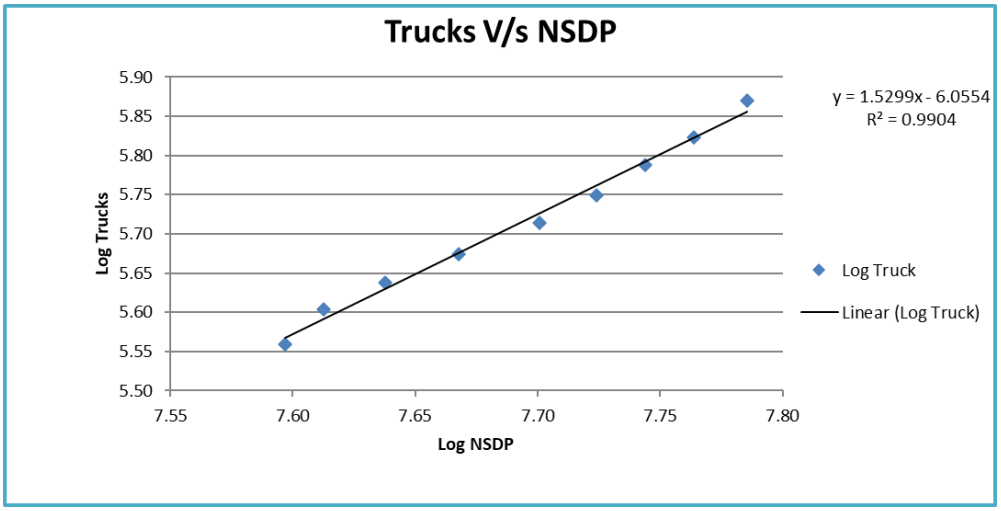


Figure 5-6 : Regression Analysis NSDP Vs. Rajasthan

Summary of regression analysis for elasticity and growth estimation for Rajasthan are given in following table.

Table 5-8 : Summary Regression Analysis- Rajasthan

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average IV Growth (5yrs)	Growth Elastic Model	Remarks
RAJASTHAN	**Car/Jeep**	PCI	y = 2.3702x - - 5.4912	R^2 = 0.9888	2.4	4.0%	9.55%	Good Regression
	Bus	Population	y = 3.2595x - - 20.6187	R^2 = 0.9989	3.3	1.5%	4.91%	Good Regression
	Truck	NSDP	y = 1.5299x - - 6.0554	R^2 = 0.9904	1.5	5.6%	8.55%	Good Regression

Similarly, regression tables and graphs of economic model for Haryana are given as below.

Table 5-9 : Per Capita Income Vs. Car- Haryana

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2011	106085	989519	5.03	6.00		
2012	111780	1134616	5.05	6.05	5%	
2013	119791	1278272	5.08	6.11	7%	

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2014	125032	1420621	5.10	6.15	4%	
2015	137833	1711692	5.14	6.23	10%	
2016	150259	1851788	5.18	6.27	9%	
2017	158039	1996788	5.20	6.30	5%	
2018	164976	2141788	5.22	6.33	4%	6.5%

Regression analysis of above is given in following figure.

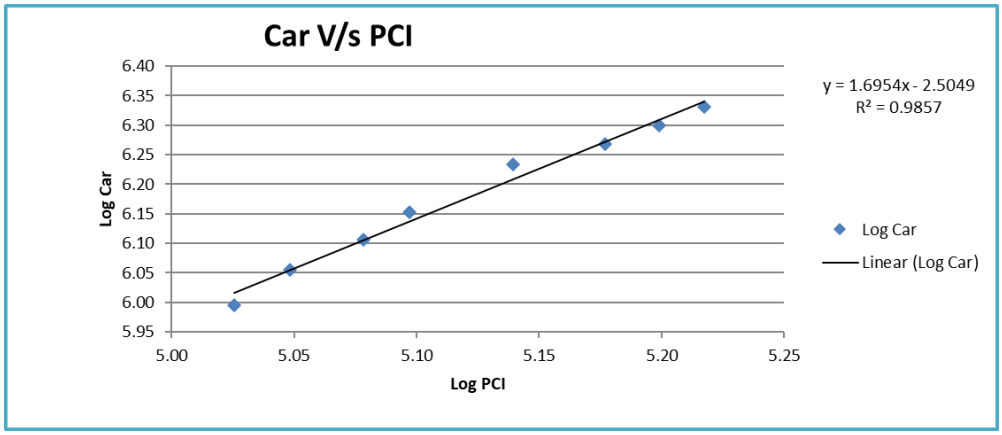


Figure 5-7 : Regression Analysis Car Vs. PCI Haryana

Table 5-10 : Population Vs. Bus- Haryana

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth
2011	25351000	39153	7.40	4.59		
2012	25772000	43456	7.41	4.64	2%	
2013	26193000	46558	7.42	4.67	2%	
2014	26614000	52640	7.43	4.72	2%	
2015	27034000	55781	7.43	4.75	2%	
2016	27455000	60129	7.44	4.78	2%	
2017	27861000	61329	7.44	4.79	1%	
2018	28266000	62594	7.45	4.80	1%	1.6%

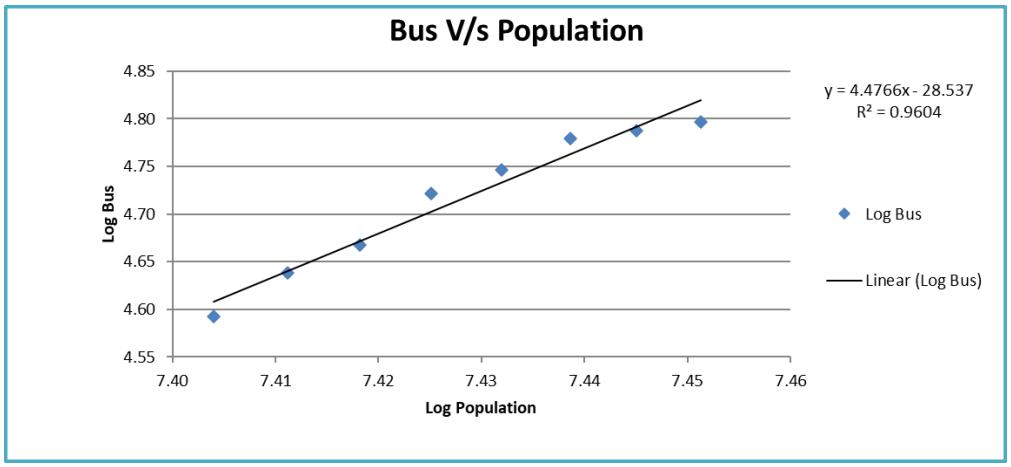


Figure 5-8 : Regression Analysis Population Vs. Bus Haryana

Table 5-11 : NSDP Vs. Truck- Haryana

Year	NSDP	Trucks	Log NDSP	Log Truck	NSDP Growth	Average Growth (5 Year)
2011	27115248	292735	7.43	5.47		
2012	28975622	307509	7.46	5.49	7%	
2013	31493120	327882	7.50	5.52	9%	
2014	33335925	348732	7.52	5.54	6%	
2015	37270025	367730	7.57	5.57	12%	
2016	41205461	390321	7.61	5.59	11%	
2017	43952345	465321	7.64	5.67	7%	
2018	46533095	545321	7.67	5.74	6%	8.0%

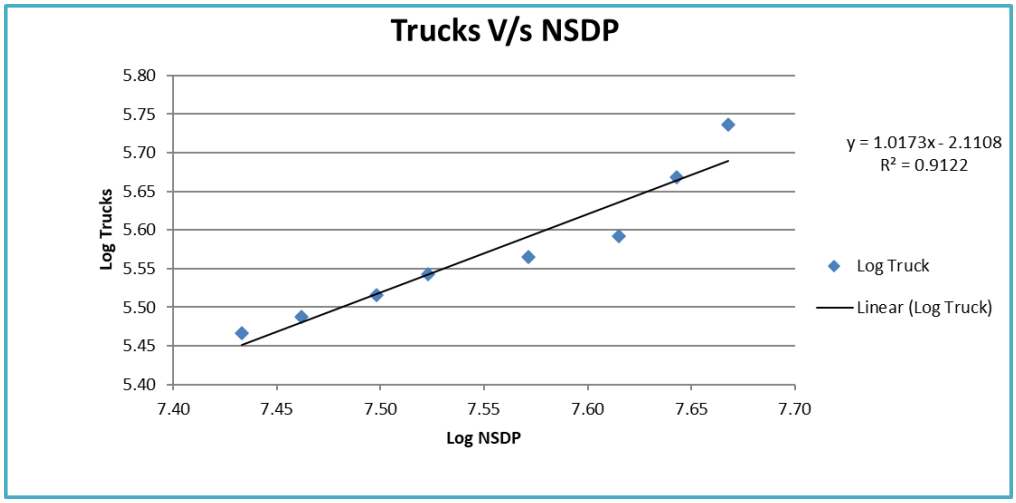


Figure 5-9 : Regression Analysis NSDP Vs. Haryana

Summary of regression analysis for elasticity and growth estimation for Haryana are given in following table.

Table 5-12 : Summary Regression Analysis- Haryana

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average IV Growth (5yrs)	Growth Elastic Model	Remarks
HARAYAN	**Car/Jeep**	PCI	y = 1.6954x - -2.5049	R^2 = 0.9857	1.6954	6.53%	11.08%	Good Regression
	Bus	Population	y = 4.4766x - -28.5367	R^2 = 0.9604	4.4766	1.57%	7.02%	Good Regression
	Truck	NSDP	y = 1.0173x - -2.1108	R^2 = 0.9122	1.0173	8.04%	8.18%	Good Regression

Similarly, regression tables and graphs of economic model for Panjab are given as below.

Table 5-13 : Per Capita Income Vs. Car- Panjab

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2011	85577	616549	4.93	5.79		
2012	88915	641549	4.95	5.81	4%	
2013	93238	706549	4.97	5.85	5%	
2014	95807	778549	4.98	5.89	3%	
2015	100141	865549	5.00	5.94	5%	

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2016	105848	964549	5.02	5.98	6%	
2017	110857	1074549	5.04	6.03	5%	
2018	115784	1196549	5.06	6.08	4%	
2019	119162	18,52,280	5.08	6.27	3%	4.2%

Regression analysis of above is given in following figure.

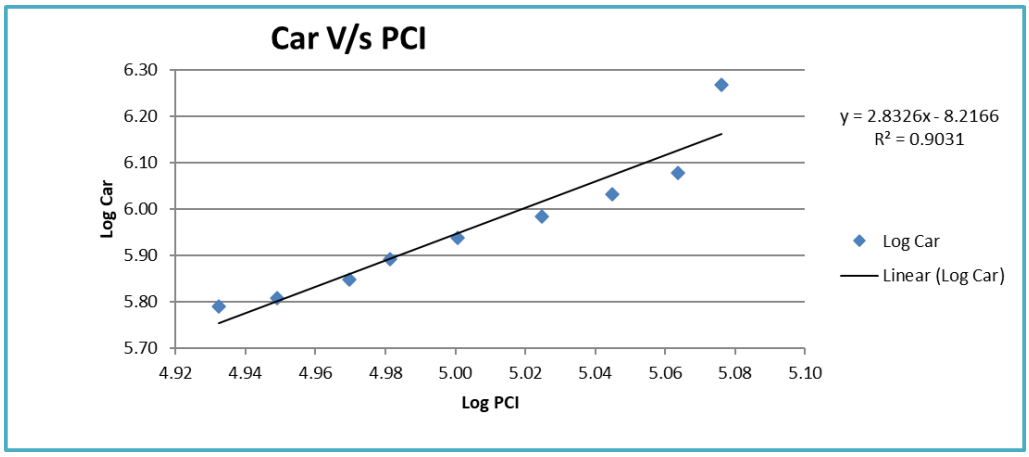


Figure 5-10 : Regression Analysis Car Vs. PCI Panjab

Table 5-14 : Population Vs. Bus- Panjab

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth
2011	27743000	30160	7.44	4.48		
2012	28023000	31360	7.45	4.50	1%	
2013	28302000	33860	7.45	4.53	1%	
2014	28581000	35660	7.46	4.55	1%	
2015	28861000	41908	7.46	4.62	1%	
2016	29140000	45378	7.46	4.66	1%	
2017	29380000	46163	7.47	4.66	1%	
2018	29619000	49271	7.47	4.69	1%	
2019	29859000	51771	7.48	4.71	1%	0.9%

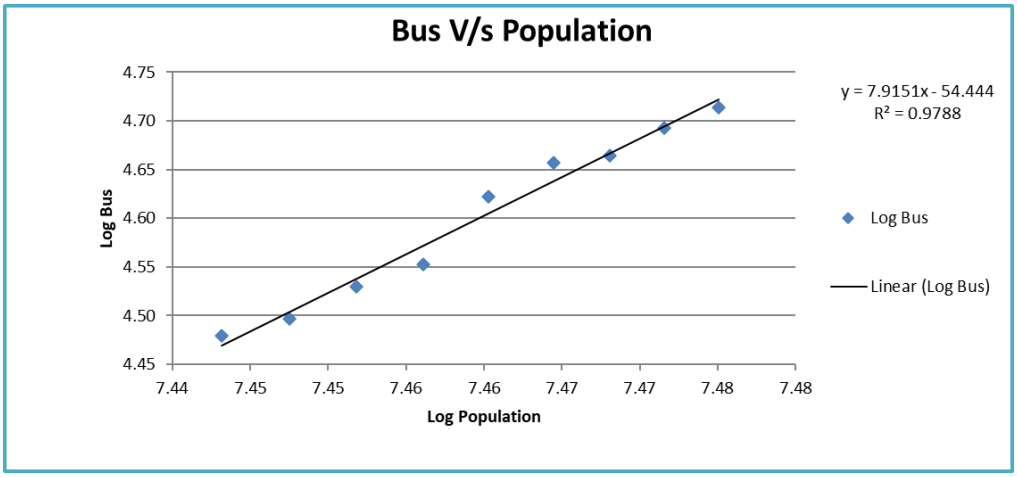


Figure 5-11 : Regression Analysis Population Vs. Bus Panjab

Table 5-15 : NSDP Vs. Truck- Panjab

Year	NSDP	Trucks	Log NDSP	Log Truck	NSDP Growth	Average Growth (5 Year)
2011	23922695	125898	7.38	5.10		
2012	25181259	125898	7.40	5.10	5%	
2013	26751521	125898	7.43	5.10	6%	
2014	27848460	125898	7.44	5.10	4%	
2015	29489486	247087	7.47	5.39	6%	
2016	31578299	255684	7.50	5.41	7%	
2017	33505679	340244	7.53	5.53	6%	
2018	35452832	364047	7.55	5.56	6%	
2019	36965044	479374	7.57	5.68	4%	5.6%

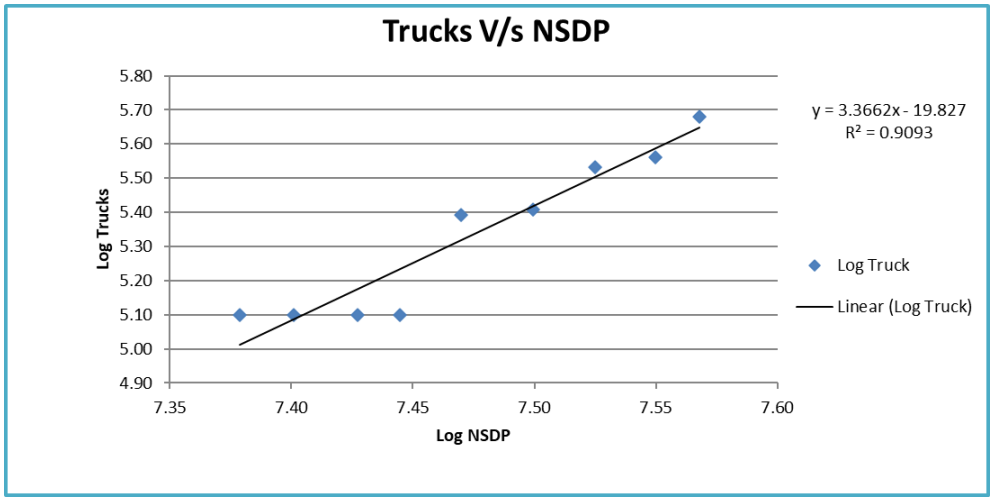


Figure 5-12 : Regression Analysis NSDP Vs. Punjab

Summary of regression analysis for elasticity and growth estimation for Punjab are given in following table.

Table 5-16 : Summary Regression Analysis- Punjab

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average IV Growth (5yrs)	Growth Elastic Model	Remarks
PUNJAB	**Car/Jeep**	PCI	y = 2.8326x - -8.2166	R^2 = 0.9031	2.8326	4.23%	11.98%	Good Regression
	Bus	Population	y = 7.9151x - -54.4444	R^2 = 0.9788	7.9151	0.92%	7.31%	Good Regression
	Truck	NSDP	y = 3.3662x - -19.8275	R^2 = 0.9093	3.3662	5.59%	18.83%	Good Regression

Similarly, regression tables and graphs of economic model for West Bengal are given below.

Table 5-17 : Per Capita Income Vs. Car- West Bengal

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2011	51543	575085	4.71	5.76		
2012	53157	877588	4.73	5.94	3%	
2013	53811	938271	4.73	5.97	1%	
2014	54520	1001618	4.74	6.00	1%	

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2015	57255	1251618	4.76	6.10	5%	
2016	60618	1501618	4.78	6.18	6%	
2017	64007	1801618	4.81	6.26	6%	
2018	68212	2126618	4.83	6.33	7%	
2019	71719	2151618	4.86	6.33	5%	4.2%

Regression analysis of above is given in following figure.

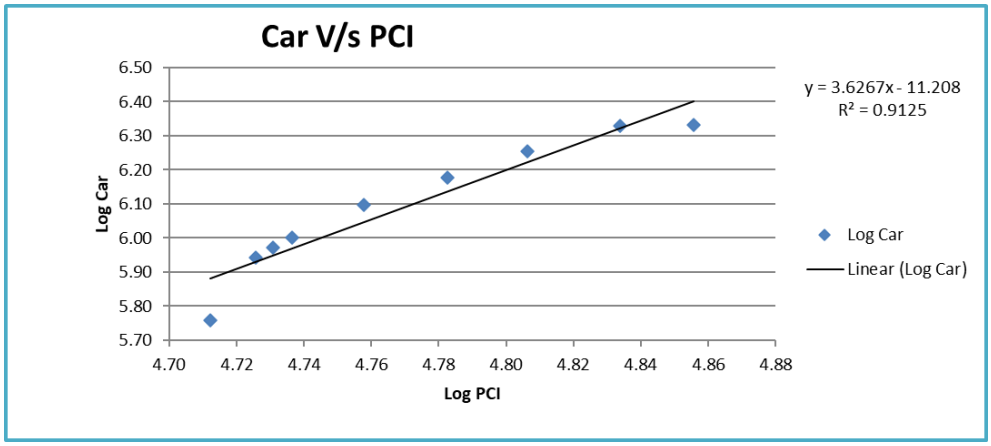


Figure 5-13 : Regression Analysis Car Vs. PCI West Bengal

Table 5-18 : Population Vs. Bus- West Bengal

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth
2011	91276000	35603	7.96	4.55		
2012	92037000	106470	7.96	5.03	1%	
2013	92797000	188968	7.97	5.28	1%	
2014	93558000	205480	7.97	5.31	1%	
2015	94318000	316355	7.97	5.50	1%	
2016	95079000	427229	7.98	5.63	1%	
2017	95688000	682229	7.98	5.83	1%	
2018	96297000	706229	7.98	5.85	1%	
2019	96906000	734729	7.99	5.87	1%	0.8%

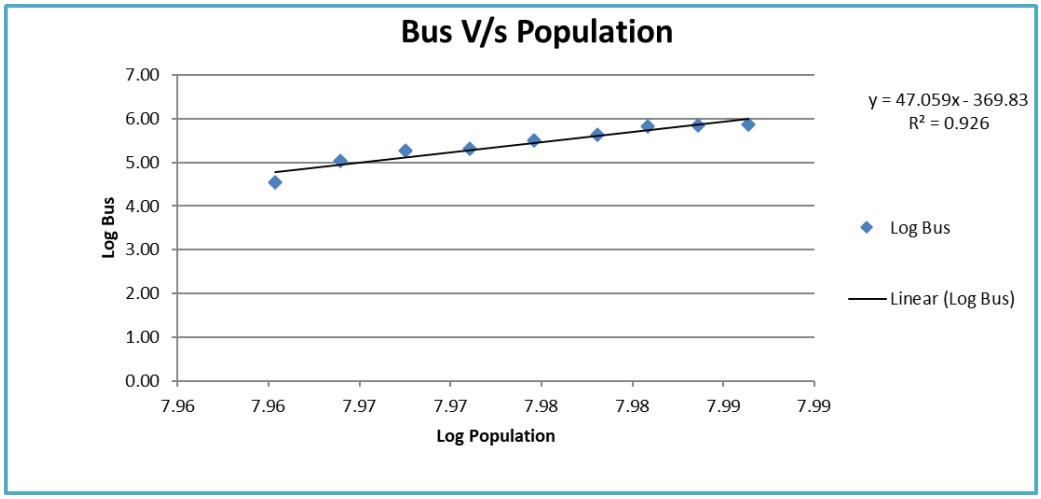


Figure 5-14 : Regression Analysis Population Vs. Bus West Bengal

Table 5-19 : NSDP Vs. Truck- West Bengal

Year	NSDP	Trucks	Log NDSP	Log Truck	NSDP Growth	Average Growth (5 Year)
2011	47320465	193068	7.68	5.29		
2012	49290117	193943	7.69	5.29	4%	
2013	50395157	203584	7.70	5.31	2%	
2014	51570160	212623	7.71	5.33	2%	
2015	54698805	407229	7.74	5.61	6%	
2016	58491083	657229	7.77	5.82	7%	
2017	62378682	907229	7.80	5.96	7%	
2018	65928789	1157229	7.82	6.06	6%	
2019	69755447	1307229	7.84	6.12	6%	5.0%

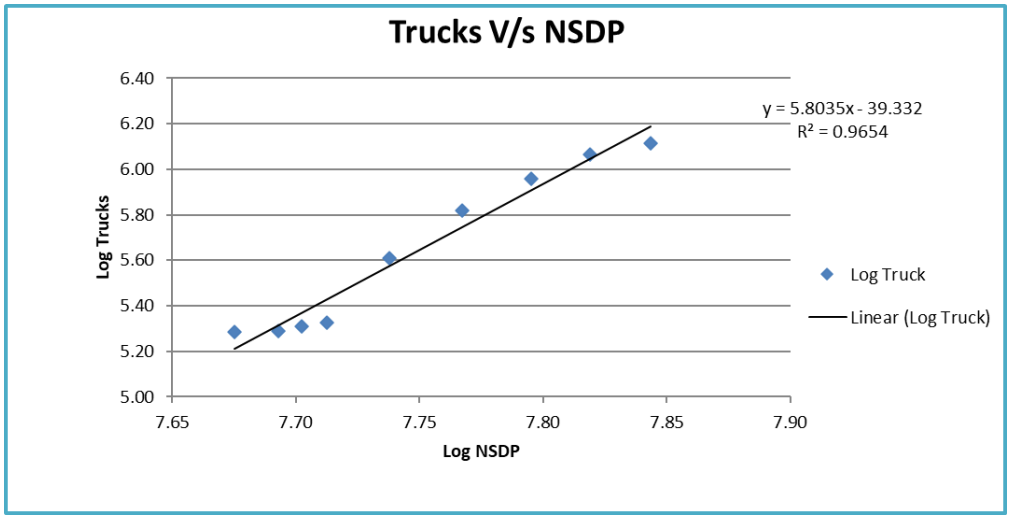


Figure 5-15 : Regression Analysis NSDP Vs. West Bengal

Summary of regression analysis for elasticity and growth estimation for West Bengal are given in following table.

Table 5-20 : Summary Regression Analysis- West Bengal

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average IV Growth (5yrs)	Growth Elastic Model	Remarks
WEST BENGAL	**Car/Jeep**	PCI	y = 3.6267x - -11.2076	R² = 0.9125	3.6	4%	15.36%	Good Regression
	Bus	Population	y = 47.0593x - -369.8258	R² = 0.926	47.1	1%	35.34%	Good Regression
	Truck	NSDP	y = 5.8035x - -39.3324	R² = 0.9654	5.8	5%	28.93%	Good Regression

Similarly, regression tables and graphs of economic model for Delhi are given as below.

Table 5-21 : Per Capita Income Vs. Car- Delhi

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2011	185001	2172069	5.27	6.34		
2012	192220	2416974	5.28	6.38	4%	
2013	200702	2568380	5.30	6.41	4%	
2014	213669	2730071	5.33	6.44	6%	
2015	233115	2986579	5.37	6.48	9%	
2016	244255	3061817	5.39	6.49	5%	

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2017	252960	3087309	5.40	6.49	4%	
2018	260967	3249670	5.42	6.51	3%	
2019	274671	33,11,579	5.44	6.52	5%	5.1%

Regression analysis of above is given in following figure.

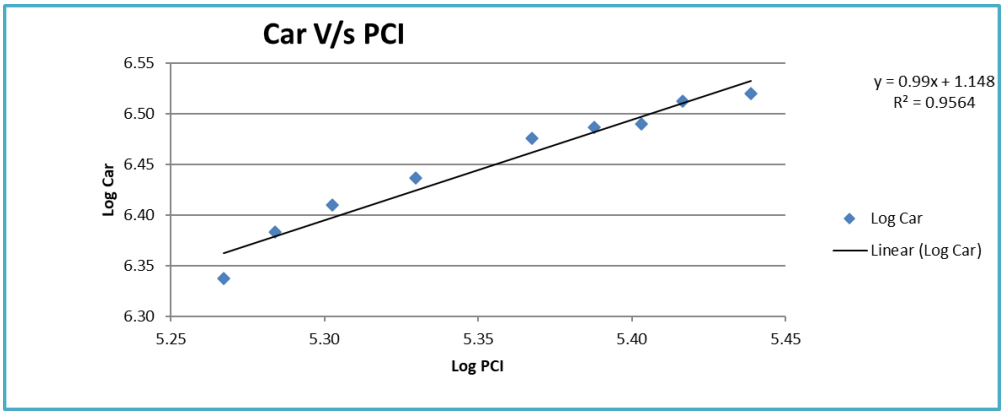


Figure 5-16 : Regression Analysis Car Vs. PCI Delhi

Table 5-22 : Population Vs. Bus- Delhi

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth
2011	16788000	20142	7.22	4.30		
2012	17166000	21142	7.23	4.33	2%	
2013	17544000	22592	7.24	4.35	2%	
2014	17921000	24292	7.25	4.39	2%	
2015	18299000	25492	7.26	4.41	2%	
2016	18677000	26912	7.27	4.43	2%	
2017	19056000	28912	7.28	4.46	2%	
2018	19435000	32112	7.29	4.51	2%	
2019	19814000	36612	7.30	4.56	2%	2.1%

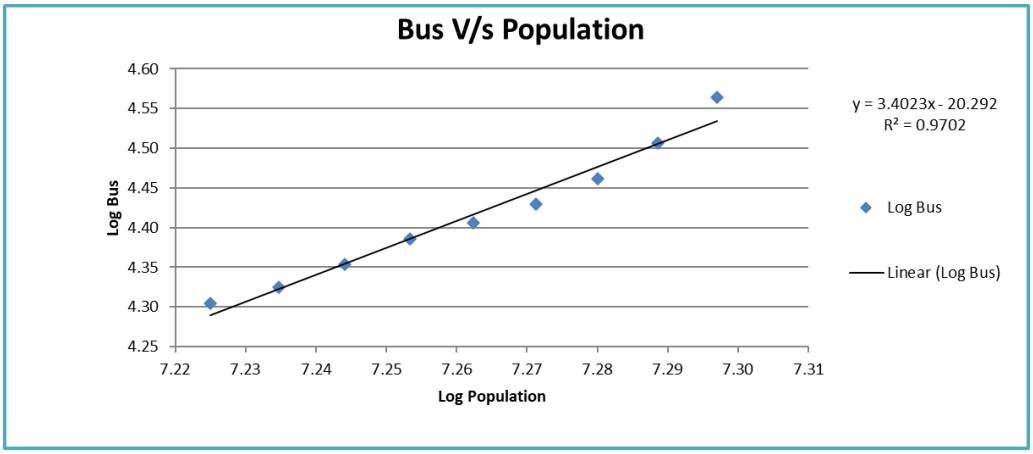


Figure 5-17 : Regression Analysis Population Vs. Bus Delhi

Table 5-23 : NSDP Vs. Truck- Delhi

Year	NSDP	Trucks	Log NDSP	Log Truck	NSDP Growth	Average Growth (5 Year)
2011	31465002	181159	7.50	5.26		
2012	33419330	206159	7.52	5.31	6%	
2013	35652751	231159	7.55	5.36	7%	
2014	38763874	256159	7.59	5.41	9%	
2015	43172959	281159	7.64	5.45	11%	
2016	46159238	293159	7.66	5.47	7%	
2017	48763115	305159	7.69	5.48	6%	
2018	51295715	317159	7.71	5.50	5%	
2019	55030297	329159	7.74	5.52	7%	7.3%

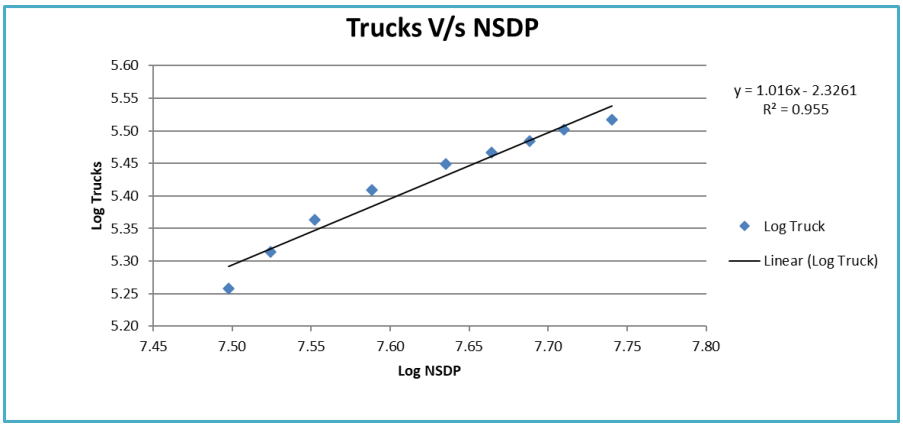


Figure 5-18 : Regression Analysis NSDP Vs. Delhi

Summary of regression analysis for elasticity and growth estimation for Delhi are given in following table.

Table 5-24 : Summary Regression Analysis- Delhi

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average IV Growth (5yrs)	Growth Elastic Model	Remarks
DELHI	**Car/Jeep**	PCI	y = 0.99x - 1.148	R^2 = 0.9564	0.9900	5.08%	5.03%	Good Regression
	Bus	Population	y = 3.4023x - -20.2917	R^2 = 0.9702	3.4023	2.09%	7.12%	Good Regression
	Truck	NSDP	y = 1.016x - -2.3261	R^2 = 0.955	1.0160	7.25%	7.37%	Good Regression

Similarly, regression tables and graphs of economic model for Madhya Pradesh are given below.

Table 5-25 : Per Capita Income Vs. Car- Madhya Pradesh

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2011	38497	424644	4.59	5.63		
2012	41142	493412	4.61	5.69	7%	
2013	42548	555461	4.63	5.74	3%	
2014	44027	637626	4.64	5.80	3%	
2015	47351	820391	4.68	5.91	8%	
2016	52782	869777	4.72	5.94	11%	
2017	54829	982124	4.74	5.99	4%	
2018	57401	994624	4.76	6.00	5%	
2019	62236	12,28,865	4.79	6.09	8%	6.2%

Regression analysis of above is given in following figure.

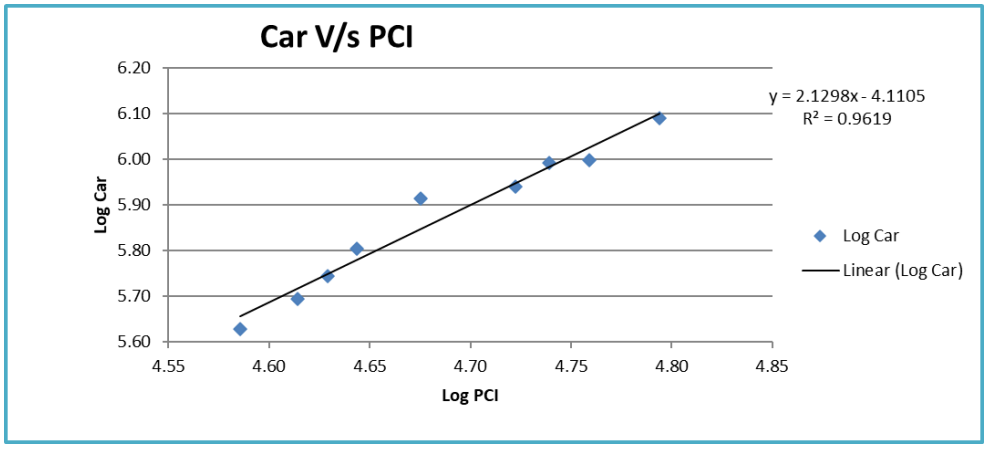


Figure 5-19 : Regression Analysis Car Vs. PCI Madhya Pradesh

Table 5-26 : Population Vs. Bus- Madhya Pradesh

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth
2011	72627000	40551	7.86	4.61		
2012	73863000	40633	7.87	4.61	2%	
2013	75099000	42636	7.88	4.63	2%	
2014	76334000	45976	7.88	4.66	2%	
2015	77570000	167467	7.89	5.22	2%	
2016	78806000	189118	7.90	5.28	2%	
2017	79948000	195102	7.90	5.29	1%	
2018	81090000	213643	7.91	5.33	1%	
2019	82232000	234643	7.92	5.37	1%	1.6%

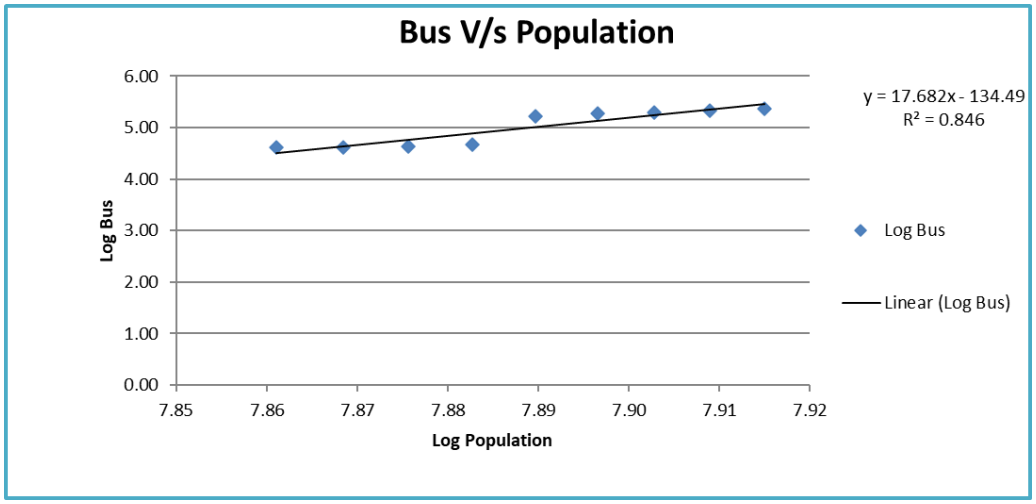


Figure 5-20 : Regression Analysis Population Vs. Bus Madhya Pradesh

Table 5-27 : NSDP Vs. Truck- Madhya Pradesh

Year	NSDP	Trucks	Log NDSP	Log Truck	NSDP Growth	Average Growth (5 Year)
2011	28237104	162813	7.45	5.21		
2012	30685334	186404	7.49	5.27	9%	
2013	32259760	202761	7.51	5.31	5%	
2014	33924690	217609	7.53	5.34	5%	
2015	37071567	245688	7.57	5.39	9%	
2016	41946525	265167	7.62	5.42	13%	
2017	44200243	307096	7.65	5.49	5%	
2018	46928896	356828	7.67	5.55	6%	
2019	51592278	376828	7.71	5.58	10%	7.9%

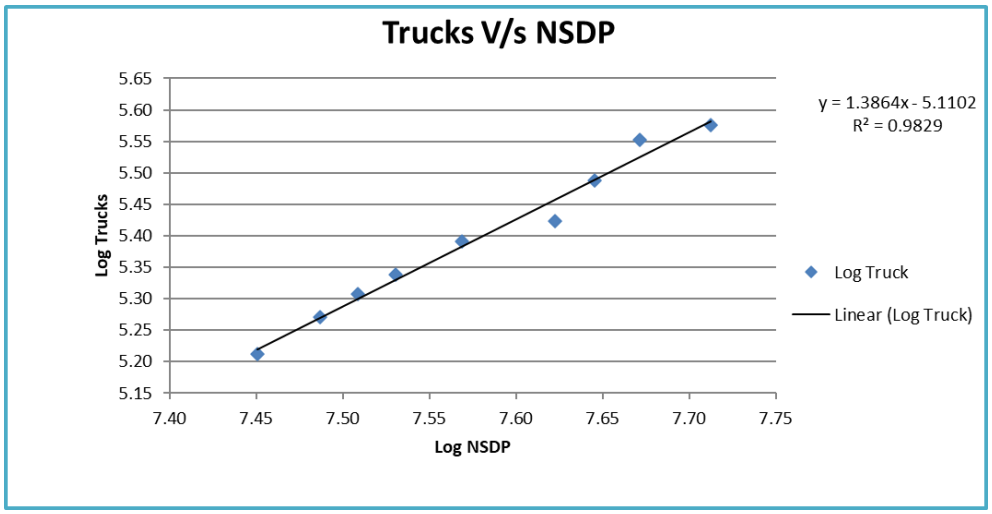


Figure 5-21 : Regression Analysis NSDP Vs. Madhya Pradesh

Summary of regression analysis for elasticity and growth estimation for Madhya Pradesh are given in following table.

Table 5-28 : Summary Regression Analysis- Madhya Pradesh

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average IV Growth (5yrs)	Growth Elastic Model	Remarks
MADHYA PRADESH	**Car/Jeep**	PCI	y = 2.8326x - -8.2166	R^2 = 0.9031	2.8326	4.23%	11.98%	Good Regression
	Bus	Population	y = 7.9151x - -54.4444	R^2 = 0.9788	7.9151	0.92%	7.31%	Good Regression
	Truck	NSDP	y = 3.3662x - -19.8275	R^2 = 0.9093	3.3662	5.59%	18.83%	Good Regression

Similarly, regression tables and graphs of economic models for Bihar are given as below.

Table 5-29 : Per Capita Income Vs. Car- Bihar

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2011	21750	160340	4.34	5.21		
2012	22201	184792	4.35	5.27	2%	
2013	22776	208205	4.36	5.32	3%	
2014	23223	235762	4.37	5.37	2%	
2015	24064	266512	4.38	5.43	4%	
2016	25455	300082	4.41	5.48	6%	
2017	26719	349947	4.43	5.54	5%	
2018	29092	404481	4.46	5.61	9%	
2019	30621	4,64,204	4.49	5.67	5%	4.4%

Regression analysis of above is given in following figure.

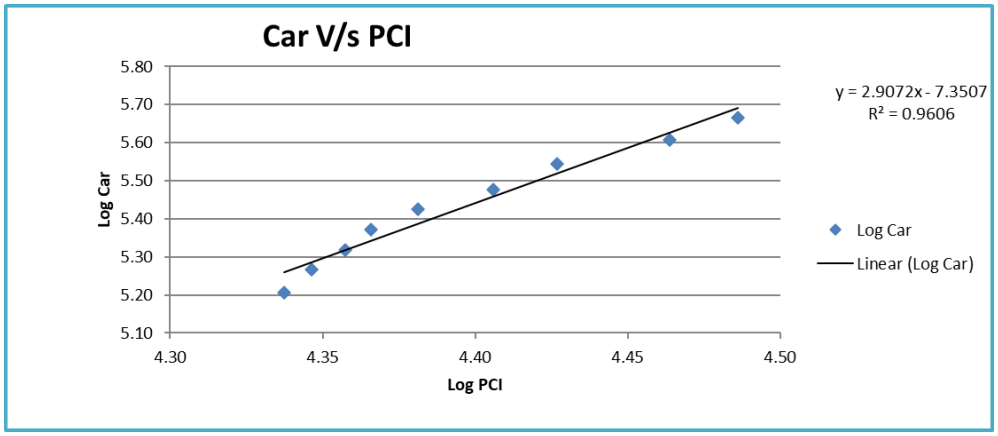


Figure 5-22 : Regression Analysis Car Vs. PCI Bihar

Table 5-30 : Population Vs. Bus- Bihar

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth
2011	105615000	24097	8.02	4.38		
2012	106115000	25992	8.03	4.41	0%	
2013	108130000	27638	8.03	4.44	2%	
2014	110145000	29384	8.04	4.47	2%	
2015	112161000	31075	8.05	4.49	2%	
2016	114176000	33751	8.06	4.53	2%	
2017	115957000	36584	8.06	4.56	2%	
2018	117739000	39618	8.07	4.60	2%	
2019	119520000	42118	8.08	4.62	2%	1.6%

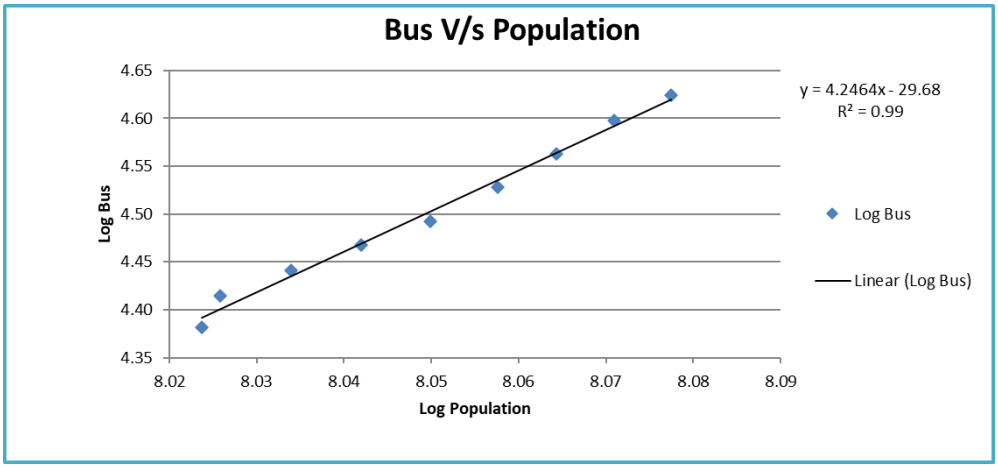


Figure 5-23 : Regression Analysis Population Vs. Bus Bihar

Table 5-31 : NSDP Vs. Truck- Bihar

Year	NSDP	Trucks	Log NDSP	Log Truck	NSDP Growth	Average Growth (5 Year)
2011	22849744	83191	7.36	4.92		
2012	23693255	89754	7.37	4.95	4%	
2013	24691474	86228	7.39	4.94	4%	
2014	25573881	91823	7.41	4.96	4%	
2015	26919960	99012	7.43	5.00	5%	
2016	28926487	107756	7.46	5.03	7%	
2017	31260514	116483	7.49	5.07	8%	
2018	34554545	128667	7.54	5.11	11%	
2019	36916198	138267	7.57	5.14	7%	6.2%

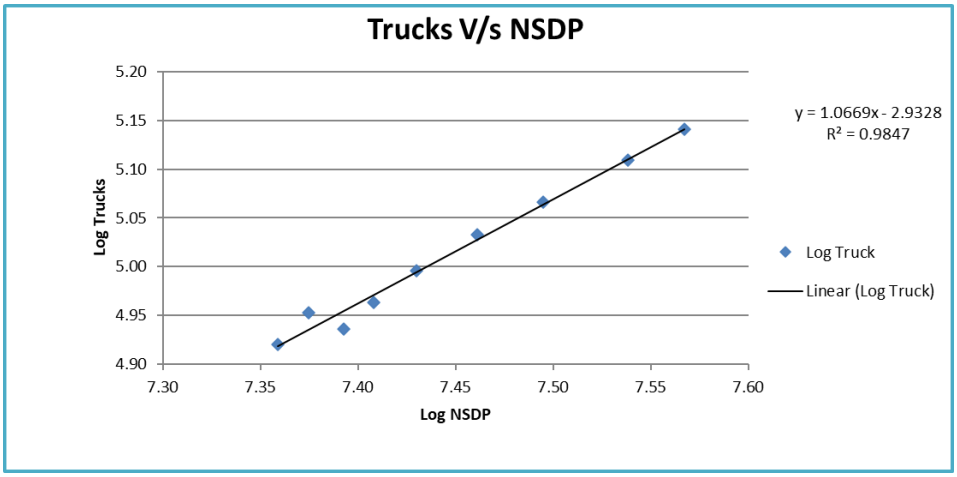


Figure 5-24 : Regression Analysis NSDP Vs. Bihar

Summary of regression analysis for elasticity and growth estimation for Bihar are given in following table.

Table 5-32 : Summary Regression Analysis- Bihar

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average IV Growth (5yrs)	Growth Elastic Model	Remarks

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average IV Growth (5yrs)	Growth Elastic Model	Remarks
BIHAR	**Car/Jeep**	PCI	y = 2.9072x - -7.3507	R^2 = 0.9606	2.9	4.4%	12.77%	Good Regression
	Bus	Population	y = 4.2464x - -29.6796	R^2 = 0.99	4.2	1.6%	6.62%	Good Regression
	Truck	NSDP	y = 1.0669x - -2.9328	R^2 = 0.9847	1.1	6.2%	6.62%	Good Regression

Similarly, regression tables and graphs of economic model for Gujrat are given below.

Table 5-33 : Per Capita Income Vs. Car- Gujrat

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2011	87481	1411898	4.94	6.15		
2012	96683	1602129	4.99	6.20	11%	
2013	102589	1771298	5.01	6.25	6%	
2014	111370	2008748	5.05	6.30	9%	
2015	120683	2260084	5.08	6.35	8%	
2016	129738	2527537	5.11	6.40	8%	
2017	143604	2794957	5.16	6.45	11%	
2018	154887	3011656	5.19	6.48	8%	
2019	164310	34,57,788	5.22	6.54	6%	8.2%

Regression analysis of above is given in following figure.

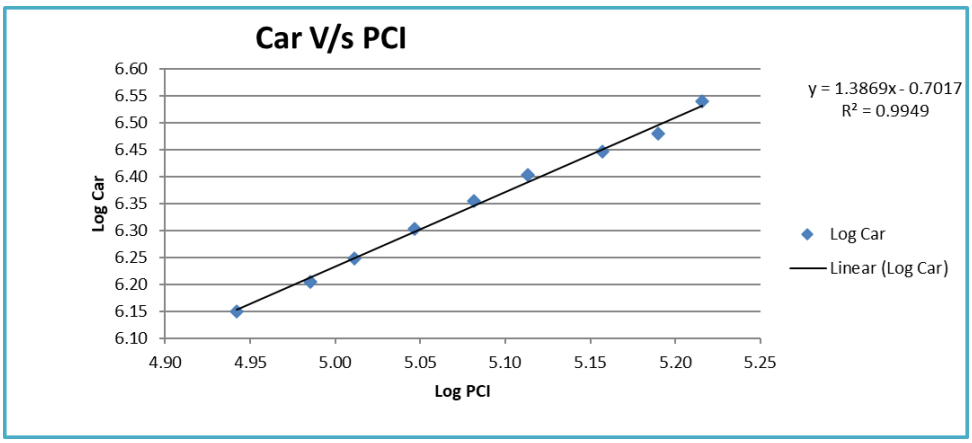


Figure 5-25 : Regression Analysis Car Vs. PCI Gujrat

Table 5-34 : Population Vs. Bus- Gujrat

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth
2011	60440000	67546	7.78	4.83		
2012	61383000	70615	7.79	4.85	2%	
2013	62327000	72998	7.79	4.86	2%	
2014	63271000	76435	7.80	4.88	2%	
2015	64214000	82734	7.81	4.92	1%	
2016	65158000	83984	7.81	4.92	1%	
2017	66084000	85484	7.82	4.93	1%	
2018	67010000	86156	7.83	4.94	1%	
2019	67936000	87256	7.83	4.94	1%	1.5%

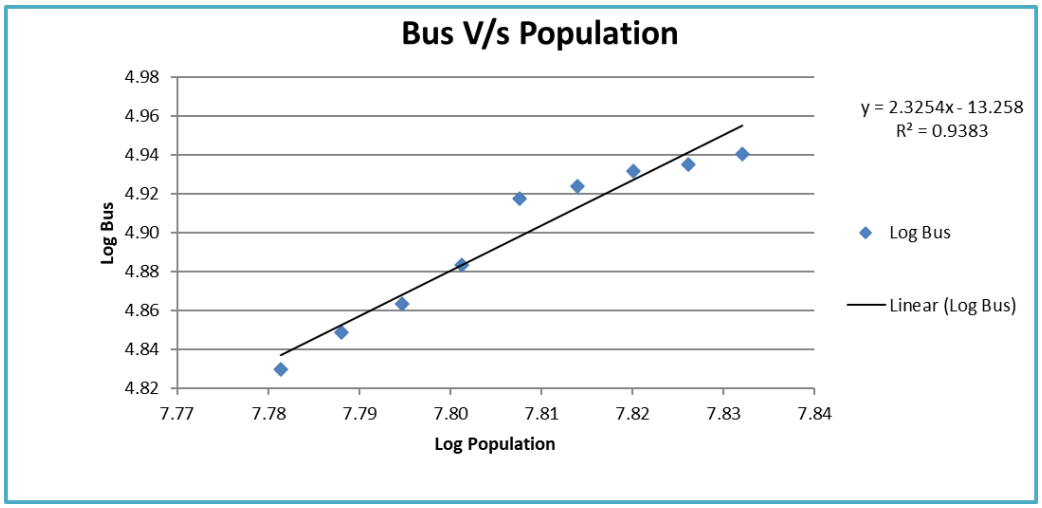


Figure 5-26 : Regression Analysis Population Vs. Bus Gujrat

Table 5-35 : NSDP Vs. Truck- Gujrat

Year	NSDP	Trucks	Log NDSP	Log Truck	NSDP Growth	Average Growth (5 Year)
2011	53280946	301533	7.73	5.48		
2012	59665883	319207	7.78	5.50	12%	
2013	64148881	332185	7.81	5.52	8%	

Year	NSDP	Trucks	Log NDSP	Log Truck	NSDP Growth	Average Growth (5 Year)
2014	70562884	352225	7.85	5.55	10%	
2015	77477522	375265	7.89	5.57	10%	
2016	84393034	396061	7.93	5.60	9%	
2017	94651119	425799	7.98	5.63	12%	
2018	103439901	457299	8.01	5.66	9%	
2019	111186835	582299	8.05	5.77	7%	9.6%

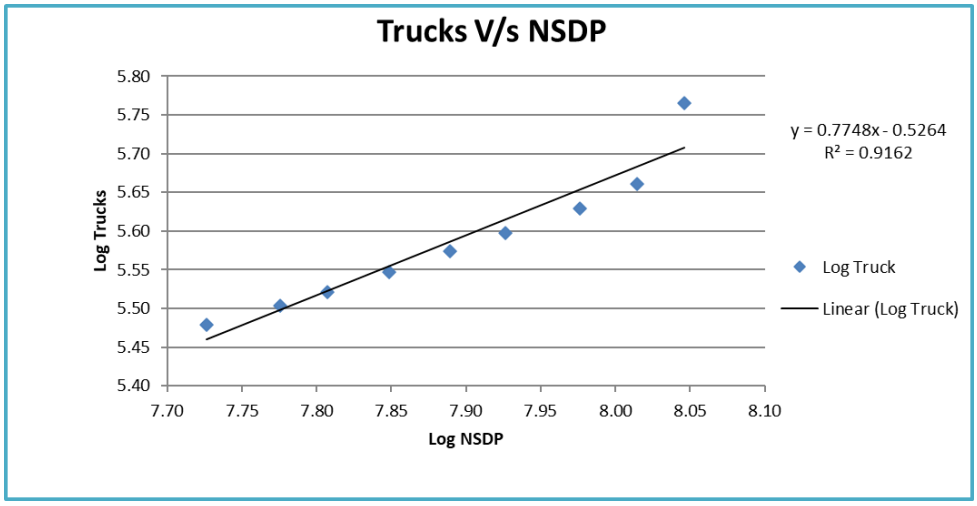


Figure 5-27 : Regression Analysis NSDP Vs. Gujrat

Summary of regression analysis for elasticity and growth estimation for Gujrat are given in following table.

Table 5-36 : Summary Regression Analysis- Gujrat

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average IV Growth (5yrs)	Growth Elastic Model	Remarks
GUJRAT	**Car/Jeep**	PCI	y = 1.3869x - -0.7017	R^2 = 0.9949	1.4	8.2%	11.39%	Good Regression
	Bus	Population	y = 2.3254x - -13.2577	R^2 = 0.9383	2.3	1.5%	3.42%	Good Regression
	Truck	NSDP	y = 0.7748x - -0.5264	R^2 = 0.9162	0.8	9.6%	7.47%	Good Regression

Similarly, regression tables and graphs of economic model for Maharashtra are given as below.

Table 5-37 : Per Capita Income Vs. Car- Maharashtra

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2011	99597	2307841	5.00	6.36		
2012	104008	2592565	5.02	6.41	4%	
2013	109597	2834847	5.04	6.45	5%	
2014	115058	3113773	5.06	6.49	5%	
2015	122889	3406872	5.09	6.53	7%	
2016	133686	3715744	5.13	6.57	9%	
2017	139958	4050681	5.15	6.61	5%	
2018	147097	4347089	5.17	6.64	5%	
2019	152566	46,57,833	5.18	6.67	4%	5.5%

Regression analysis of above is given in following figure.

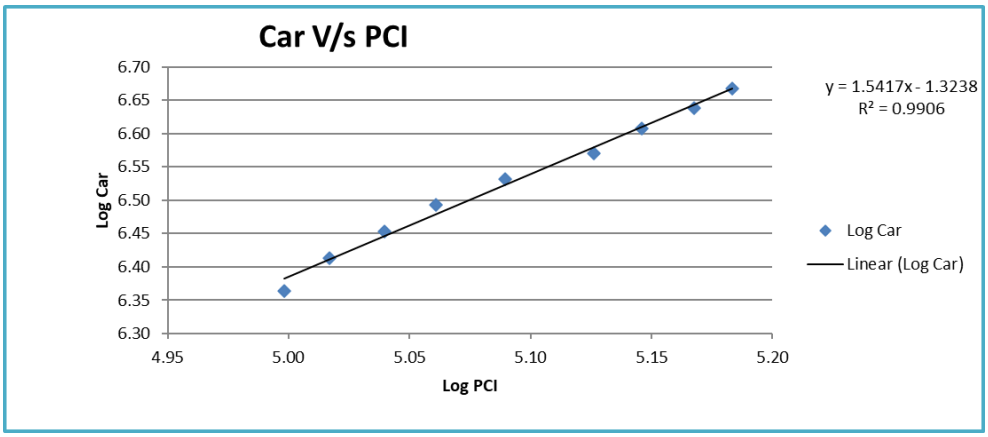


Figure 5-28 : Regression Analysis Car Vs. PCI Maharashtra

Table 5-38 : Population Vs. Bus- Maharashtra

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth
2011	112374000	119118	8.05	5.08		
2012	113645000	129535	8.06	5.11	1%	
2013	114915000	140087	8.06	5.15	1%	
2014	116186000	140102	8.07	5.15	1%	

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth
2015	117456000	150427	8.07	5.18	1%	
2016	118727000	160042	8.07	5.20	1%	
2017	119869000	170483	8.08	5.23	1%	
2018	121110000	179794	8.08	5.25	1%	
2019	122153000	181294	8.09	5.26	1%	1.0%

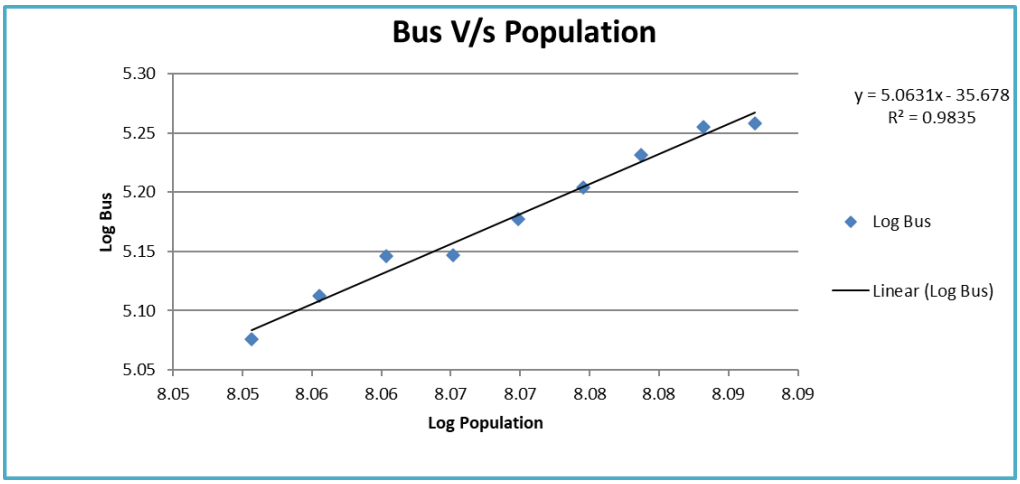


Figure 5-29 : Regression Analysis Population Vs. Bus Maharashtra

Table 5-39 : NSDP Vs. Truck- Maharashtra

Year	NSDP	Trucks	Log NDSP	Log Truck	NSDP Growth	Average Growth (5 Year)
2011	112659470	411418	8.05	5.61		
2012	118971084	440773	8.08	5.64	6%	
2013	126755127	470128	8.10	5.67	7%	
2014	134534146	491582	8.13	5.69	6%	
2015	145251339	494011	8.16	5.69	8%	
2016	159612075	496439	8.20	5.70	10%	
2017	168698024	537164	8.23	5.73	6%	
2018	178983775	583839	8.25	5.77	6%	
2019	187380069	633839	8.27	5.80	5%	6.6%

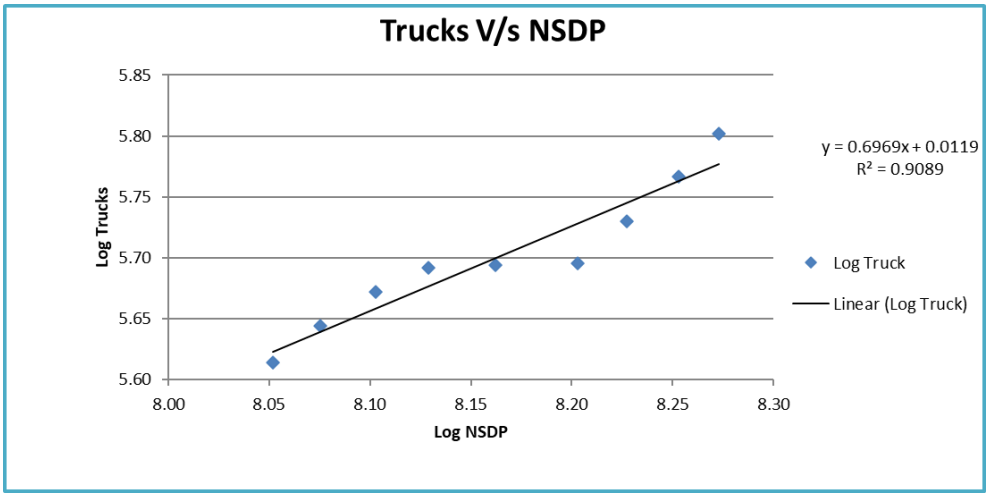


Figure 5-30 : Regression Analysis NSDP Vs. Maharashtra

Summary of regression analysis for elasticity and growth estimation for Maharashtra are given in following table.

Table 5-40 : Summary Regression Analysis- Maharashtra

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average IV Growth (5yrs)	Growth Elastic Model	Remarks
MAHARASHTRA	**Car/Jeep**	PCI	y = 1.5417x - -1.3238	R^2 = 0.9906	1.5	5.5%	8.46%	Good Regression
	Bus	Population	y = 5.0631x - -35.6779	R^2 = 0.9835	5.1	1.0%	5.31%	Good Regression
	Truck	NSDP	y = 0.6969x - 0.0119	R^2 = 0.9089	0.7	6.6%	4.58%	Good Regression

Most of the traffic on the project road is from Uttar Pradesh, Haryana, Delhi, Uttarakhand and Punjab. Hence growth trends of these states only have been taken for growth projections.

Elasticity Coefficient of different states is different. The elasticity of traffic demand is moderated on the basis of experience of traffic growth in various regions and trends of logistic development. The elasticity coefficient for future years has been stepped down as same growth may not be sustainable in the longer future. Finally adopted Elasticity of travel demand is given in the table below. Transportation and logistic infrastructure and market in India is growing at fast pace and with stable economy and political scenario it is expected that this sector will grow at good rate in near future too.

5.4 Other Factors Influencing Growth

There are many factors which have an impact on traffic growth. As discussed previously these factors can be economic, social, educational, and industrial.
Potentiality of such factors for project highway is discussed as under.

ECONOMY

After witnessing a slowdown during 2011-12, the economy recovered in 2013-14, and a high growth rate of GDP was recorded up to 2018-19. Pandemic of COVID-19 impacted all economies of world including India up to year 2021-22. Following figure show trend of GDP growth in India.

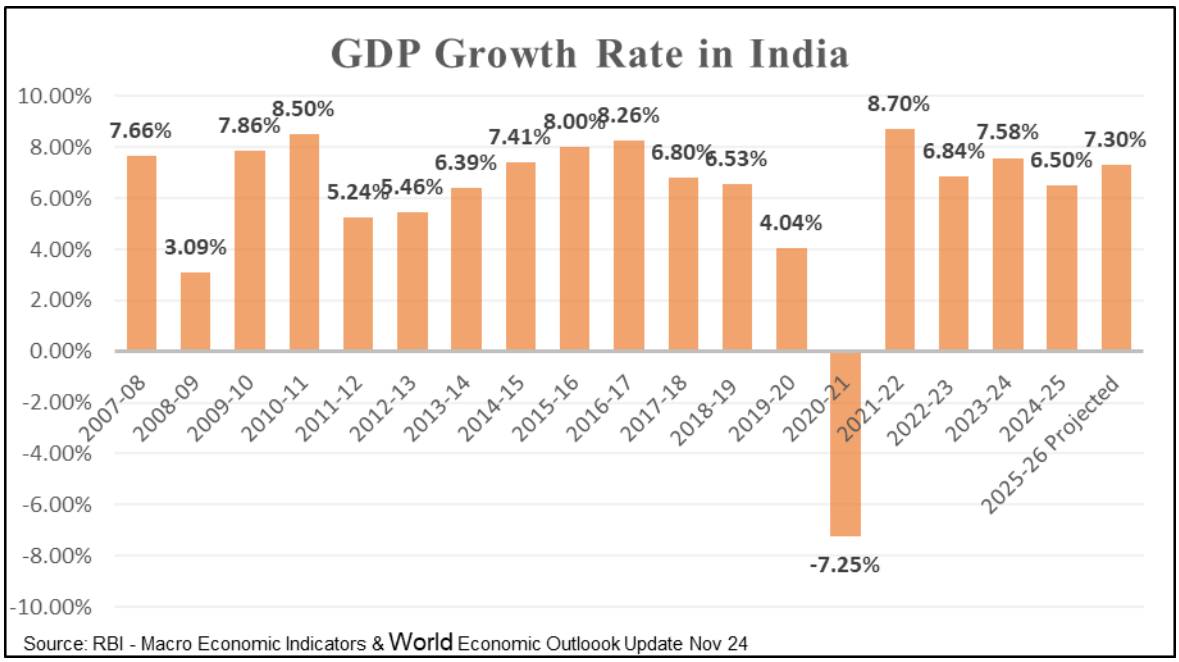


Figure 5-31 : Growth of GDP in India

FY 2017-18 recorded a growth of 6.7% which had a slight impact of GST and demonetization. Indian economy appears on recovery path with estimated growth of 6.8% in FY 2018-19. The government took major policy decisions including tax infrastructure reforming, banking sector improvement and ease of doing business.

In post COVID-19 scenario, in year 2022-23 and 2023-24 India registered an impressive growth of 7% to 7.5%. In last year despite global slow down due to Russia-Ukraine war and Gaza crises, India grew at good rate of 7%(Estimated).
Indian economy is now on good growth path and all major institutions including IMF / ADB have estimated growth of Indian Economy to peg around 6.5% to 7% in coming years.

5.5 Developments along and around the Project Corridor & State

It is imperative that developments in surrounding would impact traffic growth on project corridor. Major relevant establishments and developments in project influence area are discussed as under.

Gorakhpur, Ayodhya and Lucknow are among major cities/districts along the project corridor.

A. Developments in and around Gorakhpur Area

Gorakhpur, a city of historical and cultural significance in eastern Uttar Pradesh, has undergone substantial transformation in recent years, bringing together its rich heritage and modern developments. Named after the revered Saint Gorakhnath, whose shrine remains a focal point of spiritual significance, the city has long been a center for religion, culture, and commerce. It has close ties to Buddhist history as well, with the nearby town of Kushinagar marking the place where Lord Buddha attained Mahaparinirvana. This cultural heritage is complemented by a thriving tradition of arts, crafts, and literature, making Gorakhpur a city deeply rooted in both religious and cultural values. Festivals, fairs, and religious gatherings are regular events in the city, and these traditions are carefully preserved even as Gorakhpur evolves.

The city's progress is evident through numerous development projects focused on infrastructure, healthcare, connectivity, and industrial growth. These projects have brought significant improvements in quality of life and economic opportunities for Gorakhpur's residents. For instance, plans for a metro or light metro system in Gorakhpur aim to enhance public mobility and address the city's traffic challenges. This transit upgrade, coupled with expanded bus routes and modernized transport services, is expected to make the city more accessible and commuter friendly. Another transformative project is the establishment of an All India Institute of Medical Sciences (AIIMS), which has greatly improved healthcare access, offering advanced medical services and generating local employment. Similarly, the expansion of Gorakhpur Airport, with a longer runway and upgraded facilities, is making the city better connected to other Indian metros, supporting both local travel and tourism.

Further reinforcing its connectivity, Gorakhpur has been linked to major expressways, like the Gorakhpur Link Expressway, connecting the city to the Purvanchal Expressway, which links eastern Uttar Pradesh with the rest of the state. The development of Ramgarh Lake into a recreational space, with parks and boating facilities, is expected to boost tourism and provide residents with a much-needed area for leisure and outdoor activities. Industrial growth in Gorakhpur is being supported by the

Gorakhpur Industrial Development Authority (GIDA), which is creating industrial zones and inviting investment in manufacturing and logistics. Renewable energy initiatives, especially solar power projects, are also underway, aiming to promote sustainable energy practices and reduce dependence on traditional power sources. Together, these developments are enhancing the city's economy, generating jobs, and laying the foundation for a more sustainable future.

A major focus area in Gorakhpur's development has been the revival and expansion of its handloom and handicrafts industries. Gorakhpur's traditional arts, particularly terracotta crafts, have gained widespread recognition, especially after receiving a Geographical Indication (GI) tag. This GI tag has bolstered the market for Gorakhpur's terracotta products, helping artisans reach national and international markets. To support this industry, the government has launched initiatives providing artisans with financial assistance, tools, and access to subsidized raw materials. Training programs focus on teaching new techniques and digital skills, helping artisans improve the quality of their products and reach broader markets through e-commerce platforms like Amazon Karigar and Flipkart Samarth. The city's participation in national and international craft fairs also raises the profile of its handicrafts, helping artisans gain visibility and access to new buyers.

Efforts to preserve and expand traditional weaving and handicraft techniques include training in eco-friendly practices, such as using natural dyes and sustainable materials. This emphasis on sustainability not only appeals to environmentally conscious consumers but also preserves ancient practices, making Gorakhpur's crafts relevant in the modern market. Additionally, handloom clusters and artisan hubs provide artisans with shared resources, enabling them to work collaboratively, reduce costs, and enhance production quality. Financial schemes, including microcredit and subsidized loans, make it easier for artisans to invest in raw materials, expand their operations, and improve their livelihoods.

These initiatives are transforming Gorakhpur into a thriving center for artisans, supporting both economic growth and social upliftment. Many of these projects also emphasize community involvement, allowing local residents to take pride in preserving their cultural heritage while benefiting from new opportunities. This balanced development approach has created a positive impact on local communities, with improved access to education, healthcare, and public amenities. By promoting both cultural preservation and modern advancements, Gorakhpur has successfully bridged its historical legacy with contemporary aspirations.

As Gorakhpur grows, it faces challenges such as managing urbanization and ensuring equitable access to development benefits. However, the city's trajectory is

promising, with plans to continue investing in infrastructure, technology, and tourism, all while upholding its cultural roots. The future of Gorakhpur is one of balanced growth, where economic progress and cultural heritage work hand in hand. By fostering a dynamic urban environment that values tradition alongside innovation, Gorakhpur has become a model of regional development, illustrating how strategic investments in local industries and infrastructure can positively transform a community.

Gorakhpur's journey reflects the potential for growth when tradition is integrated with modern development. The city stands as a beacon of economic and cultural resilience in Uttar Pradesh, showcasing the benefits of thoughtful, community-cantered growth. As it continues on this path, Gorakhpur will likely inspire other cities with its blend of cultural pride, sustainable development, and progress.

B. Developments in and around Ayodhya and Faizabad

Ayodhya and Faizabad, two cities located in the state of Uttar Pradesh, are currently experiencing a period of transformative growth and development, blending their rich cultural and historical heritage with modern infrastructure to establish themselves as significant centres for pilgrimage, tourism, and industry. Ayodhya, famously known as the birthplace of Lord Ram, holds immense importance in Hindu tradition and is central to the Ramayana epic. This ancient city, with its spiritual roots and historical legacy, is being revitalized through a series of large-scale projects aimed at attracting tourists, enhancing connectivity, and supporting the local economy. The cornerstone of Ayodhya's transformation is the construction of the grand Ram Temple, a project that marks a new chapter for the city. Following the 2019 Supreme Court ruling that allowed the temple's construction, this ambitious project has been developed on a large scale, blending traditional Indian architecture with modern engineering techniques. Once completed, the Ram Temple is expected to become one of the largest in India, drawing millions of visitors each year and positioning Ayodhya as a major center for pilgrimage and tourism. In parallel, the government has been heavily investing in infrastructure to support the influx of visitors. Roads are being widened, new transportation hubs are being built, and the Ayodhya Airport is undergoing expansion, with an extended runway and

modernized terminal to accommodate both domestic and international flights. The Ayodhya Railway Station is also being renovated, incorporating design elements inspired by the Ramayana to enhance the city's cultural and visual appeal.

To further boost tourism, the **Sarayu Riverfront** is being transformed into a scenic and vibrant public space. This project includes the construction of promenades, gardens, and viewing decks along the river, offering visitors a serene environment that complements Ayodhya's spiritual atmosphere. Additionally, lighting and landscaping improvements will allow the riverfront to host cultural events and religious ceremonies, adding to Ayodhya's allure as a destination for spiritual and cultural experiences. New hotels, guesthouses, and other accommodations are being constructed to cater to the diverse needs of tourists, ensuring that Ayodhya can provide comfortable stays for pilgrims, tourists, and families alike.

Ayodhya's local economy is benefiting from these developments, with the revitalization of traditional handicrafts and artisan industries. The city's artisans are renowned for crafts like metalwork, stone carving, and textile weaving, which have deep cultural significance. These crafts are now being promoted through government support, including training programs in marketing, digital skills, and product diversification. Local craftspeople are also gaining access to e-commerce platforms, allowing them to reach wider markets and benefit directly from Ayodhya's growing tourism. Additionally, Ayodhya's vibrant festivals, such as **Ram Navami** and the **Ayodhya Deepotsav**, are gaining national recognition and drawing even larger crowds, creating new opportunities for local businesses and artisans.

Faizabad, the neighbouring city, is also experiencing substantial growth and development, with a focus on modern infrastructure and economic diversification. Historically significant in its own right, Faizabad has seen progress in areas such as industry and connectivity, complementing the developments in Ayodhya. The region's economy has traditionally been largely agrarian, but the focus is shifting toward industrial growth with a push for modernization and value-added products. Faizabad is seeing an expansion of its industrial base, particularly through the establishment of dedicated industrial zones and industrial parks that focus on sectors like agro-processing, textiles, and small-scale manufacturing. The city's proximity to Ayodhya has enabled a connected industrial corridor that benefits both cities. The government's focus on infrastructure, including road and rail connectivity, has made Faizabad an attractive location for industries aiming to cater to both local and national markets. The **Purvanchal Expressway**, which connects Faizabad to major cities like Lucknow and Varanasi,

has significantly improved road access, and the modernization of Faizabad's railway station facilitates both passenger and cargo services.

Faizabad is also witnessing growth in its textile sector, which includes traditional weaving and modern manufacturing. The city's artisans, known for their skills in textile production, are benefiting from training programs and government support aimed at expanding their reach through marketing and digital skills. These initiatives help local craftspeople modernize their produc tion processes and sell their products on global e-commerce platforms, ensuring they can access wider markets and earn better wages. The development of small-scale industries, such as food processing, is further diversifying the local economy and creating job opportunities. Faizabad's growing industries complement the industrial advancements in Ayodhya, contributing to a broader economic corridor that fosters regional growth.

Sustainability and environmental considerations are also central to the development of both Ayodhya and Faizabad. Projects along the Sarayu River in Ayodhya prioritize water conservation and waste management, with green building practices and renewable energy sources integrated into urban planning. This focus on sustainability ensures that growth in both cities respects their natural surroundings and cultural heritage. Faizabad's infrastructure projects, including the expansion of industrial zones and improvements in transport networks, emphasize eco-friendly practices such as the use of sustainable materials and renewable energy.

The rapid development in both cities has brought significant social and economic benefits to the residents of Ayodhya and Faizabad. Employment opportunities in construction, tourism, and hospitality have surged, offering locals stable livelihoods. Education and skill development programs are being introduced to equip residents with the expertise needed to work in Ayodhya's and Faizabad's growing tourism and service sectors. These initiatives ensure that residents benefit directly from the cities' evolution, contributing to a higher standard of living and improved quality of life.

Overall, the growth and development in Ayodhya and Faizabad represent a unique blend of tradition and progress. By investing in large-scale infrastructure, supporting local industries, and prioritizing sustainability, these cities are becoming major pilgrimage and cultural destinations while fostering economic growth. The cities' transformation serves as an example of how ancient heritage and modern development can coexist, enhancing Ayodhya's and Faizabad's identity as both spiritual centres and dynamic urban hubs. With a vision that respects historical significance while embracing new opportunities, Ayodhya and Faizabad stand as beacons of cultural pride and a testament to the potential of thoughtful, heritage-cantered urban development. The collaborative efforts between state and central governments, local stakeholders, and the private sector are laying a solid foundation for future growth, ensuring that these cities not only preserve their spiritual and historical legacy but also thrive economically, socially, and environmentally.

C. Developments in and around Lucknow

Lucknow, the capital city of Uttar Pradesh, is rapidly transforming into a key economic and industrial hub in northern India. Historically known for its cultural heritage and historical significance, the city is now embracing modernization while retaining its traditional roots. The city's growth has been driven by large-scale infrastructure projects, industrialization, and a business-friendly environment, which together aim to position it as a prominent urban center in India.

The small-scale industries (SSIs) in Lucknow play a crucial role in the city's economy by providing employment and preserving local craftsmanship. One of the most notable small-scale industries is Chikan embroidery, a traditional craft that has made Lucknow famous across the globe. This intricate hand-embroi dery work, primarily done on cotton, silk, and georgette fabrics, supports thousands of artisans, with many small workshops and home-based businesses producing garments, scarves, and other embroidered products. The city's government has launched various initiatives to support these artisans, including providing training and marketing assistance, ensuring their products reach global markets.

Apart from textiles, handicrafts and metalworks are other significant small-scale industries. These industries involve the production of brassware, woodcraft, stone carvings, pottery, and other decorative items, which are sold both locally and internationally. Many of these products are crafted by local artisans in small workshops, with government support aimed at improving product quality and expanding export opportunities. Another important area for small-scale industries is food processing, where local units process fruits, vegetables, and other agricultural products into items like jams, pickles, snacks, and sweets. The popularity of Awadhi cuisine has also led to a rise in food businesses producing packaged food items for local and international markets.

Additionally, Lucknow is home to a growing furniture and home décor industry, where small manufacturers produce high-quality wooden furniture and home furnishings that are in demand both within India and abroad. These small-scale industries not only help preserve Lucknow's cultural heritage but also contribute significantly to its local economy.

While small-scale industries form the backbone of Lucknow's traditional economy, large-scale industries have also emerged as key contributors to the city's industrial landscape. One of the prominent sectors is the automobile industry, where major manufacturers like Honda, Hero MotoCorp, and Eicher Motors have set up plants. These companies contribute significantly to employment, and their presence has created a thriving automotive ecosystem that includes logistics, assembly, and distribution. The pharmaceutical industry is another important sector, with large companies such as Dr. Reddy's Laboratories, Cadila Pharmaceuticals, and Medi-Pharma contributing to the city's role as a hub for medical manufacturing and distribution. This sector benefits from the growing domestic and international demand for healthcare products.

The information technology (IT) sector is also rapidly expanding in Lucknow, driven by the development of IT parks and research centres. The Lucknow IT City project, located in the Gomti Nagar area, has attracted large companies such as Tata Consultancy Services (TCS), HCL, and Tech Mahindra. These companies are contributing to the growth of the IT sector and creating a tech-driven ecosystem that supports the city's economic diversification. The growth of the IT sector also aligns with the government's focus on fostering innovation and job creation, especially for young professionals.

Additionally, the food processing and beverage industry has witnessed considerable growth, with large-scale companies involved in manufacturing packaged foods, dairy products, beverages, snacks, and confectionery. These industries leverage the city's proximity to agricultural regions, allowing them to process local crops into value-added products for both domestic and international markets. The city is also witnessing growth in textile and garment manufacturing, with the establishment of larger textile mills and garment factories that contribute to India's export-oriented economy.

In terms of infrastructure, Lucknow is benefiting from several large-scale development projects that improve connectivity and boost industrial growth. Key projects such as the Purvanchal Expressway, the Lucknow-Agra Expressway, and the Lucknow Metro have significantly improved the city's transportation network, making it an attractive destination for both industrial investment and tourism. The Lucknow Metro, which began operations in 2017, has reduced traffic congestion and connected major parts of the city, further enhancing its appeal to businesses and residents.

The city's government has also prioritized the development of Dedicated Industrial Zones and Industrial Parks, which cater to sectors like electronics, engineering, and agro processing. These zones are designed to attract investment and foster the growth of manufacturing units. Furthermore, Lucknow is a key node in the Uttar Pradesh Defence Industrial Corridor, a major initiative aimed at creating a defence manufacturing

ecosystem in the region. This project is expected to offer significant employment opportunities and attract global defence companies to Lucknow, further driving its industrial growth.

Moreover, the city is embracing sustainability and green development through projects focused on eco-friendly infrastructure, renewable energy, and environmental conservation. The Saryu Riverfront Development is one such project aimed at beautifying the city's riverside while improving water quality and conservation. Urban planning initiatives are also incorporating solar energy, rainwater harvesting, and the creation of green spaces to ensure that the city's growth is environmentally sustainable.

As Lucknow continues to grow, the city's real estate sector has also experienced a boom, with increasing demand for residential, commercial, and retail spaces. New housing complexes, office buildings, and mixed-use developments are being constructed in areas like Gomti Nagar, Sushant Golf City, and Indira Nagar, contributing to the city's urbanization. This rapid expansion of the real estate sector is complemented by the growing retail, tourism, and hospitality industries, with new shopping malls, luxury hotels, and entertainment complexes emerging in the city.

The education and healthcare sectors are also important drivers of Lucknow's growth. The city is home to several prestigious educational institutions, including the Indian Institute of Management Lucknow (IIML), Dr. Ram Manohar Lohia National Law University, and a range of engineering and medical colleges. These institutions provide a skilled workforce for various industries and also support the city's growing medical tourism sector. World-class hospitals, such as King George's Medical University (KGMU), attract patients from across India and abroad, further strengthening the city's healthcare infrastructure.

Looking ahead, the future prospects for Lucknow's industrial and economic growth appear bright. The city's infrastructure is continuously improving, and several initiatives, such as the development of IT hubs, smart cities, and industrial corridors, are expected to further enhance its economic potential. The focus on sustainability and green development ensures that the city's growth is balanced with environmental conservation. With continued investment in infrastructure, technology, and education, Lucknow is well-positioned to become a leading economic, cultural, and political center in northern India. The combination of traditional industries and modern industrial growth, along with the city's rich cultural heritage, provides a unique opportunity for sustained economic development and global recognition.

D. Developments in and around Sultanpur

Sultanpur, located in the central part of Uttar Pradesh, is an emerging city with a rich historical background and a growing industrial and agricultural economy. Known for its agricultural activities, Sultanpur is increasingly becoming a key player in Uttar Pradesh's economic development. The city has traditionally been known for its

agricultural produce, including wheat, sugarcane, and pulses, which are grown in abundance due to its fertile soil and favourable climatic conditions. Over time, Sultanpur has also made strides in industrial development, particularly with the establishment of small and medium-scale industries that are contributing to the region's overall growth.

Agriculture and Small-Scale Industries: Agriculture remains the backbone of Sultanpur's economy. The district is well known for its high production of crops such as wheat, sugarcane, rice, and pulses, which not only feed the local population but also support the broader economy of Uttar Pradesh. The region's agricultural growth is supported by various irrigation projects, including canals and tube wells, which ensure a steady water supply for crops. This fertile agricultural land also provides raw materials for local industries, particularly in the food processing and agro-based sectors.

One of the prominent small-scale industries in Sultanpur is food processing, where agricultural products are processed and packaged for local and regional markets. There are several small food processing units in the district, which handle products like fruits, vegetables, grains, and pulses, turning them into packaged goods such as snacks, j ams, pickles, and flour. These small units help in adding value to the raw agricultural produce, creating job opportunities, and enhancing the income of local farmers.

Another important small-scale industry in Sultanpur is textile production. The district is home to a number of traditional weaving and embroidery units, where skilled artisans create beautiful handloom products. The focus is primarily on fabric and garment production, including handwoven textiles, which are sold both locally and in national markets. These small businesses are often family-run and contribute to preserving the cultural heritage of the region while providing a livelihood for many.

The handicraft industry is also significant in Sultanpur, with artisans producing a range of products such as pottery, brassware, wooden crafts, and decorative items. These items are often sold in local markets and also find their way into international export markets. The local government supports these small industries through various training programs and financial assistance to improve product quality and promote their export potential.

Industrial Growth and Large-Scale Industries: Over recent years, Sultanpur has seen gradual progress in large-scale industrial development.

The district's industrial landscape has diversified, with industries in textiles, automobiles, and agro processing becoming more prominent. The establishment of industrial zones and parks has attracted investors, creating an environment conducive to business growth.

One of the sectors that have seen significant growth is the automobile industry. Sultanpur has been positioning itself as a potential hub for automobile manufacturing, with various automobile companies setting up their production units in the region. The development of related industries, such as the manufacture of auto parts and accessories, has also contributed to employment generation in the district. The expansion of the automobile supply chain has further helped local businesses in the region thrive.

Food processing has also expanded into larger-scale operations, with companies setting up large plants for the processing of fruits, vegetables, dairy, and other agricultural products. These large units focus on producing value-added products, such as frozen food, packaged snacks, and processed dairy items, which are then distributed across India and exported abroad. Sultanpur's proximity to agricultural hubs ensures that these large-scale food processing companies have a steady supply of raw materials, making it an attractive investment destination for businesses in the agri-business sector.

The pharmaceutical industry is also growing in Sultanpur, with a few companies involved in the manufacturing of medicines, healthcare products, and medical devices. As the demand for healthcare products grows both in India and internationally, Sultanpur is well-positioned to become a center for pharmaceutical manufacturing due to its infrastructure and the increasing number of skilled workers in the region.

Infrastructure Development: Sultanpur is benefiting from several infrastructure projects aimed at boosting the city's connectivity and industrial capacity. The construction of new roads, bridges, and highways has improved connectivity to nearby cities such as Lucknow, Allahabad, and Varanasi. Additionally, the development of the Purvanchal Expressway, which passes through Sultanpur, is expected to further enhance the region's connectivity and facilitate the movement of goods and services.

Moreover, power supply and water management systems are being upgraded to meet the growing demands of both agricultural and industrial sectors. The local government has focused on improving basic infrastructure, including roadways and electricity, to attract more industrial investments and ensure smoother operations for existing businesses.

Education, Healthcare, and Tourism: Sultanpur is also focusing on the development of its education and healthcare sectors. The city has several schools, colleges, and vocational training centres that are helping to create a skilled workforce for the growing industries. Educational institutions, including technical and vocational institutes, are playing a key role in equipping young people with the skills needed for employment in industrial sectors.

The healthcare infrastructure in Sultanpur is improving, with the establishment of new hospitals and healthcare centres, providing better medical services to residents and attracting patients from surrounding regions. This development is crucial in ensuring that the district can support its growing population, particularly as the economy expands and more people migrate to the city for work.

Sultanpur also has tourism potential, with several historical and cultural sites attracting visitors. The city is home to several religious places, temples, and historical monuments that contribute to its tourism industry. Efforts are being made to develop these areas further, with projects aimed at improving facilities for tourists and promoting the city's rich cultural heritage.

Future Prospects: Looking ahead, Sultanpur's prospects for growth are promising. The city is likely to continue benefiting from state and central government initiatives such as Make in India and Atmanirbhar Bharat, which are designed to boost industrialization and self-reliance. The establishment of industrial parks and zones dedicated to sectors like electronics, engineering, and defence manufacturing is expected to foster further industrial growth.

The government's focus on improving infrastructure, such as the Purvanchal Expressway, railway networks, and airports, is likely to increase Sultanpur's connectivity to major economic centres in India, making it an even more attractive location for investment. With the government's emphasis on creating a conducive business environment, Sultanpur is expected to see further industrial diversification, including sectors such as renewable energy, electronics, and pharmaceuticals, in the coming years.

In conclusion, Sultanpur is on a growth trajectory, with agriculture, small-scale industries, and large-scale manufacturing playing vital roles in its economic development. The city's strategic location, government support, and infrastructure development are creating an environment conducive to business growth and industrialization. Sultanpur's growing industries, coupled with the focus on education, healthcare, and tourism, position the city as an emerging economic center in Uttar Pradesh, contributing to the overall growth and development of the state.

5.6 Recommended Growth Rates of Traffic

Based on the above analysis and after giving due consideration to the entire listed factors, the following overall growth rates are recommended for each category of vehicle as below. The rate of growth is moderate in light of overall regional trends. Growth of multi-Axle is kept higher as compared to LCV, 2 Axle and 3-Axle traffic, as trend of technological advances in logistic industry favors multi-axle over 2/3 axle carriage and LCV. It is also expected that as the economy moves from developing to developing, the rate of growth diminishes. The same growth rate is not sustainable for long. Hence growth rates have been suitably stepped down in future years.

Growth rates are recommended for three scenarios for sensitivity analysis namely **Optimistic, Pessimistic** and **Most Likely** with a positive and negative variation from Most Likely case for corridors in all states.

It can be observed that TOT-17 has three distinctive stretches namely Lucknow-Ayodhya, Ayodhya- Gorakhpur and Lucknow – Sultanpur. There are certain factors

which may encourage differential growth in these sections. It is expected that Lucknow-Ayodhya section would register more growth as compared to other two due to impact of growing urban mega city of Lucknow and fast developing religious major center of Ayodhya specially after Ram Temple opening. Third section of Lucknow to Sultanpur as such does not have any other emerging development hub except Varanasi which is far off, is also expected to grow moderately as compared to Lucknow- Ayodhya section. These factors have been considered as the growth as derived has been adjusted considering above. Following tables present adopted traffic growth on various sections in horizon years.

5.6.1 Recommended Growth Rates of Traffic for Madhya Pradesh Part of Stretch

Table 5-41 : Recommended Growth Rates Most Likely –Section 1 Lucknow to Ayodhya

Category / Year	FY-2026-2030	FY-2031-2035	FY-2036-2040	FY-2041-2045	FY-2046-2050
Car/Jeep/Van	8.69%	8.04%	7.40%	6.78%	6.16%
LCV	4.54%	3.83%	3.18%	2.59%	2.07%
Bus	3.29%	2.84%	2.42%	2.01%	1.62%
Truck	5.20%	4.38%	3.63%	2.95%	2.35%
3-Axle Commercial vehicle	3.22%	2.73%	2.28%	1.87%	1.51%
Multi axle	6.19%	5.20%	4.30%	3.49%	2.77%
Oversized Vehicles	6.19%	5.20%	4.30%	3.49%	2.77%

Table 5-42 : Recommended Growth Rates Most Likely - Section 2 Ayodhya to Gorakhpur

Category / Year	FY-2026-2030	FY-2031-2035	FY-2036-2040	FY-2041-2045	FY-2046-2050
Car/Jeep/Van	8.01%	7.41%	6.83%	6.25%	5.69%
LCV	4.33%	3.65%	3.03%	2.47%	1.98%
Bus	3.14%	2.71%	2.31%	1.92%	1.55%
Truck	4.95%	4.17%	3.46%	2.82%	2.25%
3-Axle Commercial vehicle	3.07%	2.60%	2.17%	1.79%	1.45%
Multi axle	5.89%	4.95%	4.10%	3.33%	2.64%
Oversized Vehicles	5.89%	4.95%	4.10%	3.33%	2.64%

Table 5-43 : Recommended Growth Rates Most Likely -Section 3 Lucknow to Sultanpur

Category / Year	FY-2026-2030	FY-2031-2035	FY-2036-2040	FY-2041-2045	FY-2046-2050
Car/Jeep/Van	7.34%	6.79%	6.26%	5.73%	5.22%

Category / Year	FY-2026-2030	FY-2031-2035	FY-2036-2040	FY-2041-2045	FY-2046-2050
LCV	3.68%	3.11%	2.59%	2.12%	1.71%
Bus	2.68%	2.32%	1.98%	1.66%	1.34%
Truck	4.21%	3.55%	2.95%	2.41%	1.93%
3-Axle Commercial vehicle	2.63%	2.23%	1.87%	1.55%	1.26%
Multi axle	5.00%	4.21%	3.49%	2.84%	2.27%
Oversized Vehicles	5.00%	4.21%	3.49%	2.84%	2.27%

Table 5-44 : Recommended Growth Rates Optimistic –Section 1 Lucknow to Ayodhya

Category / Year	FY-2026-2030	FY-2031-2035	FY-2036-2040	FY-2041-2045	FY-2046-2050
Car/Jeep/Van	8.94%	8.29%	7.65%	7.03%	6.41%
LCV	4.79%	4.08%	3.43%	2.84%	2.32%
Bus	3.54%	3.09%	2.67%	2.26%	1.87%
Truck	5.45%	4.63%	3.88%	3.20%	2.60%
3-Axle Commercial vehicle	3.47%	2.98%	2.53%	2.12%	1.76%
Multi axle	6.44%	5.45%	4.55%	3.74%	3.02%
Oversized Vehicles	6.44%	5.45%	4.55%	3.74%	3.02%

Table 5-45 : Recommended Growth Rates Optimistic -Section 2 Ayodhya to Gorakhpur

Category / Year	FY-2026-2030	FY-2031-2035	FY-2036-2040	FY-2041-2045	FY-2046-2050
Car/Jeep/Van	8.26%	7.66%	7.08%	6.50%	5.94%
LCV	4.58%	3.90%	3.28%	2.72%	2.23%
Bus	3.39%	2.96%	2.56%	2.17%	1.80%
Truck	5.20%	4.42%	3.71%	3.07%	2.50%
3-Axle Commercial vehicle	3.32%	2.85%	2.42%	2.04%	1.70%
Multi axle	6.14%	5.20%	4.35%	3.58%	2.89%
Oversized Vehicles	6.14%	5.20%	4.35%	3.58%	2.89%

Table 5-46 : Recommended Growth Rates Optimistic - Section 3 Lucknow to Sultanpur

Category / Year	FY-2026-2030	FY-2031-2035	FY-2036-2040	FY-2041-2045	FY-2046-2050
Car/Jeep/Van	7.59%	7.04%	6.51%	5.98%	5.47%
LCV	3.93%	3.36%	2.84%	2.37%	1.96%

Category / Year	FY-2026-2030	FY-2031-2035	FY-2036-2040	FY-2041-2045	FY-2046-2050
Bus	2.93%	2.57%	2.23%	1.91%	1.59%
Truck	4.46%	3.80%	3.20%	2.66%	2.18%
3-Axle Commercial vehicle	2.88%	2.48%	2.12%	1.80%	1.51%
Multi axle	5.25%	4.46%	3.74%	3.09%	2.52%
Oversized Vehicles	5.25%	4.46%	3.74%	3.09%	2.52%

Table 5-47 : Recommended Growth Rates Pessimistic – Section 1 Lucknow to Ayodhya

Category / Year	FY-2026-2030	FY-2031-2035	FY-2036-2040	FY-2041-2045	FY-2046-2050
Car/Jeep/Van	8.44%	7.79%	7.15%	6.53%	5.91%
LCV	4.29%	3.58%	2.93%	2.34%	1.82%
Bus	3.04%	2.59%	2.17%	1.76%	1.37%
Truck	4.95%	4.13%	3.38%	2.70%	2.10%
3-Axle Commercial vehicle	2.97%	2.48%	2.03%	1.62%	1.26%
Multi axle	5.94%	4.95%	4.05%	3.24%	2.52%
Oversized Vehicles	5.94%	4.95%	4.05%	3.24%	2.52%

Table 5-48 : Recommended Growth Rates Pessimistic -Section 2 Ayodhya to Gorakhpur

Category / Year	FY-2026-2030	FY-2031-2035	FY-2036-2040	FY-2041-2045	FY-2046-2050
Car/Jeep/Van	7.76%	7.16%	6.58%	6.00%	5.44%
LCV	4.08%	3.40%	2.78%	2.22%	1.73%
Bus	2.89%	2.46%	2.06%	1.67%	1.30%
Truck	4.70%	3.92%	3.21%	2.57%	2.00%
3-Axle Commercial vehicle	2.82%	2.35%	1.92%	1.54%	1.20%
Multi axle	5.64%	4.70%	3.85%	3.08%	2.39%
Oversized Vehicles	5.64%	4.70%	3.85%	3.08%	2.39%

Table 5-49 : Recommended Growth Rates Pessimistic - Section 3 Lucknow to Sultanpur

Category / Year	FY-2026-2030	FY-2031-2035	FY-2036-2040	FY-2041-2045	FY-2046-2050
Car/Jeep/Van	7.09%	6.54%	6.01%	5.48%	4.97%
LCV	3.43%	2.86%	2.34%	1.87%	1.46%
Bus	2.43%	2.07%	1.73%	1.41%	1.09%

Category / Year	FY-2026-2030	FY-2031-2035	FY-2036-2040	FY-2041-2045	FY-2046-2050
Truck	3.96%	3.30%	2.70%	2.16%	1.68%
3-Axle Commercial vehicle	2.38%	1.98%	1.62%	1.30%	1.01%
Multi axle	4.75%	3.96%	3.24%	2.59%	2.02%
Oversized Vehicles	4.75%	3.96%	3.24%	2.59%	2.02%

CHAPTER 6

TRAFFIC FORECAST

6.1 Traffic Projections

Growth rates recommended in the previous section of the report are used to arrive at traffic projections for future years. Toll plaza wise futuristic traffic projection is given in tables below.

These projections have been done for the following three cases of growth up to concession period.

1. Most Likely Scenario
2. Pessimistic Scenario
3. Optimistic Scenario

Traffic projections for Most Likely scenario is given as under

Table 6-1 : Total Tollable Traffic @ Toll Plaza 1- At Km.53+000 (Most Likely Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	14672	1086	1122	1380	810	2510	4	**21584**	**39969**
2027-28	15947	1135	1159	1452	871	2773	4	**23341**	**42613**
2028-29	17333	1187	1198	1528	899	2945	4	**25094**	**45448**
2029-30	18839	1240	1237	1607	926	3128	4	**26981**	**48488**
2030-31	20352	1287	1272	1678	951	3291	4	**28835**	**51387**
2031-32	21987	1337	1308	1752	976	3462	4	**30826**	**54479**
2032-33	23754	1388	1345	1828	1003	3642	4	**32964**	**57776**
2033-34	25664	1441	1384	1907	1030	3831	4	**35261**	**61294**
2034-35	27726	1496	1423	1991	1057	4030	4	**37727**	**65048**
2035-36	29778	1544	1458	2063	1082	4203	4	**40132**	**68600**
2036-37	31983	1593	1493	2137	1106	4384	4	**42700**	**72372**
2037-38	34350	1644	1529	2215	1131	4573	4	**45446**	**76376**
2038-39	36891	1696	1566	2295	1157	4769	4	**48378**	**80629**
2039-40	39622	1749	1604	2377	1182	4975	4	**51513**	**85148**
2040-41	42307	1794	1636	2447	1204	5148	4	**54540**	**89392**
2041-42	45173	1841	1668	2519	1225	5327	4	**57757**	**93879**
2042-43	48233	1888	1702	2594	1249	5514	4	**61184**	**98624**
2043-44	51501	1938	1736	2670	1272	5706	4	**64827**	**103644**
2044-45	54990	1988	1771	2748	1296	5905	4	**68702**	**108955**
2045-46	58378	2029	1799	2812	1315	6069	4	**72406**	**113906**
2046-47	61976	2071	1829	2878	1335	6237	4	**76330**	**119121**

Table 6-2 : Total Tollable Traffic @ Toll Plaza 2- 107+000
(Most Likely Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	13909	1213	1163	1463	859	3095	7	**21709**	**42871**
2027-28	15117	1267	1201	1539	887	3286	7	**23304**	**45668**
2028-29	16431	1324	1241	1619	915	3490	7	**25027**	**48663**
2029-30	17858	1384	1282	1703	944	3707	7	**26885**	**51871**
2030-31	19293	1437	1318	1777	970	3900	7	**28702**	**54914**
2031-32	20844	1491	1355	1854	996	4102	7	**30649**	**58156**
2032-33	22519	1548	1393	1935	1023	4315	7	**32740**	**61608**
2033-34	24329	1607	1433	2020	1050	4540	7	**34986**	**65287**
2034-35	26284	1669	1474	2108	1078	4775	7	**37395**	**69208**
2035-36	28229	1721	1510	2184	1103	4980	7	**39734**	**72896**
2036-37	30318	1776	1546	2264	1128	5194	7	**42233**	**76807**
2037-38	32562	1833	1583	2346	1154	5417	7	**44902**	**80954**
2038-39	34971	1891	1621	2431	1180	5651	7	**47752**	**85353**
2039-40	37559	1950	1661	2519	1206	5893	7	**50795**	**90020**
2040-41	40104	2001	1694	2593	1229	6098	7	**53726**	**94377**
2041-42	42820	2053	1728	2670	1251	6310	7	**56839**	**98977**
2042-43	45721	2106	1763	2748	1274	6531	7	**60150**	**103837**
2043-44	48819	2161	1799	2829	1298	6758	7	**63671**	**108970**
2044-45	52126	2217	1835	2913	1323	6994	7	**67415**	**114395**
2045-46	55338	2263	1864	2983	1343	7188	7	**70986**	**119421**
2046-47	58748	2309	1894	3053	1364	7386	7	**74761**	124708

Table 6-3 : Total Tollable Traffic @ Toll Plaza 3- At Km.163+000
(Most Likely Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	6766	852	1055	1332	793	3409	4	**14211**	**38786**
2027-28	7308	889	1088	1398	817	3610	4	**15114**	**41098**
2028-29	7893	926	1122	1468	842	3823	4	**16078**	**43559**
2029-30	8527	966	1157	1540	868	4048	4	**17110**	**46179**
2030-31	9159	1001	1188	1604	891	4250	4	**18097**	**48625**
2031-32	9838	1038	1220	1671	914	4461	4	**19146**	**51213**
2032-33	10567	1075	1253	1741	938	4681	4	**20259**	**53952**
2033-34	11350	1115	1287	1813	962	4913	4	**21444**	**56851**
2034-35	12190	1156	1322	1888	987	5156	4	**22703**	**59919**
2035-36	13023	1191	1353	1953	1009	5367	4	**23900**	**62756**
2036-37	13911	1227	1384	2021	1031	5586	4	**25164**	**65743**
2037-38	14861	1264	1416	2091	1053	5815	4	**26504**	**68889**

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2038-39	15875	1302	1448	2163	1076	6053	4	**27921**	**72204**
2039-40	16960	1341	1482	2238	1099	6300	4	**29424**	**75697**
2040-41	18020	1374	1510	2301	1120	6510	4	**30839**	**78896**
2041-42	19147	1408	1539	2365	1140	6727	4	**32330**	**82251**
2042-43	20344	1442	1569	2432	1161	6951	4	**33903**	**85770**
2043-44	21617	1478	1599	2500	1182	7182	4	**35562**	**89463**
2044-45	22967	1514	1630	2571	1203	7420	4	**37309**	**93339**
2045-46	24274	1544	1656	2628	1220	7617	4	**38943**	**96858**
2046-47	25656	1575	1682	2687	1238	7818	4	**40660**	100536

Table 6-4 : Total Tollable Traffic @ Toll Plaza 4- At Km.198+000 (Most Likely Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	4229	649	788	1112	718	2282	3	**9781**	**30758**
2027-28	4991	742	891	1279	811	2645	3	**11362**	**32608**
2031-32	6717	866	1000	1528	905	3268	3	**14287**	**40737**
2032-33	7214	898	1027	1592	928	3430	3	**15092**	**42950**
2033-34	7749	931	1054	1659	951	3600	3	**15947**	**45295**
2034-35	8324	964	1083	1729	975	3779	3	**16857**	**47781**
2035-36	8892	994	1108	1789	997	3934	3	**17717**	**50095**
2036-37	9499	1023	1134	1851	1018	4096	3	**18624**	**52535**
2037-38	10147	1054	1160	1915	1040	4264	3	**19583**	**55109**
2038-39	10840	1086	1187	1981	1062	4439	3	**20598**	**57824**
2039-40	11580	1119	1214	2049	1085	4621	3	**21671**	**60689**
2040-41	12305	1147	1237	2106	1104	4776	3	**22678**	**63335**
2041-42	13075	1174	1260	2165	1125	4935	3	**23737**	**66113**
2042-43	13893	1203	1285	2226	1145	5100	3	**24855**	**69032**
2043-44	14762	1233	1310	2289	1165	5270	3	**26032**	**72100**
2044-45	15684	1263	1335	2353	1186	5446	3	**27270**	**75324**
2045-46	16576	1289	1356	2406	1202	5591	3	**28423**	**78277**
2046-47	17520	1314	1377	2460	1219	5740	3	**29633**	81367
2026-27	4229	649	788	1112	718	2282	3	**9781**	**30758**
2027-28	4991	742	891	1279	811	2645	3	**11362**	**32608**
2031-32	6717	866	1000	1528	905	3268	3	**14287**	**40737**

Table 6-5 : Total Tollable Traffic @ Toll Plaza 5- At Km.178+135 (Most Likely Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	8594	590	531	1052	522	1583	2	**12874**	**24050**

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2027-28	9077	587	545	1072	507	1525	2	**13315**	**25370**
2028-29	9744	608	559	1117	521	1602	2	**14153**	**26769**
2029-30	10458	630	574	1163	534	1682	2	**15043**	**28253**
2030-31	11168	651	587	1204	546	1752	2	**15910**	**29653**
2031-32	11927	671	601	1246	559	1826	2	**16832**	**31131**
2032-33	12736	691	615	1291	571	1903	2	**17809**	**32691**
2033-34	13601	712	629	1337	583	1983	2	**18847**	**34337**
2034-35	14524	734	644	1384	596	2066	2	**19950**	**36076**
2035-36	15432	752	657	1425	608	2138	2	**21014**	**37705**
2036-37	16397	773	670	1467	619	2212	2	**22140**	**39418**
2037-38	17424	793	683	1510	630	2290	2	**23332**	**41220**
2038-39	18514	813	697	1555	642	2370	2	**24593**	**43114**
2039-40	19672	834	711	1601	654	2452	2	**25926**	**45108**
2040-41	20799	851	723	1639	665	2522	2	**27201**	**46962**
2041-42	21992	870	735	1679	675	2594	2	**28547**	**48905**
2042-43	23252	888	747	1720	685	2667	2	**29961**	**50941**
2043-44	24584	906	760	1761	696	2742	2	**31451**	**53076**
2044-45	25994	925	773	1803	706	2820	2	**33023**	**55314**
2045-46	27349	941	784	1838	716	2883	2	**34513**	**57381**
2046-47	28776	956	795	1875	725	2948	2	**36077**	**59539**

Table 6-6 : Total Tollable Traffic @ Toll Plaza 6- At Km.101+925 (Most Likely Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	6362	500	440	984	519	1521	1	**10327**	**20827**
2027-28	6605	458	452	984	471	1375	1	**10346**	**21942**
2028-29	7090	475	464	1024	484	1443	1	**10981**	**23121**
2029-30	7610	491	476	1067	496	1515	1	**11656**	**24370**
2030-31	8128	506	487	1104	507	1579	1	**12312**	**25542**
2031-32	8680	521	498	1143	518	1645	1	**13006**	**26776**
2032-33	9269	537	509	1183	530	1714	1	**13743**	**28077**
2033-34	9900	554	521	1225	541	1786	1	**14528**	**29449**
2034-35	10572	571	533	1269	553	1861	1	**15360**	**30895**
2035-36	11234	585	544	1306	564	1926	1	**16160**	**32241**
2036-37	11936	600	555	1344	574	1993	1	**17003**	**33654**
2037-38	12683	615	566	1384	585	2061	1	**17895**	**35137**
2038-39	13476	631	577	1424	595	2134	1	**18838**	**36696**
2039-40	14320	647	588	1466	607	2209	1	**19838**	**38333**
2040-41	15139	662	598	1501	617	2271	1	**20789**	**39845**
2041-42	16007	676	608	1537	626	2336	1	**21791**	**41428**
2042-43	16924	690	618	1575	636	2402	1	**22846**	**43084**
2043-44	17894	704	628	1612	646	2470	1	**23955**	**44818**

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2044-45	18918	719	638	1650	656	2540	1	**25122**	**46633**
2045-46	19905	731	647	1682	665	2597	1	**26228**	**48298**
2046-47	20943	744	656	1715	673	2656	1	**27388**	**50035**

Table 6-7 : Total Tollable Traffic @ Toll Plaza 1- At Km.53+0000 (Pessimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	14639	1084	1119	1377	809	2504	4	**21536**	**39875**
2027-28	15874	1130	1153	1445	868	2760	4	**23234**	**42414**
2028-29	17214	1179	1188	1516	893	2924	4	**24918**	**45129**
2029-30	18667	1229	1224	1591	919	3098	4	**26732**	**48035**
2030-31	20121	1274	1256	1656	942	3252	4	**28505**	**50787**
2031-32	21689	1319	1288	1724	965	3414	4	**30403**	**53716**
2032-33	23377	1366	1322	1795	989	3583	4	**32436**	**56833**
2033-34	25198	1416	1357	1869	1013	3760	4	**34617**	**60152**
2034-35	27161	1466	1392	1947	1038	3946	4	**36954**	**63686**
2035-36	29103	1509	1422	2013	1058	4106	4	**39215**	**67005**
2036-37	31184	1553	1453	2080	1079	4273	4	**41626**	**70522**
2037-38	33414	1599	1484	2150	1100	4447	4	**44198**	**74248**
2038-39	35803	1645	1516	2222	1122	4626	4	**46938**	**78198**
2039-40	38363	1693	1548	2297	1144	4813	4	**49862**	**82385**
2040-41	40867	1733	1575	2359	1163	4970	4	**52671**	**86287**
2041-42	43533	1774	1602	2423	1181	5132	4	**55649**	**90404**
2042-43	46373	1815	1630	2489	1201	5299	4	**58811**	**94749**
2043-44	49399	1858	1658	2556	1220	5471	4	**62166**	**99336**
2044-45	52623	1902	1688	2625	1239	5648	4	**65729**	**104179**
2045-46	55734	1936	1711	2680	1255	5791	4	**69111**	**108654**
2046-47	59030	1971	1734	2737	1270	5937	4	**72683**	**113358**

Table 6-8 : Total Tollable Traffic @ Toll Plaza 2- At Km.107+000 (Pessimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	13877	1210	1160	1459	857	3087	7	**21657**	**42770**
2027-28	15048	1261	1196	1531	883	3270	7	**23196**	**45453**
2028-29	16316	1314	1232	1607	909	3465	7	**24850**	**48321**
2029-30	17694	1370	1269	1687	936	3670	7	**26633**	**51386**
2030-31	19072	1419	1302	1757	958	3853	7	**28368**	**54273**
2031-32	20556	1470	1335	1830	983	4043	7	**30224**	**57341**

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2032-33	22158	1523	1370	1906	1007	4243	7	**32214**	**60602**
2033-34	23884	1578	1406	1984	1032	4453	7	**34344**	**64069**
2034-35	25743	1633	1442	2065	1058	4673	7	**36621**	**67757**
2035-36	27583	1681	1474	2134	1079	4863	7	**38821**	**71200**
2036-37	29555	1730	1506	2206	1101	5060	7	**41165**	**74842**
2037-38	31668	1781	1539	2280	1122	5264	7	**43661**	**78696**
2038-39	33934	1833	1572	2357	1145	5478	7	**46326**	**82776**
2039-40	36359	1886	1606	2437	1167	5701	7	**49163**	**87097**
2040-41	38731	1930	1634	2503	1187	5885	7	**51877**	**91095**
2041-42	41258	1975	1663	2571	1206	6075	7	**54755**	**95309**
2042-43	43950	2021	1692	2640	1226	6272	7	**57808**	**99751**
2043-44	46818	2068	1721	2711	1246	6475	7	**61046**	**104434**
2044-45	49874	2116	1751	2784	1266	6685	7	**64483**	**109374**
2045-46	52823	2154	1775	2842	1282	6854	7	**67737**	**113907**
2046-47	55945	2193	1799	2902	1297	7026	7	**71169**	**118667**

Table 6-9 : Total Tollable Traffic @ Toll Plaza 3- At Km.163+000 (Pessimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	6751	850	1052	1329	791	3401	4	**14178**	**38694**
2027-28	7276	885	1082	1391	813	3593	4	**15044**	**40905**
2028-29	7840	921	1113	1456	836	3796	4	**15966**	**43252**
2029-30	8448	958	1145	1524	859	4010	4	**16948**	**45745**
2030-31	9052	991	1173	1584	879	4197	4	**17880**	**48054**
2031-32	9702	1024	1202	1646	900	4396	4	**18874**	**50492**
2032-33	10396	1059	1232	1710	921	4603	4	**19925**	**53066**
2033-34	11141	1095	1262	1777	943	4820	4	**21042**	**55784**
2034-35	11938	1132	1293	1847	965	5046	4	**22225**	**58656**
2035-36	12724	1163	1320	1907	983	5241	4	**23342**	**61287**
2036-37	13561	1196	1347	1967	1002	5442	4	**24519**	**64051**
2037-38	14453	1229	1374	2030	1022	5652	4	**25764**	**66957**
2038-39	15403	1262	1402	2095	1042	5869	4	**27077**	**70011**
2039-40	16417	1297	1431	2162	1062	6094	4	**28467**	**73223**
2040-41	17404	1326	1454	2217	1078	6282	4	**29765**	**76135**
2041-42	18449	1355	1478	2274	1095	6477	4	**31132**	**79183**
2042-43	19557	1384	1503	2332	1111	6676	4	**32567**	**82374**
2043-44	20731	1415	1528	2391	1128	6881	4	**34078**	**85716**
2044-45	21975	1446	1554	2453	1145	7092	4	**35669**	**89216**
2045-46	23169	1471	1575	2501	1159	7262	4	**37141**	**92358**
2046-47	24430	1496	1596	2551	1173	7435	4	**38685**	**95636**

Table 6-10 : Total Tollable Traffic @ Toll Plaza 4- At Km.198+000
(Pessimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	4220	647	786	1110	717	2276	3	**9759**	**30686**
2027-28	4968	739	888	1274	808	2634	3	**11314**	**32454**
2031-32	6626	855	986	1509	894	3223	3	**14096**	**40164**
2032-33	7100	884	1011	1568	915	3374	3	**14855**	**42245**
2033-34	7609	913	1036	1629	936	3534	3	**15660**	**44446**
2034-35	8153	945	1062	1693	958	3700	3	**16514**	**46774**
2035-36	8690	970	1084	1747	977	3843	3	**17314**	**48923**
2036-37	9260	998	1106	1803	996	3991	3	**18157**	**51184**
2037-38	9870	1025	1129	1860	1015	4145	3	**19047**	**53564**
2038-39	10520	1054	1152	1920	1034	4304	3	**19987**	**56070**
2039-40	11212	1084	1175	1981	1054	4470	3	**20979**	**58708**
2040-41	11885	1107	1195	2032	1070	4609	3	**21901**	**61121**
2041-42	12599	1132	1215	2084	1086	4751	3	**22870**	**63650**
2042-43	13355	1157	1236	2137	1103	4896	3	**23887**	**66302**
2043-44	14157	1183	1257	2192	1119	5048	3	**24959**	**69083**
2044-45	15007	1208	1278	2249	1135	5204	3	**26084**	**72000**
2045-46	15824	1229	1295	2294	1149	5328	3	**27122**	**74644**
2046-47	16684	1250	1312	2340	1162	5457	3	**28208**	**77405**

Table 6-11 : Total Tollable Traffic @ Toll Plaza 5- At Km.178+135
(Pessimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	8574	588	530	1050	521	1579	2	**12844**	**23993**
2027-28	9032	584	543	1067	505	1517	2	**13250**	**25250**
2028-29	9674	604	556	1109	517	1590	2	**14052**	**26579**
2029-30	10361	625	570	1153	529	1665	2	**14905**	**27986**
2030-31	11038	642	582	1191	540	1730	2	**15725**	**29303**
2031-32	11761	660	594	1231	550	1799	2	**16597**	**30690**
2032-33	12531	678	607	1272	561	1870	2	**17521**	**32151**
2033-34	13350	698	620	1314	573	1944	2	**18501**	**33691**
2034-35	14224	718	633	1358	584	2021	2	**19540**	**35313**
2035-36	15078	735	644	1394	594	2086	2	**20533**	**36819**
2036-37	15983	752	656	1431	603	2154	2	**21581**	**38400**
2037-38	16943	770	668	1470	613	2224	2	**22690**	**40059**
2038-39	17961	788	680	1510	623	2295	2	**23859**	**41801**
2039-40	19040	806	692	1551	633	2370	2	**25094**	**43629**
2040-41	20084	822	701	1584	642	2431	2	**26266**	**45314**
2041-42	21185	837	710	1619	650	2494	2	**27497**	**47076**
2042-43	22347	852	720	1654	659	2558	2	**28792**	**48919**
2043-44	23571	868	730	1690	668	2624	2	**30153**	**50847**
2044-45	24864	883	741	1726	676	2693	2	**31585**	**52865**
2045-46	26097	896	749	1754	684	2747	2	**32929**	**54709**
2046-47	27393	908	757	1785	691	2802	2	**34338**	**56631**

Table 6-12 : Total Tollable Traffic @ Toll Plaza 6- At Km.101+925
(Pessimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	6347	500	439	982	518	1518	1	**10305**	**20778**
2027-28	6574	457	450	980	470	1369	1	**10301**	**21838**
2028-29	7040	472	461	1018	481	1434	1	**10907**	**22957**
2029-30	7538	488	472	1057	493	1501	1	**11550**	**24140**
2030-31	8031	502	482	1092	502	1561	1	**12171**	**25240**
2031-32	8555	516	492	1127	512	1623	1	**12826**	**26397**
2032-33	9115	530	502	1165	522	1687	1	**13522**	**27613**
2033-34	9711	545	512	1203	533	1753	1	**14258**	**28893**
2034-35	10346	560	523	1243	543	1822	1	**15038**	**30240**
2035-36	10967	572	532	1276	552	1881	1	**15781**	**31482**
2036-37	11626	585	542	1310	561	1942	1	**16567**	**32783**
2037-38	12325	600	552	1344	570	2005	1	**17397**	**34147**
2038-39	13065	614	562	1381	580	2069	1	**18272**	**35576**
2039-40	13849	628	572	1418	589	2136	1	**19193**	**37075**
2040-41	14608	639	580	1449	597	2191	1	**20065**	**38445**
2041-42	15409	651	589	1481	605	2247	1	**20983**	**39876**
2042-43	16252	663	598	1512	613	2305	1	**21944**	**41371**
2043-44	17143	675	607	1545	621	2365	1	**22957**	**42933**
2044-45	18083	688	616	1578	629	2426	1	**24021**	**44565**
2045-46	18982	698	622	1605	637	2476	1	**25021**	**46045**
2046-47	19924	707	629	1632	644	2525	1	**26062**	**47587**

Table 6-13 : Total Tollable Traffic @ Toll Plaza 1- At Km.53+000

(Optimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	14706	1088	1125	1384	812	2516	4	**21635**	**40063**
2027-28	16021	1139	1165	1459	876	2786	4	**23450**	**42813**
2028-29	17453	1194	1206	1538	907	2966	4	**25268**	**45768**
2029-30	19013	1251	1249	1622	937	3157	4	**27233**	**48944**
2030-31	20587	1303	1288	1697	965	3329	4	**29173**	**51993**
2031-32	22294	1356	1328	1775	993	3512	4	**31262**	**55251**
2032-33	24141	1411	1369	1858	1022	3703	4	**33508**	**58733**
2033-34	26143	1468	1412	1944	1053	3905	4	**35929**	**62455**
2034-35	28309	1528	1456	2033	1084	4118	4	**38532**	**66436**
2035-36	30475	1580	1495	2112	1110	4305	4	**41081**	**70230**
2036-37	32807	1634	1535	2194	1138	4501	4	**43813**	**74265**
2037-38	35315	1689	1576	2279	1166	4707	4	**46736**	**78559**
2038-39	38017	1746	1618	2367	1195	4921	4	**49868**	**83130**
2039-40	40925	1806	1661	2458	1225	5144	4	**53223**	**87995**
2040-41	43801	1857	1699	2537	1251	5337	4	**56486**	**92601**
2041-42	46878	1910	1738	2618	1277	5537	4	**59962**	**97479**
2042-43	50171	1966	1777	2702	1304	5744	4	**63668**	**102649**
2043-44	53696	2021	1817	2789	1331	5959	4	**67617**	**108129**
2044-45	57467	2078	1858	2878	1358	6182	4	**71825**	**113939**
2045-46	61153	2126	1893	2953	1382	6369	4	**75880**	**119399**
2046-47	65075	2176	1928	3031	1406	6562	4	**80182**	**125162**

Table 6-14 : Total Tollable Traffic @ Toll Plaza 2- At Km.107+000

(Optimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	13940	1215	1166	1466	861	3102	7	**21757**	**42971**
2027-28	15187	1273	1207	1546	892	3302	7	**23414**	**45882**
2028-29	16544	1334	1250	1630	923	3515	7	**25203**	**49006**
2029-30	18021	1397	1294	1719	954	3741	7	**27133**	**52359**
2030-31	19516	1454	1334	1799	982	3945	7	**29037**	**55562**
2031-32	21132	1513	1375	1882	1011	4161	7	**31081**	**58980**
2032-33	22884	1575	1418	1969	1041	4387	7	**33281**	**62629**
2033-34	24780	1638	1462	2060	1072	4625	7	**35644**	**66525**
2034-35	26833	1705	1507	2155	1104	4878	7	**38189**	**70686**
2035-36	28886	1762	1547	2239	1131	5101	7	**40673**	**74630**
2036-37	31095	1822	1588	2326	1159	5332	7	**43329**	**78819**
2037-38	33474	1884	1630	2417	1189	5574	7	**46175**	**83271**

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2038-39	36036	1947	1674	2510	1219	5828	7	**49221**	**88003**
2039-40	38792	2014	1719	2608	1249	6093	7	**52482**	**93034**
2040-41	41517	2071	1758	2692	1276	6320	7	**55641**	**97769**
2041-42	44433	2129	1798	2779	1302	6557	7	**59005**	**102778**
2042-43	47554	2189	1839	2868	1330	6802	7	**62589**	**108079**
2043-44	50896	2251	1880	2960	1357	7056	7	**66407**	**113691**
2044-45	54470	2314	1922	3055	1385	7319	7	**70472**	**119634**
2045-46	57963	2367	1958	3135	1410	7540	7	**74380**	**125187**
2046-47	61679	2422	1995	3216	1435	7767	7	**78521**	131041

Table 6-15 : Total Tollable Traffic @ Toll Plaza 3- At Km.163+000

(Optimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	6783	854	1057	1335	795	3416	4	**14244**	**38877**
2027-28	7344	894	1093	1405	821	3626	4	**15187**	**41293**
2028-29	7951	935	1130	1479	849	3849	4	**16197**	**43868**
2029-30	8607	977	1169	1556	878	4085	4	**17276**	**46616**
2030-31	9267	1015	1204	1624	903	4298	4	**18315**	**49202**
2031-32	9977	1054	1240	1696	928	4522	4	**19421**	**51944**
2032-33	10742	1096	1276	1770	954	4757	4	**20599**	**54851**
2033-34	11565	1138	1314	1848	981	5004	4	**21854**	**57935**
2034-35	12451	1182	1353	1930	1009	5264	4	**23193**	**61206**
2035-36	13331	1222	1388	2001	1033	5492	4	**24471**	**64257**
2036-37	14274	1261	1423	2075	1058	5730	4	**25825**	**67476**
2037-38	15285	1303	1459	2152	1083	5979	4	**27265**	**70873**
2038-39	16367	1345	1496	2232	1109	6239	4	**28792**	**74460**
2039-40	17526	1389	1535	2315	1135	6511	4	**30415**	**78247**
2040-41	18667	1427	1569	2386	1158	6744	4	**31955**	**81749**
2041-42	19880	1467	1603	2460	1182	6985	4	**33581**	**85429**
2042-43	21173	1506	1638	2535	1206	7234	4	**35296**	**89297**
2043-44	22550	1547	1673	2612	1230	7494	4	**37110**	**93364**
2044-45	24017	1589	1709	2692	1255	7763	4	**39029**	**97641**
2045-46	25444	1624	1740	2759	1276	7987	4	**40834**	**101566**
2046-47	26954	1660	1771	2828	1298	8219	4	**42734**	**105676**

Table 6-16 : Total Tollable Traffic @ Toll Plaza 4- At Km.198+000

(Optimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	4239	650	790	1115	721	2287	3	**9805**	**30831**
2027-28	5013	744	897	1285	815	2656	3	**11413**	**32762**
2031-32	6809	878	1016	1552	920	3311	3	**14489**	**41318**
2032-33	7330	912	1046	1619	946	3483	3	**15339**	**43666**
2033-34	7892	948	1077	1691	973	3664	3	**16248**	**46159**
2034-35	8496	984	1109	1766	1001	3854	3	**17213**	**48806**
2035-36	9097	1016	1138	1831	1024	4021	3	**18130**	**51292**
2036-37	9741	1050	1167	1899	1048	4197	3	**19105**	**53919**
2037-38	10431	1084	1197	1970	1074	4380	3	**20139**	**56695**
2038-39	11170	1119	1228	2043	1100	4570	3	**21233**	**59629**
2039-40	11960	1155	1259	2119	1127	4768	3	**22391**	**62732**
2040-41	12737	1187	1286	2184	1149	4938	3	**23484**	**65623**
2041-42	13566	1219	1313	2251	1172	5114	3	**24638**	**68665**
2042-43	14448	1252	1342	2320	1195	5298	3	**25858**	**71868**
2043-44	15387	1287	1371	2391	1219	5487	3	**27145**	**75240**
2044-45	16388	1322	1401	2464	1243	5683	3	**28504**	**78792**
2045-46	17362	1351	1426	2525	1264	5848	3	**29779**	**82077**
2046-47	18392	1381	1452	2588	1285	6017	3	**31118**	85522
2026-27	4239	650	790	1115	721	2287	3	**9805**	**30831**
2027-28	5013	744	897	1285	815	2656	3	**11413**	**32762**
2031-32	6809	878	1016	1552	920	3311	3	**14489**	**41318**

Table 6-17 : Total Tollable Traffic @ Toll Plaza 5 - At Km.178+135

(Optimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	8614	592	532	1054	524	1587	2	**12905**	**24107**
2027-28	9119	591	547	1076	510	1533	2	**13378**	**25490**
2028-29	9810	614	563	1123	524	1614	2	**14250**	**26960**
2029-30	10554	637	579	1173	540	1698	2	**15183**	**28521**
2030-31	11298	658	594	1218	553	1773	2	**16096**	**30006**
2031-32	12093	680	609	1264	566	1852	2	**17066**	**31576**
2032-33	12944	703	624	1313	580	1935	2	**18101**	**33237**
2033-34	13855	726	640	1363	594	2021	2	**19201**	**34995**
2034-35	14830	751	656	1415	609	2111	2	**20374**	**36854**
2035-36	15795	773	671	1459	622	2190	2	**21512**	**38610**
2036-37	16823	795	686	1505	635	2271	2	**22717**	**40461**
2037-38	17918	818	701	1554	648	2356	2	**23997**	**42411**
2038-39	19083	841	716	1604	662	2444	2	**25352**	**44466**
2039-40	20324	864	732	1655	676	2536	2	**26789**	**46632**
2040-41	21539	884	746	1699	688	2615	2	**28173**	**48666**
2041-42	22828	904	760	1744	700	2695	2	**29633**	**50800**
2042-43	24193	925	774	1790	713	2779	2	**31176**	**53042**
2043-44	25640	947	789	1837	725	2864	2	**32804**	**55397**

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2044-45	27174	970	804	1886	738	2953	2	**34527**	**57870**
2045-46	28660	988	817	1927	750	3027	2	**36171**	**60177**
2046-47	30227	1007	830	1969	761	3103	2	**37899**	**62590**

Table 6-18 : Total Tollable Traffic @ Toll Plaza 6- At Km.101+925

(Optimistic Growth Scenario)

Year	Car	Minibus /LCV	Bus	Truck	3-Axle Commercial vehicle	Multi axle	Oversized Vehicles	Total Tollable Traffic	PCU (Including Exempted)
2026-27	6377	501	441	987	520	1526	1	**10353**	**20877**
2027-28	6637	459	454	989	474	1382	1	**10396**	**22046**
2028-29	7141	477	467	1034	487	1454	1	**11061**	**23286**
2029-30	7683	496	480	1079	501	1530	1	**11770**	**24602**
2030-31	8224	512	492	1119	513	1598	1	**12459**	**25846**
2031-32	8803	529	504	1161	525	1669	1	**13192**	**27160**
2032-33	9422	547	517	1205	538	1743	1	**13973**	**28547**
2033-34	10087	565	530	1250	551	1821	1	**14805**	**30013**
2034-35	10796	584	543	1298	564	1902	1	**15688**	**31562**
2035-36	11499	601	555	1339	576	1973	1	**16544**	**33016**
2036-37	12247	617	567	1382	588	2047	1	**17449**	**34545**
2037-38	13043	634	579	1426	601	2124	1	**18408**	**36154**
2038-39	13892	652	592	1471	613	2203	1	**19424**	**37848**
2039-40	14796	670	605	1517	625	2285	1	**20499**	**39631**
2040-41	15680	686	616	1557	637	2355	1	**21532**	**41293**
2041-42	16618	703	628	1597	648	2428	1	**22623**	**43036**
2042-43	17611	720	640	1640	660	2503	1	**23775**	**44863**
2043-44	18663	736	652	1683	671	2581	1	**24987**	**46781**
2044-45	19779	753	664	1727	684	2660	1	**26268**	**48792**
2045-46	20860	767	675	1764	694	2726	1	**27487**	**50655**
2046-47	22000	782	686	1803	705	2794	1	**28771**	**52603**

CHAPTER 7

FORECAST OF TOLL REVENUE

7.1 General

This chapter presents the estimates of traffic forecast, tolling categories, tolling rate calculations and toll revenue of the project.

7.2 Discount Categories

As per the Toll Notification (Schedule - G) the discounts and special provisions have been considered. In addition to discounts as per Fee Notification concessionaire has declared special category rates also. Salient features of toll rate structure are given as under

1. Monthly Pass: For frequent users monthly pass would be issued at fee at 2/3rd rate for 50 single journey trips.
2. Multiple Journeys (for Return Trip): Will be charged at 1.5 times single journey.
3. Single Journey: Full single journey toll would be charged to this category of vehicles who are infrequent travellers or whose frequency does not yield any discount from the above categories.
4. Local Discounts: There are several categories of local discounts.
    a) Local Car Jeep Van - Rs. 350 per month (for locals residing within a radius of 20 kms from toll plaza)

Building of inflation and escalation of rate on the basis of WPI are done as per toll notification (Schedule G) as given under as extract from concession agreement.

The formula for determining the applicable rate of fee shall be as follows:-

$$\text{Applicable rate of fee} = \text{base rate} + \text{base rate} \times \left\{ \frac{\text{WPI A-WPI B}}{\text{WPI B}} \right\} \times 0.4$$

Factors of inflation / growth have been incorporated as per Schedule R. WPI are available up to the year 2025-26.

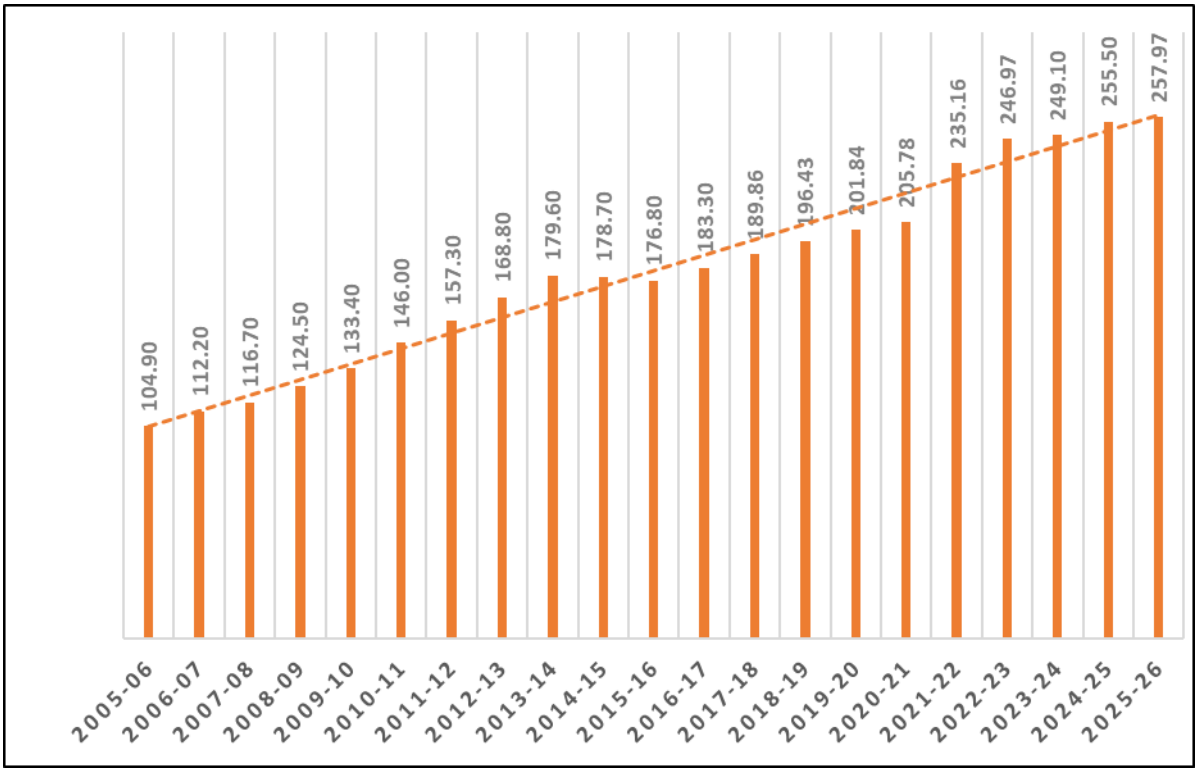


Figure 7-1 : Historical Rate of WPI Inflation in India

The wholesale price index (WPI) and the inflation rate in the past are presented in Table below.

***Table 7-1* : Historical WPI value and Growth Inflation**

December of year	2021	2022	2023	2024	2025	Avg.
WPI	235.2	247.0	249.1	255.5	257.97	
Inflation	14.27%	5.02%	0.86%	2.57%	0.96%	4.74%

WPI of December 2025 is posted on ministry site which is shows 0.96% inflation from the previous year. Same has been applied for FY 2026-27.

The average WPI inflation over the period FY 2021 to FY 2025 works out to approximately 4.74%, reflecting inflationary cycles across both high and low inflation years. Based on this analysis, an annual escalation factor of 4.5% has been adopted for the remaining concession period.

7.3 Estimation of Toll Rates

As per the recent MORTH notification dated January 12, 2011, the following Base rate of fee for the categories mentioned in the table stands true in the National

Highways Fee Rules, 2008.

Table 7-2 : Base Toll Rates 2007 - 08

Type of Vehicle	Base Rate of Fee / Km (in Rs.)
Car, Jeep, Van or Light Motor Vehicle	0.65
Light Commercial Vehicle, Light Goods Vehicle or Minibus	1.05
Bus or Truck (2 Axle)	2.2
Truck-3 Axle	2.4
Heavy Construction Machinery (HCM) or Earth Moving Equipment (EME) or Multi Axle Vehicle (MAV) (4-6 axles) including Truck-3 Axle	3.45
Oversized Vehicle (seven or more axles)	4.2

***Table 7-3* : Length of tollable section under each Toll plazas**

Location of Toll Plaza	Length (in Km) for which Fee is payable under TOT Bundle 17 (excluding structures)
A. Lucknow- Ayodhya Section of NH-27	
Ahmadpur Toll Plaza (Km.53.000)	41.850 [excluding 0.351 km of structures (having length more than 60m) and excluding bypass length 18.899 km]
Raunahi Toll Plaza*(Km.107.000)	Before Completion of construction of VUP at Km 137+100 59.865 [excluding 1.6046 km of structures (having length more than 60m)] After Completion of construction of VUP at Km 137+100 59.795 [excluding 1.6746 km of structures (having length more than 60m)]
B. Ayodhya- Gorakhpur Section of NH-27	
Chaukadi Toll Plaza (Km.163.000)	47.200 [excluding 1.587 km of structures (having length more than 60m) and excluding bypass length 4.454 km]
Mandawnagar Toll Plaza (Km.198.000)	62.095 [excluding 0.765 km of structures (having length more than 60m)]
C. Lucknow- Sultanpur Section of NH-731	

Location of Toll Plaza	Length (in Km) for which Fee is payable under TOT Bundle 17 (excluding structures)
Bara Toll Plaza (Km 178.135)	69.084 [excluding 0.164 km of structures (having length more than 60m)]
Asroga Toll Plaza (Km. 101.925)	25.523 [excluding bypass length 32.654 km]

Table 7-4 : Toll Rates for Forecasting Year Single Journey (Rs. Rupees) Toll Plaza -01 At Km 53+000

Year	Car	Minibus /LCV	Bus	Truck	3 axles	Multi axle	Oversized Vehicles
2026-27	115	185	390	390	425	610	740
2027-28	120	195	405	405	445	640	775
2028-29	125	205	425	425	465	670	815
2029-30	130	215	445	445	485	700	850
2030-31	140	225	465	465	510	730	890
2031-32	145	235	490	490	535	765	935
2032-33	150	245	510	510	560	805	980
2033-34	160	255	535	535	585	840	1025
2034-35	165	270	565	565	615	880	1075
2035-36	175	280	590	590	645	925	1125
2036-37	185	295	620	620	675	970	1180
2037-38	190	310	650	650	705	1015	1235
2038-39	200	325	680	680	740	1065	1295
2039-40	210	340	710	710	775	1115	1360
2040-41	220	355	745	745	815	1170	1425
2041-42	230	375	785	785	855	1230	1495
2042-43	245	390	820	820	895	1290	1570
2043-44	255	410	860	860	940	1355	1645
2044-45	265	430	905	905	985	1420	1730
2045-46	280	455	950	950	1035	1490	1815
2046-47	295	475	995	995	1090	1565	1905

Table 7-5 : Toll Rates for Forecasting Year Single Journey (Rs. Rupees) Toll Plaza -02 At Km 107+000

Year	Car	Minibus /LCV	Bus	Truck	3 axle	Multi axle	Oversized Vehicles
2026-27	120	195	405	405	440	635	770
2027-28	125	200	420	420	460	660	805
2028-29	130	210	440	440	480	695	845
2029-30	135	220	465	465	505	725	885
2030-31	145	230	485	485	530	760	925
2031-32	150	240	510	510	555	795	970
2032-33	155	255	530	530	580	835	1015
2033-34	165	265	560	560	610	875	1065
2034-35	175	280	585	585	635	915	1115
2035-36	180	290	610	610	670	960	1170
2036-37	190	305	640	640	700	1005	1225
2037-38	200	320	675	675	735	1055	1285
2038-39	210	335	705	705	770	1105	1345
2039-40	220	355	740	740	805	1160	1410
2040-41	230	370	775	775	845	1215	1480
2041-42	240	390	815	815	890	1275	1555
2042-43	250	405	855	855	930	1340	1630
2043-44	265	425	895	895	975	1405	1710
2044-45	280	450	940	940	1025	1475	1795
2045-46	290	470	985	985	1075	1545	1885
2046-47	305	495	1035	1035	1130	1625	1975

Table 7-6 : Toll Rates for Forecasting Year Single Journey (Rs. Rupees) Toll Plaza -03 At Km 163+000

Year	Car	Minibus /LCV	Bus	Truck	3 axle	Multi axle	Oversized Vehicles
2026-27	110	175	370	370	400	575	700
2027-28	115	185	385	385	420	605	735
2028-29	120	190	405	405	440	630	770
2029-30	125	200	420	420	460	660	805
2030-31	130	210	440	440	480	695	845
2031-32	135	220	465	465	505	725	885
2032-33	145	230	485	485	530	760	925
2033-34	150	245	510	510	555	795	970
2034-35	155	255	530	530	580	835	1015
2035-36	165	265	560	560	610	875	1065
2036-37	175	280	585	585	640	915	1115
2037-38	180	295	615	615	670	960	1170

Year	Car	Minibus /LCV	Bus	Truck	3 axle	Multi axle	Oversized Vehicles
2038-39	190	305	645	645	700	1010	1225
2039-40	200	320	675	675	735	1055	1285
2040-41	210	335	705	705	770	1110	1350
2041-42	220	355	740	740	810	1165	1415
2042-43	230	370	780	780	850	1220	1485
2043-44	240	390	815	815	890	1280	1560
2044-45	255	410	855	855	935	1345	1635
2045-46	265	430	900	900	980	1410	1715

Table 7-7 : Toll Rates for Forecasting Year Single Journey (Rs. Rupees) Toll Plaza -04 At Km 198+000

Year	Car	Minibus /LCV	Bus	Truck	3 axle	Multi axle	Oversized Vehicles
2026-27	110	175	370	370	400	575	700
2027-28	115	185	385	385	420	605	735
2028-29	120	190	405	405	440	630	770
2029-30	125	200	420	420	460	660	805
2030-31	130	210	440	440	480	695	845
2031-32	135	220	465	465	505	725	885
2032-33	145	230	485	485	530	760	925
2033-34	150	240	510	510	555	795	970
2034-35	155	255	530	530	580	835	1015
2035-36	165	265	560	560	610	875	1065
2036-37	175	280	585	585	640	915	1115
2037-38	180	295	615	615	670	960	1170
2038-39	190	305	645	645	700	1010	1225
2039-40	200	320	675	675	735	1055	1285
2040-41	210	335	705	705	770	1110	1350
2041-42	220	355	740	740	810	1165	1415
2042-43	230	370	780	780	850	1220	1485
2043-44	240	390	815	815	890	1280	1560
2044-45	255	410	855	855	935	1345	1635
2045-46	265	430	900	900	980	1410	1715
2046-47	280	450	945	945	1030	1480	1800

Table 7-8 : Toll Rates for Forecasting Year Single Journey (Rs. Rupees) Toll Plaza -05 At Km 178+135

Year	Car	Minibus /LCV	Bus	Truck	3 axle	Multi axle	Oversized Vehicles
2026-27	110	180	375	375	405	585	710
2027-28	115	185	390	390	425	610	745
2028-29	120	195	410	410	445	640	780
2029-30	125	205	430	430	465	670	815
2030-31	130	215	450	450	490	705	855
2031-32	140	225	470	470	510	735	895
2032-33	145	235	490	490	535	770	940
2033-34	150	245	515	515	560	810	985
2034-35	160	260	540	540	590	845	1030
2035-36	165	270	565	565	615	885	1080
2036-37	175	285	595	595	645	930	1130
2037-38	185	295	620	620	680	975	1185
2038-39	195	310	650	650	710	1020	1245
2039-40	200	325	685	685	745	1070	1305
2040-41	210	340	715	715	780	1125	1370
2041-42	220	360	750	750	820	1180	1435
2042-43	235	375	790	790	860	1235	1505
2043-44	245	395	830	830	905	1300	1580
2044-45	255	415	870	870	945	1360	1660
2045-46	270	435	910	910	995	1430	1740
2046-47	285	455	955	955	1045	1500	1825

Table 7-9 : Toll Rates for Forecasting Year Single Journey (Rs. Rupees) Toll Plaza -06 At Km 101+925

Year	Car	Minibus /LCV	Bus	Truck	3 axle	Multi axle	Oversized Vehicles
2026-27	115	185	395	395	430	615	750
2027-28	120	195	410	410	450	645	785
2028-29	125	205	430	430	470	675	820
2029-30	135	215	450	450	490	705	860
2030-31	140	225	470	470	515	740	900
2031-32	145	235	495	495	540	775	945
2032-33	155	245	520	520	565	810	990
2033-34	160	260	545	545	590	850	1035

Year	Car	Minibus /LCV	Bus	Truck	3 axle	Multi axle	Oversized Vehicles
2034-35	170	270	570	570	620	890	1085
2035-36	175	285	595	595	650	935	1140
2036-37	185	300	625	625	680	980	1195
2037-38	195	315	655	655	715	1025	1250
2038-39	205	330	685	685	750	1075	1310
2039-40	215	345	720	720	785	1130	1375
2040-41	225	360	755	755	825	1185	1440
2041-42	235	380	790	790	865	1240	1510
2042-43	245	395	830	830	905	1305	1585
2043-44	260	415	870	870	950	1365	1665
2044-45	270	435	915	915	1000	1435	1745
2045-46	285	460	960	960	1045	1505	1835
2046-47	300	480	1010	1010	1100	1580	1925

Table 7-10 : Toll Rates for Forecasting Year Return Journey (Rs. Rupees) Toll Plaza -01 At Km 53+000

Year	Car	Minibus /LCV	Bus	Truck	3 axle	Multi axle	Oversized Vehicles
2026-27	170	280	585	585	635	915	1115
2027-28	180	290	610	610	665	955	1165
2028-29	190	305	640	640	695	1000	1220
2029-30	200	320	670	670	730	1050	1275
2030-31	205	335	700	700	765	1100	1340
2031-32	215	350	735	735	800	1150	1400
2032-33	225	365	770	770	840	1205	1470
2033-34	240	385	805	805	880	1265	1540
2034-35	250	405	845	845	920	1325	1610
2035-36	260	420	885	885	965	1385	1690
2036-37	275	440	925	925	1010	1455	1770
2037-38	285	465	970	970	1060	1525	1855
2038-39	300	485	1020	1020	1110	1600	1945
2039-40	315	510	1070	1070	1165	1675	2040
2040-41	330	535	1120	1120	1220	1755	2140
2041-42	345	560	1175	1175	1280	1845	2245
2042-43	365	590	1235	1235	1345	1935	2355
2043-44	380	615	1295	1295	1410	2030	2470
2044-45	400	650	1360	1360	1480	2130	2590
2045-46	420	680	1425	1425	1555	2235	2720

Year	Car	Minibus /LCV	Bus	Truck	3 axle	Multi axle	Oversized Vehicles
2046-47	440	715	1495	1495	1630	2345	2855

Table 7-11 : Toll Rates for Forecasting Year Return Journey (Rs. Rupees) Toll Plaza -02 At Km 107+000

Year	Car	Minibus /LCV	Bus	Truck	3 axle	Multi axle	Oversized Vehicles
2026-27	180	290	605	605	660	950	1155
2027-28	185	300	635	635	690	995	1210
2028-29	195	315	665	665	725	1040	1265
2029-30	205	330	695	695	760	1090	1325
2030-31	215	345	730	730	795	1140	1390
2031-32	225	365	760	760	830	1195	1455
2032-33	235	380	800	800	870	1250	1525
2033-34	245	400	835	835	910	1310	1595
2034-35	260	420	875	875	955	1375	1675
2035-36	270	440	920	920	1000	1440	1755
2036-37	285	460	965	965	1050	1510	1840
2037-38	300	480	1010	1010	1100	1585	1925
2038-39	315	505	1060	1060	1155	1660	2020
2039-40	330	530	1110	1110	1210	1740	2120
2040-41	345	555	1165	1165	1270	1825	2220
2041-42	360	585	1220	1220	1330	1915	2330
2042-43	380	610	1280	1280	1395	2010	2445
2043-44	395	640	1345	1345	1465	2105	2565
2044-45	415	675	1410	1410	1540	2210	2690
2045-46	435	705	1480	1480	1615	2320	2825
2046-47	460	740	1555	1555	1695	2435	2965

Table 7-12 : Toll Rates for Forecasting Year Return Journey (Rs. Rupees) Toll Plaza -03 At Km 163+000

Year	Car	Minibus /LCV	Bus	Truck	3 axle	Multi axle	Oversized Vehicles
2026-27	165	265	550	550	600	865	1055
2027-28	170	275	575	575	630	905	1100
2028-29	180	290	605	605	660	950	1155

Year	Car	Minibus /LCV	Bus	Truck	3 axle	Multi axle	Oversized Vehicles
2029-30	185	300	635	635	690	995	1210
2030-31	195	315	665	665	725	1040	1265
2031-32	205	330	695	695	760	1090	1325
2032-33	215	345	725	725	795	1140	1390
2033-34	225	365	760	760	830	1195	1455
2034-35	235	380	800	800	870	1250	1525
2035-36	245	400	835	835	915	1315	1600
2036-37	260	420	875	875	955	1375	1675
2037-38	270	440	920	920	1005	1440	1755
2038-39	285	460	965	965	1050	1510	1840
2039-40	300	485	1010	1010	1105	1585	1930
2040-41	315	505	1060	1060	1155	1665	2025
2041-42	330	530	1110	1110	1215	1745	2125
2042-43	345	555	1165	1165	1275	1830	2230
2043-44	360	585	1225	1225	1335	1920	2335
2044-45	380	615	1285	1285	1400	2015	2455
2045-46	400	645	1350	1350	1470	2115	2575
2046-47	420	675	1415	1415	1545	2220	2700

Table 7-13 : Toll Rates for Forecasting Year Return Journey (Rs. Rupees) Toll Plaza -04 At Km 198+000

Year	Car	Minibus /LCV	Bus	Truck	3 axle	Multi axle	Oversized Vehicles
2026-27	165	265	550	550	600	865	1055
2027-28	170	275	575	575	630	905	1100
2028-29	180	290	605	605	660	950	1155
2029-30	185	300	635	635	690	995	1210
2030-31	195	315	665	665	725	1040	1265
2031-32	205	330	695	695	755	1090	1325
2032-33	215	345	725	725	795	1140	1390
2033-34	225	365	760	760	830	1195	1455
2034-35	235	380	800	800	870	1250	1525
2035-36	245	400	835	835	915	1310	1600
2036-37	260	420	875	875	955	1375	1675
2037-38	270	440	920	920	1005	1440	1755
2038-39	285	460	965	965	1050	1510	1840
2039-40	300	485	1010	1010	1105	1585	1930

Year	Car	Minibus /LCV	Bus	Truck	3 axle	Multi axle	Oversized Vehicles
2040-41	315	505	1060	1060	1155	1665	2025
2041-42	330	530	1110	1110	1215	1745	2125
2042-43	345	555	1165	1165	1275	1830	2225
2043-44	360	585	1225	1225	1335	1920	2335
2044-45	380	615	1285	1285	1400	2015	2450
2045-46	400	645	1350	1350	1470	2115	2575
2046-47	420	675	1415	1415	1545	2220	2700

Table 7-14 : Toll Rates for Forecasting Year Return Journey (Rs. Rupees) Toll Plaza -05 At Km 178+135

Year	Car	Minibus /LCV	Bus	Truck	3 axle	Multi axle	Oversized Vehicles
2026-27	165	265	560	560	610	875	1070
2027-28	175	280	585	585	640	920	1120
2028-29	180	295	615	615	670	960	1170
2029-30	190	305	640	640	700	1005	1225
2030-31	200	320	670	670	735	1055	1285
2031-32	210	335	705	705	770	1105	1345
2032-33	220	350	740	740	805	1155	1410
2033-34	230	370	775	775	845	1210	1475
2034-35	240	385	810	810	885	1270	1545
2035-36	250	405	850	850	925	1330	1620
2036-37	265	425	890	890	970	1395	1700
2037-38	275	445	930	930	1015	1460	1780
2038-39	290	465	980	980	1065	1535	1865
2039-40	305	490	1025	1025	1120	1610	1955
2040-41	320	515	1075	1075	1175	1685	2055
2041-42	335	540	1130	1130	1230	1770	2155
2042-43	350	565	1185	1185	1290	1855	2260
2043-44	365	590	1240	1240	1355	1945	2370
2044-45	385	620	1305	1305	1420	2045	2485
2045-46	405	650	1365	1365	1490	2145	2610
2046-47	425	685	1435	1435	1565	2250	2740

Table 7-15 : Toll Rates for Forecasting Year Return Journey (Rs. Rupees) Toll Plaza -06 At Km 101+925

Year	Car	Minibus /LCV	Bus	Truck	3 axle	Multi axle	Oversized Vehicles
2026-27	175	280	590	590	645	925	1125
2027-28	180	295	615	615	675	965	1175
2028-29	190	310	645	645	705	1015	1235
2029-30	200	325	675	675	740	1060	1290
2030-31	210	340	710	710	775	1110	1350
2031-32	220	355	740	740	810	1165	1415
2032-33	230	370	775	775	850	1220	1485
2033-34	240	390	815	815	890	1275	1555
2034-35	250	405	855	855	930	1340	1630
2035-36	265	425	895	895	975	1400	1705
2036-37	275	445	935	935	1020	1470	1790
2037-38	290	470	980	980	1070	1540	1875
2038-39	305	490	1030	1030	1125	1615	1965
2039-40	320	515	1080	1080	1180	1695	2060
2040-41	335	540	1135	1135	1235	1775	2160
2041-42	350	565	1190	1190	1295	1865	2270
2042-43	370	595	1245	1245	1360	1955	2380
2043-44	385	625	1310	1310	1425	2050	2495
2044-45	405	655	1370	1370	1495	2150	2620
2045-46	425	685	1440	1440	1570	2260	2750
2046-47	445	720	1510	1510	1650	2370	2885

Table 7-16 : Toll Rates for Monthly Pass Local (Rs. Rupees) Toll Plaza -01 At Km 53+000

Year	Car
2026-27	360
2027-28	375
2028-29	395
2029-30	415
2030-31	430
2031-32	455
2032-33	475
2033-34	495
2034-35	520
2035-36	545
2036-37	570
2037-38	600

Year	Car
2038-39	630
2039-40	660
2040-41	690
2041-42	725
2042-43	760
2043-44	800
2044-45	835
2045-46	880
2046-47	920

Table 7-17 : Toll Rates for Monthly Pass Local (Rs. Rupees) Toll Plaza -02 At Km 107+000

Year	Car
2026-27	360
2027-28	375
2028-29	395
2029-30	415
2030-31	430
2031-32	455
2032-33	475
2033-34	495
2034-35	520
2035-36	545
2036-37	570
2037-38	600
2038-39	630
2039-40	660
2040-41	690
2041-42	725
2042-43	760
2043-44	800
2044-45	835
2045-46	880
2046-47	920

Table 7-18 : Toll Rates for Monthly Pass Local Toll Plaza -03 At Km 163+000

Year	Car
2026-27	360
2027-28	375
2028-29	395
2029-30	415
2030-31	430
2031-32	455
2032-33	475
2033-34	495
2034-35	520
2035-36	545
2036-37	570
2037-38	600
2038-39	630
2039-40	660
2040-41	690
2041-42	725
2042-43	760
2043-44	800
2044-45	835
2045-46	880
2046-47	920

Table 7-19 : Toll Rates for Monthly Pass Local (Rs. Rupees) Toll Plaza -04 At Km 198+000

Year	Car
2026-27	360
2027-28	375
2028-29	395
2029-30	415
2030-31	430
2031-32	455
2032-33	475
2033-34	495
2034-35	520
2035-36	545
2036-37	570
2037-38	600
2038-39	630
2039-40	660
2040-41	690
2041-42	725
2042-43	760
2043-44	800
2044-45	835

Year	Car
2045-46	880
2046-47	920

Table 7-20 : Toll Rates for Monthly Pass Local Toll Plaza -05 At Km 178+135

Year	Car
2026-27	360
2027-28	375
2028-29	395
2029-30	415
2030-31	430
2031-32	455
2032-33	475
2033-34	495
2034-35	520
2035-36	545
2036-37	570
2037-38	600
2038-39	630
2039-40	660
2040-41	690
2041-42	725
2042-43	760
2043-44	800
2044-45	835
2045-46	880
2046-47	920

Table 7-21 : Toll Rates for Monthly Pass Local (Rs. Rupees) Toll Plaza -06 At Km 101+925

Year	Car
2026-27	360
2027-28	375
2028-29	395
2029-30	415
2030-31	430
2031-32	455
2032-33	475
2033-34	495
2034-35	520
2035-36	545
2036-37	570
2037-38	600

Year	Car
2038-39	630
2039-40	660
2040-41	690
2041-42	725
2042-43	760
2043-44	800
2044-45	835
2045-46	880
2046-47	920

Table 7-22 : Toll Rates for Monthly Pass (Rs. Rupees) Toll Plaza -01 At Km 53+000

Year	Car	Minibus /LCV	Bus	Truck	3 -Axle	Multi axle	Oversized Vehicles
2026-27	3825	6180	12950	12950	14130	20310	24725
2027-28	4005	6470	13560	13560	14790	21260	25885
2031-32	4820	7785	16305	16305	17790	25575	31130
2032-33	5045	8155	17085	17085	18635	26790	32615
2033-34	5290	8540	17900	17900	19525	28065	34170
2034-35	5540	8950	18755	18755	20460	29410	35805
2035-36	5805	9380	19655	19655	21440	30820	37525
2036-37	6085	9830	20600	20600	22475	32305	39330
2037-38	6380	10305	21595	21595	23560	33865	41230
2038-39	6690	10805	22645	22645	24700	35510	43225
2039-40	7015	11330	23745	23745	25900	37235	45330
2040-41	7355	11885	24900	24900	27165	39050	47540
2041-42	7715	12465	26120	26120	28495	40960	49865
2042-43	8095	13080	27400	27400	29890	42970	52310
2043-44	8495	13720	28750	28750	31365	45085	54885
2044-45	8915	14400	30170	30170	32910	47310	57595
2045-46	9355	15110	31660	31660	34540	49650	60445
2046-47	9820	15860	33235	33235	36255	52115	63445

Table 7-23 : Toll Rates for Monthly Pass (Rs. Rupees) Toll Plaza -02 At Km 107+000

Year	Car	Minibus /LCV	Bus	Truck	3 -Axle	Multi axle	Oversized Vehicles
2026-27	3975	6420	13450	13450	14670	21090	25675
2027-28	4160	6720	14080	14080	15360	22080	26880
2031-32	5005	8080	16935	16935	18475	26555	32330
2032-33	5240	8465	17740	17740	19350	27820	33865
2033-34	5490	8870	18585	18585	20275	29145	35480
2034-35	5755	9295	19475	19475	21245	30540	37180

Year	Car	Minibus /LCV	Bus	Truck	3 -Axle	Multi axle	Oversized Vehicles
2035-36	6030	9740	20410	20410	22265	32005	38965
2036-37	6320	10210	21395	21395	23340	33550	40840
2037-38	6625	10705	22425	22425	24465	35170	42815
2038-39	6945	11220	23515	23515	25650	36875	44890
2039-40	7285	11770	24655	24655	26895	38665	47070
2040-41	7640	12340	25860	25860	28210	40550	49365
2041-42	8015	12945	27125	27125	29590	42535	51780
2042-43	8405	13580	28455	28455	31040	44620	54320
2043-44	8820	14250	29855	29855	32570	46815	56995
2044-45	9255	14950	31330	31330	34175	49130	59810
2045-46	9715	15690	32880	32880	35870	51560	62770
2046-47	10195	16470	34510	34510	37650	54120	65885

Table 7-24 : Toll Rates for Monthly Pass Toll Plaza -03 At Km 163+000

Year	Car	Minibus /LCV	Bus	Truck	3 -Axle	Multi axle	Oversized Vehicles
2026-27	3620	5850	12255	12255	13370	19220	23395
2027-28	3790	6125	12830	12830	13995	20120	24495
2031-32	4560	7365	15430	15430	16835	24200	29460
2032-33	4775	7715	16165	16165	17635	25350	30860
2033-34	5005	8085	16935	16935	18475	26560	32335
2034-35	5245	8470	17750	17750	19360	27830	33880
2035-36	5495	8875	18600	18600	20290	29165	35510
2036-37	5760	9305	19495	19495	21265	30570	37220
2037-38	6040	9755	20435	20435	22295	32050	39015
2038-39	6330	10225	21425	21425	23375	33600	40905
2039-40	6640	10725	22470	22470	24510	35235	42895
2040-41	6960	11245	23565	23565	25705	36955	44985
2041-42	7305	11795	24715	24715	26965	38760	47185
2042-43	7660	12375	25930	25930	28285	40665	49500
2043-44	8040	12985	27205	27205	29680	42665	51940
2044-45	8435	13625	28550	28550	31145	44770	54500
2045-46	8850	14300	29960	29960	32685	46985	57200
2046-47	9290	15010	31450	31450	34310	49320	60040

Table 7-25 : Toll Rates for Monthly Pass (Rs. Rupees) Toll Plaza -04 At Km 198+000

Year	Car	Minibus /LCV	Bus	Truck	3 -Axle	Multi axle	Oversized Vehicles
2026-27	3620	5850	12255	12255	13370	19215	23395
2027-28	3790	6125	12830	12830	13995	20120	24490
2031-32	4560	7365	15430	15430	16835	24200	29460
2032-33	4775	7715	16165	16165	17635	25350	30860

Year	Car	Minibus /LCV	Bus	Truck	3 -Axle	Multi axle	Oversized Vehicles
2033-34	5005	8085	16935	16935	18475	26560	32330
2034-35	5245	8470	17745	17745	19360	27830	33880
2035-36	5495	8875	18600	18600	20290	29165	35505
2036-37	5760	9305	19495	19495	21265	30570	37215
2037-38	6040	9755	20435	20435	22295	32045	39010
2038-39	6330	10225	21425	21425	23375	33600	40905
2039-40	6640	10725	22465	22465	24510	35230	42890
2040-41	6960	11245	23560	23560	25705	36950	44985
2041-42	7300	11795	24715	24715	26960	38755	47185
2042-43	7660	12375	25930	25930	28285	40660	49500
2043-44	8035	12985	27205	27205	29675	42660	51935
2044-45	8435	13625	28545	28545	31140	44765	54500
2045-46	8850	14300	29960	29960	32685	46980	57195
2046-47	9290	15010	31445	31445	34305	49315	60035

Table 7-26 : Toll Rates for Monthly Pass Toll Plaza -05 At Km 178+135

Year	Car	Minibus /LCV	Bus	Truck	3 -Axle	Multi axle	Oversized Vehicles
2026-27	3670	5930	12425	12425	13555	19485	23725
2027-28	3845	6210	13010	13010	14190	20400	24835
2031-32	4625	7470	15645	15645	17070	24540	29870
2032-33	4845	7825	16390	16390	17880	25705	31295
2033-34	5075	8195	17175	17175	18735	26930	32785
2034-35	5315	8590	17995	17995	19630	28220	34355
2035-36	5570	9000	18860	18860	20575	29575	36005
2036-37	5840	9435	19765	19765	21565	31000	37735
2037-38	6120	9890	20720	20720	22605	32495	39560
2038-39	6420	10370	21725	21725	23700	34070	41475
2039-40	6730	10875	22780	22780	24855	35725	43495
2040-41	7060	11405	23895	23895	26065	37470	45615
2041-42	7405	11960	25060	25060	27340	39300	47845
2042-43	7770	12550	26290	26290	28680	41230	50195
2043-44	8150	13165	27585	27585	30095	43260	52665
2044-45	8555	13815	28945	28945	31580	45395	55265
2045-46	8975	14500	30380	30380	33140	47640	58000
2046-47	9420	15220	31890	31890	34785	50005	60880

Table 7-27 : Toll Rates for Monthly Pass (Rs. Rupees) Toll Plaza -06 At Km 101+925

Year	Car	Minibus /LCV	Bus	Truck	3 -Axle	Multi axle	Oversized Vehicles
2026-27	3870	6250	13090	13090	14280	20530	24990
2027-28	4050	6540	13705	13705	14950	21490	26165
2031-32	4870	7865	16485	16485	17980	25850	31470
2032-33	5100	8240	17265	17265	18835	27080	32965

Year	Car	Minibus /LCV	Bus	Truck	3 -Axle	Multi axle	Oversized Vehicles
2033-34	5345	8635	18090	18090	19735	28370	34540
2034-35	5600	9050	18955	18955	20680	29730	36190
2035-36	5870	9480	19865	19865	21675	31155	37930
2036-37	6150	9940	20825	20825	22715	32655	39755
2037-38	6450	10420	21830	21830	23815	34235	41675
2038-39	6760	10925	22885	22885	24970	35890	43695
2039-40	7090	11455	24000	24000	26180	37635	45820
2040-41	7435	12015	25170	25170	27460	39470	48050
2041-42	7800	12600	26400	26400	28800	41400	50405
2042-43	8185	13220	27695	27695	30215	43435	52875
2043-44	8585	13870	29060	29060	31700	45570	55480
2044-45	9010	14555	30495	30495	33265	47820	58215
2045-46	9455	15275	32005	32005	34915	50190	61100
2046-47	9925	16035	33595	33595	36645	52680	64130

Table 7-28 : Toll Rates for Local Commercial single Journey (Rs. Rupees) Toll Plaza -01 At Km 53+000

Year	Car	Minibus /LCV	Bus	Truck	3 -Axle	Multi axle	Oversized Vehicles
2026-27	55	95	195	195	210	305	370
2027-28	60	95	205	205	220	320	390
2028-29	65	100	215	215	230	335	405
2029-30	65	105	225	225	245	350	425
2030-31	70	110	235	235	255	365	445
2031-32	70	115	245	245	265	385	465
2032-33	75	120	255	255	280	400	490
2033-34	80	130	270	270	295	420	515
2034-35	85	135	280	280	305	440	535
2035-36	85	140	295	295	320	460	565
2036-37	90	145	310	310	335	485	590
2037-38	95	155	325	325	355	510	620
2038-39	100	160	340	340	370	535	650
2039-40	105	170	355	355	390	560	680
2040-41	110	180	375	375	405	585	715
2041-42	115	185	390	390	425	615	750
2042-43	120	195	410	410	450	645	785
2043-44	125	205	430	430	470	675	825
2044-45	135	215	455	455	495	710	865
2045-46	140	225	475	475	520	745	905
2046-47	145	240	500	500	545	780	950

Table 7-29 : Toll Rates for Local Commercial single Journey (Rs. Rupees) Toll Plaza -02 At Km 107+000

Year	Car	Minibus /LCV	Bus	Truck	3 -Axle	Multi axle	Oversized Vehicles
2026-27	60	95	200	200	220	315	385
2027-28	60	100	210	210	230	330	405
2028-29	65	105	220	220	240	345	420
2029-30	70	110	230	230	255	365	440
2030-31	70	115	245	245	265	380	465
2031-32	75	120	255	255	275	400	485
2032-33	80	125	265	265	290	415	510
2033-34	80	135	280	280	305	435	530
2034-35	85	140	290	290	320	460	560
2035-36	90	145	305	305	335	480	585
2036-37	95	155	320	320	350	505	615
2037-38	100	160	335	335	365	530	640
2038-39	105	170	355	355	385	555	675
2039-40	110	175	370	370	405	580	705
2040-41	115	185	390	390	425	610	740
2041-42	120	195	405	405	445	640	775
2042-43	125	205	425	425	465	670	815
2043-44	130	215	450	450	490	700	855
2044-45	140	225	470	470	515	735	895
2045-46	145	235	495	495	540	775	940
2046-47	155	245	520	520	565	810	990

Table 7-30 : Toll Rates for Local Commercial single Journey Toll Plaza -03 At Km 163+000

Year	Car	Minibus /LCV	Bus	Truck	3 -Axle	Multi axle	Oversized Vehicles
2026-27	55	90	185	185	200	290	350
2027-28	55	90	190	190	210	300	365
2028-29	60	95	200	200	220	315	385
2029-30	60	100	210	210	230	330	405
2030-31	65	105	220	220	240	345	420
2031-32	70	110	230	230	255	365	440
2032-33	70	115	240	240	265	380	465
2033-34	75	120	255	255	275	400	485
2034-35	80	125	265	265	290	415	510
2035-36	80	135	280	280	305	440	535
2036-37	85	140	290	290	320	460	560
2037-38	90	145	305	305	335	480	585
2038-39	95	155	320	320	350	505	615
2039-40	100	160	335	335	370	530	645
2040-41	105	170	355	355	385	555	675
2041-42	110	175	370	370	405	580	710
2042-43	115	185	390	390	425	610	745
2043-44	120	195	410	410	445	640	780
2044-45	125	205	430	430	465	670	820
2045-46	135	215	450	450	490	705	860

Year	Car	Minibus /LCV	Bus	Truck	3 -Axle	Multi axle	Oversized Vehicles
2046-47	140	225	470	470	515	740	900

Table 7-31 : Toll Rates for Local Commercial single Journey (Rs. Rupees) Toll Plaza -04 At Km 198+000

Year	Car	Minibus /LCV	Bus	Truck	3 -Axle	Multi axle	Oversized Vehicles
2026-27	55	90	185	185	200	290	350
2027-28	55	90	190	190	210	300	365
2028-29	60	95	200	200	220	315	385
2029-30	60	100	210	210	230	330	405
2030-31	65	105	220	220	240	345	420
2031-32	70	110	230	230	250	365	440
2032-33	70	115	240	240	265	380	465
2033-34	75	120	255	255	275	400	485
2034-35	80	125	265	265	290	415	510
2035-36	80	135	280	280	305	435	535
2036-37	85	140	290	290	320	460	560
2037-38	90	145	305	305	335	480	585
2038-39	95	155	320	320	350	505	615
2039-40	100	160	335	335	370	530	645
2040-41	105	170	355	355	385	555	675
2041-42	110	175	370	370	405	580	710
2042-43	115	185	390	390	425	610	740
2043-44	120	195	410	410	445	640	780
2044-45	125	205	430	430	465	670	815
2045-46	135	215	450	450	490	705	860
2046-47	140	225	470	470	515	740	900

Table 7-32 : Toll Rates for Local Commercial single Journey Toll Plaza -05 At Km 178+135

Year	Car	Minibus /LCV	Bus	Truck	3 -Axle	Multi axle	Oversized Vehicles
2026-27	55	90	185	185	205	290	355
2027-28	60	95	195	195	215	305	375
2028-29	60	100	205	205	225	320	390
2029-30	65	100	215	215	235	335	410
2030-31	65	105	225	225	245	350	430
2031-32	70	110	235	235	255	370	450
2032-33	75	115	245	245	270	385	470
2033-34	75	125	260	260	280	405	490
2034-35	80	130	270	270	295	425	515
2035-36	85	135	285	285	310	445	540
2036-37	90	140	295	295	325	465	565
2037-38	90	150	310	310	340	485	595

Year	Car	Minibus /LCV	Bus	Truck	3 -Axle	Multi axle	Oversized Vehicles
2038-39	95	155	325	325	355	510	620
2039-40	100	165	340	340	375	535	650
2040-41	105	170	360	360	390	560	685
2041-42	110	180	375	375	410	590	720
2042-43	115	190	395	395	430	620	755
2043-44	120	195	415	415	450	650	790
2044-45	130	205	435	435	475	680	830
2045-46	135	215	455	455	495	715	870
2046-47	140	230	480	480	520	750	915

Table 7-33 : Toll Rates for Local Commercial single Journey (Rs. Rupees) Toll Plaza -06 At Km 101+925

Year	Car	Minibus /LCV	Bus	Truck	3 -Axle	Multi axle	Oversized Vehicles
2026-27	60	95	195	195	215	310	375
2027-28	60	100	205	205	225	320	390
2028-29	65	105	215	215	235	340	410
2029-30	65	110	225	225	245	355	430
2030-31	70	115	235	235	260	370	450
2031-32	75	120	245	245	270	390	470
2032-33	75	125	260	260	285	405	495
2033-34	80	130	270	270	295	425	520
2034-35	85	135	285	285	310	445	545
2035-36	90	140	300	300	325	465	570
2036-37	90	150	310	310	340	490	595
2037-38	95	155	325	325	355	515	625
2038-39	100	165	345	345	375	540	655
2039-40	105	170	360	360	395	565	685
2040-41	110	180	380	380	410	590	720
2041-42	115	190	395	395	430	620	755
2042-43	125	200	415	415	455	650	795
2043-44	130	210	435	435	475	685	830
2044-45	135	220	455	455	500	715	875
2045-46	140	230	480	480	525	755	915
2046-47	150	240	505	505	550	790	960

7.4 Toll Revenue

As indicated earlier, toll revenue on the Project Road has been calculated in all three scenarios based on above rates and projected traffic. The estimates of toll revenue under ***Optimistic***, ***Pessimistic*** and ***Most Likely*** growth scenarios are presented in the following section.

7.5 Toll Revenue at all toll plazas under Scenarios

Toll Revenue estimates under all scenarios at each of the toll plaza up to 2049-50 years starting from the year 2026-27 are shown in tables below.

Table 7-34 : Toll Revenue (Toll Plaza wise) Most Likely Scenario

(Rs. Crores)

Location / Year	TP-1 Ahmadpur	TP-2 Ronahi	TP-3 Chaukadi	TP-4 Madwanagar	TP-4A Kheendiah	TP-5 Bara	TP-6 Asroga	Total in cr.
2026-27	154.79	172.78	133.07	80.19	16.85	93.02	86.36	**737.06**
2027-28	176.00	191.55	147.21	0.00	115.48	98.10	86.81	**815.15**
2028-29	195.76	213.01	162.33	0.00	127.18	107.25	95.38	**900.91**
2029-30	216.89	236.14	179.16	0.00	140.17	118.23	105.28	**995.87**
2030-31	240.92	262.79	197.13	0.00	153.99	129.87	115.30	**1100.01**
2031-32	267.25	290.90	217.09	0.00	169.32	143.82	126.55	**1214.92**
2032-33	294.67	320.30	238.75	0.00	185.91	157.01	138.97	**1335.60**
2033-34	328.86	356.39	262.27	0.00	203.89	172.16	152.00	**1475.58**
2034-35	362.15	395.17	287.81	0.00	223.61	189.02	167.21	**1624.96**
2035-36	401.40	434.05	315.96	0.00	245.08	206.11	181.96	**1784.55**
2036-37	443.56	478.30	345.07	0.00	267.40	226.36	198.42	**1959.09**
2037-38	485.91	528.88	376.39	0.00	291.41	246.82	217.19	**2146.60**
2038-39	535.76	583.53	412.96	0.00	319.18	270.85	237.69	**2359.97**
2039-40	593.62	643.81	453.20	0.00	349.77	295.91	260.20	**2596.52**
2040-41	650.17	703.31	491.62	0.00	379.52	321.85	282.28	**2828.74**
2041-42	714.52	770.82	535.37	0.00	412.06	349.75	306.55	**3089.08**
2042-43	787.81	845.92	582.53	0.00	447.88	383.35	333.97	**3381.48**
2043-44	866.15	930.25	635.35	0.00	487.91	418.86	364.29	**3702.81**
2044-45	948.57	1022.83	691.86	0.00	531.42	453.39	395.35	**4043.40**
2045-46	1037.82	1109.92	749.01	0.00	574.47	494.56	429.64	**4395.43**
2046-47	1138.08	1217.44	813.35	0.00	623.06	537.21	465.63	**4794.75**

Note: *from 01 February 2027 Includes Kheendiah TP in place of Mandwanagar

Table 7-35 : Toll Revenue (Toll Plaza wise) Pessimistic Scenario

(Rs. Crores)

Location / Year	TP-1 Ahmadpur	TP-2 Ronahi	TP-3 Chaukadi	TP-4 Madwanagar	TP-4A Kheendiah	TP-5 Bara	TP-6 Asroga	Total in cr.
2026-27	154.46	172.33	132.78	79.97	16.82	92.84	86.16	**735.36**
2027-28	175.29	190.61	146.54	0.00	114.98	97.63	86.33	**811.37**
2028-29	194.49	211.44	161.22	0.00	126.24	106.53	94.59	**894.51**
2029-30	215.05	233.85	177.45	0.00	138.85	117.22	104.15	**986.56**
2030-31	238.31	259.64	194.73	0.00	152.18	128.41	113.75	**1087.03**
2031-32	263.77	286.72	213.94	0.00	166.93	141.76	124.47	**1197.59**
2032-33	290.17	314.91	234.69	0.00	182.83	154.34	136.28	**1313.22**
2033-34	323.04	349.50	257.20	0.00	200.05	168.88	148.71	**1447.38**
2034-35	354.92	386.63	281.59	0.00	218.86	184.96	163.15	**1590.12**
2035-36	392.45	423.73	308.38	0.00	239.31	201.13	177.09	**1742.09**
2036-37	432.72	465.86	336.02	0.00	260.45	220.25	192.62	**1907.91**
2037-38	472.90	513.82	365.71	0.00	283.17	239.51	210.29	**2085.40**
2038-39	520.14	565.60	400.27	0.00	309.39	262.08	229.53	**2287.01**

Location / Year	TP-1 Ahmadpur	TP-2 Ronahi	TP-3 Chaukadi	TP-4 Madwanagar	TP-4A Kheendiah	TP-5 Bara	TP-6 Asroga	Total in cr.
2039-40	574.89	622.56	438.22	0.00	338.22	285.70	250.61	**2510.20**
2040-41	628.26	678.52	474.18	0.00	366.20	310.00	271.13	**2728.29**
2041-42	688.76	741.97	515.20	0.00	396.67	335.97	293.72	**2972.29**
2042-43	757.55	812.29	559.19	0.00	430.05	367.33	319.10	**3245.50**
2043-44	830.92	891.22	608.46	0.00	467.42	400.33	347.27	**3545.64**
2044-45	907.82	977.58	661.03	0.00	507.81	432.26	375.90	**3862.39**
2045-46	990.87	1058.31	713.81	0.00	547.54	470.39	407.64	**4188.55**
2046-47	1083.96	1158.09	773.30	0.00	592.34	509.68	440.68	**4558.06**

*Note: ***from 01 February 2027 Includes Kheendiah TP in place of Mandwanagar***

Table 7-36 : Toll Revenue (Toll Plaza wise) Optimistic Scenario

(Rs. Crores)

Location / Year	TP-1 Ahmadpur	TP-2 Ronahi	TP-3 Chaukadi	TP-4 Madwanagar	TP-4A Kheendiah	TP-5 Bara	TP-6 Asroga	Total in cr.
2026-27	155.18	173.13	133.39	80.38	16.88	93.29	86.58	**738.82**
2027-28	176.87	192.43	147.93	0.00	115.99	98.60	87.20	**819.02**
2028-29	197.16	214.45	163.53	0.00	128.00	108.01	96.02	**907.18**
2029-30	218.95	238.28	180.89	0.00	141.42	119.38	106.24	**1005.17**
2030-31	243.79	265.85	199.49	0.00	155.75	131.45	116.63	**1112.95**
2031-32	271.11	294.97	220.23	0.00	171.72	145.84	128.24	**1232.11**
2032-33	299.59	325.52	242.75	0.00	189.00	159.61	141.12	**1357.60**
2033-34	335.15	362.97	267.26	0.00	207.75	175.43	154.73	**1503.30**
2034-35	369.88	403.46	294.01	0.00	228.37	193.09	170.59	**1659.39**
2035-36	410.91	444.25	323.51	0.00	250.84	210.98	186.09	**1826.57**
2036-37	455.19	490.73	354.24	0.00	274.36	232.13	203.40	**2010.06**
2037-38	499.82	543.91	387.34	0.00	299.74	253.69	223.18	**2207.69**
2038-39	552.44	601.52	426.01	0.00	329.12	279.00	244.78	**2432.87**
2039-40	613.52	665.24	468.68	0.00	361.54	305.58	268.47	**2683.03**
2040-41	673.64	728.49	509.69	0.00	393.21	333.22	291.93	**2930.17**
2041-42	742.05	800.43	556.44	0.00	428.01	362.85	317.78	**3207.56**
2042-43	820.07	880.45	606.83	0.00	466.37	398.70	347.04	**3519.46**
2043-44	903.79	970.63	663.46	0.00	509.31	436.54	379.49	**3863.21**
2044-45	992.16	1069.65	724.29	0.00	555.96	473.63	412.79	**4228.48**
2045-46	1088.19	1163.58	785.78	0.00	602.49	517.98	449.60	**4607.62**
2046-47	1196.21	1279.34	855.34	0.00	655.00	564.05	488.49	**5038.43**

Note: *from 01 February 2027 Includes Kheendiah TP in place of Mandwanagar

Above Tables show scenario-wise toll revenue estimates for all plazas from 2025–26 to 2046-47, while the tables below provide the same projections for sections.

TOT-17 comprises of basically two separate sections. The first section from Lucknow to Ayodhya on NH-27 is basically part of NHAI important transportation link of East-West connectivity from Porbunder in Gujarat to Silchar in Assam. Thus, this stretch connects Northern India, western UP, Gujarat and part of Rajasthan to Eastern part of India i.e. Eastern UP, Bihar, Assam, and part of Jharkhand and Odisha,

Second section of project road Lucknow – Sultanpur stretch is basically part of Lucknow – Varanasi- Kolkata route. This section can be taken as a major transportation link between western UP (Bareilly) – Lucknow – Varanasi – Kolkata.

Table 7-37 **: Toll Revenue (section wise)- Most Likely Scenario (Rs. Crores)**

Location / Year	Lucknow-Ayodhya Section of NH-28 (New NH-27)	Ayodhya-Gorakhpur Section of NH-28 (New NH-27) and Lucknow-Sultanpur section of NH-731	Total All toll plaza
2026-27	327.56	409.50	**737.06**
2027-28	367.55	447.60	**815.15**
2028-29	408.76	492.15	**900.91**
2029-30	453.03	542.84	**995.87**
2030-31	503.71	596.29	**1100.01**
2031-32	558.14	656.78	**1214.92**
2032-33	614.96	720.63	**1335.60**
2033-34	685.25	790.32	**1475.58**
2034-35	757.32	867.64	**1624.96**
2035-36	835.45	949.11	**1784.55**
2036-37	921.85	1037.24	**1959.09**
2037-38	1014.78	1131.82	**2146.60**
2038-39	1119.29	1240.69	**2359.97**
2039-40	1237.43	1359.09	**2596.52**
2040-41	1353.48	1475.26	**2828.74**
2041-42	1485.34	1603.74	**3089.08**
2042-43	1633.74	1747.74	**3381.48**
2043-44	1796.40	1906.41	**3702.81**
2044-45	1971.39	2072.01	**4043.40**
2045-46	2147.75	2247.69	**4395.43**
2046-47	2355.51	2439.24	**4794.75**

Note: *from 01 February 2027 Includes Kheendiah TP in place of Mandwanagar

***Table 7-38* : : Toll Revenue (section wise)- Pessimistic Scenario (Rs. Crores)**

Location / Year	Lucknow-Ayodhya Section of NH-28 (New NH-27)	Ayodhya-Gorakhpur Section of NH-28 (New NH-27) and Lucknow-Sultanpur section of NH-731	Total All toll plaza
2026-27	326.79	408.57	**735.36**
2027-28	365.90	445.48	**811.37**
2028-29	405.93	488.58	**894.51**
2029-30	448.90	537.67	**986.56**
2030-31	497.95	589.08	**1087.03**
2031-32	550.49	647.10	**1197.59**
2032-33	605.08	708.14	**1313.22**
2033-34	672.54	774.84	**1447.38**
2034-35	741.55	848.57	**1590.12**
2035-36	816.18	925.91	**1742.09**
2036-37	898.57	1009.34	**1907.91**
2037-38	986.73	1098.67	**2085.40**
2038-39	1085.75	1201.27	**2287.01**
2039-40	1197.46	1312.75	**2510.20**
2040-41	1306.78	1421.51	**2728.29**
2041-42	1430.73	1541.56	**2972.29**
2042-43	1569.84	1675.67	**3245.50**
2043-44	1722.15	1823.49	**3545.64**
2044-45	1885.40	1976.99	**3862.39**
2045-46	2049.17	2139.38	**4188.55**
2046-47	2242.05	2316.01	**4558.06**

Note: *from 01 February 2027 Includes Kheendiah TP in place of Mandwanagar

***Table 7-39* : : Toll Revenue (section wise)- Optimistic Scenario (Rs. Crores)**

Location / Year	Lucknow-Ayodhya Section of NH-28 (New NH-27)	Ayodhya-Gorakhpur Section of NH-28 (New NH-27) and Lucknow-Sultanpur section of NH-731	Total All toll plaza
2026-27	328.30	410.52	**738.82**
2027-28	369.30	449.72	**819.02**

Location / Year	Lucknow-Ayodhya Section of NH-28 (New NH-27)	Ayodhya-Gorakhpur Section of NH-28 (New NH-27) and Lucknow-Sultanpur section of NH-731	Total All toll plaza
2028-29	411.61	495.57	**907.18**
2029-30	457.23	547.94	**1005.17**
2030-31	509.64	603.31	**1112.95**
2031-32	566.07	666.03	**1232.11**
2032-33	625.11	732.48	**1357.60**
2033-34	698.12	805.17	**1503.30**
2034-35	773.33	886.06	**1659.39**
2035-36	855.15	971.42	**1826.57**
2036-37	945.92	1064.14	**2010.06**
2037-38	1043.73	1163.96	**2207.69**
2038-39	1153.96	1278.91	**2432.87**
2039-40	1278.75	1404.27	**2683.03**
2040-41	1402.13	1528.04	**2930.17**
2041-42	1542.47	1665.09	**3207.56**
2042-43	1700.52	1818.94	**3519.46**
2043-44	1874.42	1988.79	**3863.21**
2044-45	2061.81	2166.67	**4228.48**
2045-46	2251.77	2355.85	**4607.62**
2046-47	2475.55	2562.88	**5038.43**

Note: *from 01 February 2027 Includes Kheendiah TP in place of Mandwanagar

7.6 Modification Of Concession Period

Modification is a concession period due to variation in traffic is worked out as per procedure given in RFP. There are three milestones for revenue testing in March 2030, 2035, and 2040.

It has been clarified in corrigendum 13 that there will be two contracts for TOT-The first concession will be for Lucknow- Ayodhya section while as Ayodhya- Gorakhpur and Lucknow Sultanpur sections have been clubbed together as second concession contract. Working of modification in concession period is given as under for all scenarios

The following table provides details of target revenue as given in RFP for both sections.

Table 7-40 **: Section wise Target Date and Target Revenue**

Target Point Date	Lucknow-Ayodhya Section of NH-28 (New NH-27)	Ayodhya-Gorakhpur Section of NH-28 (New NH-27) and Lucknow-Sultanpur section of NH-731
	Target Revenue. Rs cr.	
Target 1- March 30	37.55	48.22
Target 2- March 35	59.09	70.98
Target 3- March 40	92.17	105.56

Summary of estimate of modification in concession period on the basis of forecast revenue is given as follows.

Table 7-41 : Section -1 Modification concession period details

TOT-17 -Modification in Concession Period									
Section-01	**Lucknow-Ayodhya Section of NH-28 (New NH-27)**								
Types of Scenarios	**Pessimistic Case**			**Most likely Case**			**Optimistic Case**		
Target no.	**Target-1**	**Target-2**	**Target-3**	**Target-1**	**Target-2**	**Target-3**	**Target-1**	**Target-2**	**Target-3**
Target Month	**Mar-30**	**Mar-35**	**Mar-40**	**Mar-30**	**Mar-35**	**Mar-40**	**Mar-30**	**Mar-35**	**Mar-40**
Target Revenue (Rs. Crores)	37.55	59.09	92.17	37.55	59.09	92.17	37.55	59.09	92.17
Calculated Revenue (Rs. Crores)	37.58	61.95	99.72	37.93	63.28	103.06	38.29	64.63	106.52
Difference %	0.07%	4.84%	8.19%	1.01%	7.09%	11.82%	1.97%	9.37%	15.57%
If qualifies for Modification in Concession Period	No	No	Yes	No	Yes	Yes	No	Yes	Yes
Qualifying Increment or shortfall	-	-	3.19%	-	2.09%	6.82%	-	0.04	0.11
Change in Concession period %	0.00%	0.00%	-3.19%	0.00%	-2.09%	-6.82%	0.00%	-4.37%	-10.57%
Remaining Concession Period (Year)	15.91	10.90	5.90	15.91	10.90	5.90	15.91	10.90	5.90
Change in Concession period (Year)	0.00	0.00	-0.19	0.00	-0.23	-0.40	0.00	-0.48	-0.62
Change in Concession period in (Days)	**0**	**0**	**-69**	**0**	**-83**	**-147**	**0**	**-174**	**-228**
Total Change in Concession period	0.00			0.00			0.00		
Calculated Modified Concession Period	19.81			19.37			18.90		
Final Concession Period subject to Cap	0.00			0.00			0.00		

Table 7-42 : Section -2 Modification concession period details

TOT-17 -Modification in Concession Period									
Section-02	**Ayodhya-Gorakhpur Section of NH-28 (New NH-27) and Lucknow-Sultanpur Section of NH-731**								
Types of Scenarios	**Pessimistic Case**			**Most likely Case**			**Optimistic Case**		
Target no.	**Target-1**	**Target-2**	**Target-3**	**Target-1**	**Target-2**	**Target-3**	**Target-1**	**Target-2**	**Target-3**
Target Month	**Mar-30**	**Mar-35**	**Mar-40**	**Mar-30**	**Mar-35**	**Mar-40**	**Mar-30**	**Mar-35**	**Mar-40**
Target Revenue (Rs. Crores)	48.22	70.98	105.56	48.22	70.980839	105.564265	48.22	70.98	105.56
Calculated Revenue (Rs. Crores)	44.87	70.81	109.32	45.31	72.42	113.20	45.74	73.96	116.98
Difference %	-6.95%	-0.23%	3.56%	-6.03%	2.03%	7.23%	-5.13%	4.20%	10.81%
If qualifies for Modification in Concession Period	Yes	No	No	Yes	No	Yes	Yes	No	Yes
Qualifying Increment or shortfall	1.95%	-	-	1.03%	-	2.23%	0.13%	-	0.06
Change in Concession period %	1.95%	0.00%	0.00%	1.03%	0.00%	-2.23%	0.13%	0.00%	-5.81%
Remaining Concession Period (Year)	15.91	10.90	5.90	15.91	10.90	5.90	15.91	10.90	5.90
Change in Concession period (Year)	0.31	0.00	0.00	0.16	0.00	-0.13	0.02	0.00	-0.34
Change in Concession period in (Days)	**113**	**0**	**0**	**60**	**0**	**-48**	**8**	**0**	**-125**
Total Change in Concession period	0.00			0.00			0.00		
Calculated Modified Concession Period	20.31			20.03			19.68		
Final Concession Period subject to Cap	0.00			0.00			0.00		

CHAPTER 8
CONCLUSION & RECOMMENDATIONS

8.1 Conclusion & Recommendations

Project stretch of Lucknow- Ayodhya -Gorakhpur (NH-27) & Lucknow- Sultanpur (NH-731) in state of Uttar Pradesh is currently four lane road. The road is in sound condition and serves healthy traffic volumes. Project corridor is a part of the important regional network connecting Bihar, Madhya Pradesh to Southern States and vice-versa. There are large number of townships, industrial corridors and other business establishment coming up along project corridor. As discussed, dominant portion of traffic is long route traffic, which is more sensitive towards the growth of national economy. As Indian economy is poised to grow at 7%+ post COVID-19, the project corridor is expected to pick up the same trend in terms of traffic flow. All these developments have potential to give positive impact to traffic flow on project. The following can be considered as major outcomes of the study.

a) There is good amount of tollable traffic running on project

b) Project corridor has potential to witness traffic growth @ 6-8% annually in near future due to various development in area and overall development of economy.

c) Project corridor has committed traffic as long route traffic and does not run a risk of traffic leakage due to quality competing road.

Based on above it can be considered a stable healthy project from traffic and revenue point of view.

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CHANDIKHOLE – BHADRAKH SECTION FROM KM.62+000 TO KM.136+500 IN STATE OF ODISHA

TRAFFIC STUDY & REVENUE PROJECTION REPORT (FINAL)

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ABBREVIATIONS

AADT	-	Annual Average Daily Traffic	**NHAI**	-	National Highway Authority of India
BOT	-	Build Operate Transfer	**NHDP**	-	National Highways Development Project
CAGR	-	Compound Annual Growth Rate	**NSDP**	-	Net State Domestic Product
CTV	-	Classified traffic volume	**O&M**	-	Operation & Maintenance
DBFOT	-	Design, Build, Finance, Operate & Transfer	**PCDP**	-	Per Capita Domestic Product
EME	-	Earth Moving Equipment	**PCI**	-	Per Capita Income
GDP	-	Gross Domestic Product	**PCU**	-	Passenger Car Unit
GSDP	-	Gross State Domestic Product	**PSC**	-	Pre-stressed Concrete
HCM	-	Heavy Construction Machinery	**RCC**	-	Reinforced cement concrete
HCV	-	Heavy Commercial Vehicle	**RHS**	-	Right Hand Side
HTMS	-	Highway Traffic Management System	**SH**	-	State Highway
IRC	-	Indian Road Congress	**TP**	-	Toll Plaza
IRR	-	Internal Rate of Return	**WPI**	-	Wholesale Price Index
LCV	-	Light Commercial Vehicle	**SIR**	-	Special Investment Region
LHS	-	Left Hand Side	**c.**	-	Circa
LGV	-	Light Goods Vehicle	**ROB**	-	Railway Over Bridge
MAV	-	Multi Axle Vehicle	**MDR**	-	Major District Road
MORTH	-	Ministry of Road Transport and Highways	**ODR**	-	Other District Road
NH	-	National Highway	**CA**	-	Concession Agreement
PCC	-	Plain Cement Concrete	**RMT**	-	Running Meter
CR	-	Coarse Rubble			

CHAPTER 1

INTRODUCTION

1.1 Background

The Project constitutes Tolling, Operation, Maintenance & Transfer of Chandikhole to Bhadrak Section of NH-16 from km 62.000 to km 136.500, in the state of Odisha (Bundle 18) on Toll Operate Transfer (TOT) Model with total project length of 74.500 km.

IRB Chandibhadra Tollway Private Limited (SPV) promoted by IRB Infrastructure Trust for the

Project (hereinafter referred to as "ICTPL" or the "Company"), which is the private Infrastructure Investment Trust (InvIT) sponsored by IRB Infrastructure Developers Limited (hereinafter referred to as "IRB"), has been awarded Tolling, Operation, Maintenance & Transfer of Chandikhole to Bhadrak Section of NH-16 from km 62.000 to km 136.500, in the state of Odisha (Bundle 18) on Toll Operate Transfer (TOT) Model for a Revenue Linked Concession period of 20 years (hereinafter referred to as the "Project") with total project length of 74.500 km.

Project Highway alignment is depicted in the following figure.

Figure 1-1 : Alignment of Project stretch

1.2 Objective of the Study

M/s IRB Infrastructure Developers Limited (IRB) intends to develop a traffic study report for Chandikhole to Bhadrak Section of NH-16 from km 62.000 to km 136.500, in the state of Odisha (Bundle 18) on TOT basis. GMD Consultants have been assigned the work of conducting traffic study including revenue model based on traffic projections and forecasts.

For making the proper assessment of traffic volume on project stretch, base year traffic and its projection, GMD Consultants have been provided with the basic survey data and other reveleant reports available with client. The base year traffic data is the primary input for determination of future traffic demand. With a view to estimate the base year traffic volume in different categories of goods and passenger carrying vehicles, the traffic data has been analyzed and complied in this report

The year 2025-26 has been taken as the base year for projections and forecasting of traffic in the horizon year. This report fulfils part of the requirements of the assignment.

1.3 Scope of Services

The following may be referred to as broad scope of Traffic Study of Chandikhole-Bhadrakh section NH-16

Classified Traffic Volume Count at the main toll plaza location at Toll Plaza locations. This data was supplied by the Concessionaire.

- Establishment of traffic pattern
- Working our traffic demand elasticity and growth
- Traffic forecast up to concession period.
- Preparation of revenue model up to concession period
- Any other analysis relevant to scope

CHAPTER 2

PROJECT DETAILS

2.1 Project Corridor

Project road section Chandikhole–Bhadrak stretch of NH-16 is a critical segment of the Golden Quadrilateral and serves as a key north–south and east-coast mobility corridor in Odisha. This section facilitates long-distance movement between major cities such as Kolkata, Bhubaneswar, and Visakhapatnam, along with other important metropolitan and industrial centres in eastern India.

This section has been upgraded to a six-lane highway under the National Highways Development Project, improving traffic capacity and safety for long-distance movement.

Project Stretch Description

The project stretch under this study starts from Km 62+000 of NH-16 and ends at Km 136+500 of NH-16 Chandikhole to Bhadrakh in the state of Odisha. The length of project stretch is 74.500 km and has 6-lane configuration.

The following figure shows the alignment of the project highway in the above context.

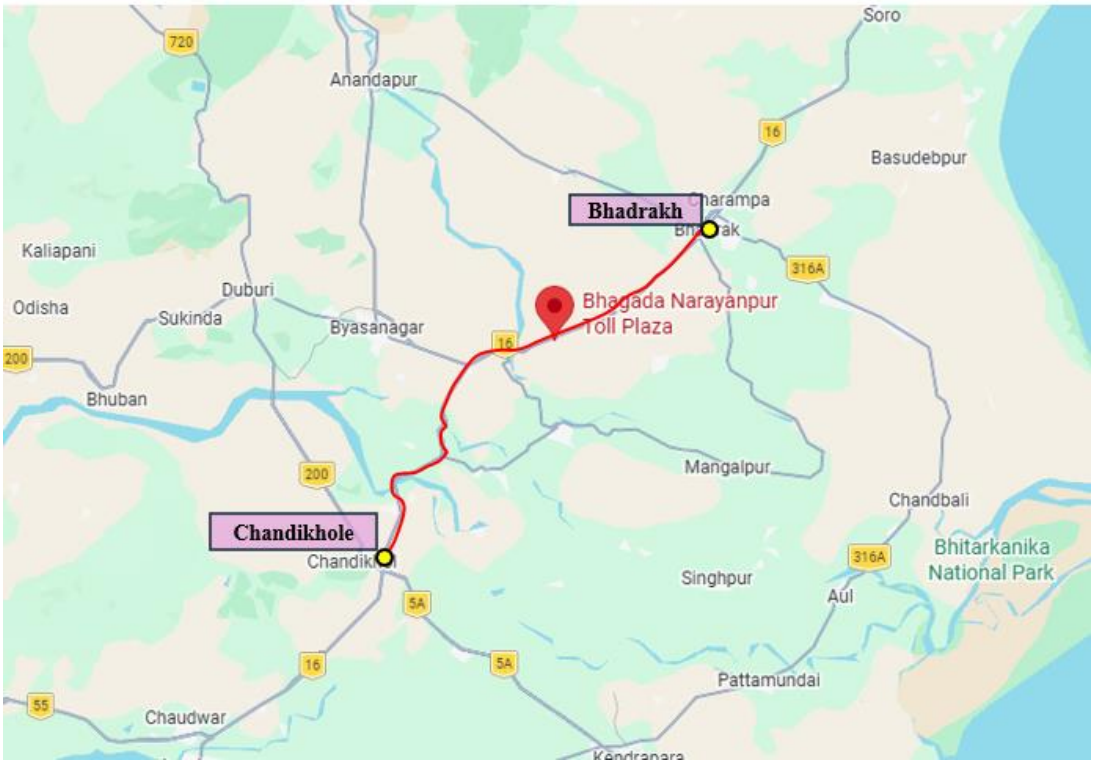

Figure 2-1 : Project Alignment with Toll Plaza

Six laning of project stretch is complete. Following photographs illustrate project section along the corridor.

Figure 2-2 : Photographs showing Project Corridor

CHAPTER 3

TRAFFIC SURVEYS AND ANALYSIS

3.1 Traffic Surveys

The Consultants have collected the required information for project corridor to understand the general traffic and travel characteristics on the corridor.

The following traffic data has been collected from a client for a project.

- Classified traffic volume counts at toll plaza locations on Chandi hole to Bhadrak Section of NH-16 from km 62.000 to km 136.500, in the state of Odisha (Bundle 18) Provided by Concessionaire for base year 2025-26.
- Local Component of traffic
- Component of Return Journey
- Component of Monthly Pass Journey

The main objective of the traffic data analysis is to:

- Determine the existing traffic movement characteristics of the project
- Establish base year traffic
- Identification of travel patterns and modal split of project traffic
- Deriving growth factors for traffic forecasting
- Estimation of corridor traffic including traffic diversion if any
- Preparation of revenue model and projection of revenue as per toll policy for various scenarios

Table 3-1 below lists provides details of locations from where traffic details have been collected.

Table 3-1 : Traffic Data Details

SR. NO	LOCATION	CTV	Single Journey Traffic	Daily Return Journey	Monthly Pass	Local Pass
1	Bhagada Narayanpur Toll Plaza At.Km.102+500	AADT For 2025-26	AADT For 2025-26	-	-	-

Toll plaza is located in Odisha.

3.2 Classified Traffic Volume

The objective of conducting a Classified Traffic Volume Count is to understand the traffic flow pattern including modal split on a roadway. The Classified Traffic Volume Count survey has been provided by the concessionaire of project highway from actual traffic data gathered at toll plaza locations-based traffic survey done at project stretch.

The vehicles can broadly be classified into fast moving / motorized and slow moving / non-motorized vehicles, which can be further classified into specific categories of vehicles. The groupings of vehicles are further segregated to capture the tollable vehicle categories specifically and toll exempted vehicles are counted separately. The detailed vehicle classification system as per IRC: 64-1990 is given in table below .

Table 3-2 : Vehicle Classification System

Vehicle Type	
Auto Rickshaw	
Passenger Car	Car, Jeep, Taxi & Van (Old / new technology)
Bus	Minibus
	Standard Bus
Truck	Light Goods Vehicle (LCV)
	2 – Axle Truck
	3 Axle Truck (HCV)
	Multi Axle Truck (4-6 Axle)
	Oversized Vehicles (7 or more axles)
Other Vehicles	Agriculture Tractor, Tractor & Trailer

Source - IRC: 64 – 1990

However, since the project highway is currently under toll operation, the data collected corresponds to the category of tollable vehicles. The following are the types of vehicles as per concession agreement.

- Car / Jeep / van
- Minibus /LCV
- Bus
- Truck /
- 3 Axle commercial vehicle
- Multi Axle

3.3 Traffic Characteristic

Toll revenue of project highway does not solely depend on traffic volume. There are certain characteristics of traffic which have substantial potential to affect toll collection.. These will be discussed in subsequent sections of report.

3.3.1 Traffic Data

Project concessionaire has provided traffic Data for the year 2025-26.that traffic data is used for future projections and revenue calculations. The following table shows derived Annual Average Daily Traffic (AADT) for year 2025-26.

Table 3-3 : Traffic Data at Toll Plaza Bagada Narayanpur At Km.102+500

Sr. No	Type of Vehicle	Annual Average Daily Traffic (Nos.) - 2025-26
1	Car / Jeep / Van	5,918
2	Mini LCV	1,255
3	LCV	470
4	Minibus	42
5	Bus	1,061
6	Truck - 2 Axle	1,255
7	3 - Axle	1,504
8	4 - 6 Axle	4,925
9	7 & above Axle	5
	Total	**16435**

3.4 Data Analysis

3.4.1 Analysis of Traffic Volume Count

Understanding the character of existing traffic forms the basis of the traffic forecast. The various vehicle types having different sizes and characteristics can be converted into a single unit called Passenger Car Unit (PCU). Passenger Car equivalents for various vehicles are adopted based on recommendations of Indian Road Congress prescribed in "IRC-64-1990: Guidelines for Capacity of Roads in Rural areas". The adopted passenger car unit values (PCU) are presented in Table 3-4.

Table 3-4 : PCU Factors Adopted for Study

Vehicle Type	PCUs
Car	1.0
Minibus	1.5
Standard Bus	3.0
LCV/LGV	1.5
2 Axle Truck	3.0
3 – 6 Axle Truck	4.5
MAV	4.5
Auto Rickshaw	1.0
Van/Tempo	1.0
Agriculture Tractor with Trailer	4.5
Agriculture Tractor without Trailer	1.5

Source: IRC: 64-1990

Traffic volume at each toll plaza was converted to PCU and same is presented as under

Table 3-5 : Traffic in PCU at Project Stretch

Year	Toll Plaza Location (Km)	Traffic No.	PCU	PCU Index
2025-2026	Bagada Narayanpur At Km.102+500	16435	41586	2.53

It can be observed from above that project traffic has PCU index 2 to 2.6 which is an indicator of high proportion of commercial traffic in traffic mix in project corridors. The following figure illustrates variation of PCU index at four toll plaza locations.

3.4.2 Components of Traffic

As discussed previously, components of traffic volume play an important role in determining project revenue. A larger component of commercial traffic with higher axle configuration adds to project revenue positively. Similarly, a larger component of local traffic affects the project revenue potential negatively.

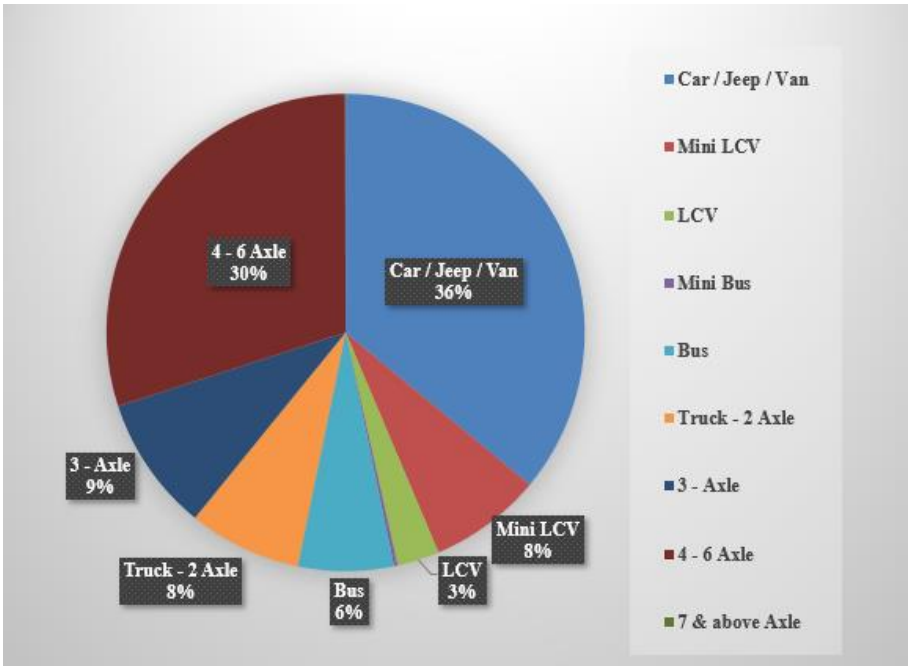

Figure 3-1 : Model split of tollable vehicle At Km 102+500

It is observed that car traffic forms about 36% of total traffic at toll plaza location Km. 102+500 (Bagada Narayanpur) while 4-6 axle commercial vehicles are about 30% of total traffic. Truck / Bus and LCV share about 8% and 3% of traffic volume respectively.

3.5 Secondary Data Collection

There are several other factors which have a substantial impact on traffic patterns and growth on any project corridor. The following are some of such important factors.

- Industrial development around project corridor and its catchment
- Educational infrastructure along project corridor
- Demographic pattern
- Urban area development
- Tourism potential
- Upcoming major infrastructural or Industrial projects
- Special Industry in project corridor

- Overall trends of economic growth local as well as national / regional

Hence in addition to traffic details on the project site, secondary data was also collected from various other sources. Typical secondary data includes the following:

1. Vehicle registration data of regional and national level.
2. Economic Data

a) GDP
b) NSDP
c) Population Growth
d) Per Capita Income growth
e) Industrial Growth
f) Special Industry Potential
g) Regional and National development vision / plan
h) Any other relevant data

3.Competing road network

We have collected and utilized such underlying data in the study to estimate the growth and risk factors for traffic along the project corridor. The same is discussed in subsequent chapter.

CHAPTER 4

INFLUENCE ZONE TRANSPORT NETWORK ANALYSIS

4.1 Introduction

Highway corridors behave like integrated circuit networks and more often than not every road is connected to various networks having different origins and destinations. Traffic running on these networks behaves like fluid and flow on network on alignment of least friction.

The following Factors can be considered as major contributors to friction on transportation networks.

- Travel Speed / Travel Time
- Geometric deficiencies like blind horizontal curves and steep vertical gradients etc.
- Configuration of road
- Riding quality
- Traffic delays,
- Length of road,
- Passing through built up or Urban Area,
- Terrain,
- Facilities,

4.2 Regional Network

The Coastal Highway, proposed from Digha to Paradip to Tangi (ending at NH-16), is being developed in two phases. Since this new corridor will run broadly parallel to the existing Chandikhole–Bhadrak section of NH-16, its completion—particularly the high-priority Paradip–Tangi 4-lane stretch expected by FY 2028 and the remaining Digha–Paradip 2-lane stretch anticipated by FY 2030—may influence traffic patterns on NH-16 by diverting a portion of coastal-bound and port-oriented traffic to the new alignment.

Figure 4-1 : Alignment of Costal Highway Network

Some traffic has been diverted due to the opening of the new Coastal Highway from Year 2029, which has affected traffic volumes on the project road. A certain percentage of traffic has been diverted, and this percentage has been provided by the concessionaire. The adjusted traffic volumes will be used for further revenue analysis and traffic forecasting.

Table 4-1 ***:% of Diversion Impact on all Toll Plaza***

Traffic Diversion	FY	TP-1
Coastal Road		
Car / Jeep / Van	31-Mar-29	-5%
Mini LCV	31-Mar-29	0%
LCV	31-Mar-29	-3%
Minibus	31-Mar-29	0%
Bus	31-Mar-29	-6%
Truck - 2 Axle	31-Mar-29	-3%
3 - Axle	31-Mar-29	-1%
4 - 6 Axle	31-Mar-29	-1%
7 & above Axle	31-Mar-29	

CHAPTER 5

GROWTH OF TRAFFIC ON PROJECT HIGHWAY

5.1 Introduction

Traffic growth is a result of the interplay of a number of contributory factors such as National economy, Government policy, socio-economic conditions of the people, and changes in land uses along the project corridor precincts etc. Further these factors have uncertainties associated with them. Forecasts of traffic have, therefore, to be dependent on the forecasts of factors such as population, gross domestic product (GDP), vehicle ownership, per capita income (PCI), agricultural output, fuel consumption etc. Future patterns of change in these factors can be estimated with only a limited degree of accuracy and hence the forecasting of future traffic levels cannot be precise.

The following section deals with methods, techniques, and considerations used in traffic forecasts for the project under study.

5.2 Trend Analysis

Time series data of vehicle Registered in state of concerned states is taken from respective authorized websites and the same is used as the base data for analysis of growth.

The growth of vehicle traffic depends on the type of vehicle. Traffic growth on any highway typically depends on the number of economic parameters like

- Per Capita Income
- Net State Domestic Product (NSDP)
- Population

The elasticity model of growth projection is one of the most widely acceptable methods for traffic forecasts. The same is recommended in **IRC: 108-2015- Guidelines for Traffic Prediction on Rural Highways**.

The following can be pair of vehicle type and independent variable for elasticity modeling of growth.

- Car / Jeep – Par Capita Income
- Bus / Minibus – Population
- Goods Vehicle – NSDP

The same is used in the analysis below.

5.3 Estimation of Traffic Demand Elasticity

Elasticity of traffic demand is defined as the rate at which traffic intensity varies due to a change in the corresponding indicator selected. Hence, In order to estimate the elasticity of traffic demand, it is necessary to establish relationship between the growth in number of given category of vehicles with the relevant economic variable considered, such as NSDP,

per capita income and population growth. Latest available data for vehicle registration, per capita income, NSDP and population is used in analysis.

As per IRC: 108-1996 the model for estimating elasticity index for the project corridor is of the following form and is given as below:

Log (P) = k x Log (EI) + A

Where,

P = Number of Vehicles (Mode wise)

EI = Economic Indicator

A = Regression constant

k = Elasticity coefficient (Regression coefficient)

The elasticity for car and bus (passenger vehicles) is calculated based on the Population and Per Capita Domestic Product (PCDP) and the elasticity for trucks is calculated based on the Net State Domestic Product (NSDP).

The project corridor spreads across state of Odisha. Toll plazas at Bhagada Narayanpur in the state of Odisha. Project traffic has share of majorly states like West Bengal, Andhra Pradesh, Tamil Nadu, Jharkhand and Karnataka . For elasticity calculations, working data from these states also has been analysed.

The following tables and graphs depict regression and elasticity of growth model for stretch falling in Odisha State.

Table 5-1 : Per Capita Income Vs Car Odisha

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth (9 Year)
2011	48499	186323	4.69	5.27		
2012	51087	214047	4.71	5.33	5%	
2013	54762	241113	4.74	5.38	7%	
2014	55123	272976	4.74	5.44	1%	
2015	58838	309565	4.77	5.49	7%	
2016	67851	350226	4.83	5.54	15%	
2017	72922	400435	4.86	5.60	7%	
2018	77531	450648	4.89	5.65	6%	
2019	82257	4,99,444	4.92	5.70	6%	6.9%

Regression analysis of same is given in figure below.

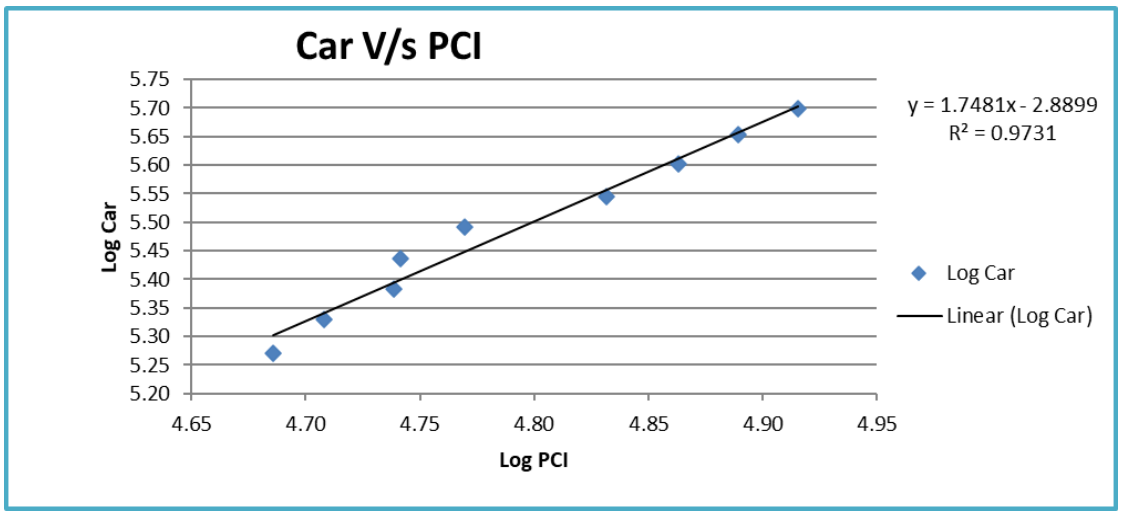

Figure 5-1 : Regression and Elasticity PCI vs. Car – Extrapolation Odisha

Table 5-2 : Population Vs Bus Odisha

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth (9 Year)
2011	41974000	25585	7.62	4.41		
2012	42373000	26672	7.63	4.43	1%	
2013	42771000	27775	7.63	4.44	1%	
2014	43170000	28669	7.64	4.46	1%	
2015	43568000	29818	7.64	4.47	1%	
2016	43966000	31289	7.64	4.50	1%	
2017	44312000	32986	7.65	4.52	1%	
2018	44658000	35131	7.65	4.55	1%	
2019	45004000	38631	7.65	4.59	1%	0.9%

Regression analysis of same is given in figure below.

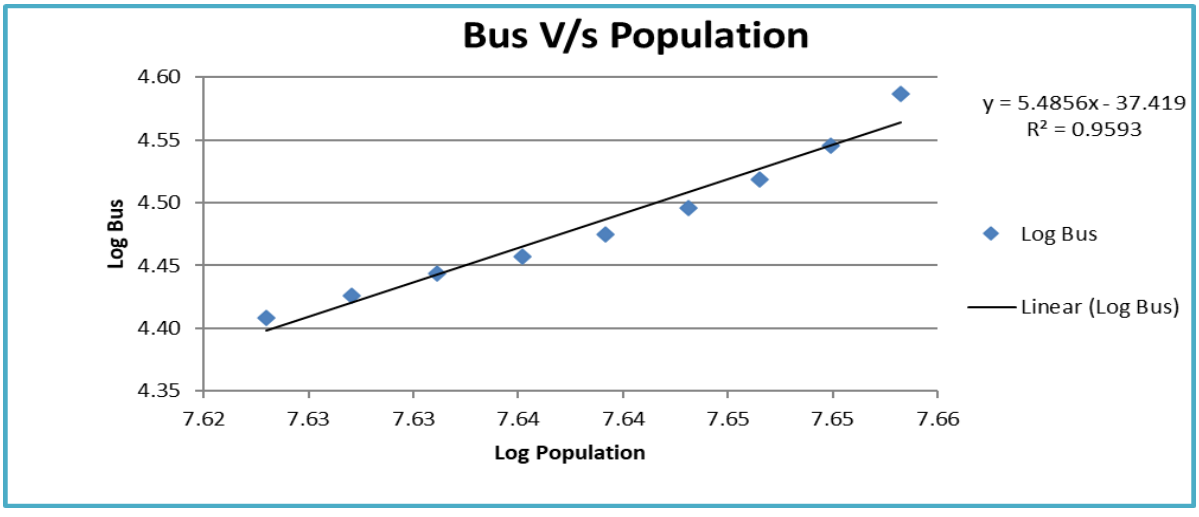

Figure 5-2 : Regression and Elasticity Population vs. Bus – Extrapolation Odisha

Elasticity of Trucks has been worked out by regression analysis with NSDP. The following table represents the data and details.

Table 5-3 : Trucks Vs NSDP Odisha

Year	NSDP	Trucks	Log NDSP	Log Truck	NSDP Growth	Average Growth (9 Year)
2011	20422595	130030	7.31	5.11		
2012	21630107	134990	7.34	5.13	6%	
2013	23312187	141230	7.37	5.15	8%	
2014	23593074	148519	7.37	5.17	1%	
2015	25319167	158247	7.40	5.20	7%	
2016	29334825	171044	7.47	5.23	16%	
2017	31659195	188561	7.50	5.28	8%	
2018	33800202	216680	7.53	5.34	7%	
2019	36009480	251680	7.56	5.40	7%	7.4%

The following figure depicts regression analysis and extrapolation.

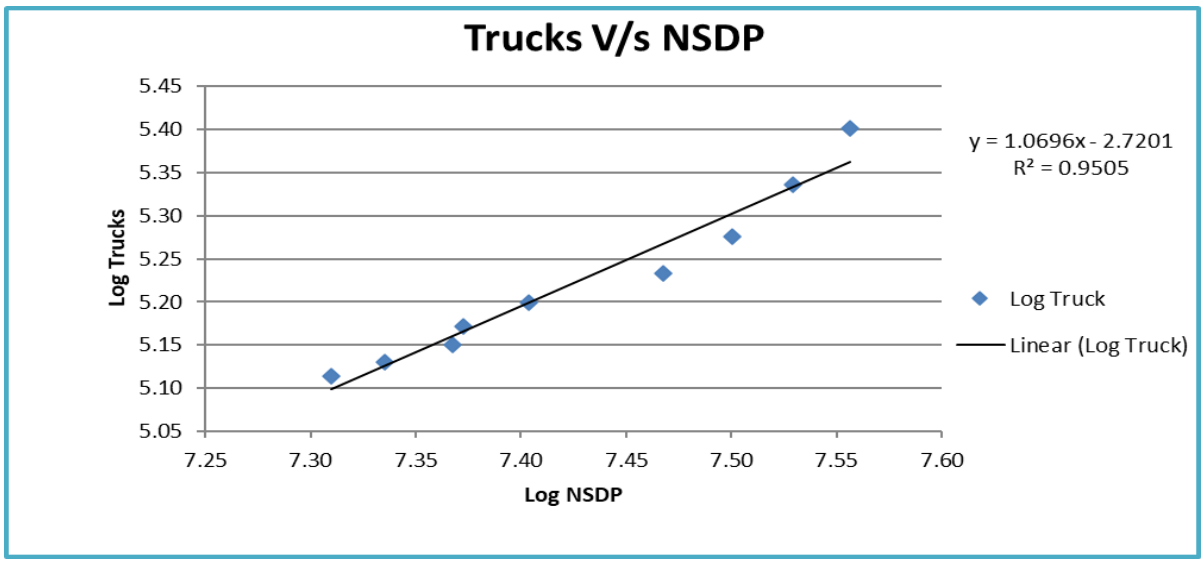

Figure 5-3 : Regression and Elasticity NSDP vs. Trucks Traffic - extrapolation Odisha

Using the regression analysis above, we have arrived at the elasticity of traffic demand for each class of vehicle to a given change in relevant economic indicators. Average traffic growth of a vehicle class is multiplied by the corresponding elasticity coefficient to arrive at traffic growth. R2 statistical measure of how close the data are to the fitted regression line. It varies from 0 to 1. The higher the value of R2 more representative is the regression model of data.

The results of these analyses for *the good fit* regression as reflected by R^2 values are presented in the Table below.

Table 5-4 : Summary Regression Analysis Odisha

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average Growth (8yrs)	Growth Elastic Model	Remarks
Odisha	**Car/Jeep**	PCI	y = 1.7481x - -2.8899	R^2 = 0.9731	1.7	7%	12.05%	Good Regression
	Bus	Population	y = 5.4856x - -37.4187	R^2 = 0.9593	5.5	1%	4.80%	Good Regression
	Truck	NSDP	y = 1.0696x - -2.7201	R^2 = 0.9505	1.1	7%	7.93%	Good Regression

The following tables and graphs depict regression and elasticity of growth model for stretch falling in West Bengal State.

Table 5-5 : Per Capita Income Vs Car West Bengal

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth (9 Year)
2011	51543	575085	4.71	5.76		
2012	53157	877588	4.73	5.94	3%	
2013	53811	938271	4.73	5.97	1%	
2014	54520	1001618	4.74	6.00	1%	
2015	57255	1251618	4.76	6.10	5%	
2016	60618	1501618	4.78	6.18	6%	
2017	64007	1801618	4.81	6.26	6%	
2018	68212	2126618	4.83	6.33	7%	
2019	71719	2151618	4.86	6.33	5%	4.2%

Regression analysis of same is given in figure below.

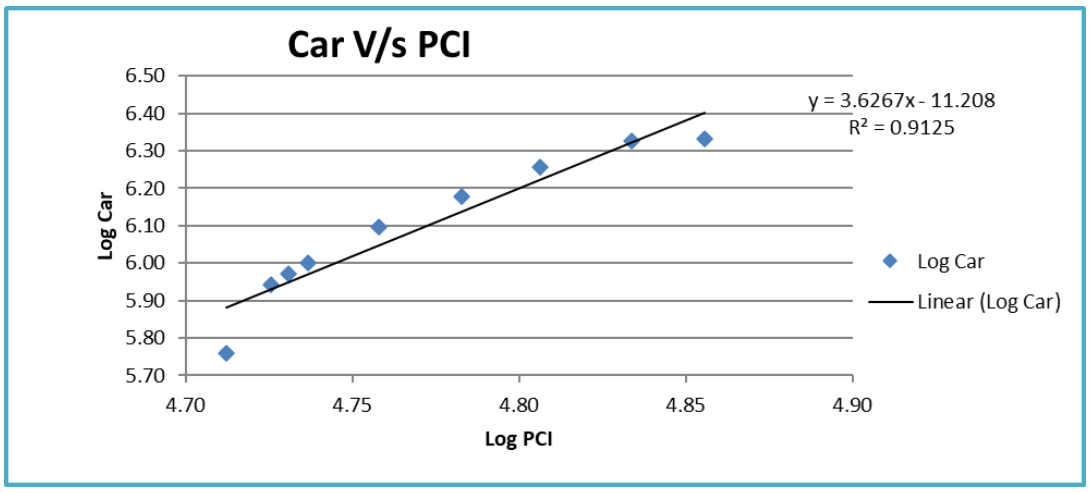

Figure 5-4 : Regression and Elasticity PCI vs. Car – Extrapolation Car West Bengal

Table 5-6 : Population Vs Bus Car West Bengal

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth (9 Year)
2011	91276000	35603	7.96	4.55		
2012	92037000	106470	7.96	5.03	1%	
2013	92797000	188968	7.97	5.28	1%	
2014	93558000	205480	7.97	5.31	1%	
2015	94318000	310480	7.97	5.49	1%	
2016	95079000	390480	7.98	5.59	1%	
2017	95688000	465480	7.98	5.67	1%	
2018	96297000	561480	7.98	5.75	1%	
2019	96906000	646480	7.99	5.81	1%	0.8%

Regression analysis of same is given in figure below.

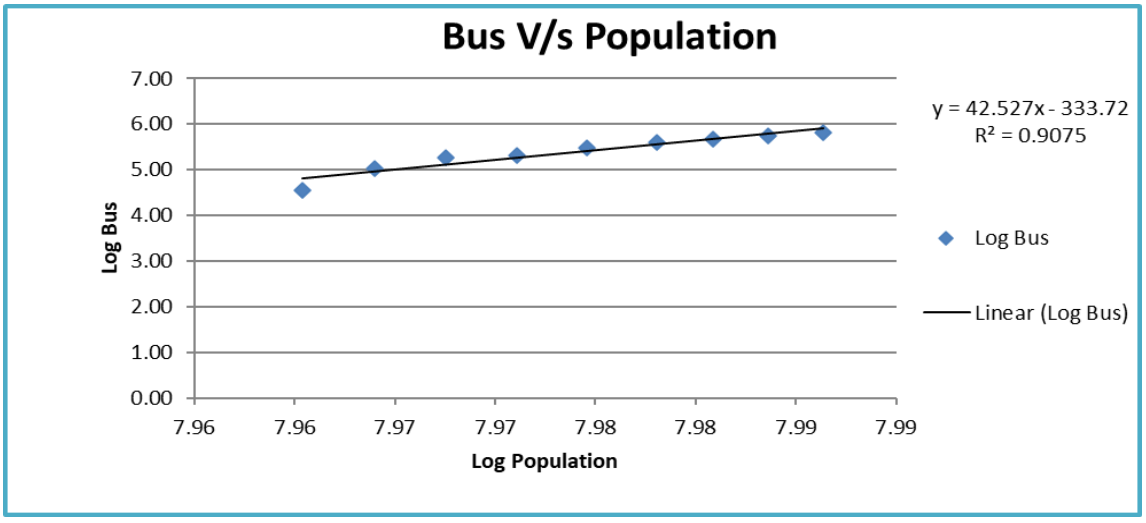

Figure 5-5 : Regression and Elasticity Population vs. Bus – Extrapolation Car West Bengal

Elasticity of Trucks has been worked out by regression analysis with NSDP. The following table represents the data and details.

Table 5-7 : Trucks Vs NSDP Car West Bengal

Year	NSDP	Trucks	Log NDSP	Log Truck	NSDP Growth	Average Growth (9 Year)
2011	47320465	193068	7.68	5.29		
2012	49290117	193943	7.69	5.29	4%	
2013	50395157	203584	7.70	5.31	2%	
2014	51570160	212623	7.71	5.33	2%	
2015	54698805	407229	7.74	5.61	6%	
2016	58491083	657229	7.77	5.82	7%	
2017	62378682	907229	7.80	5.96	7%	
2018	65928789	1157229	7.82	6.06	6%	
2019	69755447	1307229	7.84	6.12	6%	5.0%

The following figure depicts regression analysis and extrapolation.

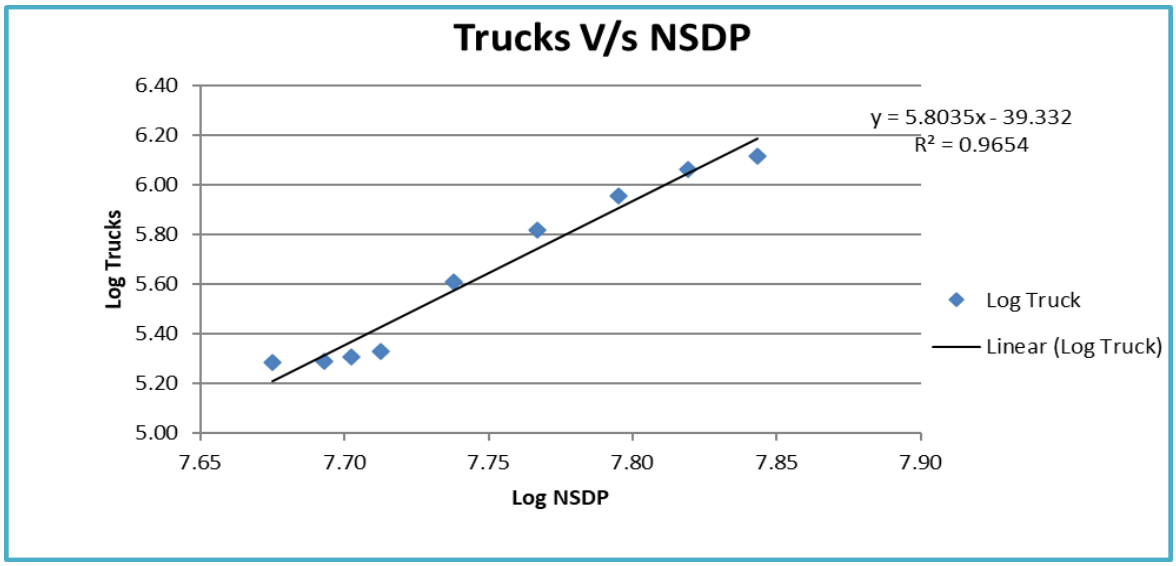

Figure 5-6 : Regression and Elasticity NSDP vs. Trucks Traffic - extrapolation Car West Bengal

Using the regression analysis above, we have arrived at the elasticity of traffic demand for each class of vehicle to a given change in relevant economic indicators. Average traffic growth of a vehicle class is multiplied by the corresponding elasticity coefficient to arrive at traffic growth. R2 statistical measure of how close the data are to the fitted regression line. It varies from 0 to 1. The higher the value of R2 more representative is the regression model of data.

The results of these analyses for *the good fit* regression as reflected by R^2 values are presented in the Table below.

Table 5-8 : Summary Regression Analysis Car West Bengal

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average Growth (8yrs)	Growth Elastic Model	Remarks
West Bengal	**Car/Jeep**	PCI	y = 3.6267x - -11.2076	R^2 = 0.9125	3.6	4%	15.36%	Good Regression
	Bus	Population	y = 42.5267x - -333.7231	R^2 = 0.9075	42.5	1%	31.94%	Good Regression
	Truck	NSDP	y = 5.8035x - -39.3324	R^2 = 0.9654	5.8	5%	28.93%	Good Regression

Table 5-9 : Summary Regression Analysis West Bengal

Using the same methodology, regression analysis has also been carried out for additional states including Andhra Pradesh, Tamil Nadu, Jharkhand, Karnataka, and Bihar.

Economical model for predicting growth is good tool, however other local, regional, national factors should also be considered before finalizing growth factors. Considering factors such as proposed developments and other influencing economic factors, moderated growth should be considered. These factors are discussed in subsequent sections.

5.4 Other Factors Influencing Growth

There are many factors which have an impact on traffic growth. As discussed previously these factors can be economical, social, educational, and industrial.

Potentiality of such factors for project highway is discussed as under.

ECONOMY

After witnessing a slowdown during 2011-12, the economy recovered in 2013-14, and a high growth rate of GDP was recorded up to 2018-19. Pandemic of COVID-19 impacted all economies of world including India up to year 2021-22. Following figure show trend of GDP growth in India.

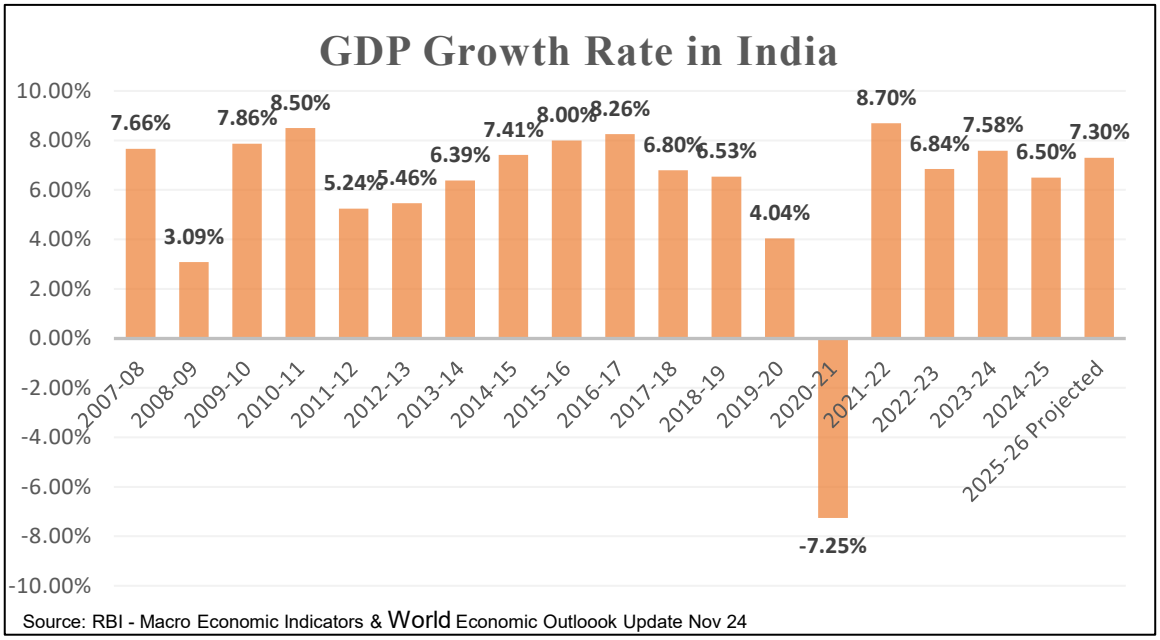

Figure 5-7 : Growth of GDP in India

FY 2017-18 recorded a growth of 6.7% which had a slight impact of GST and demonetization. Indian economy appears on recovery path with estimated growth of 6.8% in FY 2018-19. The government took major policy decisions including tax infrastructure reforming, banking sector improvement and ease of doing business.

In post COVID-19 scenario, in year 2022-23 and 2023-24 India registered an impressive growth of 7% to 7.5%. In last year despite global slow down due to Russia-Ukraine war and Gaza crises, India grew at good rate of 7%(Estimated).

Indian economy is now on good growth path and all major institutions including IMF / ADB have estimated growth of Indian Economy to peg around 6.5% to 7% in coming years.

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5.5 Developments along and around the Project Corridor & State

The Chandikhole–Bhadrak highway serves as a vital north–south industrial and logistics corridor in eastern Odisha, enabling high-volume movement of minerals, industrial goods, agricultural produce, construction materials, and regional passenger traffic between the state's hinterland and its coastal industrial and port hubs.

The project corridor stretches across Jajpur, Kendujhar (Keonjhar), Bhadrak, Balasore, Angul, and nearby districts, connecting communities and industries with key hubs like Kalinga Nagar, Duburi, Chandikhol, the Joda–Barbil mining region, Paradeep Port, and the wider industrial network that drives Odisha's growth

Jajpur District and Kalinga Nagar Industrial Profile

Jajpur district, particularly the Kalinga Nagar–Duburi industrial belt, has established itself as one of the foremost industrial centres in eastern India. The area hosts a significant concentration of large integrated steel plants, ferro-alloy units, and downstream metal-processing industries. Collectively, these facilities generate substantial and sustained heavy commercial vehicle traffic along the Chandikhole–Bhadrak corridor.

The Kalinga Nagar industrial complex accommodates major steel and ferro-alloy producers, including integrated steel plants, sponge iron units, rolling mills, and power-dependent

industrial facilities. These industries rely extensively on the project corridor for the inbound movement of key raw materials such as iron ore, coal, coke, limestone, and fluxes. The corridor is equally critical for the outbound transportation of finished steel products, billets, slabs, and alloy materials to ports, domestic markets, and downstream manufacturing centres.

With its strong mineral resource base and a readily available skilled workforce, Jajpur district also presents considerable potential for the development of small and medium enterprises (SMEs) and ancillary industries. This growing ecosystem is expected to further reinforce long-term freight demand along the corridor, while strengthening Kalinga Nagar's position as a principal industrial anchor in the region.

Kendujhar (Keonjhar) Mining and Mineral-Based Industrial Profile

Kendujhar district serves as one of the key mineral influence zones for the project corridor. The district is richly endowed with iron ore, manganese, chromite, quartz, and quartzite, and hosts a large cluster of active mines and mineral-processing industries. With nearly 80 operational mines and more than 30 medium and large mineral-based industries, Kendujhar generates substantial multi-axle truck movement and heavy mining traffic throughout the year.

The Joda–Barbil mining belt, located upstream of the project corridor, depends heavily on the Chandikhole–Bhadrak highway for transporting both raw ore and processed minerals to major industrial destinations, including:

- **Kalinga Nagar's steel and metallurgical plants**
- **Industrial hubs in Angul and Talcher**
- **Paradeep Port for export and coastal shipping**

This continuous mining-driven freight movement significantly contributes to the corridor's high traffic volumes, elevated PCU levels, and the prominence of heavy commercial vehicles along the route.

5.6 Recommended Growth Rates of Traffic

Based on the above analysis and after giving due consideration to the entire listed factors, the following overall growth rates are recommended for each category of vehicle as under. Rate of growth is moderated in light of overall regional trend. Growth of Multi-Axle is kept slightly higher as trend of technological advances in logistic industry Favors multi-axle over 2/3 axle carriage. It is also expected that as the economy moves from developing to developed, rate of growth diminishes. Same growth rate is not sustainable for long. Traffic growth has been suitably stepped down for future years.

Growth rates are recommended for three scenarios for sensitivity analysis namely **Optimistic, Pessimistic** and **Most Likely** with a positive and negative variation 0.25% from Most Likely case for corridor in both states.

5.6.1 Recommended Growth Rates of Stretch

Table 5-10 : Recommended Growth Rates Optimistic

Category / Year	FY2027-FY2031	FY2032 – FY2036	FY2037-FY2041	FY2042 – FY2046	FY2047 onwards
Car / Jeep / Van	7.80%	7.00%	6.30%	5.40%	4.50%
Mini LCV	5.20%	4.70%	4.20%	3.70%	3.20%
LCV	5.20%	4.70%	4.20%	3.70%	3.20%
Minibus	2.90%	2.60%	2.40%	2.10%	1.80%

Category / Year	FY2027-FY2031	FY2032 – FY2036	FY2037-FY2041	FY2042 – FY2046	FY2047 onwards
Bus	2.90%	2.60%	2.40%	2.10%	1.80%
Truck - 2 Axle	4.60%	4.20%	3.80%	3.30%	2.80%
3 - Axle	-2.60%	-2.20%	-1.90%	-1.60%	-1.30%
4 - 6 Axle	6.40%	5.80%	5.20%	4.50%	3.80%
7 & above Axle	6.40%	5.80%	5.20%	4.50%	3.80%

Table 5-11 : Recommended Growth Rates Pessimistic

Category / Year	FY2027-FY2031	FY2032 – FY2036	FY2037-FY2041	FY2042 – FY2046	FY2047 onwards
Car / Jeep / Van	7.30%	6.50%	5.80%	4.90%	4.00%
Mini LCV	4.70%	4.20%	3.70%	3.20%	2.70%
LCV	4.70%	4.20%	3.70%	3.20%	2.70%
Minibus	2.40%	2.10%	1.90%	1.60%	1.30%
Bus	2.40%	2.10%	1.90%	1.60%	1.30%
Truck - 2 Axle	4.10%	3.70%	3.30%	2.80%	2.30%
3 - Axle	-3.10%	-2.70%	-2.40%	-2.10%	-1.80%
4 - 6 Axle	5.90%	5.30%	4.70%	4.00%	3.30%
7 & above Axle	5.90%	5.30%	4.70%	4.00%	3.30%

Table 5-12 : Recommended Growth Rates Most Likely

Category / Year	FY2027-FY2031	FY2032 – FY2036	FY2037-FY2041	FY2042 – FY2046	FY2047 onwards
Car / Jeep / Van	7.55%	6.75%	6.05%	5.15%	4.25%
Mini LCV	4.95%	4.45%	3.95%	3.45%	2.95%
LCV	4.95%	4.45%	3.95%	3.45%	2.95%
Minibus	2.65%	2.35%	2.15%	1.85%	1.55%
Bus	2.65%	2.35%	2.15%	1.85%	1.55%
Truck - 2 Axle	4.35%	3.95%	3.55%	3.05%	2.55%
3 - Axle	-2.85%	-2.45%	-2.15%	-1.85%	-1.55%
4 - 6 Axle	6.15%	5.55%	4.95%	4.25%	3.55%
7 & above Axle	6.15%	5.55%	4.95%	4.25%	3.55%

Traffic and revenue have been worked out on the basis of above growths and same is presented in subsequent chapter of report.

CHAPTER 6

TRAFFIC FORECAST

6.1 Traffic Projections

The growth rates recommended in the previous section of the report are used to arrive at traffic projections for future years. Toll plaza wise futuristic traffic projection is given in tables below.

These projections have been done for the following three cases of growth up to the concession period.

1. Most Likely Scenario
2. Pessimistic Scenario
3. Optimistic Scenario

Traffic projections for Most Likely scenario is given as under

Table 6-1 : Total Tollable Traffic @ Toll Plaza -Bhagada Narayanpur At. Km.102+500 (Most Likely Growth Scenario)

Year	Car / Jeep / Van	Mini LCV	LCV	Minibus	Bus	Truck - 2 Axle	3 - Axle	4 - 6 Axle	7 & above Axle	Total Tollable Traffic	PCU (Including Exempted)
2026-27	7002	1449	542	47	1198	1441	1607	5751	6	19042	47976
2027-28	7530	1520	569	49	1230	1504	1561	6104	6	20073	50357
2028-29	7721	1595	579	50	1216	1522	1502	6415	6	20606	51874
2029-30	8304	1674	609	51	1248	1588	1459	6809	6	21748	54521
2030-31	8931	1757	639	52	1280	1657	1418	7227	6	22967	57338
2031-32	9534	1835	667	53	1310	1722	1383	7628	6	24138	60047
2032-33	10177	1917	697	54	1341	1790	1350	8052	6	25384	62925
2033-34	10865	2002	728	55	1373	1861	1317	8499	6	26706	65967
2034-35	11598	2091	760	56	1405	1935	1284	8970	6	28105	69177
2035-36	12381	2184	794	57	1438	2011	1252	9468	6	29591	72578
2036-37	13130	2270	825	58	1469	2083	1226	9936	6	31003	75798
2037-38	13924	2360	858	59	1501	2157	1199	10428	6	32492	79184
2038-39	14767	2453	892	60	1534	2233	1173	10944	6	34062	82743
2039-40	15660	2550	927	61	1566	2313	1149	11486	6	35718	86490
2040-41	16608	2651	964	62	1600	2396	1124	12054	6	37465	90428
2041-42	17463	2742	997	63	1630	2468	1103	12566	6	39038	93972
2042-43	18362	2837	1031	64	1660	2544	1082	13099	6	40685	97672
2043-44	19308	2935	1067	65	1690	2622	1062	13656	6	42411	101542
2044-45	20302	3036	1104	66	1721	2701	1043	14236	6	44215	105577
2045-46	21348	3141	1141	67	1753	2784	1024	14841	6	46105	109796

Table 6-2 : Total Tollable Traffic @ Toll Plaza -Bhagada Narayanpur At. Km.102+500

(Pessimistic Growth Scenario)

Year	Car / Jeep / Van	Mini LCV	LCV	Minibus	Bus	Truck - 2 Axle	3 - Axle	4 - 6 Axle	7 & above Axle	Total Tollable Traffic	PCU (Including Exempted)
2026-27	6985	1445	541	47	1195	1437	1603	5738	6	18996	47859
2027-28	7495	1513	567	48	1223	1496	1553	6076	6	19977	50116
2028-29	7667	1584	577	49	1205	1511	1490	6370	6	20459	51500
2029-30	8227	1658	604	50	1234	1573	1444	6746	6	21542	54003
2030-31	8827	1736	632	51	1264	1637	1399	7144	6	22696	56663
2031-32	9401	1809	658	52	1291	1697	1361	7522	6	23797	59198
2032-33	10012	1885	685	53	1318	1760	1325	7921	6	24965	61885
2033-34	10664	1964	714	54	1346	1825	1289	8341	6	26203	64722
2034-35	11357	2046	744	55	1374	1893	1254	8784	6	27513	67720
2035-36	12095	2132	776	56	1402	1963	1221	9249	6	28900	70881
2036-37	12796	2211	805	57	1429	2028	1191	9684	6	30207	73849
2037-38	13538	2293	835	58	1456	2095	1162	10139	6	31582	76962
2038-39	14324	2378	866	59	1484	2164	1135	10615	6	33031	80233
2039-40	15154	2466	898	60	1512	2235	1107	11114	6	34552	83659
2040-41	16033	2557	931	61	1541	2309	1080	11637	6	36155	87262
2041-42	16819	2639	961	62	1566	2374	1057	12102	6	37586	90470
2042-43	17642	2723	992	63	1591	2441	1036	12586	6	39080	93816
2043-44	18507	2810	1024	64	1616	2509	1014	13090	6	40640	97298
2044-45	19414	2900	1057	65	1642	2579	992	13614	6	42269	100926
2045-46	20365	2993	1091	66	1668	2651	971	14159	6	43970	104706

Table 6-3 : Total Tollable Traffic Toll Plaza -Bhagada Narayanpur At. Km.102+500 (Optimistic Growth Scenario)

Year	Car / Jeep / Van	Mini LCV	LCV	Minibus	Bus	Truck - 2 Axle	3 - Axle	4 - 6 Axle	7 & above Axle	Total Tollable Traffic	PCU (Including Exempted)
2026-27	7018	1452	543	47	1201	1444	1612	5764	6	19087	48090
2027-28	7565	1528	572	49	1236	1511	1570	6133	6	20170	50601
2028-29	7775	1607	584	50	1224	1534	1514	6461	6	20755	52251
2029-30	8381	1691	614	51	1260	1605	1474	6875	6	21957	55051
2030-31	9035	1779	646	52	1297	1679	1436	7314	6	23244	58037
2031-32	9667	1863	677	53	1330	1749	1404	7739	6	24488	60927
2032-33	10344	1951	709	54	1365	1823	1373	8188	6	25813	63996
2033-34	11069	2043	742	55	1401	1900	1343	8663	6	27222	67250
2034-35	11844	2139	776	56	1437	1979	1313	9166	6	28716	70692
2035-36	12673	2240	813	57	1475	2063	1284	9698	6	30309	74352
2036-37	13471	2334	847	58	1510	2141	1259	10201	6	31827	77824
2037-38	14320	2432	883	59	1547	2223	1236	10732	6	33438	81504
2038-39	15222	2534	920	60	1585	2307	1212	11291	6	35137	85375
2039-40	16181	2640	959	61	1623	2395	1189	11878	6	36932	89450
2040-41	17200	2751	999	62	1662	2486	1166	12495	6	38827	93739
2041-42	18129	2853	1036	63	1696	2568	1148	13058	6	40557	97655
2042-43	19108	2959	1073	64	1732	2653	1129	13646	6	42370	101749
2043-44	20139	3068	1113	65	1768	2740	1111	14260	6	44270	106028
2044-45	21227	3182	1154	66	1806	2830	1093	14901	6	46265	110508
2045-46	22373	3300	1197	67	1843	2924	1075	15572	6	48357	115196

CHAPTER 7

FORECAST OF TOLL REVENUE

7.1 General

This chapter presents the tolling rate calculations, categories and toll revenue of the project.

7.2 Discount Categories

As per the Toll Notification (Schedule - R) the discounts and special provisions have been considered. In addition to discounts as per Fee Notification concessionaire has declared special category rates also. Salient features of toll rate structure are given as under

1. Monthly Pass: For frequent users monthly pass would be issued at fee at 2/3rd rate for 50 single journey trips.
2. Multiple Journeys (for Return Trip): Will be charged at 1.5 times single journey.
3. Single Journey: Full single journey toll would be charged to this category of vehicles who are infrequent travellers or whose frequency does not yield any discount from the above categories.
4. Local Discounts: There are several categories of local discounts.
    i) Local Car Jeep Van - Rs. 350 per month (for locals residing within a radius of 20 kms from toll plaza)

Building of inflation and escalation of rate on the basis of WPI are done as per toll notification (Schedule G) as given under as extract from concession agreement.

The formula for determining the applicable rate of fee shall be as follows:-

$$\text{Applicable rate of fee} = \text{base rate} + \text{base rate} \times \left\{ \frac{\text{WPI A-WPI B}}{\text{WPI B}} \right\} \times 0.4$$

Factors of inflation / growth have been incorporated as per Schedule R. WPI are available up to the year 2025-26.

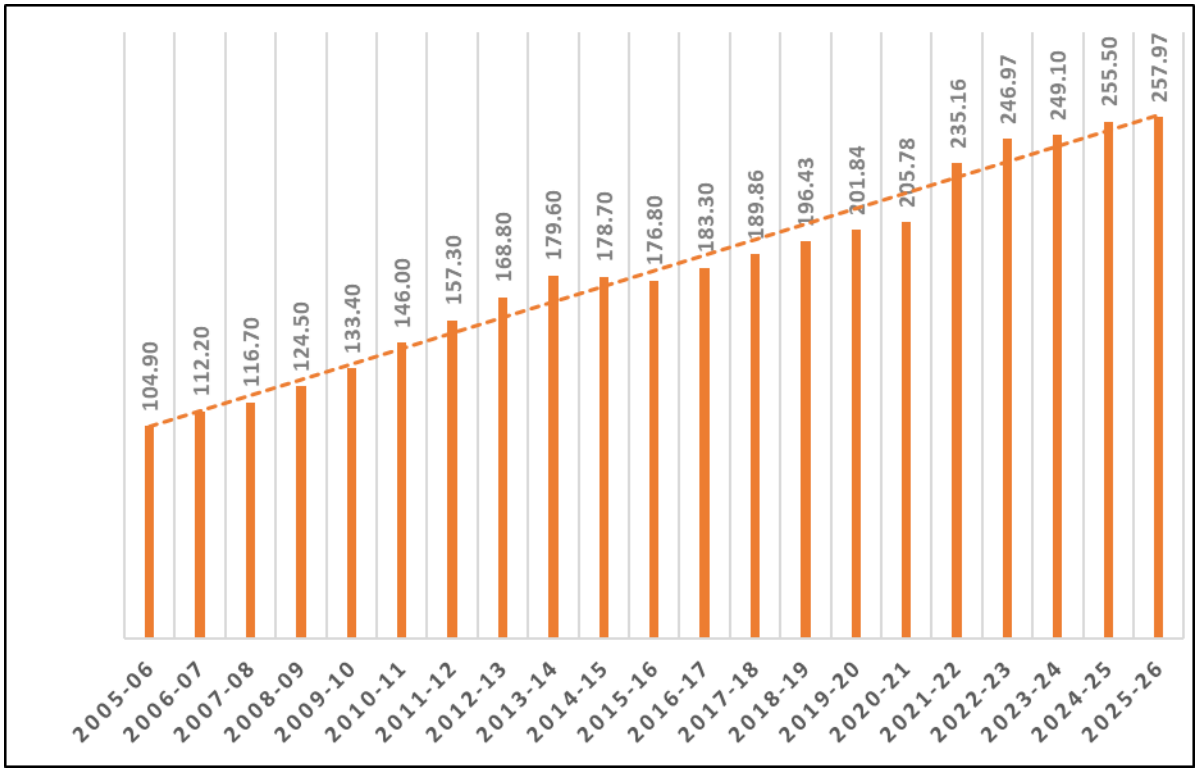

Figure 7-1 : Historical Rate of WPI Inflation in India

The wholesale price index (WPI) and the inflation rate in the past are presented in Table below.

***Table 7-1* : Historical WPI value and Growth Inflation**

December of year	2021	2022	2023	2024	2025	Avg.
WPI	235.2	247.0	249.1	255.5	257.97	
Inflation	14.27%	5.02%	0.86%	2.57%	0.96%	4.74%

WPI of December 2025 is posted on ministry site which is shows 0.96% inflation from the previous year. Same has been applied for FY 2026-27.

The average WPI inflation over the period FY 2021 to FY 2025 works out to approximately 4.74%, reflecting inflationary cycles across both high and low inflation years. Based on this analysis, an annual escalation factor of 4.5% has been adopted for the remaining concession period.

7.3 Estimation of Toll Rates

As per the recent MORTH notification dated January 12, 2011, the following Base rate of fee for the categories mentioned in the table stands true in the National Highways Fee Rules, 2008.

Table 7-2 : Base Toll Rates June 2007-08

Type of Vehicle	Base Rate of Fee / Km (in Rs.)
Car, Jeep, Van or Light Motor Vehicle	0.65
Light Commercial Vehicle, Light Goods Vehicle or Minibus	1.05
Bus or Truck (Two Axles)	2.20
Three Axle Commercial Vehicles	2.40
Heavy Construction Machinery (HCM) or Earth Moving Equipment (EME) or Multi Axle Vehicle (MAV) (4 to 6 axles)	3.45
Oversized Vehicles (7 or more Axles)	4.20

Table 7-3 : Applicable Tolling Length

Length	TP-01 Bhagada Narayanpur
Total Length	102.519
Highway Length	71.387
Structure Length (>INR 60m)	3.113
Bypass Length (>INR 10 Cr)	0.000
Total Linear Length (Km.)	74.500

Toll rates are calculated as per guidelines provided in schedule R (rounded to nearest Rs.) for the concession period and are given below.

Thus, worked out rates for various categories of vehicle and discounts are given as under

Table 7-4 : Toll Rates for Single Journey @ Toll Plaza -Bhagada Narayanpur At. Km.102+500

Year	Car / Jeep / Van	Mini LCV	LCV	Minibus	Bus	Truck - 2 Axle	3 - Axle	4 - 6 Axle	7 & above Axle
2026-27	155	155	250	250	525	525	570	820	1000
2027-28	160	160	260	260	550	550	600	860	1050
2028-29	170	170	275	275	575	575	625	900	1095
2029-30	180	180	285	285	600	600	655	940	1145
2030-31	185	185	300	300	630	630	685	985	1200
2031-32	195	195	315	315	660	660	720	1035	1255
2032-33	205	205	330	330	690	690	750	1080	1315
2033-34	215	215	345	345	720	720	790	1130	1380
2034-35	225	225	360	360	755	755	825	1185	1445
2035-36	235	235	380	380	790	790	865	1240	1515
2036-37	245	245	395	395	830	830	905	1300	1585
2037-38	255	255	415	415	870	870	950	1365	1660
2038-39	270	270	435	435	910	910	995	1430	1740
2039-40	280	280	455	455	955	955	1040	1500	1825
2040-41	295	295	480	480	1000	1000	1095	1570	1910
2041-42	310	310	500	500	1050	1050	1145	1645	2005
2042-43	325	325	525	525	1100	1100	1200	1725	2100
2043-44	340	340	550	550	1155	1155	1260	1810	2205
2044-45	360	360	580	580	1210	1210	1320	1900	2315
2045-46	375	375	605	605	1270	1270	1385	1995	2425

7.4 DP MP Factor

Category-wise DP and MP discount factors provided by the concessionaire for toll plaza revenue forecasting are shown in the table below.

Following factors taken into consideration while derived DP MP factor for all toll plazas.

Table 7-5 : DP MP Factors for all Toll Plazas

Sr. No.	Type of Vehicle	DP MP Factor
1	Car / Jeep / Van	0.83
2	Mini LCV	0.84
3	LCV	0.88
4	Minibus	0.88
5	Bus	0.90
6	Truck - 2 Axle	0.90
7	3 - Axle	0.88
8	4 - 6 Axle	0.91
9	7 & above Axle	0.91

7.5 Toll Revenue

As indicated earlier, toll revenue on the Project Road has been calculated in all three scenarios based on above rates and projected traffic. The estimates of toll revenue under ***Optimistic***, ***Pessimistic*** and ***Most Likely*** growth scenarios are presented in the following section.

7.6 Toll Revenue at all toll plazas under Scenarios

Toll Revenue estimates under all scenarios at each of the toll plaza up to 2045-46 years starting from the year 2026-27 are shown in tables below

Table 7-6 : Toll Revenue Most Likely Scenario

(Rs. Crores)

Year	TP-1 (Bhagada Narayanpur)	Total in Cr
2026-27	272.58	272.58
2027-28	300.14	300.14
2028-29	323.20	323.20
2029-30	355.43	355.43
2030-31	390.54	390.54
2031-32	430.91	430.91
2032-33	470.43	470.43
2033-34	516.16	516.16
2034-35	567.19	567.19
2035-36	624.28	624.28
2036-37	680.98	680.98
2037-38	745.65	745.65
2038-39	817.43	817.43
2039-40	896.77	896.77
2040-41	980.03	980.03
2041-42	1067.66	1067.66
2042-43	1163.44	1163.44
2043-44	1271.96	1271.96
2044-45	1386.17	1386.17
2045-46	1511.11	1511.11

Table 7-7 : Toll Revenue Pessimistic Scenario

(Rs. Crores)

Year	TP-1 (Bhagada Narayanpur)	Total in Cr
2026-27	271.93	271.93
2027-28	298.71	298.71
2028-29	320.92	320.92
2029-30	352.11	352.11
2030-31	386.00	386.00
2031-32	424.88	424.88
2032-33	462.77	462.77
2033-34	506.55	506.55
2034-35	555.32	555.32

Year	TP-1 (Bhagada Narayanpur)	Total in Cr
2035-36	609.82	609.82
2036-37	663.59	663.59
2037-38	724.81	724.81
2038-39	792.75	792.75
2039-40	867.53	867.53
2040-41	945.82	945.82
2041-42	1027.89	1027.89
2042-43	1117.48	1117.48
2043-44	1218.71	1218.71
2044-45	1325.02	1325.02
2045-46	1440.97	1440.97

Table 7-8 : Toll Revenue Optimistic Scenario

(Rs. Crores)

Year	TP-1 (Bhagada Narayanpur)	Total in Cr
2026-27	273.21	273.21
2027-28	301.55	301.55
2028-29	325.51	325.51
2029-30	358.85	358.85
2030-31	395.28	395.28
2031-32	437.15	437.15
2032-33	478.37	478.37
2033-34	526.14	526.14
2034-35	579.50	579.50
2035-36	639.39	639.39
2036-37	699.04	699.04
2037-38	767.30	767.30
2038-39	843.19	843.19
2039-40	927.21	927.21
2040-41	1015.69	1015.69
2041-42	1109.19	1109.19
2042-43	1211.57	1211.57
2043-44	1327.68	1327.68
2044-45	1450.35	1450.35
2045-46	1584.90	1584.90

7.6 Modification in Concession Period

Modification of the concession period shall be done on the basis of Revenue targets given in the contract for milestones 1 ,2 & 3.

Modification in concession period as per provisions of DCA and same is summarized in table for all scenarios.

Pessimistic Case

Target Point 1- March 2031										
Sr. no	**TOT-18**	**Target Revenue (Rs. Crores)**	**Calculated Revenue (Rs. Crores)**	**Difference %**	**If qualifies for Modification in Concession Period**	**Qualifying increment or shortfall**	**Change in Concession period %**	**Remaining Concession Period (Year)**	**Change in Concession period (Year)**	**Modified Concession Period**
1	TP-1 (Bhagada Narayan pur)	30.74	32.31	5.09%	Yes	0.0916 %	-0.0916%	15.01	-0.01	

Target Point 2- March 2036										
Sr. no	**TOT-18**	**Target Revenue (Rs. Crores)**	**Calculated Revenue (Rs. Crores)**	**Difference %**	**If qualifies for Modification in Concession Period**	**Qualifying increment or shortfall**	**Change in Concession period %**	**Remaining Concession Period (Year)**	**Change in Concession period (Year)**	**Modified Concession Period**
1	TP-1 (Bhagada Narayan pur)	46.01	50.80	10.40%	Yes	5.40%	-5.40%	10.01	-0.54	

Target Point 3- March 2041												
Sr. no	**TOT-18**	**Target Revenue (Rs. Crores)**	**Calculated Revenue (Rs. Crores)**	**Difference %**	**If qualifies for Modification in Concession Period**	**Qualifying increment or shortfall**	**Change in Concession period %**	**Remaining Concession Period (Year)**	**Change in Concession period (Year)**	**Total Change in Concession period (Year)**	**Calculated Modified Concession Period**	**Final Concession Period subject to Cap**
1	TP-1 (Bhagada Narayanpur)	70.04	78.92	12.69 %	Yes	7.69%	-7.69%	4.46	-0.34		19.10	

Most likely Case

Target Point 1- March 2031										
Sr. no	**TOT-18**	**Target Revenue (Rs. Crores)**	**Calculated Revenue (Rs. Crores)**	**Difference %**	**If qualifies for Modification in Concession Period**	**Qualifying increment or shortfall**	**Change in Concession period %**	**Remaining Concession Period (Year)**	**Change in Concession period (Year)**	**Modified Concession Period**
1	TP-1 (Bhagada Narayan pur)	30.74	32.69	6.35%	Yes	1.35%	-1.35%	15.01	-0.20	

Target Point 2- March 2036										
Sr. no	**TOT-18**	**Target Revenue (Rs. Crores)**	**Calculated Revenue (Rs. Crores)**	**Difference %**	**If qualifies for Modification in Concession Period**	**Qualifying increment or shortfall**	**Change in Concession period %**	**Remaining Concession Period (Year)**	**Change in Concession period (Year)**	**Modified Concession Period**
1	TP-1 (Bhagada Narayan pur)	46.01	52.01	13.04%	Yes	8.04%	-8.04%	10.01	-0.80	

Target Point 3- March 2041												
Sr. no	**TOT-18**	**Target Revenue (Rs. Crores)**	**Calculated Revenue (Rs. Crores)**	**Difference %**	**If qualifies for Modification in Concession Period**	**Qualifying increment or shortfall**	**Change in Concession period %**	**Remaining Concession Period (Year)**	**Change in Concession period (Year)**	**Total Change in Concession period (Year)**	**Calculated Modified Concession Period**	**Final Concession Period subject to Cap**
1	TP-1 (Bhagada Narayanpur)	70.04	81.79	16.78 %	Yes	11.78 %	-11.78 %	4.46	-0.53		18.47	

Optimistic Case

Target Point 1- March 2031										
Sr. no	**TOT-18**	**Target Revenue (Rs. Crores)**	**Calculated Revenue (Rs. Crores)**	**Difference %**	**If qualifies for Modification in Concession Period**	**Qualifying increment or shortfall**	**Change in Concession period %**	**Remaining Concession Period (Year)**	**Change in Concession period (Year)**	**Modified Concession Period**
1	TP-1 (Bhagada Narayan pur)	30.74	33.09	7.65%	Yes	2.65%	-2.65%	15.01	-0.40	

Target Point 2- March 2036										
Sr. no	**TOT-18**	**Target Revenue (Rs. Crores)**	**Calculated Revenue (Rs. Crores)**	**Difference %**	**If qualifies for Modification in Concession Period**	**Qualifying increment or shortfall**	**Change in Concession period %**	**Remaining Concession Period (Year)**	**Change in Concession period (Year)**	**Modified Concession Period**
1	TP-1 (Bhagada Narayan pur)	46.01	53.28	15.79%	Yes	10.79%	-10.79%	10.01	-1.08	

Target Point 3- March 2041												
Sr. no	**TOT-18**	**Target Revenue (Rs. Crores)**	**Calculated Revenue (Rs. Crores)**	**Difference %**	**If qualifies for Modification in Concession Period**	**Qualifying increment or shortfall**	**Change in Concession period %**	**Remaining Concession Period (Year)**	**Change in Concession period (Year)**	**Total Change in Concession period (Year)**	**Calculated Modified Concession Period**	**Final Concession Period subject to Cap**
1	TP-1 (Bhagada Narayanpur)	70.04	84.78	21.05 %	Yes	16.05 %	-16.05 %	4.46	-0.72		17.81	

TOT-18 -Modification in Concession Period									
Chandikhole-Bhadrakh Section of NH-16									
Types of Scenarios	**Pessimistic Case**			**Most likely Case**			**Optimistic Case**		
Target no.	**Target-1**	**Target-2**	**Target-3**	**Target-1**	**Target-2**	**Target-3**	**Target-1**	**Target-2**	**Target-3**
Target Month	**Mar-30**	**Mar-35**	**Mar-40**	**Mar-30**	**Mar-35**	**Mar-40**	**Mar-30**	**Mar-35**	**Mar-40**
Target Revenue (Rs. Crores)	30.74	46.01	70.04	30.74	46.01	70.04	30.74	46.01	70.04
Calculated Revenue (Rs. Crores)	32.31	50.80	78.92	32.69	52.01	81.79	33.09	53.28	84.78
Difference %	5.09%	10.40%	12.69%	6.35%	13.04%	16.78%	7.65%	15.79%	21.05%
If qualifies for Modification in Concession Period	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Qualifying Increment or shortfall	0.09%	5.40%	7.69%	1.35%	8.04%	11.78%	2.65%	0.11	0.16
Change in Concession period %	-0.09%	-5.40%	-7.69%	-1.35%	-8.04%	-11.78%	-2.65%	-10.79%	-16.05%
Remaining Concession Period (Year)	15.01	10.01	4.46	15.01	10.01	4.46	15.01	10.01	4.46
Change in Concession period (Year)	-0.01	-0.54	-0.34	-0.20	-0.80	-0.53	-0.40	-1.08	-0.72
Change in Concession period in (Days)	**-5**	**-197**	**-125**	**-74**	**-294**	**-192**	**-145**	**-394**	**-261**
Total Change in Concession period	0.00			0.00			0.00		
Calculated Modified Concession Period	19.10			18.47			17.81		
Final Concession Period subject to Cap	0.00			0.00			0.00		

CHAPTER 8

CONCLUSION & RECOMMENDATIONS

8.1 Conclusion & Recommendations

Project road section Chandikhole–Bhadrak stretch of NH-16 is a critical segment of the Golden Quadrilateral and serves as a key north–south and east-coast mobility corridor in Odisha. This section facilitates long-distance movement between major cities such as Kolkata, Bhubaneswar, and Visakhapatnam, along with other important metropolitan and industrial centres in eastern India.There are large number of townships, industrial corridors and other business establishment coming up along project corridor. As discussed, dominant portion of traffic is long route traffic, which is more sensitive towards the growth of national economy. As Indian economy is poised to grow at 7%+ post COVID-19, the project corridor is expected to pick up the same trend in terms of traffic flow. All these developments have potential to give positive impact to traffic flow on project. The following can be considered as major outcomes of the study

a) There is good amount of tollable traffic running on project

b) Project corridor has potential to witness traffic growth @ 6-8% annually in near future due to various development in area and overall development of economy

c) Project corridor has committed traffic as long route traffic and does not run a risk of traffic leakage due to quality competing road

Based on above it can be considered a stable healthy project from traffic and revenue point of view.

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(Group-1 MBEL)

TRAFFIC STUDY & REVENUE PROJECTION REPORT (FINAL)

MAY 2026

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GMD CONSULTANTS ★ NAVI MUMBAI ★

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ABBREVIATIONS

AADT	-	Annual Average Daily Traffic	**NHAI**	-	National Highway Authority of India
BOT	-	Build Operate Transfer	**NHDP**	-	National Highways Development Project
CAGR	-	Compound Annual Growth Rate	**NSDP**	-	Net State Domestic Product
CTV	-	Classified traffic volume	**O&M**	-	Operation & Maintenance
DBFOT	-	Design, Build, Finance, Operate & Transfer	**PCDP**	-	Per Capita Domestic Product
EME	-	Earth Moving Equipment	**PCI**	-	Per Capita Income
GDP	-	Gross Domestic Product	**PCU**	-	Passenger Car Unit
GSDP	-	Gross State Domestic Product	**PSC**	-	Pre-stressed Concrete
HCM	-	Heavy Construction Machinery	**RCC**	-	Reinforced cement concrete
HCV	-	Heavy Commercial Vehicle	**RHS**	-	Right Hand Side
HTMS	-	Highway Traffic Management System	**SH**	-	State Highway
IRC	-	Indian Road Congress	**TP**	-	Toll Plaza
IRR	-	Internal Rate of Return	**WPI**	-	Wholesale Price Index
LCV	-	Light Commercial Vehicle	**SIR**	-	Special Investment Region
LHS	-	Left Hand Side	**c.**	-	Circa
LGV	-	Light Goods Vehicle	**ROB**	-	Railway Over Bridge
MAV	-	Multi Axle Vehicle	**MDR**	-	Major District Road
MORTH	-	Ministry of Road Transport and Highways	**ODR**	-	Other District Road
NH	-	National Highway	**CA**	-	Concession Agreement
PCC	-	Plain Cement Concrete	**RMT**	-	Running Meter
CR	-	Coarse Rubble			

CHAPTER 1

INTRODUCTION

1.1 Background

The Government of Uttar Pradesh had entrusted Uttar Pradesh Expressway Industrial Development Authority (UPEIDA) to develop a six-lane access controlled Expressway extendable to eight lanes from Meerut to Prayagraj under Design Build Finance Operate and Transfer (DBFOT) mode. The total length of project corridor is approximately 594 km.

Figure 1-1: Project Stretch

1.2 Objective of the Study

M/s IRB Infrastructure Developers Limited (IRB) intends to develop a traffic study report for Six lane (Expandable to Eight lane) Greenfield Expressway from Meerut to Prayagraj "Ganga Expressway" (Total length-593.947 km) in the state of Uttar Pradesh. GMD Consultants have been assigned the work of conducting traffic study including revenue model based on traffic projections and forecasts.

For making the proper assessment of traffic volume on project stretch, base year traffic and its projection, GMD Consultants have been provided with the basic survey data and other relevant reports available with clients. The base year traffic data is the primary input for determination of future traffic demand. With a view to estimate the base year traffic volume in different categories of goods and passenger carrying vehicles, the traffic data has been analyzed and complied in this report

The year 2025-26 has been taken as the base year for projections and forecasting of traffic in the horizon year. This report fulfils part of the requirements of the assignment

1.3 Scope of Services

The following may be referred to as broad scope of Traffic Study of Six lane (Expandable to Eight lane) Greenfield Expressway from Meerut to Prayagraj "Ganga Expressway" (Total length-593.947 km) in the state of Uttar Pradesh.

Classified Traffic Volume Count at main toll plaza location at Toll Plaza locations. This data was supplied by the Concessionaire.

- Establishment of traffic pattern
- Working our traffic demand elasticity and growth
- Traffic forecast up to concession period.
- Preparation of revenue model up to concession period
- Any other analysis relevant to scope

CHAPTER 2
PROJECT DETAILS

2.1 Project Corridor Description

The project corridor starts from Meerut and ends at Parayagraj passing through the districts of Meerut, Hapur, Bulandshahr, Amroha, Sambhal, Budaun, Shahjahapur, Hardoi, Unnao, Raebarelli, ParaGard and Prayagraj. Figure 2-1 shows the alignment of project corridors.

2.2 Concept of Tolling based on entry & exit in the Project corridor

The total Project Corridor has 21 nodes. Nodes are entry exit points or interchange points at which the traffic could enter and exit the Project Corridor or traffic interchanges between two Groups of the Project Corridor. The division of project corridor into groups. The nomenclature from A to U in the figure below describes these points on the project corridor. The toll fee paid by the user is based on length of section the user uses.

The following figure shows the alignment of the project corridor in above context.

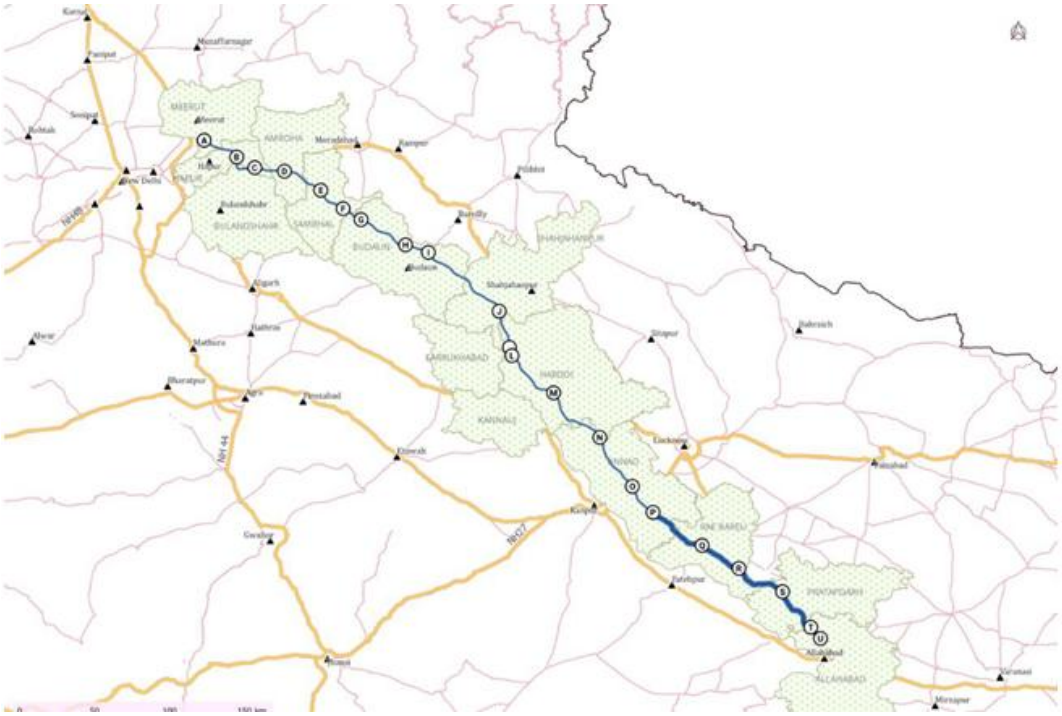

Figure 2-1 : Districts of Project corridor

2.3 Strategic location of Project corridor

Distance advantage from competing Highways

Old NH-24, NH-19, NH-34, Yammuna-Expressway and Agra Lucknow Expressway and NH-34 are important parallel roads to the project corridor. The project corridor shortens the distance between Merrut to Prayagraj by 74 Km from Old NH-24 and 120 km from NH-19. Figure 1-2 Shows location of project highways vis-à-vis other competing highways. In the figure it could be seen competing highways of NH-19 and old NH-24 have a curvature in the alignment while the alignment of Ganga Expressway is straight. Table 1-2 compares the distance between project corridor and important OD pairs where Ganga Expressway is shorter in length.

Network of Expressways with Ganga Expressway

With North linkages and Eastern Linkages, the Ganga Expressway gets connected from Jammu & Kashmir/Uttarakhand upto Bihar-Uttar Pradesh border. This is described in following subsections.

North Linkages of Ganga Expressway (Meerut & Hapur end)

1. Delhi-Amritsar-Katra Expressway links Katra in Jammu and Kashmir to Western Peripheral Expressway via Amritsar, Ludhiana and Jind
2. Kundli-Manesar Expressay (Western Peripheral Expressway) links to Eastern Peripheral Expressway.
3. Link of Ganga-Expressway with Eastern Peripheral Expressway links it with Ganga Expressway. The connection of Ganga Expressway becomes seamless with Jammu & Kashmir and Punjab.
4. Haridwar link of Ganga Expressway is also proposed that it would connect Garhwal region of Uttarakhand with Ganga Expressway
5. Delhi-Dasna-Hapur is 8 lane expressway that connects Delhi to Hapur. There is one node (node B) of Ganga Expressway at Hapur.

Eastern Linkages of Ganga Expressway (Meerut & Hapur end)

1. The Ganga-Expressway forms a seamless connection with other existing and proposed expressways. Agra-Lucknow Expressway intersects the project corridor at node N. Through node N Ganga Expressway connects to Lucknow and further to Purvanchal Expressway and NH-27. This forms a connection to Ganga Expressway to Purvanchal region of Uttar Pradesh, North Bihar and North Eastern States. Agra-Lucknow expressway and NH-21 is also likely to feed traffic from Rajasthan to Eastern parts of India (South Bihar, Jharkhand, Odhisa) at node N.
2. It is proposed in future that Ganga-Expressway would be extended from

Prayagraj upto Ballia via Varanasi. These connections will increase the network length of expressway and would complement the traffic of project corridors.

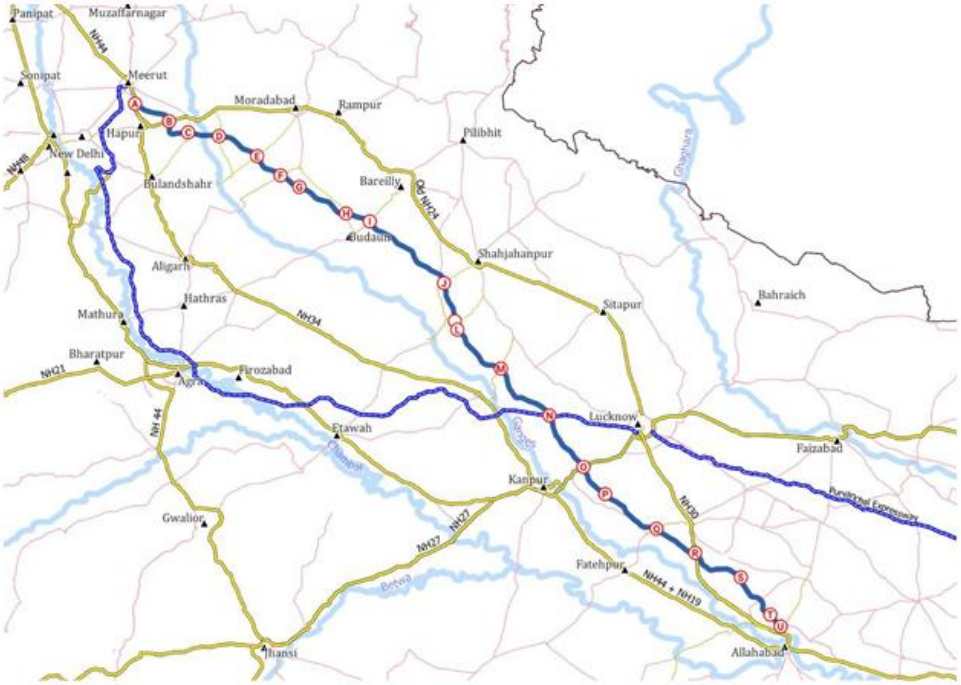

Figure 2-2 : Project corridor and Highways in the vicinity

2.4 Advantage of Expressway over National Highway

The expressway because of higher design speed result in time savings of user and because of less curvatures, better riding quality, absence of non tollable modes, access control result in lower operating cost of the vehicle. All these factors are captured in Road User Cost analysis of Section 3.5. One of the significant advantages of expressway over National Highway is absence of non tollable modes like two wheeler, three-wheeler, non-motorized vehicles which ply on National Highways and State Highway. In National Highways and State Highways because of ribbon development occurring along the Highways friction causing factors like non tollable increase in number. Figure 1-3 shows the percentage PCU of motorized non tollable mode at various locations of parallel highways. It could be seen that at Brijghat toll plaza and Niyamatpur Toll Plaza of old NH-24 that lie in the vicinity of project corridor the percentage contribution of PCU of non-tollable mode is 14.1% and 22.5% respectively. In the State Highways in the vicinity of Project corridor the contribution is even higher and goes as high as 45.8% at SH-51. These non tollable modes along with non-motorized modes become impediment to the movement of tollable modes. Moreover, there percentage share is likely to increase with growing habitation near National Highway and State Highway.

2.5 Group of Project corridor

The Project Corridor is divided into four groups in RFQ cum RFP documents. The following sections describes each group of Project Corridor. The tolling of the project is

based on length traversed from entry and exit points. The description of groups is provided in following sub sections.

Group -1:

Group 1 of Project Corridor starts in district of Meerut and ends at Budaun. It starts at node A and ends at node G. The length of Group 1 is 129.7 km.

Group -2:

Group 2 of Project Corridor starts in district of Budaun and ends at Hardoi. It starts at node G and ends at node L. The length of Group 2 is 151.7 km.

Group -3:

Group 3 of Project Corridor starts in district of Hadoi and ends at Unnao. It starts at node L and ends at node P. The length of Group 3 is 155.7 km.

Group -4:

Group 4 of Project Corridor starts in district of Unnao and ends at Prayagraj. It starts at node L and ends at node P. The length of Group 4 is 156.847 km.

IRB Infrastructure Trust has been appointed for operation and maintenance of Group -1 of project corridor (Meerut to Budaun) MBEL. This report contains traffic study of Group-1 of project corridor of Ganga Expressway.

The following figures show details of Group -1 of project corridor.

Figure 2-3 : Project corridor and Highways in the vicinity

Following photographs illustrate project section along the corridor.

Figure 2-4 : Photographs showing Project Corridor

CHAPTER 3

TRAFFIC SURVEYS AND ANALYSIS

3.1 Traffic Surveys

The Consultants have collected the required information for project corridor to understand the general traffic and travel characteristics on the corridor.

The following traffic data has been collected from a client for a project.

- Classified traffic volume counts at toll plaza locations of Group-1 (MBEL) on Six lane (Expandable to Eight lane) Greenfield Expressway from Meerut to Prayagraj "Ganga Expressway" (Total length-593.947 km) in the state of Uttar Pradesh Provided by Concessionaire for base year 2025-26.
- Local Component of traffic
- Component of Return Journey
- Component of Monthly Pass Journey

The main objective of the traffic data analysis is to:

- Determine the existing traffic movement characteristics of the project
- Establish base year traffic
- Identification of travel patterns and modal split of project traffic
- Deriving growth factors for traffic forecasting
- Estimation of corridor traffic including traffic diversion if any
- Preparation of revenue model and projection of revenue as per toll policy for various scenarios

3.2 Classified Traffic Volume

The objective of conducting a Classified Traffic Volume Count is to understand the traffic flow pattern including modal split on a roadway. The Classified Traffic Volume Count survey has been provided by the concessionaire of project highway from actual traffic data gathered at toll plaza locations-based traffic survey done at project stretch.

The vehicles can broadly be classified into fast moving / motorized and slow moving / non-motorized vehicles, which can be further classified into specific categories of vehicles. The groupings of vehicles are further segregated to capture the tollable vehicle categories specifically and toll exempted vehicles are counted separately. The detailed vehicle classification system as per IRC: 64-1990 is given in table below .

Table 3-1 : Vehicle Classification System

Vehicle Type	
Auto Rickshaw	
Passenger Car	Car, Jeep, Taxi & Van (Old / new technology)
Bus	Minibus
	Standard Bus
Truck	Light Goods Vehicle (LCV)
	2 – Axle Truck
	3 Axle Truck (HCV)
	Multi Axle Truck (4-6 Axle)
	Oversized Vehicles (7 or more axles)
Other Vehicles	Agriculture Tractor, Tractor & Trailer

Source - IRC: 64 – 1990

However, since the project highway is currently under toll operation, the data collected corresponds to the category of tollable vehicles. The following are the types of vehicles as per concession agreement.

- Car / Jeep / van
- Minibus /LCV
- Bus
- Truck /
- 3 Axle commercial vehicle
- Multi Axle

3.3 Traffic Characteristic

Toll revenue of project highway does not solely depend on traffic volume. There are certain characteristics of traffic which have substantial potential to affect toll collection. Component of local traffic, component of passenger and commercial traffic, portion of return journey traffic, % of monthly pass traffic are some of such characteristics of traffic. These will be discussed in subsequent sections of report.

3.3.1 Traffic Data

Project Concessionaire has provided category-wise traffic data for FY 2025–26, classified by Journey type, namely Single Journey, Return Journey, Monthly Pass and Exempted vehicles.

Table 3-2 : Category-wise Traffic Data for Base FY 2025–26

Sr. No.	Types of vehicles	Total tollable traffic
1	Car, Jeep, Van, LMV	7085
2	LCV, LGV	2013
3	Bus	1341
4	2 Axle Truck	924
5	3 Axle Truck	1024
6	MAV	2322
	Total	**14710**

3.4 Data Analysis

3.4.1 Analysis of Traffic Volume Count

Understanding the character of existing traffic forms the basis of the traffic forecast. The various vehicle types having different sizes and characteristics can be converted into a single unit called Passenger Car Unit (PCU). Passenger Car equivalents for various vehicles are adopted based on recommendations of Indian Road Congress prescribed in "IRC-64-1990: Guidelines for Capacity of Roads in Rural areas". The adopted passenger car unit values (PCU) are presented in Table 3-3.

Table 3-3 : PCU Factors Adopted for Study

Vehicle Type	PCUs
Car	1.0
Minibus	1.5
Standard Bus	3.0
LCV/LGV	1.5
2 Axle Truck	3.0
3 – 6 Axle Truck	4.5
MAV	4.5
Auto Rickshaw	1.0
Van/Tempo	1.0
Agriculture Tractor with Trailer	4.5

Vehicle Type	PCUs
Agriculture Tractor without Trailer	1.5

Source: IRC: 64-1990

Traffic volume at each toll plaza was converted to PCU and same is presented as under

Table 3-4 : Traffic in PCU at Project Stretch

Year	Total Tollable traffic at all toll plaza	Total PCU including Exp. (Entry + Exit)
2025– 2026 (Base Year)	14710	61815

3.4.2 Components of Traffic

As discussed previously, components of traffic volume play an important role in determining project revenue. A larger component of commercial traffic with higher axle configuration adds to project revenue positively. Similarly, a larger component of local traffic affects the project revenue potential negatively.

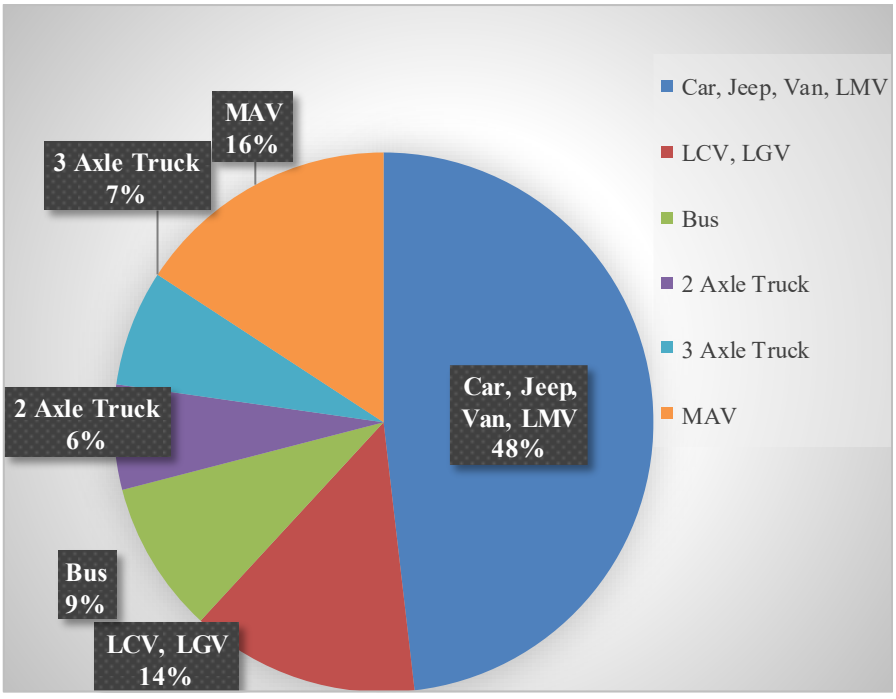

Figure 3-1: Model split of total tollable vehicle of all toll plaza FY 2025-26

It is observed that car traffic constitutes approximately 48% of the total traffic across all toll plazas. Multi-axle commercial vehicles account for about 23% of the overall traffic volume, while trucks/buses and light commercial vehicles (LCVs) contribute nearly 15% and 14% of the total traffic, respectively.

Another important bifurcation of traffic is components of traffic with respect to various type of toll ticketing like

1. Single Journey
2. Multi Journey
3. Monthly Pass
4. Exemptions

Table 3-5 : Journey Type Bifurcation of Traffic

Sr. No.	Type	Traffic Volume (Nos)
1	Single Journey	13073
2	Return Journey	1277
3	Monthly Pass	359
4	Exemptions	402

Most dominant part of the above is the single journey type followed by return journey at
project stretch. Monthly pass commuters are a very low fraction of the total traffic on the
project corridor.

Single Journey traffic forms the dominant share of total traffic at about 87% across all toll plazas, followed by Return Journey traffic at around 8%, while 2% traffic has been observed under the Monthly Local Pass category & 3% is exempted traffic at any of the toll plazas.

CHAPTER 4
GROWTH OF TRAFFIC ON PROJECT HIGHWAY

4.1 Introduction

Traffic growth is a function of the interplay of a number of contributory factors such as National economy, Government policy, socio-economic conditions of the people, and changes in land uses along the project corridor precincts etc. As these factors have a number of uncertainties associated with them, forecasts of traffic are dependent on the projections of other factors such as population, gross domestic product (GDP), vehicle ownership, per capita income (PCI), agricultural output, fuel consumption etc. Future patterns of change in these factors can be estimated with only a reasonable degree of accuracy and hence the resultant traffic forecast levels may not be precise.

Traffic growth forecast for project corridor is Greenfield expressway from Meerut to Prayagraj "Ganga Expressway" has been done taking the above factors into consideration. "**IRC: 108-2015-Guidelines for Traffic Prediction on Rural Highways**" is established best practice and has been used for traffic growth forecast.

4.2 Trend Analysis

One of the methods of estimation of future rate of growth is to assume the same rate of growth as in the past. Although such a method is more suitable for projects of short durations say 5-10 years, however for long term projections it would be erroneous to assume that the past rate of growth will continue to prevail for a long time in future. Economic conditions, which are major influencing factors, are bound to change over a long period of time. Thus, it would be necessary to modify the past trends of growth suitably.

Elasticity model of growth projection is one of the most widely acceptable methods for traffic forecasts. The same is recommended in **IRC: 108-12015-Guidelines for Traffic Prediction on Rural Highways**.

In this method the past trend of vehicular data is paired with an economic indicator, and a regression analysis is done to yield the economic model of growth. Growth of vehicle traffic varies for different types of vehicles. It is a proven fact that the growth pattern for passengers and goods vehicles is different. Traffic growth on any highway typically depends on a number of economic parameters. Most important and direct parameters are given as under

- Per Capita Income
- Net State Domestic Product (NSDP)
- Population

It can be observed that the ownership of a car is more closely related to affordability; hence per capita is the index which closely fits the growth of car traffic among other criteria. In a similar fashion, the following can be pairs of vehicle type and independent variable for elasticity modeling of growth.

- Car / Jeep – Par Capita Income
- Bus / Minibus – Population
- Goods Vehicle – NSDP

4.3 Estimation of Traffic Demand Elasticity

Elasticity of traffic demand is defined as the rate at which traffic intensity varies due to a change in the corresponding indicator selected. Hence, In order to estimate the elasticity of traffic demand, it is necessary to establish relationship between the growth in number of given category of vehicles with the relevant economic variable considered, such as NSDP, per capita income and population growth. Latest available data for vehicle registration, per capita income, NSDP and population is used in analysis.

As per IRC: 108-1996 the model for estimating elasticity index for the project corridor is of the following form and is given as below:

Log (P) = k x Log (EI) + A

Where,

P = Number of Vehicles (Mode wise)

EI = Economic Indicator

A = Regression constant

k = Elasticity coefficient (Regression coefficient)

The elasticity for car and bus (passenger vehicles) is calculated based on the Population and Per Capita Domestic Product (PCDP) and the elasticity for trucks is calculated based on the Net State Domestic Product (NSDP).

The project corridor spreads across state in Uttar Pradesh. Project traffic has share of majorly states like Uttar Pradesh, Madhya Pradesh and Bihar. For elasticity calculations, working data from these states also has been analysed.

Following tables and graphs depict regression and elasticity of growth model for stretch falling in Uttar Pradesh State.

Table 4-1 : Per Capita Income Vs. Car- Uttar Pradesh

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2011	32002	1108100	4.51	6.04		
2012	32908	1205374	4.52	6.08	3%	
2013	34044	1423020	4.53	6.15	3%	
2014	34583	1572217	4.54	6.20	2%	
2015	36973	1746117	4.57	6.24	7%	
2016	40847	2027972	4.61	6.31	10%	
2017	41832	2195783	4.62	6.34	2%	

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2018	43670	2439845	4.64	6.39	4%	
2019	44618	27,94,390	4.65	6.45	2%	4.3%

Regression analysis of above is given in following figure.

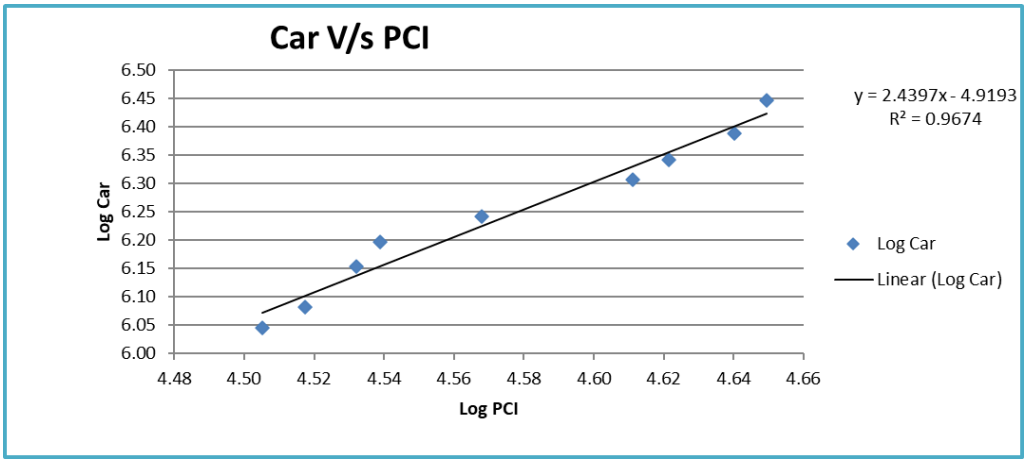

Figure 4-1 : Regression Analysis Car Vs. PCI Uttar Pradesh

Table 4-2 : Population Vs. Bus- Uttar Pradesh

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth
2011	199812000	57901	8.30	4.76		
2012	203670000	64147	8.31	4.81	2%	
2013	206322000	74389	8.31	4.87	1%	
2014	209577000	80460	8.32	4.91	2%	
2015	212832000	89127	8.33	4.95	2%	
2016	216870000	112020	8.34	5.05	2%	
2017	219510000	112766	8.34	5.05	1%	
2018	222150000	121975	8.35	5.09	1%	
2019	224979000	131775	8.35	5.12	1%	1.5%

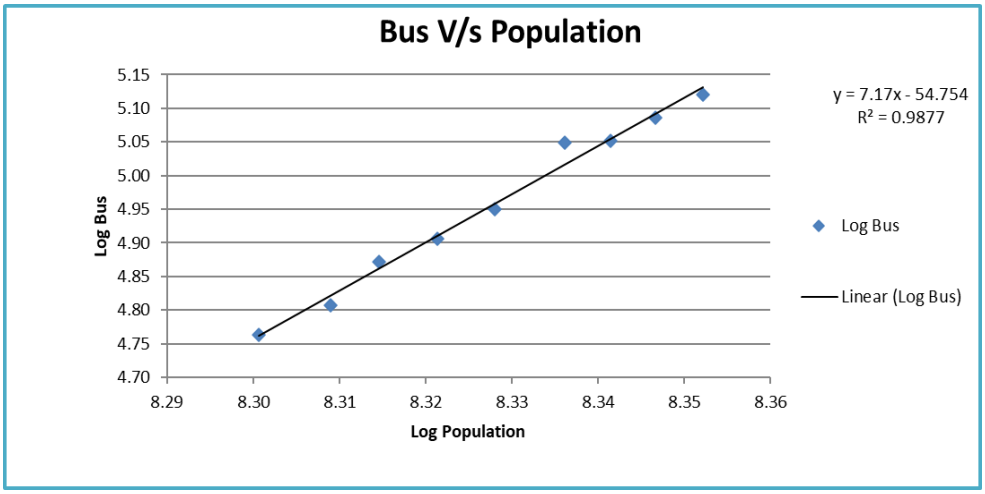

Figure 4-2 : Regression Analysis Population Vs. Bus Uttar Pradesh

Table 4-3 : NSDP Vs. Truck- Uttar Pradesh

Year	NSDP	Trucks	Log NDSP	Log Truck	NSDP Growth	Average Growth (5 Year)
2011	64513155	162813	7.81	5.21		
2012	67355218	186404	7.83	5.27	4%	
2013	70746910	202761	7.85	5.31	5%	
2014	72968630	217609	7.86	5.34	3%	
2015	79204874	245688	7.90	5.39	9%	
2016	88845325	265167	7.95	5.42	12%	
2017	92380571	307096	7.97	5.49	4%	
2018	97915937	356828	7.99	5.55	6%	
2019	101573466	376828	8.01	5.58	4%	5.9%

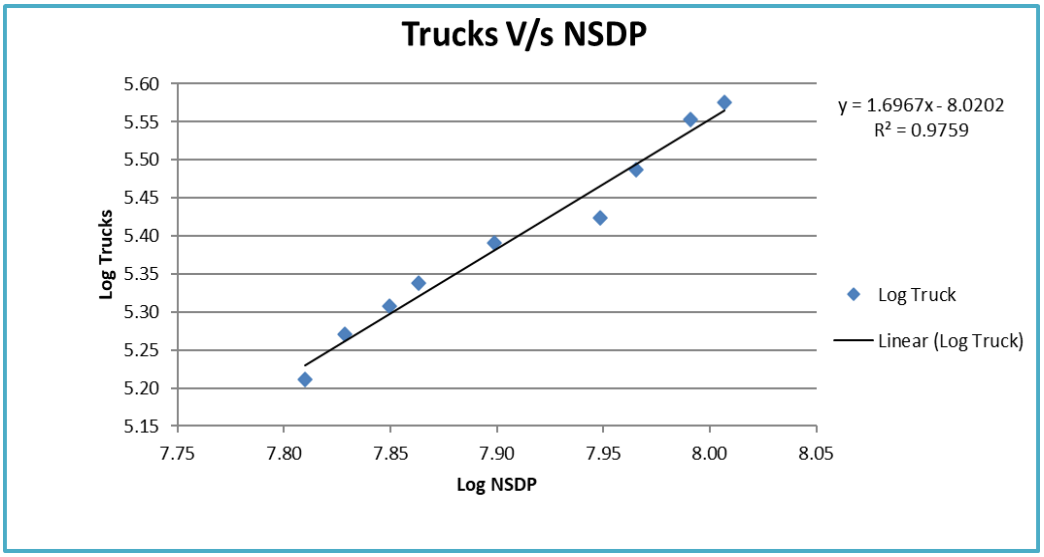

Figure 4-3 : Regression Analysis NSDP Vs. Truck Uttar Pradesh

Summary of regression analysis for elasticity and growth estimation for Uttar Pradesh are given in following table.

Table 4-4 : Summary Regression Analysis- Uttar Pradesh

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average IV Growth (5yrs)	Growth Elastic Model	Remarks
UTTAR PRADESH	**Car/Jeep**	PCI	y = 2.4397x - -4.9193	R^2 = 0.9674	2.4	4.3%	10.44%	Good Regression
	Bus	Population	y = 7.17x - -54.7542	R^2 = 0.9877	7.2	1.5%	10.71%	Good Regression
	Truck	NSDP	y = 1.6967x - -8.0202	R^2 = 0.9759	1.7	5.9%	9.97%	Good Regression

Similarly, regression tables and graphs of economic model for Delhi are given as below.

Table 4-5 : Per Capita Income Vs. Car- Delhi

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2011	185001	2172069	5.27	6.34		
2012	192220	2416974	5.28	6.38	4%	
2013	200702	2568380	5.30	6.41	4%	
2014	213669	2730071	5.33	6.44	6%	

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2015	233115	2986579	5.37	6.48	9%	
2016	244255	3061817	5.39	6.49	5%	
2017	252960	3087309	5.40	6.49	4%	
2018	260967	3249670	5.42	6.51	3%	
2019	274671	33,11,579	5.44	6.52	5%	5.1%

Regression analysis of above is given in following figure.

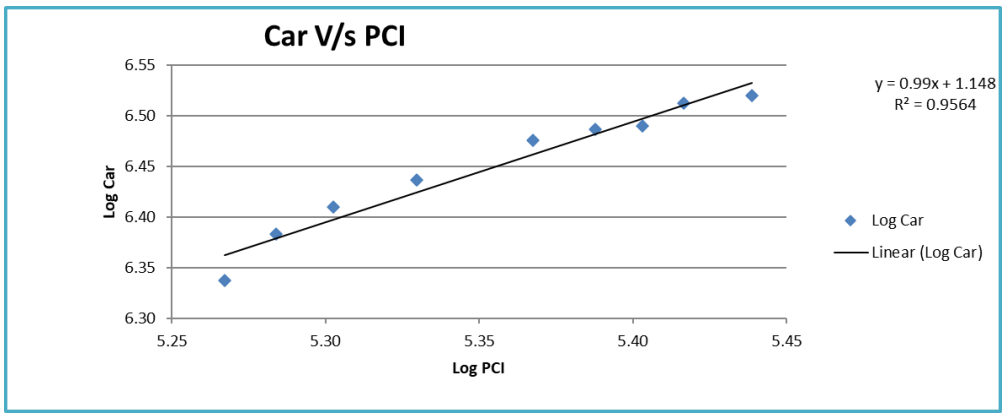

Figure 4-4 : Regression Analysis Car Vs. PCI Delhi

Table 4-6 : Population Vs. Bus- Delhi

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth
2011	16788000	20142	7.22	4.30		
2012	17166000	21142	7.23	4.33	2%	
2013	17544000	22592	7.24	4.35	2%	
2014	17921000	24292	7.25	4.39	2%	
2015	18299000	25492	7.26	4.41	2%	
2016	18677000	26912	7.27	4.43	2%	
2017	19056000	28912	7.28	4.46	2%	
2018	19435000	32112	7.29	4.51	2%	
2019	19814000	36612	7.30	4.56	2%	2.1%

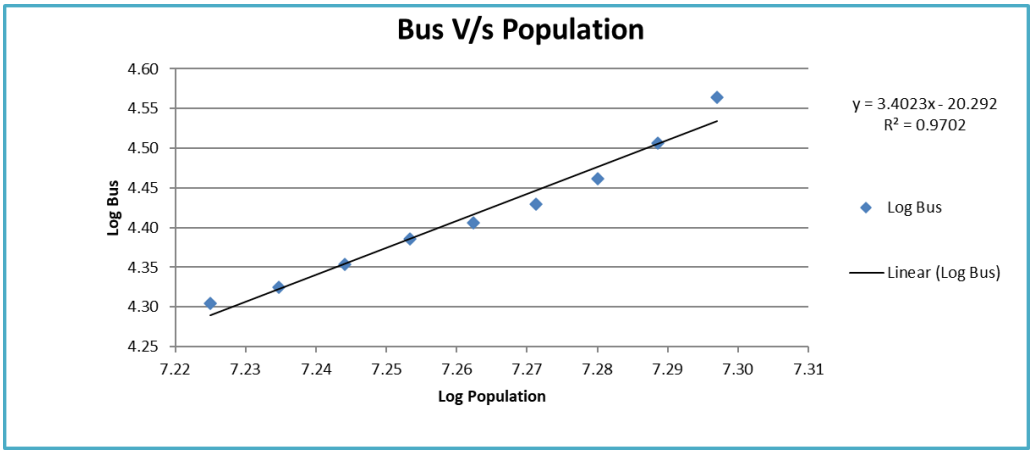

Figure 4-5 : Regression Analysis Population Vs. Bus Delhi

Table 4-7 : NSDP Vs. Truck- Delhi

Year	NSDP	Trucks	Log NDSP	Log Truck	NSDP Growth	Average Growth (5 Year)
2011	31465002	181159	7.50	5.26		
2012	33419330	206159	7.52	5.31	6%	
2013	35652751	231159	7.55	5.36	7%	
2014	38763874	256159	7.59	5.41	9%	
2015	43172959	281159	7.64	5.45	11%	
2016	46159238	293159	7.66	5.47	7%	
2017	48763115	305159	7.69	5.48	6%	
2018	51295715	317159	7.71	5.50	5%	
2019	55030297	329159	7.74	5.52	7%	7.3%

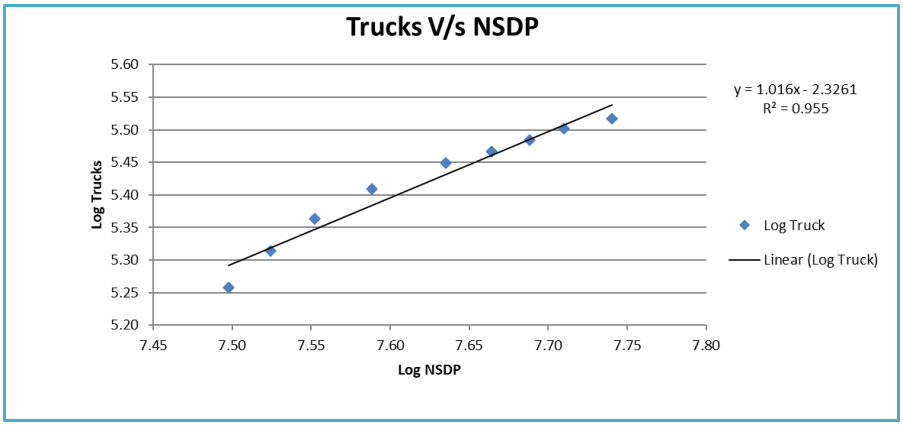

Figure 4-6 : Regression Analysis NSDP Vs. Delhi

Summary of regression analysis for elasticity and growth estimation for Delhi are given in following table.

Table 4-8 : Summary Regression Analysis- Delhi

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average IV Growth (5yrs)	Growth Elastic Model	Remarks
DELHI	**Car/Jeep**	PCI	y = 0.99x - 1.148	R^2 = 0.9564	0.9900	5.08%	5.03%	Good Regression
	Bus	Population	y = 3.4023x - -20.2917	R^2 = 0.9702	3.4023	2.09%	7.12%	Good Regression
	Truck	NSDP	y = 1.016x - -2.3261	R^2 = 0.955	1.0160	7.25%	7.37%	Good Regression

Similarly, regression tables and graphs of economic model for Madhya Pradesh are given below.

Table 4-9 : Per Capita Income Vs. Car- Madhya Pradesh

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2011	38497	424644	4.59	5.63		
2012	41142	493412	4.61	5.69	7%	
2013	42548	555461	4.63	5.74	3%	
2014	44027	637626	4.64	5.80	3%	
2015	47351	820391	4.68	5.91	8%	
2016	52782	869777	4.72	5.94	11%	
2017	54829	982124	4.74	5.99	4%	
2018	57401	994624	4.76	6.00	5%	
2019	62236	12,28,865	4.79	6.09	8%	6.2%

Regression analysis of above is given in following figure.

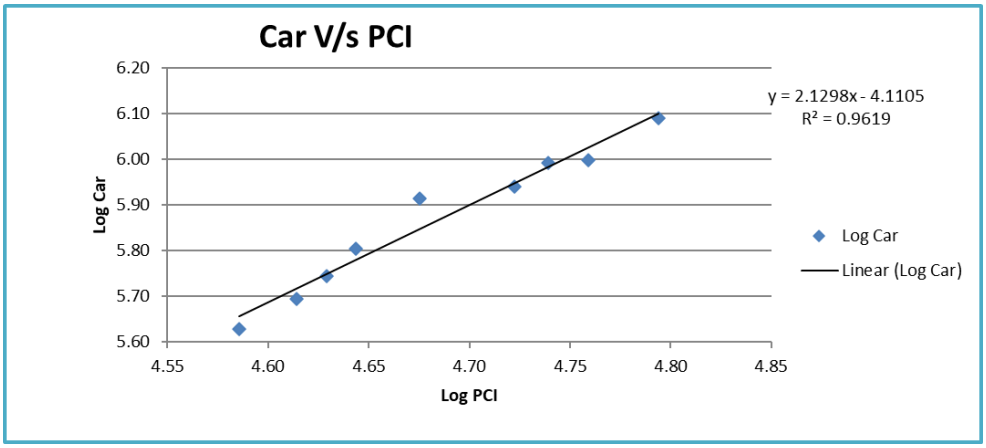

Figure 4-7 : Regression Analysis Car Vs. PCI Madhya Pradesh

Table 4-10 : Population Vs. Bus- Madhya Pradesh

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth
2011	72627000	40551	7.86	4.61		
2012	73863000	40633	7.87	4.61	2%	
2013	75099000	42636	7.88	4.63	2%	
2014	76334000	45976	7.88	4.66	2%	
2015	77570000	167467	7.89	5.22	2%	
2016	78806000	189118	7.90	5.28	2%	
2017	79948000	195102	7.90	5.29	1%	
2018	81090000	213643	7.91	5.33	1%	
2019	82232000	234643	7.92	5.37	1%	1.6%

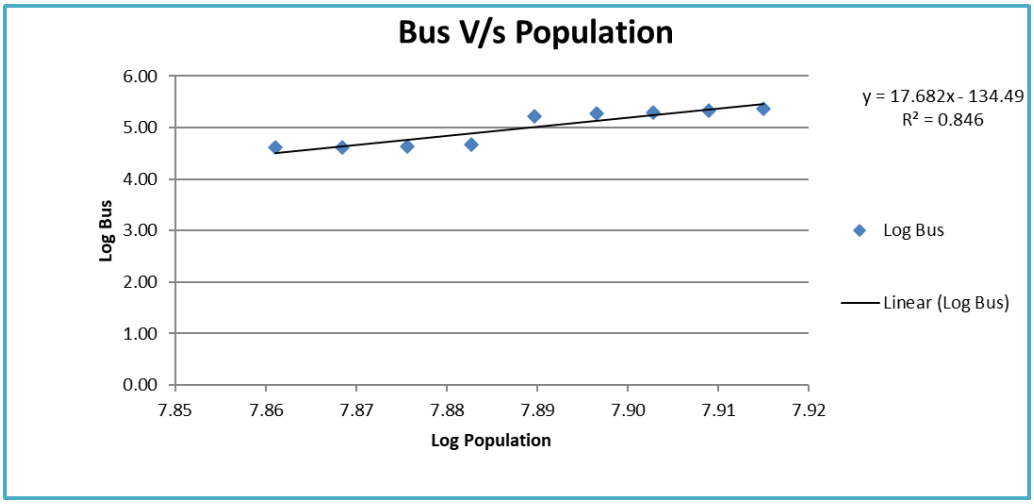

Figure 4-8 : Regression Analysis Population Vs. Bus Madhya Pradesh

Table 4-11 : NSDP Vs. Truck- Madhya Pradesh

Year	NSDP	Trucks	Log NDSP	Log Truck	NSDP Growth	Average Growth (5 Year)
2011	28237104	162813	7.45	5.21		
2012	30685334	186404	7.49	5.27	9%	
2013	32259760	202761	7.51	5.31	5%	
2014	33924690	217609	7.53	5.34	5%	
2015	37071567	245688	7.57	5.39	9%	
2016	41946525	265167	7.62	5.42	13%	
2017	44200243	307096	7.65	5.49	5%	
2018	46928896	356828	7.67	5.55	6%	
2019	51592278	376828	7.71	5.58	10%	7.9%

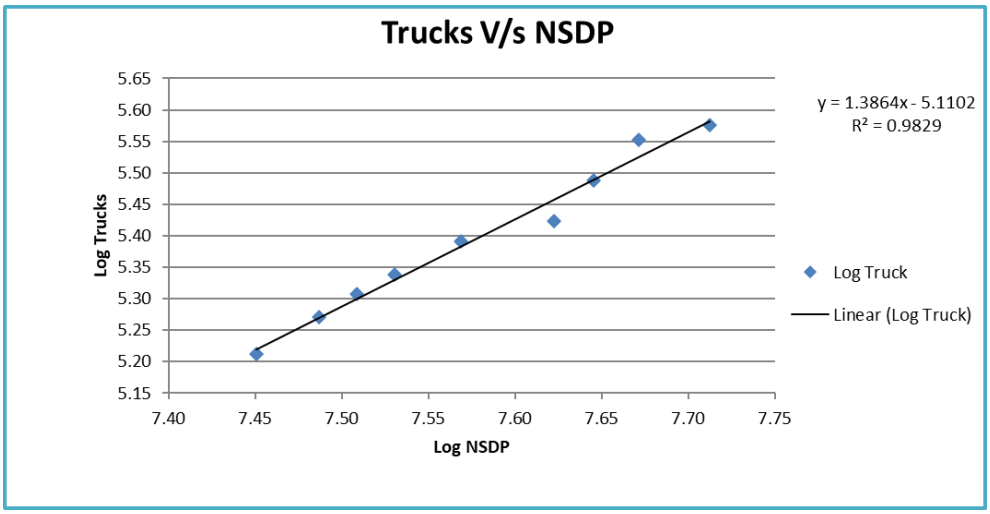

Figure 4-9 : Regression Analysis NSDP Vs. Madhya Pradesh

Summary of regression analysis for elasticity and growth estimation for Madhya Pradesh are given in following table.

Table 4-12 : Summary Regression Analysis- Madhya Pradesh

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average IV Growth (5yrs)	Growth Elastic Model	Remarks
MADHYA PRADESH	**Car/Jeep**	PCI	y = 2.8326x - - 8.2166	R^2 = 0.9031	2.8326	4.23%	11.98%	Good Regression
	Bus	Population	y = 7.9151x - - 54.4444	R^2 = 0.9788	7.9151	0.92%	7.31%	Good Regression
	Truck	NSDP	y = 3.3662x - - 19.8275	R^2 = 0.9093	3.3662	5.59%	18.83%	Good Regression

Similarly, regression tables and graphs of economic models for Bihar are given as below.

Table 4-13 : Per Capita Income Vs. Car- Bihar

Year	PCI	Car	Log PCI	Log Car	PCI Growth	Average Growth
2011	21750	160340	4.34	5.21		
2012	22201	184792	4.35	5.27	2%	
2013	22776	208205	4.36	5.32	3%	
2014	23223	235762	4.37	5.37	2%	
2015	24064	266512	4.38	5.43	4%	
2016	25455	300082	4.41	5.48	6%	
2017	26719	349947	4.43	5.54	5%	
2018	29092	404481	4.46	5.61	9%	
2019	30621	4,64,204	4.49	5.67	5%	4.4%

Regression analysis of above is given in following figure.

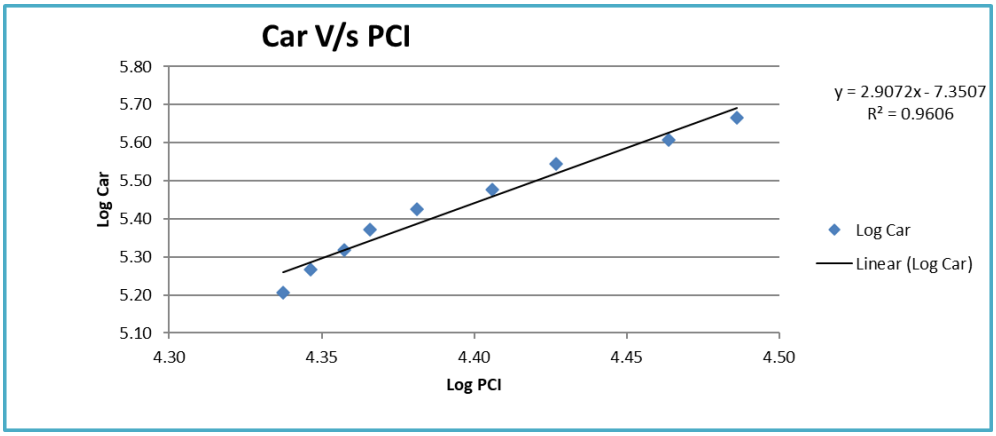

Figure 4-10 : Regression Analysis Car Vs. PCI Bihar

Table 4-14 : Population Vs. Bus- Bihar

Year	Population	Buses	Log Pop	Log Bus	Pop Growth	Average Growth
2011	105615000	24097	8.02	4.38		
2012	106115000	25992	8.03	4.41	0%	
2013	108130000	27638	8.03	4.44	2%	
2014	110145000	29384	8.04	4.47	2%	
2015	112161000	31075	8.05	4.49	2%	
2016	114176000	33751	8.06	4.53	2%	
2017	115957000	36584	8.06	4.56	2%	
2018	117739000	39618	8.07	4.60	2%	
2019	119520000	42118	8.08	4.62	2%	1.6%

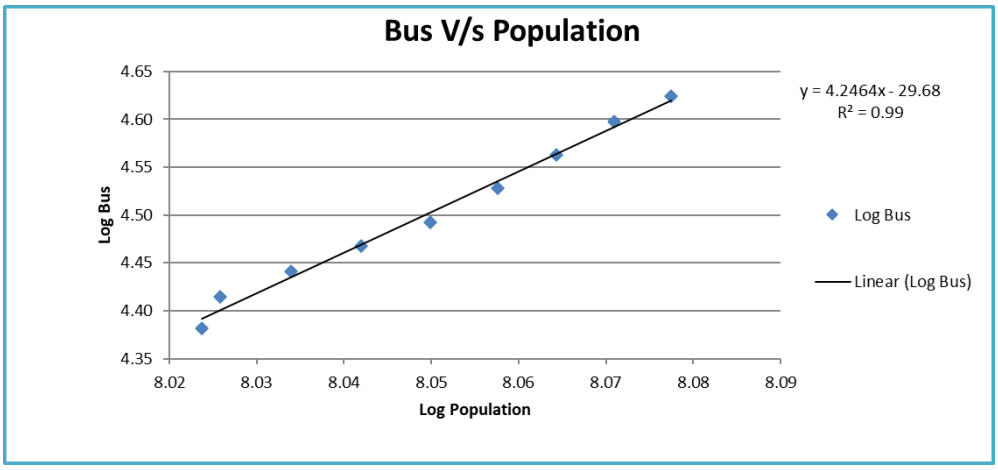

Figure 4-11 : Regression Analysis Population Vs. Bus Bihar

Table 4-15 : NSDP Vs. Truck- Bihar

Year	NSDP	Trucks	Log NDSP	Log Truck	NSDP Growth	Average Growth (5 Year)
2011	22849744	83191	7.36	4.92		
2012	23693255	89754	7.37	4.95	4%	
2013	24691474	86228	7.39	4.94	4%	
2014	25573881	91823	7.41	4.96	4%	
2015	26919960	99012	7.43	5.00	5%	
2016	28926487	107756	7.46	5.03	7%	
2017	31260514	116483	7.49	5.07	8%	
2018	34554545	128667	7.54	5.11	11%	
2019	36916198	138267	7.57	5.14	7%	6.2%

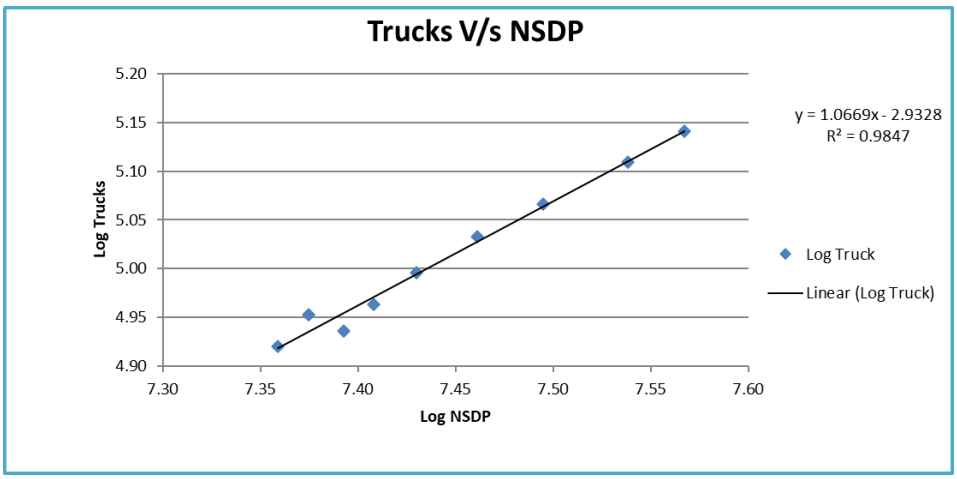

Figure 4-12 : Regression Analysis NSDP Vs. Bihar

Summary of regression analysis for elasticity and growth estimation for Bihar are given in following table.

Table 4-16 : Summary Regression Analysis- Bihar

State	Vehicle Category	Independent Variable	Regression Equation	R Square	Elasticity Coefficient (y)	Average IV Growth (5yrs)	Growth Elastic Model	Remarks
BIHAR	**Car/Jeep**	PCI	y = 2.9072x - - 7.3507	R^2 = 0.9606	2.9	4.4%	12.77%	Good Regression
	Bus	Population	y = 4.2464x - - 29.6796	R^2 = 0.99	4.2	1.6%	6.62%	Good Regression
	Truck	NSDP	y = 1.0669x - - 2.9328	R^2 = 0.9847	1.1	6.2%	6.62%	Good Regression

Using the same methodology, regression analysis has also been carried out for additional states, including Haryana, Jharkhand, Rajasthan, Uttarakhand, and West Bengal.

Economical model for predicting growth is good tool, however other local, regional, national factors should also be considered before finalizing growth factors. Considering factors such as proposed developments and other influencing economic factors, moderated growth should be considered. These factors are discussed in subsequent sections.

4.4 Other Factors Influencing Growth

There are many factors which have an impact on traffic growth. As discussed previously these factors can be economical, social, educational, and industrial.

Potentiality of such factors for project highway is discussed as under.

ECONOMY

After witnessing a slowdown during 2011-12, the economy recovered in 2013-14, and a high growth rate of GDP was recorded up to 2018-19. Pandemic of COVID-19 impacted all economies of world including India up to year 2021-22. Following figure show trend of GDP growth in India.

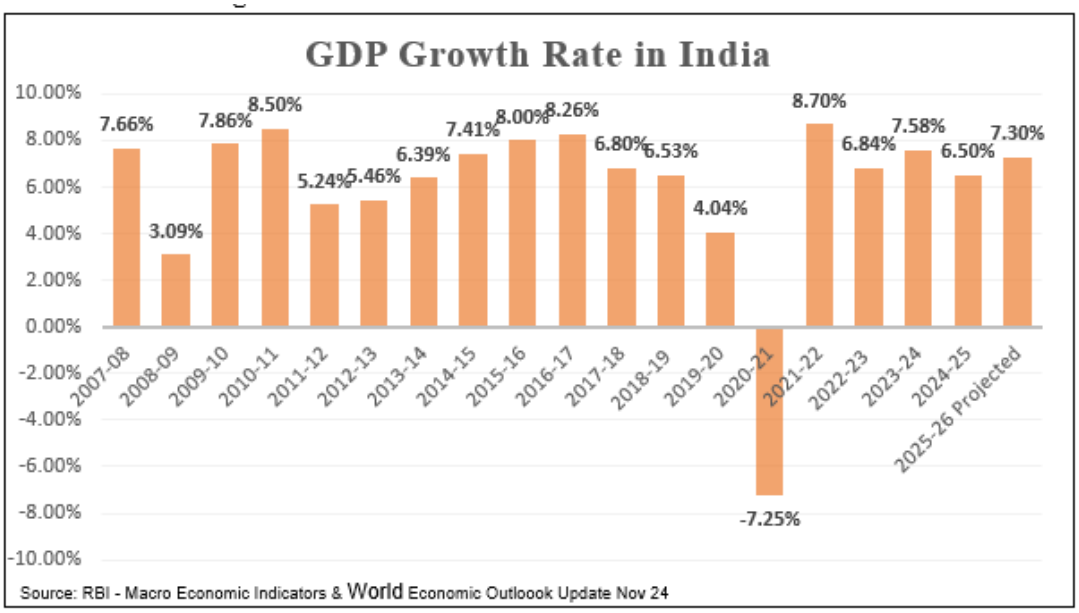

Figure 4-13 : Growth of GDP in India

FY 2017-18 recorded a growth of 6.7% which had a slight impact of GST and demonetization. Indian economy appears on recovery path with estimated growth of 6.8% in FY 2018-19. The government took major policy decisions including tax infrastructure reforming, banking sector improvement and ease of doing business.

In post COVID-19 scenario, in year 2022-23 and 2023-24 India registered an impressive growth of 7% to 7.5%. In last year despite global slow down due to Russia-Ukraine war and Gaza crises, India grew at good rate of 7%(Estimated).
Indian economy is now on good growth path and all major institutions including IMF / ADB have estimated growth of Indian Economy to peg around 6.5% to 7% in coming years.

4.5 Developments along and around the Project Corridor & State

Moradabad: Moradabad district is located approximately 167 kilometres from New Delhi in the western part of Uttar Pradesh and lies on the banks of the Ramganga River. **In terms of regional connectivity, Moradabad is located on the north-western side of the Ganga Expressway corridor, with the expressway alignment passing through the southern and south-eastern part of western Uttar Pradesh.** Over the decades, the district has emerged as one of India's most prominent industrial and export centres, particularly known for its traditional metal craftsmanship. Moradabad has earned national and international recognition as the "Brass City of India" due to its long-standing association with the production of ornamental brassware and related handicrafts. The city's strategic proximity to the National Capital Region, along with improved expressway and highway connectivity, availability of skilled artisan labour and export-oriented infrastructure, has played a vital role in shaping its industrial growth.

To support export-oriented industrial development, the Government of Uttar Pradesh has established a Special Economic Zone at Moradabad, located along the Pakbara–Dingarpur Road adjacent to National Highway-9. Initially developed as a handicrafts-specific zone, the Moradabad SEZ has since been converted into a multi-sector SEZ to accommodate diversified industrial activities. Spread over more than 435 acres, the SEZ offers modern infrastructure including uninterrupted power supply, internal road networks, green belts, boundary walls, security systems, a common effluent treatment plant, design and training centres, an inland container depot and customs facilities. By 2026, several operational export units are functioning within the SEZ, providing direct employment to more than one lakh people and strengthening Moradabad's role as an export hub.

Moradabad is also home to several notable medium and large-scale industrial units, including sugar mills, distilleries, dairy processing units, paper and pulp industries, fibre manufacturing facilities and waste management industries. These industries contribute significantly to industrial output and provide stable employment to a large workforce. The combined contribution of MSMEs, large industries and export units makes Moradabad one of the most industrially diversified districts in western Uttar Pradesh.

Meerut: Meerut city is in the western part of Uttar Pradesh, approximately 70 kilometres northeast of New Delhi, and forms an important component of the National Capital Region influence zone. The district is bounded by Muzaffarnagar to the north, Ghaziabad and Buland Shahr to the south, Baghpat to the west, and Bijnor and Amroha to the east. Geographically, Meerut lies between the Ganga and Hindon rivers, which mark its eastern and western boundaries respectively. **In terms of regional connectivity, Meerut is located on the western starting side of the Ganga Expressway, which originates near Bijouli village in Meerut district and extends eastward along the Ganga basin towards Prayagraj**. The presence of high-capacity expressways and proximity to Delhi have significantly enhanced Meerut's accessibility and economic integration.

Meerut holds a historically significant position in India's industrial development and is widely known as the **"Sports City of India."** The city has evolved as the country's largest manufacturing hub for sports goods, a legacy that dates back to the nineteenth century when local artisans began producing sporting equipment for British forces. Over time, Meerut developed a dense cluster of sports goods manufacturing units comprising micro, small and medium enterprises engaged in the production of cricket bats, balls, hockey sticks, badminton rackets, boxing gloves, gym equipment and protective sports gear. These products are supplied to domestic markets and exported extensively to countries such as the United States, United Kingdom, Germany, France and Australia, making Meerut a major contributor to India's sports goods exports.

In addition to sports goods, Meerut possesses a highly diversified industrial base supported by a strong MSME ecosystem. The district hosts thousands of industrial units engaged in scissors manufacturing, metal fabrication, glass and wooden beads, artificial jewellery, textile weaving and printing, leather goods, food processing and engineering products. Traditional industries such as scissors and handloom weaving coexist with modern manufacturing units, reflecting a blend of heritage skills and contemporary production practices. The presence of institutional support, including the Process and

Product Development Centre for Sports Goods at Meerut, has played an important role in skill development, product standardisation and technology upgradation for local industries.

Agra: Agra city is located in the western part of Uttar Pradesh, approximately 230 kilometres southeast of New Delhi, on the banks of the Yamuna River. The district occupies a strategically significant position in the Indo-Gangetic plains and serves as an important urban, industrial and tourism centre of the state. **In terms of regional connectivity, Agra is located on the south-western side of the Ganga Expressway corridor and lies at a close inter-junction point between the Ganga Expressway and the Agra–Lucknow Expressway, which has significantly enhanced the city's access to eastern and central Uttar Pradesh.** The city's historical prominence, supported by strong highway, rail and expressway connectivity, has contributed to its sustained economic development.

Agra's economy has historically been driven by tourism due to the presence of world-renowned monuments such as the Taj Mahal, Agra Fort and Fatehpur Sikri; however, over time the city has also developed a strong industrial base. Agra is globally recognised as a major centre for leather and footwear manufacturing and is often referred to as one of India's leading leather clusters. The city hosts a large concentration of micro, small and medium enterprises engaged in the manufacture of leather footwear, uppers, saddlery, bags and fashion accessories. These products cater to both domestic markets and international buyers, with exports reaching Europe, the United States and Middle Eastern countries. The leather industry remains a major source of employment and income for the local population.

Agra also hosts several medium and large-scale industrial units operating in sectors such as oil refining, chemical manufacturing, glass and ceramics, engineering goods and food processing. The presence of industrial estates at locations such as Nunhai, Sikandra and Foundry Nagar has supported industrial clustering and infrastructure development. These industrial areas provide employment to a substantial workforce and play an important role in balancing Agra's tourism-based economy with manufacturing-led growth. The city also benefits from institutional support through MSME development offices and training centres aimed at improving productivity, quality standards and skill levels.

Prayagraj: Prayagraj city is located in the eastern part of Uttar Pradesh at the confluence of the rivers Ganga, Yamuna and the mythical Saraswati, a geographical and cultural setting that has given the city exceptional historical importance. It lies approximately 120 kilometres south of Lucknow and serves as a major administrative, educational and religious centre of the state. In terms of regional connectivity, Prayagraj is located on the eastern terminal side of the Ganga Expressway corridor, with the expressway originating from Meerut in western Uttar Pradesh and terminating near Prayagraj, thereby directly linking the city with the western and central regions of the state. This strategic position significantly enhances Prayagraj's accessibility and economic integration within Uttar Pradesh.

The economy of Prayagraj has traditionally been dominated by administrative functions, education, religious tourism and trade, but in recent decades the city has also developed a diversified economic base. As a major centre for pilgrimage tourism,

Prayagraj experiences periodic large-scale economic activity during events such as the Kumbh Mela and Magh Mela, which generate employment in hospitality, transport, trade and services. Alongside tourism, the city functions as a regional commercial hub serving surrounding agricultural districts, facilitating the trade of food grains, pulses, oilseeds and other agricultural produce.

Prayagraj hosts a substantial number of micro, small and medium enterprises engaged in agro-based industries, food processing, printing and publishing, engineering workshops, metal fabrication, electrical goods, leather products and handicrafts. Cottage and small-scale industries play an important role in livelihood generation, particularly in traditional sectors such as wooden furniture, earthenware, handloom products and religious artefacts used in ritual practices. The presence of government offices, educational institutions and defence establishments has also stimulated demand for service-oriented enterprises and small manufacturing units.

Overall, by 2026 Prayagraj has emerged as a city where religious, administrative and educational functions coexist with growing industrial and commercial activities. While the city's economy remains service-oriented, expanding connectivity through the Ganga Expressway and continued development of MSMEs offer considerable scope for balanced regional growth. Prayagraj's strategic location at the eastern end of a major expressway corridor, combined with its historical importance, ensures its continued relevance in Uttar Pradesh's socio-economic landscape.

4.6 Recommended Growth Rates of Traffic

Based on the above analysis and after giving due consideration to the entire listed factors, the following overall growth rates are recommended for each category of vehicle as under. Rate of growth is moderated in light of overall regional trend. Growth of Multi-Axle is kept slightly higher as trend of technological advances in logistic industry Favors multi-axle over 2/3 axle carriage. It is also expected that as the economy moves from developing to developed, rate of growth diminishes. Same growth rate is not sustainable for long. Traffic growth has been suitably stepped down for future years.

Growth rates are recommended for three scenarios for sensitivity analysis namely **Optimistic, Pessimistic** and **Most Likely** with a positive and negative variation 0.25% from Most Likely case for corridor in both states.

4.6.1 Recommended Growth Rates of Traffic for Project corridor

Table 4-17 : Recommended Growth Rates Pessimistic

Category / Year	Car, Jeep, Van, LMV	Bus	LCV, LGV	2 Axle Truck	3 Axle Truck	MAV
2026-27	6.83%	3.81%	4.27%	4.05%	4.14%	7.46%
2027-28	7.01%	3.91%	4.39%	4.16%	4.28%	7.56%
2028-29	7.19%	4.00%	4.52%	4.29%	4.41%	7.65%
2029-30	7.37%	4.10%	4.65%	4.42%	4.53%	7.74%

Category / Year	Car, Jeep, Van, LMV	Bus	LCV, LGV	2 Axle Truck	3 Axle Truck	MAV
2030-31	7.30%	4.25%	4.81%	4.58%	4.69%	7.87%
2031-32	7.48%	4.35%	4.94%	4.71%	4.82%	7.97%
2032-33	7.91%	3.99%	5.07%	4.81%	4.90%	8.10%
2033-34	8.09%	4.08%	5.20%	4.94%	5.04%	8.21%
2034-35	8.26%	4.17%	5.33%	5.07%	5.16%	8.30%
2035-36	7.47%	4.07%	5.12%	4.86%	4.96%	8.06%
2036-37	7.41%	4.04%	5.07%	4.81%	4.90%	7.98%
2037-38	7.36%	4.00%	5.01%	4.75%	4.85%	7.89%
2038-39	7.31%	3.97%	4.96%	4.70%	4.79%	7.81%
2039-40	7.19%	3.93%	4.88%	4.62%	4.71%	7.70%
2040-41	5.92%	3.31%	3.85%	3.60%	3.69%	6.62%
2041-42	5.88%	3.28%	3.81%	3.55%	3.64%	6.55%
2042-43	5.95%	2.88%	3.34%	3.08%	3.14%	5.47%
2043-44	5.90%	2.85%	3.29%	3.04%	3.09%	5.42%
2044-45	5.86%	2.83%	3.25%	3.00%	3.05%	5.36%
2045-46	5.24%	2.55%	2.84%	2.59%	2.64%	4.93%
2046-47	5.19%	2.52%	2.80%	2.55%	2.60%	4.87%
2047-48	5.15%	2.50%	2.76%	2.51%	2.56%	4.82%
2048-49	5.10%	2.47%	2.72%	2.47%	2.52%	4.76%
2049-50	5.05%	2.45%	2.68%	2.43%	2.48%	4.71%
2050-51	4.83%	2.30%	2.45%	2.20%	2.25%	4.46%
2051-52	4.78%	2.28%	2.41%	2.16%	2.21%	4.41%
2052-53	4.91%	2.26%	2.33%	2.10%	2.16%	4.37%
2053-54	4.86%	2.23%	2.29%	2.06%	2.12%	4.31%
2054-55	4.82%	2.21%	2.25%	2.02%	2.08%	4.26%
2055-56	4.54%	2.03%	2.00%	1.78%	1.84%	4.00%
2056-57	4.49%	2.01%	2.00%	1.78%	1.84%	3.99%
2057-58	4.45%	1.98%	2.00%	1.78%	1.84%	3.98%
2058-59	4.40%	1.96%	2.00%	1.78%	1.84%	3.98%
2059-60	4.35%	1.94%	2.00%	1.78%	1.84%	3.97%

Table 4-18 : Recommended Growth Rates Most Likely

Category / Year	Car, Jeep, Van, LMV	Bus	LCV, LGV	2 Axle Truck	3 Axle Truck	MAV
2026-27	7.08%	4.06%	4.52%	4.30%	4.39%	7.71%
2027-28	7.26%	4.16%	4.64%	4.41%	4.53%	7.81%
2028-29	7.44%	4.25%	4.77%	4.54%	4.66%	7.90%
2029-30	7.62%	4.35%	4.90%	4.67%	4.78%	7.99%
2030-31	7.55%	4.50%	5.06%	4.83%	4.94%	8.12%
2031-32	7.73%	4.60%	5.19%	4.96%	5.07%	8.22%
2032-33	8.16%	4.24%	5.32%	5.06%	5.15%	8.35%
2033-34	8.34%	4.33%	5.45%	5.19%	5.29%	8.46%
2034-35	8.51%	4.42%	5.58%	5.32%	5.41%	8.55%
2035-36	7.72%	4.32%	5.37%	5.11%	5.21%	8.31%
2036-37	7.66%	4.29%	5.32%	5.06%	5.15%	8.23%

Category / Year	Car, Jeep, Van, LMV	Bus	LCV, LGV	2 Axle Truck	3 Axle Truck	MAV
2037-38	7.61%	4.25%	5.26%	5.00%	5.10%	8.14%
2038-39	7.56%	4.22%	5.21%	4.95%	5.04%	8.06%
2039-40	7.44%	4.18%	5.13%	4.87%	4.96%	7.95%
2040-41	6.17%	3.56%	4.10%	3.85%	3.94%	6.87%
2041-42	6.13%	3.53%	4.06%	3.80%	3.89%	6.80%
2042-43	6.20%	3.13%	3.59%	3.33%	3.39%	5.72%
2043-44	6.15%	3.10%	3.54%	3.29%	3.34%	5.67%
2044-45	6.11%	3.08%	3.50%	3.25%	3.30%	5.61%
2045-46	5.49%	2.80%	3.09%	2.84%	2.89%	5.18%
2046-47	5.44%	2.77%	3.05%	2.80%	2.85%	5.12%
2047-48	5.40%	2.75%	3.01%	2.76%	2.81%	5.07%
2048-49	5.35%	2.72%	2.97%	2.72%	2.77%	5.01%
2049-50	5.30%	2.70%	2.93%	2.68%	2.73%	4.96%
2050-51	5.08%	2.55%	2.70%	2.45%	2.50%	4.71%
2051-52	5.03%	2.53%	2.66%	2.41%	2.46%	4.66%
2052-53	5.16%	2.51%	2.58%	2.35%	2.41%	4.62%
2053-54	5.11%	2.48%	2.54%	2.31%	2.37%	4.56%
2054-55	5.07%	2.46%	2.50%	2.27%	2.33%	4.51%
2055-56	4.79%	2.28%	2.25%	2.03%	2.09%	4.25%
2056-57	4.74%	2.26%	2.25%	2.03%	2.09%	4.24%
2057-58	4.70%	2.23%	2.25%	2.03%	2.09%	4.23%
2058-59	4.65%	2.21%	2.25%	2.03%	2.09%	4.23%
2059-60	4.60%	2.19%	2.25%	2.03%	2.09%	4.22%

Table 4-19 : Recommended Growth Rates Optimistic

Category / Year	Car, Jeep, Van, LMV	Bus	LCV, LGV	2 Axle Truck	3 Axle Truck	MAV
2026-27	7.3%	4.3%	4.8%	4.5%	4.6%	8.0%
2027-28	7.5%	4.4%	4.9%	4.7%	4.8%	8.1%
2028-29	7.7%	4.5%	5.0%	4.8%	4.9%	8.1%
2029-30	7.9%	4.6%	5.1%	4.9%	5.0%	8.2%
2030-31	7.8%	4.7%	5.3%	5.1%	5.2%	8.4%
2031-32	8.0%	4.8%	5.4%	5.2%	5.3%	8.5%
2032-33	8.4%	4.5%	5.6%	5.3%	5.4%	8.6%
2033-34	8.6%	4.6%	5.7%	5.4%	5.5%	8.7%
2034-35	8.8%	4.7%	5.8%	5.6%	5.7%	8.8%
2035-36	8.0%	4.6%	5.6%	5.4%	5.5%	8.6%
2036-37	7.9%	4.5%	5.6%	5.3%	5.4%	8.5%
2037-38	7.9%	4.5%	5.5%	5.3%	5.3%	8.4%
2038-39	7.8%	4.5%	5.5%	5.2%	5.3%	8.3%
2039-40	7.7%	4.4%	5.4%	5.1%	5.2%	8.2%
2040-41	6.4%	3.8%	4.4%	4.1%	4.2%	7.1%
2041-42	6.4%	3.8%	4.3%	4.0%	4.1%	7.0%
2042-43	6.5%	3.4%	3.8%	3.6%	3.6%	6.0%
2043-44	6.4%	3.4%	3.8%	3.5%	3.6%	5.9%

Category / Year	Car, Jeep, Van, LMV	Bus	LCV, LGV	2 Axle Truck	3 Axle Truck	MAV
2044-45	6.4%	3.3%	3.8%	3.5%	3.6%	5.9%
2045-46	5.7%	3.0%	3.3%	3.1%	3.1%	5.4%
2046-47	5.7%	3.0%	3.3%	3.1%	3.1%	5.4%
2047-48	5.6%	3.0%	3.3%	3.0%	3.1%	5.3%
2048-49	5.6%	3.0%	3.2%	3.0%	3.0%	5.3%
2049-50	5.6%	3.0%	3.2%	2.9%	3.0%	5.2%
2050-51	5.3%	2.8%	3.0%	2.7%	2.8%	5.0%
2051-52	5.3%	2.8%	2.9%	2.7%	2.7%	4.9%
2052-53	5.4%	2.8%	2.8%	2.6%	2.7%	4.9%
2053-54	5.4%	2.7%	2.8%	2.6%	2.6%	4.8%
2054-55	5.3%	2.7%	2.7%	2.5%	2.6%	4.8%
2055-56	5.0%	2.5%	2.5%	2.3%	2.3%	4.5%
2056-57	5.0%	2.5%	2.5%	2.3%	2.3%	4.5%
2057-58	4.9%	2.5%	2.5%	2.3%	2.3%	4.5%
2058-59	4.9%	2.5%	2.5%	2.3%	2.3%	4.5%
2059-60	4.9%	2.4%	2.5%	2.3%	2.3%	4.5%

CHAPTER 5

TRAFFIC FORECAST

5.1 Traffic Projections

Growth rates recommended in the previous section of the report are used to arrive at traffic projections for future years. All Toll Plaza futuristic traffic projections are given in tables below.

These projections have been done for the following three cases of growth up to concession period.

1. Pessimistic Scenario
2. Most Likely Scenario
3. Optimistic Scenario

Table 5-1 : Total Traffic at all Toll Plaza of Group-1 of Project corridor (Pessimistic Growth Scenario)

Year/Types of vehicles	Car, Jeep, Van, LMV	LCV, LGV	Bus	2 Axle Truck	3 Axle Truck	MAV	Total Tollable traffic at all toll plaza	Total PCU including Exp. (Entry + Exit)
2026-27	7569	2099	1392	962	1066	2496	**15583**	**65442**
2027-28	8099	2153	1447	962	1081	2594	**16335**	**68020**
2028-29	8803	2282	1526	1017	1145	2831	**17604**	**73231**
2029-30	9495	2400	1596	1068	1202	3064	**18826**	**78217**
2030-31	10189	2515	1664	1116	1258	3305	**20048**	**83239**
2031-32	10950	2639	1737	1169	1319	3569	**21383**	**88708**
2032-33	11816	2773	1806	1225	1384	3858	**22863**	**94684**
2033-34	12773	2917	1880	1286	1454	4174	**24483**	**101210**
2034-35	13827	3073	1958	1351	1529	4521	**26259**	**108336**
2035-36	14860	3230	2038	1416	1604	4886	**28035**	**115597**
2036-37	15962	3394	2120	1484	1683	5275	**29919**	**123298**
2037-38	17137	3564	2205	1555	1765	5692	**31917**	**131458**
2038-39	18389	3741	2293	1628	1849	6136	**34036**	**140103**
2039-40	19712	3923	2383	1703	1936	6608	**36266**	**149209**
2040-41	20880	4074	2462	1764	2008	7046	**38234**	**157336**
2041-42	22107	4229	2542	1827	2081	7507	**40294**	**165842**
2042-43	23423	4370	2616	1883	2146	7918	**42357**	**173906**
2043-44	24806	4514	2690	1941	2213	8347	**44511**	**182300**
2044-45	26259	4661	2766	1999	2280	8794	**46760**	**191036**
2045-46	27635	4794	2837	2051	2341	9228	**48884**	**199327**
2046-47	29070	4928	2908	2103	2402	9678	**51089**	**207909**
2047-48	30566	5064	2981	2156	2463	10144	**53374**	**216786**

Year/Types of vehicles	Car, Jeep, Van, LMV	LCV, LGV	Bus	2 Axle Truck	3 Axle Truck	MAV	Total Tollable traffic at all toll plaza	Total PCU including Exp. (Entry + Exit)
2048-49	32125	5202	3055	2209	2525	10627	**55744**	**225965**
2049-50	33749	5342	3130	2263	2588	11128	**58199**	**235452**
2050-51	35379	5473	3202	2312	2646	11625	**60637**	**244825**
2051-52	37071	5605	3275	2362	2705	12137	**63155**	**254484**
2052-53	38892	5735	3349	2412	2763	12667	**65818**	**264563**
2053-54	40783	5866	3423	2462	2822	13214	**68570**	**274949**
2054-55	42747	5998	3499	2511	2881	13777	**71413**	**285646**
2055-56	44687	6118	3570	2556	2934	14329	**74193**	**296059**
2056-57	46694	6241	3642	2601	2988	14901	**77066**	**306821**
2057-58	48769	6366	3714	2648	3043	15495	**80034**	**317942**
2058-59	50915	6493	3787	2695	3099	16111	**83099**	**329431**

Table 5-2 : Total Traffic at all Toll Plaza of Group-1 of Project corridor (Most likely Growth Scenario)

Year/Types of vehicles	Car, Jeep, Van, LMV	LCV, LGV	Bus	2 Axle Truck	3 Axle Truck	MAV	Total Tollable traffic at all toll plaza	Total PCU including Exp. (Entry + Exit)
2026-27	7586	2104	1396	964	1069	2502	**15620**	**65596**
2027-28	8137	2163	1454	966	1086	2606	**16412**	**68341**
2028-29	8864	2299	1537	1025	1153	2851	**17728**	**73748**
2029-30	9584	2423	1612	1078	1214	3093	**19003**	**78953**
2030-31	10308	2545	1684	1130	1274	3344	**20284**	**84220**
2031-32	11104	2677	1762	1186	1338	3619	**21686**	**89963**
2032-33	12010	2820	1837	1246	1407	3921	**23240**	**96249**
2033-34	13012	2973	1916	1310	1481	4252	**24946**	**103122**
2034-35	14119	3139	2001	1380	1562	4616	**26817**	**110641**
2035-36	15209	3308	2087	1451	1643	5000	**28697**	**118333**
2036-37	16375	3484	2177	1524	1728	5411	**30698**	**126510**
2037-38	17621	3667	2269	1600	1816	5852	**32825**	**135199**
2038-39	18953	3858	2365	1679	1907	6323	**35086**	**144427**
2039-40	20364	4056	2464	1761	2002	6826	**37472**	**154174**
2040-41	21621	4222	2552	1829	2081	7295	**39599**	**162956**
2041-42	22945	4394	2642	1898	2162	7791	**41832**	**172173**
2042-43	24368	4551	2725	1961	2235	8237	**44078**	**180973**
2043-44	25868	4712	2809	2026	2310	8703	**46429**	**190161**

Year/Types of vehicles	Car, Jeep, Van, LMV	LCV, LGV	Bus	2 Axle Truck	3 Axle Truck	MAV	Total Tollable traffic at all toll plaza	Total PCU including Exp. (Entry + Exit)
2044-45	27448	4878	2896	2092	2386	9191	**48890**	**199747**
2045-46	28955	5028	2977	2151	2455	9667	**51234**	**208915**
2046-47	30531	5182	3059	2211	2525	10163	**53672**	**218429**
2047-48	32178	5338	3143	2273	2596	10678	**56207**	**228300**
2048-49	33900	5497	3229	2334	2668	11213	**58842**	**238536**
2049-50	35699	5658	3316	2397	2741	11770	**61580**	**249146**
2050-51	37512	5811	3401	2456	2810	12324	**64313**	**259685**
2051-52	39400	5965	3487	2515	2879	12899	**67145**	**270577**
2052-53	41434	6119	3574	2574	2949	13494	**70143**	**281969**
2053-54	43552	6274	3663	2633	3019	14110	**73251**	**293740**
2054-55	45758	6431	3753	2693	3089	14747	**76471**	**305900**
2055-56	47949	6576	3838	2748	3154	15374	**79639**	**317814**
2056-57	50222	6724	3925	2803	3220	16027	**82921**	**330159**
2057-58	52580	6875	4013	2860	3287	16706	**86321**	**342949**
2058-59	55024	7030	4102	2918	3356	17412	**89842**	**356196**

Table 5-3 : Total Traffic at all Toll Plaza of Group-1 of Project corridor (Optimistic Growth Scenario)

Year/Types of vehicles	Car, Jeep, Van, LMV	LCV, LGV	Bus	2 Axle Truck	3 Axle Truck	MAV	Total Tollable traffic at all toll plaza	Total PCU including Exp. (Entry + Exit)
2026-27	7604	2109	1399	966	1071	2507	**15657**	**65751**
2027-28	8175	2174	1461	971	1091	2618	**16489**	**68664**
2028-29	8926	2315	1548	1032	1161	2870	**17853**	**74267**
2029-30	9673	2446	1627	1088	1225	3121	**19181**	**79695**
2030-31	10428	2576	1705	1143	1289	3382	**20523**	**85210**
2031-32	11260	2716	1787	1203	1357	3669	**21992**	**91233**
2032-33	12206	2867	1867	1267	1431	3985	**23623**	**97836**
2033-34	13255	3030	1953	1336	1510	4332	**25415**	**105067**
2034-35	14416	3207	2044	1410	1595	4713	**27386**	**112989**
2035-36	15565	3387	2138	1485	1683	5116	**29374**	**121126**
2036-37	16797	3576	2235	1564	1773	5550	**31495**	**129799**
2037-38	18117	3773	2335	1646	1868	6016	**33756**	**139038**
2038-39	19532	3979	2440	1732	1967	6516	**36165**	**148874**
2039-40	21035	4193	2548	1821	2070	7050	**38715**	**159292**
2040-41	22386	4375	2645	1895	2157	7552	**41010**	**168763**

Year/Types of vehicles	Car, Jeep, Van, LMV	LCV, LGV	Bus	2 Axle Truck	3 Axle Truck	MAV	Total Tollable traffic at all toll plaza	Total PCU including Exp. (Entry + Exit)
2041-42	23813	4564	2745	1972	2246	8084	**43424**	**178729**
2042-43	25350	4739	2838	2043	2328	8567	**45864**	**188311**
2043-44	26973	4919	2933	2115	2411	9074	**48425**	**198340**
2044-45	28688	5103	3031	2189	2497	9605	**51113**	**208834**
2045-46	30334	5274	3123	2256	2575	10127	**53690**	**218939**
2046-47	32061	5448	3217	2325	2655	10671	**56379**	**229456**
2047-48	33872	5626	3314	2395	2737	11239	**59182**	**240397**
2048-49	35769	5807	3412	2466	2819	11830	**62105**	**251775**
2049-50	37756	5992	3513	2539	2903	12447	**65150**	**263602**
2050-51	39768	6169	3612	2607	2983	13064	**68204**	**275409**
2051-52	41869	6348	3712	2677	3064	13706	**71377**	**287647**
2052-53	44135	6528	3814	2746	3146	14373	**74742**	**300474**
2053-54	46502	6710	3918	2816	3228	15065	**78240**	**313768**
2054-55	48973	6894	4025	2887	3312	15783	**81874**	**327538**
2055-56	51440	7066	4126	2953	3389	16494	**85469**	**341111**
2056-57	54008	7243	4230	3020	3469	17235	**89205**	**355211**
2057-58	56679	7425	4335	3089	3550	18008	**93085**	**369856**
2058-59	59455	7611	4442	3160	3633	18814	**97114**	**385065**

5.2 Modification in concession period

As per Article 29 of the concession agreement, if actual traffic on the project falls short or exceeds Target Traffic on project highway on defined date, concession period shall be modified subject to calculation stipulated therein. For Ganga expressway project five targets traffic has been defined in Article 29.

Target 1- Date: 1st April 2030 Target Traffic 40759
Target 2- Date: 1st April 2035 Target Traffic 61199
Target 3- Date: 1st April 2040 Target Traffic 87256
Target 4- Date: 1st April 2045 Target Traffic 118274
Target 5- Date: 1st April 2050 Target Traffic 148644

The following tables shows the variations in all targets.

Target Point 1	Excess	Short
	01-04-2030	01-04-2030
Target PCU 1 estimated as per CA	40,759	40,759
Revised PCU	32,607	32,607
Estimated Traffic	10,967	10,967
% variation	0%	66%
Residual concession period from Target Traffic	8229.00	8229.00
Increase in concession period (days)	-	2,191.60

Target Point 2	Excess	Short
	4/1/2035	4/1/2035
Target PCU 2 estimated as per CA	61,199	61,199
Revised PCU	48,959	48,959
Estimated Traffic	15,477	15,477
% variation	0%	68%
Residual concession period from Target Traffic	6403.00	6403.00
Increase in concession period (days)	-	2,191.60

Target Point 3	Excess	Short
	4/1/2040	4/1/2040
Target PCU 3 estimated as per CA	87,256	87,256
Revised PCU	69,805	69,805
Estimated Traffic	21,316	21,316
% variation	0%	69%
Residual concession period from Target Traffic	4576.00	4576.00
Increase in concession period (days)	-	2,191.60

Target Point 4	Excess	Short
	4/1/2045	4/1/2045
Target PCU 4 estimated as per CA	118,274	118,274
Revised PCU	94,619	94,619
Estimated Traffic	27,291	27,291
% variation	0%	71%
Residual concession period from Target Traffic	2750.00	2750.00
Increase in concession period (days)	-	1,819.32

Target Point 5	Excess	Short
	4/1/2050	4/1/2050
Target PCU 5 estimated as per CA	148,644	148,644
Revised PCU	118,915	118,915
Estimated Traffic	33,636	33,636
% variation	0%	72%
Residual concession period from Target Traffic	924.00	924.00
Increase in concession period (days)	-	616.44

Therefore total variation in CP days is 2192 in pessimistic scenario.

CHAPTER 6

FORECAST OF TOLL REVENUE

6.1 General

The gazette notification of Government of Uttar Pradesh provides per km base rate for expressway and base rate of structures based on the cost of structure. This forms an input to the toll rate calculation for each vehicle type.

6.2 Estimation of Toll Rates as per UPEDIA policy

Following table below presents the expressway base rate, specified in accordance with UPEDIA Policy for toll computation purposes for period

Table 6-1 : Base Rate as per types of vehicles

Sr. No	Type of Vehicle	Base rate of Fee per Km (in Rs.) based on the WPI of week ending on December 2016 (WPI 343.32) for the year 2017-18	Toll rate of Fee per Km (in Rs.) based on the WPI of week ending on December 2025 (WPI 482.55) for the year 2026-27
1	Car, Jeep, Van or Light Motor Vehicle.	2.2	2.55
2	Light Commercial Vehicle, Light Goods Vehicles or Minibus.	3.5	4.05
3	Bus or Truck	7.05	8.2
4	Heavy Construction Machinery (HCM) or Earth Moving Equipment (EME) or Multi Axle Vehicle (MAV) Three to Six Axles	10.85	12.6
5	Oversized Vehicle (Seven or more Axles)	13.85	16.1

Table 6-2 : Base rates for the use of Structures / Bypass, for the base year 2017-18

Sr. No	Type of Vehicle	10 to 15	15 to 100	100 to 200	>200
1	Car, Jeep, Van or Light Motor Vehicle.	6	1.2	0.9	0.6
2	Light Commercial Vehicle, Light Goods Vehicle or Minibus.	9	1.8	1.4	0.9

Sr. No	Type of Vehicle	10 to 15	15 to 100	100 to 200	>200
3	Bus or Truck	18	3.6	2.7	1.8
4	Heavy Construction Machinery (HCM) or Earth Moving Equipment (EME) or Multi Axle Vehicle (MAV) Three to Six Axles	26.4	5.4	4.1	2.7
5	Oversized Vehicle (Seven or more Axles)	35.95	7.2	5.4	3.6

Table 6-3 : Base rates for the use of Structures / Bypass, for the year 2026-27

Sr. No	Type of Vehicle	10 to 15	15 to 100	100 to 200	>200
1	Car, Jeep, Van or Light Motor Vehicle.	7	1.4	1.05	0.7
2	Light Commercial Vehicle, Light Goods Vehicle or Minibus.	10.45	2.1	1.65	1.05
3	Bus or Truck	20.95	4.2	3.15	2.1
4	Heavy Construction Machinery (HCM) or Earth Moving Equipment (EME) or Multi Axle Vehicle (MAV) Three to Six Axles	30.7	6.3	4.75	3.15
5	Oversized Vehicle (Seven or more Axles)	41.8	8.35	6.3	4.2

Following matrix summarizes the tollable length, length of structures, and the corresponding net tollable length considered for toll computation

Table 6-4 : Total Tolling Length - Group I

Toll Plaza Locations			13.400	19.941	35.270	54.640	74.181	102.427	123.288	135.400
Entry / Exit		7.900	13.400	19.941	35.270	54.640	74.181	102.427	123.288	137.600
0	7.9									
13.4	13.4		-	12.041	27.370	46.740	66.281	94.527	115.388	129.700
19.941	19.941		12.041	-	15.329	34.699	54.240	82.486	103.347	117.659
35.27	35.27		27.370	15.329	-	19.370	38.911	67.157	88.018	102.330
54.64	54.64		46.740	34.699	19.370	-	19.541	47.787	68.648	82.960
74.181	74.181		66.281	54.240	38.911	19.541	-	28.246	49.107	63.419
102.427	102.427		94.527	82.486	67.157	47.787	28.246	-	20.861	35.173
123.288	123.288		115.388	103.347	88.018	68.648	49.107	20.861	-	14.312
135.4	137.6		129.700	117.659	102.330	82.960	63.419	35.173	14.312	-

Table 6-5 : Structures Length - Group I

Toll Plaza Locations			13.400	19.941	35.270	54.640	74.181	102.427	123.288	135.400
Entry / Exit		7.900	13.400	19.941	35.270	54.640	74.181	102.427	123.288	137.600
	7.9									
13.4	13.4		0	0.600	0.600	1.560	1.560	1.666	1.666	1.666
19.941	19.941		0.600	0	0.600	1.560	1.560	1.666	1.666	1.666
35.27	35.27		0.600	0.600	0	0.960	0.960	1.066	1.066	1.066
54.64	54.64		1.560	1.560	0.960	0	0.960	1.066	1.066	1.066
74.181	74.181		1.560	1.560	0.960	0.960	0	0.106	0.106	0.106
102.427	102.427		1.666	1.666	1.066	1.066	0.106	0	0.106	0.106
123.288	123.288		1.666	1.666	1.066	1.066	0.106	0.106	0	0.106
135.4	137.6		1.666	1.666	1.066	1.066	0.106	0.106	0.106	0

Table 6-6 : Net Tolling Length - Group I

Toll Plaza Locations			13.400	19.941	35.270	54.640	74.181	102.427	123.288	135.400
Entry / Exit		7.900	13.400	19.941	35.270	54.640	74.181	102.427	123.288	137.600
0	7.9									
13.4	13.4		0.000	11.441	26.770	45.180	64.721	92.861	113.722	128.034
19.941	19.941		11.441	0.000	14.729	33.139	52.680	80.820	101.681	115.993
35.27	35.27		26.770	14.729	0.000	18.410	37.951	66.091	86.952	101.264
54.64	54.64		45.180	33.139	18.410	0.000	18.581	46.721	67.582	81.894
74.181	74.181		64.721	52.680	37.951	18.581	0.000	28.140	49.001	63.313
102.427	102.427		92.861	80.820	66.091	46.721	28.140	0.000	20.755	35.067
123.288	123.288		113.722	101.681	86.952	67.582	49.001	20.755	0.000	14.206
135.4	137.6		128.034	115.993	101.264	81.894	63.313	35.067	14.206	0.000

Factors of inflation / growth have been incorporated as per Schedule R. WPI are available up to the year 2025-26.

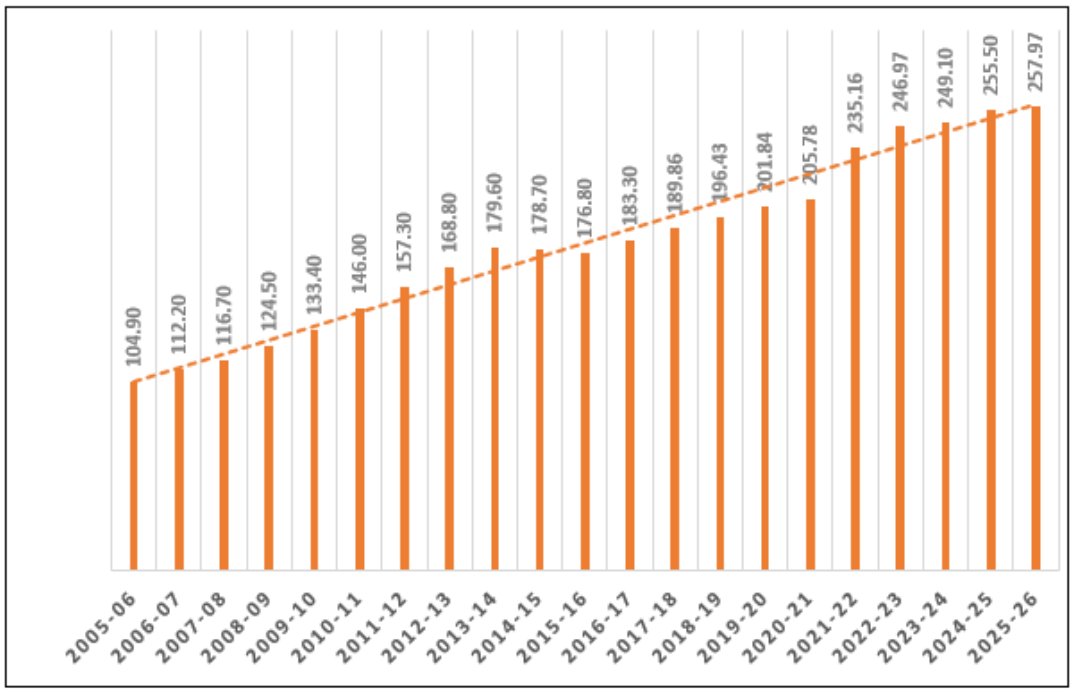

Figure 6-1 : Historical Rate of WPI Inflation in India

The wholesale price index (WPI) and the inflation rate in the past are presented in Table below.

Table 6-7 : : Historical WPI value and Growth Inflation

December of year	2021	2022	2023	2024	2025	Avg.
WPI	235.2	247.0	249.1	255.5	257.97	
Inflation	14.27%	5.02%	0.86%	2.57%	0.96%	4.74%

WPI of December 2025 is posted on ministry site which is shows 0.96% inflation from the previous year. Same has been applied for FY 2026-27.

The average WPI inflation over the period FY 2021 to FY 2025 works out to approximately 4.74%, reflecting inflationary cycles across both high and low inflation years. Based on this analysis, an annual escalation factor of 4.5% has been adopted for the remaining concession period.

6.3 Tolling Toll Rates at all toll plazas

As per the Gazette Notification issued by the Government of Uttar Pradesh under UPEID Policy, the base user fee is prescribed on a per-kilometre basis for expressways and separately for structures based on the cost of construction. These prescribed base rates shall form the basis for calculation of toll rates for each vehicle category.

The following matrix presents the toll rates applicable for Cars, LCVs, Trucks/Bus and HCM for various journey types for the year 2026–27

Table 6-8 : : Single Journey Rate- Car (After Rounding rates)

Toll Plaza Locations		-	13.400	19.941	35.270	54.640	74.181	102.427	123.288	135.400
Entry / Exit		7.900	13.400	19.941	35.270	54.640	74.181	102.427	123.288	137.600
0	7.9									
13.4	13.4			50	90	205	255	345	400	435
19.941	19.941		50		60	175	225	315	370	405
35.27	35.27		90	60		115	165	255	310	345
54.64	54.64		205	175	115		115	205	260	295
74.181	74.181		255	225	165	115		95	145	180
102.427	102.427		345	315	255	205	95		75	110
123.288	123.288		400	370	310	260	145	75		55
135.4	137.6		435	405	345	295	180	110	55	

Table 6-9 : : Return Journey Rate -Car (After Rounding rates)

Toll Plaza Locations		-	13.400	19.941	35.270	54.640	74.181	102.427	123.288	135.400
Entry / Exit		7.900	13.400	19.941	35.270	54.640	74.181	102.427	123.288	137.600
-	7.900									
13.400	13.400			85	145	325	405	555	640	695
19.941	19.941		85		95	275	355	505	590	650
35.270	35.270		145	95		180	260	410	495	550
54.640	54.640		325	275	180		180	330	415	475
74.181	74.181		405	355	260	180		150	235	290
102.427	102.427		555	505	410	330	150		120	175
123.288	123.288		640	590	495	415	235	120		90
135.400	137.600		695	650	550	475	290	175	90	

Table 6-10 : : 20 One Way Trips Rate -Car (After Rounding rates)

Toll Plaza Locations		0	13.4	19.941	35.27	54.64	74.181	102.427	123.288	135.4
Entry / Exit		7.9	13.4	19.941	35.27	54.64	74.181	102.427	123.288	137.6
0	7.9									
13.4	13.4			825	1450	3255	4050	5535	6385	6970
19.941	19.941		825		960	2765	3560	5045	5895	6480
35.27	35.27		1450	960		1805	2600	4085	4935	5520
54.64	54.64		3255	2765	1805		1810	3295	4145	4730
74.181	74.181		4050	3560	2600	1810		1485	2335	2920
102.427	102.427		5535	5045	4085	3295	1485		1185	1765
123.288	123.288		6385	5895	4935	4145	2335	1185		915
135.4	137.6		6970	6480	5520	4730	2920	1765	915	

Table 6-11 : Single Journey Toll Rates - LCV

Toll Plaza Locations		-	13.4	19.9	35.3	54.6	74.2	102.4	123.3	135.4
Entry / Exit		7.9	13.4	19.9	35.3	54.6	74.2	102.4	123.3	137.6
0	7.9									
13.4	13.4			80	140	315	395	540	625	685
19.941	19.941		80		95	270	345	490	575	635
35.27	35.27		140	95		175	255	400	485	540
54.64	54.64		315	270	175		175	320	405	465
74.181	74.181		395	345	255	175		145	230	290
102.427	102.427		540	490	400	320	145		115	175
123.288	123.288		625	575	485	405	230	115		90
135.4	137.6		685	635	540	465	290	175	90	

Table 6-12 : Return Journey Toll Rates -LCV

Toll Plaza Locations		-	13.400	19.941	35.270	54.640	74.181	102.427	123.28	135.4
Entry / Exit		7.9	13.40	19.94	35.27	54.64	74.18	102.42	123.28	137.60
-	7.900									
13.400	13.400			130	225	505	635	865	1000	1095
19.941	19.941		130		150	430	555	790	925	1015
35.270	35.270		225	150		280	405	640	775	865
54.640	54.640		505	430	280		280	515	650	740
74.181	74.181		635	555	405	280		235	370	460
102.427	102.427		865	790	640	515	235		185	280
123.288	123.288		1000	925	775	650	370	185		140
135.400	137.600		1095	1015	865	740	460	280	140	

Table 6-13 : 20 One Way Trips Toll Rates -LCV

Toll Plaza Locations		0	13.4	19.94	35.27	54.6	74.2	102.4	123.3	135.4
Entry / Exit		7.9	13.4	19.94	35.27	54.6	74.2	102.4	123.3	137.6
0	7.9									
13.4	13.4			1280	2270	5065	6335	8660	10010	10940
19.941	19.941		1280		1490	4285	5555	7880	9230	10160
35.27	35.27		2270	1490		2795	4060	6390	7740	8670
54.64	54.64		5065	4285	2795		2805	5135	6485	7410
74.181	74.181		6335	5555	4060	2805		2325	3680	4605
102.427	102.427		8660	7880	6390	5135	2325		1850	2775
123.288	123.288		10010	9230	7740	6485	3680	1850		1425
135.4	137.6		10940	10160	8670	7410	4605	2775	1425	

Table 6-14 : Single Journey Toll Rates- Truck & Bus

Toll Plaza Locations		-	13.400	19.941	35.270	54.640	74.181	102.42	123.28	135.40
Entry / Exit		7.90	13.40	19.94	35.27	54.64	74.18	102.42	123.28	137.60
0	7.9									
13.4	13.4			160	285	635	795	1090	1260	1375
19.941	19.941		160		190	535	695	990	1160	1280
35.27	35.27		285	190		350	510	800	975	1090
54.64	54.64		635	535	350		350	645	815	930
74.181	74.181		795	695	510	350		295	465	580
102.427	102.427		1090	990	800	645	295		235	350
123.288	123.288		1260	1160	975	815	465	235		180
135.4	137.6		1375	1280	1090	930	580	350	180	

Table 6-15 : Return Journey Toll Rates -Truck & Bus

Toll Plaza Locations		-	13.4	19.9	35.3	54.6	74.2	102.4	123.3	135.4
Entry / Exit		7.9	13.4	19.9	35.3	54.6	74.2	102.4	123.3	137.6
-	7.900									
13.400	13.400			260	460	1015	1270	1740	2015	2205
19.941	19.941		260		300	860	1115	1585	1860	2045
35.270	35.270		460	300		555	815	1285	1555	1745
54.640	54.640		1015	860	555		560	1030	1305	1490
74.181	74.181		1270	1115	815	560		470	745	930
102.427	102.427		1740	1585	1285	1030	470		375	560
123.288	123.288		2015	1860	1555	1305	745	375		285
135.400	137.600		2205	2045	1745	1490	930	560	285	

Table 6-16 : 20 One Way Trips Toll Rates -Truck & Bus

Toll Plaza Locations		0.0	13.4	19.9	35.3	54.6	74.2	102.4	123.3	135.4
Entry / Exit		7.9	13.4	19.9	35.3	54.6	74.2	102.4	123.3	137.6
0	7.9									
13.4	13.4			2575	4585	10160	12725	17425	20160	22035
19.941	19.941		2575		3005	8580	11145	15845	18580	20455
35.27	35.27		4585	3005		5575	8135	12835	15575	17450
54.64	54.64		10160	8580	5575		5595	10295	13030	14910
74.181	74.181		12725	11145	8135	5595		4700	7435	9315
102.427	102.427		17425	15845	12835	10295	4700		3730	5610
123.288	123.288		20160	18580	15575	13030	7435	3730		2870
135.4	137.6		22035	20455	17450	14910	9315	5610	2870	

Table 6-17 : Single Journey Toll Rates - HCM

Toll Plaza Locations		-	13.400	19.941	35.270	54.640	74.181	102.42	123.28	135.40
Entry / Exit		7.90	13.40	19.94	35.27	54.64	74.18	102.42	123.28	137.60
0	7.9									
13.4	13.4			245	435	965	1210	1660	1920	2105
19.941	19.941		245		285	815	1060	1510	1770	1950
35.27	35.27		435	285		530	775	1220	1485	1665
54.64	54.64		965	815	530		530	980	1240	1420
74.181	74.181		1210	1060	775	530		450	710	890
102.427	102.427		1660	1510	1220	980	450		355	535
123.288	123.288		1920	1770	1485	1240	710	355		275
135.4	137.6		2105	1950	1665	1420	890	535	275	

Table 6-18 : Return Journey Toll Rates -HCM

Toll Plaza Locations		-	13.40	19.94	35.27	54.64	74.18	102.43	123.29	135.40
Entry / Exit		7.90	13.40	19.94	35.27	54.64	74.18	102.43	123.29	137.60
-	7.900									
13.400	13.400			390	700	1545	1940	2655	3075	3365
19.941	19.941		390		455	1300	1695	2415	2835	3120
35.270	35.270		700	455		845	1240	1955	2375	2665
54.640	54.640		1545	1300	845		850	1565	1985	2275
74.181	74.181		1940	1695	1240	850		715	1140	1425
102.427	102.427		2655	2415	1955	1565	715		570	855
123.288	123.288		3075	2835	2375	1985	1140	570		435
135.400	137.600		3365	3120	2665	2275	1425	855	435	

Table 6-19 : 20 One Way Trips Toll Rates -HCM

Toll Plaza Locations		0	13.4	19.941	35.27	54.64	74.181	102.427	123.288	135.4
Entry / Exit		7.9	13.4	19.941	35.27	54.64	74.181	102.427	123.288	137.6
0	7.9									
13.4	13.4			3905	6995	15440	19380	26555	30760	33645
19.941	19.941		3905		4570	13015	16955	24125	28330	31215
35.27	35.27		6995	4570		8445	12385	19555	23760	26645
54.64	54.64		15440	13015	8445		8480	15650	19855	22740
74.181	74.181		19380	16955	12385	8480		7170	11380	14265
102.427	102.427		26555	24125	19555	15650	7170		5685	8570
123.288	123.288		30760	28330	23760	19855	11380	5685		4365
135.4	137.6		33645	31215	26645	22740	14265	8570	4365	

Table 6-20 : Single Journey Toll rates- OSV

Toll Plaza Locations		-	13.400	19.941	35.270	54.640	74.181	102.42	123.28	135.40
Entry / Exit		7.90	13.40	19.94	35.27	54.64	74.18	102.42	123.28	137.60
0	7.9									
13.4	13.4			320	565	1255	1570	2150	2485	2715
19.941	19.941		320		370	1060	1375	1955	2290	2520
35.27	35.27		565	370		690	1005	1585	1920	2150
54.64	54.64		1255	1060	690		695	1270	1605	1840
74.181	74.181		1570	1375	1005	695		580	915	1145
102.427	102.427		2150	1955	1585	1270	580		460	690
123.288	123.288		2485	2290	1920	1605	915	460		355
135.4	137.6		2715	2520	2150	1840	1145	690	355	

Table 6-21 : Return Journey Toll rates- OSV

Toll Plaza Locations		-	13.400	19.941	35.270	54.640	74.181	102.42	123.28	135.40
Entry / Exit		7.90	13.40	19.94	35.27	54.64	74.18	102.42	123.28	137.60
-	7.900									
13.400	13.400			510	905	2010	2510	3435	3975	4340
19.941	19.941		510		595	1700	2200	3125	3665	4030
35.270	35.270		905	595		1105	1610	2535	3070	3440
54.640	54.640		2010	1700	1105		1110	2035	2570	2940
74.181	74.181		2510	2200	1610	1110		925	1465	1830
102.427	102.427		3435	3125	2535	2035	925		735	1105
123.288	123.288		3975	3665	3070	2570	1465	735		565
135.400	137.600		4340	4030	3440	2940	1830	1105	565	

Table 6-22 : 20 One Way Trips Toll rates- OSV

Toll Plaza Locations		0	13.4	19.941	35.27	54.64	74.181	102.427	123.288	135.4
Entry / Exit		7.9	13.4	19.941	35.27	54.64	74.181	102.427	123.288	137.6
0	7.9									
13.4	13.4			5085	9035	20075	25110	34365	39740	43425
19.941	19.941		5085		5935	16975	22010	31260	36635	40325
35.27	35.27		9035	5935		11040	16075	25330	30705	34390
54.64	54.64		20075	16975	11040		11085	20340	25715	29400
74.181	74.181		25110	22010	16075	11085		9255	14625	18315
102.427	102.427		34365	31260	25330	20340	9255		7350	11040
123.288	123.288		39740	36635	30705	25715	14625	7350		5665
135.4	137.6		43425	40325	34390	29400	18315	11040	5665	

6.4 Toll Revenue

As indicated earlier, toll revenue on the Project Road has been calculated in all three scenarios based on above rates and projected traffic. The estimates of toll revenue under ***Optimistic***, ***Pessimistic*** and ***Most Likely*** growth scenarios are presented in the following section.

6.5 Toll Revenue at all toll plazas under Scenarios

Toll Revenue estimates under all scenarios at each of the toll plaza starting from the year 2026-27 are shown in tables below.

Table 6-23 : Toll Revenue Pessimistic Scenario

(Rs. Crores)

Year/Types of vehicles	Car, Jeep, Van, LMV	LCV, LGV	Bus	2 Axle Truck	3 Axle Truck	MAV	Total Revenue (Cr)
2026-27*	63.19	28.44	41.71	29.29	48.59	117.83	**329.04**
2027-28*	69.18	29.90	44.46	30.08	50.51	125.70	**349.83**
2028-29	101.89	43.18	63.54	43.10	72.75	186.59	**511.05**
2029-30	114.12	46.37	68.10	46.32	78.16	206.59	**559.66**
2030-31	124.07	49.76	72.56	49.50	83.61	227.71	**607.21**
2031-32	136.14	53.44	77.99	53.39	89.88	252.12	**662.96**
2032-33	151.67	57.39	82.68	57.06	96.35	278.54	**723.70**
2033-34	167.03	62.20	88.30	61.43	103.65	308.66	**791.27**
2034-35	186.92	66.95	94.00	65.94	111.96	343.40	**869.17**
2035-36	204.86	72.57	101.00	71.41	120.84	381.54	**952.22**
2036-37	226.36	77.79	107.34	76.43	129.66	421.43	**1039.01**
2037-38	249.52	83.93	114.39	82.07	139.48	466.50	**1135.90**
2038-39	273.37	90.68	122.40	88.43	150.09	516.39	**1241.35**
2039-40	301.24	98.04	130.86	95.14	162.31	574.38	**1361.98**
2040-41	327.57	104.10	138.98	101.33	172.22	626.64	**1470.84**
2041-42	356.76	111.01	147.40	107.75	183.80	687.48	**1594.21**
2042-43	388.50	118.43	156.08	114.32	194.97	745.86	**1718.16**
2043-44	427.29	125.75	165.53	121.47	207.34	811.04	**1858.42**
2044-45	464.59	133.78	175.15	128.72	219.75	878.81	**2000.81**
2045-46	503.94	141.73	185.30	136.27	232.27	949.56	**2149.08**
2046-47	544.95	150.19	195.42	143.75	245.78	1026.96	**2307.06**
2047-48	594.87	159.10	207.49	152.60	260.49	1112.43	**2486.98**
2048-49	643.13	168.57	218.73	160.89	274.83	1199.30	**2665.44**
2049-50	698.28	178.37	230.92	169.86	290.58	1295.65	**2863.66**
2050-51	755.46	188.72	243.92	179.18	307.15	1399.14	**3073.58**
2051-52	818.90	200.21	258.21	189.47	324.82	1511.39	**3302.99**
2052-53	882.99	211.46	272.39	199.55	342.28	1627.03	**3535.70**
2053-54	959.79	223.01	287.66	210.44	361.00	1752.83	**3794.72**
2054-55	1034.60	235.89	304.11	222.05	380.88	1888.79	**4066.32**

Year/Types of vehicles	Car, Jeep, Van, LMV	LCV, LGV	Bus	2 Axle Truck	3 Axle Truck	MAV	Total Revenue (Cr)
2055-56	1123.90	249.41	321.82	234.33	402.51	2038.44	**4370.39**
2056-57	1209.94	263.23	338.72	246.13	423.17	2188.39	**4669.59**
2057-58	1310.50	277.30	357.35	259.16	445.78	2353.84	**5003.93**
2058-59	1418.10	292.91	377.21	273.06	470.18	2534.54	**5366.00**

Note: *Since the Ganga Expressway is a greenfield project, revenue projections for the initial two years (FY 2026-27 & FY 2027-28) have been conservatively estimated at 75%.

Table 6-24 : Toll Revenue Most Likely Scenario

(Rs. Crores)

Year/Types of vehicles	Car, Jeep, Van, LMV	LCV, LGV	Bus	2 Axle Truck	3 Axle Truck	MAV	Total Revenue (Cr)
2026-27*	63.34	28.51	41.81	29.36	48.70	118.10	**329.81**
2027-28*	69.50	30.04	44.67	30.22	50.76	126.29	**351.49**
2028-29	102.60	43.48	64.00	43.41	73.28	187.89	**514.66**
2029-30	115.18	46.82	68.75	46.76	78.91	208.51	**564.93**
2030-31	125.52	50.35	73.43	50.10	84.61	230.36	**614.37**
2031-32	138.05	54.21	79.12	54.16	91.18	255.64	**672.35**
2032-33	154.16	58.35	84.07	58.02	97.98	283.08	**735.66**
2033-34	170.16	63.39	90.01	62.62	105.64	314.42	**806.24**
2034-35	190.86	68.39	96.05	67.37	114.39	350.61	**887.68**
2035-36	209.66	74.31	103.44	73.14	123.75	390.46	**974.77**
2036-37	232.21	79.85	110.21	78.46	133.10	432.27	**1066.11**
2037-38	256.57	86.36	117.73	84.45	143.52	479.62	**1168.25**
2038-39	281.74	93.53	126.27	91.22	154.80	532.14	**1279.70**
2039-40	311.19	101.36	135.33	98.37	167.82	593.27	**1407.34**
2040-41	339.19	107.88	144.07	105.02	178.49	648.77	**1523.42**
2041-42	370.28	115.32	153.17	111.94	190.95	713.43	**1655.10**
2042-43	404.18	123.32	162.58	119.06	203.04	775.84	**1788.03**
2043-44	445.59	131.27	172.84	126.81	216.45	845.64	**1938.61**
2044-45	485.63	139.99	183.33	134.71	229.96	918.49	**2092.11**
2045-46	528.01	148.66	194.44	142.96	243.66	994.80	**2252.52**
2046-47	572.34	157.93	205.56	151.17	258.46	1078.44	**2423.89**
2047-48	626.25	167.70	218.78	160.87	274.59	1170.98	**2619.17**
2048-49	678.66	178.11	231.19	170.02	290.41	1265.44	**2813.84**
2049-50	738.62	188.92	244.67	179.94	307.81	1370.36	**3030.33**
2050-51	801.00	200.37	259.08	190.28	326.16	1483.37	**3260.26**
2051-52	870.35	213.10	274.93	201.69	345.76	1606.21	**3512.03**
2052-53	940.70	225.62	290.74	212.94	365.24	1733.25	**3768.48**

Year/Types of vehicles	Car, Jeep, Van, LMV	LCV, LGV	Bus	2 Axle Truck	3 Axle Truck	MAV	Total Revenue (Cr)
2053-54	1024.95	238.53	307.78	225.12	386.15	1871.73	**4054.26**
2054-55	1107.47	252.92	326.18	238.12	408.42	2021.76	**4354.87**
2055-56	1205.94	268.07	346.02	251.90	432.67	2187.18	**4691.77**
2056-57	1301.37	283.62	365.09	265.24	456.00	2353.73	**5025.04**
2057-58	1412.90	299.51	386.11	279.96	481.54	2537.76	**5397.79**
2058-59	1532.57	317.14	408.57	295.71	509.15	2739.15	**5802.29**

Note: *Since the Ganga Expressway is a greenfield project, revenue projections for the initial two years (FY 2026-27 & FY 2027-28) have been conservatively estimated at 75%.

Table 6-25 : Toll Revenue Optimistic Scenario

(Rs. Crores)

Year/Types of vehicles	Car, Jeep, Van, LMV	LCV, LGV	Bus	2 Axle Truck	3 Axle Truck	MAV	Total Revenue (Cr)
2026-27*	63.48	28.58	41.91	29.43	48.82	118.37	**330.59**
2027-28*	69.83	30.19	44.89	30.37	51.00	126.88	**353.15**
2028-29	103.32	43.80	64.46	43.72	73.80	189.19	**518.29**
2029-30	116.25	47.27	69.41	47.21	79.66	210.44	**570.24**
2030-31	126.99	50.95	74.31	50.70	85.62	233.03	**621.60**
2031-32	139.98	54.99	80.26	54.93	92.49	259.21	**681.85**
2032-33	156.68	59.33	85.49	59.00	99.62	287.69	**747.80**
2033-34	173.34	64.61	91.75	63.82	107.67	320.27	**821.45**
2034-35	194.88	69.87	98.13	68.82	116.86	357.96	**906.53**
2035-36	214.57	76.10	105.95	74.89	126.72	399.56	**997.80**
2036-37	238.20	81.96	113.14	80.54	136.63	443.37	**1093.84**
2037-38	263.79	88.86	121.15	86.89	147.67	493.07	**1201.44**
2038-39	290.35	96.45	130.26	94.08	159.66	548.33	**1319.13**
2039-40	321.44	104.78	139.94	101.70	173.49	612.74	**1454.10**
2040-41	351.19	111.79	149.33	108.84	184.97	671.63	**1577.75**
2041-42	384.29	119.79	159.15	116.29	198.36	740.30	**1718.17**
2042-43	420.46	128.41	169.34	123.98	211.43	806.96	**1860.58**
2043-44	464.62	137.01	180.46	132.37	225.94	881.64	**2022.05**
2044-45	507.57	146.47	191.88	140.96	240.62	959.85	**2187.35**
2045-46	553.17	155.92	203.99	149.96	255.57	1042.07	**2360.68**
2046-47	601.03	166.04	216.19	158.96	271.75	1132.38	**2546.34**
2047-48	659.21	176.74	230.65	169.56	289.42	1232.47	**2758.05**
2048-49	716.07	188.17	244.33	179.65	306.84	1335.06	**2970.12**
2049-50	781.18	200.08	259.21	190.59	326.01	1449.20	**3206.27**
2050-51	849.18	212.72	275.14	202.03	346.29	1572.46	**3457.82**
2051-52	924.89	226.78	292.68	214.67	367.99	1706.74	**3733.75**

Year/Types of vehicles	Car, Jeep, Van, LMV	LCV, LGV	Bus	2 Axle Truck	3 Axle Truck	MAV	Total Revenue (Cr)
2052-53	1002.02	240.69	310.27	227.20	389.67	1846.13	**4015.99**
2053-54	1094.37	255.08	329.26	240.78	413.00	1998.40	**4330.88**
2054-55	1185.29	271.13	349.80	255.30	437.88	2163.74	**4663.14**
2055-56	1293.75	288.07	371.97	270.75	465.01	2346.40	**5035.95**
2056-57	1399.47	305.53	393.44	285.78	491.29	2531.12	**5406.61**
2057-58	1523.03	323.44	417.11	302.38	520.07	2735.57	**5821.60**
2058-59	1655.97	343.31	442.45	320.18	551.24	2959.74	**6272.89**

Note: *Since the Ganga Expressway is a greenfield project, revenue projections for the initial two years (FY 2026-27 & FY 2027-28) have been conservatively estimated at 75%.

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