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TRAFFIC STUDY FOR BEAWAR-PALI-PINDWARA SECTION OF NH-14 IN THE STATE OF RAJASTHAN

RAMBØLL

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1. INTRODUCTION

1.1 General

The Govt. of India (GoI) through the National Highways Authority of India (NHAI) has embarked on a programme of upgrading existing national highways to provide a safer, more comfortable and faster journey on the national road network. The NHAI has launched seven phases of National Highways Development Projects (NHDP), to upgrade, rehabilitate and widen major highways in India to a higher standard. The Phase III consists of the widening of some of the existing highway corridors from 2-lane to 4- lane.

National Highway No. 14 (NH-14) originates in Beawar, Rajasthan and terminates at Radhanpur, Gujarat comprising a total length of 450 km. The project road, a section of NH-14, starts at Beawar (km 0.0); passes through Pali (km 110) & Sirohi (km 200); and ends at Pindwara (km 244.12) with a length of about 244.12 km. Few other towns it passes through are Bar, Sojat, Sanderao, Sheoganj and Sumerpur. **Figure 1-1** gives the alignment of NH-14 and the major places.

Figure 1-1: Alignment of NH-14 with major places

The four laning of the project road was awarded to M/s. L&T Infrastructure Development Projects Limited, (who in turn formed a SPV, M/s. L&T BPP Tollways Limited) on Design, Build Finance, Operate and Transfer (DBFOT) basis for a concession period of 23 years including construction period of 2.5 years.

M/s. L&T IDPL has appointed M/s. Ramboll India Private Ltd as a traffic consultant to carry out a due diligence study for assessing the present traffic levels, travel pattern and revenue estimation for the project, duly considering the network characteristics, future economic perspective in the influence area of the project and the provisions in the Concession Agreement of the project for the balance concession period.

1.2 Objective and Scope of Services

The objective of the study is to estimate the base year tollable traffic, projected tollable traffic and related revenues on the project road for the balance duration of the concession period. The scope of services of this study is to:

- Undertake Traffic Survey on the project road sections as per the following:

  ➢ One day Origin-Destination survey at the four existing toll plaza locations to assess the existing travel pattern of vehicles plying on the project road

- Analysis of the toll traffic data since COD and review past traffic reports traffic trend related to the project

- Traffic and revenue projections with FY18 traffic as AADT

- Identify current and proposed competing routes & analyses the network conditions, traffic characteristics & level of tolls charged, if any on the competing corridors

- Identify any permanent and temporary factors which may have a positive and / or negative impact on the traffic.

- Assessment of upcoming developments and future development potential of the region for induced/newly generated traffic

- Impact of expansion of Kandla, Tuna & Mundra ports on BPP traffic

- Impact of DFC & DMIC on BPP traffic

- Estimation of traffic growth rates by each category of vehicles (using the perspective growth of economic indicators and projected elasticities)

- Preparation of traffic projections based on the analysis of macro-economic indicators related to forecasts of national/state GDP/WPI for the concession period

- Estimation of toll-able traffic streams for different categories of traffic streams paying normal and concessional toll rates as per concession document

- Estimation of toll revenue as per categories of traffic streams stipulated in the tolling schedule

1.3 Structure of Report

The report is divided into four chapters, including this introduction chapter. Chapter 2 contains details pertaining to various traffic surveys conducted for data collection and

its analysis to understand the base year traffic and travel characteristics in the Project Influence Area (PIA). Chapter 3 contains the details on the derivation of traffic growth rates, traffic projections and capacity analysis. Chapter 4 presents the details regarding tolling strategy, toll rates and the revenue projections for the duration of the concession.

2. TRAFFIC SURVEY AND ANALYSIS

2.1 General

The traffic surveys are conducted to appreciate the existing traffic levels on the roads in the influence area of the project and used for future estimation of traffic levels on the project road. As part of the study, a systematic methodology has been followed to assess the characteristics of the traffic on the study road corridor.

The data collected enables the historic socio-economic variables that drive demand for travel, together with the existing traffic demand in the area to be analysed and ultimately used in the forecasting of traffic demand over the length of the concession period. This chapter presents the details of various traffic and travel characteristics based on the surveys carried out by the Consultants.

2.2 Project Road Characteristics

The project road starts at Beawar at km 0.00 and ends at Pindwara at km 242.00. It falls under the jurisdiction of two districts, Pali and Sirohi. The economy of Pali is based on agriculture to quite an extent. The city is also known for its textile/ dyeing based industries which export cotton and synthetic clothes. Rajasthan State Industrial Development & Investment Corporation Ltd. (RIICO) has developed industrial areas at Beawar, Bar, Sojat and Pali. Marwar is another big industrial area which is 20 km from the project corridor. Sojat is Asia's biggest market yard of Henna which is distributed to various parts of India and abroad.

The proposed Western Dedicated Freight Corridor (WDFC) connecting Delhi to Mumbai, which is 1540 km long runs along the project road alignment. As a part of this development, the Delhi Mumbai Industrial Corridor Development Corporation (DMICDC) has identified 24 nodes (investment regions and industrial areas) across seven states. Rajasthan, 553 km (39%) of WFDC and 58% of the state is in influence area of DMIC zone. At present in Rajasthan, an Investment Region (IR) of Khushkheda- Bhiwadi-Neemrana and an Industrial Area (IA) of Jodhpur-Pali-Marwar Industrial Area (JPMIA) are being developed in Phase I of DMIC.

In wider context, the project road serves for the long distance traffic which is majorly plying between North India and the Gujarat Ports (i.e Kandla, Mundra, Mandvi and Tuna). In addition, it also acts as a major conduit for traffic plying between Rajasthan districts (Pali/Beawar/Jodhpur/Jaisalmer etc) to the Gujarat ports. Apart from long distance traffic, it also serves the short distance traffic which is mainly generated between Beawar, Pali and Pindawara areas. There are four toll plazas on the project road, the details of which are given in **Table 2-1**.

S. No.	Toll Plaza Location	Chainage	District
TP-01	Near Raipur	km 27.500	Pali
TP-02	Near Indranagar	km 93.750	
TP-03	Near Birami	km 154.000	
TP-04	Near Uthaman	km 202.315	Sirohi

Table 2-1: Locations of Toll Plazas on the Project Road

The settlements of Barr, Sojat, Hemawas, Gundoj, Sanderao and Sumerpur lie along the project corridor. The alignment of the project road along with the location of four toll plazas and major places are shown in **Figure 2-1**.
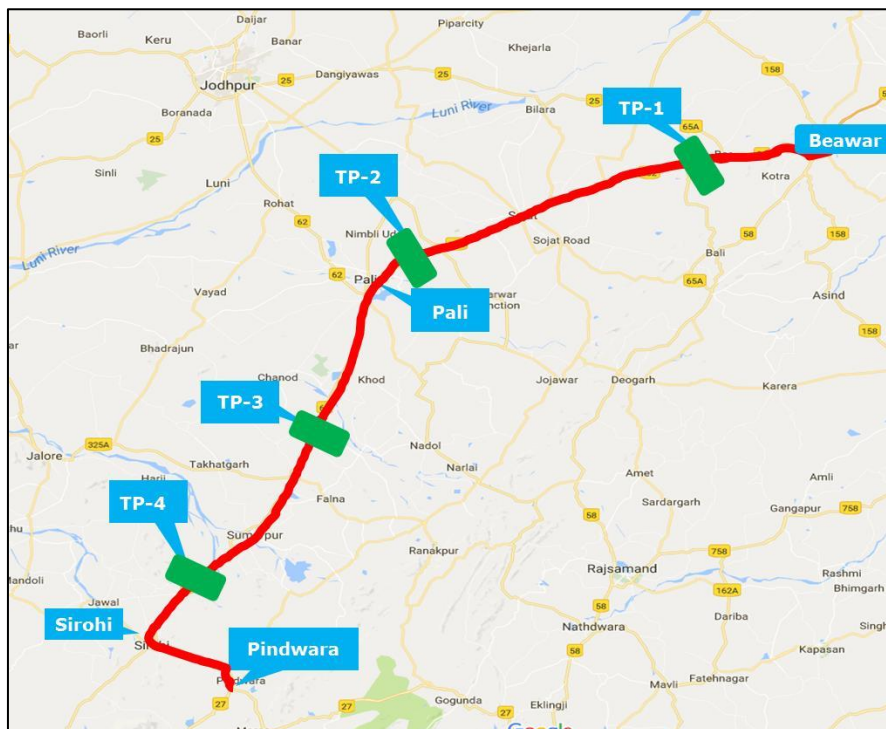
Figure 2-1: Project Road Alignment

2.3 Traffic Characteristics-Annual Average Daily Traffic (AADT)

The traffic plying on any road generally varies over different periods of the year depending on the cycle of different socio-economic activities in the region through which it passes. Therefore, in order to have a more realistic picture of the traffic on the project road, it is required to assess its seasonal variation to estimate the Annual average daily traffic (AADT).

For the present study, toll traffic data was provided by the client from the start of operation from June 2015 to August 2017 for all the four locations. The month wise daily toll data along with the yearly average for all the operational years is presented in **Appendix 2.1**.

Based on the recent five months of toll data from April 17 to August 17, AADT estimation for the year FY18 has been done. In order to estimate the AADT for FY18, a factor based on the behaviour of these five months (April to August) to the yearly

average as derived from the year FY17 has been used. The resultant AADT for FY18 at the toll plazas is presented in **Table 2-2**.

FY18	Car	Bus	LCV	2-A	3A	MAV
TP01						
Average of 5 months	2,303	209	234	415	595	3,586
5 to 12 months factor	1.00	0.99	1.05	1.12	1.01	1.03
AADT	2,305	207	247	467	598	3,705
TP02						
Average of 5 months	3,447	320	380	372	544	3,835
5 to 12 months factor	0.99	1.00	1.04	1.13	1.01	1.04
AADT	3,409	318	394	420	547	3,982
TP03						
Average of 5 months	3,227	411	377	626	995	4,613
5 to 12 months factor	1.00	1.00	1.09	1.08	1.01	1.04
AADT	3,218	412	410	679	1,004	4,781
TP04						
Average of 5 months	3,850	354	440	543	1,002	4,597
5 to 12 months factor	0.99	0.99	1.10	1.06	1.01	1.03
AADT	3,815	351	484	577	1,010	4,738

Table 2-2: Annual Average Daily Traffic (AADT) at the toll plazas, FY18

2.4 Travel Characteristics

2.4.1 Methodology

In order to understand the travel demand pattern in the region and tollable traffic streams, results of origin and destination (OD) surveys carried out at the toll plaza locations for 24 hours, by roadside interview method as described in IRC: 102-1988 have been used. Both passenger and commercial vehicles plying on the project road were stopped on a random sampling basis and interviewed in order to gain a full appreciation of existing travel pattern and route choice on the regional network.

The travel characteristics obtained by OD survey facilitate the identification of:

1. Local and through traffic on the project road.

2. Potential divertible traffic to/from project road to various alternative routes.

Trained enumerators under the supervision of transport planners collected the trip characteristics using survey forms designed for this purpose. The OD survey elicited the characteristics like origin, destination, frequency, purpose of trip for passenger vehicles and commodity being transported for goods vehicles. The information pertaining to origin and destination of trips collected during roadside interviews was analysed to

obtain the trip distribution based on a zoning system suitably designed for the present study.

2.4.2 Traffic Zoning System

To understand the spatial dimensions of the trip characteristics of the vehicles interviewed during the O-D survey, a detailed zoning system was developed giving due consideration to the following factors:

- The road network catering to the traffic on the project road and its generating points

- Important towns, villages, factories and industrial centres around the project road area

- Administrative boundaries of districts and states.

- Configuration of the project road in the regional road network with respect to other roads

Two major types of areas were identified for analysis purpose:-

Immediate Influence Area (IIA): It includes the cities/towns/villages and districts along the project road and adjacent to it, which generate/attract trips to the project road. In this study, it consists of districts of Pali, Sirohi and Ajmer in the state of Rajasthan.

Broad Influence Area (BIA): It includes the remaining districts of Rajasthan and other neighbouring states such as Delhi, Gujarat, Haryana, Uttar Pradesh, Punjab Maharashtra, Madhya Pradesh and remaining states of India.

Detailed zoning system is prepared for IIA, while more aggregate or broad zoning is developed for BIA. The zoning system adopted for data collection was based on 74 zones and is presented in **Appendix 2.2.** Based on the sample size of different categories of vehicles interviewed during the OD survey, direction-wise expansion factors were calculated using AADT. The OD matrices for all vehicle categories were generated and a comparison was made in terms of regional distribution, travel pattern, commodity distribution and trip purpose for cars. The derived matrices are presented in **Appendix 2.3.**

2.4.3 Regional Distribution

Based on the OD matrices, the regional distribution of tollable vehicles at the toll plaza locations has been calculated. The regional distribution was observed to be almost similar for TP01 and TP02, also between TP03 and TP04, hence the average of first two TPs (TP01 and TP02); and last two (TP03 and TP04) are given in **Table 2-3**.

Region/Modes	Car	Bus	LCV/M Bus	2A	3A	MAV
Average of TP01 and TP02						

Region/Modes	Car	Bus	LCV/M Bus	2A	3A	MAV
Rajasthan	88.7	91.2	54.6	55.1	44.3	32.9
Gujarat	6.5	4.8	25.9	26.2	33.2	40.9
Madhya Pradesh	0.1	0.4	0.0	0.0	0.1	0.0
Maharashtra & Goa	0.8	0.6	0.7	0.5	1.1	1.0
Uttar Pradesh	0.3	0.6	1.6	3.3	3.7	5.0
Delhi	2.3	1.8	9.3	8.4	9.0	9.2
Punjab	0.3	0.0	0.9	0.1	0.6	0.7
Haryana	0.6	0.0	3.8	3.7	4.2	5.9
Rest of India	0.6	0.6	3.0	2.7	3.8	4.3
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
Average of TP03 and TP04						
Rajasthan	82.3	81.2	50.9	50.6	56.7	35.9
Gujarat	11.6	10.5	31.3	28.7	24.3	36.4
Madhya Pradesh	0.6	0.3	0.6	0.5	0.7	0.6
Maharashtra & Goa	2.6	5.2	2.6	5.2	5.4	3.4
Uttar Pradesh	0.2	0.2	1.7	1.3	2.0	3.7
Delhi	1.3	1.5	4.7	5.2	3.3	9.0
Punjab	0.3	0.0	1.9	2.7	2.6	1.9
Haryana	0.7	0.0	4.2	3.3	2.1	5.9
Rest of India	0.5	1.2	2.0	2.4	2.9	3.3
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Table 2-3 : Regional Distribution of Tollable Traffic (in %)

Passenger traffic

- The majority of car traffic at all toll plaza locations is from state of Rajasthan (about 82-89 per cent) and Gujarat (6-11 percent). The remaining traffic is from Delhi, Punjab, Haryana, Uttar Pradesh and rest of the states of India.

- For car traffic at TP01 and TP02, OD pair experiencing the highest amount of traffic is from Jaipur/Ajmer/Beawar to Pali/Sojat/Marwar; while at TP03 and TP04, the top OD pair for car traffic is travelling between Jodhpur/Pali and Sumerpur/Sirohi/Udaipur/Pindwara/Sabarkantha/Gujarat.

- The major share of bus traffic at all toll plaza locations is from Rajasthan (about 81-92 per cent). The remaining bus traffic is from Gujarat, Delhi and Maharashtra. The major interaction is between Jaipur/Alwar/Dausa/Ajmer to Pali at TP01. Pali to Sojat interaction is the major OD pair at TP02 and Jodhpur to Sirohi at TP03.

Freight traffic

- In case of total freight traffic, Rajasthan and Gujarat contribute about 25-56 per cent each followed by Delhi (5-9 percent), Haryana (around 5 percent) and Uttar Pradesh (3-5 percent) at all the toll plaza locations.

- At TP01 & TP02, LCV traffic was found to be travelling between Ajmer/Jaipur to Pali/Beawar/Gandhinagar/Ahmedabad.

- LCV traffic (including MLCV) at TP03 & TP04 was observed to be plying between Haryana/Jodhpur/Pali to Sabarkantha/GandhiNagar/Ahmedabad/Kheda/Anand.

- Most of the 2A, 3A & MAV are found to be travelling from Punjab/Haryana/Delhi/Jaipur/Jodhpur to Ahmedabad/Bhuj/Morvi, Kandla & Mundra ports in Kuchchh districts.

2.4.4 Travel Pattern

The travel pattern of the passenger and freight vehicles is presented in **Appendix 2.4**. Some of the main observations are:

Passenger vehicles

- The total through passenger traffic for cars at all toll plazas is in the range of 440-490 vehicles. This traffic is travelling entire length of project road which is mainly traveling between Delhi/Jaipur/Ajmer/Beawar and Ahmedabad/Gandhinagar/Sirohi.

- The passenger traffic passing through the first three TPs (TP01, TP02 & TP03) is 135 – 160 vehicles. This traffic is mainly plying between Ajmer/Beawar/Bar and Sanderao/Sumerpur.

- The passenger vehicles crossing both TP01 & TP02 are around 820 – 925 vehicles, mainly travelling from Jaipur/Ajmer/Beawar/Barr to Pali.

The passenger vehicles crossing both TP03 & TP04 are around 1,500 – 1,550 vehicles, mainly travelling from Pali/Jodhpur to Sirohi/Udaipur**.**

Freight vehicles

- The total through freight traffic is high at all toll plazas is in the range of 3,800-4100 vehicles. This traffic is travelling entire length of project road which is mainly traveling between Delhi / Jaipur / Beawar and Ahmedabad / Gandhidham / Bhuj / Rajkot / Jamnagar / Kandla port.

- 2A/3A/MAV vehicles crossing both TP01 & TP02 are around 380 vehicles, mainly travelling from Jaipur/Ajmer/Beawar/Bar to Pali.

- 2A/3A/MAV vehicles crossing both TP03 & TP04 are around 1,425-1,450 vehicles, mainly travelling from Pali / Jodhpur to Ahmedabad / Gandhidham / Bhuj / Rajkot / Jamnagar / Maharashtra.

- The freight traffic movement is also destined to the ports of Gujarat which includes Kandla, Mundra, Mandvi and Tuna ports. The majority of MAV traffic is destined to Kandla port (around 70-77 percent) with around 22 percent traffic from Mundra port. The mode wise generation from the ports of Gujarat is presented in **Table 2-4.**

Location/Mode	LCV	2A	3A	MAV

TP01	11	21	39	592
TP02	16	33	68	533
TP03	10	18	26	617
TP04	15	24	47	541

Table 2-4 : Traffic destined to the ports in Gujarat

2.4.5 Commodity Distribution

An analysis was also carried out to understand the different commodities being transported by the commercial vehicles. The overall commodity distribution is presented in **Table 2-5** which shows the commodity - wise share of the total commercial traffic on the project road. The toll plaza wise commodity distribution is presented in **Appendix 2.5**.

Commodity Type	M LCV	LCV	2A	3A	MAV
Food Grains and Cash Crops	4.6	7.0	7.0	10.8	8.8
Fruits & Vegetables	13.9	14.9	10.2	8.5	5.1
Building Materials and Cement	3.9	6.5	8.4	9.5	14.7
Iron & Steel Products	2.5	1.6	2.1	2.8	2.6
Petroleum Products, Chemicals and Gas	4.2	6.5	6.7	11.0	8.5
Automobile and Heavy Machinery	1.6	4.4	3.4	1.8	2.3
Industrial Products & Equipment	6.8	15.5	14.9	17.8	28.7
Plastic & Plastic Pipes	0.9	1.9	1.6	2.3	1.0
Miscellaneous Items	30.9	25.7	28.7	22.8	18.5
Empty Vehicles	30.9	16.0	17.0	12.8	9.8
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Table 2-5: Combined Commodity distribution of Vehicles at Toll plaza Locations (%)

- Consumer items among miscellaneous items is the major commodity being transported, ranging from a share of 18-31 percent across all freight modes at all toll plaza locations.

- Food grains, cash crops, fruits and vegetables are another prominent commodity observed across all the modes with a combined share of about 14-22 percent across all modes.

- The major movement of industrial products & equipment are observed in MAV, which accounts for about 29 percent of the total commodities of which the primary interaction is found between UP/Haryana/Delhi/Jaipur/Beawar and Surendranagar/Rajkot/Jamnagar/Porbandar/Junagadh/Amreli/Bhavnagar/ Bhuj/Gandhidham/Anjar/Nalia/Bhachau/Rapar.

- A considerable movement of petroleum products, chemicals and gas was observed at all the locations which are majorly plying between North India and Surendranagar/Rajkot/Jamnagar/Porbandar/Junagadh/Amreli/Bhavnagar/Gujarat Ports.

- A significant amount of building materials and cement movement is observed in 2A/3A/MAV, which accounts for about 8-15 percent of the total commodities of

which the primary interaction is found between Delhi/Jaipur/UP to Pali/Ahmedabad/Bhuj/Morvi, Kandla & Mundra ports in Kachchh.

2.4.6 Trip Purpose Distribution

An analysis was also carried out to assess the purpose of car trips on the project road. **Table 2-6** present the purpose-wise share of the passenger cars at all survey locations.

Purpose	TP01	TP02	TP03	TP04
Work & Business	92.8	89.7	93.5	92.6
Education	1.4	3.1	1.8	1.3
Social	0.9	1.2	1.1	1.1
Shopping	2.3	3.0	1.3	2.2
Religious	2.1	1.4	1.4	2.4
Others	0.5	1.5	1.0	0.5
Total	**100.0**	**100.0**	**100.0**	**100.0**

Table 2-6: Trip Purpose distribution-Car

- The work & business trips of car passengers are around 90-93 per cent across all toll plazas.

- Notably, at TP02 the education trips are around 3 per cent whereas at the remaining toll plazas education trips are around 1-2 per cent.

- Shopping and religious trips have a share of around 1-3 percent across all toll plaza locations. Also, minimal share of social trips was also observed across all toll plazas.

2.5 Travel Pattern on Alternate Routes

Since the start of the toll operations on the PR, it is likely that some of the freight traffic bound to Gujarat/ southern Rajasthan might have started using the alternate routes in the nearby network to avoid the toll on the PR section. In order to ascertain the same, travel pattern on Jodhpur-Bar and Jodhpur-Balotra section were studied. Origin-destination survey data along with the traffic volume was provided by client for the two sections. The location of the alternate routes along with the project road is presented in **Figure 2-2**.
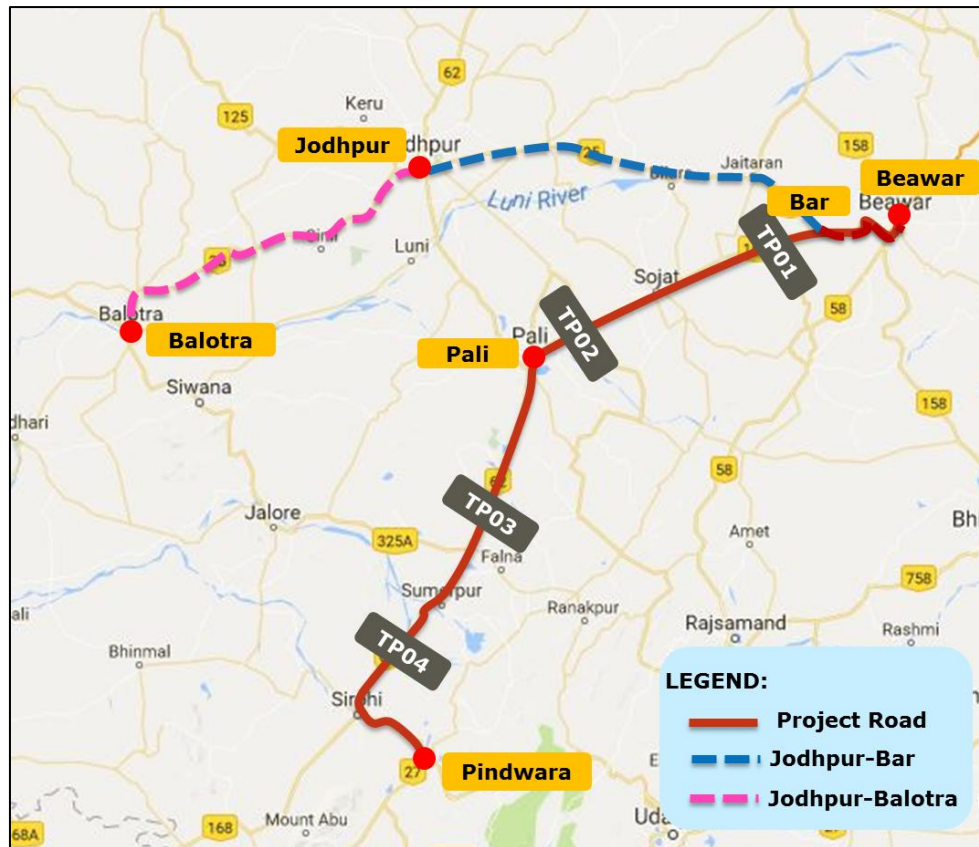
Figure 2-2: Map showing location of Alternate routes and Project road

2.5.1 Jodhpur-Barr section

This OD data was analysed in terms of travel pattern along with the volume characteristics to find out the truck traffic using this section in order to avoid the toll plazas on the PR. The summary of travel pattern of this section is presented in **Table 2-7 .**

S. No.	Traffic Stream	MLCV	LCV	2A	3A	MAV
1	Jodhpur & Surroundings to Bilara, Beawar & Surroundings	215	155	131	53	92
2	Jodhpur & Surroundings to Beyond Beawar (North)	56	165	152	126	244
3	Jodhpur & Surroundings to Beyond Beawar (South)	42	47	25	55	99
4	Beyond Jodhpur (North) to Bilara, Beawar & Surroundings	0	13	4	8	13
5	Beyond Jodhpur (North) to Beyond Beawar (South)	0	7	4	6	7
6	Pali & surroundings to Bilara, Beawar & Surroundings	7	3	13	6	7
7	Pali & surroundings to Beyond Beawar (North)	0	7	21	18	7
8	Gujarat & Beyond to Bilara, Beawar & Surroundings	0	3	0	0	20
9	Gujarat & Beyond to Beyond Beawar (North)	7	7	46	37	79
10	Pali, Sirohi & Gujarat to Beyond Beawar (South)	0	3	0	2	26
	ADT	**327**	**410**	**397**	**310**	**594**

Table 2-7: Travel pattern on Jodhpur-Barr section

Out of all the above traffic streams, the traffic stream no. 1, 2 and 4 represents the local movement on this section. Streams 3 and 5 on this section signify that it has already crossed the PR toll plazas in order to reach Jodhpur and surroundings. Stream no 6 and 7 though destined to Bilara/ Beawer could be using Pali- Jodhpur, Bilara-Beawer route.

The streams of traffic which could be the potential for the PR is the traffic destined from/to Beawer and beyond to/from south of Sirohi. In case of this section, stream no 8, 9 and 10 are the likely potential streams which could have used the PR to reach the destinations in Gujarat/southern Rajasthan. This amount to a total of 232 trucks (7-MLCV, 13-LCV, 46-2A, 39-3A and 125-MAV). Some of this traffic might be using this alternate route in order to avoid the toll charges and the overloading charges being imposed on the toll plazas on the project road.

2.5.2 Jodhpur-Balotra section

In addition, OD data from this section was analysed in terms of travel pattern in order to make an assessment of the traffic, if any, using the alternate route to avoid the toll plazas on the PR.

The summary of travel pattern of this section is presented in **Table 2-8 .**

S. No.	Traffic Stream	MLCV	LCV	2A	3A	MAV
1	Jodhpur & Surroundings to Balotra & Surroundings	300	294	155	142	251
2	Jodhpur & Surroundings to Barmer	39	139	66	91	181
3	Jodhpur & Surroundings to Sirohi & beyond	13	40	45	56	352
4	RJ North to Sirohi and beyond/GJ/MH	0	10	11	24	176
5	Beyond Rajasthan to Sirohi and beyond/GJ/MH	0	69	39	64	267
6	WB to Balotra & Gujarat (Kandla, Rajkot)	0	0	4	5	11
	ADT	**352**	**553**	**319**	**382**	**1,238**

Table 2-8: Travel pattern on Jodhpur-Balotra section

Out of all the above traffic streams, the traffic stream no. 1 and 2 represents the local movement on this section. Stream no 3 on this section signifies that it has already crossed the PR toll plazas in order to reach Jodhpur and surroundings. In case of this section, traffic captured under stream no 4 and 5 might be using this road section as the preferred route to reach the destinations in Gujarat.

3. TRAFFIC GROWTH RATE AND PROJECTIONS

3.1 General

As the project road has been executed on a DBFOT basis with a concession period of 23 years, an estimation of the traffic using the tolled highway and its future growth are important elements to assess the project's economics as they are generally the main/sole source of revenue for the project. This chapter details various aspects of the current traffic of the project road and its growth potential.

3.2 Project Road Traffic

The traffic that is likely to use the project road was estimated on the basis of the traffic and travel characteristics gathered through primary surveys as well as secondary sources. The traffic on the project road would normally consist of the following components:

- Normal Traffic
- Diverted Traffic
- Induced/Developmental Traffic

3.2.1 Normal Traffic

Normal traffic is the traffic which is already plying on the project road, which has been assessed on the basis of toll data.

3.2.2 Diverted Traffic

Diverted traffic is generally dictated by the presence of an alternative route at a cheaper generalised cost , which is in-turn defined by the road configuration and its condition, the type of vehicle and its operating costs, the average riding speed, the route distance and any tolling that may apply on a specific route. In case of the project road, there is no alternate route available in the vicinity of the project road. However, since the start of the tolling on the project road, some of the traffic may have started using Jodhpur-Bar road to reach their destinations in Gujarat/south of the PR.

3.2.3 Induced/ Dissuaded traffic

Developmental /new generated traffic is the one which would be generated, over and above normal growth, because of lowering of transport costs or new developments in the immediate influence area of the project road.

Impact of DMIC

Along the alignment of the Delhi-Mumbai Freight Corridor, "Delhi Mumbai Industrial Corridor (DMIC)" is being set up in a strip of 150-200 km. The proposed alignment of dedicated freight corridor passes through the region that already has well-developed industrial base. However, in order to optimize on the alignment of DFC and feeder

transport infrastructure for freight distribution, influence region for development of high impact economic regions with quality infrastructure is considered to be extended up to 150-200 km on both sides of the alignment of the DFC.

Project influence area (PIA) for DMIC comprises 436,486 Sq km and constitutes 29.2% of the total area of DMIC states (1,492,557 Sq km) and 13.8% of overall India. The influence area states for DMIC include Delhi, Haryana, Rajasthan, Gujarat, Maharashtra, Union Territories of Diu & Daman and Dadra & Nagar Haveli along with parts of Western Uttar Pradesh, Uttaranchal and Madhya Pradesh.

Under DMIC, high impact/ market driven nodes- integrated Investment Region (IRs) and Industrial Areas (IAs) have been identified within the corridor to provide transparent and investment friendly facility regimes.

An Investment Region (IR) would be a specifically delineated industrial region with a minimum area of over 200 square km (20,000 hectares), while an Industrial Area (IA) would be developed with a minimum area of over 100 square km (10,000 hectares). 24 such nodes - 11 IRs and 13 IAs spanning across six states have been identified after wide consultations with the stakeholders i.e. the State Governments and the concerned Central Ministries. It is proposed that 6 IR and 6 IAs would be taken up for implementation in the Phase 1. As per the initial plan of DMIC authorities, Phase I development was proposed to happen between 2008 and 2012. However the development/construction is yet to start for Phase I.

In case of the project road, DMIC node for Jodhpur-Pali-Marwar (JPM) is proposed to be developed in Phase I with an area of 154 sq km. The map showing location and strategic road and rail network in the surroundings is presented in **Figure 3-1**.
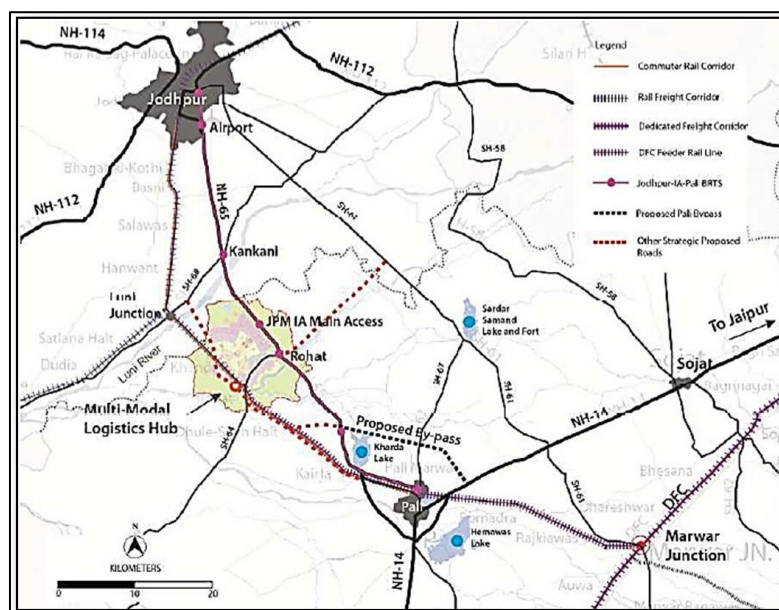
Figure 3-1: JPM Investment Area and surrounding road and rail network

As per the draft master plan of this IA, Jodhpur-Pali-Marwar industrial area is proposed to be developed in three phases. The first phase (2014-22) will kick in with the Multi-Modal Logistic hub which is anticipated to be the main catalyst of growth in the initial phases. The existing skill development programs in the region shall be upgraded to meet the anticipated skill level of the industries proposed in the township. During the first development phase, the SH-64 corridor shall be the focus for development. Four basic industry groups are expected to be attracted to the IA and consolidated as regional economic drivers i.e. agro food, apparel and textile, building materials and handicrafts.

The second development phase (2023-2032) is a transitional phase where the initial Emerging Strategic Industry 1 groups are attracted, based on changing market conditions, consolidation of infrastructure, labour supply, government incentive schemes etc. During this phase, therefore, some of the basic industry groups would continue to thrive and be located within or adjoining industry zones/parks where the Emerging Strategic Industry groups would be set up.

During the third development phase (2033-2042), a large portion of the industrial lands is taken up by general machinery and equipment. In order to avoid possible noise or ground pollution issues, it is suggested that the electrical and communication machinery & apparatus subdivision should be located away from main living areas. Therefore, it could be co-located with other heavy industries at the periphery.

As per the master plan of Jodhpur-Pali-Marwar Industrial Area (IA), regional network analysis of IA has been done. It mentions, under existing conditions, NH-65, SH-64 and SH-61 are major highways linking the IA to the outside region. SH-64 is one of the busiest roads within the JPM IA area. To better serve the freight transport of IA area, it is recommended to add two highways in the future. One proposed new highway construction is to extend SH-64 to SH-61 to facilitate truck access to Jodhpur Airport and to DFC at Marwar Junction. The other highway project is to connect the IA with SH-64 and SH-68. Also a feeder road link is planned from Rohat on NH65 to SH61.

Regarding the rail networks, Jodhpur to Marwar Junction rail line connects JPM IA with Jodhpur and DFC. Currently, it is a single track broad gauge line. The government is intending to convert the existing single track to double tracks. It is proposed that the current Rohat Station will be used mainly for freight in the future. A new passenger rail station will be constructed near the IA city centre.

Trips from the JPM IA to outside are expected to be relatively low because most people will work and reside within the IA. As per the draft master plan, the passenger vehicle generation from this IA is expected to be around 19,000 car/taxi and 134 buses per day by 2042. The draft master plan states that the total cargo generated by IA is likely to be 0.32 million ton in 2022, 1.76 million ton in 2032 and 7.18 million ton in 2042. Of all the cargo, average 30% will use rail and 70% use the road to transport. Using the

rail road split for different commodity types, the total road cargo tonnage is expected to be 0.24 MTPA in 2022, 1.27 MTPA in 2032 and 5.14 MTPA in 2042.

The assessment of the likely generation by different types of trucks from this industrial area is based on likely composition of freight traffic, average load carried by different type of freight vehicles and likely percentage of total traffic to use the project road toll plazas. TP01 and TP02 being on the north side of Marwar junction is likely to have less impact from the industrial area as compared to the other two toll plazas (TP03/TP04). The vehicles likely to be generated per day for the project road are presented in **Table 3-1.**

Years/Mode	Vehicles per day					
	Car	Bus	LGV	2-Axle	3-Axle	MAV
TP01						
2022	803	6	5	2	2	4
2032	2006	14	28	10	9	19
TP02/TP03/TP04						
2022	803	6	11	4	3	7
2032	2,006	14	56	21	17	39

Table 3-1: Vehicle generation from DMIC per day

In addition, the construction activities of DMIC Industrial Area may bring some upside for freight traffic during the construction period due to movement of construction equipment and material deliveries. It is also likely that some of the passenger traffic will also be generated as cars/buses will be providing access to the area for the workers there. The likely start of construction period for Phase I (FY22) is assumed to be FY19 and for Phase II (FY32) to be FY27. The likely generation from the construction activities has been presented in **Table 3-2**.

Years/Mode	Vehicles per day					
	Car	Bus	LGV	2-Axle	3-Axle	MAV
TP01/TP02						
FY19 to FY21	40	6	5	2	2	4
FY27 to FY31	60	8	23	8	7	16
TP03/TP04						
FY19 to FY21	40	6	11	4	3	7
FY27 to FY31	60	8	45	17	14	31

Table 3-2: Vehicle generation from construction activities from DMIC per day

The impact of development of this node of DMIC on toll revenue has been tested as a scenario.

Impact of DFC

The Ministry of Railways has embarked upon the Dedicated Freight Corridor (DFC) project which would provide a quantum leap in the railways transportation capacity which will be enough to meet the transportation demands generated by the rapidly growing economy and industrial production for the next four to five decades.

Two Dedicated Freight Corridors (DFC) i.e. between Mumbai-Delhi (Western DFC) and Delhi- Kolkata (Eastern DFC) legs of the golden quadrilateral are proposed under Phase 1 for a total length of 2,792 km.

The distribution of length of dedicated freight corridor indicates that Rajasthan and Gujarat together constitute 77% of total length of the alignment of freight corridor between Delhi and Mumbai. The envisaged alignment of freight corridor is shown in **Figure 3-2.**
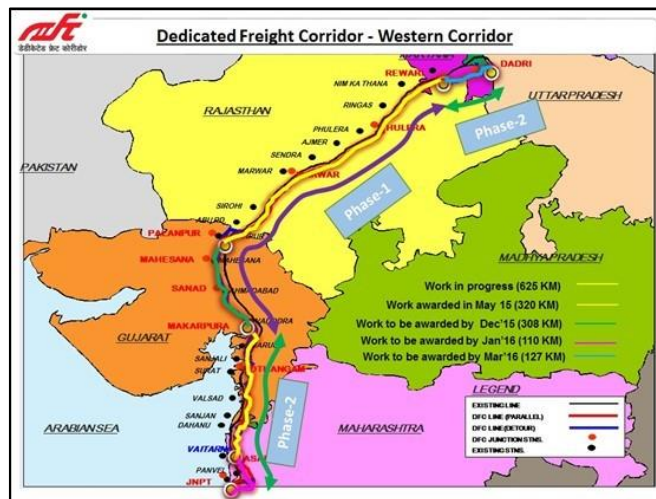
Figure 3-2: DFC alignment with major transhipment points

The traffic on the Delhi-Mumbai Corridor may comprise of ISO containers, POL, Fertilizers, food grains, salt, coal, iron & steel and cement as per the details available.

As part of DFC development, junction stations between the existing railway system and the Western DFC have been planned at Pirthala Road, Rewari, Phulera, Marwar Jn, Palanpur, Amli Road (Sabarmati), Makarpura (Vadodara), Kosad/ Gothangam and Vasai Road.

The proposed Western DFC is passing parallel to the project road under consideration. Marwar station is the nearest DFC junction to the project road and is around 40 kms east of Pali. Palanpur is the next exchange junction to the project road and would majorly serve traffic from Kandla and Mundra Ports and the Kutch region of Gujarat. With DFC coming up, there is a possibility that some of the freight traffic at present passing through the project road may shift to DFC.

The potential divertible traffic stream on the PR could be the traffic from North India to Gujarat and Maharashtra. The analysis has been done separately for these two streams of traffic which are more likely to get impacted by DFC.

The estimation process of the diverted traffic to DFC covers identification of potential divertible traffic stream likely to shift to DFC i.e. North India to Gujarat and Maharashtra traffic stream and share of DFC commodities (ISO containers, POL,

fertilizers, food grains, salt, coal, iron & steel and cement) in these two streams on the project road.

The impact of DFC has been estimated for the toll plazas on the project road catering to the long distance movement on the project corridor for the commodities likely to be carried by DFC. Citing that DFC corridor will attract more of the freight traffic from the existing rail network, it is assumed that 25 percent of road freight traffic is expected to shift to DFC. The likely traffic shift to DFC is estimated to be 204 MAV (189 from Gujarat stream and 15 from Mumbai stream)

Though the recent news clippings mention that Western DFC is under different stages of implementation and it will be fully operational in FY20. Considering the delays in completion of large scale railways projects, it has been assumed to be fully operational by FY21.

3.3 Review of Past Traffic Data

Past traffic count data was available for the toll plaza locations from the past studies (FY13 and FY14) available with the consultants. A comparison of the same with the toll data (FY16 and FY17) is presented in **Table 3-3.**

FY/ Mode	Car	Bus	LCV	2A truck	3A	MAV (≥3A)
TP01						
2013	1,262	171	181	349	808	2,128
2014	1,328	161	181	308	778	2,353
2016	1,811	186	239	309	703	3,282
2017	2,117	197	228	350	625	3,503
YOY/ End Point Growth in %						
2013-2017	13.8%	3.6%	5.9%	0.1%	-6.2%	13.3%
2014-2017	16.8%	7.0%	8.1%	4.4%	-7.0%	14.2%
2016-2017	16.9%	5.7%	-4.7%	13.1%	-11.1%	6.7%
2014-2016	16.8%	7.7%	15.1%	0.3%	-4.9%	18.1%
Trend Line Growth in %						
FY13 vs FY17	14.4%	4.4%	7.7%	0.1%	-6.0%	14.2%
TP02						
2013	1,727	292	239	376	947	2,330
2014	2,068	284	278	329	892	2,834
2016	2,695	277	381	276	686	3,474
2017	3,158	288	378	310	590	3,730
YOY/ End Point Growth in %						
2013-2017	16.3%	-0.3%	12.1%	-4.7%	-11.2%	12.5%
2014-2017	15.2%	0.5%	10.8%	-2.0%	-12.9%	9.6%
2016-2017	17.2%	3.9%	-0.9%	12.3%	-13.9%	7.4%
2014-2016	14.2%	-1.2%	17.2%	-8.4%	-12.3%	10.7%
Trend Line Growth in %						
FY13 vs FY17	15.9%	-0.5%	13.1%	-5.5%	-11.4%	12.1%
TP03						

FY/ Mode	Car	Bus	LCV	2A truck	3A	MAV (≥3A)
2013	1,975	352	425	627	1,867	2,942
2014	2,227	370	419	535	1,591	3,163
2016	2,707	350	426	467	1,237	4,280
2017	3,021	378	398	531	1,069	4,528
YOY/ End Point Growth in %						
2013-2017	11.2%	1.8%	-1.6%	-4.1%	-13.0%	11.4%
2014-2017	10.7%	0.7%	-1.7%	-0.3%	-12.4%	12.7%
2016-2017	11.6%	8.0%	-6.7%	13.8%	-13.6%	5.8%
2014-2016	10.2%	-2.8%	0.9%	-6.6%	-11.8%	16.3%
Trend Line Growth in %						
2013 to 2017	11.0%	0.9%	-1.1%	-4.6%	-12.8%	12.4%
TP04						
2013	2,577	304	452	578	1,772	3,011
2014	2,602	315	419	572	1,535	3,261
2016	3,096	295	414	427	1,230	4,220
2017	3,599	318	403	497	1,072	4,514
YOY/ End Point Growth in %						
2013-2017	8.7%	1.1%	-2.8%	-3.7%	-11.8%	10.7%
2014-2017	11.4%	0.3%	-1.3%	-4.6%	-11.3%	11.4%
2016-2017	16.3%	7.6%	-2.6%	16.3%	-12.8%	7.0%
2014-2016	9.1%	-3.1%	-0.7%	-13.6%	-10.5%	13.8%
Trend Line Growth in %						
2013 to 2017	8.8%	0.3%	-2.4%	-5.8%	-11.5%	11.3%

Table 3-3: Past traffic comparison

The comparison of the past data shows a 11-17 percent growth in cars across the four toll plazas in different comparisons. Bus growth has been varying in different time periods, highest being 8.0 percent at TP03 (FY16 vs FY17) and lowest being at -3.1 percent at TP04 (FY14 vs FY16). LCV growth has been negative at all the toll plazas in FY16 vs FY17 comparison. During FY14 to FY17 the growth of LCV has been around 8.1 percent at TP01 and 10.8 percent at TP02. 2A trucks have shown a positive growth at all the toll plazas in FY16 vs FY17 comparison. 3A trucks have shown a decline in all the comparisons made above due to the tonnage shift being witnessed all over the Indian highways with MAVs gaining priority with growth hovering around 6-18 percent across the four TPs. The recent comparison of toll data in FY16 and FY17 shows a 6-7 percent growth at the four locations.

3.4 Traffic Growth Rate Estimation

3.4.1 Methodology

Traffic growth for both passenger and freight vehicles has been estimated using the econometric approach as described in IRC-108, 1996. For freight traffic, due consideration has been given to the total tonnage transported and the shift in types of vehicles used for moving goods.

The econometric model applied, relates traffic growth to changes in state (or district) domestic product via an elasticity factor. According to IRC guidelines, elasticity based econometric model for highway projects should be derived in the following form:

Log e (P) = A0 + A1 Log e (EI), where:

P = traffic volume;

EI = Economic Indicator;

A0 = Regression constant;

A1 = Regression co-efficient (Elasticity Index).

In order to estimate traffic on the project road the methodology described below has been followed:

- Identify the influence area - From the analysis of travel patterns observed during the OD surveys, the project influencing states and districts, which are likely to impact the traffic growth on the project road, were identified.

- Review Past traffic Data – Based on data points available for the project corridor from different sources a review of past traffic and tonnage growth is carried out.

- Analysis of economic growth of the Project Influencing Area (PIA) - For each PIA state an economic profile describing past performance and future outlook was prepared. This also considers India's past economic performance and its future outlook.

- Estimation of traffic elasticity to income – in order to translate economic growth into traffic growth, an elasticity factor was estimated.

- Derivation of traffic growth rates – On the basis of the traffic weighted PIA outlook and related traffic elasticity, traffic growth rates were estimated.

The methodology thus adopted incorporates, as basic data inputs, the perspective growth envisaged in the influence area and the changes in transport demand elasticities over a period of time. The traffic growth rates by vehicle type for the project road have been determined in line with the concession period of 23 years up to financial year FY 2035.

3.4.2 Traffic Pattern and Influence Area

The travel pattern as derived from origin and destination survey analysis reveals the predominance of Rajasthan in both passenger and freight vehicles. Besides Rajasthan, the states of Gujarat, Maharashtra, Uttar Pradesh, Delhi and Haryana do contribute to the project road traffic.

The travel pattern observed at the four toll plaza locations is almost similar; therefore, the OD shares have been combined for further analysis. The travel pattern for the combined locations reveal that around 85 percent of Cars are being generated from the state of Rajasthan. In case of Buses also, around 85 percent are being generated from

the state of Rajasthan. The states of Gujarat and Maharashtra contribute around 8-9 percent and 2-3 percent respectively in the passenger traffic.

As the project corridor caters to the long distance freight traffic, a number of states have an influence on project road freight traffic. The share of freight traffic from Rajasthan is 40 percent for all trucks together, 35 percent from Gujarat, 8 percent from Delhi, around 5 percent from Haryana, 2.6 to 3.7 percent each from Maharashtra and Uttar Pradesh. There are mode wise variations in the state shares across the different modes but the main influencing states remain the same. The normalised shares of all the influencing states for the proposed/ existing toll plaza are presented in **Table 3-4**.

Region / Modes	Cars	Bus	LCV	2A	3A	MAV	All trucks
Rajasthan	88.4	88.2	54.9	54.9	55.3	36.6	41.9
Gujarat	9.7	8.4	30.3	29.0	29.2	40.6	37.4
Maharashtra	1.9	3.4	1.9	3.5	4.1	2.5	2.8
Uttar Pradesh	0.0	0.0	1.7	2.2	2.8	4.5	3.9
Delhi	0.0	0.0	7.0	6.7	5.7	9.6	8.6
Haryana	0.0	0.0	4.2	3.6	3.0	6.2	5.4
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Table 3-4 : Normalised OD shares for the project road

Looking at the predominance of Rajasthan, Gujarat and Maharashtra in passenger, these states have been considered as the PIA state for all vehicle types. In case of freight vehicles, additionally, the states of UP, Delhi and Haryana have been considered as the PIA states.

3.5   Past Economic Growth of PIA

Growth of traffic on the project road depends on existing development and future growth prospects of the connecting regions. A number of economic indicators for the PIA state, as published by Central Statistical Organisation (2004/05 prices), have been studied to assess their past performance.

Rajasthan

- Rajasthan's Gross State Domestic Product (GSDP) stood at Rs 2,722 billion in 2014-15 and has been growing at a compounded annual growth rate of 8.2 per cent since 2004-05.

- The state's growth has been fluctuating in the year on year comparisons varying between 5 to 14 percent growth. The recent years have shown a growth of around 5-6 percent during the period between FY13 to FY15.

- The services sector is the largest contributor to GSDP (50 percent), agriculture allied activities sector at 19.4 percent, industry sector at 30.6 per cent of the GSDP in 2014-15.

The change of sectoral composition of GSDP over the years is presented in **Figure 3-3**.
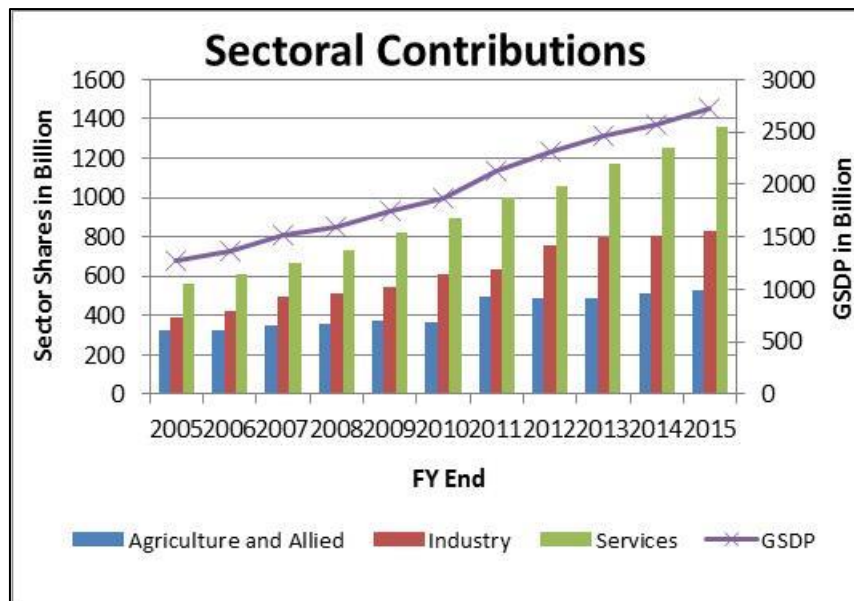
Figure 3-3: GSDP (in Rs billion) and its Sectoral Composition for Rajasthan

The performance of the state economy and its different sectors has been studied using time trend analysis. The average annual growth rates as obtained using regression analysis are presented in **Table 3-5**.

Particulars	2004/05 to 2007/08	2007/08 to 2014/15	2004/05 to 2014/15
GSDP	8.2	8.1	8.2
Agriculture and Allied	3.5	6.1	5.7
Industry	10.2	7.6	8.2
Services	9.3	9.3	9.4
Construction	8.5	2.9	3.8
Per Capita Income	6.2	6.3	6.5

Table 3-5 : Average Annual Growth Rates (%) of State Income for Rajasthan

Rajasthan is known for its textile industry and the state is the fourth largest producer of spun yarn in India. The main industries of Rajasthan include textile, rugs, woollen goods, vegetable oil and dyes. Heavy industries consist of copper and zinc smelting and the manufacture of railway rolling stock. The other industries related to private sector include steel, cement, ceramics and glass wares, electronic, leather and footwear, stone and other chemical industries.

Rajasthan has huge reserves of cement-grade and Steel Melting-Shop (SMS) grade limestone. SMS-grade limestone from Jaisalmer is supplied to various steel plants in the country. Rajasthan has 21 major cement plants, having a total capacity of 55 million tonnes per annum (MTPA). It is the largest cement-producing state in India. The state has about 17 per cent share in cement grade limestone reserves of India. Given the availability of huge cement grade limestone reserves, more than 10 cement plants would be installed in the state in near future, particularly in Chittorgarh, Jaipur, Jhunjhunu, Nagaur and Pali.

The state is a leading producer of major minerals such as lead-zinc, calcite, gypsum, rock phosphate, ochre, silver as well as minor minerals such as marble, sandstone,

serpentine (green marble), etc. which contribute a major percentage to national production.

The state is developing sector specific infrastructure, such as special purpose industrial parks and special economic zones (SEZs) for exports of handicrafts, IT and electronic goods. Eight SEZs have got formal approval and eight have been notified. The primary industries for these SEZs are IT/ITES, Handicrafts, Gems and Jewellery, Engineering and related services.

Per Capita Income of Rajasthan is Rs 38,033 in the year 2014-15 and has been growing at 6.5 percent during 2004/05 to 2014/15. The growth in Per Capita Income is presented in **Figure 3-4**.
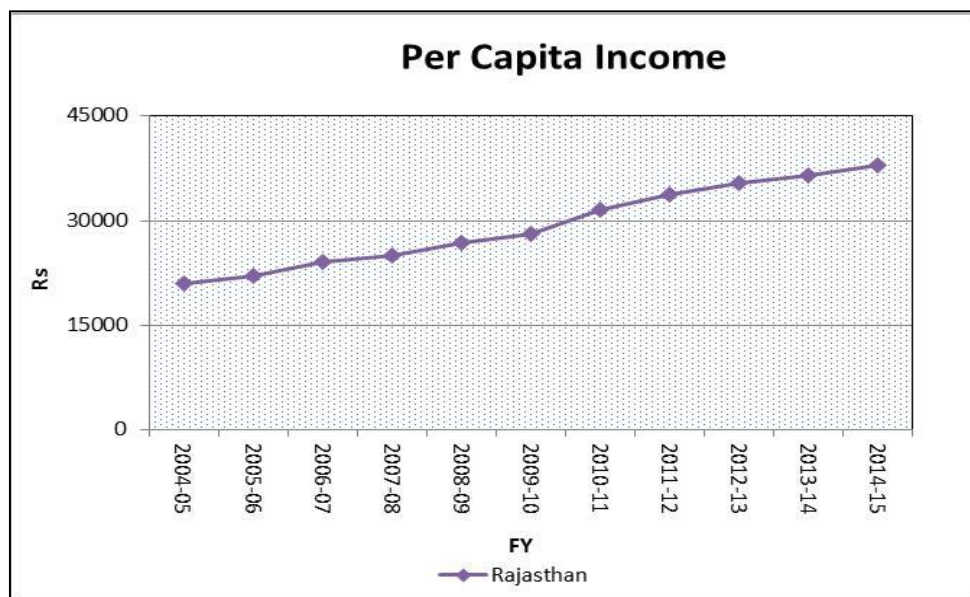
Figure 3-4: Per Capita Income of Rajasthan from 2004/05 to 2014/15

The districts of Ajmer and Pali are a major generator of traffic on the PR. Ajmer district is known for its textile, food products, leather and leather products, wood products, felspars and quartz grinding, marble, asbestos and cement. The Gross District Domestic Product of Ajmer has grown by 8.9 percent during 2004-05 to 2011-12 on 2004-05 prices (constant prices).

Economy of Pali district, though dependant on agriculture to quite an extent, is well known for its textile industries. Cotton and synthetic clothes and yarn are exported to other states of India at a very cheap rate. Some new industries have also been developed, like marble cutting, finishing etc. One of the biggest composite textile mills of India, ' Maharaja Shri Umaid mills' (established in the year 1940) is also situated at Pali. The main production of this mill is cotton, hank yarn etc. which is used for preparing different cloths. The District Domestic Product of Pali has grown by 7 percent during FY05 to FY12 on 2004-05 prices (constant prices).

Other PIA States

The other PIA states contributing to the traffic on the project road are Gujarat, Maharashtra, UP, Delhi and Haryana.

- Gujarat's Gross State Domestic Product (GSDP) stood at Rs 4,526 billion in 2013-14 and has been growing at a compounded annual growth rate of 9.1 percent since 2004/05.

- Maharashtra's Gross State Domestic Product (GSDP) stood at Rs 9,475 billion in 2014-15 and has been growing at a compounded annual growth rate of 8.7 percent since 2004/05.

- Uttar Pradesh's Gross State Domestic Product (GSDP) stood at Rs 4,923 billion in 2014-15 and has been growing at a compounded annual growth rate of 6.6 percent since 2004/05.

- Delhi's Gross State Domestic Product (GSDP) stood at Rs 2,380 billion in 2014-15 and has been growing at a compounded annual growth rate of 8.9 percent since 2004/05.

- Haryana's GSDP is recorded at Rs 2,151 billion in the year 2014-15 recording a long term growth of 8.4 percent since 2004/05

- The services sector is the largest contributor to GSDP of all the PIA states, 90.0 percent share in Delhi, 57 percent in UP and Haryana, 64.7 percent in Maharashtra for the year 2014-15 and 48.6 percent in Gujarat (2013-14).

The average annual growth rates as obtained using regression analysis till the last available year are presented in **Table 3-6**.

Particular	Gujarat	Maharashtra	Uttar Pradesh	Delhi	Haryana
	(2004/05 to 2013/14)	(2004/05 to 2014Delh/15)			
GSDP	9.1	8.7	6.6	8.9	8.4
Agriculture and Allied	5.0	3.7	3.2	4.7	3.6
Industry	8.9	7.9	5.1	1.4	6.3
Services	10.5	9.8	9.0	10.2	11.5
Construction	12.9	11.2	6.1	-2.7	6.7
Per Capita Income	7.6	7.1	4.7	6.8	6.6

Table 3-6 : Average Annual Growth Rates (%) of State Income for other PIA states

The GSDP over the years for the states of Gujarat, Maharashtra, Uttar Pradesh, Delhi and Haryana are presented in **Figure 3-5.**
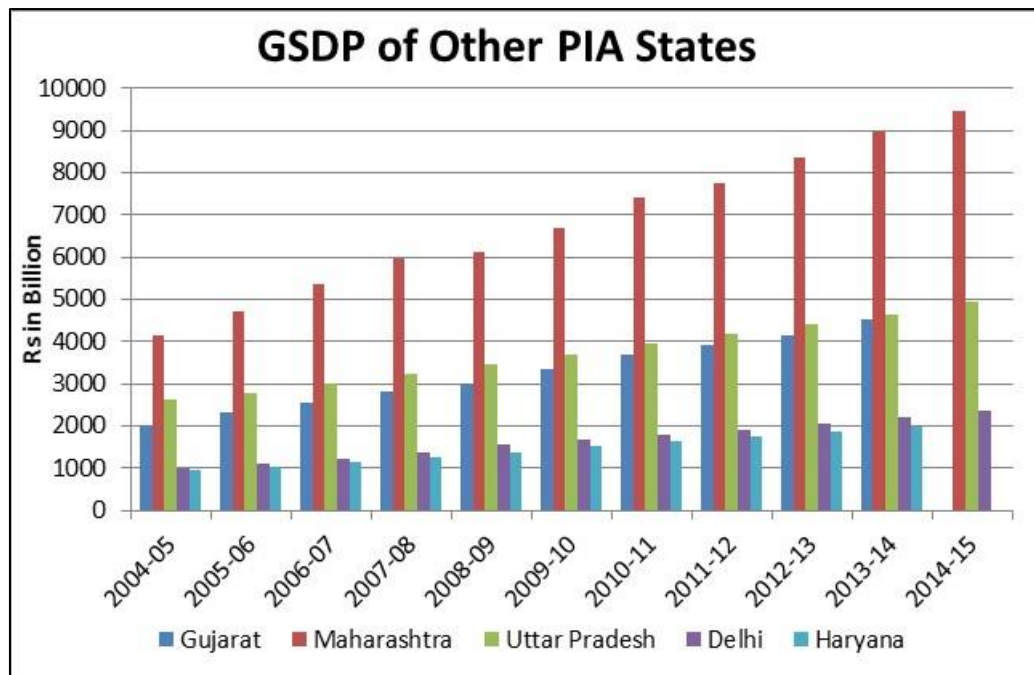
Figure 3-5: GSDP (in Rs billion) of other PIA states

3.6   PIA Outlook

For determining the perspective growth of the PIA states, their long and short term past growth were considered, along with their performances relative to India's, and the opportunities for growth for each of them.

3.6.1 India's past performance and outlook for future

India's GDP on 2004-05 series is available in public domain till 2011/12 and from FY12 to FY15 it is available on 2011-12 series. To analyse the data on one complete series, 2011/12 series has been converted into 2004-05 series.

Indian economy has grown at constant rate of 9.5 per cent during the years 2004/05 to 2007/08. After being hit by the global economic turmoil, the growth slipped to 6.7 per cent in 2008/09. The economy has revived in 2009/10 after achieving a growth of 8.6 per cent and 8.9 per cent in 2010/11.

In 2011/12, the GDP growth lowered to 6.7 per cent. FY 2012-13 has shown an average growth of 4.9 per cent. The results for 2013-14 revealed a grim economic growth of 6.6 per cent due to huge outflows by Foreign Institutional Investors (FIIs) and increasing fiscal deficit and current account deficit. The growth has been in the range of 7.5 percent for the year FY15. India's growth trend during the recent years has been presented in **Figure 3-6.**
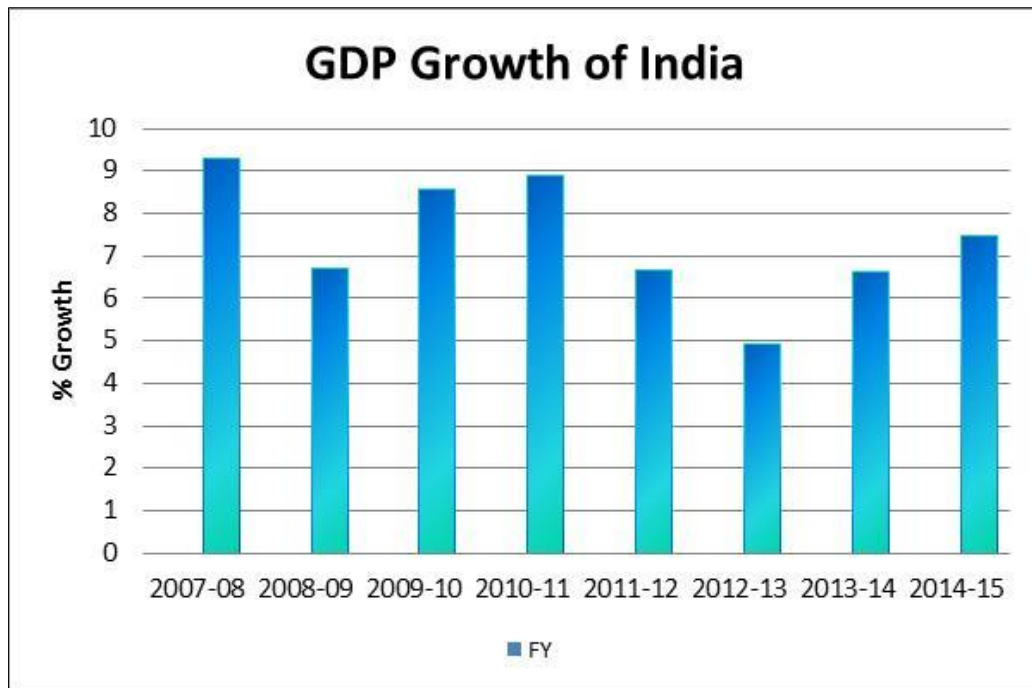
Figure 3-6: GDP growth in India

The recent estimates show a growth of 7.1 percent in 2016-17. The historical data for state GSDPs and national GDP from the NITI Aayog website (http://niti.gov.in/content/gsdp-constant2004-05prices-percent-growth-2004-05   to   2014-15) and computed the linear correlation between the growth rate of state GSDPs with the national GDP growth in the historical period (from 2005-06 to 2013-14). This linear correlation for individual states was then applied on the forecast national GDP growth rate to arrive at the forecast growth rates for the state GSDPs. National and State GSDPs of 2014-15 can't be used as the same is computed considering 2011-12 prices as base. The year wise forecasts have been converted into five year slabs and used for further analysis. The outlook for India as well as PIA state has been presented in **Table 3-7**.

Period	India	Rajasthan	Gujarat	Maharas htra	Uttar Pradesh	Delhi	Haryana
Up to 2022	7.00	7.76	8.75	8.18	6.37	8.80	8.09
2023-2027	6.05	7.19	7.87	6.95	5.98	8.28	7.43
2027-2032	5.81	7.05	7.64	6.63	5.89	8.14	7.26
Beyond 2032	5.81	7.05	7.64	6.63	5.89	8.14	7.26

Table 3-7: Future outlook of PIA states

Based on the OD shares of the toll plaza location (Table 3-4) and the outlooks adopted for PIA states, the future weighted income for different vehicle types is presented in **Table 3-8**.

Indicators	Cars	Bus	LCV	2A	3A	MAV
Up to 2022	7.94	7.93	8.22	8.20	8.18	8.29
2023-2027	7.28	7.25	7.49	7.45	7.42	7.53
2027-2032	7.11	7.08	7.30	7.26	7.23	7.33
Beyond 2032	7.11	7.08	7.30	7.26	7.23	7.33

Table 3-8 : Future Perspective of PIA Weighted Income

3.6.2 Transport Demand Elasticity

The econometric model applied for the project, relates traffic growth to changes in state domestic product via an elasticity factor according to IRC guidelines.

Generally to derive traffic elasticity to income, long time series of previous traffic on the road are used. For the project road however, such time series were not available, therefore number of vehicles registered in the PIA states have been used as proxy for it as the dependent variable (with GSDP as the independent one). A regression between GSDP and registered vehicles of PIA state was carried out and registered vehicle elasticity is presented in **Table 3-9**.

Vehicle Type	Independent Variable	Dependent Variable	Elasticity	R^2 (%)
Cars	GSDP of Rajasthan, Gujarat, Maharashtra	Registered Vehicles of Rajasthan, Gujarat, Maharashtra	1.36	0.99
Buses			0.62	0.99
Trucks	GSDP of Rajasthan, Gujarat, Maharashtra, UP, Delhi and Haryana	Registered Vehicles of Rajasthan, Gujarat, Maharashtra, UP, Delhi and Haryana	1.04	0.99

Table 3-9 : Elasticity values-Weighted GSDP with Weighted Registered Vehicles (2004/05 to 2011/12)

Vehicle registration data represents all vehicles registered in the state, but does not indicate actual number of vehicles plying on the road as it does not account for factors such vehicles taken off the road due to lack road worthiness, those registered in a state but mostly used elsewhere, etc. Consequently, the elasticity values based on vehicle registration are somewhat different from those derived from actual traffic data.

Cars

• Car elasticity has been considered as 1.6 for the period up to 2022.

• It is likely that this growth would slow down over time as the market becomes more mature and saturated, therefore elasticity to GSDP can be expected to decline over time.

Bus

• Over the years in India there has been a change in passenger's travel mode preferences with increasingly more people shifting from public transport systems

towards personalised modes. This has resulted, in general, in elasticity of bus traffic/demand to GSDP lower than unity.

- For the project road, an elasticity of Bus traffic to GSDP of 0.5 has been adopted for both the toll plazas.

Trucks

- In India as a whole the freight vehicle mix has been changing in the last decade favouring MAV to 2 Axle/ 3Axle vehicles for long-distance traffic, given the operational efficiencies achievable with larger vehicles.

- At the same time Mini LCV have become more popular over LCVs for short distance traffic and more localised supply movements.

- Considering the ongoing technical advancements in automobile industry, some of the standard 2 Axle/ 3 Axle trucks would gradually be replaced by MAVs. 2Axle and 3 Axle trucks has been negative all through the years resulting in a negative elasticity.

It has been assumed that transport demand elasticity, for both freight and passenger traffic, would gradually decline over time, despite growth in per capita income, as regions becomes more mature, self-sufficient and with alternative mode of transport available to users. Due consideration has been given to the tonnage shifts happening in the market with Mini LCV gaining importance for short distance movements over LCVs and MAVs being preferred over 2A/3A for long distance movements due to better operational efficiencies.

Giving due consideration to the past performance of different vehicle types and the anticipated growth momentum in the coming years, higher elasticity values have been considered for the slab up to FY22 and further tapering has been done in the next slab. The recommended elasticity values adopted for all vehicle types in line with the past traffic data and changes in freight traffic pattern observed on the project road are presented **Table 3-10.**

Period/Modes	Cars	Bus	LCV	2A	3A	MAV
All Toll Plazas						
Up to 2022	1.6	0.5	0.2	0.6	-0.8	1.0
2022-2027	1.4	0.5	0.2	0.5	-0.8	1.0
2027-2032	1.2	0.4	0.2	0.5	-0.8	0.8
Beyond 2032	1.0	0.4	0.2	-0.1	-0.1	0.7

Table 3-10 : Recommended Elasticity for Project Road

3.7 Projected Traffic Growth Rates

Based on the moderated perspective elasticity values and the projected growth rates of the income for PIA states, the future average annual compound traffic growth rates by

vehicle type have been estimated for the project road by using the following relationship:

Tgr = (GSDPgr) x E

Where,

Tgr – Traffic growth rate for mode

GSDPgr – growth rate of GSDP

E – Elasticity value for mode

The estimated traffic growth rates for the project road have been presented in **Table 3-11**.

Period/Modes	Cars	Bus	LCV	2A	3A	MAV
All Toll Plazas						
Up to 2022	12.7	4.0	1.6	4.9	-6.5	8.3
2022-2027	10.2	3.6	1.5	3.7	-5.9	7.5
2027-2032	8.5	2.8	1.5	3.6	-5.8	5.9
Beyond 2032	7.1	2.8	1.5	-0.7	-0.7	5.1

Table 3-11 : Projected Traffic Growth Rates for PIA (%)

The above growth rates results in average annual car growth of 9.9 percent till the end of concession. In derivation of above growth rates, the likely shift of buses to cars in case of passenger vehicles and the replacement/ tonnage shift of LCV/2A/3A trucks by Mini LCV for short distance and MAV for long distance in case of freight vehicles has been duly considered.

3.8 Effective growth rates

As described in chapter 4, the paying traffic has been derived by excluding the exemptions and violations from the total traffic. The effective year-wise growth rates of paying traffic after considering the impact of DFC diversion from FY21 and DMIC generation is presented from **Table 3-12** to **Table 3-15** for all four TPs.

FY END	Car	Bus	LCV	2A Truck	3A Truck	MAV
2019	14.68	6.71	3.82	5.33	-6.23	8.40
2020	12.48	3.90	1.57	4.88	-6.48	8.29
2021	12.51	3.90	1.57	4.88	-6.48	1.84
2022	38.44	4.07	1.46	4.89	-6.41	8.30
2023	8.19	3.51	1.47	3.69	-5.87	7.49
2024	8.34	3.52	1.47	3.69	-5.87	7.49
2025	8.49	3.52	1.47	3.69	-5.87	7.49
2026	8.62	3.52	1.47	3.69	-5.87	7.49
2027	9.81	6.50	9.74	4.99	-3.91	7.74
2028	7.31	2.67	1.36	3.54	-5.65	5.88
2029	7.39	2.67	1.36	3.55	-5.64	5.88
2030	7.47	2.67	1.37	3.55	-5.63	5.88
2031	7.54	2.68	1.37	3.55	-5.62	5.89
2032	21.49	2.54	1.50	3.49	-5.63	5.88
2033	5.68	2.69	1.37	-0.69	-0.68	5.09
2034	5.75	2.69	1.37	-0.69	-0.68	5.09
2035	5.83	2.69	1.37	-0.69	-0.68	5.09

Table 3-12 : Effective growth rates at TP01

FY END	Car	Bus	LCV	2A Truck	3A Truck	MAV
2019	14.07	5.76	2.98	5.38	-6.20	8.39
2020	12.55	3.93	1.58	4.88	-6.48	8.29
2021	12.56	3.94	1.58	4.88	-6.48	2.29
2022	30.59	4.05	1.52	4.89	-6.40	8.30
2023	8.72	3.54	1.48	3.69	-5.87	7.49
2024	8.84	3.54	1.48	3.69	-5.87	7.49
2025	8.95	3.55	1.48	3.69	-5.87	7.49
2026	9.05	3.55	1.48	3.69	-5.87	7.50
2027	9.92	5.50	6.65	5.15	-3.73	7.72
2028	7.64	2.71	1.41	3.54	-5.63	5.88
2029	7.70	2.71	1.41	3.54	-5.62	5.89
2030	7.76	2.72	1.41	3.54	-5.61	5.89
2031	7.81	2.72	1.41	3.54	-5.60	5.89
2032	17.79	2.63	1.50	3.48	-5.61	5.88
2033	6.05	2.73	1.42	-0.69	-0.67	5.09
2034	6.11	2.73	1.42	-0.69	-0.67	5.09
2035	6.17	2.73	1.42	-0.69	-0.67	5.09

Table 3-13 : Effective growth rates at TP02

FY END	Car	Bus	LCV	2A Truck	3A Truck	MAV
2019	14.26	5.36	4.30	5.50	-6.17	8.45
2020	12.53	3.95	1.56	4.87	-6.48	8.29
2021	12.55	3.95	1.56	4.87	-6.48	3.29
2022	33.04	4.04	1.67	4.88	-6.51	8.28
2023	8.55	3.56	1.46	3.68	-5.88	7.49
2024	8.68	3.56	1.46	3.68	-5.88	7.49
2025	8.80	3.56	1.46	3.68	-5.87	7.49
2026	8.91	3.56	1.46	3.68	-5.87	7.49
2027	9.89	5.07	11.46	5.51	-3.51	7.87
2028	7.54	2.73	1.33	3.52	-5.63	5.87
2029	7.60	2.73	1.33	3.53	-5.62	5.88
2030	7.67	2.73	1.34	3.53	-5.61	5.88
2031	7.73	2.74	1.34	3.53	-5.60	5.88
2032	18.97	2.67	1.31	3.54	-5.61	5.89
2033	5.93	2.74	1.34	-0.69	-0.67	5.08
2034	5.99	2.74	1.35	-0.69	-0.67	5.08
2035	6.06	2.74	1.35	-0.69	-0.67	5.09

Table 3-14 : Effective growth rates at TP03

FY END	Car	Bus	LCV	2A Truck	3A Truck	MAV
2019	14.03	5.61	3.91	5.60	-6.17	8.45
2020	12.55	3.94	1.56	4.87	-6.48	8.29
2021	12.57	3.94	1.56	4.87	-6.48	3.25
2022	30.10	4.04	1.66	4.88	-6.51	8.28
2023	8.75	3.55	1.47	3.68	-5.88	7.49
2024	8.87	3.55	1.47	3.68	-5.88	7.49
2025	8.98	3.55	1.47	3.68	-5.87	7.49
2026	9.08	3.55	1.47	3.68	-5.87	7.49
2027	9.93	5.34	10.06	5.83	-3.50	7.87
2028	7.66	2.72	1.35	3.51	-5.63	5.87
2029	7.72	2.72	1.36	3.51	-5.62	5.88
2030	7.78	2.72	1.36	3.52	-5.61	5.88
2031	7.83	2.73	1.36	3.52	-5.59	5.88
2032	17.55	2.64	1.34	3.53	-5.61	5.89
2033	6.07	2.73	1.36	-0.69	-0.67	5.08
2034	6.13	2.73	1.37	-0.69	-0.67	5.08
2035	6.19	2.73	1.37	-0.68	-0.67	5.08

Table 3-15 : Effective growth rates at TP04

3.9   Impact of Overloading

As per the latest NHAI notification on overloading, the concessionaire shall not allow any vehicle to carry load in excess of the permissible limit on the Project Highway. The maximum Gross Vehicle Weight (GVW) for each category of vehicle is also notified as per the overloading policy. Overloading up to 5 percent is considered within the tolerance limit by NHAI and the vehicles with 5 percent overload are not required to pay any additional toll.

However, the overloaded vehicles above the permissible 5 percent limit will be charged an additional fee equal to 10 times its normal toll rate and the excess load to be removed before the vehicle is allowed to cross the toll plaza. The overloaded vehicle shall be towed away, taken into possession and parked at the designated place at the risk or cost of the driver/ owner. The vehicle shall be handed over to the owner on receipt of the following:

- Application from the owner of the vehicle with evidence in support of ownership

- Undertaking for offloading and bringing the vehicle weight within maximum GVW for further use of NH

- Proof of payment of 10 times applicable fee

- Proof of payment of towing charges (Rs 1000) and parking charges (Rs 50 per hour or part thereof)

The notification also mentions that if a vehicle remains unclaimed for seven days, the same shall be handed over to the concerned police station.

With the strict implementation of the latest policy across all National Highways, it is quite likely that the transport operators will not find it economical to carry on with this practice of overloading. In the event of overloading being totally out of practice,

additional number of vehicles will be required to carry this extra load. The estimation of these additional vehicles has been done considering the load being carried above the permissible limit and dividing it by average permissible load.

The overloaded vehicle percentage has been derived from the WIM data being collected at the toll plazas. It has been derived that on an average 2A/3A/MAV are carrying around 30% overloaded tonnage beyond the limit. The requirement to pay additional toll on overloaded vehicles may discourage this practice of overloading and may soon result in the generation of additional vehicles on the project road. This would result in an upside in the paying traffic at the toll plazas. At present, overloaded vehicles on this project road are being charged 2 times the normal fee. With stringent practice of WIM at all the toll plazas, the percentage of overloaded vehicles will come down over the next two years and practice of overloading is stopped by FY20. Owing to this, some additional vehicles will come on the road to carry the additional tonnage. The overloaded vehicles and additional number of vehicles at the toll plaza locations is presented in **Table 3-16.**

Vehicle Type	2 Axle Trucks	3 Axle Trucks	MAV
TP01			
Overloaded vehicles	52	69	263
Additional vehicles on road with full ban on overloading	15	21	79
TP02			
Overloaded vehicles	15	34	285
Additional vehicles on road with full ban on overloading	4	10	86
TP03			
Overloaded vehicles	48	108	318
Additional vehicles on road with full ban on overloading	14	32	95
TP04			
Overloaded vehicles	46	61	237
Additional vehicles on road with full ban on overloading	14	18	71

Table 3-16: Resultant AADT with ban on overloading

The overloading charge of twice the normal toll is assumed to continue for next two years. The projections of additional vehicles to carry the overloaded tonnage are presented in **Table 3-17**.

FY END	2-axle Truck	3-axle Truck	MAV	2-axle Truck	3-axle Truck	MAV
	TP01			**TP02**		
2018	6	8	34	2	4	37
2019	10	11	56	3	5	61
2020	17	17	100	5	8	109
2021	18	16	109	5	8	118
2022	19	15	118	5	7	128
2023	20	14	127	5	7	139
2024	21	13	137	6	6	149
2025	21	12	147	6	6	160
2026	22	12	158	6	6	172
2027	23	11	170	6	5	185

2028	24	10	183	6	5	199
2029	25	10	194	7	5	211
2030	26	9	205	7	4	223
2031	27	9	217	7	4	237
2032	28	8	230	7	4	251
2033	29	8	244	8	4	265
2034	28	8	256	8	4	279
2035	28	8	269	8	4	293
FY End	**TP03**			**TP04**		
2018	6	12	41	6	7	31
2019	9	17	67	9	9	50
2020	16	26	121	16	15	90
2021	17	24	131	17	14	98
2022	18	23	142	18	13	106
2023	19	21	153	19	12	115
2024	19	20	165	19	11	123
2025	20	19	177	20	11	132
2026	21	18	190	21	10	142
2027	22	17	205	22	9	153
2028	22	16	220	22	9	164
2029	23	15	233	23	8	174
2030	24	14	247	24	8	184
2031	25	13	261	25	7	195
2032	26	12	277	26	7	207
2033	27	12	293	27	7	219
2034	27	12	308	27	7	230
2035	26	12	324	26	6	242

Table 3-17: Projections of Overloaded vehicles for all TPs

3.10 Total traffic projections and capacity analysis

Table 3-18 presents the projections of the total vehicles at the toll plazas on the project road based on the traffic growth rates till the end of concession as assessed in this study including the impact of DMIC, DFC and overloading.

FY End	Total Vehicles				
	TP01	**TP02**	**TP03**	**TP04**	**Average**
2018	7,577	9,113	10,563	11,018	9,568
2019	8,260	9,964	11,464	11,977	10,416
2020	8,982	10,872	12,422	12,992	11,317
2021	9,446	11,549	13,140	13,792	11,982
2022	11,013	13,354	14,989	15,736	13,773
2023	11,768	14,328	16,009	16,841	14,737
2024	12,591	15,390	17,123	18,050	15,788
2025	13,490	16,550	18,340	19,371	16,938
2026	14,470	17,816	19,668	20,816	18,192
2027	15,661	19,321	21,294	22,570	19,712
2028	16,611	20,556	22,584	23,978	20,932
2029	17,628	21,882	23,967	25,490	22,242
2030	18,722	23,308	25,454	27,118	23,651
2031	19,897	24,842	27,053	28,870	25,165
2032	22,300	27,634	29,914	31,898	27,937
2033	23,434	29,123	31,458	33,599	29,403
2034	24,635	30,704	33,095	35,406	30,960
2035	25,911	32,386	34,836	37,328	32,615

Table 3-18 : Projected Total Traffic at the toll plazas

The toll plaza wise total PCUs along with the average of the four toll plazas is presented in **Table 3-19**.

FY End	Total PCUs				
	TP01	**TP02**	**TP03**	**TP04**	**Average**
2018	23,360	25,958	31,871	31,852	28,260
2019	25,228	28,085	34,296	34,280	30,472
2020	27,294	30,432	36,965	36,920	32,903
2021	28,069	31,529	38,360	38,361	34,080
2022	30,966	34,780	41,939	41,993	37,419
2023	33,020	37,166	44,654	44,754	39,899
2024	35,242	39,748	47,594	47,749	42,583
2025	37,648	42,545	50,782	50,998	45,493
2026	40,253	45,575	54,237	54,523	48,647
2027	43,309	49,092	58,365	58,731	52,374
2028	45,753	51,946	61,609	62,047	55,339
2029	48,346	54,978	65,055	65,578	58,489
2030	51,111	58,212	68,732	69,348	61,851
2031	54,058	61,664	72,653	73,373	65,437
2032	58,336	66,483	77,978	78,813	70,402
2033	61,160	69,809	81,739	82,695	73,850
2034	64,130	73,313	85,699	86,787	77,482
2035	67,266	77,016	89,880	91,110	81,318

Table 3-19 : Projected Total Traffic in PCUs at the toll plaza

The concession agreement for the project specifies the design capacity to be 60,000 PCUs for a four lane project highway. The CA also mentions that if the average daily traffic of PCUs in any accounting year shall exceed the design capacity of the project highway, the Authority at its option may terminate the concession. In context of this, the total projected traffic for the project road (average of four TPs) exceeds 60,000 PCUs in FY30 as per the projections based on the traffic growth rates.

4. TOLL REVENUE PROJECTIONS

4.1 Tolling Strategy

Generally in BOT road projects, "Open System" of toll collection is specified. As the project road is being widened on existing alignment and there are several roads joining the highway, an open tolling system would be implemented on the project road. This enables the concessionaire to collect tolls from through traffic as well as from short distance one.

As per the Schedule R of the Concession Agreement, there are four operational toll plazas at km 27.5 (TP01), at km 93.75 (TP02), at km 154 (TP03) and at km 202.3 (TP4). The location and the tolling lengths for each toll plaza are presented in **Table 4-1.**

S.No	Location of TP	Length (in km)
1	27.5	34.93
2	93.75	58.427
3	154	50.1
4	202.315	46.417

Table 4-1: Locations and tolling lengths of Toll Plazas

In addition to this, eleven bypasses are proposed to be charged at bypass rate, five at TP01, two at TP03 and four at TP4 with a total length of 53.67 km. A tunnel of around 0.573 km is also being tolled at TP4.

4.2 Schedule of User Fee

As per Schedule of User Fee (Schedule R) of Draft Concession Agreement for the project, the per km toll rates applicable from 2007/08 for normal tolling length and permanent structures, the revision basis and concessions are provided.

The concessions to traffic have been given in the form of rates as below:

Local traffic

Car / Jeep / Vans - includes local users owning a vehicle registered for non-commercial purposes, residing within a distance of 20 km from the toll plaza and crossing the same for commuting purposes. The discounted fee for these users shall be a monthly passes of Rs. 150.00

Commercial vehicles - includes local users owning a commercial vehicle (excluding vehicles under National Permit), registered with address on the Registration Certificate of a particular district and uses such vehicle for commuting on a section of National Highway, permanent bridge, tunnel or bypass, as the case may be, which is located within that district, shall be levied user fee on all toll plazas which are located within that district at the rate of fifty per cent of the prescribed rate of fee. No such

concession shall be provided, if a service road or alternative road is available for use by such commercial vehicles. Thus, local commercial traffic has to pay only 50 percent of the normal ticket.

Daily Pass

When the vehicle has to cross the tolled section more than once in a day, the user shall have the option to pay one and half times (1.5 times) of the fee for a single entry; this pass shall be valid for 2 entries within 24 hours of purchase.

Monthly Pass

A user, who makes use of the project road frequently during a month, may opt to purchase a monthly pass upon payment of a charge equal to two-thirds of the fee payable for 50 single journeys; this pass can be used for a maximum 50 one way journeys over the month of validity.

Thus the different categories of toll tickets are as follows:

(i)   Traffic paying normal toll rates (single trip)
(ii)   Traffic paying return journey rates
(iii)   Traffic paying monthly pass rates
(iv)   Traffic paying local personal rates
(v)   Traffic paying local commercial rates

4.3   Tolling Streams

In line with the above categories of toll payments, a segmentation of total traffic was done. The tolling stream distribution has been provided by L&T IDPL for each of the toll plaza for the present study and is presented in **Table 4-2**.

Ticket Type/Modes	Car	Bus	LCV	2-axle Truck	3-axle Truck	MAV
TP01						
Normal Toll	38.0	29.0	68.0	71.0	73.0	98.0
Monthly Pass	0.0	0.0	0.0	1.0	3.0	0.0
Daily Pass	34.0	65.0	26.0	22.0	20.0	2.0
Local Personal Concessions	16.0					
Local Commercial		6.0	2.0	5.0	4.0	0.0
Exemptions	7.0	0.0	3.0	1.0	0.0	0.0
Violations	5.0	0.0	1.0	0.0	0.0	0.0
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
TP02						
Normal Toll	32.0	21.0	52.0	82.0	92.0	97.0
Monthly Pass	0.0	0.0	0.0	0.0	0.0	0.0
Daily Pass	41.0	56.0	33.0	14.0	7.0	2.0
Local Personal Concessions	13.0					
Local Commercial		23.0	12.0	2.0	1.0	1.0
Exemptions	7.0	0.0	2.0	2.0	0.0	0.0

Ticket Type/Modes	Car	Bus	LCV	2-axle Truck	3-axle Truck	MAV
Violations	7.0	0.0	1.0	0.0	0.0	0.0
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
TP03						
Normal Toll	46.0	25.0	64.0	81.0	90.0	98.0
Monthly Pass	0.0	0.0	0.0	0.0	0.0	0.0
Daily Pass	30.0	74.0	28.0	13.0	8.0	2.0
Local Personal Concessions	4.0					
Local Commercial		1.0	3.0	3.0	1.0	0.0
Exemptions	8.0	0.0	4.0	3.0	1.0	0.0
Violations	12.0	0.0	1.0	0.0	0.0	0.0
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
TP04						
Normal Toll	39.0	23.0	67.0	78.0	87.0	96.0
Monthly Pass	0.0	0.0	0.0	0.0	0.0	0.0
Daily Pass	26.0	76.0	24.0	15.0	9.0	3.0
Local Personal Concessions	14.0					
Local Commercial		0.0	3.0	4.0	2.0	1.0
Exemptions	9.0	1.0	5.0	3.0	2.0	0.0
Violations	12.0	0.0	1.0	0.0	0.0	0.0
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Table 4-2: Tolling Distribution for the project road including exemptions and violations

The paying traffic for the year FY18 has been worked out by deducting the toll exempt percentage (exemptions/violations) from total AADT and is presented in **Table 4-3.**

Toll Plaza/Mode	Car	Bus	LCV	2A Truck	3A Truck	MAV
AADT						
TP1	2,305	207	247	467	598	3,705
TP2	3,409	318	394	420	547	3,982
TP3	3,218	412	410	679	1,004	4,781
TP4	3,815	351	484	577	1,010	4,738
% of exemptions and violations						
TP1	12.0	0.0	4.0	1.0	0.0	0.0
TP2	14.0	0.0	3.0	2.0	0.0	0.0
TP3	20.0	0.0	5.0	3.0	1.0	0.0
TP4	21.0	1.0	6.0	3.0	2.0	0.0
Tollable traffic						
TP1	2,028	207	237	462	598	3,705
TP2	2,932	318	382	412	547	3,982
TP3	2,574	412	390	659	994	4,781
TP4	3,014	347	455	560	990	4,738

Table 4-3: Toll Paying Traffic, FY18

The tolling stream distribution excluding exemptions and violations from paying traffic in presented in **Table 4-4**.

Ticket Type/Modes	Car	Bus	LCV	2-axle Truck	3-axle Truck	MAV
TP01						
Normal Toll	43.2	29.0	70.8	71.7	73.0	98.0
Monthly Pass	0.0	0.0	0.0	1.0	3.0	0.0
Daily Pass	38.6	65.0	27.1	22.2	20.0	2.0
Local Personal Concessions	18.2	0.0	0.0	0.0	0.0	0.0
Local Commercial	0.0	6.0	2.1	5.1	4.0	0.0
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
TP02						
Normal Toll	37.2	21.0	53.6	83.7	92.0	97.0
Monthly Pass	0.0	0.0	0.0	0.0	0.0	0.0
Daily Pass	47.7	56.0	34.0	14.3	7.0	2.0
Local Personal Concessions	15.1	0.0	0.0	0.0	0.0	0.0
Local Commercial	0.0	23.0	12.4	2.0	1.0	1.0
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
TP03						
Normal Toll	57.5	25.0	67.4	83.5	90.9	98.0
Monthly Pass	0.0	0.0	0.0	0.0	0.0	0.0
Daily Pass	37.5	74.0	29.5	13.4	8.1	2.0
Local Personal Concessions	5.0	0.0	0.0	0.0	0.0	0.0
Local Commercial	0.0	1.0	3.1	3.1	1.0	0.0
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**
TP04						
Normal Toll	49.4	23.2	71.3	80.4	88.8	96.0
Monthly Pass	0.0	0.0	0.0	0.0	0.0	0.0
Daily Pass	32.9	76.8	25.5	15.5	9.2	3.0
Local Personal Concessions	17.7	0.0	0.0	0.0	0.0	0.0
Local Commercial	0.0	0.0	3.2	4.1	2.0	1.0
Total	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**	**100.0**

Table 4-4:   Tolling Distribution for the project road excluding exemptions and violations

The normal toll paying traffic for cars is between 37 percent and 57 percent across the four locations. Daily pass is in double digits in all the modes except 3A/MAV. Higher percentage of Bus and LCV are opting for local commercial traffic. This could be attributed to the vehicles registered in the district of the toll plazas. The top OD of Bus at TP01 is between Pali to Jaipur/ Ajmer/ Beawer. AT TP02, the top OD pair of buses is Pali to Sojat/ Beawer.

Normal toll paying percentage is high in MAV (3A/MAV) especially larger axle vehicles which are more likely to ply on long distances. Around 7-20 percent of 3A trucks may

fall in daily pass category across the four locations and 2-3 percent in case of MAV. The long distance OD pairs in 3A/MAV are Delhi/Jaipur/Alwar/Dausa to Sabarkantha/ Ahmedabad/Gandhinagar/Surendranagar.

Trip rate for local cars eligible for local concession pass is between 0.8 and 1.3 across the four locations. For monthly passes, given the Schedule of User Fee cap on multiple entries with a single pass, a trip rate of 1.67 trips per day has been assumed for all vehicle types at the both locations. For daily, pass, a trip rate of around 2 has been considered derived from the toll data. The mode wise trip rates adopted for the four toll plazas are presented in **Table 4-5**.

FY End	Car	Bus	LCV	2-axle Truck	3-axle Truck	MAV
TP01						
Monthly Pass	1.67	1.67	1.67	1.67	1.67	1.67
Daily Pass	1.95	1.98	1.96	1.97	1.97	1.92
Local Concessions	1.30					
Local Commercial	1.00	1.00	1.00	1.00	1.00	1.00
TP02						
Monthly Pass	1.67	1.67	1.67	1.67	1.67	1.67
Daily Pass	1.96	1.97	1.98	1.97	1.95	1.91
Local Concessions	0.80					
Local Commercial	1.00	1.00	1.00	1.00	1.00	1.00
TP03						
Monthly Pass	1.67	1.67	1.67	1.67	1.67	1.67
Daily Pass	1.95	1.97	1.96	1.96	1.96	1.92
Local Concessions	0.80					
Local Commercial	1.00	1.00	1.00	1.00	1.00	1.00
TP04						
Monthly Pass	1.67	1.67	1.67	1.67	1.67	1.67
Daily Pass	1.96	1.97	1.97	1.97	1.96	1.93
Local Concessions	1.20					
Local Commercial	1.00	1.00	1.00	1.00	1.00	1.00

Table 4-5 : Trip rates under different concession categories

4.4   Modifications in Concession Period

Table 4-6 presents the projections of the tollable vehicles at the toll plazas on the project road based on the most likely growth rates till the end of concession as assessed in this study. The tollable vehicles in this context, herein include the exempt vehicles and violations whereas local personal users have been excluded for the computation of PCUs for the purpose of comparison with the target traffic in line with the definition of PCU in the concession agreement.

FY End	TP01	TP02	TP03	TP04	Average
Traffic projections with the impact of DMIC,DFC and overloading					
2018	22,992	25,515	31,743	31,318	27,892
2019	24,813	27,586	34,151	33,678	30,057

FY End	TP01	TP02	TP03	TP04	Average
2020	26,825	29,869	36,802	36,242	32,435
2021	27,541	30,895	38,176	37,596	33,552
2022	30,371	34,065	41,732	41,131	36,825
2025	36,852	41,588	50,504	49,845	44,697
2030	49,876	56,728	68,301	67,559	60,616
2035	65,480	74,869	89,257	88,523	79,532

Table 4-6 : Projected Traffic at the toll plazas

The target traffic as per RFP is deemed to be 33,783 PCUs as on 1st April 2021.

As per clause 29.2.2 of CA, if the Actual Average Traffic shall have fallen short of or exceeded the target traffic by more than 2.5 percent, then there will be an increase or reduction in concession period.

Based on the CA (clause 29.2.2), if the traffic in PCUs at target date is higher than the target traffic, then for every 1 percent increase, the concession period shall be decreased by 0.75 percent, and no more than 10 per cent of the base concession period.

The traffic estimated on the project road with the developments of DMIC, DFC (from FY21) and overloading considering an average of all TPs and the average of the traffic for the three consecutive accounting years (FY20 to FY22) is estimated to be 34,270 PCUs which is 1.4 percent higher than the target traffic. Since the target traffic is within the 2.5 percent variation, no reduction/ increase in the concession period is envisaged.

4.5   Toll Rates

This section presents details on the toll rates that are likely to be imposed on the users of the project road during the concession period. The toll rates (Rs/km) for the base year 2007-08 for different vehicle categories as per concession agreement are presented in **Table 4-7**.

Mode	Base rate per km (in Rs)
Car, Jeep, Van, LMV	0.65
LCV /Mini Bus	1.05
Bus/ 2 Axle Truck	2.20
3 Axle	2.40
MAV	3.45
Oversized	4.20

Table 4-7: Toll Rates in Rs/km for Different Vehicle Categories

The CA states that the 2007 toll rates shall be increased without compounding by three per cent each year with effect from the 1st day of April 2008 and such increased rate shall be deemed to be the base rate for the subsequent years.

In addition to this, the rate of fee for use of bypass forming part of a section of a National Highway constructed with a cost of Rs 10 crore or more, for the base year

2007, shall be one and a half times of the per km base rates specified above and the length of such bypass shall be excluded from the length of such section of National Highway.

Additionally, when permanent structures such as bridges, tunnels or flyovers are part of the project road and their construction cost exceeds 500 million Rs (50 Crore), then the length of such structures shall be deducted from the tolling length and the structure tolled according to the rates presented in **Table 4-8**.

Cost of Structure (rupees in crore)	Car, Jeep, Van or Light Motor Vehicle	LCV, Light Goods Vehicle or Mini Bus	Truck or Bus	Three Axle Truck	HCM, EME or MAV	Over size Vehicle
10 to 15	5	7.50	15	16.5	22	30
For every additional rupees five crore or part thereof, exceeding rupees fifteen crore and up to rupees one hundred crore.	1	1.50	3	3.3	4.50	6
For every additional rupees five crore or part thereof, exceeding rupees one hundred crore and upto rupees two hundred crore.	0.75	1.15	2.25	2.45	3.40	4.50
For every additional rupees five crore or part thereof, exceeding rupees two hundred crore.	0.50	0.75	1.50	1.65	2.25	3

Table 4-8: Toll Rates in Rs for permanent structure exceeding 500 million Rs cost

In case of the project road, eleven bypasses are proposed to be charged at the proposed toll plazas at bypass rate and a tunnel costing Rs 684.8 million to be charged at structure rate at TP4. The details regarding length of the bypasses are presented in **Table 4-9**.

Toll plaza	Bypass	Length in km
TP01	Beawer	6.2
	Sendra	5.9
	Bara	3.07
	Piplikalan	3.4
	Chandava	2.5
TP03	Sanderav	4
	Sumerpur	10.9
TP04	Paldi	2.8
	Sirohi	7.7
	Vaarwada	2.1
	Jhadoli	5.1

Table 4-9: Length of Bypasses to be charged at bypass rate

The applicable base rates shall be revised annually with effect from April 1 each year to reflect the increase in wholesale price index for the month of December of the immediate preceding year in which sub revision is undertaken but such revision shall be restricted for 40 per cent of the increase in wholesale price index.

The December 2006 WPI on 2004-05 series of (111.4) has been estimated by applying a linking factor on WPI of December 2006 under the old series and has been used for toll rates calculation purposes. Actual WPI information for December 2016 (183.3) on 2004-05 series has been used to arrive at toll rates applicable for FY18.

The year on year forecast of WPI has been derived from Oxford WPI data till the end of concession period and is presented in **Table 4-10**.

December	WPI forecast
2017	4.59
2018	5.67
2019	6.02
2020	5.73
2021	5.36
2022	5.16
2023	4.99
2024	4.48
2025	4.11
2026	4.00
Beyond 2026	3.93

Table 4-10: WPI Forecast

The stream of toll rates to be charged at the toll plazas for cardinal years is presented in **Table 4-11.** The toll fee has been rounded to nearest 5 Rupees as per Schedule R of the concession agreement.

FY	Car	Bus/2A truck	LCV	3A Truck	MAV	Oversize	Local monthly pass for Cars
TP01							
2017	70	230	110	250	360	440	235
2022	85	295	140	320	460	560	300
2025	100	340	165	375	535	655	350
2030	125	425	205	465	670	815	440
2035	155	530	255	580	835	1,015	545
TP02							
2017	60	200	95	220	315	385	235
2022	75	260	125	280	405	495	300
2025	90	300	145	330	470	575	350
2030	110	375	180	410	590	715	440
2035	140	465	225	510	730	890	545
TP03							
2017	75	250	120	275	390	475	235
2022	95	320	155	350	500	610	300
2025	110	375	180	405	585	710	350

FY	Car	Bus/2A truck	LCV	3A Truck	MAV	Oversize	Local monthly pass for Cars
2030	140	465	220	510	730	890	440
2035	170	580	275	630	905	1,105	545
TP04							
2017	100	325	160	355	505	630	235
2022	125	420	200	460	650	810	300
2025	150	490	235	535	755	940	350
2030	185	610	295	665	945	1,175	440
2035	230	755	365	825	1,175	1,460	545

Table 4-11: Toll rates at the four toll plazas (in Rs)

The users purchasing return journey tickets will pay 1.5 times the above toll rates; the traffic opting for monthly passes will pay 33.3 times (two-thirds of 50 single journeys) the normal traffic toll rates. All passes have been rounded to the nearest 5 Rupees as per concession agreement.

4.6   Toll Revenue Estimates

The concession period for the project road is 20 years from the appointed date (the date financial close is achieved). Toll revenue streams have been calculated assuming that:

- Toll would be collected for all 365 days in a year; however for leap year 366 days have been considered;

- Appointed date is Dec 2011;

- Tolling would terminate at end of Dec 2034; revenues have been presented till FY35;

The total realised revenue in FY17 is Rs 302.06 crore as per the total collection data made available. In FY17, as part of demonetization exercise, GoI announced toll exemption for all vehicles across all toll plazas from 9th November till midnight of 2nd December 2016. The impact of demonetisation is evident in the month of November as the traffic was not observed to be normal due to which the revenues are also impacted. The revenue collection in November is Rs 7.16 crore as against the other month varying between Rs 25 and Rs 29 crores. Taking account of the number of days in which the toll was not being collected, the actual revenue for the year FY17 would have been around Rs 323.4 crores.

The toll revenue for the total project road for the base case including the impact of DFC, DMIC and overloading along with the concessions available is presented in **Table 4-12**. A mode wise breakdown of the revenue streams is also presented for the project in **Table 4-13.**

FY	Normal Toll	Monthly Passes	Return Passes	Local Concessions	Total
2018	3,313.6	1.4	270.8	23.4	3,609.2

FY	Normal Toll	Monthly Passes	Return Passes	Local Concessions	Total
2019	3,754.4	1.4	306.2	26.1	4,088.0
2020	4,173.8	1.4	344.9	29.0	4,549.0
2021	4,509.4	1.4	385.6	32.0	4,928.4
2022	5,145.2	1.5	466.7	37.3	5,650.6
2023	5,783.1	1.5	519.7	41.2	6,345.5
2024	6,500.8	1.5	580.5	46.1	7,128.9
2025	7,270.3	1.5	648.3	50.8	7,970.9
2026	8,125.0	1.6	726.1	56.3	8,909.0
2027	9,155.8	1.6	815.5	63.3	10,036.3
2028	10,114.7	1.7	905.6	69.2	11,091.2
2029	11,115.7	1.7	990.4	75.9	12,183.7
2030	12,269.5	1.8	1,095.5	83.6	13,450.3
2031	13,512.1	1.8	1,213.0	91.5	14,818.4
2032	15,069.4	1.9	1,415.8	104.7	16,591.7
2033	16,457.3	1.9	1,543.5	113.6	18,116.3
2034	18,054.6	2.0	1,692.2	123.2	19,872.0
2035	19,743.6	2.1	1,847.2	134.5	21,727.3

Table 4-12: Toll Revenue (in Rs million) by type of concession for PR

FY	Car	Bus	LCV	2-axle Truck	3-axle Truck	MAV	Total
2018	237.6	100.3	62.5	199.1	341.3	2,668.3	3,609.2
2019	287.3	111.1	67.8	222.7	340.3	3,058.8	4,088.0
2020	342.3	122.1	72.3	241.9	327.1	3,443.3	4,549.0
2021	400.4	133.8	77.8	267.1	321.2	3,728.2	4,928.4
2022	556.8	146.9	83.7	295.9	317.5	4,249.8	5,650.6
2023	641.3	159.6	89.6	321.4	314.4	4,819.2	6,345.5
2024	732.9	174.5	95.7	352.7	310.9	5,462.1	7,128.9
2025	842.1	189.6	102.1	383.9	308.3	6,144.9	7,970.9
2026	962.3	205.3	107.6	416.2	303.7	6,913.9	8,909.0
2027	1,101.1	227.1	124.2	459.9	306.2	7,817.9	10,036.3
2028	1,241.6	243.7	131.8	497.6	302.5	8,674.1	11,091.2
2029	1,381.0	261.4	138.9	537.5	296.4	9,568.6	12,183.7
2030	1,568.4	280.4	147.3	580.2	293.3	10,580.7	13,450.3
2031	1,767.9	300.4	155.3	626.4	288.9	11,679.5	14,818.4
2032	2,186.4	322.9	165.4	681.4	285.6	12,950.1	16,591.7
2033	2,408.9	345.4	174.8	705.0	295.4	14,187.0	18,116.3
2034	2,677.5	370.7	185.5	731.4	305.8	15,601.3	19,872.0
2035	2,960.5	397.8	196.2	757.6	317.2	17,097.9	21,727.3

Table 4-13: Toll Revenue (in Rs million) for Project Road by mode

For the project, vehicles paying normal tolls are 91.1 percent of total toll revenues for the project road and around 8.2 percent of the traffic may opt for daily pass category. Remaining 0.7 percent may fall in monthly pass and local concession category.

Cars represent around 11.7 percent share in total revenue with Buses having a share of around 2.1 percent only. Amongst the freight vehicles category, MAVs represent the highest share of 77.8 percent of total revenue. LCVs have a share of 1.1 percent.

APPENDICES

TRAFFIC STUDY FOR BEAWAR-PALI-PINDWARA SECTION OF NH-14 IN THE STATE OF RAJASTHAN

TP01-Raipur						
2015-16						
Month	CJV	Bus	LCV	2-A	3A	MAV
Apr						
May						
Jun	1709	183	256	263	753	3203
Jul	1542	173	242	236	658	2809
Aug	1507	171	232	236	649	3046
Sep	1669	176	245	301	697	3249
Oct	1680	182	257	337	770	3374
Nov	2195	199	217	328	660	3057
Dec	1971	194	216	359	708	3333
Jan	1910	194	238	345	725	3537
Feb	2045	200	258	350	720	3607
Mar	1883	192	232	340	689	3604
Average	1811	186	239	309	703	3282

TP01-Raipur						
2016-17						
Month	CJV	Bus	LCV	2-A	3A	MAV
Apr	2392	201	224	326	693	3577
May	2302	215	231	321	647	3538
Jun	1981	199	226	321	674	3560
Jul	1982	198	210	288	572	3204
Aug	1918	182	192	299	518	3075
Sep	2048	193	221	362	580	3483
Oct	2054	193	225	371	625	3418
Nov	2733	229	198	363	577	3304
Dec	2231	203	230	323	576	3268
Jan	2137	196	236	318	594	3389
Feb	2279	203	269	412	676	3836
Mar	2094	189	256	448	637	3835
Average April-Oct,Feb and March	2117	197	228	350	625	3503

TP02-Indranagar						
2015-16						
Month	CJV	Bus	LCV	2-A	3A	MAV
Apr						
May						
Jun	2555	275	379	264	750	3351
Jul	2277	262	353	220	642	2971
Aug	2340	260	356	250	651	3226
Sep	2504	269	363	283	735	3455
Oct	2501	274	404	301	727	3578
Nov	3122	291	374	282	624	3218
Dec	2942	289	390	304	687	3497
Jan	2815	282	401	275	701	3762
Feb	3072	293	414	290	679	3856
Mar	2824	276	381	292	659	3829
Average	2695	277	381	276	686	3474

TP02-Indranagar						
2016-17						
Month	CJV	Bus	LCV	2-A	3A	MAV
Apr	3753	300	392	295	663	3773
May	3483	303	390	274	617	3742
Jun	2907	290	373	268	615	3778
Jul	2992	287	336	257	540	3402
Aug	2828	266	330	278	499	3265
Sep	2988	278	362	329	571	3756
Oct	3055	281	377	321	587	3632
Nov	3940	345	325	315	524	3588
Dec	3342	298	368	275	527	3514
Jan	3138	288	391	291	557	3614
Feb	3334	305	432	367	612	4102
Mar	3080	281	409	397	604	4122
Average April-Oct,Feb and March	3158	288	378	310	590	3730

TRAFFIC STUDY FOR BEAWAR-PALI-PINDWARA SECTION OF NH-14 IN THE STATE OF RAJASTHAN

TP03-Birami						
2015-16						
Month	CJV	Bus	LCV	2-A	3A	MAV
Apr						
May						
Jun	2581	338	447	411	1289	4187
Jul	2309	314	416	370	1149	3796
Aug	2394	303	429	387	1203	4056
Sep	2680	340	442	436	1231	4227
Oct	2508	342	463	459	1299	4333
Nov	3379	399	403	467	1147	3954
Dec	2913	364	420	538	1256	4296
Jan	2695	365	415	537	1254	4523
Feb	2930	376	420	545	1295	4712
Mar	2676	363	408	518	1243	4716
Average	2707	350	426	467	1237	4280

TP03-Birami						
2016-17						
Month	CJV	Bus	LCV	2-A	3A	MAV
Apr	3405	396	399	529	1208	4578
May	3174	417	371	512	1095	4518
Jun	2763	372	361	495	1098	4606
Jul	2804	356	341	445	968	4157
Aug	2998	346	360	467	927	3985
Sep	2888	355	377	529	1034	4537
Oct	2934	374	412	534	1056	4458
Nov	4092	450	333	513	930	4398
Dec	3340	401	417	502	983	4319
Jan	3067	384	450	509	1005	4411
Feb	3279	405	490	611	1121	4936
Mar	2940	385	474	655	1115	4978
Average April-Oct,Feb and March	3021	378	398	531	1069	4528

TP04-Uthaman						
2015-16						
Month	CJV	Bus	LCV	2-A	3A	MAV
Apr						
May						
Jun	2977	291	420	365	1246	4154
Jul	2530	259	386	340	1129	3754
Aug	2708	236	350	437	1263	3798
Sep	3007	295	410	415	1220	4192
Oct	2885	285	435	431	1263	4283
Nov	3930	346	424	378	1132	3886
Dec	3296	316	441	449	1238	4201
Jan	3090	312	455	451	1252	4488
Feb	3374	314	428	495	1324	4724
Mar	3161	301	390	511	1233	4721
Average	3096	295	414	427	1230	4220

TP04-Uthaman						
2016-17						
Month	CJV	Bus	LCV	2-A	3A	MAV
Apr	4223	348	394	509	1215	4599
May	4025	367	372	488	1111	4551
Jun	3360	315	361	475	1103	4616
Jul	3330	296	342	436	976	4160
Aug	3225	278	361	426	909	3971
Sep	3245	291	380	496	1025	4482
Oct	3470	306	404	502	1061	4405
Nov	4847	383	343	462	957	4370
Dec	3834	339	402	465	972	4283
Jan	3644	324	462	452	1000	4396
Feb	3996	345	514	548	1129	4901
Mar	3520	320	498	589	1119	4939
Average April-Oct,Feb and March	3599	318	403	497	1072	4514

TRAFFIC STUDY FOR BEAWAR-PALI-PINDWARA SECTION OF NH-14 IN THE STATE OF RAJASTHAN
Traffic Zoning System

Zone	Place/Region	District/ State	State
1	Beawar City/Theekrana Medratan	Project Corridor - Ajmer District	
2	Saradhana		
3	Sendra/Manpura/Kaya Bheela		
4	Bar		
5	Raipur (TP01)		
6	Pipala Kalan/Jhoontha/Dornari/Bansiya		
7	Chandawal/Sandiya/Khokhara		
8	Sojat	Project Corridor - Pali District	
9	Bagwas/Jadan		
10	Indranagar (TP02)		
11	Pali Town		
12	Ramsiya/Hemawas/Changwa/Keerwa/Gura Khuni/Dhola/Kenpura/		
13	Birami (TP03)		
14	Sanderao or Sanderav/Sindroo/Khindara Gaon		
15	Sumerpur/Shivganj or Sheoganj		
16	Vera Rampura/Posaliya		
17	Uthamam (TP04)		
18	Palri/Paladi/ Vera Vilpur/Kolar	Project Corridor - Sirohi District	
19	Sirohi City		
20	Rajpura/Junasanwara/NayaSanwara/Kotra/Undra/Parlai/Jhadoli		
21	Pindwara Town		
22	Ajmer City		Rajasthan
23	Kishangarh/Madanganj/Rupnagar/Sursara/Harmara/Tilonia		
24	Mangliawas/Nagela/Ramgarh/Peesangan/Lumana/Kharwa/Dilwara	Rest of Ajmer District	
25	Nasirabad/Srinagar/Barna/Arain/Dadhia/Kanpura/Ramsar/Kaser/Lamba Bara/Jharwasa/Bandanwara/Masooda/Sathana/Bhinay		
26	Shokla/Geola/Sarwar/Kokri/Para		
27	Jaitaran/Lototi/Banjakuri/Balara/Garnia/Nimaj/Baranthia Khurd/Atbara/Deoli/Rupawas/SardarSamand/Rajola/Khamal		
28	Rohat/Brahaman/Saji/Mandavas/Kharda/Garwara Basi/Bhanwar		
29	Marwar/Karachi/Sawrad/Awa/Khinwara/Baghana	Rest of Pali District	
30	Miniyari/Digal/Chanod/Takhatgarh		
31	Desuri/Rani/Nadol/Falna/Kot/Ghanerao/Sadri/Bali/Lunawa/Sewari/Bijapur/Bera/Nana/Erinpura		
32	Manadar/Las/Korta	Rest of Sirohi District	
33	Barlut/Kalandri/Pandiv/Jawal/Mandwara/Slidar/Revadar/AbuRoad/MountAbu/Sanwara/Derna/Deri		
34	Jodhpur City		
35	Bhopalgarh/Salwa Khurd/Narsar/Pipar/Rathkuriya/Artiyan Kalan/Bilara/Osivari/Phalodi/Shergarh/Utambar/Indroka/Bambor	Jodhpur District	
36	Jhalamand/Luni/Mogra/Phinoh/Kankani		
37	Jaisalmer District (Jaisalmer/Pokaran/Vinjorai/Ramdevra)	Jaisalmer District	
38	Barmer District (Barmer/Baytoo/Balotra/Ramsar/Chauhtan/Gudha Malni/Sawani)	Barmer District	
39	Jalor City		
40	Ahor/Sankhwali/Bhadrajari/Nosra/Balwara/Padarli/Sayla/Bagora/Bakra/Pantheri/Siyana/Jorwara/Bhinmal/Bhadwi Punasa/Raniwara/Sanchor/Chandur	Jalor District	
41	Bhilwara/Raipur/Mandal/Banera/Kotri/Mandalgarh/Bijolia/Asind/Hurra/Shahpura/Jahazpur	Bhilwara District	
42	Rajsamand City/Bhim/Thikarwas/Devgarh/Bagar/Amet/Kumbhalgarh/Relmarga/Nathdwara/Haldi Ghat/Delwara	Rajsamand District	
43	Udaipur City/Gogunda/Jhadol/Kotra/Khairwara/Jharol/Sarada/Salumbar/Dungla/Mavli/Vallabhnagar	Udaipur District	
44	Rashmi Gangrar/Pootholi/Chittaurgarh/Begun/Kapasan/Rawatbhata/Bhadesar/Nimbahera/Bari Sadri	Chittaurgarh District	
45	Dungarpur District (Dungarpur/Aspur/Sagwara/Simalwara)	Dungarpur District	
46	Nagaur/Kheenvsar/Singar/Gurha/Jayal/Merta City/Degana/Parvatsar/Makrana/Nawan/Marot/Didwana/Ladnun	Nagaur District	
47	Hanumangarh/Churu/Ganganagar/Bikaner Districts		
48	Pratapgarh/Banswara Districts		
49	Bundi/Kota/Baran/Jhalawar Districts/Tonk/Karauli/Dhaulpur/Sawai Madhopur Districts	Rest of Rajasthan Districts	
50	Jaipur/Alwar/Dausa/Bharatpur/Sikar/Jhunhunun Districts		
51	Kandla Port		
52	Mundra Port		
53	Mandvi Port	Kachchh District	
54	Tuna Port		
55	Bhuj/Gandhidham/Anjar/Nalia/Bhachau/Rapar		
56	Santalpur/Radhanpur/Patan/Vagdod/Sidhpur/Chanasma/Sami/Ved/Gotarka/Harij	Patan District	Gujarat
57	Vav/Tharad/Bhabhar/Deoder/Sihori(Kankrej)/Bhildi/Dhanera/Deesa/Dantiwada/Malan	Banaskantha District	
58	Palanpur/Vadgam/Danta/Amirgadh		
59	Mahesana District	Mahesana District	
60	Surendranagar/Rajkot/Jamnagar/Porbandar/Junagadh/Amreli/Bhavnagar		
61	Sabarkantha/GandhiaNagar/Ahmedabad/Kheda/Anand	Rest of Gujarat Districts	
62	Vadodara/Bharuch/Narmada/Surat/Tapi/Navsari/The Dangs/Valsad Districts		
63	Panchmahal/Dohad		
64	Madhya Pradesh	Central Indian states	Madhya Pradesh
65	Maharashtra & Goa	Western Indian states	Maharashtra & Goa
66	Uttar Pradesh		Uttar Pradesh
67	Delhi		Delhi
68	Punjab	Northern Indian states	Punjab
69	Haryana		Haryana
70	Uttrakhand/Chandigarh/Jammu & Kashmir/Himachal Pradesh		
71	West Bengal/Orissa/Chattisgarh	Eastern Indian States	
72	Bihar/Jharkhand/Meghalaya/Sikkim/Tripura/Mizoram/Manipur/Nagaland/Assam/Arunachal Pradesh		Rest of India
73	Andhra Pradesh/Telangana	Southern Indian States	
74	Tamil Nadu/Karnataka/Kerala		

APPENDIX 2.3
OD MATRICES OF VEHICLES IN THE STUDY AREA

TRAFFIC STUDY FOR BEAWAR-PALI-PINDWARA SECTION OF NH-14 IN THE STATE OF RAJASTHAN

Travel Pattern (OD Matrices) at TP01-Raipur, FY17

Mode: Car/MLCV

O\D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	Grand Total
1	0				55	9	6	14			148	3		12	14	3	3		12		3										6	14	6										12								3				6					3	17	3				6									357
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3			0																																																																								6
4				0	64	9	3	17	3		38			6	9		6																9																								3					3													168
5	90		6	75	0																	14	3																											9																								197
6	14			9		0																6																																																			29
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8	78			14				0														58	9																								6				23																								188
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74																																																																											0	0
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TRAFFIC STUDY FOR BEAWAR-PALI-PINDWARA SECTION OF NH-14 IN THE STATE OF RAJASTHAN

Mode Bus

O\D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	Grand Total
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TRAFFIC STUDY FOR BEAWAR-PALI-PINDWARA SECTION OF NH-14 IN THE STATE OF RAJASTHAN

Mode LCV/Mini Bus

O\D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	Grand Total
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Total	9	0	0	0	13	0	0	0	0	0	31	0	0	0	6	0	0	0	6	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	0	0	0	3	0	37	3	3	0	0	3	0	0	3	3	20	20	0	0	0	3	5	20	7	7	2	3	3	0	0	228

TRAFFIC STUDY FOR BEAWAR-PALI-PINDWARA SECTION OF NH-14 IN THE STATE OF RAJASTHAN

Mode 2A

O\D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	Grand Total
1	0			15	4	2	5				9				2				4																																									5															46
2		0																																																																									0
3			0																																																																							0
4				0																																																																						0
5	16			2	0																																																																					19
6						0																																																																				0
7	4	4					0																																																																			4
8	16							0														2																													4																	2							25
9									0																																																																	0
10										0																																																																0
11	8										0											2																													10																	2			2				24
12												0																																																														0
13													0																																																													0
14														0																																																												0
15															0																																																											0
16																0																																																										0
17																	0																																																									0
18																		0																																																								0
19	4																		0			6																												2																	2	2						16
20																				0																																																					0
21																					0																																																					0
22							4				9				4				2			0																																	2		2															2		24
23							2																0																																																			2
24																								0																																																	0
25																									0																																															0
26																										0																																														0
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28	2																											0																																													2
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31																															0																																									0
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34				2																														0																																							2
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37																																					0																																		0
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39																																							0																																0
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42																																										0																											0
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46																																														0																						0
47																																															0																					0
48																																																0																				0
49																																																	0																			0
50					4						5				5																		2							2										0	9				7				7	7					2					4				51
51	8																																																	4	0																							8
52																																																				0																					0
53																																																					0																			0
54																																																					0																		0
55																						2																													4					0										2	2							10
56																																																						0															0
57																																																						0													0
58																																																										0							2	2						4
59																																																										0								4					4
60																						2																												6										0						2	6				2		19
61																																																		12										0					6	4	4	2			33
62																																																		2											0					2					4
63																																																													0										0
64																																																														0								0
65																																																															0						0
66					2		2																																												2										2	2					0								7
67						2		2			2																																										2			4					4	4						0						18
68																																																												2							0						2
69								2											4																																		2			2									2	7							18
70																																																																						0				0
71		2																																																									2												0				2
72																																																																	2							0			2
73																																																																									0		0
74																																																		2																							0	2
Total	51	0	0	2	20	5	2	16	0	0	26	0	0	0	11	0	0	0	5	0	4	19	0	0	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0	0	49	9	4	0	0	16	0	0	2	2	15	29	0	0	0	2	16	27	0	8	0	2	2	0	2	350

TRAFFIC STUDY FOR BEAWAR-PALI-PINDWARA SECTION OF NH-14 IN THE STATE OF RAJASTHAN

Mode 3A

O\D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	Grand Total
1	0	2			14	5		14			13				2				3																								2													6				2	3	19	2												3	89
2		0																																																																								0
3			0																																																																							0
4				0	5		2																																																																			6
5	9				0																				2																																																	11
6	2	4				0																																																																				4
7	9						0																																																																			9
8	5							0																																																														2						7
9									0													2																																																				2
10										0																																																															0
11	5										0											13																												7																4	2		2		4			36
12												0																																																														0
13													0																																																													0
14														0																																																												0
15															0							2																												2																					2			5
16																0																																																									0
17																	0																																																								0
18																		0																																																							0
19																			0			4	5																											11																		2				22
20																				0																																																					0
21																					0																																																					0
22		23																				0																																						3	3	2	2											23
23						2																	0																																						3	2												6
24																								0																																						2												2
25																									0																																																	0
26																										0																																																0
27																											0																																										2						2
28																												0																																														0
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31																															0																																												0
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39																																							0																																	0
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41												2																													0																			2												3
42																																										0																														0
43																																											0																													0
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47																																															0																									0
48																																																	0																							0
49																																																		0																						0
50					2	2		5			16				3																																			0	5				13				8	8	18												79
51	2																						4																											7	0																	7		2	2			23
52																																																		2		0																							2
53																																																					0																					0
54																																																						0																			0
55	4	2																				7	2		2																										12					0													7	13		5	2	2		57
56																																																							0																			0
57																																																								0																		0
58																							2																											2								0									2	4		5					14
59	2																						4																											14									0							2	20	2	2	2		5		2
60	2																					4	4		2																									18										0					2	9		4		5	4		52
61																																																	4										0						2			2			54
62																																																													0								2			4
63																																																														0									0
64	2																																																																0								2
65																																																		4														0		4		4			11
66						2		5			2				2																																											3			3	10				0						16
67																																																			6							8			6	13	6				0					50
68																																																																				0				0
69						2																																												3			3		2				6		2						0			18
70																																																		2									2	2									0			2
71																																																											2	2										0		3
72																																																								5															0		5
73																																																																								0		0
74																																																	2																					0	2
Total	39	25	0	0	23	10	0	32	0	0	37	0	0	0	6	0	0	0	6	0	0	32	20	0	4	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	4	0	2	0	0	0	0	0	0	82	14	0	0	0	34	0	0	2	19	43	68	5	0	0	2	20	61	2	25	5	13	9	0	3	625

TRAFFIC STUDY FOR BEAWAR-PALI-PINDWARA SECTION OF NH-14 IN THE STATE OF RAJASTHAN

Mode MAV

O\D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	Grand Total
1	0				10	7	2	27			39				7				7																																2	5			42			5	10	162	71	2			2							5		407
2		0																																																																										2
3			0																																																																									0
4				0	5			2											2																																	5														2	2								20
5					0																													5											4																													9
6						0																																																																					0
7							0																																																																					0
8	7							0														2																												2																								11
9									0																																																																		0
10										0																																																																	0
11	4										0											13	2																											50																	2	4				2			78
12												0																																																														0
13													0																																																														0
14														0																																																													0
15															0																																																							2					2
16																0																																																									0
17																	0																																																								0
18																		0																																																							0
19	4																		0			7	11			2																								16																2	11		7				60
20																				0																																																						0
21																					0					2																																																2
22					7		2	7			10				2				22			0											10																			5	2			15			5	2	15	15	5												125
23					5						7								7				0										2																			2	2			2				2	5	12			2									2		54
24																								0																																																		0
25																									0																										2																							2
26																										0																																																0
27																											0																																														0
28																												0																																													0
29																													0																																												0
30																														0																																											0
31	2																					2									0																																										4
32																																0																																									0
33																						4											0																	4																		4					13
34																																		0																																							0
35																																			0																																						0
36																																				0																																				0
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43																																											0																													0
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47																																															0																									0
48																																																0																								0
49																																																	0																							0
50					5	2		17			49				27				12														2												5					0	54	17			76			10	5	86	95	7											2	2	475
51	4																					4	9																											52	0																18	109		53	20		7			276
52																						2	18																											11		0														13	13	2		2					62
53																																																					0																						0
54																																																						0																				0
55	2																					7	24			2																								119					0										62	64	13	73	18	9	11			405
56																																																							0																			0
57																																																									0																	0
58																						2	7																											13								0								2	16		4	2				47
59	13		2																				2																											2									0					2	9	2	7		2			27
60			2																			7	31			2																								89										0			71	82	2	51	36	16	27			428
61	2																					18	9																											89											0		20	44	7	55	2	2	13			263
62																																																	9												0			7		2	2			20
63																																																																0									0
64																																																																	0								0
65																																																	7															0		27		2	2	2			40
66					5			5							12				5																															33	5			51			2		24	51	2			2	0							194
67					5			10			2				5				5																															15	37			34			7	5	27	29	15			10		0						2	209
68														2	5																																					32		5					5							0					49
69								2			10								10																														17	10			22			7	7	24	27	2			5			0					145
70																			5																															5				2				2	2								0			2	20
71		5																																																																					0			5
72																			5														2																					2					7	22			2							0		39
73																																																	2																						0		2
74																						2																											5																							0	7
Total	40	0	0	2	32	10	5	76	0	0	122	0	0	2	59	0	0	0	76	0	0	71	113	0	9	0	0	0	0	0	0	0	0	17	5	0	0	0	0	0	5	0	4	0	0	0	0	0	0	470	138	84	32	0	252	0	0	37	34	363	326	34	0	0	24	193	393	27	255	84	33	58	2	15	3503

TRAFFIC STUDY FOR BEAWAR-PALI-PINDWARA SECTION OF NH-14 IN THE STATE OF RAJASTHAN

Travel Pattern (OD Matrices) at TP02-Indranagar, FY17

Mode: Car/MLCV

O/D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	Grand Total
1	0										40			17	6		3	3	9	3	9													20				3													3			3				9	3		14														143
2		0												3				3	3	6	3													3																				3					3															23
3			0														3	3	3	3																																	3			3																		17
4				0							3			3	6				3	3	3								10					6			3													3				3				3			3				3									53
5					0						14	9	9	3	3																			3																	3	3	3	3																			51
6						0					9	6	9																																						3	3	3	3																		34
7							0				9	6	9		3																																				3	3	3																			34
8								0		3	343	11	9	17	37				9		3								122					100			3														3		3	3											3	3	9	3						682
9									0	6	57	6	6																					6																	3	3		3																		92
10								3	2	0																																																							3									5
11	130		2	79	31	2	33	449	64		0											103	5			2		12						43												12				74																				12	7			1061
12	2			2							2		0																																																													7
13				7							7			0																																																												7
14	2		33	2							7	2			0							2													12															5																							33
15				7							7					0													2																					2																						12
16																0																																																									0
17																	0																																																							0
18																		0																																																						0
19	7			2				8											0			5	2											2																5																			2				34
20																				0																																																						0
21																					0																																																					0
22											11			20	11				9		3	0						3					3	3					3																						3	20			3										92
23											6								3				0																																							3													11
24											3								3					0																																																		6
25																	3								0									3																																								6
26											3						3									0																																																6
27																	3										0																																															3
28								5																				0																																															5
29								63																					0																																													63
30				3				3																						0																																												3
31																															0																																											0
32																																0																																										0
33	2							7														2											0		2															10																			2						26
34	19			5				48														5	2										0	10																19																					2			110
35											43		3		6				3														3	0		3																									3			3									66
36																																				0																																				0
37								3																													0																																				3
38																																						0																																			0
39	7							7														7	2																0											2																			2				29
40																																								0																																	0
41								3																										3							0																																6
42																																										0																														0
43																																											0																										2				2
44																																												0																													0
45																																													0																												0
46											3																																			0																											3
47																																															0																										0
48																																																0																									0
49																																																	0																								0
50											11			11	11				11		6								11	11							3													0					6			3		3	23			3	6									120
51																																																			0																							0
52																																																				0																						0
53																																																					0																					0
54																																																		2				0																				2
55					12			2														2																												5					0												2						12
56					0																																																			0																	0
57																																																									0																0
58					10			2														2																												2								0											3					10
59																						2	2																																					0													2
60																								2																																					0								2				5
61	8			5				21														29												2																27											0				2	2		3					98
62	2			10	2																	2																							2																0											10
63																																																														0										0
64																																																															0									0
65	2																					7																												5															0								19
66																																																		3					3	3					3					0						11
67											17			11					3														3	3																	3			3	3					11	3	3					0					63
68																																																						3	3					9	3						0				20
69											3																							3													2		3				3						6								0			25
70																																																			3	3						3											0			9
71											3																																								3	3					3												0			11
72																																																			3	3					3													0		9
73																																																																							0		0
74																																																																						2		0	2
Total	183	0	2	96	33	2	33	647	69	9	578	37	43	86	83	0	3	17	54	14	29	170	14	0	2	0	14	3	132	0	0	0	20	160	75	0	9	6	6	0	11	11	11	14	0	14	0	0	2	158	17	9	9	9	14	9	9	20	9	17	100	9	3	6	11	5	31	0	10	8	0	0	0	3	3158

TRAFFIC STUDY FOR BEAWAR-PALI-PINDWARA SECTION OF NH-14 IN THE STATE OF RAJASTHAN

Mode Bus

O\D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	Grand Total
1	0										19																							4																															2											25
2		0																																																																										0
3			0																																																																								0
4				0							11																						2																																									13
5					0																																																																				0
6						0																																																																			0
7							0																																																																		0
8								0			19																		4																																												23
9									0	2	2																																																														4
10										0																																																															0
11	13		9				2	35			0											9												2																13																					2				85
12												0																																																													0
13	2		4										0									2																																																			4
14	2													0								2												2																																							9
15															0																																																										0
16																0																																																								0
17																	0																																																							0
18																		0																																																						0
19	2																		0																															4																					7
20																				0																																																				0
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22											4								2			0																																																		6
23																							0																																																	0
24											2													0																																																	2
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28																												0																																												0
29								8																					0																																											8
30																														0																																										0
31																															0																																									0
32																																0																																								0
33																						2											0																	2																				4
34	2		2				2	2																										0																																		2				11
35											15																								0																															2						17
36																																				0																																			0
37																																					0																																			0
38																																						0																																		0
39			11	2																								2											0											4																				2				11
40																						2																		0										4																							7
41								2																																	0																																2
42																																										0																															0
43								2																																			0																														2
44																																												0																													0
45																																													0																												0
46			4								4																																			0																											4
47																																															0																										0
48																																																0																									0
49																																																	0																								0
50											8		6						8														4						4											0											2			4								34
51																																																			0																						0
52																																																				0																					0
53																																																					0																				0
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58																																																										0															0
59																																																											0														0
60																																																												0													0
61																						2																													2											0												4
62																																																														0											0
63																																																															0										0
64			2																																															2														0									2
65																																																																	0								0
66											2			2																																																					0							4
67																																																																				0						0
68																																																																					0					0
69																																																																						0				0
70																																																																							0			0
71																																																																								0		0
72																																																																									0	0
73																																																																										0	0
74																																																																											0	0
Total	22	0	2	11	0	0	2	50	2	2	86	0	6	2	0	0	0	0	9	0	0	20	0	0	0	0	2	0	4	0	0	0	4	6	4	0	0	0	4	0	0	0	0	0	0	0	0	0	0	35	0	0	0	0	0	0	0	0	0	0	2	0	0	2	6	2	2	0	0	2	0	0	0	0	288

TRAFFIC STUDY FOR BEAWAR-PALI-PINDWARA SECTION OF NH-14 IN THE STATE OF RAJASTHAN

Mode LCV/Mini Bus

O\D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	Grand Total
1	0										3								2															2																					3									3	2	2									16
2		0																																																																								0
3			0																																																																						0
4				0																																																																						0
5					0																																																																						0
6						0					2																																																															2
7							0				3																																																														3
8								0			29				2							2							3																					2											2							2							40
9									0		8																																																															8
10										0																																																															0
11	7			3	1		3	15	4		0											4																												11																			3			1	1		54
12												0																																																													0
13													0																																																												0
14														0																																																											0
15															0							1																																															1					3
16																0																																																									0
17																	0																																																									0
18																		0																																																								0
19	1																		0																															3																					1			6
20																				0																																																						0
21																					0																																																				0
22											5										2	0												2																																2	2							11
23																							0																																																		0
24																								0																																																	0
25																									0																																															0
26																										0																																														0
27																											0																																													0
28																												0																																												0
29			2																										0																																											2
30																														0																																										0
31																															0																																									0
32			1																													0																																								0
33			1	1							1																						0																	4																					8
34			3					3																										0																																				1			4
35			1								2				2																				0																																	2					5
36																																				0																																				0
37			2																																		0																																			2
38																																						0																																		0
39				1																																			0																																	1
40																																								0																																0
41																																									0																														0
42																																										0																													0
43																																											0																												0
44																																												0																											0
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46																						2																								0																									2
47																																															0																								0
48																																																0																							0
49																																																	0																						0
50										2	10				3				2														2																	0	2	2			2			2	3	3	8	2											40
51	1				1																																													3	0																	1		1		8
52																																																				0															1					1
53																																																					0																			0
54																																																							0																		0
55																																																		1					0											1	4		3		1		11
56																																																								0											1						1
57			1																																																					0																	0
58																						1																																					0								1	1	1	1	1		6
59																																																											0							1	1		1	1	1	7
60	6																					6	1																											3										0						10	1	1	1			31
61	1		37	1							1											4																												8												0					11	8		6	1		37
62			4	1																		1																																										0			1						4
63																																																																	0								0
64																																																																		0							0
65																																																		1										2					0		1					3
66											3				2																																								5					10		2			2	3		0						6
67			2																																																												2		5	5	2		0					2
68			2																																																																2			0					2
69			16								3																																																					2		5	5	2				0				16
70																																																															2				2					0				5
71																																																																							0				0
72																																																																							0		2	2
73																																																																								0		0
74																																																																							3		0	3
Total	17	0	2	6	4	0	3	26	4	2	68	0	0	2	6	0	0	0	6	0	0	18	1	0	0	0	0	0	0	3	0	0	0	2	3	0	0	0	0	3	0	0	0	0	0	0	0	0	2	34	8	2	0	0	16	0	0	6	3	18	26	6	0	0	2	6	37	3	18	7	1	4	0	3	378

TRAFFIC STUDY FOR BEAWAR-PALI-PINDWARA SECTION OF NH-14 IN THE STATE OF RAJASTHAN

Mode 2A

O\D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	Grand Total
1	0										4				1				1		1																													3				1						3	7					1										24
2		0																																																																									0
3			0																																																																							0
4				0																																																									1	1													3
5					0																																																																					0
6						0																																																																					0
7							0				1				1																																																											3
8			17					0			10				3						1																														1				1																	17
9									0																																																									1						1
10										0																																																															0
11	3		26				3	3	6		0																																							6																					3			26
12												0																																																													0
13													0																																																												0
14			3											0								3																																																			3
15															0																																																										0
16																0																																																									0
17																	0																																																								0
18																		0																																																							0
19	3		10																0			3																												3																					10
20			0																	0																																																					0
21																					0																																																				0
22			11								1				1							0																1																	1			1		1			1	1	1								11
23																							0																																																	1		1
24																								0																																																		0
25																									0																																																	0
26																										0																																																0
27			3								1																0																																									1						3
28																												0																																												0
29																													0																																											0
30																														0																																										0
31																															0																																										0
32																																0																																								0
33																																	0																																							0
34	10		10																															0																																					10
35																																			0																																				0
36																																				0																																			0
37																																					0																																		0
38																																						0																																0
39			6						3																														0											3																				6
40																																								0																														0
41																																									0																													0
42																																										0																												0
43																																											0																											0
44																																												0																										0
45																																													0																									0
46			3																																											0									1							1							3
47																																															0																							0
48																																																0																						0
49				1																																													0																			3		5
50			28								4				1				3																															0	3				3					4	8								3		28
51	3		13																																															3	0														3	3			13
52																																																				0																			0
53																																																					0																	0
54			3																																															3				0																3
55			13																			3																												3					0											3			3		13
56			3																																														3						0															3
57																																																									0														0
58	3		13																																														6								0							3					13
59																																																									0							3					3
60			23																																																								0							10	3		10		23
61			21																			3																																						0						11		3	3		21
62			3																																														3												0									3
63																																																														0								0
64																																																															0							0
65																																																																0						0
66			10																1																															1	1			1			3			3	3				0						10
67			35								3				1				1										1				3	1																4	1			3			1	1	3	6			1		0					3	35
68																																																																			0						0
69			13								1																																						4							1		1	1	3		1				0				13
70			4																																																		1						3								0				4
71																																																																						0			0
72																																																																							0		0
73																																																																								0	0
74																																																																								0	0
Total	23	0	0	0	1	0	3	3	10	0	27	0	0	1	8	0	0	0	6	0	4	13	0	0	0	0	0	0	1	0	0	0	3	1	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	35	17	1	0	0	14	0	3	4	1	15	35	1	0	0	4	10	30	0	10	3	3	10	0	4	310

TRAFFIC STUDY FOR BEAWAR-PALI-PINDWARA SECTION OF NH-14 IN THE STATE OF RAJASTHAN

Mode 3A

O/D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	Grand Total
1	0														3				6																																4	1	1		4			3	1	11	10														45
2		0																																																																									0
3			0																																																																							0
4				0							1										1																																																				3
5					0																																																																				0
6						0																																																																			0
7							0																																																					1													1
8			17					0			4			1																				1																									1							7			1				17
9									0		1																																														1								1								4
10										0																																																															0
11	10			4	2				9		0											2					1																						6															2	1				2			41
12												0																																																													0
13													0																																																												0
14														0																																																										0
15	1		14												0							4			1																									1																1	1		1			1		14
16																0																																																									0
17																	0																																																							0
18																		0																																																						0
19	2		14				1	1											0			6																											1																					1		14
20																				0																																																				0
21																					0																																																			0
22			24								4						1					0																											1					1			1			7	6										24
23																							0																																																	0
24																								0																																																0
25																									0																																															0
26																										0																																														0
27																											0																																						1							1
28																												0																																											0
29			1																										0																																								1			1
30																														0																																									0
31																															0																																								0
32																																0																																							0
33	1																																0																																		1						2
34	1		5								2											1												0																																		1						11
35															1				1															1	0																										4				1								10
36																																				0																																			0
37																																					0																																	0
38																																						0																															0
39																							1																0										1																		1	1			5
40																																								0																														0
41																																									0																													0
42																																										0																												0
43																																											0																											0
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46																																														0																								0
47																																															0															1									1
48																																																0																							0
49																																																	0																						0
50											3				3				1		4													1					1										0	4	1	1		4			8	15	1									50
51	1		14																																															2	0													2	5		2			14
52			11																																															2		0													2	1		4	1		11
53																																																					0																		0
54																																																						0																	0
55			33																																															5					0										9	14		1	2	1	1		33
56																																																							0											1						1
57	2																																																							0																0
58																																																	5								0							1	2	2		1		15
59																																																										0							1		1			2
60	5		59																			5																												16								0						5	12	1	5	4	4		59
61			49					1														2																					1					14									0			2	14	6	4	5			49
62			11					1														4																										4											0		1				1			11
63																																																														0									0
64																																																																0								0
65	1		1																			2																											2																	0						7
66											3																							1					1											3		3			1	3				3	3	11	4		1		0					25
67			13								6				1				1															1																	11	3			6			1	1	6	1		1			0				51
68			13																										1																				2		10	1			1					3	14							0			36
69											3																																																		3				1	3			0			3
70														1																																															1	3			1					0		7
71																																																						1								4							0		6
72																																																1																						0		1
73																																																																								0	1
Total	26	0	0	11	2	0	2	16	0	0	25	0	0	1	10	0	1	0	10	0	6	27	1	0	1	0	1	0	1	0	0	0	0	7	0	0	0	1	4	0	0	0	1	0	1	0	0	2	62	33	7	4	0	22	3	0	4	4	38	95	8	0	0	7	30	56	1	23	15	14	4	0	0	590

TRAFFIC STUDY FOR BEAWAR-PALI-PINDWARA SECTION OF NH-14 IN THE STATE OF RAJASTHAN

Mode MAV

O/D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	Grand Total
1	0										21			2	6				13															2				2	4												31	6	4		58			4	6	240	108	8			2								4		523
2		0																																																																									0
3			0																																																																							0
4				0							6								2																																2										2	8				2								23
5					0																																																																					0
6						0																																																																				0
7							0				2				4														2																																				2									10
8			48					0			10				2				6														2													2	2		2							2					4			2	2	4			4						48
9									0		4																							2																															6									13
10									2	0																																																															2
11	11		2		2	11					0											7												2																23																			9	13	2	4		84
12												0																																																														0
13													0																																																													0
14			2											0																																																												2
15	13														0																																			11																	6				2			31
16																0																																																									0
17																	0																																																								0
18																		0																																																							0
19	5																		0			9																											2		13															2			7		4			41
20																				0																																																						0
21			2																		0																																																				2
22											6								17			0																												2	27	6		17						33	19	4			15									146
23											8												0												2			2												10							2		2													27
24																			2					0																																																	0
25																			2						0																																								4								6
26																										0																																													0
27																			2								0																					2						2									2							8
28																												0																																											0
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31																															0																																								0
32																																0																																						0
33	4					2																											0																	9																		2		2	2		29
34	4		2																			4												0																																						9
35																																			0														2		8						2	4	2			2										21
36																																				0																																			0
37																																					0																																		0
38																																						0																																	0
39			25	2		4																																	0										7															9				2		2		25
40																																								0																															0
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47																																														0																				0
48																																															0																	0
49																																																2	0											2		4
50											35				4				17			2					2				2	6	2						2		6		2						0	38	17	2		42			4	4	81	114	10				6			2					390
51	27					2																2					2																						27	0													23	66		38	20	2	5	213
52	2																					4	5																										4		0												7	16		21	9			68
53																																																			0																			0
54																																																2				0																2
55	21	2		2		2		2														9	5																									50				0										50	80		36	13	2	5	279
56																																																						0													0
57																																																							0													0
58	18		127	2																		20																											23									0							21	32	2	2	2	5	127
59	2							4														2	2																									7										0							9		5	2	5	2	39
60	32	2		2																		11	4																								2	2	75										0					80	172	2	86	43	21	23	556
61	18																					9	2							4																		50												0			29	95	2	38	18	20	16	299
62	5																					2													2													2												0		2	7		7	4			30
63																																																												0								0
64			27																																															11												0		4	5	2	2	4		27
65											2				2																			2													2				15	8			21		2			21	38				0						4	115
66											15								2								2																		2				2	38	8			67			4	10	31	33	2			6		0				2	223
67											10				2				6												2														4				11	35	2			35			2	2	33	48				4	4		0				199
68																																																		4					8					4	4				4	2			0			25
69			29																																															4					4					8						0		4	2	29
70			23								2																																					2									2	8	2		4					0		23
71																			2																														2															4			2	0		2
73																						2																																																4	2	0		13
Total	161	4	0	13	0	4	0	23	2	0	122	0	0	4	19	0	0	0	67	0	0	73	24	0	0	0	5	0	4	0	2	0	8	10	4	0	0	6	21	4	0	0	2	0	0	4	6	2	19	318	206	50	6	0	267	0	6	21	23	469	404	31	0	0	58	227	512	6	254	121	57	63	4	15	3730

TRAFFIC STUDY FOR BEAWAR-PALI-PINDWARA SECTION OF NH-14 IN THE STATE OF RAJASTHAN

Travel Pattern (OD Matrices) at TP03-Birami, FY17

Mode   Car/MLCV

O\D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	Grand Total
1	0													5	11	3			5		5										3		8										3															3	5		11				3								3		66
2		0																																																																							0
3			0																																																																					0
4				0																	3																																												3	3		5								16
5					0																																																																			0
6			21			0																																	13	8																																		21
7							0																																3																																		3
8								0		11																					3																								3										3	3							3		24
9									0																																																															0
10										0																																																															0
11											0			35	135	5	5	3	122		63										34		16										3				3	3		58		5			5				3	8	56	13		8	24									607
12			58											16	24	3			5												3												3																3			3												58
13													0																																																												0
14							3	3	3	65	42	3	0						5															58			5		24	16							5			3																				3				236
15	3									5	68	18		0							24	3												31			3													3															13						5	5		188
16											3				0																																																									3
17																0																																																									0
18																	0																																																								0
19	3	3		3						58	10							0			18													44												3				8																				5			3		157
20																			0																																																							0
21										10										0	5										3																			3																							21
22														3	5			8				0									3		5										8												13									16	3		3	11					77
23																							0																																																			0
24																								0																																																		0
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26																										0																																																0
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28														3														0																																													3
29																			3										0																																												3
30																		3												0																																											3
31	3		5							73	16										18										0			3																5																	3					3	3		131
32																															0																																										0
33	5									18											21												0	18																																						5			71
34				27										11	56	3	3	3	112	3	18										5		32	0					16	5			116	3						5					11						8	3	5	58	11		5	13			3		533
35															3																				0																															5							8
36																			3																	0																																				3
37														3	3																						0																														5							11
38																																						0																																		0
39										24	3											3												8					0											3																			3			42
40			3							13																								8	3					0											3																	3	3			34
41																																									0																																0
42										5																																0																															5
43			5							8												3												29		3							0							10																	5						63
44				3																		3												5										0																											3		13
45			3																																										0																													3
46																																							3							0												3			3				5								13
47															3				3																											0									3																	8
48	3																				5																										0																					3						10
49																																																0																									0
50														3	11	3			5		8										5		8										16					0		3			3			11		3	32	3			13									125
51													3																																					3	0												5		3							13
52											3																																									0																						3
53																																																					0																				0
54																																																						0																			0
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56																																																								0																		0
57																																																									0											3					3
58	3										3											5												24																	8								0															42
59																																																											0															0
60														3	3																			5																8										0									3		5	3		29
61											5	3										8												42												3				8											0							3	5		3	5		84
62											3											3												5																5												0					5			3	5		21
63	3			5						8											3												26																10															0				5				60
64	5									86	5										5												42			3											3		5																	0	3	8		3	5		60
65			86								5										5												42			37										3				5						3					3					0	8	3	5		86
66																																														3								3			3			3					16	5					0				13
67																						3									5		5										8												3			3		16	5						0			48
68																															3																									3														0		5
69																						3									3												5												3			3		8			11							0	35
70																																																							5			3												5
71			3																																																										3											3
72																																																								3															0		3
73																																																																							0		0
74																																																																						3			0	3
Total	26	3	00	16	8	0	27	8	3	21	374	97	3	74	252	16	8	5	265	3	106	133	3	0	0	0	0	0	0	0	66	0	74	351	3	0	13	0	64	29	0	0	219	3	3	10	3	3	86	11	8	0	0	40	0	0	32	13	21	226	37	0	19	90	5	68	8	16	29	10	0	5	3	3021

TRAFFIC STUDY FOR BEAWAR-PALI-PINDWARA SECTION OF NH-14 IN THE STATE OF RAJASTHAN

Mode Bus

OID	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	Grand Total
1	0																		2		2																																																								5
2		0																																																																										0
3			0																																																																								0
4				0																																																																								0
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11											0				11				9														2													2				11										2			5		5				2	2					51
12			2									0																																																															2
13													0																																																														0
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31																						4									0			2																	2																				2				11
32																																0																																										0
33																						2											0	15	2															2																						21
34														5	16				11	13												2	18	0					2				25																					18		2	21				2		135
35																																			0																																						0
36																																				0																																					0
37																																					0																											2		5							7
38																																		2				0																																			2
39																																		2					0											2																				4			8
40			2								4																							2						0																																	11
41																																									0																																0
42																																		2								0																															2
43																						2												11									0							2																						15
44																																												0																												0
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46																																												2			0																											2
47																																												2				0																										2
48																																																	0																									0
49											2																							2															0																								4
50																			2																					2										0																							4
51																																																			0																						0
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61											2											2												4																											0								2				11
62																																																													0												0
63																																																														0											0
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65																																		2																2														0								11
66																																												2																					0						2
67														2					2																								9																							0					14
68																																																																				0					0
69																																																																						0				0
70																																																																							0			0
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72																																																																									0	0
73																																																																										0	0
74																																		2																																							2
Total	0	0	0	4	0	0	0	0	0	0	17	0	0	9	27	0	0	0	27	0	15	15	0	0	0	0	0	0	0	0	2	0	21	84	2	0	0	0	5	4	0	0	49	0	0	0	0	0	0	17	0	0	0	0	2	0	0	5	0	25	0	0	5	27	0	4	0	0	11	0	0	0	0	2	378

TRAFFIC STUDY FOR BEAWAR-PALI-PINDWARA SECTION OF NH-14 IN THE STATE OF RAJASTHAN

Mode LCV/Mini Bus

O\D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	Grand Total
1		9													2																		2																										3	2																9
2																																																																										0
3																																																																										0
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10																																																																										0
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12																																																													2													2
13																																																																										0
14											4	1																						3													1			1																							11
15	1		1						1		7																							8																																								19
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18																																																																										0
19													1														1							1																																					1	1				7
20																																																																										0
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22																																											2		2					1												3		2			2								10
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33																																		1																1																								3
34														2	7				7													2	9										4								3				2					1	2	8	25	7										78
35																																																																										0
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49																																																																										0
50															2						2									2																	2			2										3		2		3	5			2								2	26
51																						1																													4																		1							7
52																																																																										0
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58											1																							10																																				1	1				14
59		5																																3																																							1			5
60				1																	1													1													3			5																	5	3	5					26
61																					3													5																4																3	3	1	3	1		1		25
62											1										1													5																1																							10
63																																																																										0
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65			8	1							1																							3																																		3					8
66																																																											7			5													12
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68																																																														2	2												3
69																						2																																										3	1	9	3		2								23
70																																																																										0
71																																																																										0
72																																																																	2										2
73																																																																										0
74																																		1																																				1		1			4
Total	1	1	0	3	1	0	0	1	0	0	23	3	0	2	15	0	0	0	17	0	5	8	0	0	0	0	0	1	0	0	0	2	0	12	49	0	0	1	0	2	0	0	0	10	0	0	0	4	0	2	29	7	1	0	0	7	0	0	23	9	17	66	12	0	3	7	7	19	7	11	3	0	1	3	3	398

TRAFFIC STUDY FOR BEAWAR-PALI-PINDWARA SECTION OF NH-14 IN THE STATE OF RAJASTHAN

Mode 2A

O\D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	Grand Total
1																																																							2			2	3	4	2			2											15
2																																																																										0
3																																																																										0
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10																																																																										0
11															10				6														2																										2	2	2	10			3	5							2		45
12																																																																										0
13																																																																										0
14													3									3												3																																									9
15											3	3																						12																																									17
16																																																																										0
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18																																																																										0
19											3																							9																																			6				17
20																																																																										0
21											3																																							3														3									9
22																																												2			2														2	2											8
23																																																																2										2
24																																																																										0
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31											3																																																														3
32																																																																										0
33																						3												3																																								6
34														6	7				11																													7									4			2	27	2		2	11							2	82
35																																																																4									4
36																																																																										0
37																			2																																																							2
38																																																																										0
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47																																												2																3		2											7
48	3																																																																									3
49																																																																										0
50															2							2											3																												2		2	4	6											21
51																																																																				3		3					6
52																																																																										0
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54																																																																										0
55																																																		9																	3	9	3					23
56																																																																										0
57																																																																										0
58		12																																																															3	3		3					12
59								6																																																																	6
60											3																																							12																3	5	3	3				28
61											3											6												12														4			3															3	9	3	3				44
62											3																							3																																		3					9
63																																																																										0
64																																																																										0
65																						3												17													3	3																	6							32
66																																																																	6	4							10
67																			2												2											2														4				2	9				5							30
68																																																											3	2	2			4									11
69																					4																														6								2		10	8									2		33
70																																															4													4											0
71																																																																										0
72																			2																																														2								4
73																																																																								3		3
74																																																																								3		3
Total	3	0	0	0	0	0	0	9	0	0	23	6	0	6	19	0	0	0	23	0	6	14	0	0	3	0	0	0	0	0	2	0	5	58	0	0	0	2	0	0	0	0	0	4	0	0	3	7	0	0	26	12	0	0	0	21	0	0	15	16	22	83	4	0	9	39	6	20	29	14	3	6	6	0	6	531

TRAFFIC STUDY FOR BEAWAR-PALI-PINDWARA SECTION OF NH-14 IN THE STATE OF RAJASTHAN

Mode 3A

O/D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	Grand Total
1			18						158						2																		2																2						4			4		4	2			2	6											203
2																																																																										0
3																																																																										0
4																																																																										0
5																																																																										0
6																																																																										0
7																																																																										0
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9																																																	2									2														4
10														12																																																											12
11														4	18				14		2																									4					2				2			4		4	6	2			2	6									69
12																																																																										0
13																																																																										0
14				2							6																																																																7
15			2										2																					9																2																	2		2			2			20
16																																																																										0
17													2																																																														2
18																																																																										0
19	2										15																2							13																7																	2					2		43
20																																																																										0
21											2																							2																4																		4		4				15
22														2				8														4											2					2																	2		6							26
23																																																																										0
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25			2																																																																						2
26																																																																										0
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31	2																																																																										2
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33																																		6																																		2							7
34													2		6				17													21								2				4								4				4			10	2	14	22	6		4	22									139
35																																																																										0
36																																																																										0
37															2																																																										2
38																																																																										0
39											4																			2																																						4		2				11
40																																																																										0
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47																																																												2	2	2	4	2											12
48																																																		2																								2
49																																																																										0
50			22																		6											4										2								4					8					2	12	8											68
51				2																														2																11																		6	4		2			26
52											2																																																															2
53																																																																										0
54																																																																										0
55											2																2							4																					11												7	15		9	6		2			58
56																																																																										0
57																																																																										0
58											2																							2		2										2				2																2	6						15
59											2																							6													2																		2			2			7
60	2																				2		2											6												2				15														6	6		4	2	6			50
61	7										2										2	2												7															20														6	15	6	4	4	4	2		80
62											2										2													6															11														4	2	2					28
63																																																																										0
64	4										2																2																							2																4	2					15
65	2	2									6																							6																9																2	6	19	6	7			63
66																																																															2	4							6
67																																																																							2	2
68																															2																																				12				2	16
69																																																																			4						4
70																																																																									0
71																																																																										0
72																																																																										0
73																																																																					2		2			4
74																																																	4	4																			2		2		19
Total	19	2	100	0	44	0	4	0	158	0	45	2	2	20	28	0	0	0	39	0	8	6	2	2	0	0	6	0	0	2	2	0	33	65	2	0	0	0	8	0	4	0	8	0	0	6	0	0	4	100	8	0	0	0	24	0	0	24	10	39	53	10	0	16	57	39	67	30	32	22	11	7	2	2	1069

TRAFFIC STUDY FOR BEAWAR-PALI-PINDWARA SECTION OF NH-14 IN THE STATE OF RAJASTHAN

Mode MAV

OID	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	Grand Total
1									311										5												2		4						2				2								17	9			21			7	5	163	18			5	12							2		586
2																																																																									0
3																																																																								0
4																			2																				2																	5									2										12
5																																		2	2																													2								7
6																																																																									0
7																																																																			2						2
8																																																											7			2	8	7	12	2			5								43
9																																																																									0
10																		9																																																							9
11																			40	2	7										2								2				2								7	2			5			11	2	14	13				7						1	2	2	118
12																			2																																							2		2	2				2								12
13																																																																									0
14	2										5															2																									2																2					12
15	2										7																																							5															2					16
16												2																																																												2
17																																																																									0
18																																		2																																							2
19	9		5								14														5		2							12													5			23																12		4		2		94
20											12																							7													2		25															4	18		12		2		85
21											12								20			4												7														2		25													4	18		12		2		85
22																			20												5															5		2			5	4			25			12	4	5	7			7	7							111
23															5				2																									2							5	6			7				2	11	2	2		2								47
24																																																																									0
25																			2		4																													2									5		2					7							23
26																																																																									0
27															2																																																			2							5
28																																																																									0
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31	4																					2																																														2						7
32																																																																									0
33	2																																																9																							11
34															2				18	21		2																									5				2							9			17	5	18	54	7		2	27							12	209
35	2																																																																		2							2
36																																																																									0
37																2																																																									2
38	2																																	2																						5											4							7
39	5										7											2												4		2																2														2			2				28
40	2										2										2													2																																						2	9
41																			2																																											19						2				26
42																																																																								0
43	2		2																			2												5																	5																2		5	2			25
44	2										9																		2					2																																						14
45																																																																									0
46																		2																																								5													9
47																			2																														5									7		2	2		2	16	4		2	25							70
48	2										7																							2																4																	2					14
49																																																																					2					2
50															9				18	24																			5									2			27	6			41			4	4	75	21			7	12						5	260
51	11	2									2											4												4													2			48																37	78		23	4	4	5		225
52	2			4																																														9															11	11	2	7			5		50
53											2																																																									2	2
54																																																																									0
55	11		2	2							4								9	5														11																82												28	62		35	9	4	7		270
56																																		2																																					2
57																																																												2												2
58	2		28																2															2													4															7	7	4		2					28
59	2																		2	2														2											2																			2	4			2				14
60	11		2		2						7								21	2		2												28	4											2	4		92											69	106	11	75	16	9	27		489
61	11		2								12								4		4												32																35										28	39	2	18	2	2	12		206
62											5								5															11					2											9									2	7	4	2	4		5		67
63																																																																							0
64	11		2								11								2															16		2											2		16													2	2		2				66
65			2								12								2															14										4	4		16									4	28	5	12	18	5	9		134
66														5				2														2														2			35	16			49			21	10	33	23	11		2	7							219
67														2			24																					2				7		5		95	35			65			13	12	30	44	2		12						5	354
68												2						11																				2	2			2						2			12			2	6	13	35	2		2	42					5	132
69																		11																													55	12			72			20	5	33	25	14		2	9			2	261
70													2																																			11								2		7	2							24
71															2																																2					5	5				2					4	24
72														5																																	5	2			2	2	2		9	17	5							49
73																																	2																																	4
74									2																								4											2		5														4		4	4			23
Total	91	2	0	14	2	0	4	4	311	0	121	2	0	4	31	2	0	30	120	2	74	59	12	0	11	0	7	0	0	0	9	0	18	163	4	0	5	2	26	0	2	2	23	2	0	14	25	2	7	396	274	92	0	0	335	0	4	119	62	452	296	50	0	38	185	193	390	30	197	64	24	75	2	44	4528

TRAFFIC STUDY FOR BEAWAR-PALI-PINDWARA SECTION OF NH-14 IN THE STATE OF RAJASTHAN

Travel Pattern (OD Matrices) at TP04-Uthaman, FY17

Mode: Car/MLCV

O\D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	Grand Total
1	0																		2		8												2																											3	2	3					11									31
2		0																																																																									0
3			0																																																																								0
4				0																																																																								0
5					0																																																																							0
6						0																																																																						0
7							0											2	5																																																2									8
8								0										2			2																																										2				2									7
9									0																																																																		0
10										0																							8																																										8
11											0							8	109		76												48																	61								2		13	5	8	66				8									404
12											2	0																																																															2
13													0								11	5											11																											5		5												38
14														0							8	3											3																											3		2												20
15															0			77	345		25												56																	7								2		33	8	10	77		5		10								654
16																0		25	20		3												2																												3												53
17																	0	3	13		5												3																																		2						28
18											6			2	39	22		0																6	2		2									2				4																						81
19								4			41			10	10	397	59	10	0		39									2		2		138	2		2										2	4		38																		2	2		2			766
20																				0																																																							0
21											6			8	35	14	2				0	4												16			2													4															2								94
22																		2	11		3	0												5																5									3		2	16	3		2								53
23																							0																																																			0
24																								0																																																		0
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26																										0																																															0
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28																												0																																												0
29																													0																																											0
30																														0																																										0
31																			3												0		7	3																										2	7	3											25
32																																0																																									0
33											20		2	2	33	2	2				16												0	41				4												24																8			4				159
34																		8	76		48												33	0																38								2		30	2	2	57	3		18								315
35																			2														2		0																											3											7
36																																				0																																				0
37																		2	3														2				0													3									3	2	11											26
38																		3	2														3					0																					3	2	3				2							18
39																		15	5														5						0											2						2								2							30
40																		2																						0																							2								3
41																																									0																																0
42																																										0																														0
43											4		2	6	24	2																		16				4					0							4																						65
44																																												0																													0
45																																													0																													0
46															3																															0													2	2					3								8
47																																														0												2														2
48																																															0																										0
49																																																	0																								0
50																		2	20		7												3																	0	3							2		10	2	5	26	2									85
51											2				4																																				0																						6
52																																																			0																					0
53											2																																									0																					2
54																																																					0																				0
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56											2																																													0																	2
57															2																																										0																2
58	2										2			4	10	6	4				4													10			2		2	4										4								0															55
59															2																			2																4									0													6
60											2				2																			2																4										0												10
61	2									2	14	12	8		98	4	4				16	2												69		14														26											0					2	10	8		2			294
62											4				8						6													2		2														6													0				2					31
63															2						2																																											0								4
64											8		2	2	41						14													14																14															0							104
65																																																		2															0						2
66																			8														3																	2										3	3			3	0				23
67																																	2																									2			5					0				8
68																		3		7																														8					5					7	3		2				0			36
69																																																												2	2		2					0		5
70																																																																				0		
71																																	2																																					0		2
72																																																																						0	0
Total	4	0	0	0	0	0	0	6	0	0	115	0	28	43	702	110	22	128	661	0	203	104	2	0	0	0	0	0	0	2	0	2	0	199	323	2	0	28	0	10	4	0	0	124	0	0	2	4	0	0	134	15	0	0	0	13	0	0	107	30	50	291	13	0	0	64	4	28	12	6	2	2	0	0	3599

TRAFFIC STUDY FOR BEAWAR-PALI-PINDWARA SECTION OF NH-14 IN THE STATE OF RAJASTHAN

Mode Bus

OID	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	Grand Total
1	0																																																																										0
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11											0							2	3		7												4																		12											2	2	8		4								45
12												0																																																												0
13													0																																																											0
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15															0				4		2												4																														2				2								15
16																0					2																																																			2
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19											3				3				0																23	3														12																						43
20																				0																																																					0
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31																															0																																								0
32																																0																																						0
33											3				6		3					3											0	20			3													3																				3		43
34																			6		4													23	0															2									4	2		28	8		8							2	89
35																			2																0																																				2
36																																				0																																			0
37																			2																		0																											2							4
38																																						0																										2							2
39																			4																				0																									4						8
40																																								0																														0
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51																																																			0																		0
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58																							3																																				0											3
59																																																											0											0
60																																																												0										0
61											3		3									6												14																6										0									32
62																																											3																		0								3
63																																																															0							0
64																																																																0						0
65											3				3							9															3						3																					0					17
66																																																																	0				0
67																																																																		0			0
68																																																																			0		0
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71																																																																					0
72																																																																					0
73																																																																					0
74																																																																					0
Total	0	0	0	0	0	0	0	0	0	0	12	0	3	0	12	0	3	2	24	0	16	20	0	0	0	0	0	0	0	0	0	0	36	58	6	0	3	0	0	3	0	0	14	0	0	0	0	0	0	20	0	0	0	0	0	0	0	0	6	4	2	42	11	0	0	17	0	3	0	0	0	0	0	2	318

TRAFFIC STUDY FOR BEAWAR-PALI-PINDWARA SECTION OF NH-14 IN THE STATE OF RAJASTHAN

Mode LCV

O\D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	Grand Total
1	0																																1																						1			1		1	6													12
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11											0								3																																				1			1		3	1	1	10	3											25
12												0																																																													0
13													0																																																	1												1
14														0																																																											0
15															0				4														3																						1			1		14	1		1									28
16																0																	1																											1												3
17																	0																																												1											1
18														2		2		0																																																					2		5
19	2										7		2	7				0																5															7																				2			32
20	2												2						0																																																					2
21													2							0																																																				2
22													1								0											1																														1	3											7
23																						0																																																			0
24																							0																																												1							1
25																								0																																																	0
26																									0																																															0
27																										0																																													0
28																											0																																												0
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32																															0																																									0
33															7																	0	2																																							9
34																			3		1												0																											3	1	3	24	3			6							1	46
35																																		0																																					0
36																																			0																																				0
37																																				0																																			0
38																																					0																																	0
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46																																														0																									1	1
47																																															0												1	4	1											7
48																																																0																									0
49																																																	0																							0
50																			1		3												4														1			1	0	1				6		1		7	4	1		1								1	37
51						2	2																																											2	0												2		2		2					14
52																																																			0																					0
53																																																	2			0																				2
54																																																					0															2			2
55														2																																			2					0																	5
56																																																						0																0
57															2																																			2							0															0
58															2																															2			2									0											2				12
59			2																																																							0									7	5				25
60											2			2					7																														2									0													25
61	2										7			5																			2															7											0				5	12	2	2				44
62	2																															2						1																							0					2			8
63																																																														0								0
64														2																																			2														0							0
65																																																															1		0	2		2			9
66																																																																0				1
67																		1		7																																						2			3	3	1			4		0				18
68																																																																	4		0			4
69																																	1																								1	1	5	7	1	1		3			0			23
70																																																																				0		1	1
71																																																																					0			0
72																																																																						0		0
73																																																																					2		0	2
74																																																																							0	0
Total	7	0	0	0	0	2	2	0	0	0	16	0	2	12	23	2	0	0	14	0	13	7	0	0	0	0	0	0	0	0	0	0	13	16	0	0	0	0	0	0	1	0	1	0	0	0	2	0	1	30	3	0	0	0	14	0	0	12	7	25	79	12	1	0	17	7	21	16	9	5	0	0	3	4	403

TRAFFIC STUDY FOR BEAWAR-PALI-PINDWARA SECTION OF NH-14 IN THE STATE OF RAJASTHAN

Mode 2A

OID	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	Grand Total
1	0																	2																																								2		2															6
2		0																																																																							0
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11											0								6		6												11																																4	8	2	8								47
12												0																																																												0
13													0																																																											0
14														0																																																						2						2
15															0				2	15	2												4																															2	6	2							34
16																0				2																																																				2
17																	0																																																	2						2
18															4			0																																																					4
19											4								0														7														4		7																			11				33
20																				0																																																					0
21	4														4						0																																																4		4		15
22																					2	0																																							2	2					2						8
23																							0																																							2										2
24																								0																																																0
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33																																	0																	4																				4
34																			8		2												8	0																					4						2	6	2	19	4	2	6				65
35																																			0																																				0
36																																				0																																		0
37																																					0																																	0
38																																						0																			2													2
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48																																																0																								0
49																																																	0																							0
50																			4		6												6										2							0	2				14					2	6			4						48
51	4																																	4															0																			4				11
52																																		4																0																						4
53														4																																					0																				7
54																																																				0																			0
55	4																																4																				0														4				19
56																																																						0																	0
57																																																							0																0
58	4							4			4				7																		7																		4								0									7					37
59																																																											0													0
60																																		4																4										0								7			15
61											4				4																			15																7										0				4	4	4	4		44
62											4											4												4																												0								11
63																																																															0							0
64																																																																0						0
65																																	11																																0					11
66																																																												2					2	0				4
67																			2		6												4																				11						2	2			2		0				30
68																																		4																																	0			4
69																					2																																							4		2	2					0		11
70																																																													2						0		2
71																																																																					0		0
72																																																																						0	0
73																																																																						0	0
74																																																																				4			0	4
Total	15	0	0	0	0	0	0	4	0	0	19	0	0	0	26	0	0	4	38	0	27	11	0	0	0	0	0	0	0	0	0	0	34	59	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0	4	0	0	26	13	4	0	0	14	0	0	8	11	19	57	11	2	2	25	7	26	11	11	4	0	497

TRAFFIC STUDY FOR BEAWAR-PALI-PINDWARA SECTION OF NH-14 IN THE STATE OF RAJASTHAN

Mode 3A

OID	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	Grand Total
1	0																		6														2																							2							8				2									19
2		0																																																																								0
3			0																																																																						0
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6						0																																																																				0
7							0																																																																		0
8								0																									2																																	2		2	2		4						12
9									0																																																															0
10										0																																																														0
11											0								10		2												8																								2	2		2	2						2	2	23	6						60
12		2										0																																																												2
13													0																																																										0
14														0				30	6	6	4																																2	2	2	4		2	2	2	4		4		4		8							81
15															0				10	18	14	8											6																		4	2			8	2					10	4			8								94
16																0			6	10	4	14																															2				2					6				6								50
17																	0		6	2	4	8																														2				2					4				6								34
18																		0																																																						0
19											11				6				0			4												2																6																				2	2		2		36
20																				0																																																					0
21																					0	2																											2																				2		2		9
22																						0											4																																	2						6
23																							0																																																			0
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31																															0																																										0
32																																0																																								0
33															2																		0	4																2																			2	4		2		17
34																			4		2												6	0													6				6	2						6	6	2	33	12				6							90
35																																			0																																						0
36																																				0																																				0
37																																					0																												2								2
38																																						0																							2												2
39																				2	2																		0																												2						6
40																																								0																																0
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43															2																												0																												2			4
44																																												0																													0
45																																													0																												0
46																																														0															2												2
47																			4																												0											2			2	2			2							2	14
48																																																0		2																							2
49																2																																		0																								2
50	2																		2		14												4																2	0	9		2		8				2		24	14				8							2	91
51	2										6					2																																		4	0	4														2	2	2	6	2			34
52	2																																																	2		0																	2			6
53																																																					0																2	4			6
54																						2																																0																		2
55	2										4					2																																	4					0													2	13					28
56																																																								0																	0
57																																																		2							0															2
58	2										2																						2																	4								0								2	2	2	2			19
59																																																	2										0										4			6
60	2						2				9					2																	9																														0					11	15	4	4	2	2		68
61	4										9			4																			19													4				13											0				11	21	6	15	13	2	4		130
62											4			2							2												4														2			9												0			2	2	2	4		2		34
63																																																															0										0
64																																																																0									0
65											4					2						2											11																	9															0	2		9		2			40
66																																																															2				0							2
67																			2		4												2																																			2	0				2	12
68																																																										2									18		0					19
69																					10																																																		0		4		14
70	2																																															4																							0			2	6
71																																																																									0			0
72																																																																										0		0
73																																		2																																				2			0		4
74																																																																										2		0	2
Total	15	0	0	0	0	0	2	0	0	0	49	0	0	0	17	11	0	52	65	30	68	13	4	0	0	0	0	0	0	0	0	0	33	57	0	0	0	0	0	0	0	0	0	0	0	12	0	0	2	6	0	0	66	20	10	6	6	20	4	4	19	18	32	104	27	4	0	72	38	60	45	38	19	9	4	0	12	1072

TRAFFIC STUDY FOR BEAWAR-PALI-PINDWARA SECTION OF NH-14 IN THE STATE OF RAJASTHAN

Mode MAV

O\D	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60	61	62	63	64	65	66	67	68	69	70	71	72	73	74	Grand Total
1	0																	6	6														11																	2		15	2		4	13			4	19	243	88	13			13								2		442
2		0																																																																									0
3			0																																																																						0
4				0																																																																					0
5					0																																																																				0
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8								0																																																							4											4
9									0																																																				2												2
10										0																																																															0
11											0								24		9												15														6				4		2					4	2	21	62	11			6							2		170
12												0																																																												0
13													0																				2																																							2
14														0					2																															2								4												9
15															0				11			4											2																	2					4			2	2	4	24	4			9								69
16																0			2																																								4	6	2			2						2		17
17																	0		2																																								2	2	2											9
18											2				2			0																																																					6
19	2		2								21				17	2			0			2												29															13															2	15	6	4			2		117
20																				0																																																				0
21	2		2								2			2	2						0	2											2				2												10																		2		15		4		48
22																		2	13		4	0											2																		2	2			4					13	13	11	2	2	2							71
23																							0																																																	11
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32																																0																																								0
33	4										4				6							2											0	8																15																6	4	4	8		2			65
34																		2	21		4												15	0													6				11	4	4		2			13	9	15	56	26		2	30							6	228
35																																			0																										2											2
36																																				0																																			0
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38																																						0																																	0
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40																			2																					0																														2
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43											2				2	2	2																										0				2			2																2	2		2			17
44																																												0																							2				2
45																																													0																												0
46																																														0													2		2										4
47																																	2													0			2					2					2	6	6	4			9			8		2			45
48																																		4													0		4																		8		2			19
49																																																0	2																								2
50																			11		21												9																0	49	4	2			38			17	2	71	98	9			2						2	4	346
51	36										2				2						2												19																	6	25	0															25	71	15	23	19	4	2		251
52															2						2	4											2																4	0															8	31		2				59
53															2																																					0													2							2
54																																																					0													2		2				4
55	27										15				2	6						4	2				2						29																6		29				0										29	88	2	17	10	4		284
56																						2																																		0											2						2
57																																																									0									2						2
58	8										2				4							2											8																2		8							0					2	8		2				48
59																																																											0												2
60			2				2				17		2		6	2					8	4							2				29									2								4	27									0					25	77	15	31	2	13	13	284
61	19						2				38		2		13	8	4				15												48															19	40									0			52	63	29	63	8	13	10	446
62	4										6				4	4																	15															10		2											0		2	6	8	10		2		75
63																																	2															2															0		2	2				8
64			2																															2																																0						2
65	4										21			2		4	2					4	2										31															4		25													0	4	31	19	10	8	4	4	182
66																																	2																2		6	4	2		17			2	6	9	28	4			4	0							90
67																		2	6		25												13													2				4		38	30			40			4	4	111	135	15			11		0					2	6	451
68																			2															4									2						2		4	2	4		2			2		4	26	13	2	6				0				2	79
69																			2		21												2																						38			6	19	85	119	26		2	11			0			406
70																																																	2									2	2		2				4	4			0			32
71																																																													2	9			2				0			13
72																																	2	2													2															2	9			2				0		17
73															2																			2																																		2	2		2	0		11
74																																		2																																	4	4	2			0	13
Total	107	0	2	4	0	0	0	4	0	0	132	0	4	4	71	27	6	15	105	0	89	42	17	0	0	0	2	0	2	0	0	0	84	236	0	0	0	2	0	0	2	2	26	0	0	0	54	0	13	209	216	62	17	6	168	0	0	58	71	612	708	144	0	9	112	161	425	105	199	50	46	46	9	28	4514

TRAFFIC STUDY FOR BEAWAR-PALI-PINDWARA SECTION OF NH-14 IN THE STATE OF RAJASTHAN

Travel Pattern (Traffic Streams) of Vehicles at all the Toll Plazas, FY17

S.No.	Traffic Stream	Crossing TP's	Car/ MLCV	Bus	LCV/ Mini	2-Axle Trucks	3-Axle Trucks	MAV
	OD01-Raipur							
1	Beawar and North - Sirohi, Pindwara and South	1234	490	53	148	190	431	3056
2	Beawar and North - Sanderao, Sumerpur (B/w TP3 & TP4)	123	145	12	3	13	8	60
3	Beawar and North - Pali (B/w TP2 & TP3)	12	716	107	50	54	90	244
4	Local Traffic	1	765	25	27	93	95	142
	Total		**2117**	**197**	**228**	**350**	**625**	**3503**
	OD02-Indranagar							
1	Beawar and North - Sirohi, Pindwara and South	1234	473	28	201	207	430	3253
2	Beawar and North - Sanderao, Sumerpur (B/w TP3 & TP4)	123	140	15	12	7	17	52
3	Sojat (B/w TP1 & TP2) - Sirohi, Pindwara and South	234	67	2	12	6	21	42
4	Beawar and North - Pali (B/w TP2 & TP3)	12	769	154	55	45	71	243
5	Sojat (B/w TP1 & TP2) - Sanderao, Sumerpur (B/w TP3 & TP4)	23	90	2	7	7	17	85
6	Local Traffic	2	1620	88	91	37	34	55
	Total		**3158**	**288**	**378**	**310**	**590**	**3730**
	OD03-Birami							
1	Beawar and North - Sirohi, Pindwara and South	1234	438	32	163	247	409	3102
2	Beawar and North - Sanderao, Sumerpur (B/w TP3 & TP4)	123	132	4	12	11	16	53
3	Sojat (B/w TP1 & TP2) - Sirohi, Pindwara and South	234	53	6	8	13	26	62
4	Sojat (B/w TP1 & TP2) - Sanderao, Sumerpur (B/w TP3 & TP4)	23	81	26	12	5	19	59
5	Pali (B/w TP2 & TP3), Jodhpur/Bikaner/Nagaur - Sanderao, Sumerpur (B/w TP3 & TP4)	34	1288	209	151	205	306	936
6	Local Traffic	3	1029	101	52	50	295	315
	Total		**3021**	**378**	**398**	**531**	**1069**	**4528**
	OD04-Uthaman							
1	Beawar and North - Sirohi, Pindwara and South	1234	457	39	193	208	445	3229
2	Sojat (B/w TP1 & TP2) - Sirohi, Pindwara and South	234	71	10	13	14	24	57
3	Pali (B/w TP2 & TP3), Jodhpur/Bikaner/Nagaur - Sanderao, Sumerpur (B/w TP3 & TP4)	34	1309	228	121	189	295	943
4	Local Traffic	4	1761	41	76	85	308	284
	Total		**3599**	**318**	**403**	**497**	**1072**	**4514**

APPENDIX 2.5
TOLL PLAZA WISE COMMODITY DISTRIBUTION

TRAFFIC STUDY FOR BEAWAR-PALI-PINDWARA SECTION OF NH-14 IN THE STATE OF RAJASTHAN

Toll Plaza wise Commodity Distribution of Tollable Traffic

	TP01					
	Commodity Type	Mini LCV	LCV	2A	3A	MAV
1	Food Grains and Cash Crops	2.9	4.0	6.1	8.7	8.7
2	Fruits & Vegetables	24.3	15.0	14.9	10.3	4.8
3	Building Materials and Cement	3.7	12.0	13.3	13.0	14.6
4	Iron & Steel Products	0.7	1.0	1.7	2.4	1.7
5	Petroleum Products, Chemicals and Gas	4.4	6.0	7.2	10.6	9.4
6	Automobile and Heavy Machinery	4.4	8.0	3.3	2.2	4.6
7	Industrial Products & Equipment	8.8	17.0	6.1	10.1	25.7
8	Plastic & Plastic Pipes	0.0	0.0	0.6	2.4	0.8
9	Miscellaneous Items	26.5	16.0	22.7	20.9	17.2
10	Empty Vehicles	24.3	21.0	24.3	19.3	12.5
	Total	**100**	**100**	**100**	**100**	**100**

	TP02					
	Commodity Type	Mini LCV	LCV	2A	3A	MAV
1	Food Grains and Cash Crops	4.5	5.2	7.5	9.1	6.3
2	Fruits & Vegetables	7.7	15.1	6.3	6.4	3.6
3	Building Materials and Cement	4.5	3.8	9.4	10.2	16.7
4	Iron & Steel Products	1.3	1.9	1.9	3.8	3.0
5	Petroleum Products, Chemicals and Gas	2.6	8.5	6.9	12.2	8.7
6	Automobile and Heavy Machinery	1.3	5.2	1.9	2.4	2.1
7	Industrial Products & Equipment	6.4	12.3	13.2	20.6	34.3
8	Plastic & Plastic Pipes	1.9	3.3	1.9	2.7	0.4
9	Miscellaneous Items	33.3	28.8	39.0	24.8	18.8
10	Empty Vehicles	36.5	16.0	11.9	7.8	6.2
	Total	**100**	**100**	**100**	**100**	**100**

	TP03					
	Commodity Type	Mini LCV	LCV	2A	3A	MAV
1	Food Grains and Cash Crops	3.8	5.8	6.8	12.2	12.0
2	Fruits & Vegetables	14.2	23.7	9.5	9.7	7.2
3	Building Materials and Cement	4.7	6.7	5.9	8.1	14.0
4	Iron & Steel Products	5.7	2.2	3.2	2.7	3.5
5	Petroleum Products, Chemicals and Gas	3.8	4.5	5.9	13.8	8.8
6	Automobile and Heavy Machinery	0.0	4.0	5.0	1.3	2.2
7	Industrial Products & Equipment	6.6	14.7	18.5	18.7	25.5
8	Plastic & Plastic Pipes	0.9	1.8	1.4	2.7	1.2
9	Miscellaneous Items	34.9	25.9	31.1	19.6	15.6
10	Empty Vehicles	25.5	10.7	13.1	11.3	10.0
	Total	**100**	**100**	**100**	**100**	**100**

	TP04					
	Commodity Type	Mini LCV	LCV	2A	3A	MAV
1	Food Grains and Cash Crops	6.4	11.6	7.6	12.3	7.8
2	Fruits & Vegetables	11.0	5.3	9.8	7.6	4.6
3	Building Materials and Cement	2.9	6.3	6.0	7.8	13.7
4	Iron & Steel Products	2.9	1.0	1.6	2.5	1.8
5	Petroleum Products, Chemicals and Gas	5.8	6.8	7.1	7.4	7.3
6	Automobile and Heavy Machinery	0.6	2.4	2.7	1.5	1.0
7	Industrial Products & Equipment	5.8	18.8	20.7	19.7	29.0
8	Plastic & Plastic Pipes	0.6	1.4	2.7	1.3	1.5
9	Miscellaneous Items	29.7	27.1	22.8	25.8	22.2
10	Empty Vehicles	34.3	19.3	19.0	14.0	11.1
	Total	**100**	**100**	**100**	**100**	**100**