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## 7 TRAFFIC SURVEYS AND ANALYSIS

### 7.1 GENERAL

To achieve the desired objectives, the Consultant thoroughly studied the road network during the reconnaissance stage. Keeping in view of the requirements of the TOR, the consultants undertook surveys to assess typical traffic, travel, socio-economic and transport characteristics within the influence area of each survey location. The following traffic surveys were conducted:

- Classified traffic volume count surveys were conducted at Four (4) locations for 7-days using ATCC. (Video graphic Method)
- Origin-destination surveys for passengers and commodity movements at Four (4) locations for one-day (24hrs)
- Axle Load Survey at Four (4) locations for one day (24 hours).
- Turning Movement Count at Twelve (12) Major Junction Locations for one day (24 hours)

Locations for carrying out these surveys were selected after considering the following factors: The locations should cover all the roads from where the traffic is likely to divert to the proposed project corridor.

- The survey location should be outside urban influence.
- The survey location is in a reasonably level terrain with good visibility.
- The location is in a straight section of road and shall facilitate in reducing the speed of vehicles for easy enumeration of data.

Homogeneous sections were identified for carrying out traffic surveys and all locations of traffic surveys are finalized in consultation with the authority. The map of the same is presented in Figure.7-1. The survey schedule is given in Table 7-1

The following key activities were performed before commencement of actual surveys:

- Reconnaissance and an extensive study of existing traffic characteristic were made before finalizing the survey locations.
- Survey formats were prepared keeping in view of guidelines specified in IRC: SP:19-2001
- Necessary permissions were obtained from police personnel of respective districts before commencing the surveys.
- Automatic Traffic Counter and Classifier (ATCC) system was deployed at site to record the mode wise traffic data.
- Trained enumerators were deployed to capture the OD survey data accurately.
- All necessary precautions were exercised during surveys for the safety of enumerators. Enumerators were provided with traffic cones, reflective jackets, electronic gadgets, and accurate measuring equipment(s).

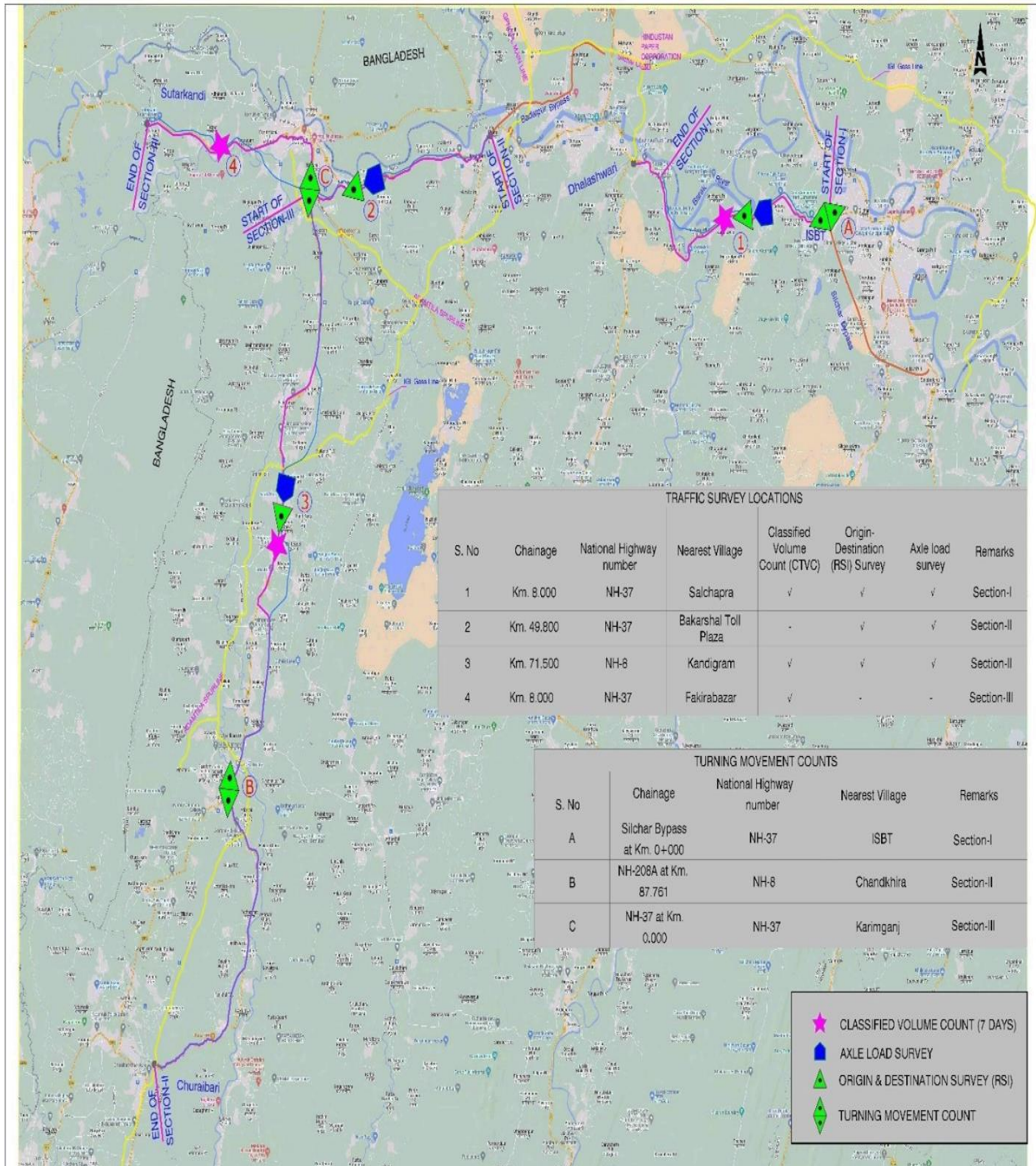



Figure 7-1: Figure Showing Proposed Traffic Survey Locations



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|--|--|---|
|  | <b>Consultancy services for preparation of DPR and Pre-Construction services from (i) Silchar ISBT (Start point of Silchar Bypass) to junction of NH-37 &amp; NH-6 at Dhaleshwari, (ii) End of proposed Badarpur bypass to Churaibari (Assam-Tripura border), (iii) Spur from NH-8 near Karimganj to Sutherkandi (Package-VII)</b> | <b>DRAFT<br/>FEASIBILITY<br/>REPORT</b> |
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## 7.2 OBJECTIVE

The primary objectives of these traffic studies are to:

- Determine characteristics of traffic movement and to establish base year traffic demand.
- Identify zones of influence for the project stretch and extent of influence based on O-D Survey.
- Determine travel pattern as well as type and weight of commodities carried by goods vehicles.
- Capacity assessment and recommendation for number of lanes based on demand forecast and evolving suitable design.
- Geometric design of intersections
- Determination of Vehicle Damage Factor as an aid to pavement design
- Cost benefit and financial analysis
- Enable preliminary design of the project facilities.

## 7.3 SCOPE OF THE STUDY


The scope of traffic study includes the analysis of the primary data collected from traffic surveys and collection of secondary sources including petrol sales data, to determine the seasonal variation and truck parking surveys. Vehicle Damage Factor is assessed from the Axle Load Survey to design of pavement layers. To determine the capacity and level of service of the project corridor, the following parameters are assessed:

- Average Daily Traffic, Annual Average Daily Traffic, Peak Hour Factor and Seasonal Correction Factor of the Base Year
- Traffic Growth Rates
- Travel pattern, major origin, and destinations, and influencing zones.
- Axle load survey

## 7.4 NEED FOR TRAFFIC STUDY

A comprehensive traffic and transportation study for a project corridor involves traffic surveys as an integral component. Appreciation of existing traffic and travel characteristics is extremely important for the development of an effective traffic and transportation plan for the proposed expressway. An accurate estimate of the traffic that is likely to use the project road is very important as it forms the basic input in planning, design, operation, and financing. It provides the basis for determining and justifying the number of traffic lanes to be provided for different road sections having regards to volume, composition and other parameters of traffic.

For existing road networks along the project corridor, traffic analysis provides a means of assessing the traffic conditions. Traffic analysis thus helps further in the evaluation of the investment needed for the future expressway improvements. A thorough knowledge of the travel characteristics of the traffic likely to use the project stretch as well as other major roads

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in the influence area of the study corridor is essential for future traffic estimation. The estimation of revenue through toll collection plays a pivotal role in assessing the financial viability of the project and finalizing the financial covenants for the concession agreement. Thus, accurate assessment of the existing traffic and forecasting attains utmost importance.

## 7.5 OBJECTIVE

The objectives of the current traffic study are listed as under:

- Establish the base year traffic characteristics of existing road networks in and around the project influence area.
- Identify zones of influence for the project stretch and extent of influence based on O-D Survey.
- Determine travel pattern as well as type and weight of commodities carried by goods vehicles.
- Estimate potential traffic diversion from existing road network to project stretch.
- Project the traffic demand on the proposed expressway for a horizon period of 30 years.
- Forecast traffic levels for developing tolling strategies.
- Determine load distribution along proposed expressway and arrive at Vehicle Damage Factors (VDF) to aid in pavement design.
- Benefit-Cost Analysis (BCA) of proposed expressway along with Sensitivity Analysis.


## 7.6 OUTCOME

The following outcome will be derived from the current report:

- Base year traffic demand of existing road network along the project stretch.
- Traffic forecast along the project stretch considering the generated as well as developmental traffic for a horizon period of 30 years.
- Projected traffic on section-wise breakup of project stretch to provide inputs for tolling strategy.
- Vehicle Damage Factor(s) to provide input for pavement design.
- Justification on provision of 4 lane/ 6 lane carriageway

## 7.7 METHODOLOGY

Traffic Surveys were carried out strictly as per TOR and within the time frame given for submission. In general, the Specifications and Standards primarily based on the Guidelines for Expressway by Ministry of Road Transport and Highways (MORT&H) have been followed. Specific Codes and Guidelines of the IRC and publications of the MORT&H including circulars & general/special publications, technical Specifications & Standards have been kept in view.

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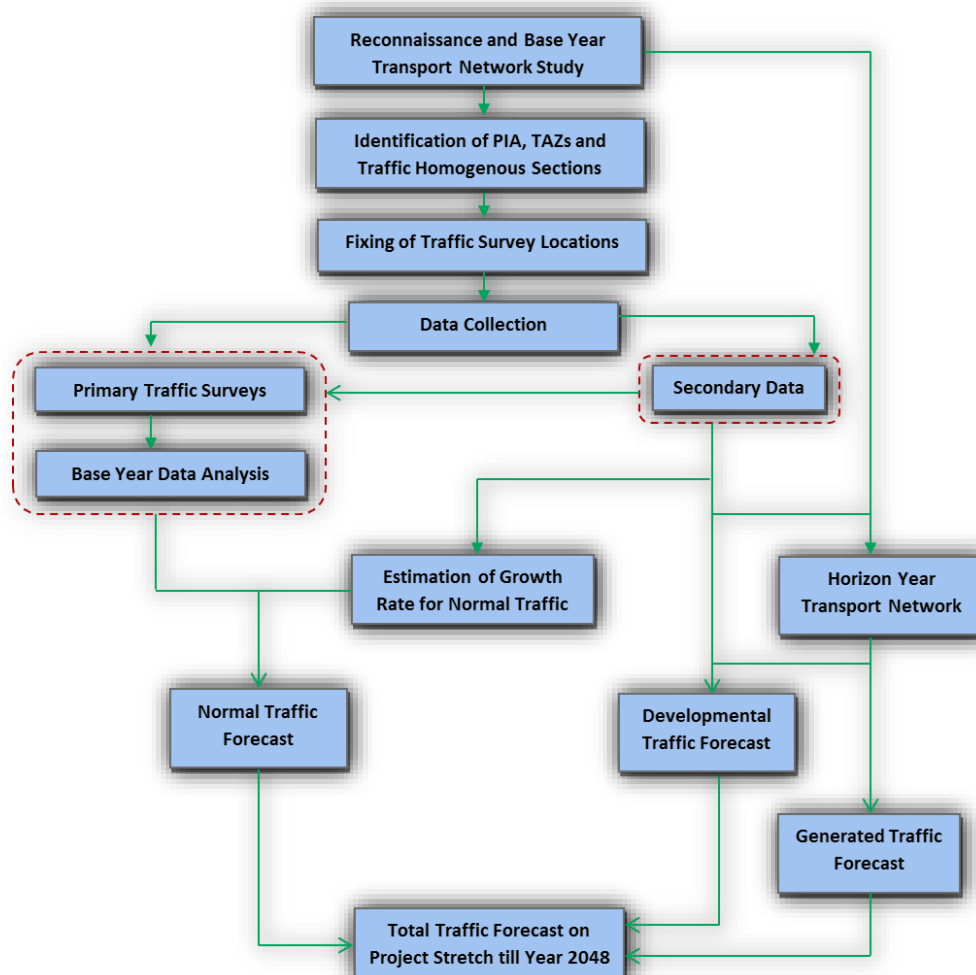
### 7.7.1 Socio-economic profile

Socio-economic profile of the influence area is prepared, after study of data on growth of population and density, human settlement pattern, land use, sub-profiles of agriculture and industries, economic base, trends in socio-economic indicators, development scenarios for various sectors, transport infrastructure and its uses such as use of rail transport etc. The relevant data helpful is collected from the following sources:

- State Statistical Abstracts
- State Year Books
- Census Publications – Districts and State
- Handbooks of Statistics of Districts in the area of influence
- Economic Surveys of the State constituting the zone of influence
- Directorate of Economics & Statistics of Andhra Pradesh

### 7.8 FLOW CHART OF WORK PLAN

The work plan adopted for the current study is represented in the form of a flow chart as shown below.




## 7.9 TRAFFIC SURVEYS

To achieve the desired objectives, the Consultant thoroughly studied the road network during the reconnaissance stage. Keeping in view of the requirements of the TOR, the consultants undertook surveys to assess typical traffic, travel, socio-economic and transport characteristics within the influence area of each survey location. The following traffic surveys were conducted:

- The Automatic Classified Traffic Volume Count (ATCC) surveys were conducted at 3 strategic points in 7 days. The surveys were conducted using ATCC(Video graphic) methods.
- Origin-Destination & Commodity Movement Survey by Roadside Interview (RSI) method were conducted at three locations i.e., at Salchapra village on NH-37, at existing toll plaza near Bakarshal on NH-37 and at Nilambazar on NH-8 for 24 hrs.



|   |  |   |
|---|--|---|
|  | <b>Consultancy services for preparation of DPR and Pre-Construction services from (i) Silchar ISBT (Start point of Silchar Bypass) to junction of NH-37 &amp; NH-6 at Dhaleshwari, (ii) End of proposed Badarpur bypass to Churaibari (Assam-Tripura border), (iii) Spur from NH-8 near Karimganj to Sutherkandi (Package-VII)</b> | <b>DRAFT<br/>FEASIBILITY<br/>REPORT</b> |
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- Axle load Survey were conducted at three locations i.e., at Salchapra village on NH-37, at existing toll plaza near Bakarshal on NH-37 and at Nilambazar on NH-8 for 24 hrs.
- Locations for carrying out these surveys were selected in consultation with the Authority and based on the following factors:
- Each location being selected near the point from where the possibility of diversion of traffic on the proposed alignment of the expressway is expected.
- The survey location should be outside urban influence.
- The survey location is in a reasonably level terrain with good visibility.
- The location is in a straight section of road and shall facilitate in reducing the speed of vehicles for easy enumeration of data.

Mid-block sections were identified for carrying out traffic surveys and all locations of traffic surveys are finalized in consultation with the Authority. The map of the same is presented in Figure-7.1. The survey schedule is given in Table-7.1.


The following key activities were performed before commencement of actual surveys:

- Reconnaissance and an extensive study of existing traffic characteristics were made before finalizing the survey locations.
- Survey formats were prepared keeping in view of guidelines specified in *IRC:SP:19-2001*
- Necessary permissions were obtained from police personnel of respective districts before commencing the surveys.
- Automatic Traffic Counter and Classifier (ATCC) system was deployed at site to record the mode wise traffic data.
- Trained enumerators were deployed to capture the OD survey data accurately.
- All necessary precautions were exercised during surveys for the safety of enumerators. Enumerators were provided with traffic cones, reflective jackets, electronic gadgets, and accurate measuring equipment(s).

## 7.10 TRAFFIC SURVEYS PLANNING SCHEDULE

During the reconnaissance survey, the existing road network was studied. As per the details given in TOR traffic locations sections were identified for carrying out traffic surveys and all other locations of traffic surveys were finalized in consultation with the Authority. Traffic Surveys Planning Schedule is presented in Table below:

- a) Classified Traffic Volume Count, Axle Load, OD-RSI:

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*Table 7-1: Traffic Survey Schedule*

| S. No | Survey Location at | Classified Volume Count (CTVC) – 7 days (24 hours) | Origin-Destination (RSI) Survey-1 day (24 Hours) | Axle load survey-1 day (24 Hours) |
|-------|--------------------|--|--|-----------------------------------|
| 1     | Fakirabazar        | 12/09/2023 to 18/09/2023                           | -  | -                                 |





Site Photographs

Figure 7-2: Photographs During Traffic Survey

### 7.11 AVERAGE DAILY TRAFFIC (ADT)

The various vehicle types having different sizes and characteristics were converted into a standard unit called passenger car unit. Passenger Car equivalents for various vehicles are adopted based on recommendations of Indian Road Congress prescribed in “Guidelines for Capacity of Roads in Rural areas”, IRC:64-1990. The passenger car unit values (PCU) which were adopted are presented in Table below. The information derived from the surveys was utilized to obtain traffic intensity, traffic composition, hourly variation and daily variations and peak hour characteristics.

Table 7-2: Passenger Car Unit Factors for various Vehicle Types

| S. No | Vehicle Type          | PCU factors | S.No. | Vehicle Type         |                | PCU factors |
|-------|-----------------------|-------------|-------|----------------------|----------------|-------------|
| 1     | Two Wheelers          | 0.5         | 12    | Two Axle             |                | 3.0         |
| 2     | Three Wheelers        | 1.0         | 13    | Three Axle           |                | 3.0         |
| 3     | Car / Jeep / Van      | 1.0         | 14    | Multi Axle           |                | 4.5         |
| 4     | Car (Yellow Board)    | 1.0         | 15    | Heavy Earth Moving   |                | 4.5         |
| 5     | Tata Magic            | 1.0         | 16    | LCV/ LGV             |                | 1.5         |
| 6     | RTC Bus               | 3.0         | 17    | Mini LCV             |                | 1.0         |
| 7     | Private Bus           | 3.0         | 18    | Tractor              |                | 1.5         |
| 8     | School Bus            | 3.0         | 19    | Tractor with trailer |                | 4.5         |
| 9     | College Bus           | 3.0         | 20    | Non-Motorised        | Cycle          | 0.5         |
| 10    | Minibus               | 1.5         | 21    |                      | Cycle Rickshaw | 2.0         |
| 11    | Three-Wheeler (Goods) | 1.0         | 22    |                      | Animal Drawn   | 8.0         |


Source: IRC:64-1990



The Average Daily Traffic (ADT) is obtained from the Classified Traffic Volume Counts to determine the characteristics of traffic movement and to establish base year traffic demand. The data collected from primary and secondary sources were recorded in worksheets, compiled, checked, and corrected before further proceeding for analysis. Traffic data analysis was carried out, to understand the traffic characteristics and travel pattern in the study area and to provide basic input for pavement design. ADT has been worked out in terms of vehicles per day (VPD) and Passenger Car Units (PCU) by averaging 7 days volume counts. Table below gives the average daily traffic at 3 survey locations based on average of 7 days traffic volume count.

*Table 7-3: Average Daily Traffic at Classified Traffic Count Locations*

| Survey Location No.       | 1                |
|---------------------------|------------------|
| Name of Location          | Near Fakirabazar |
| Two-Wheeler               | 1852             |
| Three-Wheeler (Passenger) | 2632             |
| Car                       | 618              |
| Car (Y)                   | 2                |
| Tata Magic                | 1                |
| RTC Bus                   | 0                |
| Private Bus               | 0                |
| Minibus                   | 0                |
| School/ College Bus       | 0                |
| 2 Axle                    | 27               |
| 3 Axle                    | 65               |
| Multi Axle                | 5                |
| HEM                       | 3                |
| LCV                       | 28               |
| Mini LCV                  | 148              |
| Tractor                   | 0                |
| Tractor with Trailer      | 2                |


|   |  |   |
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| Survey Location No.   |                  | 1                |
|-----------------------|------------------|------------------|
| Name of Location      |                  | Near Fakirabazar |
| Three-Wheeler (Goods) |                  | 19               |
| Bicycle               |                  | 611              |
| Cycle Rickshaw        |                  | 37               |
| Animal Drawn          |                  | 1                |
| Government Exempted   |                  | 0                |
|                       |                  | 2                |
|                       |                  | 4                |
| Others                |                  | 0                |
| Vehicles              | Motorized        | 5408             |
|                       | Non-Motorized    | 649              |
|                       | Total Traffic    | 6057             |
|                       | Tollable Traffic | 770              |
| PCUs                  | Motorized        | 4727             |
|                       | Non-Motorized    | 388              |
|                       | Total Traffic    | 5115             |
|                       | Tollable Traffic | 1124             |

## 7.12 SEASONAL VARIATION FACTOR

Monthly sales data from the fuel stations located on the project corridor were collected to estimate the Seasonal Variation Factor (SVF) or Seasonal Correction Factor (SCF). Data collected from fuel stations are found to be with fluctuated and hence adopted average Seasonal Variation Factor are presented in Table below. The SVF was applied to the vehicular traffic volume of ADT to obtain the Annual Average Daily Traffic (AADT) and it was later converted to PCU's. The factor is calculated based on the month of survey conducted, i.e., September 2023, was applied to the ADT to determine the AADT.



|   |  |   |
|---|--|---|
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*Table 7-4: Seasonal Variation Factor*

| Survey Location No   | 1                |
|----------------------|------------------|
| Name of the Location | Near Fakirabazar |
| Petrol driven        | 1.05             |
| Diesel driven        | 1.05             |

### 7.13 ANNUAL AVERAGE DAILY TRAFFIC (AADT)

The Annual Average Daily Traffic (AADT) at each of the survey location was obtained by multiplying the Average Daily Traffic (ADT) with the Seasonal Correction Factor. The AADT for the year 2023 at survey locations are calculated and tabulated in the below Table below. The AADT values represented in the following table are actual values obtained from the survey.


*Table 7-5: Section wise Annual Average Daily Traffic (AADT)*

| Survey Location No.       | 1                |
|---------------------------|------------------|
| Name of Location          | Near Fakirabazar |
| Two-Wheeler               | 1945             |
| Three-Wheeler (Passenger) | 2764             |
| Car                       | 649              |
| Car (Y)                   | 2                |
| Tata Magic                | 1                |
| RTC Bus                   | 0                |
| Private Bus               | 0                |
| Minibus                   | 0                |
| School/ College Bus       | 0                |
| 2 Axle                    | 28               |
| 3 Axle                    | 68               |
| Multi Axle                | 5                |
| HEM                       | 3                |

| Survey Location No.   |                  | 1                |
|-----------------------|------------------|------------------|
| Name of Location      |                  | Near Fakirabazar |
| LCV                   |                  | 29               |
| Mini LCV              |                  | 155              |
| Tractor               |                  | 0                |
| Tractor with Trailer  |                  | 2                |
| Three-Wheeler (Goods) |                  | 20               |
| Bicycle               |                  | 611              |
| Cycle Rickshaw        |                  | 37               |
| Animal Drawn          |                  | 1                |
| Government Exempted   |                  | 0                |
|                       |                  | 2                |
|                       |                  | 4                |
| Others                |                  | 0                |
| Vehicles              | Motorized        | 5678             |
|                       | Non-Motorized    | 649              |
|                       | Total Traffic    | 6327             |
|                       | Tollable Traffic | 942              |
| PCUs                  | Motorized        | 4959             |
|                       | Non-Motorized    | 388              |
|                       | Total Traffic    | 5347             |
|                       | Tollable Traffic | 1178             |

#### 7.14 PEAK HOUR PROPORTION (PHP)

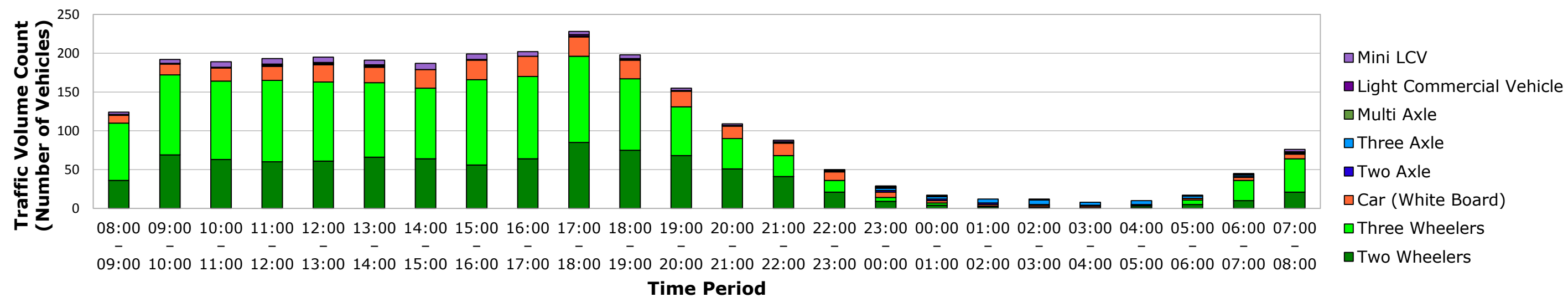
Peak Hour Proportion is defined as Traffic volume during Peak hour expressed as Percentage of AADT. Peak Hour Traffic is obtained as the highest Hourly traffic volume observed during a typical day (24 hours). Peak Hour proportions of all locations are presented in Table. It is observed that Peak Hour Proportion is in between 6.44 & 8.29.

|  |  |  |
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|--|--|--|

*Table 7-6: Peak Hour Composition*

| Survey Location | Peak Hour Volume | Total Volume | Peak Hour Composition (%) | Time          |
|-----------------|------------------|--------------|---------------------------|---------------|
| 1               | 438              | 5284         | 8.29                      | 11:00 – 12:00 |

### Mode-wise Hourly Variation of Traffic Volume



### Mode-wise Hourly Variation of Traffic Volume

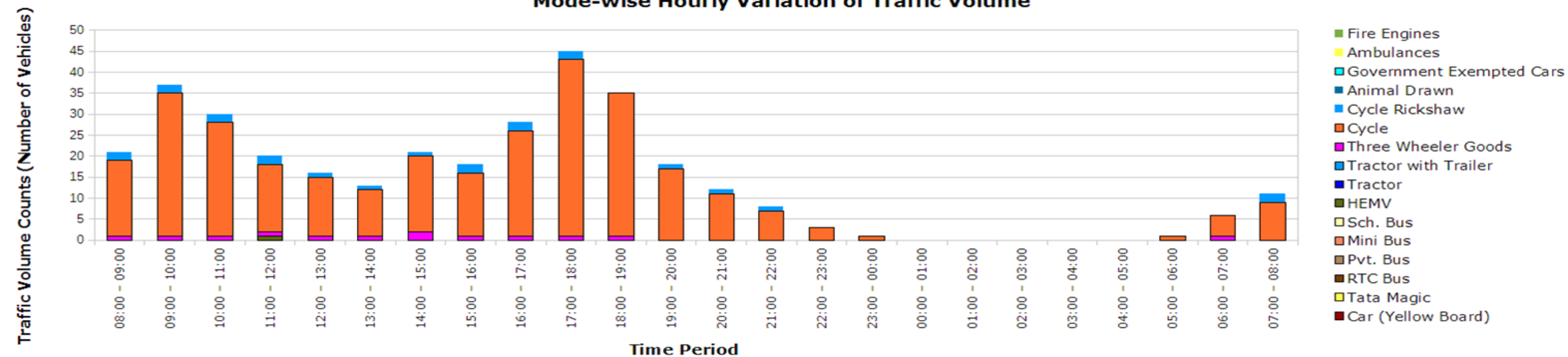


Figure 7-3: Mode-wise Hourly Variation of Traffic Volume at Fakirabazar

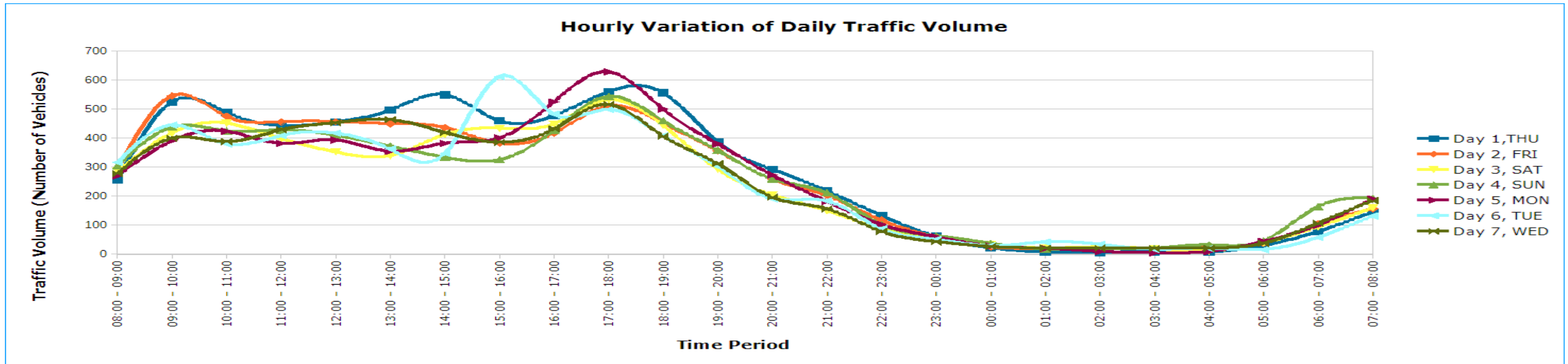



Figure 7-4: Hourly variation of Daily Traffic Volume at Fakirabazar



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|---|--|---|
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## 7.15 TRAFFIC FORECASTING

### 7.15.1 Methodology for forecasting

Investment priorities are governed by traffic demand, assessed benefits, and cost of the project. Demand plays the important role, which governs which type of facility/ infrastructure to be created. This in turn determines likely benefits and costs to develop the same. An expressway project of this magnitude calls for significant investment. Prediction of traffic demand becomes an important task and has to be carried out as accurately as possible. Accurate estimation of traffic has direct bearing on the viability of the project. Recognizing this, efforts need to be made to carefully assess all the parameters that help in predicting the traffic demand in future, which necessitates realistic estimation of traffic growth rates. Traffic growth on a road facility is generally estimated on the basis of historical trends. In the present case, traffic growth rates are estimated using elasticity method as per IRC:108-2015. Demand changes are usually because of shifts in the pattern of economic activities in the surrounding regions. Hence, future traffic estimation necessitates a preview, however imprecise, of the probable pattern of future growth of the economy. In the absence of historical traffic census data on the project road, the future traffic has been forecasted using transport demand elasticity approach by regression of registered vehicles of Andhra Pradesh with respect to socio-economic parameters *viz.*, population, PCI and NSDP as explained below.

The exercise of traffic growth rate estimation has been carried out by us using the elasticity approach. The elasticity method relates traffic growth to changes in the related economic parameters. According to IRC:108-2015, elasticity based econometric model for highway projects could be derived in the following form:


$$\text{Log}_e (P) = A_0 + A_1 \text{Log}_e (EI)$$

Where:

- P = Traffic volume (of any vehicle type)
- EI = Economic Indicator (GDP/NSDP/Population/PCI)
- $A_0$  = Regression constant;
- $A_1$  = Regression co-efficient (Elasticity Index)

The main steps followed are:

- Defining the Project Influence Area from OD analysis of travel pattern
- Estimating the past elasticity of traffic growth from time series of registered vehicles of influencing states
- Assessment of future elasticity values for major vehicle groups, namely, cars, buses and trucks
- Study of past performance and assessment of prospective growth rates of state economies of influence area

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- The growth rates are found using the formulae Eqn (a) & (b).
- For Passenger vehicles,
- $G = \sum [(R_i * E_i * I_i)] \dots \dots \dots \text{Eqn. (a)}$
- Where  $R_i$  = Growth in PCI and Population index of Andhra Pradesh
- $E_i$  = Elasticity Value
- For commercial vehicles,
- $G = \sum [(R_j * E_j * I_j)] \dots \dots \dots \text{Eqn. (b)}$
- Where,  $R_j$  = Growth in Economic index (NSDP) of Andhra Pradesh
- $E_j$  = Elasticity Value
- $I_j$  = Influence factor

### 7.15.2 Secondary data collection

A study of the socio-economic profiles of the regions comprising the project influence area (PIA) provides an overview of the factors likely to influence the pattern of economic development, and hence the flows and volumes of traffic on the proposed highway. The details include population, per-capita Income, NSDP, GDP and targeted growth rates of the economy. The profiles help to generate basic inputs for the estimation of future growth in transport demand based on past scenarios, prospective changes in transport demand elasticity and economic growth rates.


#### (a) Growth of Registered Vehicles

To analyze the vehicle growth in the state, the vehicle registration data of Assam has been collected from the state handbook of statistics. The Compounded Average Growth Rate (%) of different vehicle types is shown in the table below.

*Table 7-7: Growth of Registered Vehicles in Assam*

| S. No | Year | 2 Wheelers | Car    | Car (Y) | Goods  | Tractor | Tractor with trailer | Mini Bus | Buses | LCV    |
|-------|------|------------|--------|---------|--------|---------|----------------------|----------|-------|--------|
| 1     | 2015 | 1431933    | 524793 | 42024   | 125215 | 31180   | 18288                | 4324     | 13202 | 71233  |
| 2     | 2016 | 1634157    | 557364 | 47759   | 128684 | 38787   | 19595                | 4502     | 13674 | 78496  |
| 3     | 2017 | 1852067    | 579082 | 53490   | 136807 | 41310   | 19667                | 4622     | 14633 | 83908  |
| 4     | 2018 | 2106900    | 646534 | 59909   | 141718 | 45796   | 20289                | 4882     | 15511 | 100202 |
| 5     | 2019 | 2400197    | 688919 | 65096   | 144896 | 58112   | 21008                | 5523     | 16442 | 118255 |
| 6     | 2020 | 2710763    | 747980 | 70509   | 152141 | 65874   | 22007                | 5808     | 17429 | 137586 |
| 7     | 2021 | 2917380    | 792871 | 85522   | 159748 | 74438   | 25079                | 6156     | 18475 | 152894 |
| 8     | 2022 | 3173011    | 855731 | 93075   | 167735 | 84115   | 25885                | 6525     | 19584 | 170140 |

**Source: Statistical HandBook of Assam & further Rationalised the data**

|   |  |   |
|---|--|---|
|  | <b>Consultancy services for preparation of DPR and Pre-Construction services from (i) Silchar ISBT (Start point of Silchar Bypass) to junction of NH-37 &amp; NH-6 at Dhaleshwari, (ii) End of proposed Badarpur bypass to Churaibari (Assam-Tripura border), (iii) Spur from NH-8 near Karimganj to Sutherkandi (Package-VII)</b> | <b>DRAFT<br/>FEASIBILITY<br/>REPORT</b> |
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## (b) Economic Growth

The past performance of the economic indicators for Andhra Pradesh was also collected for the same period (2015-22), with the objective of establishing elasticity of travel demand to the different economic indicators. The economic indicators considered for the analysis include:

- Gross/ Net State Domestic Product
- Per Capita Income (PCI)
- Population

Table below gives the growth of Economic indicators for Assam.

*Table 7-8: Growth in Economic Indices of Assam State (2011-12 Prices)*

| S.No                              | Year | GSDP (Rs Cr.) | PCI (Rs.)    | Population (Cr.) | NSDP (Rs. Cr) |
|-----------------------------------|------|---------------|--------------|------------------|---------------|
| 1                                 | 2015 | 156895        | 48013        | 3.12             | 138387        |
| 2                                 | 2016 | 179595        | 54257        | 3.27             | 160724        |
| 3                                 | 2017 | 192400        | 56747        | 3.31             | 173050        |
| 4                                 | 2018 | 211940        | 62510        | 3.35             | 185667        |
| 5                                 | 2019 | 234772        | 68384        | 3.38             | 208035        |
| 6                                 | 2020 | 248796        | 72129        | 3.42             | 216243        |
| 7                                 | 2021 | 273837        | 77403        | 3.46             | 239373        |
| 8                                 | 2022 | 289192        | 80231        | 3.50             | 251688        |
| <b>Annual Average Growth Rate</b> |      | <b>9.93%</b>  | <b>9.38%</b> | <b>11.55%</b>    | <b>8.58%</b>  |


*Source: Statistical Hand Book of AP & further Rationalised the data*

## 7.15.3 Transport elasticity demand

### Description of Regression Analysis

The regression analysis tool performs linear regression analysis by using the "least squares" method to fit a line through a set of observations. We can analyze how a single dependent variable is affected by the values of one or more independent variables. In the present case, registered vehicles by type are dependent variables whereas the economic parameters are independent variables.

### R Square

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|---|--|---|
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R Square is another measure of the explanatory power of the model. In theory, R square compares the amount of error explained by the model as compared to the amount of error explained by averages. The higher the R-Square, the better it is.

Regression analysis has been carried out by creating econometric models as suggested in IRC: 108–2015, using past vehicle registration data, and economic indicators such as population and PCI for passenger vehicles and NSDP for freight vehicles. All India registered trucks are also regressed with GDP to estimate national level elasticity value for trucks and its growth rate. The elasticity values obtained for each class of vehicle are given in Table below.

The following steps have been adopted to derive the Elasticity and Growth factors:

- Growth rate of registered vehicles of zone of influence (Assam) is found out.
- Growth rates of NSDP/GSDP, GDP, Per Capita Income (at 2011-12 constant prices) and population are obtained.
- For Cars, number of registered vehicles has been regressed with Per Capita Income of Assam State
- For Buses, number of registered vehicles has been regressed with Population of Assam State
- For trucks, the number of registered trucks has been regressed with NSDP of the State for Intra-State movement and GDP for Inter-State movement.
- Mean value of Average growth rate of registered vehicles and the growth rate obtained by Regression Analysis for all categories were found out both at State level and at National level (For trucks only)
- For Cars and Buses, the mean growth rate of registered vehicular growth rate and growth rate from regression analysis is adopted.

### **Recommended Elasticity Values**

Vehicle registration data represents all vehicles registered in the state but does not indicate actual number of vehicles plying on the road owing to vehicles taken off the road due to lack of fitness certificate. Consequently, the elasticity values based on registration data are usually higher than those based on actual traffic.

Hence, there is a need to moderate values obtained from registration data. In order to arrive at realistic future elasticities for the project road; various factors relating to vehicle technology changes besides character of traffic and travel pattern on the project road have been considered:

High elasticity of cars being witnessed now is because of large demand facilitated by financing schemes and loans. Factors like growth of household incomes (particularly in urban areas), reduction in the prices of entry-level cars, growth of the used car market, changes in lifestyle, growing personal incomes, desire to own a vehicle facilitated by availability of

loans/financing schemes on easy terms, etc. have all contributed to the rapid growth in ownership of cars. However, such a trend would slow down and elasticity can be expected to decline. The elasticity obtained by using registered vehicles is an overestimate for the traffic moving on suburban and inter-city routes. In view of all this, combined with the travel pattern of vehicles moving on the road, elasticity value obtained by using registration data has been moderated for future years.

Over the years, there is a change in passenger movement with more and more persons shifting towards personalized modes. Moreover, buses usually plying on fixed pre-decided routes and thus elasticity values for buses have been considered accordingly. With the changing freight vehicle mix in favor of LCV for short distance traffic and 3-axle/MAV for long-distance traffic, higher elasticity values for these have been considered as compared to 2-axle trucks. Considering the ongoing technical advancements in automobile industry, some of the standard two axle trucks would gradually be replaced by three axle truck and MAVs, leading to reduction in number of trucks. This shift has already started taking place in different parts of the country.

Considering the economic indicators of Andhra Pradesh, the projected elasticity values for various vehicle types are presented in, which have been used to estimate the growth rates of each vehicle type. The transport demand elasticity by vehicle type over a period of time tends to decline and approach unity or even less.

As the economy and its various sectors grow, every region tends to become self-sufficient. Moreover, much of the past growth has been associated with the country's transition from a largely rural, subsistence economy to cash based urban economy, dominated by regional and national linkages.


As the transition proceeds, its impact on transport pattern can be expected to become less dominant. Therefore, the demand for different type of vehicles falls, over time, despite greater economic development. The same is also clear from the relationships of the economy and transport demand elasticity over time nationally and internationally.

*Table 7-9: Adopted Elasticity Values for Assam*

| Mode     | Variable | Elasticity | R-Square |
|----------|----------|------------|----------|
| Car/Jeep | PCI      | 1.02       | 0.99     |
| Bus      | POP      | 2.08       | 0.97     |
| Truck    | NSDP     | 2.00       | 0.99     |

The estimated traffic growth rates are arrived at by multiplying elasticity values and projected growth in economic factors.



|   |  |   |
|---|--|---|
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*Table 7-10: Projected Traffic Growth Rates for Assam*

| Projected Growth Rates of Assam |             |       |       |       |      |         |                      |
|---------------------------------|-------------|-------|-------|-------|------|---------|----------------------|
| S. No                           | Period      | 2W    | Car   | Truck | Bus  | Tractor | Tractor with trailer |
| 1                               | 2023 - 2027 | 13.5% | 14.5% | 8.50% | 6.5% | 12.0%   | 10.5%                |
| 2                               | 2028 – 2032 | 13.5% | 14.5% | 7.50% | 6.0% | 11.0%   | 9.5%                 |
| 3                               | 2033 – 2037 | 13.0% | 14.0% | 7.0%  | 5.5% | 10.5%   | 9.0%                 |
| 4                               | 2038 - 2042 | 12.5% | 13.0% | 6.5%  | 5.0% | 10.0%   | 8.5%                 |
| 5                               | Beyond 2043 | 12.0% | 12.0% | 6.0%  | 5.0% | 9.0%    | 8.0%                 |

#### 7.15.4 Recommended growth rates


Against this background, any agenda for future growth of the state economies has to take into account past trends, future prospects and the emerging challenges. The growth prospects for the state have been developed taking into consideration the past performance of the state economies and the economic growth envisaged for the future. The pace with which the regional economies grow with the envisaged growth of the state is a major contributing factor in growth of traffic. Final growth rates were obtained for horizon years by considering the projected economic trend of the State. Table below shows the growth rates, which are adopted in finding the future traffic demand estimates.

*Table 7-11: Traffic Growth Rates*

| Projected Growth Rates of Assam |             |      |      |       |      |         |                      |
|---------------------------------|-------------|------|------|-------|------|---------|----------------------|
| S. No                           | Period      | 2W   | Car  | Truck | Bus  | Tractor | Tractor with trailer |
| 1                               | 2023 - 2027 | 5.0% | 5.0% | 5.0%  | 5.0% | 5.0%    | 5.0%                 |
| 2                               | 2028 – 2032 | 5.0% | 5.0% | 5.0%  | 5.0% | 5.0%    | 5.0%                 |
| 3                               | 2033 – 2037 | 5.0% | 5.0% | 5.0%  | 5.0% | 5.0%    | 5.0%                 |
| 4                               | 2038 - 2042 | 5.0% | 5.0% | 5.0%  | 5.0% | 5.0%    | 5.0%                 |
| 5                               | Beyond 2043 | 5.0% | 5.0% | 5.0%  | 5.0% | 5.0%    | 5.0%                 |

#### 7.16 PROJECTED TRAFFIC ON PROJECT CORRIDOR

The project stretch has been divided into 3 homogeneous traffic sections. In view of the same, section-wise (*leg-wise*) traffic is considered for forecasting.

|   |  |   |
|---|--|---|
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## 7.17 CAPACITY STANDARDS

The leg wise projected Traffic volume/Design service volume has been compared against the respective capacities of 2/4/6 lanes as per IRC standards and with the 4/6lane manuals and the year during which the projected volume reaches its capacity and the year of requirement of lane upgradation has been given in Tables below.

Land port Authority of India, Sutarkandi has stated that due to some road/bridge repair works in Bangladesh, there are no commodity movement and hence truck movement has reduced in HS-3. They have shared details of approximate truck movement in the section when the repair works is completed.

*Table 7-12: Truck data shared by LPI*

| S. No | Vehicle Movement                | Approximate number |
|-------|---------------------------------|--------------------|
| 1     | Total vehicle movement in Day   | 350-400            |
| 2     | Total vehicle movement in Night | 300-350            |

So, an average of 375 vehicles during day and 325 vehicles during night time are considered on our section. A total of 700 vehicles are considered to ply on road everyday.

Section wise, year of lane upgradation has been analysed with calculated growth rates and 5% growth rates.

Table 7-13: Projected Traffic along HS-III on Project corridor at 5% growth rate

| Year | PASSENGER TRAFFIC |       |            |                 |            |         |             |          |        | GOODS TRAFFIC |        |            |            |          |          |         |                              |          | Non Motorised |                |              |      | TOLL EXEMPTED |        |       | Total Traffic volume in numbers | Total tollable traffic volume in numbers | Total Traffic In PCU's | Allowable Traffic in PCU's |
|------|-------------------|-------|------------|-----------------|------------|---------|-------------|----------|--------|---------------|--------|------------|------------|----------|----------|---------|------------------------------|----------|---------------|----------------|--------------|------|---------------|--------|-------|---------------------------------|--|------------------------|----------------------------|
|      | 2W                | 3W    | Car / Jeep | Car / Jeep (YB) | Tata Magic | RTC Bus | Private Bus | Mini Bus | School | 2 Axle        | 3 Axle | Multi Axle | Over sized | LGV/ LCV | Mini LCV | Tractor | Tractor with trailer/ Others | 3w Goods | Cycle         | Cycle Rickshaw | Animal Drawn | car  | MINI BUS      | TRUCKS |       |                                 |  |                        |                            |
|      | 0.50              | 1.00  | 1.00       | 1.00            | 1.00       | 3.00    | 3.00        | 1.50     | 3.00   | 3.00          | 3.00   | 4.50       | 4.50       | 1.50     | 1.00     | 1.50    | 4.50                         | 1.00     | 0.50          | 2.00           | 8.00         | 1.00 | 1.50          | 3.00   |       |                                 |  |                        |                            |
| 2023 | 1945              | 2764  | 649        | 2               | 1          | 0       | 0           | 0        | 0      | 28            | 68     | 5          | 3          | 29       | 155      | 0       | 2                            | 20       | 611           | 37             | 1            | 0    | 2             | 4      | 6327  | 942                             | 5348                                     | 1179                   |                            |
| 2024 | 2042              | 2902  | 681        | 2               | 1          | 0       | 0           | 0        | 0      | 30            | 72     | 6          | 3          | 31       | 163      | 0       | 2                            | 21       | 642           | 39             | 1            | 0    | 2             | 4      | 6644  | 989                             | 5599                                     | 1238                   |                            |
| 2025 | 2144              | 3047  | 715        | 2               | 1          | 0       | 0           | 0        | 0      | 31            | 75     | 6          | 3          | 32       | 171      | 0       | 2                            | 22       | 674           | 41             | 1            | 0    | 2             | 5      | 6976  | 1038                            | 5878                                     | 1300                   |                            |
| 2026 | 2251              | 3199  | 751        | 2               | 1          | 0       | 0           | 0        | 0      | 33            | 79     | 6          | 4          | 34       | 180      | 0       | 2                            | 23       | 707           | 43             | 1            | 0    | 2             | 5      | 7325  | 1090                            | 6172                                     | 1365                   |                            |
| 2027 | 2364              | 3359  | 789        | 3               | 1          | 0       | 0           | 0        | 0      | 34            | 83     | 6          | 4          | 36       | 189      | 0       | 3                            | 24       | 743           | 45             | 1            | 0    | 3             | 5      | 7691  | 1145                            | 6481                                     | 1433                   |                            |
| 2028 | 2482              | 3527  | 828        | 3               | 1          | 0       | 0           | 0        | 0      | 36            | 87     | 7          | 4          | 38       | 198      | 0       | 3                            | 25       | 780           | 47             | 1            | 0    | 3             | 5      | 8076  | 1202                            | 6805                                     | 1505                   |                            |
| 2029 | 2606              | 3703  | 870        | 3               | 1          | 0       | 0           | 0        | 0      | 38            | 91     | 7          | 4          | 39       | 208      | 0       | 3                            | 27       | 819           | 50             | 1            | 0    | 3             | 6      | 8479  | 1262                            | 7145                                     | 1580                   |                            |
| 2030 | 2736              | 3889  | 913        | 3               | 1          | 0       | 0           | 0        | 0      | 40            | 96     | 7          | 4          | 41       | 219      | 0       | 3                            | 28       | 860           | 52             | 1            | 0    | 3             | 6      | 8903  | 1325                            | 7503                                     | 1659                   |                            |
| 2031 | 2873              | 4083  | 959        | 3               | 2          | 0       | 0           | 0        | 0      | 42            | 101    | 8          | 5          | 43       | 230      | 0       | 3                            | 29       | 903           | 55             | 1            | 0    | 3             | 6      | 9348  | 1392                            | 7878                                     | 1742                   |                            |
| 2032 | 3017              | 4287  | 1007       | 3               | 2          | 0       | 0           | 0        | 0      | 44            | 106    | 8          | 5          | 46       | 241      | 0       | 3                            | 31       | 948           | 57             | 2            | 0    | 3             | 7      | 9816  | 1461                            | 8272                                     | 1829                   |                            |
| 2033 | 3168              | 4502  | 1057       | 3               | 2          | 0       | 0           | 0        | 0      | 46            | 111    | 9          | 5          | 48       | 253      | 0       | 3                            | 32       | 995           | 60             | 2            | 0    | 3             | 7      | 10307 | 1534                            | 8685                                     | 1921                   |                            |
| 2034 | 3326              | 4727  | 1110       | 4               | 2          | 0       | 0           | 0        | 0      | 48            | 117    | 9          | 5          | 50       | 266      | 0       | 4                            | 34       | 1045          | 63             | 2            | 0    | 4             | 7      | 10822 | 1611                            | 9119                                     | 2017                   |                            |
| 2035 | 3492              | 4963  | 1165       | 4               | 2          | 0       | 0           | 0        | 0      | 51            | 123    | 9          | 6          | 53       | 279      | 0       | 4                            | 36       | 1097          | 66             | 2            | 0    | 4             | 8      | 11363 | 1691                            | 9575                                     | 2118                   |                            |
| 2036 | 3667              | 5211  | 1224       | 4               | 2          | 0       | 0           | 0        | 0      | 53            | 129    | 10         | 6          | 55       | 293      | 0       | 4                            | 38       | 1152          | 70             | 2            | 0    | 4             | 8      | 11931 | 1776                            | 10054                                    | 2223                   |                            |
| 2037 | 3850              | 5472  | 1285       | 4               | 2          | 0       | 0           | 0        | 0      | 56            | 135    | 10         | 6          | 58       | 308      | 0       | 4                            | 39       | 1210          | 73             | 2            | 0    | 4             | 8      | 12528 | 1865                            | 10557                                    | 2335                   |                            |
| 2038 | 4043              | 5745  | 1349       | 4               | 2          | 0       | 0           | 0        | 0      | 59            | 142    | 11         | 7          | 61       | 323      | 0       | 4                            | 41       | 1270          | 77             | 2            | 0    | 4             | 9      | 13154 | 1958                            | 11085                                    | 2451                   |                            |
| 2039 | 4245              | 6033  | 1416       | 5               | 2          | 0       | 0           | 0        | 0      | 62            | 149    | 11         | 7          | 64       | 339      | 0       | 5                            | 44       | 1334          | 81             | 2            | 0    | 5             | 9      | 13812 | 2056                            | 11639                                    | 2574                   |                            |
| 2040 | 4457              | 6334  | 1487       | 5               | 2          | 0       | 0           | 0        | 0      | 65            | 156    | 12         | 7          | 67       | 356      | 0       | 5                            | 46       | 1400          | 85             | 2            | 0    | 5             | 10     | 14503 | 2159                            | 12221                                    | 2703                   |                            |
| 2041 | 4680              | 6651  | 1562       | 5               | 3          | 0       | 0           | 0        | 0      | 68            | 164    | 13         | 8          | 71       | 374      | 0       | 5                            | 48       | 1470          | 89             | 2            | 0    | 5             | 10     | 15228 | 2267                            | 12832                                    | 2838                   |                            |
| 2042 | 4914              | 6983  | 1640       | 5               | 3          | 0       | 0           | 0        | 0      | 72            | 172    | 13         | 8          | 74       | 393      | 0       | 5                            | 50       | 1544          | 93             | 3            | 0    | 5             | 11     | 15989 | 2380                            | 13474                                    | 2980                   |                            |
| 2043 | 5160              | 7333  | 1722       | 6               | 3          | 0       | 0           | 0        | 0      | 75            | 181    | 14         | 8          | 78       | 412      | 0       | 6                            | 53       | 1621          | 98             | 3            | 0    | 6             | 11     | 16788 | 2499                            | 14147                                    | 3129                   |                            |
| 2044 | 5418              | 7699  | 1808       | 6               | 3          | 0       | 0           | 0        | 0      | 79            | 190    | 15         | 9          | 82       | 433      | 0       | 6                            | 56       | 1702          | 103            | 3            | 0    | 6             | 12     | 17628 | 2624                            | 14855                                    | 3285                   |                            |
| 2045 | 5688              | 8084  | 1898       | 6               | 3          | 0       | 0           | 0        | 0      | 83            | 200    | 15         | 9          | 86       | 455      | 0       | 6                            | 58       | 1787          | 108            | 3            | 0    | 6             | 12     | 18509 | 2755                            | 15597                                    | 3449                   |                            |
| 2046 | 5973              | 8488  | 1993       | 6               | 3          | 0       | 0           | 0        | 0      | 87            | 210    | 16         | 10         | 90       | 477      | 0       | 6                            | 61       | 1877          | 114            | 3            | 0    | 6             | 13     | 19435 | 2893                            | 16377                                    | 3622                   |                            |
| 2047 | 6272              | 8913  | 2093       | 7               | 3          | 0       | 0           | 0        | 0      | 91            | 220    | 17         | 10         | 95       | 501      | 0       | 7                            | 64       | 1971          | 119            | 3            | 0    | 7             | 14     | 20406 | 3038                            | 17196                                    | 3803                   |                            |
| 2048 | 6585              | 9359  | 2197       | 7               | 4          | 0       | 0           | 0        | 0      | 96            | 231    | 18         | 11         | 100      | 526      | 0       | 7                            | 68       | 2069          | 125            | 3            | 0    | 7             | 14     | 21427 | 3189                            | 18056                                    | 3993                   |                            |
| 2049 | 6914              | 9826  | 2307       | 7               | 4          | 0       | 0           | 0        | 0      | 101           | 243    | 19         | 11         | 105      | 553      | 0       | 7                            | 71       | 2173          | 132            | 4            | 0    | 7             | 15     | 22498 | 3349                            | 18959                                    | 4193                   |                            |
| 2050 | 7260              | 10318 | 2423       | 8               | 4          | 0       | 0           | 0        | 0      | 106           | 255    | 20         | 12         | 110      | 580      | 0       | 8                            | 74       | 2281          | 138            | 4            | 0    | 8             | 16     | 23623 | 3516                            | 19907                                    | 4402                   |                            |
| 2051 | 7623              | 10834 | 2544       | 8               | 4          | 0       | 0           | 0        | 0      | 111           | 268    | 21         | 12         | 115      | 609      | 0       | 8                            | 78       | 2395          | 145            | 4            | 0    | 8             | 16     | 24804 | 3692                            | 20902                                    | 4622                   |                            |
| 2052 | 8004              | 11375 | 2671       | 9               | 4          | 0       | 0           | 0        | 0      | 117           | 281    | 22         | 13         | 121      | 640      | 0       | 9                            | 82       | 2515          | 152            | 4            | 0    | 9             | 17     | 26044 | 3877                            | 21947                                    | 4854                   |                            |

Table 7-14: Projected Traffic along HS-III (including LPI data) on Project corridor at 5% growth rate

| Year | PASSENGER TRAFFIC |       |            |                 |            |         |             |          |        | GOODS TRAFFIC |        |            |            |          |          |         |                              | 3w Goods | Non Motorised |                |              | TOLL EXEMPTED |          |        | Total Traffic volume in numbers | Total tollable traffic volume in numbers | Total Traffic In PCU's | Allowable Traffic in PCU's |
|------|-------------------|-------|------------|-----------------|------------|---------|-------------|----------|--------|---------------|--------|------------|------------|----------|----------|---------|------------------------------|----------|---------------|----------------|--------------|---------------|----------|--------|---------------------------------|--|------------------------|----------------------------|
|      | 2W                | 3W    | Car / Jeep | Car / Jeep (YB) | Tata Magic | RTC Bus | Private Bus | Mini Bus | School | 2 Axle        | 3 Axle | Multi Axle | Over sized | LGV/ LCV | Mini LCV | Tractor | Tractor with trailer/ Others |          | Cycle         | Cycle Rickshaw | Animal Drawn | car           | MINI BUS | TRUCKS |                                 |  |                        |                            |
| 2023 | 1945              | 2764  | 649        | 2               | 1          | 0       | 0           | 0        | 0      | 28            | 68     | 5          | 3          | 29       | 155      | 0       | 2                            | 20       | 611           | 37             | 1            | 0             | 2        | 4      | 6327                            | 942                                      | 5348                   | 1179                       |
| 2024 | 2042              | 2902  | 681        | 2               | 1          | 0       | 0           | 0        | 0      | 30            | 72     | 6          | 3          | 31       | 163      | 0       | 2                            | 21       | 642           | 39             | 1            | 0             | 2        | 4      | 6644                            | 989                                      | 5599                   | 1238                       |
| 2025 | 2144              | 3047  | 715        | 2               | 1          | 0       | 0           | 0        | 0      | 31            | 75     | 6          | 3          | 32       | 171      | 0       | 2                            | 22       | 674           | 41             | 1            | 0             | 2        | 5      | 6976                            | 1038                                     | 5878                   | 1300                       |
| 2026 | 2251              | 3199  | 751        | 2               | 1          | 0       | 0           | 0        | 0      | 33            | 79     | 6          | 4          | 34       | 180      | 0       | 2                            | 23       | 707           | 43             | 1            | 0             | 2        | 5      | 7325                            | 1090                                     | 6172                   | 1365                       |
| 2027 | 2364              | 3359  | 789        | 3               | 1          | 0       | 0           | 0        | 0      | 34            | 83     | 6          | 4          | 36       | 189      | 0       | 3                            | 24       | 743           | 45             | 1            | 0             | 3        | 5      | 7691                            | 1145                                     | 6481                   | 1433                       |
| 2028 | 2482              | 3527  | 828        | 3               | 1          | 0       | 0           | 0        | 0      | 36            | 87     | 7          | 4          | 38       | 198      | 0       | 3                            | 25       | 780           | 47             | 1            | 0             | 3        | 5      | 8076                            | 1202                                     | 6805                   | 1505                       |
| 2029 | 2606              | 3703  | 870        | 3               | 1          | 0       | 0           | 0        | 0      | 38            | 91     | 7          | 4          | 39       | 208      | 0       | 3                            | 27       | 819           | 50             | 1            | 0             | 3        | 6      | 8479                            | 1262                                     | 7145                   | 1580                       |
| 2030 | 2736              | 3889  | 913        | 3               | 1          | 0       | 0           | 0        | 0      | 40            | 96     | 7          | 4          | 41       | 219      | 0       | 3                            | 28       | 860           | 52             | 1            | 0             | 3        | 6      | 8903                            | 1325                                     | 7503                   | 1659                       |
| 2031 | 2873              | 4083  | 959        | 3               | 2          | 0       | 0           | 0        | 0      | 42            | 101    | 8          | 5          | 43       | 230      | 0       | 3                            | 29       | 903           | 55             | 1            | 0             | 3        | 6      | 9348                            | 1392                                     | 7878                   | 1742                       |
| 2032 | 3017              | 4287  | 1007       | 3               | 2          | 0       | 0           | 0        | 0      | 44            | 106    | 8          | 5          | 46       | 241      | 0       | 3                            | 31       | 948           | 57             | 2            | 0             | 3        | 7      | 9816                            | 1461                                     | 8272                   | 1829                       |
| 2033 | 3168              | 4502  | 1057       | 3               | 2          | 0       | 0           | 0        | 0      | 46            | 111    | 9          | 5          | 48       | 253      | 0       | 3                            | 32       | 995           | 60             | 2            | 0             | 3        | 7      | 10307                           | 1534                                     | 8685                   | 1921                       |
| 2034 | 3326              | 4727  | 1110       | 4               | 2          | 0       | 0           | 0        | 0      | 48            | 117    | 9          | 5          | 50       | 266      | 0       | 4                            | 34       | 1045          | 63             | 2            | 0             | 4        | 7      | 10822                           | 1611                                     | 9119                   | 2017                       |
| 2035 | 3492              | 4963  | 1165       | 4               | 2          | 0       | 0           | 0        | 0      | 51            | 123    | 9          | 6          | 53       | 279      | 0       | 4                            | 36       | 1097          | 66             | 2            | 0             | 4        | 8      | 11363                           | 1691                                     | 9575                   | 2118                       |
| 2036 | 3667              | 5211  | 1224       | 4               | 2          | 0       | 0           | 0        | 0      | 53            | 129    | 10         | 6          | 55       | 293      | 0       | 4                            | 38       | 1152          | 70             | 2            | 0             | 4        | 8      | 11931                           | 1776                                     | 10054                  | 2223                       |
| 2037 | 3850              | 5472  | 1285       | 4               | 2          | 0       | 0           | 0        | 0      | 56            | 135    | 10         | 6          | 58       | 308      | 0       | 4                            | 39       | 1210          | 73             | 2            | 0             | 4        | 8      | 12528                           | 1865                                     | 10557                  | 2335                       |
| 2038 | 4043              | 5745  | 1349       | 4               | 2          | 0       | 0           | 0        | 0      | 59            | 142    | 11         | 7          | 61       | 323      | 0       | 4                            | 41       | 1270          | 77             | 2            | 0             | 4        | 9      | 13154                           | 1958                                     | 11085                  | 2451                       |
| 2039 | 4245              | 6033  | 1416       | 5               | 2          | 0       | 0           | 0        | 0      | 62            | 149    | 11         | 7          | 64       | 339      | 0       | 5                            | 44       | 1334          | 81             | 2            | 0             | 5        | 9      | 13812                           | 2056                                     | 11639                  | 2574                       |
| 2040 | 4457              | 6334  | 1487       | 5               | 2          | 0       | 0           | 0        | 0      | 65            | 156    | 12         | 7          | 67       | 356      | 0       | 5                            | 46       | 1400          | 85             | 2            | 0             | 5        | 10     | 14503                           | 2159                                     | 12221                  | 2703                       |
| 2041 | 4680              | 6651  | 1562       | 5               | 3          | 0       | 0           | 0        | 0      | 68            | 164    | 13         | 8          | 71       | 374      | 0       | 5                            | 48       | 1470          | 89             | 2            | 0             | 5        | 10     | 15228                           | 2267                                     | 12832                  | 2838                       |
| 2042 | 4914              | 6983  | 1640       | 5               | 3          | 0       | 0           | 0        | 0      | 72            | 172    | 13         | 8          | 74       | 393      | 0       | 5                            | 50       | 1544          | 93             | 3            | 0             | 5        | 11     | 15989                           | 2380                                     | 13474                  | 2980                       |
| 2043 | 5160              | 7333  | 1722       | 6               | 3          | 0       | 0           | 0        | 0      | 75            | 181    | 14         | 8          | 78       | 412      | 0       | 6                            | 53       | 1621          | 98             | 3            | 0             | 6        | 11     | 16788                           | 2499                                     | 14147                  | 3129                       |
| 2044 | 5418              | 7699  | 1808       | 6               | 3          | 0       | 0           | 0        | 0      | 79            | 190    | 15         | 9          | 82       | 433      | 0       | 6                            | 56       | 1702          | 103            | 3            | 0             | 6        | 12     | 17628                           | 2624                                     | 14855                  | 3285                       |
| 2045 | 5688              | 8084  | 1898       | 6               | 3          | 0       | 0           | 0        | 0      | 83            | 200    | 15         | 9          | 86       | 455      | 0       | 6                            | 58       | 1787          | 108            | 3            | 0             | 6        | 12     | 18509                           | 2755                                     | 15597                  | 3449                       |
| 2046 | 5973              | 8488  | 1993       | 6               | 3          | 0       | 0           | 0        | 0      | 87            | 210    | 16         | 10         | 90       | 477      | 0       | 6                            | 61       | 1877          | 114            | 3            | 0             | 6        | 13     | 19435                           | 2893                                     | 16377                  | 3622                       |
| 2047 | 6272              | 8913  | 2093       | 7               | 3          | 0       | 0           | 0        | 0      | 91            | 220    | 17         | 10         | 95       | 501      | 0       | 7                            | 64       | 1971          | 119            | 3            | 0             | 7        | 14     | 20406                           | 3038                                     | 17196                  | 3803                       |
| 2048 | 6585              | 9359  | 2197       | 7               | 4          | 0       | 0           | 0        | 0      | 96            | 231    | 18         | 11         | 100      | 526      | 0       | 7                            | 68       | 2069          | 125            | 3            | 0             | 7        | 14     | 21427                           | 3189                                     | 18056                  | 3993                       |
| 2049 | 6914              | 9826  | 2307       | 7               | 4          | 0       | 0           | 0        | 0      | 101           | 243    | 19         | 11         | 105      | 553      | 0       | 7                            | 71       | 2173          | 132            | 4            | 0             | 7        | 15     | 22498                           | 3349                                     | 18959                  | 4193                       |
| 2050 | 7260              | 10318 | 2423       | 8               | 4          | 0       | 0           | 0        | 0      | 106           | 255    | 20         | 12         | 110      | 580      | 0       | 8                            | 74       | 2281          | 138            | 4            | 0             | 8        | 16     | 23623                           | 3516                                     | 19907                  | 4402                       |
| 2051 | 7623              | 10834 | 2544       | 8               | 4          | 0       | 0           | 0        | 0      | 111           | 268    | 21         | 12         | 115      | 609      | 0       | 8                            | 78       | 2395          | 145            | 4            | 0             | 8        | 16     | 24804                           | 3692                                     | 20902                  | 4622                       |
| 2052 | 8004              | 11375 | 2671       | 9               | 4          | 0       | 0           | 0        | 0      | 117           | 281    | 22         | 13         | 121      | 640      | 0       | 9                            | 82       | 2515          | 152            | 4            | 0             | 9        | 17     | 26044                           | 3877                                     | 21947                  | 4854                       |


Table 7-15: Projected Traffic along HS-III on Project corridor at calculated growth rate

| Year | PASSENGER TRAFFIC |       |            |                 |            |         |             |          |        | GOODS TRAFFIC |        |            |            |          |          |         |                              |          | Non Motorised |                |              | TOLL EXEMPTED |          |        | Total Traffic volume in numbers | Total tollable traffic volume in numbers | Total Traffic In PCU's | Allowable Traffic in PCU's |
|------|-------------------|-------|------------|-----------------|------------|---------|-------------|----------|--------|---------------|--------|------------|------------|----------|----------|---------|------------------------------|----------|---------------|----------------|--------------|---------------|----------|--------|---------------------------------|--|------------------------|----------------------------|
|      | 2W                | 3W    | Car / Jeep | Car / Jeep (YB) | Tata Magic | RTC Bus | Private Bus | Mini Bus | School | 2 Axle        | 3 Axle | Multi Axle | Over sized | LGV/ LCV | Mini LCV | Tractor | Tractor with trailer/ Others | 3w Goods | Cycle         | Cycle Rickshaw | Animal Drawn | car           | MINI BUS | TRUCKS |                                 |  |                        |                            |
|      | 0.50              | 1.00  | 1.00       | 1.00            | 1.00       | 3.00    | 3.00        | 1.50     | 3.00   | 3.00          | 3.00   | 4.50       | 4.50       | 1.50     | 1.00     | 1.50    | 4.50                         | 1.00     | 0.50          | 2.00           | 8.00         | 1.00          | 1.50     | 3.00   |                                 |  |                        |                            |
| 2023 | 1945              | 2764  | 649        | 2               | 1          | 0       | 0           | 0        | 0      | 28            | 68     | 5          | 3          | 29       | 155      | 0       | 2                            | 20       | 611           | 37             | 1            | 0             | 2        | 4      | 6327                            | 942                                      | 5348                   | 1179                       |
| 2024 | 2207              | 3137  | 743        | 2               | 1          | 0       | 0           | 0        | 0      | 31            | 74     | 6          | 3          | 32       | 169      | 0       | 2                            | 23       | 642           | 39             | 1            | 0             | 2        | 5      | 7118                            | 1061                                     | 5999                   | 1318                       |
| 2025 | 2505              | 3560  | 851        | 3               | 1          | 0       | 0           | 0        | 0      | 33            | 80     | 6          | 4          | 35       | 183      | 0       | 3                            | 26       | 674           | 41             | 1            | 0             | 2        | 5      | 8012                            | 1196                                     | 6752                   | 1475                       |
| 2026 | 2843              | 4041  | 974        | 3               | 1          | 0       | 0           | 0        | 0      | 36            | 87     | 7          | 4          | 38       | 198      | 0       | 3                            | 29       | 707           | 43             | 1            | 0             | 3        | 5      | 9024                            | 1349                                     | 7605                   | 1652                       |
| 2027 | 3227              | 4586  | 1115       | 3               | 1          | 0       | 0           | 0        | 0      | 39            | 95     | 7          | 4          | 41       | 215      | 0       | 3                            | 33       | 743           | 45             | 1            | 0             | 3        | 6      | 10169                           | 1522                                     | 8569                   | 1851                       |
| 2028 | 3663              | 5205  | 1277       | 4               | 2          | 0       | 0           | 0        | 0      | 42            | 102    | 8          | 5          | 44       | 232      | 0       | 3                            | 38       | 780           | 47             | 1            | 0             | 3        | 6      | 11461                           | 1714                                     | 9652                   | 2068                       |
| 2029 | 4157              | 5908  | 1462       | 4               | 2          | 0       | 0           | 0        | 0      | 45            | 109    | 8          | 5          | 47       | 249      | 0       | 4                            | 43       | 819           | 50             | 1            | 0             | 3        | 7      | 12924                           | 1933                                     | 10878                  | 2313                       |
| 2030 | 4718              | 6706  | 1674       | 5               | 2          | 0       | 0           | 0        | 0      | 49            | 118    | 9          | 5          | 51       | 268      | 0       | 4                            | 48       | 860           | 52             | 1            | 0             | 3        | 7      | 14581                           | 2180                                     | 12266                  | 2589                       |
| 2031 | 5355              | 7611  | 1917       | 6               | 2          | 0       | 0           | 0        | 0      | 52            | 126    | 10         | 6          | 54       | 288      | 0       | 4                            | 55       | 903           | 55             | 1            | 0             | 4        | 8      | 16457                           | 2461                                     | 13837                  | 2900                       |
| 2032 | 6078              | 8638  | 2195       | 7               | 2          | 0       | 0           | 0        | 0      | 56            | 136    | 10         | 6          | 58       | 309      | 0       | 5                            | 62       | 948           | 57             | 2            | 0             | 4        | 8      | 18583                           | 2780                                     | 15616                  | 3252                       |
| 2033 | 6869              | 9761  | 2502       | 7               | 2          | 0       | 0           | 0        | 0      | 60            | 145    | 11         | 7          | 63       | 331      | 0       | 5                            | 70       | 995           | 60             | 2            | 0             | 4        | 9      | 20905                           | 3129                                     | 17556                  | 3634                       |
| 2034 | 7762              | 11030 | 2853       | 8               | 2          | 0       | 0           | 0        | 0      | 65            | 155    | 12         | 7          | 67       | 354      | 0       | 6                            | 80       | 1045          | 63             | 2            | 0             | 4        | 10     | 23525                           | 3523                                     | 19744                  | 4064                       |
| 2035 | 8771              | 12464 | 3252       | 9               | 3          | 0       | 0           | 0        | 0      | 69            | 166    | 13         | 8          | 72       | 379      | 0       | 6                            | 90       | 1097          | 66             | 2            | 0             | 4        | 10     | 26482                           | 3970                                     | 22213                  | 4549                       |
| 2036 | 9911              | 14085 | 3707       | 11              | 3          | 0       | 0           | 0        | 0      | 74            | 178    | 14         | 8          | 77       | 405      | 0       | 7                            | 102      | 1152          | 70             | 2            | 0             | 5        | 11     | 29820                           | 4476                                     | 24999                  | 5095                       |
| 2037 | 11199             | 15916 | 4226       | 12              | 3          | 0       | 0           | 0        | 0      | 79            | 190    | 15         | 9          | 82       | 434      | 0       | 8                            | 115      | 1210          | 73             | 2            | 0             | 5        | 12     | 33589                           | 5050                                     | 28144                  | 5712                       |
| 2038 | 12599             | 17905 | 4776       | 14              | 3          | 0       | 0           | 0        | 0      | 84            | 203    | 16         | 9          | 87       | 462      | 0       | 8                            | 129      | 1270          | 77             | 2            | 0             | 5        | 12     | 37662                           | 5654                                     | 31535                  | 6359                       |
| 2039 | 14174             | 20144 | 5396       | 15              | 3          | 0       | 0           | 0        | 0      | 90            | 216    | 17         | 10         | 93       | 492      | 0       | 9                            | 145      | 1334          | 81             | 2            | 0             | 6        | 13     | 42240                           | 6332                                     | 35345                  | 7083                       |
| 2040 | 15946             | 22661 | 6098       | 17              | 4          | 0       | 0           | 0        | 0      | 96            | 230    | 18         | 11         | 99       | 524      | 0       | 10                           | 164      | 1400          | 85             | 2            | 0             | 6        | 14     | 47383                           | 7095                                     | 39625                  | 7895                       |
| 2041 | 17939             | 25494 | 6891       | 19              | 4          | 0       | 0           | 0        | 0      | 102           | 245    | 19         | 11         | 106      | 558      | 0       | 10                           | 184      | 1470          | 89             | 2            | 0             | 6        | 15     | 53165                           | 7954                                     | 44433                  | 8806                       |
| 2042 | 20181             | 28681 | 7787       | 21              | 4          | 0       | 0           | 0        | 0      | 108           | 261    | 20         | 12         | 112      | 594      | 0       | 11                           | 207      | 1544          | 93             | 3            | 0             | 7        | 16     | 59663                           | 8920                                     | 49836                  | 9827                       |
| 2043 | 22603             | 32123 | 8721       | 24              | 4          | 0       | 0           | 0        | 0      | 115           | 277    | 21         | 13         | 119      | 630      | 0       | 12                           | 232      | 1621          | 98             | 3            | 0             | 7        | 17     | 66639                           | 9923                                     | 55624                  | 10885                      |
| 2044 | 25315             | 35977 | 9767       | 26              | 5          | 0       | 0           | 0        | 0      | 122           | 293    | 23         | 14         | 126      | 668      | 0       | 13                           | 260      | 1702          | 103            | 3            | 0             | 7        | 18     | 74442                           | 11043                                    | 62097                  | 12062                      |
| 2045 | 28353             | 40295 | 10940      | 29              | 5          | 0       | 0           | 0        | 0      | 129           | 311    | 24         | 14         | 134      | 708      | 0       | 14                           | 291      | 1787          | 108            | 3            | 0             | 8        | 19     | 83171                           | 12293                                    | 69334                  | 13374                      |
| 2046 | 31756             | 45130 | 12252      | 32              | 5          | 0       | 0           | 0        | 0      | 137           | 329    | 25         | 15         | 142      | 750      | 0       | 15                           | 326      | 1877          | 114            | 3            | 0             | 8        | 20     | 92937                           | 13688                                    | 77427                  | 14834                      |
| 2047 | 35566             | 50546 | 13723      | 36              | 5          | 0       | 0           | 0        | 0      | 145           | 349    | 27         | 16         | 150      | 795      | 0       | 17                           | 365      | 1971          | 119            | 3            | 0             | 8        | 21     | 103863                          | 15247                                    | 86479                  | 16461                      |
| 2048 | 39834             | 56611 | 15369      | 40              | 6          | 0       | 0           | 0        | 0      | 154           | 370    | 28         | 17         | 159      | 843      | 0       | 18                           | 409      | 2069          | 125            | 3            | 0             | 9        | 23     | 116088                          | 16986                                    | 96604                  | 18273                      |
| 2049 | 44614             | 63404 | 17214      | 44              | 6          | 0       | 0           | 0        | 0      | 163           | 392    | 30         | 18         | 169      | 893      | 0       | 20                           | 458      | 2173          | 132            | 4            | 0             | 9        | 24     | 129767                          | 18930                                    | 107929                 | 20294                      |
| 2050 | 49968             | 71013 | 19279      | 49              | 6          | 0       | 0           | 0        | 0      | 173           | 416    | 32         | 19         | 179      | 947      | 0       | 21                           | 513      | 2281          | 138            | 4            | 0             | 10       | 26     | 145074                          | 21101                                    | 120598                 | 22547                      |
| 2051 | 55964             | 79534 | 21593      | 55              | 7          | 0       | 0           | 0        | 0      | 183           | 441    | 34         | 20         | 190      | 1004     | 0       | 23                           | 574      | 2395          | 145            | 4            | 0             | 10       | 27     | 162203                          | 23526                                    | 134771                 | 25059                      |
| 2052 | 62680             | 89079 | 24184      | 61              | 7          | 0       | 0           | 0        | 0      | 194           | 467    | 36         | 22         | 201      | 1064     | 0       | 25                           | 643      | 2515          | 152            | 4            | 0             | 11       | 29     | 181373                          | 26236                                    | 150628                 | 27860                      |




Table 7-16: Projected Traffic along HS-III (including LPI data) on Project corridor at calculated growth rate

| Year | PASSENGER TRAFFIC |       |            |                 |            |         |             |          |        | GOODS TRAFFIC |        |            |            |          |          |         |                              |          | Non Motorised |                |              | TOLL EXEMPTED |          |        | Total Traffic volume in numbers | Total tollable traffic volume in numbers | Total Traffic In PCU's | Allowable Traffic in PCU's |
|------|-------------------|-------|------------|-----------------|------------|---------|-------------|----------|--------|---------------|--------|------------|------------|----------|----------|---------|------------------------------|----------|---------------|----------------|--------------|---------------|----------|--------|---------------------------------|--|------------------------|----------------------------|
|      | 2W                | 3W    | Car / Jeep | Car / Jeep (YB) | Tata Magic | RTC Bus | Private Bus | Mini Bus | School | 2 Axle        | 3 Axle | Multi Axle | Over sized | LGV/ LCV | Mini LCV | Tractor | Tractor with trailer/ Others | 3w Goods | Cycle         | Cycle Rickshaw | Animal Drawn | car           | MINI BUS | TRUCKS |                                 |  |                        |                            |
| 2023 | 1945              | 2764  | 649        | 2               | 1          | 0       | 0           | 0        | 0      | 28            | 368    | 405        | 3          | 29       | 155      | 0       | 2                            | 20       | 611           | 37             | 1            | 0             | 2        | 4      | 7027                            | 1641                                     | 8046                   | 3877                       |
| 2024 | 2207              | 3137  | 743        | 2               | 1          | 0       | 0           | 0        | 0      | 31            | 399    | 439        | 3          | 32       | 169      | 0       | 2                            | 23       | 642           | 39             | 1            | 0             | 2        | 5      | 7877                            | 1820                                     | 8926                   | 4246                       |
| 2025 | 2505              | 3560  | 851        | 3               | 1          | 0       | 0           | 0        | 0      | 33            | 433    | 477        | 4          | 35       | 183      | 0       | 3                            | 26       | 674           | 41             | 1            | 0             | 2        | 5      | 8836                            | 2019                                     | 9929                   | 4651                       |
| 2026 | 2843              | 4041  | 974        | 3               | 1          | 0       | 0           | 0        | 0      | 36            | 470    | 517        | 4          | 38       | 198      | 0       | 3                            | 29       | 707           | 43             | 1            | 0             | 3        | 5      | 9917                            | 2242                                     | 11051                  | 5098                       |
| 2027 | 3227              | 4586  | 1115       | 3               | 1          | 0       | 0           | 0        | 0      | 39            | 510    | 561        | 4          | 41       | 215      | 0       | 3                            | 33       | 743           | 45             | 1            | 0             | 3        | 6      | 11138                           | 2491                                     | 12308                  | 5590                       |
| 2028 | 3663              | 5205  | 1277       | 4               | 2          | 0       | 0           | 0        | 0      | 42            | 548    | 603        | 5          | 44       | 232      | 0       | 3                            | 38       | 780           | 47             | 1            | 0             | 3        | 6      | 12503                           | 2756                                     | 13672                  | 6087                       |
| 2029 | 4157              | 5908  | 1462       | 4               | 2          | 0       | 0           | 0        | 0      | 45            | 589    | 649        | 5          | 47       | 249      | 0       | 4                            | 43       | 819           | 50             | 1            | 0             | 3        | 7      | 14044                           | 3053                                     | 15199                  | 6634                       |
| 2030 | 4718              | 6706  | 1674       | 5               | 2          | 0       | 0           | 0        | 0      | 49            | 634    | 697        | 5          | 51       | 268      | 0       | 4                            | 48       | 860           | 52             | 1            | 0             | 3        | 7      | 15785                           | 3384                                     | 16911                  | 7234                       |
| 2031 | 5355              | 7611  | 1917       | 6               | 2          | 0       | 0           | 0        | 0      | 52            | 681    | 750        | 6          | 54       | 288      | 0       | 4                            | 55       | 903           | 55             | 1            | 0             | 4        | 8      | 17752                           | 3756                                     | 18830                  | 7894                       |
| 2032 | 6078              | 8638  | 2195       | 7               | 2          | 0       | 0           | 0        | 0      | 56            | 732    | 806        | 6          | 58       | 309      | 0       | 5                            | 62       | 948           | 57             | 2            | 0             | 4        | 8      | 19975                           | 4172                                     | 20984                  | 8620                       |
| 2033 | 6869              | 9761  | 2502       | 7               | 2          | 0       | 0           | 0        | 0      | 60            | 783    | 862        | 7          | 63       | 331      | 0       | 5                            | 70       | 995           | 60             | 2            | 0             | 4        | 9      | 22394                           | 4618                                     | 23300                  | 9378                       |
| 2034 | 7762              | 11030 | 2853       | 8               | 2          | 0       | 0           | 0        | 0      | 65            | 838    | 923        | 7          | 67       | 354      | 0       | 6                            | 80       | 1045          | 63             | 2            | 0             | 4        | 10     | 25118                           | 5117                                     | 25890                  | 10210                      |
| 2035 | 8771              | 12464 | 3252       | 9               | 3          | 0       | 0           | 0        | 0      | 69            | 897    | 987        | 8          | 72       | 379      | 0       | 6                            | 90       | 1097          | 66             | 2            | 0             | 4        | 10     | 28187                           | 5675                                     | 28789                  | 11125                      |
| 2036 | 9911              | 14085 | 3707       | 11              | 3          | 0       | 0           | 0        | 0      | 74            | 960    | 1056       | 8          | 77       | 405      | 0       | 7                            | 102      | 1152          | 70             | 2            | 0             | 5        | 11     | 31644                           | 6301                                     | 32036                  | 12132                      |
| 2037 | 11199             | 15916 | 4226       | 12              | 3          | 0       | 0           | 0        | 0      | 79            | 1027   | 1130       | 9          | 82       | 434      | 0       | 8                            | 115      | 1210          | 73             | 2            | 0             | 5        | 12     | 35541                           | 7002                                     | 35673                  | 13241                      |
| 2038 | 12599             | 17905 | 4776       | 14              | 3          | 0       | 0           | 0        | 0      | 84            | 1094   | 1204       | 9          | 87       | 462      | 0       | 8                            | 129      | 1270          | 77             | 2            | 0             | 5        | 12     | 39741                           | 7732                                     | 39554                  | 14377                      |
| 2039 | 14174             | 20144 | 5396       | 15              | 3          | 0       | 0           | 0        | 0      | 90            | 1165   | 1282       | 10         | 93       | 492      | 0       | 9                            | 145      | 1334          | 81             | 2            | 0             | 6        | 13     | 44453                           | 8546                                     | 43885                  | 15623                      |
| 2040 | 15946             | 22661 | 6098       | 17              | 4          | 0       | 0           | 0        | 0      | 96            | 1240   | 1365       | 11         | 99       | 524      | 0       | 10                           | 164      | 1400          | 85             | 2            | 0             | 6        | 14     | 49741                           | 9453                                     | 48720                  | 16990                      |
| 2041 | 17939             | 25494 | 6891       | 19              | 4          | 0       | 0           | 0        | 0      | 102           | 1321   | 1454       | 11         | 106      | 558      | 0       | 10                           | 184      | 1470          | 89             | 2            | 0             | 6        | 15     | 55676                           | 10465                                    | 54119                  | 18492                      |
| 2042 | 20181             | 28681 | 7787       | 21              | 4          | 0       | 0           | 0        | 0      | 108           | 1407   | 1548       | 12         | 112      | 594      | 0       | 11                           | 207      | 1544          | 93             | 3            | 0             | 7        | 16     | 62337                           | 11594                                    | 60152                  | 20143                      |
| 2043 | 22603             | 32123 | 8721       | 24              | 4          | 0       | 0           | 0        | 0      | 115           | 1491   | 1641       | 13         | 119      | 630      | 0       | 12                           | 232      | 1621          | 98             | 3            | 0             | 7        | 17     | 69474                           | 12758                                    | 66559                  | 21819                      |
| 2044 | 25315             | 35977 | 9767       | 26              | 5          | 0       | 0           | 0        | 0      | 122           | 1581   | 1740       | 14         | 126      | 668      | 0       | 13                           | 260      | 1702          | 103            | 3            | 0             | 7        | 18     | 77447                           | 14048                                    | 73687                  | 23653                      |
| 2045 | 28353             | 40295 | 10940      | 29              | 5          | 0       | 0           | 0        | 0      | 129           | 1676   | 1844       | 14         | 134      | 708      | 0       | 14                           | 291      | 1787          | 108            | 3            | 0             | 8        | 19     | 86356                           | 15478                                    | 81620                  | 25660                      |
| 2046 | 31756             | 45130 | 12252      | 32              | 5          | 0       | 0           | 0        | 0      | 137           | 1776   | 1955       | 15         | 142      | 750      | 0       | 15                           | 326      | 1877          | 114            | 3            | 0             | 8        | 20     | 96313                           | 17065                                    | 90450                  | 27857                      |
| 2047 | 35566             | 50546 | 13723      | 36              | 5          | 0       | 0           | 0        | 0      | 145           | 1883   | 2072       | 16         | 150      | 795      | 0       | 17                           | 365      | 1971          | 119            | 3            | 0             | 8        | 21     | 107442                          | 18825                                    | 100284                 | 30265                      |
| 2048 | 39834             | 56611 | 15369      | 40              | 6          | 0       | 0           | 0        | 0      | 154           | 1996   | 2196       | 17         | 159      | 843      | 0       | 18                           | 409      | 2069          | 125            | 3            | 0             | 9        | 23     | 119881                          | 20780                                    | 111236                 | 32906                      |
| 2049 | 44614             | 63404 | 17214      | 44              | 6          | 0       | 0           | 0        | 0      | 163           | 2116   | 2328       | 18         | 169      | 893      | 0       | 20                           | 458      | 2173          | 132            | 4            | 0             | 9        | 24     | 133788                          | 22951                                    | 123439                 | 35805                      |
| 2050 | 49968             | 71013 | 19279      | 49              | 6          | 0       | 0           | 0        | 0      | 173           | 2242   | 2468       | 19         | 179      | 947      | 0       | 21                           | 513      | 2281          | 138            | 4            | 0             | 10       | 26     | 149336                          | 25363                                    | 137039                 | 38988                      |
| 2051 | 55964             | 79534 | 21593      | 55              | 7          | 0       | 0           | 0        | 0      | 183           | 2377   | 2616       | 20         | 190      | 1004     | 0       | 23                           | 574      | 2395          | 145            | 4            | 0             | 10       | 27     | 166721                          | 28044                                    | 152199                 | 42486                      |
| 2052 | 62680             | 89079 | 24184      | 61              | 7          | 0       | 0           | 0        | 0      | 194           | 2520   | 2773       | 22         | 201      | 1064     | 0       | 25                           | 643      | 2515          | 152            | 4            | 0             | 11       | 29     | 186162                          | 31025                                    | 169101                 | 46334                      |

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|  | <b>Consultancy services for preparation of DPR and Pre-Construction services from (i) Silchar ISBT (Start point of Silchar Bypass) to junction of NH-37 &amp; NH-6 at Dhaleshwari, (ii) End of proposed Badarpur bypass to Churaibari (Assam-Tripura border), (iii) Spur from NH-8 near Karimganj to Sutherkandi (Package-VII)</b> | <b>DRAFT<br/>FEASIBILITY<br/>REPORT</b> |
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*Table 7-17: Capacity Calculations for the Homogeneous Sections (With calculated Growth rate)*

| Year | HS-1    | HS-2   | HS-3           | HS-3 (with LPI data) |  |
|------|---------|--------|----------------|----------------------|--|
| 2023 | 4 lane) | 4 lane | 2 lane with PS | 2 lane with PS       |  |
| 2024 |         |        |                |                      |  |
| 2025 |         |        |                |                      |  |
| 2026 |         |        |                |                      |  |
| 2027 | 6 lane  | 4 lane | 2 lane with PS | 4 lane               |  |
| 2028 |         |        |                |                      |  |
| 2029 |         |        |                |                      |  |
| 2030 |         |        |                |                      |  |
| 2031 |         | 6 lane | 4 lane         | 6 lane               |  |
| 2032 |         |        |                |                      |  |
| 2033 |         |        |                |                      |  |
| 2034 |         |        |                |                      |  |
| 2035 |         |        | 6 lane         |                      |  |
| 2036 |         |        |                |                      |  |
| 2037 |         |        |                |                      |  |
| 2038 |         |        |                |                      |  |
| 2039 |         |        |                |                      |  |
| 2040 |         |        |                |                      |  |
| 2041 |         |        |                |                      |  |
| 2042 |         |        |                |                      |  |
| 2043 |         |        |                |                      |  |
| 2044 |         |        |                |                      |  |
| 2045 |         |        |                |                      |  |
| 2046 |         |        |                |                      |  |
| 2047 |         |        |                |                      |  |
| 2048 |         |        |                |                      |  |

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|--|--|---|
|  | <b>Consultancy services for preparation of DPR and Pre-Construction services from (i) Silchar ISBT (Start point of Silchar Bypass) to junction of NH-37 &amp; NH-6 at Dhaleshwari, (ii) End of proposed Badarpur bypass to Churaibari (Assam-Tripura border), (iii) Spur from NH-8 near Karimganj to Sutherkandi (Package-VII)</b> | <b>DRAFT<br/>FEASIBILITY<br/>REPORT</b> |
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*Table 7-18: Capacity Calculations for the Homogeneous Sections (With 5% Growth)*

| Year | HS-1   | HS-2   | HS-3           | HS-3 (with LPI data) |
|------|--------|--------|----------------|----------------------|
| 2023 | 4 lane | 4 lane | 2 lane with PS | 2 lane with PS       |
| 2024 |        |        |                |                      |
| 2025 |        |        |                |                      |
| 2026 |        |        |                |                      |
| 2027 |        |        |                |                      |
| 2028 |        |        |                |                      |
| 2029 |        |        |                |                      |
| 2030 |        |        |                |                      |
| 2031 | 6 lane | 4 lane | 2 lane with PS | 4 lane               |
| 2032 |        |        |                |                      |
| 2033 |        |        |                |                      |
| 2034 |        |        |                |                      |
| 2035 |        |        |                |                      |
| 2036 |        |        |                |                      |
| 2037 |        |        |                |                      |
| 2038 |        |        |                |                      |
| 2039 |        |        |                |                      |
| 2040 |        |        |                |                      |
| 2041 |        |        |                |                      |
| 2042 |        |        |                |                      |
| 2043 |        | 6 lane | 4 lane         | 6 lane               |
| 2044 |        |        |                |                      |
| 2045 |        |        |                |                      |
| 2046 |        |        |                |                      |
| 2047 |        |        |                |                      |
| 2048 |        |        |                |                      |

|   |  |  |
|---|--|--|
|  | <p>Consultancy services for preparation of DPR and Pre-Construction services from (i) Silchar ISBT (Start point of Silchar Bypass) to junction of NH-37 &amp; NH-6 at Dhaleshwari, (ii) End of proposed Badarpur bypass to Churaibari (Assam-Tripura border), (iii) Spur from NH-8 near Karimganj to Sutherkandi (Package-VII)</p> | <p><b>DRAFT<br/>FEASIBILITY<br/>REPORT</b></p> |
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## 7.18 CONCLUSIONS

- As per the capacity standards mentioned in the Bharatmala Pariyojana Guidelines, for adopted traffic features the project corridor requires 4 lane configurations by the year of COD for HS – I & II.
- For HS-III, 4 lane configurations can be reached by 2029.
- If we adopt 5% growth rates, as per Bharatmala guidelines, for adopted traffic features the project corridor required 4 lane configurations by the year of COD for HS-I & II and for HS-III, it can be reached by 2036.
- Requirement of 4 laning of project stretch after including data received from LPI is also included.
- Considering the time required for completion of construction, it is recommended that the corridor may be developed with 4 lane capacity for HS-I, II and for HS-III 2 laning may be adopted.