QUALITY ASSURANCE STATEMENT		
CLIENT NAME **Vishwa Samudra Engineering Pvt Ltd - Avani Ecoprojects Pvt Ltd**		**PREPARED BY:** T. Pavanaram
REPORT NAME: **Report on Traffic Study and Pavement structural strength survey**		**REVIEWED BY:** M. Ramamohana Rao, Chandra Sekhar Gupta
PROJECT/CONTRACT NUMBER:		**APPROVED FOR ISSUE BY:** K Srinivasulu
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1 INTRODUCTION

In Pavement Design and Construction, there is an urgent need of economical and innovative Technology that provides sufficient strength and durability to pavement and also reduces energy consumption and Green House Gas (GHG) emission. Presently, there is lot of energy consumption and GHG emission in the manufacture of pavement material as well pavement construction. Soil and aggregate Stabilization is a solution for obtaining sustainable pavement and economically mitigating the critical issues such as energy consumption and GHG emissions.

Stabilroad German soil stabilization technology is one such solution. Vijayawada PWD department has constructed a road section near Poranki using Stabilroad German Soil Stabilization technology by its principle contractor Vishwa Samudra Engineering Pvt Ltd with their technical partners Avani Ecoprojects Pvt Ltd, Hyderabad. Vishwa Samudra Engineering Pvt Ltd have outsourced work to **KDM Engineers (India) Pvt Ltd (KDM)** for Traffic Study and structural evaluation of the pavement.

Accordingly, KDM has carried out Traffic surveys and Falling Weight Deflecometer (FWD) Test and prepared reports on Traffic and Structural condition of the pavement.

1.1 KDM'S COMAPANY PROFILE

KDM Engineers (India) Pvt. Ltd is a multi-disciplinary Civil Engineering consulting firm with demonstrated experience in Structures and Facilities, Transportation Infrastructure, Irrigation, Water Resources, Sanitation Construction Material Testing, Mix Designs, Geo-Technical Investigation, Pavement Study, Surveying and Structural Rehabilitation.

KDM Engineers (India) Pvt. Ltd laboratories are accredited by NABL for its wide range of testing facilities in Mechanical and Chemical fields as per ISO/IEC: 17025 – 2005, based at Hyderabad in Telangana, with branches at Visakhapatnam & Guntur in Andhra Pradesh, India

KDM Engineers (India) Pvt. Ltd is technically competent Organization with a team of experts and dedicated professionals including Engineers, Technicians and other Experts. KDM adopts a well-structured quality assurance and management system to carry out various types of testing and services and with a strong commitment to Aim and objective of providing complete solutions to its clients. The KDM endeavors to keep up the relentless efforts in finding the sound and quality solutions.

2 OBJECTIVE/SCOPE OF THE STUDY

The main objective of this consultancy services listed below

i. Conducting Traffic Volume count Survey to know the traffic plying on the project road

ii. Conducting Axle Load Survey to know the loading pattern along the project road

iii. Structural Condition of the pavement will be evaluated using Falling Weight Deflectometer (FWD) and subsequent analysis is to be carried out to ascertain the relative performance of the pavement in the context of evaluating residual life.

3 PROJECT STRETCH

Vijayawada PWD department has constructed a road section near Poranki using Stabilroad German Soil Stabilization technology by its principle contractor Vishwa Samudra Engineering Pvt Ltd with their technical partners Avani Ecoprojects Pvt Ltd, Hyderabad. The length of Project road is 2.2 kms.

Project road has 6m carriageway up to 0.6 kms and the remaining length is single lane of 3.75m width. Alignment of project stretch shown in Figure 1.

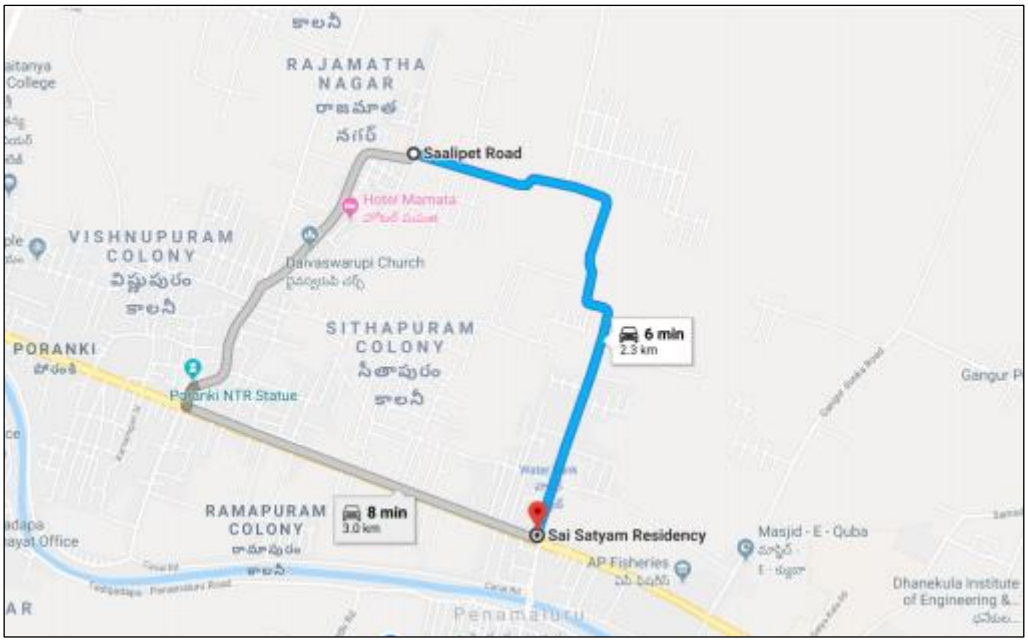


Figure 1: Project Location Map

4 DATA COLLECTION

After signing the contract, The KDM FWD Machine & Survey Crew was mobilized to Saalipet Road near Vijayawada to collect the data. Accordingly, Traffic Volume Count Survey has been conducted for continuous 3 days and Axle Load Survey has been conducted for 24hrs. FWD test also conducted and completed data collection using GEOTRAN FWD on 18-Nov-18 for the 2.2 km approx. The following table presents schedule of all surveys conducted on project road.

Table 1: Schedule of Surveys

S. No.	Type of Survey	Location	Survey Dates
1	Traffic Volume Count	Km 0+200	16-11-2018 to 19-11-2018
		Near Harijanawada (Km 1+900)	17-11-2018 to 18-11-2018
2	Axle Load Survey	Km 0+200	18-11-2018 to 19-11-2018
3	Falling Weight Deflectometer Test	Entire Stretch	18-11-2018

Methodology for carrying out above-mentioned surveys is explained in succeeding sections.

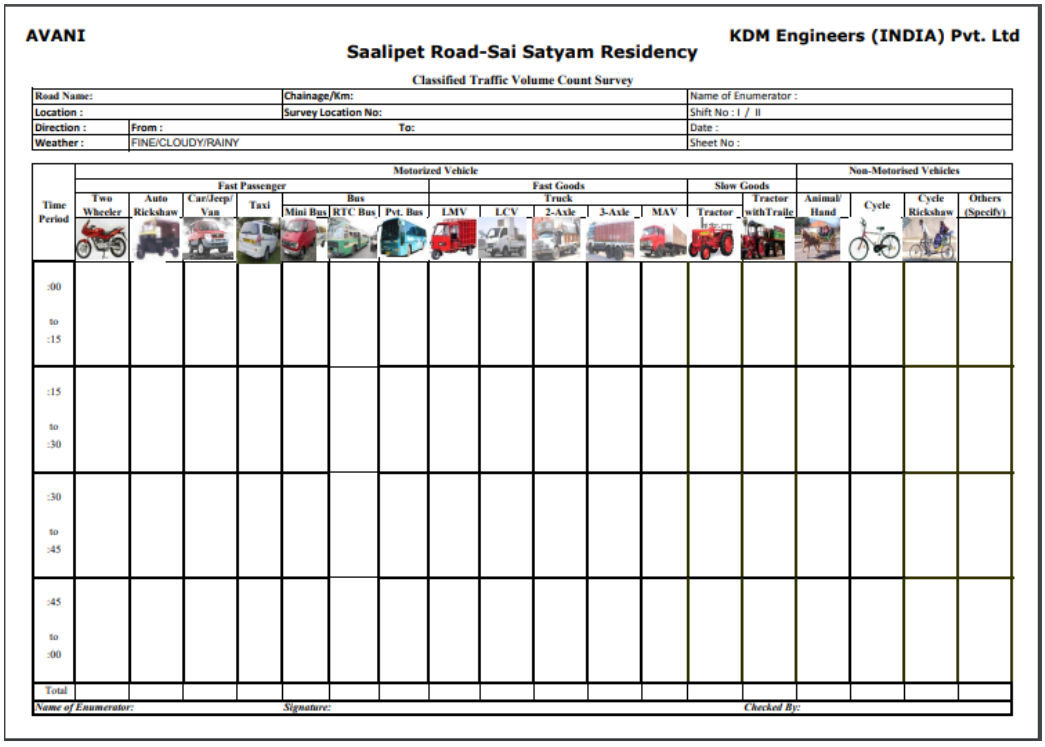
5 METHODOLOGY

5.1 METHODOLOGY FOR TRAFFIC VOLUME COUNT SURVEY

The classified traffic volume count is done for 3 days for 24 hours in both directions at one location and at other location volume count is done for 24 hours. The vehicle classification system adopted for the study is as follows.

Motorized Traffic	Non-Motorized Traffic
2 Wheeler	Bi-cycle
3 Wheeler	Cycle Rickshaw
Passenger Car	Animal Drawn Vehicles (ADV)
Utility Vehicles (Jeep, Van etc.)	Hand Cart
Mini Bus / Matador	Other non-Motorized Vehicles
Standard Bus	
LCV Passenger	
Freight	
MCV 2-Axle Rigid Chassis Truck	
3-Axle Rigid Chassis Truck	
Multi-Axle Truck Semi articulated	
Articulated	

The traffic count is done manually by the trained enumerators in three 8 hour shifts on each day. The traffic count data is recorded at 15 minute intervals. The format for field data is mentioned below.



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Classified Traffic Volume Count Survey

Road Name:	Chainage/Km:	Name of Enumerator :
Location :	Survey Location No:	Shift No : I / II
Direction : From :	To:	Date :
Weather : FINE/CLOUDY/RAINY		Sheet No :

Time Period	Motorized Vehicle														Non-Motorised Vehicles			
	Fast Passenger				Bus			Fast Goods Truck					Slow Goods					
	Two Wheeler	Auto Rickshaw	Car/Jeep/ Van	Taxi	Mini Bus	RTC Bus	Pvt. Bus	LMV	LCV	2-Axle	3-Axle	MAV	Tractor	Tractor withTraile	Animal/ Hand	Cycle	Cycle Rickshaw	Others (Specify)
:00 to :15																		
:15 to :30																		
:30 to :45																		
:45 to :00																		
Total																		

Name of Enumerator: Signature: Checked By:

Figure 2: Field format for Traffic Volume Count

Factors to be considered while doing a traffic volume survey on mid-block –

1. Surveyor should not affect the flow of traffic.
2. Survey station should be located at position where queuing do not take place.
3. Vehicles should be classified if possible as it saves time for Classified Traffic Volume Survey. Also classified results have many other application.

4. Safety of surveyor should be kept in mind and safe location should be selected. This becomes more important in rural area where carriageway is not well-defined.
5. Equipments used while automatic count should be placed such that they do not draw attention of driver.

Figure 3: Few snaps taken during Traffic Volume Count Survey

5.2 METHODOLOGY OF AXLE LOAD SURVEY

The survey is carried out on a random sample basis normally for goods vehicles only (both empty and loaded) for 24 hours. Some sample loading of buses plying on the Project Stretch is noted.

The selection of axle load survey station does not include any existing cross drainage structures which have load restrictions for vehicles passing over it.

Equipment

Portable Electronic Weigh Bridge System is used for survey. The system comprises 2 elements: a weigh pad and a remote indicator unit. The weigh pad is positioned on the shoulder close to the pavement edge. Top level of the pad is adjusted so that while measuring the wheel load, the vehicle's axle is horizontal. The equipment is pre- calibrated before starting survey.

Figure 4 : Few snaps taken during Axle Load Survey

Applicable Standards

In the absence of any IRC / IS standard on the subject, the work is carried out following the Consultants' in-house procedure based on the manufacturer's recommendation.

Work Procedure

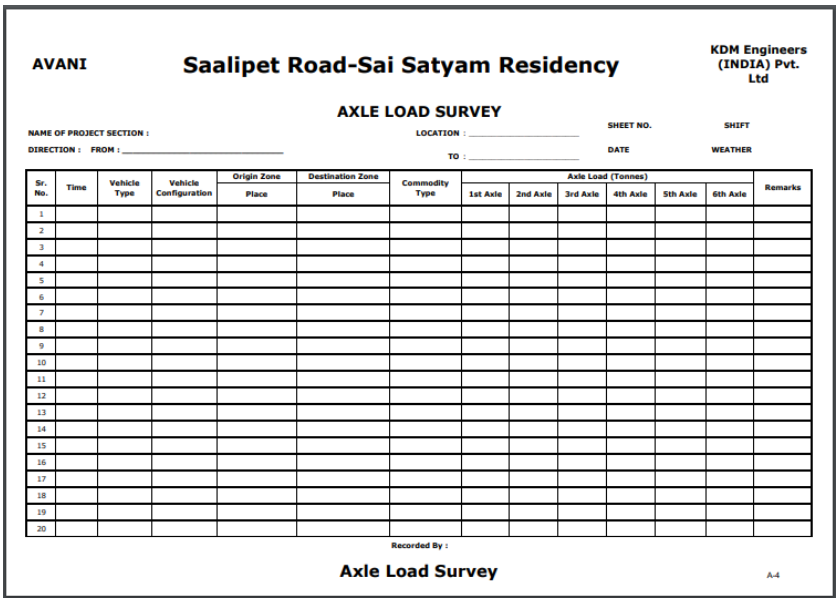
The work consists of several activities, and process control checks are exercised on these. These include:

- Choice of location of weigh stations
- Correct positioning of weigh pads
- Making arrangement for jerk-free mounting of vehicle tyres onto the pads
- Recording load data on the data sheets and taking the axle load to be twice that of the weighed wheel load.
- Ensuring that the sample covers all types of commercial vehicles, viz. LGVs, 2-axle trucks, 3-axle trucks and MAV's of different axle configurations.
- A few representative buses will also be weighed.
- Vehicles whether they are empty or full would be weighed.
- The commodity carried by the vehicle would also be noted.

Safety Considerations

The axle load survey station is located where the road is straight and more or less level and where adequate shoulder space is available. The location is sufficiently away from narrow/weak bridges or congested Stretches. Preferably, the location is in an illuminated place. Otherwise, temporary lights are used for conducting the survey in night.

Further, flagmen with red flags and red lamps during night are positioned for warning public vehicles, and for guiding heavy vehicles to be weighed on to the weigh bridge/pad. Safety cones for delineating path of vehicles to be weighed are also be placed. The format for field data is mentioned below.



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AXLE LOAD SURVEY

NAME OF PROJECT SECTION : LOCATION : SHEET NO. SHIFT

DIRECTION : FROM : TO : DATE WEATHER

Sr. No.	Time	Vehicle Type	Vehicle Configuration	Origin Zone Place	Destination Zone Place	Commodity Type	Axle Load (Tonnes) 1st Axle	2nd Axle	3rd Axle	4th Axle	5th Axle	6th Axle	Remarks
1													
2													
3													
4													
5													
6													
7													
8													
9													
10													
11													
12													
13													
14													
15													
16													
17													
18													
19													
20													

Recorded By :

Axle Load Survey A-4

Figure 5: Field format for Axle Load Survey

5.3 METHODOLOGY FOR FALLING WEIGHT DEFLECTOMETER (FWD) TEST

KDM uses a GEOTRAN Falling Weight Deflectometer. This unit is a non-destructive pavement testing device which provides accurate data on the response of the pavement (specifically the surface deflection bowl) to dynamic loads by simulating actual wheel loads in both response and duration. This allows more accurate and rapid measurement of pavement deflection under load than traditional methods.

Figure 6: Few snaps taken during FWD Survey

A dynamic load is generated by the dropping of a mass from a pre-set height onto a 300 mm diameter plate. The magnitude of the load and the pavement response are measured by a load cell and seven geophones. One geophone is located immediately under the load, whilst the others are located at variable offsets from the centre of the load.

The test load can be varied between 7 and 70 KN to meet the requirements of the particular task and the pavement response for up to four different magnitudes of load can be measured during any test sequence.

The offsets of the geophones can be set to any distance up to 1800 mm from the centre of the load and a typical sequence can be completed in approximately one minute. Highly accurate deflection bowl measurements are therefore possible and the FWD is very useful for carrying out large-scale pavement surveys.

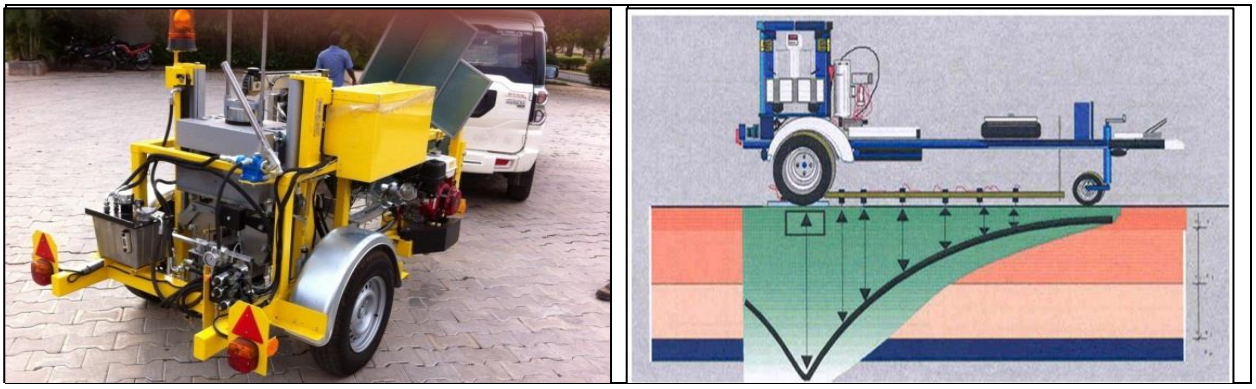

Figure 7 : Location of Geo-Phones

This data can assist in applications such as pavement overlay design, pavement condition surveys and in the development and operation of Pavement Management Systems (PMS). It is also used as input in back-calculation of Pavement Moduli packages.

The FWD is integrally mounted on a trailer which is towed by a dedicated vehicle**.** All testing is controlled by a personal computer which is located in the vehicle towing the FWD. As a result, only one operator is required to conduct a survey on most occasions making it less labour/ equipment intensive than traditional methods.

Working Principle

- A set of weights is dropped onto a platform with springs (rubber buffers) and the impact load is transferred to the pavement through a loading plate.
- The load simulates the dynamic load from a truck
- Normally, the load applied on road pavements is 40 kN
- When subjected to a load, the pavement will bend and a deflection bowl is created. The deflections at various distances from the loading centre are recorded by the sensors (geophones) and stored in a data file

Confidence Limits

- Load cell accuracy 2% +/- 2 KPa (1kPa = 0.145 psi)
- Load resolution 0.03 - 0.12 KN (7 - 26 lbf), magnitude dependent
- Deflection range 2.0 mm (80 mil)
- Deflector accuracy 2% +/- 2 microns (1 micron = 0.04 mil)
- Deflector resolution 1 micron
- Deflection random error typically 1 - 2 microns (0.04 - 0.08 mil)
- Deflection systematic error +/- 2%

Data Collection

- The FWD data collection has been collected below
- Prepare the FWD unit for deflection testing
- Bring the FWD to a stopped position at the beginning of the test section, centre on the outside wheel path (or specific position), and take a measurement by applying load using following sequence:
- One settling drop to ensure proper contact.
- Three drops with an applied load of 40 KN ± 10% (or Specified Load).
- Deflections are recorded from the sensors located at the centre of the loading plate for each drop except the settling drop.
- Along with these deflection data, the parameter like Chainage, Temperature, Date and Time and position of Sensors will also be recorded.
- After each measurement, drive the FWD forward to next measurement point.

During the data collection process, the testing patterns we have used the lined pattern. In this position, the Data Collection will be made in the same direction. For example: if the Measurement at the beginning of the section is taken on outside wheel path, then the next measurement has to be taken after moving to the specified interval on same direction. While starting the adjacent lane, an offset distance is considered while starting and continued as stated earlier. Data collection pattern is mentioned in Figure 8.

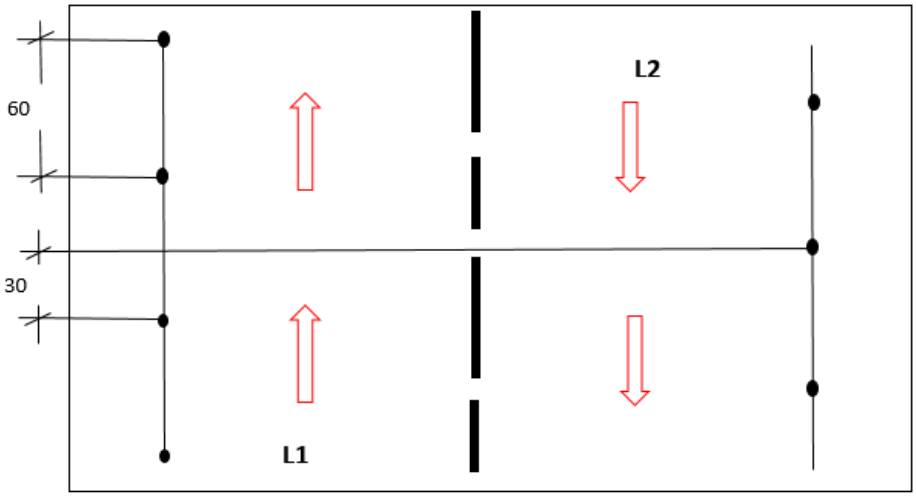

Figure 8: Data Collection Pattern -Lined

6 SITE OBSERVATIONS AT THE TIME OF SURVEY

During the time of survey, few observations were recorded by site engineers.

6.1 ROAD INVENTORY

Carriageway

Total length of the project road is 2.2km. Project road has 6m carriageway up to 0.6km and remaining length the project road has single lane configuration of 3.75m width. The carriageway is built with BT & WMM with stabilizing agent of three coat surface dressing as wearing course.

Terrain

Project road passing through plain terrain. It can cater to the design speed of about 30-50 km/hr except in some of the built-up area and at sharp curve locations.

Land use

Project road mostly traverse through builtup area and few sections it is traverse through Agricultural and Barren land. Dilip Buildcon Concrete mixing plant also observed along the project road.

Road Geometries

There is sharp curves found along the alignment. The vertical alignment is generally having smooth geometry. There are some locations observed, where adequate sight distances are not available which need improvement to the standards.

Pavement Condition

Entire stretch of the project road is in good condition. At few places it is found that half of the carriageway is covered by house hold trash which has thrown by local people.

Pavement Type and Composition

Existing pavement is flexible in nature. Pavement comprises of 40 mm bituminous layer and 300 mm Stabilized base. The crust composition details provided by the client is mentioned below. During Analysis, the same pavement thickness has been considered.

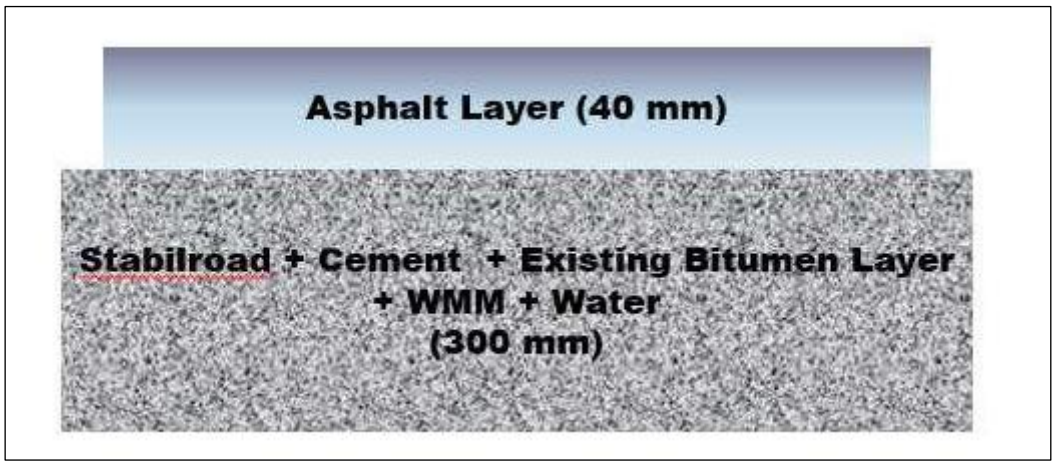

Figure 9: Existing Crust Composition

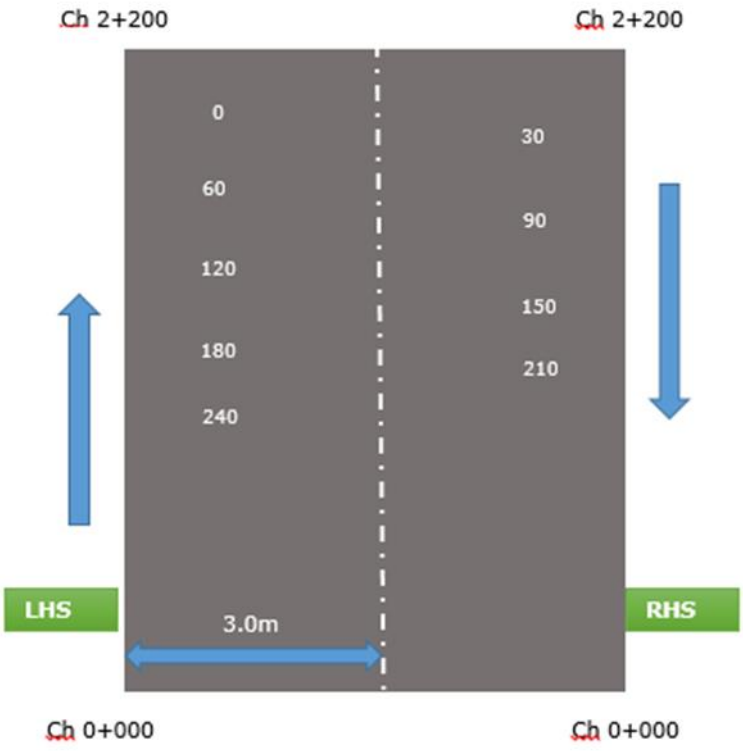

Figure 10: Site Section Sketch

Traffic Details

Light traffic observed on project road. Traffic details along the project road is discussed in succeeding sections.

7 ANALYSIS METHODOLOGY AND RESULTS

7.1 TRAFFIC VOLUME COUNT

7.1.1 Average Daily Traffic (ADT)

Traffic volume count data by direction at each location for 3 days duration is averaged to obtain the Average Daily Traffic (ADT). Summary showing the daily directional totals, daily traffic and the average daily traffic is presented in **Appendix 1**. The directional daily traffic by each hour of the day for the two locations over the survey period is presented in **Appendix 2**. Summary of ADT for each section is given in Table below.

Table 2: Summary of Average Daily Traffic

Vehicle Type/ Location	Location 1 (KM 0+200 of Saalipet Road)	Location 2 (KM1+900 of Saalipet Road)
Total Passenger Vehicles	4903	531
Total Freight Vehicles	362	13
Total Fast Moving Vehicles	5257	544
Total Slow Moving Vehicles	581	93
Total Vehicles	5846	637

7.1.2 Distribution of Traffic

Hourly variation of traffic at the count stations in terms of passenger vehicles, freight vehicles and total vehicles is presented in figure below. Details of peak hour and directional distribution of traffic at the survey stations are presented in Table below.

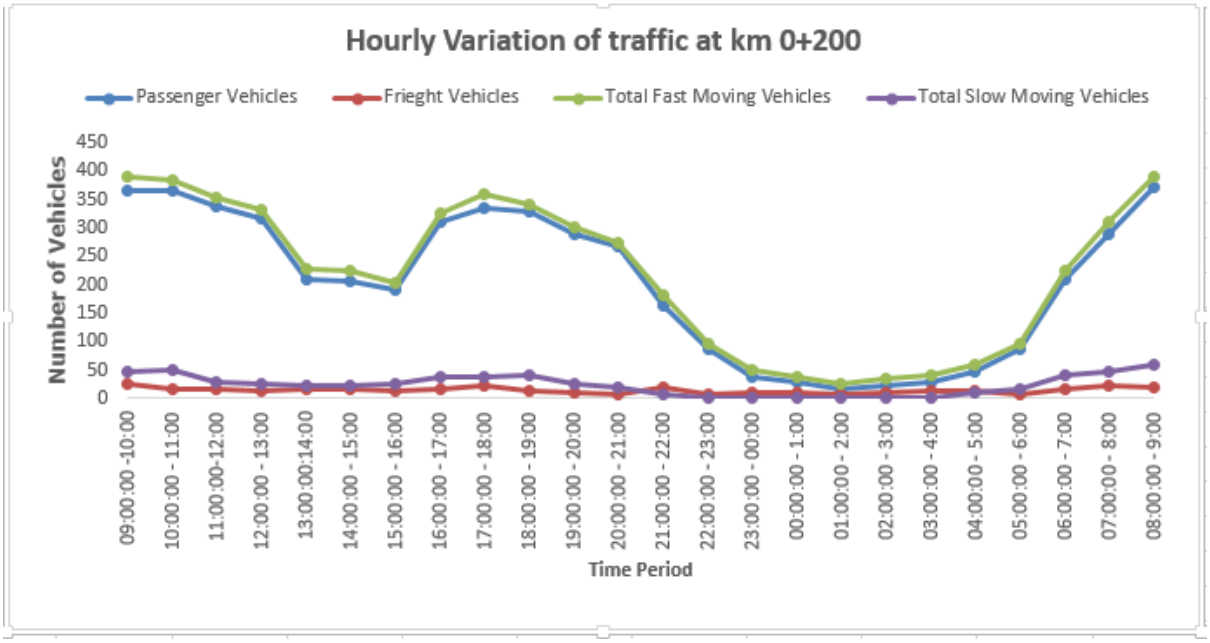

Figure 11: Hourly Variation of Traffic at KM 0/200 on Saalipet Road

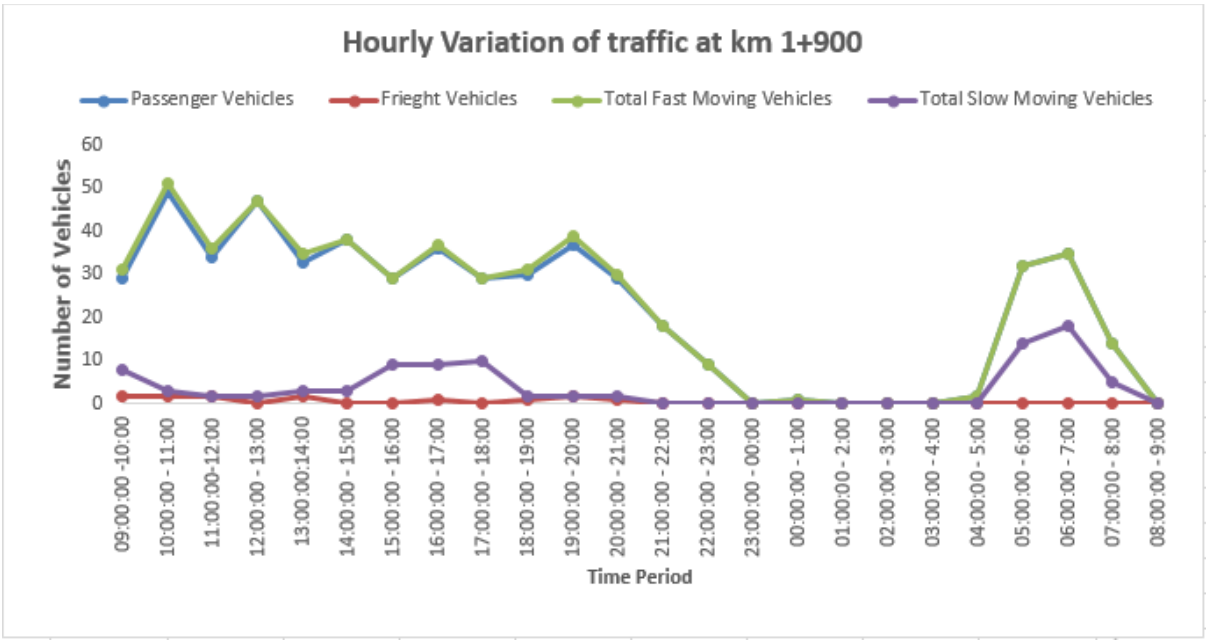

Figure 12: Hourly Variation of Traffic at KM 1/900 on Saalipet Road

Table 3: Peak Hour and Directional Distribution

Homogeneous Section	Road	Ex Location CH	Peak Hour	Vehicles	Directional Distribution
Location 1	Saalipet road	0/200	09:00-10:00	390	44.00:56.00

Location 2	Saalipet road	1/900	10:00-11:00	51	52.27:47.73

7.1.3 Traffic Composition

Composition of traffic observed at the count stations is presented in Figure below. It is observed across all the stations that share of non-motorized traffic are ranging from 9% to 12%. Composition of Cars varies from 4 to 8%. Composition of freight vehicles is in the range of 1% to 6%. Buses constitute around 1%. The two wheelers which constitute maximum share at all locations is ranging from 71% to 76%.

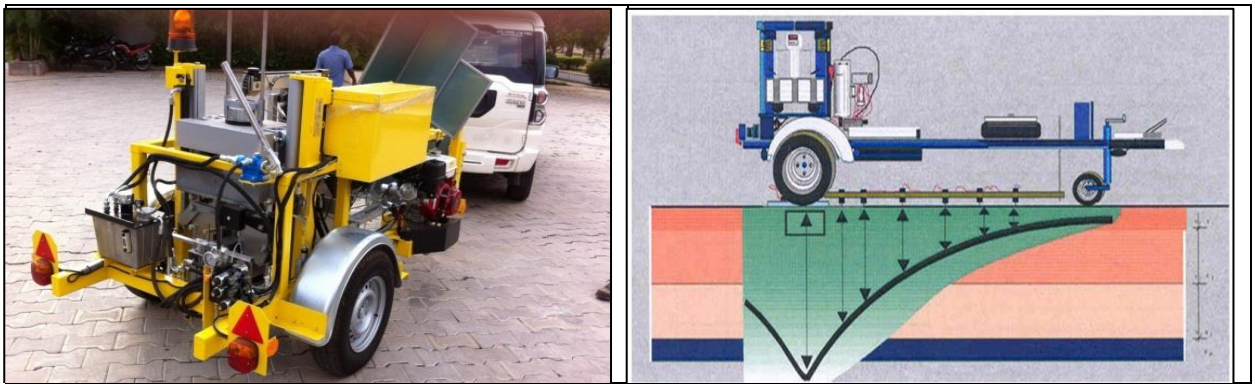

Figure 13: Traffic Composition at Various Homogeneous Sections

7.1.4 Average Annual Daily Traffic

Seasonality factors for different vehicle types are necessary in order to arrive at the average traffic representing the whole year. The factors are generally established from past PWD traffic data or from the petrol/ diesel sales data at existing petrol pumps along the project roads.

In the absence of above said data, seasonal correction factor of '1.0' has been adopted for all type of vehicles in this study. Mode-wise factors are applied to Average Daily Traffic volumes to obtain the Average Annual Daily Traffic (AADT) for individual survey stations. The location wise ADT and AADT is included in **Table below.**

Table 4: Vehicle Wise ADT and AADT for various Homogeneous Sections

Vehicle Type/ Location	Location 1 (KM 0+200 of Saalipet Road)		Location 2 (KM1+900 of Saalipet Road)	
	ADT	AADT	ADT	AADT
Car/ Jeep/Van	418	418	18	418
Taxi	43	43	4	43
Two wheeler	4134	4134	486	4134
3wh(pass)	263	263	17	263
Minibus	41	41		41
Bus (Govt)	2	2		2
Bus (Pvt)	1	1	1	1
Light Motor Vehicle	110	110	5	110
LCV	94	94	5	94
2-Axle	92	92	-	92
3-Axle	56	56	1	56
4-Axle and 6 Axle	2	2	-	2

Vehicle Type/ Location	Location 1 (KM 0+200 of Saalipet Road)		Location 2 (KM1+900 of Saalipet Road)	
	ADT	AADT	ADT	AADT
Tractor	5	5	7	5
Tractor with Trailer	66	66	8	66
Cycle	449	449	67	449
Cycle Rickshaw	53	53	9	53
Animal cart	6	6	1	6
Others	2	2	- -	2

7.2 AXLE LOAD SURVEY

Axle Load survey has been conducted at one location along the project road to know the loading pattern along the project road. Dilip Buildcon Concrete mixing plant found along the project stretch. Hence during axle load survey it is observed that 2 Axle and 3 axle trucks are mostly carrying concrete and other construction materials. The schedule and Axle load Survey locations are mentioned below.

Table 5: Schedule of Axle Load Surveys

From		To		Locations
Date	Time	Date	Time	
18-11-2018	9.00 AM	19-11-2018	9.00 AM	Near Saalipet

The spectrum of axle loads and the numbers of equivalent 8.16 t standard axles for the different categories of commercial vehicles have been determined on the basis of the axle load survey.

The Gross Vehicle Weight have been fixed as per the Central Government Notification of 1996. Table 6 below gives details of the various types of vehicles and the related details

Table 6: Notification on gross vehicle weight (gvw) of goods vehicles notification dt.18.10.96. Govt. of India

S. No	Transport Vehicles Category	Max GVW Tonnes	Maximum Safe Axle Weight
1	**RIGID FRAME VEHICLES**		
i	**Two Axle**	9.0	
	one tyre on front axle		3. Tonnes on front axle
	Two tyres on rear axle		6. Tonnes on rear axle
ii	**Two Axle**	12.0	
	Two tyres on each axle		6. Tonnes on front axle
	Two tyres on each axle		6. Tonnes on rear axle
iii	**Two Axle**	16.2	
	Two tyres on front axle and		6. Tonnes on front axle
	Four tyres on rear tandem axle		10.2. Tonnes on rear axle.
iv	**Three Axle**	25.0	
	Two tyres on front axle and		6. Tonnes on front axle

	Eight tyres on rear tandem axle		19 Tonnes on rear tandem axle
v	**Four Axle**	31.0	
	Four tyres on two front axle		12 Tonnes on two front axles
	Eight tyres on rear tandem axle		19 Tonnes on rear tandem axle
2	**SEMI ARTICULATED VEHICLES**		
i	**Two axle Tractor Single axle Trailer Tractor:**	26.4	
	2 tyres on front axle		6 Tonnes on front axle
	4 tyres on rear axle		10.2 Tonnes on rear axle
	Trailer:		
	4 tyres on single axle		10.2 Tonnes on single trailer axle
ii	**Two axle Tractor Tandem axle Trailer Tractor:**	35.2	
	2 tyres on front axle		6 Tonnes on front axle
	4 tyres on rear axle		10.2 Tonnes on rear axle
	Trailer:		
	8 tyres on single axle		19 Tonnes on tandem trailer axle
iii	**Two axle Tractor Three axle Trailer Tractor:**	40.2	
	2 tyres on front axle		6 Tonnes on front axle
	4 tyres on rear axle		10.2 Tonnes on rear axle
	12 tyres on 3 axles		24 Tonnes on 3 axles
iv	**Three axle Tractor single axle Trailor Tractor:**	35.2	
	2 tyres on front axle		6 Tonnes on front axle
	8 tyres on tandem axle		19 Tonnes on rear axle
	Trailer:		
	8 tyres on single axle		10.2 Tonnes on single axle
v	**Three axle Tractor Tandem Axle Trailor Tractor:**	38	
	8 tyres on tandem axle		19 Tonnes on rear tandem axle
	Trailer:		
	8 tyres on tandem axle		19 Tonnes on tandem axle

vi	**Three axle Tractor Three Axle Trailor Tractor:**	49	
	2 tyres on front axle		6 Tonnes on front axle
	8 tyres on tandem axle		19 Tonnes on rear tandem axle
	Trailer:		
	12 tyres on 3 axles		24 Tonnes on rear 3 axles
3	**TRUCK-TRAILERCOMBINATIONS**		
i	**Two Axle Truck Two Axle Trailer Truck:**	36.6	
	2 tyres on front axle		6 Tonnes on front axle
	4 tyres on rear axle		10.2 Tonnes on rear axle
	Trailer:		
	4 tyres on front axle		10.2 Tonnes on front axle
	4 tyres on rear axle		10.2 Tonnes on rear axle
ii	**Three Axle Truck Two Axle Trailer Truck:**	45.4 (restricted to 44.0)	
	2 tyres on front axle		6 Tonnes on front axle
	8 tyres on rear tandem axle		19 Tonnes on rear tandem axle
	Trailer:		
	4 tyres on front axle		10.2 Tonnes on front axle
	4 tyres on rear axle		10.2 Tonnes on rear axle
iii	**Two Axle Truck Three Axle Trailer Truck:**	45.4 (restricted to 44.0)	
	2 tyres on front axle		6 Tonnes on front axle
	4 tyres on rear axle		10.2 Tonnes on rear axle
	Trailer:		
	4 tyres on front axle		10.2 Tonnes on front axle
	8 tyres on rear tandem axle		19 Tonnes on rear tandem axle
iv	**Three Axle Truck Three Axle Trailer Truck:**	54.2 (restricted to 44.0)	
	2 tyres on front axle		6 Tonnes on front axle
	8 tyres on rear tandem axle		19 Tonnes on rear tandem axle
	Trailer:		
	4 tyres on front axle		10.2 Tonnes on front axle

8 tyres on rear tandem axle	19 Tonnes on rear tandem axle

The above axle wheel arrangements and the GVW implications, as contained in the Notification have been presented below in schematic form for help during the axle load surveys and later analysis of the data.

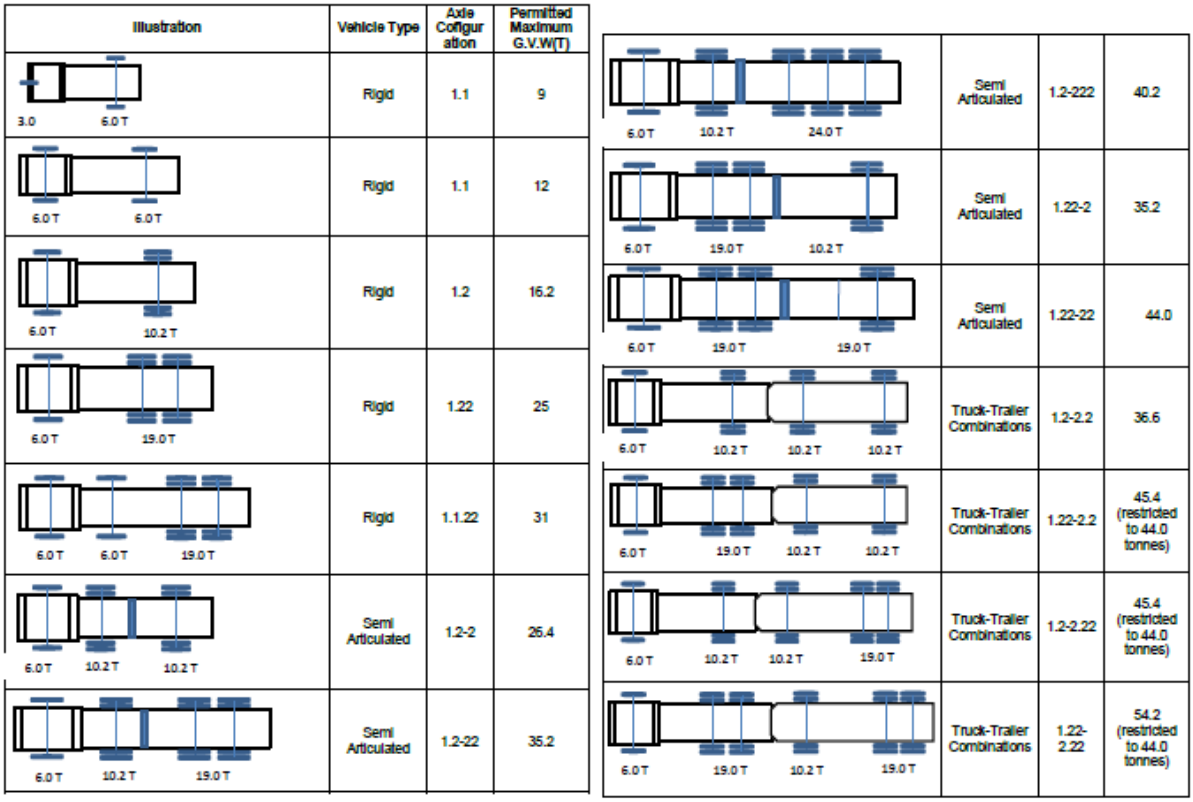

Illustration	Vehicle Type	Axle Configuration	Permitted Maximum G.V.W(T)
3.0 6.0T	Rigid	1.1	9
6.0T 6.0T	Rigid	1.1	12
6.0T 10.2T	Rigid	1.2	16.2
6.0T 19.0T	Rigid	1.22	25
6.0T 6.0T 19.0T	Rigid	1.1.22	31
6.0T 10.2T 10.2T	Semi Articulated	1.2-2	26.4
6.0T 10.2T 19.0T	Semi Articulated	1.2-22	35.2
6.0T 10.2T 24.0T	Semi Articulated	1.2-222	40.2
6.0T 19.0T 10.2T	Semi Articulated	1.22-2	35.2
6.0T 19.0T 19.0T	Semi Articulated	1.22-22	44.0
6.0T 10.2T 10.2T 10.2T	Truck-Trailer Combinations	1.2-2.2	36.6
6.0T 19.0T 10.2T 10.2T	Truck-Trailer Combinations	1.22-2.2	45.4 (restricted to 44.0 tonnes)
6.0T 10.2T 10.2T 19.0T	Truck-Trailer Combinations	1.2-2.22	45.4 (restricted to 44.0 tonnes)
6.0T 19.0T 10.2T 19.0T	Truck-Trailer Combinations	1.22-2.22	54.2 (restricted to 44.0 tonnes)

Figure 14: Axle Configurations

Calculation of VDF

The vehicle damage factor is a multiplier for converting the number of commercial vehicles of different axle loads to the number of standard axle load repetitions. Design of new pavement for additional lane or strengthening of existing pavement is based upon the cumulative number of 8.16 tons equivalent standard axles (ESA) that will pass over during the 15-year design period. The classes of traffic which lead to significant axle loads (or damage) to the pavement and accordingly considered for design are: LCVs, two / three axle and multi axle trucks. Cumulative standard axles (CSA) are calculated in accordance with the guidelines provided in IRC: 37 – 2012 and IRC: 81 - 1997. The overloaded vehicles have serious adverse impact on performance of pavement. It has been ascertained that the damaging effect of axles on flexible pavement is approximately proportional to the fourth power of the axle load.

Equivalency factors as recommended by IRC have been used to convert the axle load spectrum into an equivalent number of standard axles. The equivalency factors are derived for each axle load category from the fourth power rule.

The equations for computing equivalency factor for single, tandem and tridem axles given below is used as directed in the IRC:37-2012 for converting different axle load repetitions into equivalent standard axle load repetitions;

Single axle with single wheel on either side = {axle load in KN / 65}^{4}

Single axle with dual wheel on either side = {axle load in KN / 80}^{4}

Tandem axle with single wheel on either side = {axle load in KN / 148}^{4}

Tridem axle with dual wheel on either side = {axle load in KN / 224}^{4}

The product of frequency of axles for each axle load category and corresponding equivalency factors gives the ESA for corresponding axle load category. The VDF is calculated by dividing the total number of ESA by the number of vehicles weighed. The Axle load data and VDF analysis was presented in **Appendix 3** and the adopted VDF values are summarized in

Table 7: VDF Values of Commercial Vehicles

Location	Direction	VDF Values				
		LCV	BUS	2-Axle Truck	3-Axle Truck	MAVs
Km 0/200	NH-65 to Saalipet	1.58	0.1	1.8	9.64	16.74
	Saalipet to NH-65	1.2	-	0.57	1.44	-
	Adopted VDF	1.58	0.1	1.8	9.64	16.74

From the Axle Load analysis, it is observed that trucks arriving from NH-65 to Saalipet road are overloaded compared to trucks moving towards NH-65. Because the trucks arriving from NH-65 are supplying/carrying building materials to the existing Dilip Buildcon mixing plant along the project road. Whereas the loaded trucks arriving from Dilip Buildcon plant are mostly carrying concrete to nearby construction site. Obtained VDF values also shows that trucks arriving from NH-65 are more loaded compared to other direction. As the project road has single lane and intermediate lane configuration, higher VDF value of two directions has been considered for design traffic estimation.

The Summary of the Axle load is given in

Table 8: Summary of the Axle Load

Towards Salipet							
Vehicle Type	Total Vehilces Surveyed	Empty Vehicles (%)	Loaded Vehicles (%)	Loaded vehicles within legal limit (%)	Vehicles with Overloading (%)	Max Gross vehicle weight	Permissible Maximum Gross Weight (as per IRC: 3-1983) (T)
LCV	3	66.67	33.33	0	0	15.2	12-16.2
2Axle	5	40	60	66.67	33.33	16.36	16.2
3Axle	25	48	52	0	100	44.85	24
MAV	1	0	100	0	100	46.48	34.2
Towards NH-65							
Vehicle Type	Total Vehilces Surveyed	Empty Vehicles (%)	Loaded Vehicles (%)	Loaded vehicles within legal limit (%)	Vehicles with Overloading (%)	Max Gross vehicle weight	Permissible Maximum Gross Weight (as per IRC: 3-1983) (T)
LCV	5	60	40	100	0	14.9	12-16.2
2Axle	8	50	50	100	0	13.35	16.2
3Axle	28	71.43	28.57	75	25	33.65	24

From above table it is observed that trucks moving towards saalipet direction are 53% loaded whereas on other direction it is 34%. The loaded trucks moving towards saalipet are 83% overloaded and on other direction it is only 4%. 3Axles and MAVS moving towards saalipet are 100% overloaded and the Maximum Gross Vehicle Weight observed as 44.85 tonnnes for 3Axle vehicle whereas the permissible GVW for 3Axle vehicle is 24.

7.3 FALLING WEIGHT DEFLECTOMETER

IRC 115: 2014 procedures were used as reference and provided Structural evaluation and strengthening of flexible Pavements. Accordingly, the sequence of testing and analysis steps has been conducted in accordance with the IRC 115:2014.

For Flexible Pavements:

The Remaining Life Analysis on the Flexible Pavement analysis is carried by Evaluating the Elastic Modulus of each Layers and Performance of Flexible Pavement - Fatigue and Rutting Behavioral checks.

The step by step analysis for flexible pavement has been explained in the flow chart attached in Figure 15.

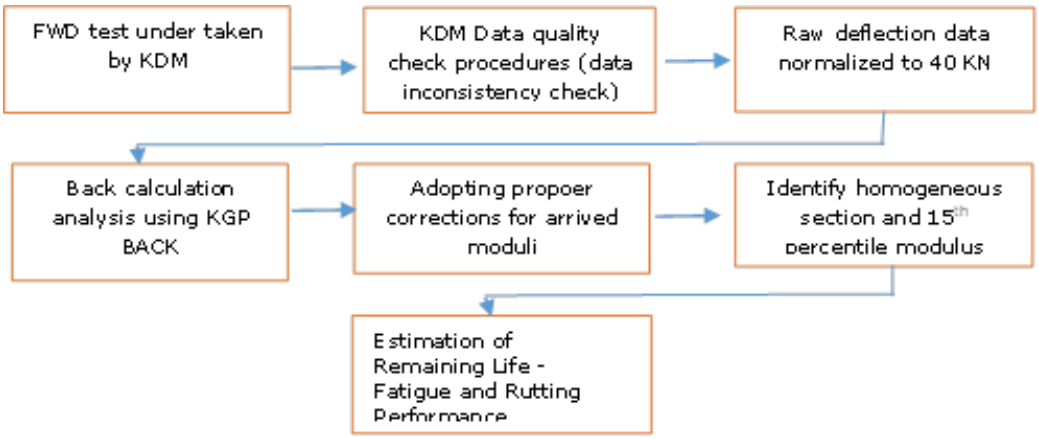

Figure 15: Process Flow to determine Pavement modulus values

These has been Explained in the procedural steps below

1. The recorded data was normalized to a standard load – 40kN (IRC 115).
2. The normalized deflections were then back calculated using the KGP-BACK application to obtain Elastic Modulus values of Bituminous, Granular layer and Sub-grade.
3. The corrections factors will be applied to all layers as suggested in IRC 115:2014.

In accordance with Section 6.4.2 of IRC 115, the calculated modulus values in the Bituminous Layers have been adjusted relative to the standard temperature of 35°C using equation 4 and 5 of IRC 115: 2014.

$$E_{T_1} = \lambda E_{T_2}$$ Eq 4, IRC115:2014

$$\lambda = \frac{1-0.238 \ln T1}{1-0.238 \ln T2}$$-- Eq 5, IRC115:2014

Where,

λ - Temperature Correction factor

*E*T1 - Backcalculated Modulus (MPa) at Temperature T1

*E*T2 - Backcalculated Modulus (MPa) at Temperature T2

In accordance with Section 6.5.2 of IRC 115, the calculated modulus values for Sub-grade and Granular Layer have been adjusted relative to the moisture conditions at the time of the testing. Since the granular layer present here is cementitious Layer - No correction needs to be applied to this cementitious layer.

$$E_{sub\_mon} = 3.351 * (E_{sub\_win})^{0.7688} - 28.9$$ Eq 6, IRC 115:2014

$$E_{sub\_mon} = 0.8554 * (E_{sub\_win}) - 8.461$$ Eq 7, IRC 115:2014

Using these corrected Moduli Values - Homogenous sections are prepared and 15th percentile Moduli values are selected for Design. Here, we have considered each section as one homogenous section.

4. Checking the in-serviceability of the Pavement layers through Performance criteria - analyzing the Remaining life (IRC 115) with reference to the Traffic MSA.

Initially, The Critical Strains Values - tensile strain (in the bituminous layer), and compressive strain (at the top of the sub-grade layer), are evaluated using the IRC approved program IITPAVE application.

Using the Critical Strain values, the pavement performance in term of Fatigue and Rutting can be evaluated as provided in Section 8.3 of IRC 115.

Fatigue Model

$$N_f = 0.711 * 10^{-04} \times [1/\varepsilon t]^{3.89} * [1/M_R]^{0.854}$$ Eq 16, IRC 115:2014

Rutting Model

$$N = 1.41 \times 10^{-8} \times [1/\varepsilon v]^{4.5337}$$ Eq 17, IRC 115:2014

For special case of Cementitious Layer,

A. Fatigue life in terms of standard axles

$$N = RF \left[\frac{(11300 / E.0804 + 191)}{\varepsilon t} \right]^{12}$$ Eq 6.6, IRC 37:2012

B. Fatigue equations for cumulative Damage Analysis

$$Log\ N_{fi} = \frac{0.972 / (\sigma t + MRup)}{0.0825}$$ Eq 6.7, IRC 37:2012

Using these equations, Actual Remaining Life of the pavement retained can be Evaluated in terms of Traffic MSA.

7.4.1 KGP BACK Application

KGP BACK is a genetic algorithm-based model for back calculation of layer moduli provided along with IRC 115 publication. It uses linear elastic theory for the analysis of pavement in its forward calculation algorithm.

The procedure provided in Appendix III has been adopted to back calculate the Elastic modulus values of each layer listed below

- The Normalize the raw deflection values to 40KN
- Derive the limits for Modulus of Bituminous layer, Granular layer and Sub grade as discussed in Appendix III.8 of IRC 115:2014 and IRC 37: 2012

For this project, The Limits has been considered as below:

	Low Limit	Upper Limit
Bituminous layers	750MPa,	3000MPa.
Cementitious layer[1]	2000MPa	9000MPa
Subgrade[2]	1.2*Esg calc *0.8	1.2* Esg calc *1.2

[1] For Cementitious Layer, the limits are derived based on UCS value shared by the client from their Records

$E_{cgsb} = 1000*UCS$ Eq 7.2, IRC 37:2012

[2] $E_{subgrade}$ (MPa) = $(1-\mu^2)*P/(3.14*r*w$ Eq III.2, IRC 115:2014

Feed the pavement structure detailing values appropriately in KGPBACK application

Modulus values can be arrived; Review the results.

The screen shot of the KGPBACK application has been attached below.

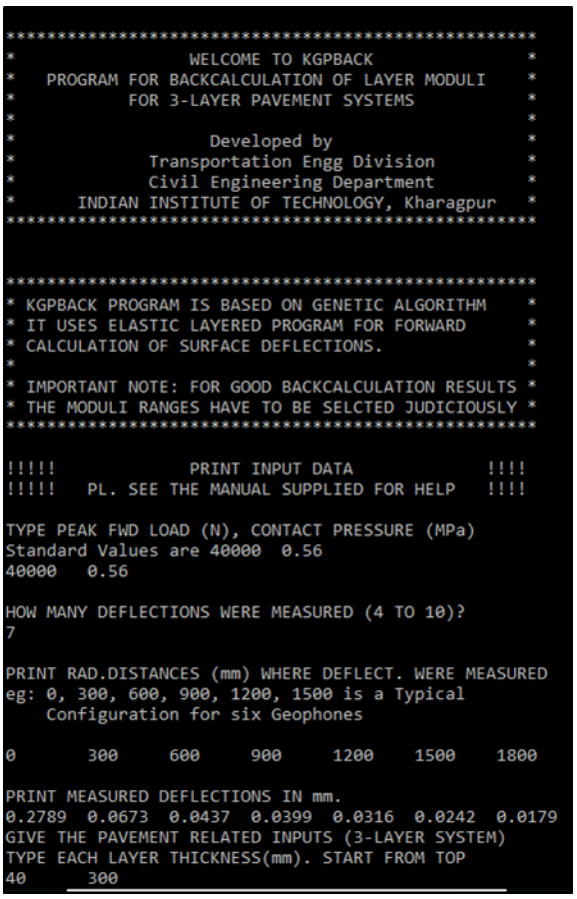

Figure 16: Feeding the data in KGP BACK application

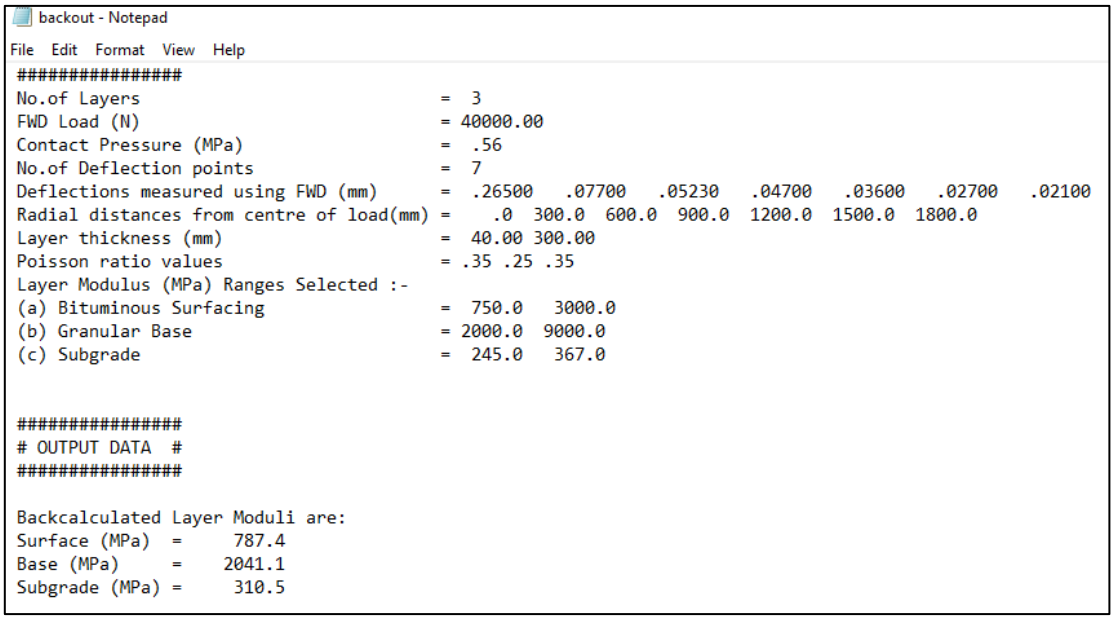

Figure 17: Results obtained from KGPBACK

7.4.2 IIT PAVE Application

IITPAVE is a multilayer elastic layer linear analysis program provided along with IRC 37:2012. This IITPAVE has been used for the computation of stresses and strains in flexible pavements. Tensile strain, at the bottom of the bituminous layer and the vertical strain, on the top of the subgrade are conventionally considered as critical parameters for pavement design to limit cracking and rutting in the bituminous layers and non-bituminous layers respectively. Under repeated wheel loads the pavement foundation materials in different layers do not behave linear elastically. The granular materials and subgrade soils are nonlinear with an elastic modulus varying with level of stresses.

An overview of the analysis process using this IITPAVE is presented below.

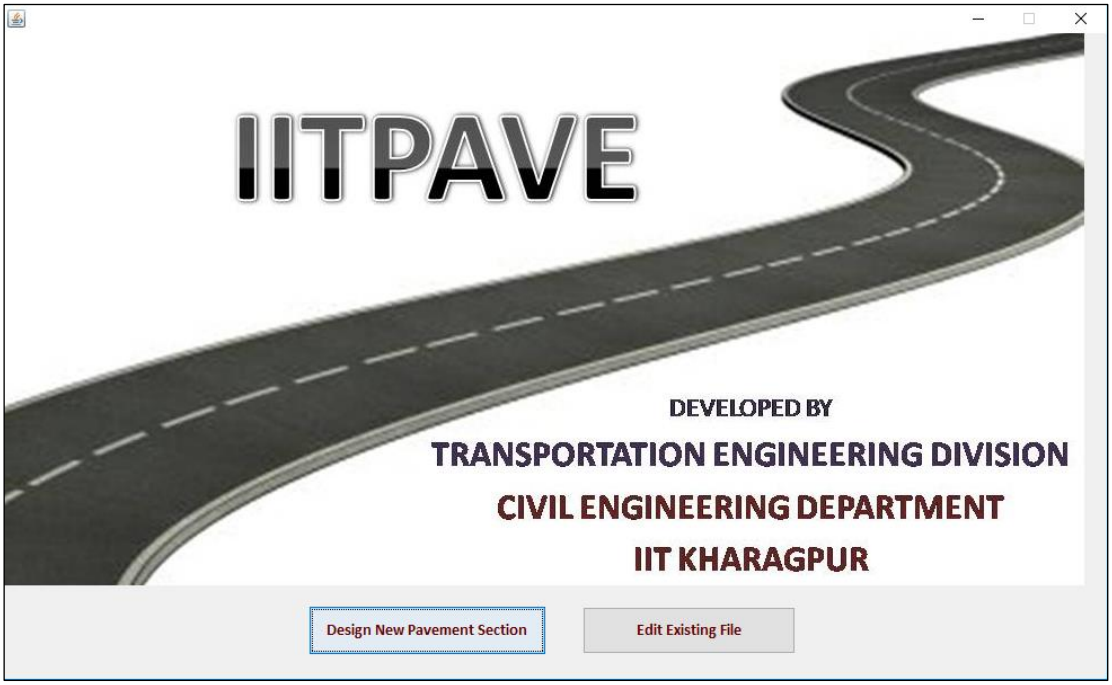

Figure 18: opening Page IITPAVE

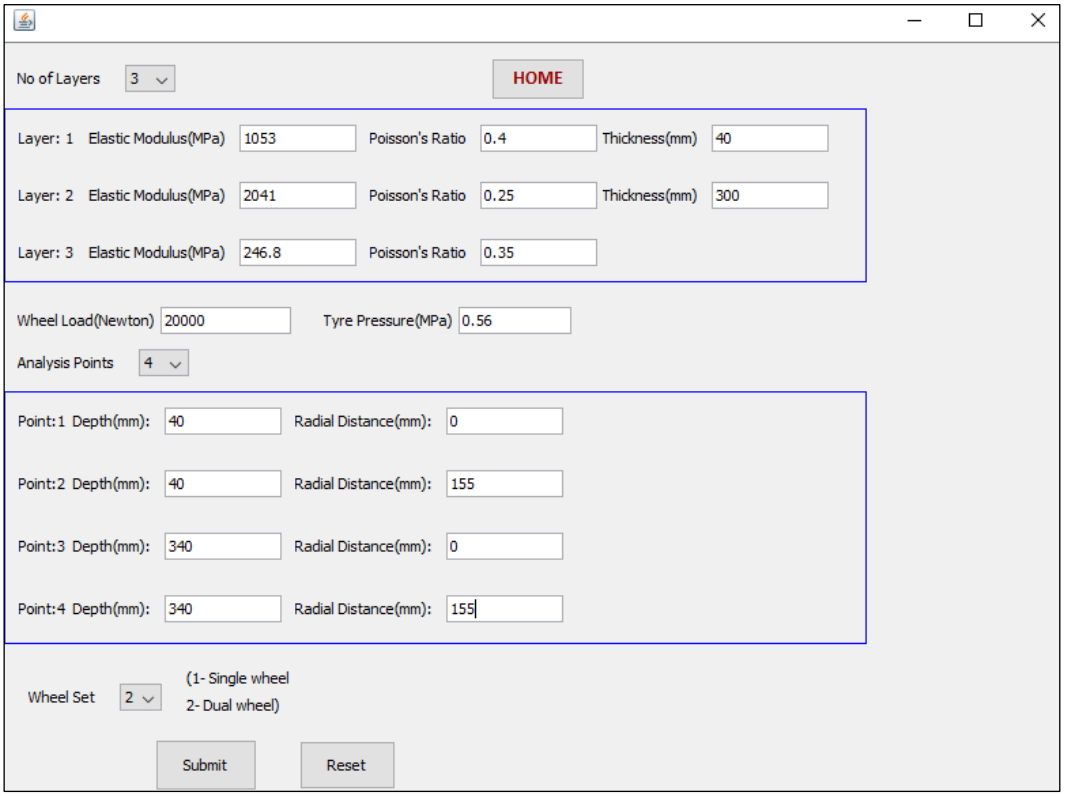

Figure 19: Providing the input values, obtained via KGP Back

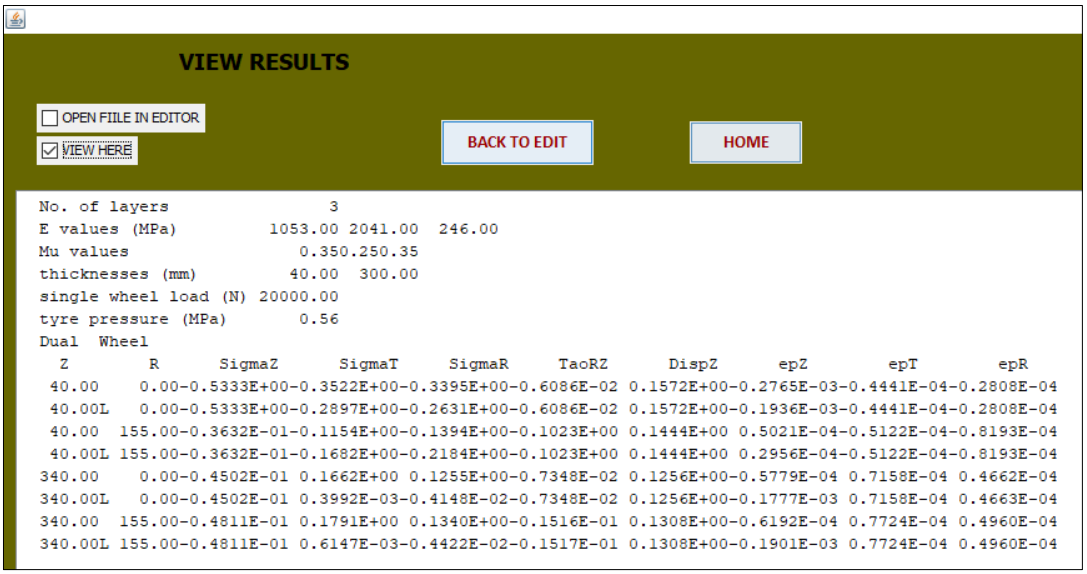

Figure 20: Obtaining required strain values for checking Fatigue and Rutting performances

7.4 ESTIMATION OF DESIGN TRAFFIC

Annual Average Daily Traffic (AADT)

AADT of commercial vehicles obtained from Traffic Volume Count has been summarized below for calculating design traffic.

Table 9: AADT of Commercial Vehicles

Vehicle Type	AADT
BUS	45
LCV	95
2AV	93
3AV	63
MAV	2

Traffic Growth Rates:

In absence of annual growth rate of commercial vehicles, a growth rate of minimum 5% has been considered as per IRC: SP: 84-2014 for calculating cumulative axle repetitions for the future

Lane Distribution Factor:

Since the project road has single lane and intermediate lane configuration lane distribution factor has been considered as 100 percent of the number of commercial vehicles in each direction.

Design life

Design life of 15 years has been considered.

Vehicle Damage Factor:

Adopted VDF values for design has been summarized below

Table 10: Recommended VDF values for Design

Vehicle Type	Adopted VDF
LCV	1.58
Bus	0.1
2Axle	1.8
3Axle	9.64
MAV	16.74

Design Traffic (Cumulative Number of Standard Axles):

The traffic loading in terms of the cumulative number of standard axles for the given period has been computed using the following relationship as given in IRC: 37-2012:

$$N = \frac{365 \times \left\{(1+r)^n - 1\right\}}{r} \times A \times D \times F$$

Where,

N = Cumulative number of standard axles to be catered for the design life in terms of msa.

r = Annual growth rate of commercial vehicles

n = Design life in years

A = Initial traffic in the year of completion of construction in terms of number of commercial vehicles per day exceeding 3 tonnes

D = Lane distribution factor

F = Vehicle Damage Factor

Based on the preceding discussions, the traffic loading in terms of cumulative number of equivalent 8.16 t standard axle loads have been computed for 15 years. Detailed calculation of design traffic has been furnished below.

Table 11: Design Traffic calculations

Vehicle Type/Year	Bus	LCV	2Axle	3Axle	MAV	Million Standard Axles (msa)	Cumulative Million Standard Axles (cmsa)
2018	45	95	93	63	2		
VDF	0.1	1.58	1.8	9.64	16.74		
Growth Rate(%)	5%	5%	5%	5%	5%		
2019	47	100	98	66	2	0.37	0.4
2020	50	105	103	69	2	0.39	0.8
2021	52	110	108	73	2	0.41	1.2
2022	55	115	113	77	2	0.43	1.6
2023	57	121	119	80	3	0.45	2
2024	60	127	125	84	3	0.47	2.5
2025	63	134	131	89	3	0.49	3
2026	66	140	137	93	3	0.52	3.5
2027	70	147	144	98	3	0.55	4.1
2028	73	155	151	103	3	0.57	4.6
2029	77	162	159	108	3	0.6	5.2
2030	81	171	167	113	4	0.63	5.9
2031	85	179	175	119	4	0.66	6.5
2032	89	188	184	125	4	0.7	7.2
2033	94	197	193	131	4	0.73	8

7.4.3 Falling Weight Deflectometer (FWD) Results

Location	File Name indicating Road Name and Direction
Chainage	Distance from start point in meters
Date	Date of Testing
Time	Time of FWD test
Drop	Number of drop number, only second drop presented
Geophone 1	Deflection under load at 0mm offset
Geophone 2	Deflection at 300mm offset from load
Geophone 3	Deflection at 600mm offset from load
Geophone 4	Deflection at 900mm offset from load
Geophone 5	Deflection at 1200mm offset from load
Geophone 6	Deflection at 1500mm offset from load
Geophone 7	Deflection at 1800mm offset from load
kPa	Applied surface pressure from FWD load
kN	Applied surface load

Location	File Name indicating Road Name and Direction
Air (deg)	Air Temperature (Deg C)
Sur (deg)	Surface Temperature (Deg C) measured by non-contact sensor

Maximum Deflection

GEOTRAN Falling Weight Deflectometer (FWD) was used to collect pavement strength and stiffness information and these values are reported in mm. The results of the normalized maximum deflection testing are presented below.

Normalised Deflection Values

In accordance with international best practice and with Section 4.4 of IRC 115, the recorded deflection values have been normalized to the equivalent applied pressure of 40KN.

This Load is representative of a standard ESAL. The following figure presents the Peak Deflection.

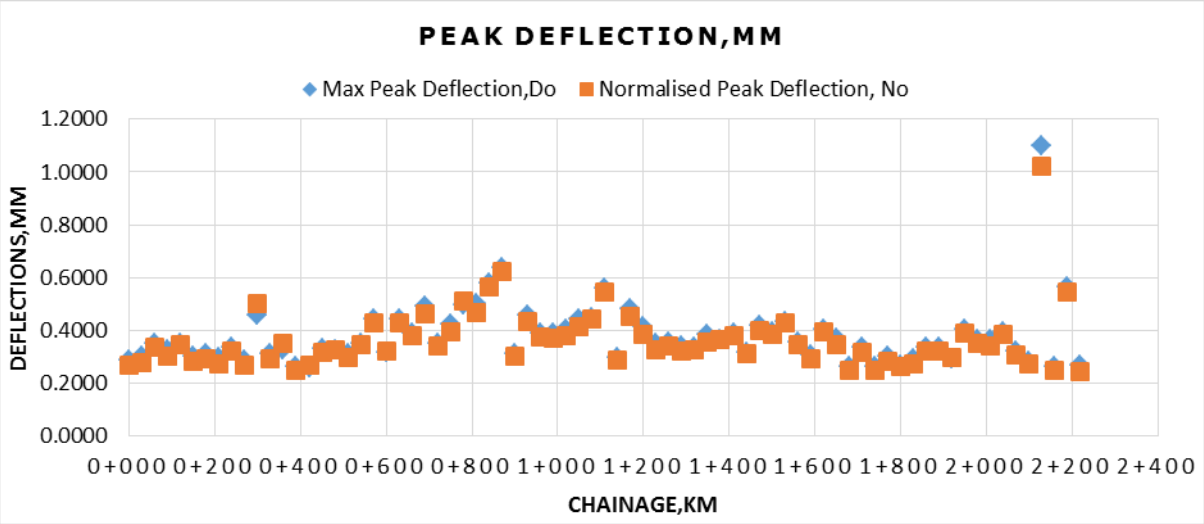

Figure 21: Peak Deflection Values

Modulus Values

In accordance with IRC 115 and IRC 37:2012, the recorded deflection values have been analyzed to determine back-calculated modulus value. The processed results are attached in Appendix.

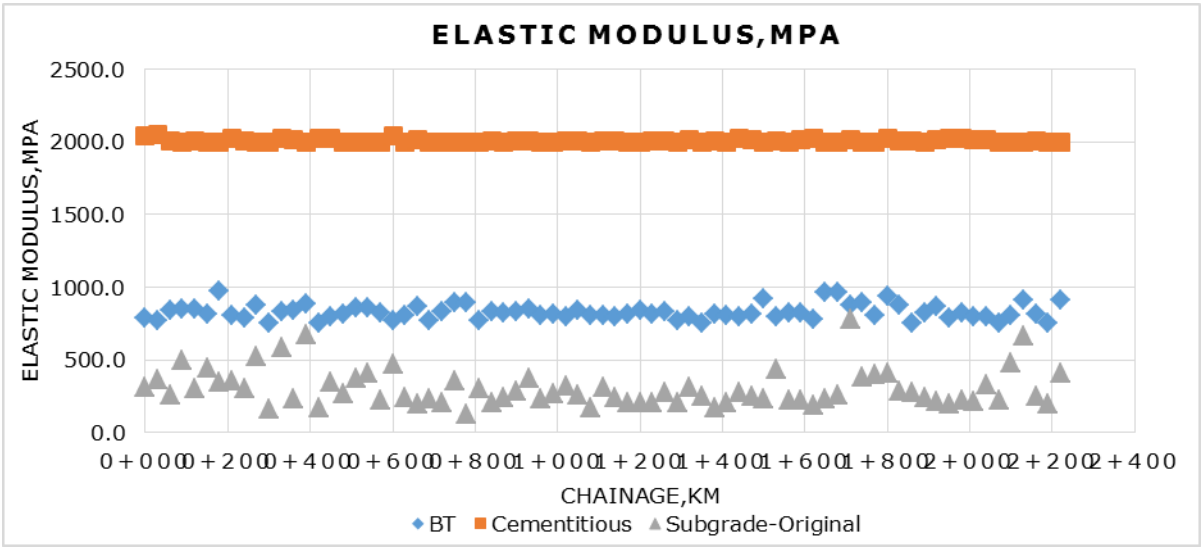

Figure 22: Back calculated Elastic Modulus values of pavement layers

Temperature Corrected Values

In accordance with Section 6.4.2 of IRC 115, the calculated modulus values in the Layer 1 Bituminous Layers have been adjusted relative to the standard temperature of 35°C. Temperature corrections were made based on the infrared pavement temperature readings collected at the time of deflection testing.

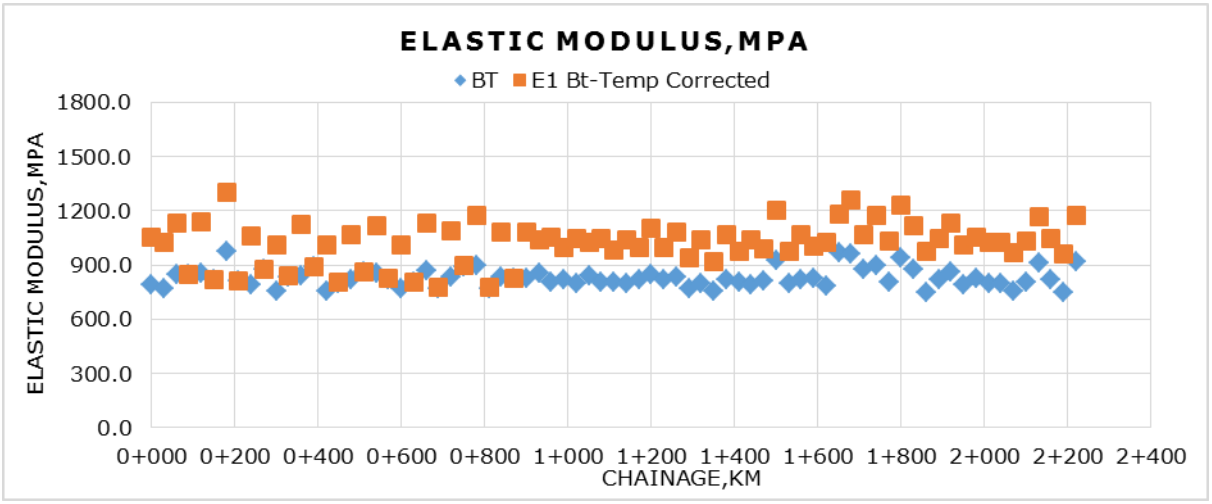

Figure 23: Elastic modulus of bituminous layer (Back calculated modulus vs temperature corrected modulus)

Seasonal Corrected Values

In accordance with Section 6.5.2 of IRC 115 - No correction applied to Cementitious Layer and seasonal correction applied for Subgrade, as the test was executed in winter season.

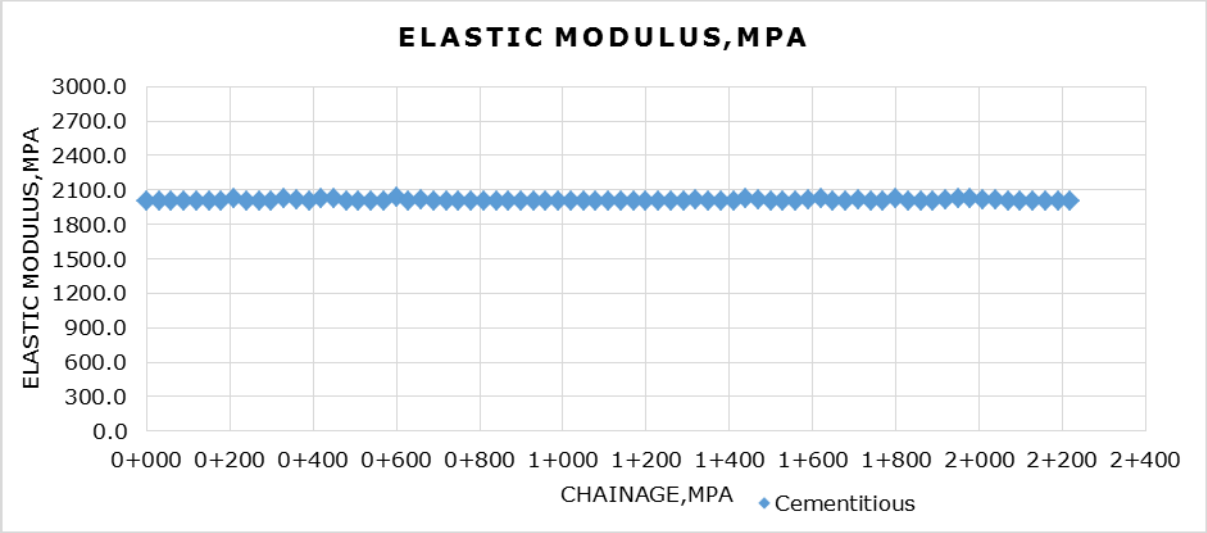

Figure 24: Elastic modulus of cementitious layer

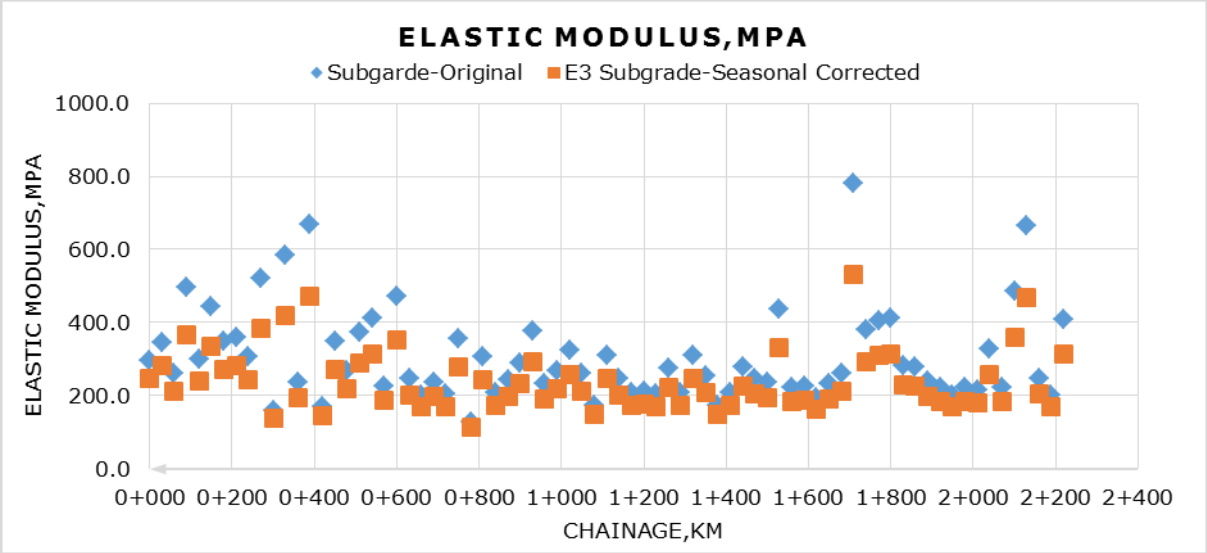

Figure 25: Elastic modulus of subgrade (Back calculated vs seasonal corrected)

7.4.4 Performance Criteria

The Pavement performance is evaluated to find the actual Remaining Life retained at present in terms of Fatigue and Rutting performances for Flexible Pavements. The Design traffic is considered as 5 MSA from clients Records.

As Discussed in Section 4.1 the analysis has been carried out. Based on the Deflection data - Elastic Modulus values has been processed. After applying appropriate correction to Derived Elastic modulus values, the Sections has been grouped to Road-wise and 15% percentile values has been arrived.

The evaluated Fatigue performance of Bituminous layer, Rutting performance based on Subgrade layer, fatigue performance in cementitious layer are listed below

Table 12: Performance criteria

S.No	15%			Fatigue in Bituminous Layer, Nf (MSA)	Fatigue in Cementitious Layer, Nfi (B) (MSA)	Rutting in	Design Traffic	Safe / Not Safe
	E-BT	E-Cementitious	E-Subgrade			Sub-grade, N (MSA)	Ni(MSA)	
1	879	2000	172	2841.4	320	431.18	8	Safe

7.5 DISCUSSION AND CONCLUSION

The project consists of a small road sections near Saalipet road near Poranki in Vijayawada, Andhra Pradesh. The total length of the existing project corridor is 2.2 km approx.

Traffic Volume Count (TVC) and Axle Load Survey has been conducted on Saalipet road near Poranki, Vijayawada. TVC Survey has been conducted for continuous 3 days from 16-11-2018 to 19-11-2018 and Axle load survey has been conducted for 24 hours on 18-11-2018.

The analysis results and observations of TVC and Axle load survey are mentioned below.

- From TVC survey, it is observed that share of non-motorized traffic are ranging from 9% to 12%. Composition of Cars varies from 4 to 8%. Composition of freight vehicles is in the range of 1% to 6%. Buses constitute around 1%. The two wheelers which constitute maximum share at all locations is ranging from 71% to 76%.
- Composition of Commercial vehicles which affects pavement are mentioned below

Buses	LCV	2Axle Truck	3 Axle Truck	MAV
45	94	92	56	2

- During axle load survey it is observed that trucks moving towards Dilip Buildcon concrete mixing plant are 83% overloaded and having maximum Gross vehicle weight more than 45 tones.
- Vehicle Damage Factor (VDF) for each type of commercial vehicles has been calculated and mentioned below

Vehicle Type	**VDF**
LCV	1.58
Bus	0.1
2Axle	1.8
3Axle	9.64
MAV	16.74

- Design traffic has been estimated for 15 years by assuming the growth of 5% at each year and reported as 8msa (million standard axles)

KDM's GEOTRAN Falling Weight Deflectometer was engaged for data collection and the survey was done on 18-Nov-2018. The testing was undertaken in all sections that reflected the road conditions

and pavement composition. Subsequently the analysis was undertaken with appropriate pavement compositions as per IRC guidelines - IRC 115: 2014 and IRC 37: 2012.

The results from the entire stretch are presented in Section 7.

The results indicate:

1. Saalipet road section has a uniform Pavement composition.
2. During initial Testing, it is observed the deflection readings recorded in these sub sections indicates a very stiff underlying layers ensuring the privileges of the high performance heavy volume pavements.
3. for Back calculation process, the limits for Subgrade and Bituminous layer has been considered based on the IRC 115: 2014 and for cementitious layer the limits have been considered based on IRC 37: 2012. The same has been discussed 7.1.
4. The predicted design traffic for 15 years (ie, 2019-2034) estimated as 8 msa. Whereas through the performance check, remaining life of pavement obtained as 320 msa from KGP BACK and IIT PAVE analysis. Considering the above, at the end of 15^{th} year (2034) the service life of the pavement will remain 80%.
5. Overall the existing pavement has approximately 75 years of remaining life, which means that the existing pavement will acceptable functionally and structurally with only routine maintenance for 75 years.

Variability in the calculated results may be a reflection on variability of the pavement composition along the alignment. For each section, the available information only supports the consideration of provided pavement composition in that section.

Appendix 1: Summary of Average Daily Traffic

Name of the Road: Saailpet Road -Sai Satyam Residency **Chainage:** 0.200 Km **Name of the Enumerator:**

Location Name: **Survey Location No:** 1 **Date** 16-11-2018 to 18-11-2018

Direction: **From:** Saalipet **To:** NH-65

Date	Direction	Fast Passenger Vehicles							Fast Goods					Slow Goods		Non -Motarised		
						Bus			Trucks							Non -Motarised		
		Two Wheeler	Auto Rickshaw	Car/Jep/Van	Taxi	Mini Bus	RTC Bus	Pvt Bus	LMV	LCV	2-Axle	3-Axle	MAV	Tractor	Tractor with Trailer	Animal/Hand Drawn	Cycle	Cycle icksha w
16-11-2018	Saalipet to NH-65	1537	108	107	15	25	0	0	53	38	79	15	2	2	6	0	173	36
	NH-65 to Saalipet	2373	184	229	33	38	1	0	98	70	38	27	3	0	51	2	242	34
	Total	**3910**	**292**	**336**	**48**	**63**	**1**	**0**	**151**	**108**	**117**	**42**	**5**	**2**	**57**	**2**	**415**	**70**
17-11-2018	Saalipet to NH-65	1973	96	265	22	16	1	3	39	37	100	21	1	3	28	3	275	19
	NH-65 to Saalipet	2444	177	278	38	33	1	0	88	80	36	68	0	2	78	5	305	32
	Total	**4417**	**273**	**543**	**60**	**49**	**2**	**3**	**127**	**117**	**136**	**89**	**1**	**5**	**106**	**8**	**580**	**51**
18-11-2018	Saalipet to NH-65	1977	99	185	8	5	2	1	32	34	12	17	0	0	20	1	209	18
	NH-65 to Saalipet	2097	126	190	12	7	2	0	20	24	10	21	0	7	14	8	144	21
	Total	**4074**	**225**	**375**	**20**	**12**	**4**	**1**	**52**	**58**	**22**	**38**	**0**	**7**	**34**	**9**	**353**	**39**
ADT		**4134**	**263**	**418**	**43**	**41**	**2**	**1**	**110**	**94**	**92**	**56**	**2**	**5**	**66**	**6**	**449**	**53**
AADT		**4134**	**263**	**418**	**43**	**41**	**2**	**1**	**110**	**94**	**92**	**56**	**2**	**5**	**66**	**6**	**449**	**53**

Name of the Road: Saailpet Road -Sai Satyam Residency **Chainage:** 1.900 Km **Name of the Enumerator:**

Location Name: **Survey Location No:** 2 **Date** 17-11-2018

Direction: **From:** Saalipet **To:** NH-65

Date	Direction	Fast Passenger Vehicles							Fast Goods					Slow Goods		Non -Motarised		
		Two Wheeler	Auto Rickshaw	Car/Jep/Van	Taxi	Bus			Trucks					Tractor	Tractor with Trailer	Non -Motarised		
						Mini Bus	RTC Bus	Pvt Bus	LMV	LCV	2-Axle	3-Axle	MAV			Animal/Hand Drawn	Cycle	Cycle ickshaw
17-11-2018	Saalipet to NH-65	247	12	7	4	3	0	0	1	1	1	1	0	6	0	0	41	8
	NH-65 to Saalipet	239	5	11	2	0	0	1	4	4	1	0	0	1	8	1	26	1
	Total	**486**	**17**	**18**	**6**	**3**	**0**	**1**	**5**	**5**	**2**	**1**	**0**	**7**	**8**	**1**	**67**	**9**
ADT		**486**	**17**	**18**	**6**	**3**	**0**	**1**	**5**	**5**	**2**	**1**	**0**	**7**	**8**	**1**	**67**	**9**
AADT		**486**	**17**	**18**	**6**	**3**	**0**	**1**	**5**	**5**	**2**	**1**	**0**	**7**	**8**	**1**	**67**	**9**

Appendix 2: Hourly data for 3 days direction wise and total

Name of the Road: Saailpet Road -Sai Satyam Residency **Chainage:** 0.200 Km **Name of the Enumerator:**
Location Name: **Survey Location No:** 1 **Date** 16-11-2018
Direction: **From:** Saalipet **To:** NH-65

Time Period		Fast Passenger Vehicles							Fast Goods					Slow Goods		Non -Motarised			Others
						Bus			Trucks							Non -Motarised			
		Two Wheeler	Auto Rickshaw	Car/Jep/Van	Taxi	Mini Bus	RTC Bus	Pvt Bus	LMV	LCV	2-Axle	3-Axle	MAV	Tractor	Tractor with Trailer	Animal/Hand Drawn	Cycle	Cycle icksha w	
09:00	10:00	115	6	14	4	2	0	0	3	0	3	0	0	0	0	0	13	5	0
10:00	11:00	119	4	10	2	0	0	0	8	2	1	0	0	0	1	0	15	5	1
11:00	12:00	128	1	8	0	0	0	0	2	2	5	0	0	0	0	0	11	2	0
12:00	13:00	85	3	7	2	1	0	0	4	2	1	1	0	1	0	0	0	12	0
13:00	14:00	70	1	4	0	0	0	0	1	6	4	1	0	0	0	0	6	2	0
14:00	15:00	35	0	4	0	0	0	0	3	3	4	3	0	0	0	0	6	0	0
15:00	16:00	60	9	8	1	2	0	0	2	3	1	1	0	0	2	0	7	5	0
16:00	17:00	94	9	5	2	3	0	0	1	4	1	2	0	0	0	0	8	0	0
17:00	18:00	100	8	9	0	3	0	0	4	4	1	2	0	0	0	0	13	1	0
18:00	19:00	110	5	5	0	1	0	0	4	1	3	0	0	0	0	0	9	0	0
19:00	20:00	68	5	0	1	0	0	0	5	1	4	0	0	1	0	0	2	0	0
20:00	21:00	60	4	7	0	0	0	0	3	0	3	0	2	0	0	0	5	0	0
21:00	22:00	29	2	1	0	0	0	0	0	2	5	0	0	0	0	0	2	0	0
22:00	23:00	21	2	1	0	0	0	0	0	4	3	1	0	0	0	0	0	0	0
23:00	00:00	16	0	0	0	0	0	0	1	0	3	1	0	0	0	0	1	0	0
00:00	01:00	7	1	0	0	0	0	0	0	1	3	1	0	0	0	0	0	0	0
01:00	02:00	6	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
02:00	03:00	7	0	0	0	0	0	0	0	1	5	0	0	0	0	0	0	0	0
03:00	04:00	6	1	0	0	0	0	0	0	1	4	0	0	0	0	0	0	0	0
04:00	05:00	12	1	0	0	0	0	0	1	0	3	0	0	0	0	0	1	0	0
05:00	06:00	40	10	0	0	0	0	0	2	0	4	0	0	0	0	0	5	0	0
06:00	07:00	75	13	0	0	0	0	0	0	1	4	0	0	0	0	0	15	0	0
07:00	08:00	94	13	3	3	8	0	0	2	0	6	0	0	0	2	0	17	4	0
08:00	09:00	180	10	21	0	5	0	0	7	0	6	2	0	0	1	0	37	0	0
Total		**1537**	**108**	**107**	**15**	**25**	**0**	**0**	**53**	**38**	**79**	**15**	**2**	**2**	**6**	**0**	**173**	**36**	**1**

Traffic and FWD Report

Report on Traffic study and Pavement Evaluation Strength survey, Saalipet Road, Near Poranki, Vijayawada, Andhra Pradesh.

Name of the Road: Saailpet Road
Chainage: 0.200 Km
Name of the Enumerator:
Location Name:
Survey Location No: 1
Date 17-11-2018
Direction: **From:** Saalipet **To:** NH-65

Time Period		Fast Passenger Vehicles							Fast Goods					Slow Goods		Non -Motarised			Others
						Bus			Trucks							Non -Motarised			
		Two Wheeler	Auto Rickshaw	Car/Jep/Van	Taxi	Mini Bus	RTC Bus	Pvt Bus	LMV	LCV	2-Axle	3-Axle	MAV	Tractor	Tractor with Trailer	Animal/Hand Drawn	Cycle	Cycle icksha w	
09:00	10:00	163	9	29	2	1	0	0	7	7	6	1	0	0	1	0	22	1	0
10:00	11:00	181	11	15	1	0	0	0	4	4	5	0	0	0	2	0	21	3	0
11:00	12:00	128	10	17	0	0	0	0	0	3	2	0	0	0	2	0	12	3	0
12:00	13:00	121	6	19	0	0	0	0	3	1	7	1	0	0	2	0	11	1	0
13:00	14:00	65	3	11	2	0	0	0	2	0	5	0	0	0	1	0	9	1	0
14:00	15:00	50	2	9	1	0	0	0	1	1	5	0	0	0	3	0	5	0	0
15:00	16:00	77	3	11	0	2	0	0	4	0	5	2	1	0	1	0	16	2	0
16:00	17:00	125	6	13	1	8	0	0	3	4	3	0	0	0	2	0	12	1	1
17:00	18:00	118	7	17	3	2	0	0	3	5	0	0	0	0	4	0	14	3	0
18:00	19:00	148	11	19	3	0	1	2	4	6	6	0	0	2	3	3	15	1	0
19:00	20:00	117	10	15	2	3	1	1	0	0	3	2	0	0	3	0	21	0	0
20:00	21:00	88	6	8	2	0	0	0	1	1	2	0	0	0	0	0	12	0	0
21:00	22:00	57	2	13	0	0	0	0	0	1	9	2	0	0	0	0	2	0	0
22:00	23:00	24	0	2	1	0	0	0	0	0	3	0	0	0	0	0	0	0	0
23:00	00:00	32	0	5	0	0	0	0	3	0	0	8	0	0	0	0	0	0	0
00:00	01:00	26	0	7	2	0	0	0	0	0	0	5	0	0	0	0	0	0	0
01:00	02:00	15	0	4	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0
02:00	03:00	18	0	5	0	0	0	0	0	0	6	0	0	0	0	0	0	0	0
03:00	04:00	11	0	3	0	0	0	0	0	0	8	0	0	0	0	0	0	0	0
04:00	05:00	18	0	8	0	0	0	0	0	0	5	0	0	0	0	0	0	0	0
05:00	06:00	37	0	7	1	0	0	0	0	0	2	0	0	0	0	0	10	0	0
06:00	07:00	52	0	7	0	0	0	0	0	1	5	0	0	0	0	0	27	0	0
07:00	08:00	118	4	8	0	0	0	0	2	1	3	0	0	1	1	0	27	0	0
08:00	09:00	184	6	13	1	0	0	0	2	2	4	0	0	0	3	0	39	3	1
Total		**1973**	**96**	**265**	**22**	**16**	**2**	**3**	**39**	**37**	**100**	**21**	**1**	**3**	**28**	**3**	**275**	**19**	**2**

Name of the Road: Saailpet Road -Sai Satyam Residency

Chainage: 0.200 Km

Name of the Enumerator:

Location Name:

Survey Location No: 1

Direction: **From:** NH 65 **To:** Saalipet

Date 17-11-2018

Time Period		Fast Passenger Vehicles							Fast Goods					Slow Goods		Non -Motorised			Others
						Bus			Trucks							Non -Motorised			
		Two Wheeler	Auto Rickshaw	Car/Jep/Van	Taxi	Mini Bus	RTC Bus	Pvt Bus	LMV	LCV	2-Axle	3-Axle	MAV	Tractor	Tractor with Trailer	Animal/Hand Drawn	Cycle	Cycle icksha w	
09:00	10:00	140	29	16	8	14	0	0	6	7	6	5	0	0	9	0	16	6	0
10:00	11:00	149	12	20	2	0	0	0	5	3	1	0	0	0	3	0	15	3	0
11:00	12:00	157	20	16	2	0	0	0	3	5	0	2	0	0	2	5	11	2	0
12:00	13:00	167	13	11	2	3	0	0	4	2	1	0	0	0	1	0	13	1	1
13:00	14:00	103	15	17	6	1	0	0	6	8	1	0	0	0	5	0	18	0	0
14:00	15:00	88	3	10	2	0	0	0	7	2	3	4	0	0	7	0	9	1	0
15:00	16:00	79	6	10	0	3	0	0	0	1	1	0	0	1	3	0	5	3	0
16:00	17:00	150	7	17	1	4	0	0	2	6	0	1	0	0	2	0	21	3	0
17:00	18:00	138	17	22	0	2	0	0	11	7	1	1	0	0	7	0	17	3	1
18:00	19:00	146	11	12	3	3	0	0	7	1	1	0	0	0	9	0	29	3	0
19:00	20:00	189	13	14	3	2	1	0	2	3	0	3	0	0	2	0	21	2	0
20:00	21:00	185	8	19	1	0	0	0	2	0	1	4	0	0	1	0	12	1	0
21:00	22:00	120	2	14	1	0	0	0	6	6	2	8	0	1	1	0	6	0	0
22:00	23:00	32	2	10	0	1	0	0	0	0	3	8	0	0	2	0	6	0	0
23:00	00:00	13	0	1	0	0	0	0	0	0	4	6	0	0	0	0	5	0	0
00:00	01:00	8	0	7	0	0	0	0	0	1	1	4	0	0	0	0	1	0	0
01:00	02:00	9	0	4	1	0	0	0	0	3	1	4	0	0	0	0	1	0	0
02:00	03:00	11	0	4	0	0	0	0	0	2	1	1	0	0	0	0	0	0	0
03:00	04:00	22	0	9	0	0	0	0	5	3	0	4	0	0	0	0	7	0	0
04:00	05:00	24	1	7	0	0	0	0	3	5	1	7	0	0	0	0	11	0	0
05:00	06:00	85	3	5	1	0	0	0	5	2	1	0	0	0	5	0	17	0	0
06:00	07:00	125	4	11	3	0	0	0	5	5	0	2	0	0	9	0	15	1	0
07:00	08:00	147	10	13	2	0	0	0	7	6	2	2	0	0	8	0	24	1	0
08:00	09:00	157	1	9	0	0	0	0	2	2	4	2	0	0	2	0	25	2	0
Total		**2444**	**177**	**278**	**38**	**33**	**1**	**0**	**88**	**80**	**36**	**68**	**0**	**2**	**78**	**5**	**305**	**32**	**2**

Name of the Road: Saailpet Road -Sai Satyam Residency **Chainage:** 0.200 Km **Name of the Enumerator:**

Location Name: **Survey Location No:** 1

Direction: **From:** Saalipet **To:** NH-65 **Date** 18-11-2018

Time Period		Fast Passenger Vehicles							Fast Goods					Slow Goods		Non -Motarised		
						Bus			Trucks							Non -Motarised		
		Two Wheeler	Auto Rickshaw	Car/Jep/Van	Taxi	Mini Bus	RTC Bus	Pvt Bus	LMV	LCV	2-Axle	3-Axle	MAV	Tractor	Tractor with Trailer	Animal/Hand Drawn	Cycle	Cycle icksha w
09:00	10:00	152	6	14	1	0	0	0	3	5	4	1	0	0	1	0	17	5
10:00	11:00	176	5	15	0	0	0	0	7	1	0	0	0	0	4	0	24	5
11:00	12:00	129	8	12	0	0	0	0	3	2	1	1	0	0	1	0	6	1
12:00	13:00	114	6	25	0	0	0	0	3	1	1	0	0	0	0	1	13	0
13:00	14:00	81	3	8	0	0	0	0	0	1	1	0	0	0	0	0	2	0
14:00	15:00	83	6	11	0	0	0	0	0	2	0	1	0	0	5	0	7	1
15:00	16:00	55	3	7	0	0	0	0	0	4	1	0	0	0	3	0	8	0
16:00	17:00	133	6	11	0	0	0	0	0	4	0	0	0	0	5	0	22	0
17:00	18:00	135	6	10	0	0	0	0	0	4	1	0	0	0	0	0	17	0
18:00	19:00	136	6	15	1	0	0	0	0	1	1	0	0	0	0	0	9	1
19:00	20:00	106	2	14	0	0	1	0	0	1	0	1	0	0	1	0	8	0
20:00	21:00	107	1	2	0	0	0	0	2	0	0	0	0	0	0	0	1	0
21:00	22:00	76	5	5	2	0	1	0	2	0	0	2	0	0	0	0	2	0
22:00	23:00	23	4	6	0	0	0	0	0	0	0	1	0	0	0	0	0	0
23:00	00:00	6	0	1	0	0	0	0	1	0	0	0	0	0	0	0	0	0
00:00	01:00	4	1	0	0	0	0	0	0	0	0	4	0	0	0	0	0	0
01:00	02:00	0	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
02:00	03:00	0	0	0	0	0	0	0	0	0	1	6	0	0	0	0	0	0
03:00	04:00	10	0	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0
04:00	05:00	29	3	2	0	0	0	0	1	0	0	0	0	0	0	0	7	0
05:00	06:00	22	0	1	0	0	0	0	0	0	0	0	0	0	0	0	4	0
06:00	07:00	127	7	3	0	0	0	0	0	0	0	0	0	0	0	0	18	4
07:00	08:00	121	14	10	3	5	0	1	5	4	0	0	0	0	0	0	25	1
08:00	09:00	152	7	11	1	0	0	0	3	2	1	0	0	0	0	0	19	0
Total		**1977**	**99**	**185**	**8**	**5**	**2**	**1**	**32**	**34**	**12**	**17**	**0**	**0**	**20**	**1**	**209**	**18**

Name of the Road: Saailpet Road -Sai Satyam Residency **Chainage:** 0.200 Km **Name of the Enumerator:**

Location Name: **Survey Location No:** 1

Direction: **From:** NH 65 **To:** Saalipet **Date** 18-11-2018

Time Period		Fast Passenger Vehicles							Fast Goods					Slow Goods		Non -Motarised		
						Bus			Trucks							Non -Motarised		
		Two Wheeler	Auto Rickshaw	Car/Jep/Van	Taxi	Mini Bus	RTC Bus	Pvt Bus	LMV	LCV	2-Axle	3-Axle	MAV	Tractor	Tractor with Trailer	Animal/Hand Drawn	Cycle	Cycle icksha w
09:00	10:00	142	8	7	1	0	0	0	3	2	0	1	0	7	1	3	5	4
10:00	11:00	149	10	8	2	0	0	0	3	0	0	0	0	0	0	0	19	3
11:00	12:00	178	9	19	0	0	0	0	3	5	0	0	0	0	0	1	12	1
12:00	13:00	137	9	20	0	0	0	0	0	0	0	0	0	0	0	0	6	0
13:00	14:00	122	6	14	2	0	0	0	1	2	1	0	0	0	0	4	10	0
14:00	15:00	132	5	14	2	0	0	0	0	1	1	0	0	0	2	0	5	0
15:00	16:00	113	3	15	0	0	0	0	0	4	0	1	0	0	1	0	7	1
16:00	17:00	123	17	11	0	0	0	0	3	2	0	1	0	0	1	0	14	1
17:00	18:00	139	9	23	0	0	0	0	3	3	1	4	0	0	6	0	12	0
18:00	19:00	97	3	5	0	0	0	0	1	0	3	0	0	0	0	0	2	0
19:00	20:00	80	2	1	0	0	1	0	0	0	0	0	0	0	0	0	4	0
20:00	21:00	115	4	3	0	0	0	0	0	0	1	0	0	0	0	0	4	0
21:00	22:00	68	1	5	0	0	0	0	0	1	0	0	0	0	0	0	3	1
22:00	23:00	65	4	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23:00	00:00	17	1	7	0	0	0	0	0	0	0	2	0	0	0	0	1	0
00:00	01:00	6	1	1	0	0	0	0	0	0	0	5	0	0	0	0	0	0
01:00	02:00	2	1	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0
02:00	03:00	3	0	0	0	0	0	0	0	1	2	5	0	0	0	0	1	0
03:00	04:00	5	1	0	0	0	0	0	1	1	0	0	0	0	0	0	1	0
04:00	05:00	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
05:00	06:00	13	4	0	0	0	0	0	0	0	0	0	0	0	0	0	2	1
06:00	07:00	119	11	7	3	1	0	0	1	0	1	1	0	0	0	0	17	7
07:00	08:00	124	7	9	0	5	1	0	1	1	0	0	0	0	3	0	9	1
08:00	09:00	140	10	13	2	1	0	0	0	0	0	0	0	0	0	0	9	1
Total		**2097**	**126**	**190**	**12**	**7**	**2**	**0**	**20**	**24**	**10**	**21**	**0**	**7**	**14**	**8**	**144**	**21**

Name of the Road: Saailpet Road -Sai Satyam Residency

Chainage: 1.9 Km

Name of the Enumerator:

Location Name:

Survey Location No: 2

Date 16-11-2018

Direction: **From:** Saalipet **To:** NH-65

Time Period		Fast Passenger Vehicles							Fast Goods					Slow Goods		Non -Motarised			Others
						Bus			Trucks							Non -Motarised			
		Two Wheeler	Auto Rickshaw	Car/Jep/Van	Taxi	Mini Bus	RTC Bus	Pvt Bus	LMV	LCV	2-Axle	3-Axle	MAV	Tractor	Tractor with Trailer	Animal/Hand Drawn	Cycle	Cycle ickshaw	
09:00	10:00	8	4	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	0
10:00	11:00	26	2	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
11:00	12:00	10	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0
12:00	13:00	22	0	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0
13:00	14:00	10	4	0	0	0	0	0	0	0	1	1	0	1	0	0	0	0	0
14:00	15:00	17	0	3	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0
15:00	16:00	17	0	0	0	0	0	0	0	0	0	0	0	3	0	0	5	0	0
16:00	17:00	15	2	1	0	2	0	0	0	0	0	0	0	0	0	0	0	3	1
17:00	18:00	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
18:00	19:00	14	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0
19:00	20:00	23	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
20:00	21:00	9	0	0	3	0	0	0	0	1	0	0	0	0	0	0	0	0	0
21:00	22:00	8	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22:00	23:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23:00	00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
00:00	01:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	05:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00	06:00	19	0	0	0	0	0	0	0	0	0	0	0	0	0	0	11	0	0
06:00	07:00	22	0	0	0	0	0	0	0	0	0	0	0	0	0	0	16	0	0
07:00	08:00	14	0	0	0	0	0	0	0	0	0	0	0	0	0	0	5	0	0
08:00	09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total		**247**	**12**	**7**	**4**	**3**	**0**	**0**	**1**	**1**	**1**	**1**	**0**	**6**	**0**	**0**	**41**	**8**	**1**

Name of the Road: Saailpet Road -Sai Satyam Residency **Chainage:** 1.9Km **Name of the Enumerator:**

Location Name: **Survey Location No:** 2 **Date** 16-11-2018

Direction: **From:** NH 65 **To:** Saalipet

Time Period		Fast Passenger Vehicles							Fast Goods					Slow Goods		Non -Motarised		
						Bus			Trucks							Non -Motarised		
		Two Wheeler	Auto Rickshaw	Car/Jep/Van	Taxi	Mini Bus	RTC Bus	Pvt Bus	LMV	LCV	2-Axle	3-Axle	MAV	Tractor	Tractor with Trailer	Animal/Hand Drawn	Cycle	Cycle icksha w
09:00	10:00	16	0	0	1	0	0	0	0	1	1	0	0	1	0	0	4	1
10:00	11:00	18	1	2	0	0	0	0	2	0	0	0	0	0	0	0	2	0
11:00	12:00	21	1	1	1	0	0	0	1	0	0	0	0	0	0	0	1	0
12:00	13:00	22	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0
13:00	14:00	14	2	3	0	0	0	0	0	0	0	0	0	0	0	0	2	0
14:00	15:00	18	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
15:00	16:00	12	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
16:00	17:00	14	0	1	0	0	0	1	1	0	0	0	0	0	0	0	6	0
17:00	18:00	15	0	1	0	0	0	0	0	0	0	0	0	0	7	0	1	0
18:00	19:00	12	0	2	0	0	0	0	0	1	0	0	0	0	1	0	0	0
19:00	20:00	13	0	0	0	0	0	0	0	2	0	0	0	0	0	0	0	0
20:00	21:00	16	1	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
21:00	22:00	10	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
22:00	23:00	9	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
23:00	00:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
00:00	01:00	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
01:00	02:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
02:00	03:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
03:00	04:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
04:00	05:00	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
05:00	06:00	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3	0
06:00	07:00	13	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0
07:00	08:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
08:00	09:00	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Total		**239**	**5**	**11**	**2**	**0**	**0**	**1**	**4**	**4**	**1**	**0**	**0**	**1**	**8**	**1**	**26**	**1**

Name of the Road: Saailpet Road **Chainage:** 0.200 Km **Name of the Enumerator:**

Location Name: **Survey Location No:** 1

Direction: **From:** Both Directions **To:** **Date** 16-11-2018

Time Period		Fast Passenger Vehicles							Fast Goods					Slow Goods		Non -Motarised			Others
						Bus			Trucks							Non -Motarised			
		Two Wheeler	Auto Rickshaw	Car/Jep/Van	Taxi	Mini Bus	RTC Bus	Pvt Bus	LMV	LCV	2-Axle	3-Axle	MAV	Tractor	Tractor with Trailer	Animal/Hand Drawn	Cycle	Cycle ickshaw	
09:00	10:00	290	24	29	6	2	0	0	8	1	4	0	0	0	2	0	33	9	0
10:00	11:00	294	17	24	4	0	0	0	14	2	2	1	0	0	4	0	34	11	1
11:00	12:00	280	3	23	1	0	0	0	9	5	7	0	0	0	3	0	20	4	0
12:00	13:00	260	13	21	3	2	0	0	11	4	1	2	2	1	2	0	14	14	0
13:00	14:00	157	4	8	0	0	0	0	6	10	8	1	0	0	0	0	12	4	0
14:00	15:00	184	11	9	0	0	0	0	9	5	5	4	0	0	7	0	16	2	0
15:00	16:00	143	19	16	3	5	0	0	6	8	1	1	0	0	3	0	13	11	0
16:00	17:00	240	20	24	7	7	0	0	4	9	2	2	0	0	0	0	26	1	0
17:00	18:00	298	18	32	4	7	0	0	7	10	3	3	0	0	3	0	29	1	0
18:00	19:00	313	21	24	0	3	0	0	5	3	3	0	0	0	7	2	33	2	0
19:00	20:00	261	15	9	3	0	1	0	8	3	5	2	0	1	1	0	18	0	0
20:00	21:00	209	12	27	1	0	0	0	5	3	3	0	2	0	0	0	24	0	0
21:00	22:00	101	10	4	0	0	0	0	5	5	6	0	0	0	1	0	8	0	0
22:00	23:00	68	6	6	1	0	0	0	2	4	3	2	0	0	0	0	1	0	0
23:00	00:00	33	1	1	0	0	0	0	2	1	4	2	0	0	0	0	1	0	0
00:00	01:00	17	2	2	0	0	0	0	2	2	3	3	0	0	0	0	0	0	0
01:00	02:00	11	0	0	0	0	0	0	2	1	3	3	0	0	1	0	0	0	0
02:00	03:00	21	2	1	0	0	0	0	1	3	6	1	0	0	0	0	1	0	0
03:00	04:00	18	2	0	0	0	0	0	2	5	6	4	1	0	1	0	0	0	0
04:00	05:00	31	6	2	0	0	0	0	4	4	6	3	0	0	3	0	6	0	0
05:00	06:00	65	16	3	0	0	0	0	3	5	6	1	0	0	2	0	13	0	0
06:00	07:00	120	21	3	0	0	0	0	6	7	11	2	0	0	4	0	23	0	0
07:00	08:00	200	24	15	5	18	0	0	15	6	8	2	0	0	6	0	31	4	0
08:00	09:00	296	25	53	10	19	0	0	15	2	11	3	0	0	7	0	59	7	0
Total		**3910**	**292**	**336**	**48**	**63**	**1**	**0**	**151**	**108**	**117**	**42**	**5**	**2**	**57**	**2**	**415**	**70**	**1**

Name of the Road: Saailpet Road -Sai Satyam Residency **Chainage:** 0.200 Km **Name of the Enumerator:**

Location Name: **Survey Location No:** 1 **Date** 17-11-2018

Direction: **Both**

Time Period		Fast Passenger Vehicles							Fast Goods					Slow Goods		Non -Motarised		
						Bus			Trucks							Non -Motarised		
		Two Wheeler	Auto Rickshaw	Car/Jep/Van	Taxi	Mini Bus	RTC Bus	Pvt Bus	LMV	LCV	2-Axle	3-Axle	MAV	Tractor	Tractor with Trailer	Animal/Hand Drawn	Cycle	Cycle ickshaw
09:00	10:00	303	38	45	10	15	0	0	13	14	12	6	0	0	10	0	38	7
10:00	11:00	330	23	35	3	0	0	0	9	7	6	0	0	0	5	0	36	6
11:00	12:00	285	30	33	2	0	0	0	3	8	2	2	0	0	4	5	23	5
12:00	13:00	288	19	30	2	3	0	0	7	3	8	1	0	0	3	0	24	2
13:00	14:00	168	18	28	8	1	0	0	8	8	6	0	0	0	6	0	27	1
14:00	15:00	138	5	19	3	0	0	0	8	3	8	4	0	0	10	0	14	1
15:00	16:00	156	9	21	0	5	0	0	4	1	6	2	1	1	4	0	21	5
16:00	17:00	275	13	30	2	12	0	0	5	10	3	1	0	0	4	0	33	4
17:00	18:00	256	24	39	3	4	0	0	14	12	1	1	0	0	11	0	31	6
18:00	19:00	294	22	31	6	3	1	2	11	7	7	0	0	2	12	3	44	4
19:00	20:00	306	23	29	5	5	2	1	2	3	3	5	0	0	5	0	42	2
20:00	21:00	273	14	27	3	0	0	0	3	1	3	4	0	0	1	0	24	1
21:00	22:00	177	4	27	1	0	0	0	6	7	11	10	0	1	1	0	8	0
22:00	23:00	56	2	12	1	1	0	0	0	0	6	8	0	0	2	0	6	0
23:00	00:00	45	0	6	0	0	0	0	3	0	4	14	0	0	0	0	5	0
00:00	01:00	34	0	14	2	0	0	0	0	1	1	9	0	0	0	0	1	0
01:00	02:00	24	0	8	1	0	0	0	0	3	7	4	0	0	0	0	1	0
02:00	03:00	29	0	9	0	0	0	0	0	2	7	1	0	0	0	0	0	0
03:00	04:00	33	0	12	0	0	0	0	5	3	8	4	0	0	0	0	7	0
04:00	05:00	42	1	15	0	0	0	0	3	5	6	7	0	0	0	0	11	0
05:00	06:00	122	3	12	2	0	0	0	5	2	3	0	0	0	5	0	27	0
06:00	07:00	177	4	18	3	0	0	0	5	6	5	2	0	0	9	0	42	1
07:00	08:00	265	14	21	2	0	0	0	9	7	5	2	0	1	9	0	51	1
08:00	09:00	341	7	22	1	0	0	0	4	4	8	2	0	0	5	0	64	5
Total		**4417**	**273**	**543**	**60**	**49**	**3**	**3**	**127**	**117**	**136**	**89**	**1**	**5**	**106**	**8**	**580**	**51**

Name of the Road: Saailpet Road -Sai Satyam Residency
Chainage: 0.200 Km
Name of the Enumerator:
Location Name:
Survey Location No: 1
Direction: Both
Date 18-11-2018

Time Period		Fast Passenger Vehicles							Fast Goods					Slow Goods		Non -Motarised		
						Bus			Trucks							Non -Motarised		
		Two Wheeler	Auto Rickshaw	Car/Jep/Van	Taxi	Mini Bus	RTC Bus	Pvt Bus	LMV	LCV	2-Axle	3-Axle	MAV	Tractor	Tractor with Trailer	Animal/Hand Drawn	Cycle	Cycle ickshaw
09:00	10:00	294	14	21	2	0	0	0	6	7	4	2	0	7	2	3	22	9
10:00	11:00	325	15	23	2	0	0	0	10	1	0	0	0	0	4	0	43	8
11:00	12:00	307	17	31	0	0	0	0	6	7	1	1	0	0	1	1	18	2
12:00	13:00	251	15	45	0	0	0	0	3	1	1	0	0	0	0	1	19	0
13:00	14:00	203	9	22	2	0	0	0	1	3	2	0	0	0	0	4	12	0
14:00	15:00	215	11	25	2	0	0	0	0	3	1	1	0	0	7	0	12	1
15:00	16:00	168	6	22	0	0	0	0	0	8	1	1	0	0	4	0	15	1
16:00	17:00	256	23	22	0	0	0	0	3	6	0	1	0	0	6	0	36	1
17:00	18:00	274	15	33	0	0	0	0	3	7	2	4	0	0	6	0	29	0
18:00	19:00	233	9	20	1	0	0	0	1	1	4	0	0	0	0	0	11	1
19:00	20:00	186	4	15	0	0	2	0	0	1	0	1	0	0	1	0	12	0
20:00	21:00	222	5	5	0	0	0	0	2	0	1	0	0	0	0	0	5	0
21:00	22:00	144	6	10	2	0	1	0	2	1	0	2	0	0	0	0	5	1
22:00	23:00	88	8	14	0	0	0	0	0	0	0	1	0	0	0	0	0	0
23:00	00:00	23	1	8	0	0	0	0	1	0	0	2	0	0	0	0	1	0
00:00	01:00	10	2	1	0	0	0	0	0	0	0	9	0	0	0	0	0	0
01:00	02:00	2	1	0	0	0	0	0	0	3	0	1	0	0	0	0	0	0
02:00	03:00	3	0	0	0	0	0	0	0	1	3	11	0	0	0	0	1	0
03:00	04:00	15	1	2	0	0	0	0	3	1	0	0	0	0	0	0	1	0
04:00	05:00	37	3	2	0	0	0	0	1	0	0	0	0	0	0	0	8	0
05:00	06:00	35	4	1	0	0	0	0	0	0	0	0	0	0	0	0	6	1
06:00	07:00	246	18	10	3	1	0	0	1	0	1	1	0	0	0	0	35	11
07:00	08:00	245	21	19	3	10	1	1	6	5	0	0	0	0	3	0	34	2
08:00	09:00	292	17	24	3	1	0	0	3	2	1	0	0	0	0	0	28	1
Total		**4074**	**225**	**375**	**20**	**12**	**4**	**1**	**52**	**58**	**22**	**38**	**0**	**7**	**34**	**9**	**353**	**39**

Appendix 3: Axle load data & VDF Calculations

Location:			Saalipet		Wheel Load (Tonnes)				Axle Load (Tonnes)				Date:				18-11-2018
Direction:		N.H-65 To Saalipet											Date:				18-11-2018
S.No.	Time	Vehicle Type	Axle Configuration	Commodity Type		1st Axle	2nd Axle	3rd Axle	1st Axle	2nd Axle	3rd Axle	4th Axle	Equivalence Factor			VEF	VDF
1	17:50	LCV	1.2	loaded	1700	5940			3400	11880			0.07	4.49		4.56	1.58
2	18;22	LCV	1.2	empty	1570	1620			3140	3240			0.05	0.02		0.08	
3	3;44	LCV	1.2	empty	1590	1790			3180	3580			0.05	0.04		0.09	
4	07:05	Bus	1.2	empty	1700	1620			3400	3240			0.07	0.02		0.10	**0.10**
5	10:42	2Axle	1.2	water	2250	5930			4500	11860			0.22	4.46		4.68	**1.80**
6	12:16	2Axle	1.2	water	1545	2535			3090	5070			0.05	0.15		0.20	
7	02:26	2Axle	1.2	empty	1690	2080			3380	4160			0.07	0.07		0.14	
8	02:20	2Axle	1.2	loaded water	2550	4250			5100	8500			0.36	1.18		1.53	
9	02:31	2Axle	1.2	loaded	3035	4680			6070	9360			0.72	1.73		2.45	
10	03:24	3Axle	1.22	empty	2595	2625	2535		5190	5250	5070		0.38	0.22		0.60	**9.64**
11	16:14	3Axle	1.22	empty	2485	2135	2260		4970	4270	4520		0.32	0.11		0.44	
12	17:08	3Axle	1.22	empty	2040	1090	1750		4080	2180	3500		0.15	0.02		0.17	
13	17:19	3Axle	1.22	empty	2355	1810	1750		4710	3620	3500		0.26	0.05		0.31	
14	17:41	3Axle	1.22	empty	2460	2105	1980		4920	4210	3960		0.31	0.09		0.39	
15	17:57	3Axle	1.22	empty	3215	2745	2665		6430	5490	5330		0.90	0.26		1.16	
16	18:08	3Axle	1.22	empty	1670	1240	1455		3340	2480	2910		0.07	0.02		0.08	
17	18:17	3Axle	1.22	empty	2580	2335	2470		5160	4670	4940		0.37	0.16		0.54	
18	08:40	3Axle	1.22	empty	1540	1750	1840		3080	3500	3680		0.05	0.05		0.10	
19	09:08	3Axle	1.22	empty	2310	1705	1675		4620	3410	3350		0.24	0.04		0.28	

Location:			Saalipet										Date:				18-11-2018
Direction:		N.H-65 To Saalipet			Wheel Load (Tonnes)				Axle Load (Tonnes)				Date:				18-11-2018
S.No.	Time	Vehicle Type	Axle Configuration	Commodity Type		1st Axle	2nd Axle	3rd Axle	1st Axle	2nd Axle	3rd Axle	4th Axle	Equivalence Factor			VEF	VDF
20	09:13	3Axle	1.22	Dust	3300	6220	6770		6600	12440	13540		1.00	8.76		9.76	
21	11:44	3Axle	1.22	empty	2650	2400	2460		5300	4800	4920		0.42	0.17		0.59	
22	11:55	3Axle	1.22	Dust	2740	5730	6440		5480	11460	12880		0.48	6.75		7.23	
23	00:16	3Axle	1.22	Dust	3140	5470	5840		6280	10940	11680		0.82	5.04		5.86	
24	00:18	3Axle	1.22	Dust	3170	9040	9010		6340	18080	18020		0.85	32.67		33.52	
25	00:23	3Axle	1.22	empty	2350	2550	2730		4700	5100	5460		0.26	0.24		0.50	
26	00:31	3Axle	1.22	Dust	3680	7580	7560		7360	15160	15120		1.55	16.17		17.72	
27	00:44	3Axle	1.22	Dust	3760	5960	5860		7520	11920	11720		1.69	6.01		7.69	
28	02:04	3Axle	1.22	water	2550	3325	3200		5100	6650	6400		0.36	0.56		0.91	
29	02:13	3Axle	1.22	Dust	3440	7950	8295		6880	15900	16590		1.18	21.43		22.61	
30	02:24	3Axle	1.22	Dust	3165	7450	8860		6330	14900	17720		0.85	21.78		22.62	
31	02:28	3Axle	1.22	Dust	3680	8820	9270		7360	17640	18540		1.55	32.96		34.50	
32	02:29	3Axle	1.22	Dust	3965	8925	8460		7930	17850	16920		2.08	28.11		30.20	
33	2;35	3Axle	1.22	Dust	3735	9230	9460		7470	18460	18920		1.64	37.55		39.19	
34	07:52	3Axle	1.22	Dust	3870	4350	4670		7740	8700	9340		1.89	2.04		3.93	
35	6;20	MAV	1.2.22	Dust	4370	4990	6540	7340	8740	9980	13080	14680	3.08	2.24	11.42	16.74	**16.74**

Location:			Saalipet												Day:18/11/18	Sunday
Direction:			Saalipet to N.H-65												Date:	18-11-2018
S.No.	Time	Vehicle Type	Axle Configuration	Commodity Type	Wheel Load (Tonnes)			Axle Load (Tonnes)				Equivalence Factor			VEF	VDF
					1st Axle	2nd Axle	3rd Axle	1st Axle	2nd Axle	3rd Axle	4th Axle					
1	01:50	LCV	1.2	dust	1580	4090		3160	8180			0.05	1.01		1.06	
2	03:36	LCV	1.1	empty	665	695		1330	1390			0.00	0.00		0.00	
3	17.05	LCV	1.2	empty	1595	1775		3190	3550			0.05	0.04		0.09	**1.22**
4	18:06	LCV	1.2	loaded	1400	6050		2800	12100			0.03	4.83		4.87	
5	18:55	LCV	1.2	empty	1540	1650		3080	3300			0.05	0.03		0.07	
6	09:26	2Axle	1.2	machine	1285	3330		2570	6660			0.02	0.44		0.47	
7	09:28	2Axle	1.2	empty	1276	2250		2552	4500			0.02	0.09		0.11	
8	09:30	2Axle	1.2	empty	1740	2095		3480	4190			0.08	0.07		0.15	
9	09:58	2Axle	1.2	machine	2840	3920		5680	7840			0.55	0.85		1.40	**0.58**
10	02:53	2Axle	1.2	water	2135	4540		4270	9080			0.18	1.53		1.71	
11	03:20	2Axle	1.2	empty	1960	3050		3920	6100			0.12	0.31		0.44	
12	02:52	2Axle	1.2	empty	1900	2380		3800	4760			0.11	0.12		0.23	
13	08:25	2Axle	1.2	water	1600	1970		3200	3940			0.06	0.05		0.11	
14	09:24	3Axle	1.22	empty	2190	1690	1825	4380	3380	3650		0.19	0.05		0.24	
15	09:29	3Axle	1.22	empty	2045	2100	2170	4090	4200	4340		0.15	0.10		0.25	
16	9.31	3Axle	1.22	concrete	4150	6745	5930	8300	13490	11860		2.50	7.94		10.44	
17	09:46	3Axle	1.22	concrete	3710	6140	5860	7420	12280	11720		1.60	6.38		7.98	**1.44**
18	10:44	3Axle	1.22	concrete	4095	3920	4345	8190	7840	8690		2.37	1.44		3.81	
19	11:57	3Axle	1.22	empty	1840	2320	1980	3680	4640	3960		0.10	0.11		0.20	
20	12:38	3Axle	1.22	Empty	2090	2550	1600	4180	5100	3200		0.16	0.09		0.25	

Location:			Saalipet												Day:18/11/18	Sunday
Direction:			Saalipet to N.H-65												Date:	18-11-2018
S.No.	Time	Vehicle Type	Axle Configuration	Commodity Type	Wheel Load (Tonnes)			Axle Load (Tonnes)				Equivalence Factor			VEF	VDF
					1st Axle	2nd Axle	3rd Axle	1st Axle	2nd Axle	3rd Axle	4th Axle					
21	12:40	3Axle	1.22	Empty	2250	1750	1250	4500	3500	2500		0.22	0.02		0.24	
22	02:42	3Axle	1.22	concrete	3785	4320	3685	7570	8640	7370		1.73	1.26		2.99	
23	16:38	3Axle	1.22	concrete	3785	3210	4990	7570	6420	9980		1.73	1.39		3.12	
24	17:32	3Axle	1.22	empty	2230	1945	1780	4460	3890	3560		0.21	0.06		0.27	
25	18:53	3Axle	1.22	concrete	2945	2795	2830	5890	5590	5660		0.63	0.31		0.94	
26	19:32	3Axle	1.22	empty	2290	1865	1640	4580	3730	3280		0.23	0.05		0.28	
27	10:10	3Axle	1.22	empty	3080	4150	5130	6160	8300	10260		0.76	2.28		3.04	
28	10:20	3Axle	1.22	cement	3780	3720	4250	7560	7440	8500		1.72	1.24		2.96	
29	00:29	3Axle	1.22	empty	1930	2050	1820	3860	4100	3640		0.12	0.07		0.19	
30	00:30	3Axle	1.22	empty	1920	1970	1780	3840	3940	3560		0.11	0.06		0.18	
31	00:45	3Axle	1.22	empty	1955	1870	2120	3910	3740	4240		0.12	0.08		0.20	
32	00:47	3Axle	1.22	empty	2065	2510	2310	4130	5020	4620		0.15	0.17		0.32	
33	00:55	3Axle	1.22	empty	1930	2200	2150	3860	4400	4300		0.12	0.11		0.23	
34	01:01	3Axle	1.22	empty	2360	2060	2340	4720	4120	4680		0.26	0.12		0.38	
35	02:17	3Axle	1.22	empty	1960	2120	2045	3920	4240	4090		0.12	0.09		0.22	
36	02:39	3Axle	1.22	empty	2060	2230	2210	4120	4460	4420		0.15	0.12		0.27	
37	02:41	3Axle	1.22	empty	2035	2260	2210	4070	4520	4420		0.14	0.12		0.27	
38	02:45	3Axle	1.22	empty	2145	2260	2280	4290	4520	4560		0.18	0.13		0.31	
39	02:46	3Axle	1.22	empty	1855	1860	1950	3710	3720	3900		0.10	0.06		0.16	
40	02:49	3Axle	1.22	empty	1930	2060	2085	3860	4120	4170		0.12	0.09		0.21	
41	08:24	3Axle	1.22	water	2150	2760	2860	4300	5520	5720		0.18	0.31		0.49	

Appendix 4: FWD Raw Data

Sl No.	Date	Place	Chainage	Side	Drop	Load (kN)	Geophone1 (mm)	Geophone2 (mm)	Geophone3 (mm)	Geophone4 (mm)	Geophone5 (mm)	Geophone6 (mm)	Geophone7 (mm)	Pavement Temp. (°C)
1	18-11-2018	Vijaywada	0+000	LHS	1	43.1854	0.2885	0.0867	0.0583	0.0503	0.0380	0.0285	0.0233	41.2
	18-11-2018	Vijaywada	0+000	LHS	2	43.0011	0.2849	0.0830	0.0565	0.0517	0.0400	0.0287	0.0219	41.2
	18-11-2018	Vijaywada	0+000	LHS	3	43.1224	0.2850	0.0797	0.0543	0.0503	0.0384	0.0294	0.0230	41.2
2	18-11-2018	Vijaywada	0+060	LHS	1	42.1981	0.3426	0.1281	0.0816	0.0596	0.0441	0.0312	0.0183	41.2
	18-11-2018	Vijaywada	0+060	LHS	2	41.1163	0.3574	0.1175	0.0782	0.0552	0.0409	0.0319	0.0180	41.2
	18-11-2018	Vijaywada	0+060	LHS	3	41.1587	0.3448	0.1203	0.0776	0.0542	0.0419	0.0309	0.0168	41.2
3	18-11-2018	Vijaywada	0+120	LHS	1	40.5516	0.3500	0.0901	0.0597	0.0495	0.0393	0.0299	0.0152	41.2
	18-11-2018	Vijaywada	0+120	LHS	2	40.4011	0.3482	0.0916	0.0545	0.0485	0.0386	0.0296	0.0157	41.2
	18-11-2018	Vijaywada	0+120	LHS	3	41.4852	0.3569	0.0899	0.0585	0.0504	0.0384	0.0302	0.0167	41.2
4	18-11-2018	Vijaywada	0+180	LHS	1	40.9160	0.3060	0.0776	0.0497	0.0455	0.0311	0.0278	0.0143	41.2
	18-11-2018	Vijaywada	0+180	LHS	2	41.9480	0.3090	0.0770	0.0506	0.0468	0.0316	0.0280	0.0148	41.2
	18-11-2018	Vijaywada	0+180	LHS	3	43.5351	0.3132	0.0768	0.0509	0.0445	0.0340	0.0290	0.0150	41.2
5	18-11-2018	Vijaywada	0+240	LHS	1	41.0872	0.3248	0.0763	0.0578	0.0489	0.0309	0.0253	0.0216	41.2
	18-11-2018	Vijaywada	0+240	LHS	2	41.7364	0.3393	0.0824	0.0593	0.0483	0.0317	0.0253	0.0207	41.2
	18-11-2018	Vijaywada	0+240	LHS	3	42.6202	0.3412	0.0824	0.0577	0.0482	0.0305	0.0255	0.0213	41.2
6	18-11-2018	Vijaywada	0+300	LHS	1	36.4292	0.4627	0.2198	0.1134	0.0908	0.0592	0.0426	0.0233	41.2
	18-11-2018	Vijaywada	0+300	LHS	2	36.0207	0.4468	0.2229	0.1178	0.0909	0.0610	0.0438	0.0238	41.2
	18-11-2018	Vijaywada	0+300	LHS	3	37.6570	0.4670	0.2400	0.1195	0.0944	0.0628	0.0442	0.0259	41.2
7	18-11-2018	Vijaywada	0+360	LHS	1	38.9249	0.3465	0.1499	0.0848	0.0703	0.0447	0.0330	0.0170	41.2
	18-11-2018	Vijaywada	0+360	LHS	2	36.9842	0.3231	0.1378	0.0795	0.0680	0.0421	0.0315	0.0158	41.2
	18-11-2018	Vijaywada	0+360	LHS	3	36.6510	0.3106	0.1443	0.0795	0.0651	0.0431	0.0326	0.0165	41.2
8	18-11-2018	Vijaywada	0+420	LHS	1	36.7231	0.2478	0.1322	0.0844	0.0719	0.0509	0.0410	0.0358	41.2
	18-11-2018	Vijaywada	0+420	LHS	2	39.0081	0.2609	0.1348	0.0880	0.0743	0.0581	0.0443	0.0361	41.2

Sl No.	Date	Place	Chainage	Side	Drop	Load (kN)	Geophone1 (mm)	Geophone2 (mm)	Geophone3 (mm)	Geophone4 (mm)	Geophone5 (mm)	Geophone6 (mm)	Geophone7 (mm)	Pavement Temp. (°C)
	18-11-2018	Vijaywada	0+420	LHS	3	39.1366	0.2593	0.1334	0.0849	0.0732	0.0557	0.0441	0.0373	41.2
9	18-11-2018	Vijaywada	0+480	LHS	1	38.7309	0.3168	0.1724	0.0922	0.0723	0.0492	0.0321	0.0133	40.7
	18-11-2018	Vijaywada	0+480	LHS	2	40.8945	0.3420	0.1748	0.0998	0.0804	0.0516	0.0332	0.0144	40.7
	18-11-2018	Vijaywada	0+480	LHS	3	39.3804	0.3175	0.1715	0.0936	0.0733	0.0498	0.0335	0.0137	40.7
10	18-11-2018	Vijaywada	0+540	LHS	1	38.8678	0.3270	0.0724	0.0569	0.0487	0.0366	0.0247	0.0090	40.7
	18-11-2018	Vijaywada	0+540	LHS	2	40.9771	0.3632	0.0803	0.0581	0.0501	0.0397	0.0260	0.0090	40.7
	18-11-2018	Vijaywada	0+540	LHS	3	42.6553	0.3652	0.0837	0.0611	0.0528	0.0396	0.0272	0.0096	40.7
11	18-11-2018	Vijaywada	0+600	LHS	1	38.0898	0.3061	0.0768	0.0518	0.0470	0.0337	0.0253	0.0027	40.7
	18-11-2018	Vijaywada	0+600	LHS	2	39.3776	0.3113	0.0764	0.0528	0.0491	0.0348	0.0262	0.0030	40.7
	18-11-2018	Vijaywada	0+600	LHS	3	41.1333	0.3377	0.0808	0.0552	0.0514	0.0376	0.0271	0.0029	40.7
12	18-11-2018	Vijaywada	0+660	LHS	1	40.2025	0.3781	0.2148	0.1136	0.0877	0.0587	0.0413	0.0203	40.7
	18-11-2018	Vijaywada	0+660	LHS	2	40.9115	0.3966	0.2167	0.1079	0.0847	0.0602	0.0437	0.0196	40.7
	18-11-2018	Vijaywada	0+660	LHS	3	41.9837	0.3871	0.2187	0.1107	0.0897	0.0640	0.0472	0.0202	40.7
13	18-11-2018	Vijaywada	0+720	LHS	1	40.9584	0.3691	0.1925	0.1059	0.0804	0.0533	0.0359	0.0218	40.7
	18-11-2018	Vijaywada	0+720	LHS	2	40.1561	0.3329	0.1910	0.1026	0.0792	0.0492	0.0359	0.0213	40.7
	18-11-2018	Vijaywada	0+720	LHS	3	42.6813	0.3533	0.2074	0.1097	0.0815	0.0541	0.0369	0.0235	40.7
14	18-11-2018	Vijaywada	0+780	LHS	1	37.7973	0.4816	0.1993	0.1152	0.0987	0.0762	0.0586	0.0399	40.7
	18-11-2018	Vijaywada	0+780	LHS	2	39.5377	0.4856	0.2222	0.1175	0.1027	0.0776	0.0616	0.0438	40.7
	18-11-2018	Vijaywada	0+780	LHS	3	39.2016	0.5224	0.2129	0.1130	0.0956	0.0796	0.0628	0.0420	40.7
15	18-11-2018	Vijaywada	0+840	LHS	1	40.5069	0.5790	0.1529	0.0931	0.0746	0.0490	0.0368	0.0238	40.7
	18-11-2018	Vijaywada	0+840	LHS	2	41.3839	0.5823	0.1551	0.0897	0.0731	0.0461	0.0390	0.0241	40.7
	18-11-2018	Vijaywada	0+840	LHS	3	40.6405	0.5683	0.1563	0.0876	0.0746	0.0469	0.0372	0.0235	40.7
16	18-11-2018	Vijaywada	0+900	LHS	1	40.2376	0.3096	0.1120	0.0658	0.0505	0.0353	0.0265	0.0158	40.7
	18-11-2018	Vijaywada	0+900	LHS	2	42.6615	0.3139	0.1125	0.0667	0.0537	0.0404	0.0281	0.0168	40.7

Sl No.	Date	Place	Chainage	Side	Drop	Load (kN)	Geophone1 (mm)	Geophone2 (mm)	Geophone3 (mm)	Geophone4 (mm)	Geophone5 (mm)	Geophone6 (mm)	Geophone7 (mm)	Pavement Temp. (°C)
	18-11-2018	Vijaywada	0+900	LHS	3	42.3401	0.3173	0.1185	0.0699	0.0517	0.0397	0.0271	0.0171	40.7
17	18-11-2018	Vijaywada	0+960	LHS	1	41.9175	0.4034	0.1818	0.0914	0.0741	0.0496	0.0324	0.0201	40.7
	18-11-2018	Vijaywada	0+960	LHS	2	41.3851	0.3735	0.1740	0.0903	0.0696	0.0455	0.0311	0.0199	40.7
	18-11-2018	Vijaywada	0+960	LHS	3	41.4247	0.3923	0.1853	0.0873	0.0744	0.0455	0.0316	0.0200	40.7
18	18-11-2018	Vijaywada	1+020	LHS	1	42.3928	0.4077	0.0997	0.0567	0.0523	0.0353	0.0258	0.0144	40.7
	18-11-2018	Vijaywada	1+020	LHS	2	43.5130	0.4139	0.0954	0.0617	0.0506	0.0365	0.0261	0.0143	40.7
	18-11-2018	Vijaywada	1+020	LHS	3	42.5846	0.3907	0.1023	0.0607	0.0520	0.0364	0.0264	0.0147	40.7
19	18-11-2018	Vijaywada	1+080	LHS	1	39.2916	0.4299	0.2202	0.1066	0.0755	0.0525	0.0444	0.0301	40.7
	18-11-2018	Vijaywada	1+080	LHS	2	41.6657	0.4499	0.2162	0.1075	0.0773	0.0539	0.0472	0.0311	40.7
	18-11-2018	Vijaywada	1+080	LHS	3	40.5601	0.4612	0.2128	0.1059	0.0745	0.0540	0.0488	0.0291	40.7
20	18-11-2018	Vijaywada	1+140	LHS	1	40.9641	0.2991	0.1192	0.0761	0.0648	0.0442	0.0339	0.0186	40.7
	18-11-2018	Vijaywada	1+140	LHS	2	42.2943	0.2863	0.1202	0.0749	0.0681	0.0455	0.0365	0.0207	40.7
	18-11-2018	Vijaywada	1+140	LHS	3	41.6991	0.3030	0.1154	0.0741	0.0612	0.0463	0.0348	0.0204	40.7
21	18-11-2018	Vijaywada	1+200	LHS	1	43.8853	0.4236	0.1565	0.0887	0.0700	0.0473	0.0422	0.0301	40.7
	18-11-2018	Vijaywada	1+200	LHS	2	43.5328	0.3948	0.1540	0.0865	0.0658	0.0430	0.0411	0.0290	40.7
	18-11-2018	Vijaywada	1+200	LHS	3	41.9254	0.4164	0.1473	0.0843	0.0617	0.0435	0.0382	0.0272	40.7
22	18-11-2018	Vijaywada	1+260	LHS	1	41.2561	0.3598	0.1275	0.0749	0.0677	0.0447	0.0399	0.0146	40.7
	18-11-2018	Vijaywada	1+260	LHS	2	41.1370	0.3353	0.1273	0.0779	0.0687	0.0468	0.0422	0.0138	40.7
	18-11-2018	Vijaywada	1+260	LHS	3	41.8292	0.3668	0.1274	0.0764	0.0663	0.0459	0.0405	0.0147	40.7
23	18-11-2018	Vijaywada	1+320	LHS	1	41.4139	0.3336	0.1101	0.0708	0.0519	0.0291	0.0236	0.0150	40.7
	18-11-2018	Vijaywada	1+320	LHS	2	41.2493	0.3459	0.1183	0.0703	0.0543	0.0298	0.0242	0.0156	40.7
	18-11-2018	Vijaywada	1+320	LHS	3	41.4077	0.3320	0.1087	0.0695	0.0519	0.0313	0.0239	0.0160	40.7
24	18-11-2018	Vijaywada	1+380	LHS	1	40.3196	0.3849	0.1986	0.1169	0.0799	0.0536	0.0411	0.0290	40.7
	18-11-2018	Vijaywada	1+380	LHS	2	39.5852	0.3511	0.1939	0.1198	0.0817	0.0497	0.0407	0.0297	40.7

Sl No.	Date	Place	Chainage	Side	Drop	Load (kN)	Geophone1 (mm)	Geophone2 (mm)	Geophone3 (mm)	Geophone4 (mm)	Geophone5 (mm)	Geophone6 (mm)	Geophone7 (mm)	Pavement Temp. (°C)
	18-11-2018	Vijaywada	1+380	LHS	3	39.3108	0.3546	0.1939	0.1138	0.0800	0.0544	0.0402	0.0294	40.7
25	18-11-2018	Vijaywada	1+440	LHS	1	38.5459	0.3019	0.1567	0.0857	0.0618	0.0474	0.0325	0.0128	40.7
	18-11-2018	Vijaywada	1+440	LHS	2	41.4711	0.3170	0.1623	0.0868	0.0691	0.0481	0.0343	0.0135	40.7
	18-11-2018	Vijaywada	1+440	LHS	3	41.0507	0.3294	0.1632	0.0874	0.0693	0.0489	0.0365	0.0133	40.7
26	18-11-2018	Vijaywada	1+500	LHS	1	42.2355	0.4202	0.1941	0.0950	0.0737	0.0473	0.0406	0.0186	40.7
	18-11-2018	Vijaywada	1+500	LHS	2	40.9884	0.3965	0.1870	0.0887	0.0686	0.0466	0.0390	0.0183	40.7
	18-11-2018	Vijaywada	1+500	LHS	3	39.7448	0.3702	0.1804	0.0855	0.0650	0.0430	0.0351	0.0167	40.7
27	18-11-2018	Vijaywada	1+560	LHS	1	41.3822	0.3605	0.1524	0.0942	0.0698	0.0490	0.0371	0.0204	40.7
	18-11-2018	Vijaywada	1+560	LHS	2	41.0331	0.3430	0.1435	0.0864	0.0676	0.0471	0.0363	0.0208	40.7
	18-11-2018	Vijaywada	1+560	LHS	3	41.1338	0.3568	0.1440	0.0881	0.0729	0.0498	0.0365	0.0200	40.7
28	18-11-2018	Vijaywada	1+620	LHS	1	39.9281	0.3921	0.2359	0.1275	0.0858	0.0531	0.0392	0.0225	40.7
	18-11-2018	Vijaywada	1+620	LHS	2	41.1225	0.4073	0.2494	0.1335	0.0874	0.0508	0.0406	0.0232	40.7
	18-11-2018	Vijaywada	1+620	LHS	3	41.8683	0.4134	0.2706	0.1299	0.0918	0.0520	0.0417	0.0230	40.7
29	18-11-2018	Vijaywada	1+680	LHS	1	42.1082	0.2573	0.1100	0.0723	0.0564	0.0421	0.0292	0.0208	40.7
	18-11-2018	Vijaywada	1+680	LHS	2	43.1424	0.2653	0.1118	0.0699	0.0582	0.0407	0.0314	0.0215	40.7
	18-11-2018	Vijaywada	1+680	LHS	3	43.6539	0.2697	0.1099	0.0725	0.0607	0.0435	0.0302	0.0210	40.7
30	18-11-2018	Vijaywada	1+740	LHS	1	41.0128	0.2569	0.0699	0.0466	0.0432	0.0373	0.0267	0.0115	40.7
	18-11-2018	Vijaywada	1+740	LHS	2	43.1807	0.2671	0.0779	0.0505	0.0442	0.0380	0.0279	0.0121	40.7
	18-11-2018	Vijaywada	1+740	LHS	3	42.4041	0.2592	0.0768	0.0467	0.0456	0.0396	0.0274	0.0116	40.7
31	18-11-2018	Vijaywada	1+800	LHS	1	40.8447	0.2789	0.1034	0.0626	0.0530	0.0406	0.0298	0.0073	40.7
	18-11-2018	Vijaywada	1+800	LHS	2	41.1910	0.2768	0.1029	0.0604	0.0505	0.0403	0.0299	0.0079	40.7
	18-11-2018	Vijaywada	1+800	LHS	3	40.0039	0.2511	0.1021	0.0589	0.0482	0.0368	0.0292	0.0074	40.7
32	18-11-2018	Vijaywada	1+860	LHS	1	42.0991	0.3433	0.1059	0.0604	0.0545	0.0428	0.0299	0.0191	40.7
	18-11-2018	Vijaywada	1+860	LHS	2	41.2295	0.3212	0.1035	0.0647	0.0542	0.0394	0.0300	0.0183	40.7

Sl No.	Date	Place	Chainage	Side	Drop	Load (kN)	Geophone1 (mm)	Geophone2 (mm)	Geophone3 (mm)	Geophone4 (mm)	Geophone5 (mm)	Geophone6 (mm)	Geophone7 (mm)	Pavement Temp. (°C)
	18-11-2018	Vijaywada	1+860	LHS	3	41.4965	0.3416	0.1019	0.0614	0.0547	0.0397	0.0293	0.0178	40.7
33	18-11-2018	Vijaywada	1+920	LHS	1	41.4518	0.2932	0.1212	0.0756	0.0658	0.0499	0.0357	0.0249	40.7
	18-11-2018	Vijaywada	1+920	LHS	2	38.9193	0.2868	0.1174	0.0733	0.0626	0.0481	0.0344	0.0235	40.7
	18-11-2018	Vijaywada	1+920	LHS	3	38.7020	0.2974	0.1147	0.0721	0.0620	0.0448	0.0345	0.0236	40.7
34	18-11-2018	Vijaywada	1+980	LHS	1	41.8716	0.3673	0.1164	0.0828	0.0735	0.0445	0.0357	0.0245	40.3
	18-11-2018	Vijaywada	1+980	LHS	2	41.1310	0.3615	0.1163	0.0758	0.0684	0.0440	0.0352	0.0242	40.3
	18-11-2018	Vijaywada	1+980	LHS	3	41.1389	0.3628	0.1180	0.0806	0.0674	0.0462	0.0343	0.0226	40.3
35	18-11-2018	Vijaywada	2+040	LHS	1	42.0850	0.3954	0.1042	0.0749	0.0576	0.0404	0.0203	0.0138	40.3
	18-11-2018	Vijaywada	2+040	LHS	2	41.0886	0.3919	0.1037	0.0741	0.0567	0.0398	0.0194	0.0132	40.3
	18-11-2018	Vijaywada	2+040	LHS	3	40.2778	0.3930	0.0996	0.0727	0.0563	0.0395	0.0192	0.0128	40.3
36	18-11-2018	Vijaywada	2+100	LHS	1	39.6633	0.2819	0.0889	0.0583	0.0439	0.0290	0.0151	0.0075	40.3
	18-11-2018	Vijaywada	2+100	LHS	2	43.0972	0.2799	0.0991	0.0636	0.0474	0.0313	0.0157	0.0081	40.3
	18-11-2018	Vijaywada	2+100	LHS	3	41.0235	0.2828	0.0922	0.0598	0.0441	0.0300	0.0156	0.0077	40.3
37	18-11-2018	Vijaywada	2+160	LHS	1	42.7283	0.2587	0.1163	0.0735	0.0653	0.0501	0.0366	0.0200	40.3
	18-11-2018	Vijaywada	2+160	LHS	2	42.3662	0.2694	0.1064	0.0766	0.0664	0.0490	0.0381	0.0201	40.3
	18-11-2018	Vijaywada	2+160	LHS	3	43.4842	0.2655	0.1104	0.0750	0.0669	0.0505	0.0377	0.0194	40.3
38	18-11-2018	Vijaywada	2+220	LHS	1	43.8271	0.2714	0.0878	0.0616	0.0391	0.0270	0.0208	0.0112	40.3
	18-11-2018	Vijaywada	2+220	LHS	2	43.2279	0.2706	0.0901	0.0631	0.0379	0.0275	0.0196	0.0109	40.3
	18-11-2018	Vijaywada	2+220	LHS	3	43.0236	0.2549	0.0910	0.0629	0.0402	0.0277	0.0198	0.0108	40.3
39	18-11-2018	Vijaywada	2+190	RHS	1	41.3268	0.5580	0.2148	0.0981	0.0801	0.0575	0.0420	0.0232	40.3
	18-11-2018	Vijaywada	2+190	RHS	2	40.9403	0.5561	0.2069	0.0952	0.0823	0.0536	0.0408	0.0214	40.3
	18-11-2018	Vijaywada	2+190	RHS	3	41.3630	0.5726	0.2110	0.1009	0.0829	0.0559	0.0397	0.0224	40.3
40	18-11-2018	Vijaywada	2+130	RHS	1	42.8822	1.0984	0.0778	0.0580	0.0517	0.0211	0.0119	0.0058	40.3
	18-11-2018	Vijaywada	2+130	RHS	2	43.0796	1.0999	0.0790	0.0568	0.0507	0.0221	0.0114	0.0061	40.3

Sl No.	Date	Place	Chainage	Side	Drop	Load (kN)	Geophone1 (mm)	Geophone2 (mm)	Geophone3 (mm)	Geophone4 (mm)	Geophone5 (mm)	Geophone6 (mm)	Geophone7 (mm)	Pavement Temp. (°C)
	18-11-2018	Vijaywada	2+130	RHS	3	43.1057	1.0944	0.0823	0.0563	0.0502	0.0218	0.0120	0.0058	40.3
41	18-11-2018	Vijaywada	2+070	RHS	1	42.5766	0.3367	0.1164	0.0769	0.0700	0.0488	0.0374	0.0259	40.3
	18-11-2018	Vijaywada	2+070	RHS	2	43.2573	0.3356	0.1186	0.0792	0.0705	0.0498	0.0360	0.0261	40.3
	18-11-2018	Vijaywada	2+070	RHS	3	39.5552	0.2859	0.1172	0.0752	0.0630	0.0440	0.0341	0.0243	40.3
42	18-11-2018	Vijaywada	2+010	RHS	1	43.2136	0.3813	0.1278	0.0792	0.0689	0.0515	0.0470	0.0281	40.3
	18-11-2018	Vijaywada	2+010	RHS	2	42.7277	0.3617	0.1241	0.0780	0.0671	0.0489	0.0441	0.0272	40.3
	18-11-2018	Vijaywada	2+010	RHS	3	42.9591	0.3521	0.1287	0.0784	0.0652	0.0475	0.0447	0.0285	40.3
43	18-11-2018	Vijaywada	1+950	RHS	1	41.7528	0.4103	0.1663	0.0897	0.0724	0.0513	0.0411	0.0244	40.3
	18-11-2018	Vijaywada	1+950	RHS	2	40.9556	0.3914	0.1648	0.0867	0.0712	0.0476	0.0415	0.0254	40.3
	18-11-2018	Vijaywada	1+950	RHS	3	42.5178	0.4095	0.1706	0.0918	0.0761	0.0510	0.0430	0.0263	40.3
44	18-11-2018	Vijaywada	1+890	RHS	1	42.2886	0.3389	0.1305	0.0838	0.0655	0.0430	0.0359	0.0199	40.3
	18-11-2018	Vijaywada	1+890	RHS	2	42.2439	0.3430	0.1252	0.0784	0.0673	0.0447	0.0343	0.0214	40.3
	18-11-2018	Vijaywada	1+890	RHS	3	41.9084	0.3307	0.1242	0.0771	0.0668	0.0446	0.0340	0.0208	40.3
45	18-11-2018	Vijaywada	1+830	RHS	1	43.0106	0.2989	0.1124	0.0679	0.0538	0.0407	0.0342	0.0177	40.3
	18-11-2018	Vijaywada	1+830	RHS	2	42.6632	0.2894	0.1125	0.0666	0.0525	0.0407	0.0339	0.0164	40.3
	18-11-2018	Vijaywada	1+830	RHS	3	42.3967	0.2798	0.1075	0.0678	0.0546	0.0400	0.0336	0.0167	40.3
46	18-11-2018	Vijaywada	1+770	RHS	1	43.7780	0.3227	0.1058	0.0637	0.0589	0.0360	0.0166	0.0108	40.3
	18-11-2018	Vijaywada	1+770	RHS	2	41.9876	0.2917	0.0948	0.0607	0.0534	0.0325	0.0170	0.0101	40.3
	18-11-2018	Vijaywada	1+770	RHS	3	42.8097	0.2939	0.0987	0.0641	0.0543	0.0343	0.0174	0.0107	40.3
47	18-11-2018	Vijaywada	1+710	RHS	1	42.6604	0.3524	0.0593	0.0466	0.0366	0.0180	0.0092	0.0050	39.3
	18-11-2018	Vijaywada	1+710	RHS	2	42.8607	0.3298	0.0615	0.0458	0.0367	0.0186	0.0096	0.0050	39.3
	18-11-2018	Vijaywada	1+710	RHS	3	42.6491	0.3312	0.0613	0.0452	0.0352	0.0184	0.0094	0.0049	39.3
48	18-11-2018	Vijaywada	1+650	RHS	1	42.0238	0.3650	0.0965	0.0688	0.0569	0.0486	0.0433	0.0247	39.3
	18-11-2018	Vijaywada	1+650	RHS	2	43.0745	0.3725	0.1029	0.0752	0.0638	0.0509	0.0459	0.0256	39.3

Sl No.	Date	Place	Chainage	Side	Drop	Load (kN)	Geophone1 (mm)	Geophone2 (mm)	Geophone3 (mm)	Geophone4 (mm)	Geophone5 (mm)	Geophone6 (mm)	Geophone7 (mm)	Pavement Temp. (°C)
	18-11-2018	Vijaywada	1+650	RHS	3	41.9548	0.3670	0.1004	0.0725	0.0590	0.0518	0.0432	0.0254	39.3
49	18-11-2018	Vijaywada	1+590	RHS	1	42.9337	0.3065	0.1201	0.0856	0.0706	0.0526	0.0429	0.0225	39.3
	18-11-2018	Vijaywada	1+590	RHS	2	41.3935	0.3006	0.1200	0.0880	0.0678	0.0548	0.0424	0.0207	39.3
	18-11-2018	Vijaywada	1+590	RHS	3	41.2323	0.3078	0.1200	0.0814	0.0675	0.0510	0.0408	0.0206	39.3
50	18-11-2018	Vijaywada	1+530	RHS	1	41.5254	0.4683	0.1675	0.0577	0.0399	0.0268	0.0201	0.0091	39.3
	18-11-2018	Vijaywada	1+530	RHS	2	40.7170	0.4279	0.1565	0.0551	0.0403	0.0273	0.0187	0.0090	39.3
	18-11-2018	Vijaywada	1+530	RHS	3	39.5643	0.4090	0.1556	0.0569	0.0369	0.0255	0.0187	0.0083	39.3
51	18-11-2018	Vijaywada	1+470	RHS	1	42.1127	0.4408	0.1219	0.0747	0.0666	0.0438	0.0348	0.0198	39.3
	18-11-2018	Vijaywada	1+470	RHS	2	42.1065	0.4047	0.1218	0.0764	0.0645	0.0427	0.0350	0.0191	39.3
	18-11-2018	Vijaywada	1+470	RHS	3	42.8075	0.4142	0.1206	0.0757	0.0635	0.0437	0.0342	0.0203	39.3
52	18-11-2018	Vijaywada	1+410	RHS	1	41.8207	0.4001	0.1720	0.1027	0.0728	0.0510	0.0396	0.0225	39.3
	18-11-2018	Vijaywada	1+410	RHS	2	40.9307	0.3896	0.1587	0.0941	0.0733	0.0475	0.0388	0.0232	39.3
	18-11-2018	Vijaywada	1+410	RHS	3	40.0215	0.3800	0.1528	0.0915	0.0691	0.0477	0.0375	0.0217	39.3
53	18-11-2018	Vijaywada	1+350	RHS	1	43.0480	0.3892	0.1357	0.0755	0.0604	0.0363	0.0357	0.0198	39.3
	18-11-2018	Vijaywada	1+350	RHS	2	42.7962	0.3770	0.1288	0.0743	0.0586	0.0387	0.0351	0.0204	39.3
	18-11-2018	Vijaywada	1+350	RHS	3	43.5004	0.3874	0.1309	0.0797	0.0614	0.0404	0.0348	0.0199	39.3
54	18-11-2018	Vijaywada	1+290	RHS	1	42.6790	0.3557	0.1667	0.0905	0.0701	0.0539	0.0416	0.0238	39.3
	18-11-2018	Vijaywada	1+290	RHS	2	42.1608	0.3433	0.1648	0.0946	0.0709	0.0558	0.0395	0.0240	39.3
	18-11-2018	Vijaywada	1+290	RHS	3	42.5902	0.3245	0.1672	0.0965	0.0764	0.0532	0.0395	0.0235	39.3
55	18-11-2018	Vijaywada	1+230	RHS	1	42.6881	0.3406	0.1554	0.0865	0.0734	0.0492	0.0409	0.0292	39.3
	18-11-2018	Vijaywada	1+230	RHS	2	43.2318	0.3562	0.1489	0.0877	0.0720	0.0474	0.0417	0.0290	39.3
	18-11-2018	Vijaywada	1+230	RHS	3	43.3671	0.3564	0.1531	0.0860	0.0681	0.0454	0.0408	0.0280	39.3
56	18-11-2018	Vijaywada	1+170	RHS	1	41.3930	0.4933	0.1499	0.0849	0.0647	0.0509	0.0448	0.0244	39.3
	18-11-2018	Vijaywada	1+170	RHS	2	43.0598	0.4696	0.1451	0.0872	0.0623	0.0490	0.0451	0.0262	39.3

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	18-11-2018	Vijaywada	1+170	RHS	3	42.9987	0.4831	0.1484	0.0875	0.0637	0.0514	0.0446	0.0256	39.3
57	18-11-2018	Vijaywada	1+110	RHS	1	41.1734	0.5628	0.1132	0.0748	0.0622	0.0353	0.0217	0.0142	39.3
	18-11-2018	Vijaywada	1+110	RHS	2	41.1638	0.5430	0.1179	0.0700	0.0660	0.0365	0.0212	0.0147	39.3
	18-11-2018	Vijaywada	1+110	RHS	3	40.5052	0.5685	0.1169	0.0713	0.0668	0.0355	0.0213	0.0144	39.3
58	18-11-2018	Vijaywada	1+050	RHS	1	42.8041	0.4451	0.1417	0.0850	0.0605	0.0421	0.0322	0.0179	39.3
	18-11-2018	Vijaywada	1+050	RHS	2	42.9789	0.4498	0.1444	0.0802	0.0608	0.0449	0.0340	0.0184	39.3
	18-11-2018	Vijaywada	1+050	RHS	3	42.9535	0.4287	0.1438	0.0820	0.0615	0.0420	0.0344	0.0177	39.3
59	18-11-2018	Vijaywada	0+990	RHS	1	41.8484	0.3950	0.1542	0.0880	0.0545	0.0432	0.0311	0.0154	39.3
	18-11-2018	Vijaywada	0+990	RHS	2	42.0799	0.3924	0.1568	0.0848	0.0579	0.0418	0.0327	0.0164	39.3
	18-11-2018	Vijaywada	0+990	RHS	3	42.3311	0.3854	0.1545	0.0843	0.0575	0.0439	0.0316	0.0162	39.3
60	18-11-2018	Vijaywada	0+930	RHS	1	42.3022	0.4632	0.1112	0.0606	0.0524	0.0318	0.0207	0.0115	39.3
	18-11-2018	Vijaywada	0+930	RHS	2	42.0193	0.4425	0.1037	0.0627	0.0495	0.0314	0.0203	0.0110	39.3
	18-11-2018	Vijaywada	0+930	RHS	3	42.3322	0.4674	0.1020	0.0635	0.0518	0.0331	0.0207	0.0115	39.3
61	18-11-2018	Vijaywada	0+870	RHS	1	40.5697	0.6232	0.1673	0.0877	0.0623	0.0449	0.0379	0.0173	35.1
	18-11-2018	Vijaywada	0+870	RHS	2	40.6671	0.6208	0.1622	0.0848	0.0622	0.0460	0.0379	0.0179	35.1
	18-11-2018	Vijaywada	0+870	RHS	3	41.0784	0.6628	0.1597	0.0855	0.0628	0.0454	0.0395	0.0171	35.1
62	18-11-2018	Vijaywada	0+810	RHS	1	43.1747	0.5039	0.1391	0.0789	0.0499	0.0331	0.0240	0.0161	35.1
	18-11-2018	Vijaywada	0+810	RHS	2	43.2882	0.4986	0.1447	0.0823	0.0499	0.0339	0.0239	0.0162	35.1
	18-11-2018	Vijaywada	0+810	RHS	3	42.5851	0.5076	0.1466	0.0788	0.0486	0.0340	0.0223	0.0157	35.1
63	18-11-2018	Vijaywada	0+750	RHS	1	42.6377	0.4179	0.1594	0.0691	0.0499	0.0320	0.0226	0.0124	35.1
	18-11-2018	Vijaywada	0+750	RHS	2	43.5102	0.4246	0.1592	0.0703	0.0531	0.0325	0.0230	0.0122	35.1
	18-11-2018	Vijaywada	0+750	RHS	3	42.6802	0.4238	0.1543	0.0719	0.0509	0.0325	0.0220	0.0124	35.1
64	18-11-2018	Vijaywada	0+690	RHS	1	43.2748	0.5170	0.2083	0.0950	0.0592	0.0397	0.0313	0.0238	35.1
	18-11-2018	Vijaywada	0+690	RHS	2	41.6680	0.4764	0.1930	0.0955	0.0569	0.0385	0.0294	0.0237	35.1

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	18-11-2018	Vijaywada	0+690	RHS	3	42.7345	0.4829	0.2082	0.0935	0.0621	0.0385	0.0305	0.0228	35.1
65	18-11-2018	Vijaywada	0+630	RHS	1	41.5073	0.4677	0.1817	0.1109	0.0673	0.0418	0.0269	0.0186	35.1
	18-11-2018	Vijaywada	0+630	RHS	2	41.2181	0.4370	0.1913	0.1031	0.0657	0.0434	0.0277	0.0178	35.1
	18-11-2018	Vijaywada	0+630	RHS	3	41.7415	0.4276	0.1966	0.1063	0.0689	0.0430	0.0266	0.0183	35.1
66	18-11-2018	Vijaywada	0+570	RHS	1	42.0234	0.4541	0.2075	0.0967	0.0850	0.0498	0.0354	0.0210	35.1
	18-11-2018	Vijaywada	0+570	RHS	2	40.7400	0.4491	0.1919	0.1016	0.0776	0.0506	0.0321	0.0190	35.1
	18-11-2018	Vijaywada	0+570	RHS	3	42.2694	0.4298	0.1964	0.1021	0.0845	0.0500	0.0331	0.0199	35.1
67	18-11-2018	Vijaywada	0+510	RHS	1	42.3141	0.3111	0.0933	0.0542	0.0521	0.0345	0.0223	0.0111	35.1
	18-11-2018	Vijaywada	0+510	RHS	2	42.2479	0.3188	0.0888	0.0567	0.0520	0.0353	0.0238	0.0119	35.1
	18-11-2018	Vijaywada	0+510	RHS	3	41.3398	0.2999	0.0920	0.0542	0.0505	0.0326	0.0216	0.0110	35.1
68	18-11-2018	Vijaywada	0+450	RHS	1	41.5876	0.3270	0.1098	0.0637	0.0566	0.0377	0.0272	0.0118	35.1
	18-11-2018	Vijaywada	0+450	RHS	2	42.0742	0.3284	0.1096	0.0646	0.0574	0.0380	0.0258	0.0115	35.1
	18-11-2018	Vijaywada	0+450	RHS	3	41.9288	0.3307	0.1057	0.0669	0.0551	0.0359	0.0275	0.0113	35.1
69	18-11-2018	Vijaywada	0+390	RHS	1	43.5224	0.2729	0.0586	0.0426	0.0333	0.0250	0.0130	0.0060	35.1
	18-11-2018	Vijaywada	0+390	RHS	2	41.7477	0.2587	0.0581	0.0377	0.0311	0.0256	0.0123	0.0059	35.1
	18-11-2018	Vijaywada	0+390	RHS	3	42.0137	0.2615	0.0592	0.0384	0.0308	0.0256	0.0125	0.0060	35.1
70	18-11-2018	Vijaywada	0+330	RHS	1	43.5809	0.3257	0.0874	0.0541	0.0491	0.0294	0.0208	0.0065	35.1
	18-11-2018	Vijaywada	0+330	RHS	2	43.0112	0.3111	0.0842	0.0536	0.0456	0.0313	0.0196	0.0062	35.1
	18-11-2018	Vijaywada	0+330	RHS	3	42.5025	0.3034	0.0825	0.0512	0.0476	0.0299	0.0202	0.0061	35.1
71	18-11-2018	Vijaywada	0+260	RHS	1	43.5108	0.2959	0.0808	0.0484	0.0399	0.0277	0.0165	0.0078	35.1
	18-11-2018	Vijaywada	0+260	RHS	2	43.3852	0.2841	0.0818	0.0492	0.0389	0.0279	0.0161	0.0080	35.1
	18-11-2018	Vijaywada	0+260	RHS	3	43.1241	0.2866	0.0815	0.0487	0.0403	0.0264	0.0157	0.0074	35.1
72	18-11-2018	Vijaywada	0+210	RHS	1	43.9793	0.2944	0.0754	0.0508	0.0432	0.0349	0.0286	0.0143	35.1
	18-11-2018	Vijaywada	0+210	RHS	2	43.0008	0.2997	0.0743	0.0487	0.0435	0.0346	0.0286	0.0143	35.1

Sl No.	Date	Place	Chainage	Side	Drop	Load (kN)	Geophone1 (mm)	Geophone2 (mm)	Geophone3 (mm)	Geophone4 (mm)	Geophone5 (mm)	Geophone6 (mm)	Geophone7 (mm)	Pavement Temp. (°C)
	18-11-2018	Vijaywada	0+210	RHS	3	43.0735	0.2936	0.0772	0.0508	0.0423	0.0330	0.0297	0.0148	35.1
73	18-11-2018	Vijaywada	0+150	RHS	1	42.8686	0.3109	0.0733	0.0515	0.0431	0.0278	0.0154	0.0105	35.1
	18-11-2018	Vijaywada	0+150	RHS	2	43.5017	0.3015	0.0719	0.0503	0.0432	0.0290	0.0152	0.0113	35.1
	18-11-2018	Vijaywada	0+150	RHS	3	43.9238	0.2989	0.0762	0.0518	0.0464	0.0300	0.0155	0.0108	35.1
74	18-11-2018	Vijaywada	0+090	RHS	1	43.7563	0.3192	0.0814	0.0523	0.0447	0.0332	0.0219	0.0077	35.1
	18-11-2018	Vijaywada	0+090	RHS	2	43.1162	0.3315	0.0857	0.0504	0.0440	0.0322	0.0208	0.0078	35.1
	18-11-2018	Vijaywada	0+090	RHS	3	43.4885	0.3271	0.0833	0.0510	0.0442	0.0312	0.0207	0.0081	35.1
75	18-11-2018	Vijaywada	0+030	RHS	1	43.5470	0.3142	0.0733	0.0489	0.0422	0.0338	0.0259	0.0195	35.1
	18-11-2018	Vijaywada	0+030	RHS	2	43.4661	0.2990	0.0705	0.0473	0.0444	0.0352	0.0263	0.0199	35.1
	18-11-2018	Vijaywada	0+030	RHS	3	43.3167	0.2956	0.0754	0.0462	0.0433	0.0339	0.0267	0.0188	35.1

Appendix 5: FWD Results

Sl No.	Chainage	Side	Normalized Deflection							Back Calculated Moduli (MPa)			Corrected Moduli (MPa)			15th Percentile		
			Geophone1 (mm)	Geophone2 (mm)	Geophone3 (mm)	Geophone4 (mm)	Geophone5 (mm)	Geophone6 (mm)	Geophone7 (mm)	BT	Granular	Subgrade	BT	Granular	Subgrade	BT	Granular	Subgrade
1	0+000	LHS	0.2655	0.0771	0.0523	0.0471	0.036	0.0268	0.0211	787.0	2041.0	310.0	1053.0	2041.0	246.8			
2	0+030	RHS	0.2789	0.0673	0.0437	0.0399	0.0316	0.0242	0.0179	767.0	2047.0	363.0	1026.0	2047.0	282.3			
3	0+060	LHS	0.3358	0.1176	0.0763	0.0543	0.0408	0.0302	0.0171	844.6	2006.8	260.2	1129.6	2006.8	212.0			
4	0+090	RHS	0.3001	0.0768	0.0472	0.0408	0.0296	0.0195	0.0072	846.8	2000.0	495.3	850.6	2000.0	366.4			
5	0+120	LHS	0.3447	0.0887	0.0564	0.0485	0.038	0.0293	0.0155	853.4	2006.8	299.8	1141.4	2006.8	239.8			
6	0+150	RHS	0.2798	0.068	0.0472	0.0407	0.0266	0.0142	0.01	816.0	2000.0	444.9	819.6	2000.0	335.1			
7	0+180	LHS	0.2939	0.0733	0.0479	0.0433	0.0306	0.0268	0.014	972.1	2000.0	347.5	1300.2	2000.0	272.1			
8	0+210	RHS	0.2731	0.0698	0.0462	0.0397	0.0315	0.0267	0.0134	809.4	2027.4	359.8	813.0	2027.4	280.2			
9	0+240	LHS	0.3205	0.0769	0.0558	0.0464	0.0297	0.0243	0.0203	791.8	2006.8	305.0	1059.0	2006.8	243.3			
10	0+270	RHS	0.2666	0.0751	0.045	0.0366	0.0252	0.0149	0.0071	873.2	2000.0	521.2	877.1	2000.0	382.2	878.40	2000.00	172.82
11	0+300	LHS	0.5001	0.2479	0.1274	0.1003	0.0665	0.0475	0.0265	754.4	2000.0	160.1	1009.0	2000.0	136.9			
12	0+330	RHS	0.2913	0.0787	0.0492	0.0441	0.0281	0.0188	0.0058	835.8	2020.5	584.2	839.5	2020.5	419.9			
13	0+360	LHS	0.3482	0.1535	0.0866	0.0723	0.0462	0.0345	0.0175	842.4	2013.7	234.3	1126.7	2013.7	193.4			
14	0+390	RHS	0.2492	0.0553	0.0373	0.0299	0.024	0.0119	0.0056	886.4	2000.0	670.0	890.3	2000.0	469.7			
15	0+420	LHS	0.2675	0.1395	0.0896	0.0764	0.0573	0.0451	0.038	754.4	2020.5	170.6	1009.0	2020.5	145.2			
16	0+450	RHS	0.3141	0.1035	0.0622	0.0539	0.0355	0.0256	0.011	798.4	2020.5	348.3	801.9	2020.5	272.6			
17	0+480	LHS	0.3281	0.1744	0.096	0.0759	0.0506	0.0332	0.0139	818.2	2000.0	268.6	1067.4	2000.0	218.0			
18	0+510	RHS	0.2954	0.0871	0.0525	0.0491	0.0325	0.0215	0.0108	860.0	2000.0	373.3	863.8	2000.0	289.1			
19	0+540	LHS	0.3445	0.0771	0.0575	0.0495	0.0379	0.0254	0.009	855.6	2000.0	411.1	1116.2	2000.0	313.6			
20	0+570	RHS	0.4266	0.1906	0.0961	0.079	0.0481	0.0322	0.0192	820.4	2000.0	225.2	824.0	2000.0	186.7			

21	0+600	LHS	0.322	0.0789	0.0539	0.0497	0.0358	0.0265	0.0029	772.0	2041.1	471.9	1007.1	2041.1	351.9			
22	0+630	RHS	0.4282	0.183	0.1029	0.0649	0.0412	0.0261	0.0176	802.8	2000.0	246.4	806.4	2000.0	202.1			
23	0+660	LHS	0.3776	0.2113	0.108	0.0852	0.0594	0.0429	0.0195	866.6	2013.7	199.4	1130.5	2013.7	167.4			
24	0+690	RHS	0.4624	0.1909	0.089	0.0558	0.0366	0.0286	0.022	769.8	2000.0	237.1	773.2	2000.0	195.4			
25	0+720	LHS	0.3411	0.1909	0.1028	0.0779	0.0506	0.0351	0.0215	833.6	2000.0	203.2	1087.5	2000.0	170.3			
26	0+750	RHS	0.3932	0.1468	0.0656	0.0478	0.0301	0.021	0.0115	890.8	2000.0	355.1	894.7	2000.0	277.1			
27	0+780	LHS	0.5113	0.2176	0.1187	0.102	0.0801	0.0628	0.0431	897.4	2000.0	128.2	1170.7	2000.0	110.9			
28	0+810	RHS	0.4681	0.1334	0.0744	0.046	0.0313	0.0218	0.0149	772.0	2000.0	305.6	775.4	2000.0	243.8			
29	0+840	LHS	0.5646	0.1516	0.0883	0.0726	0.0464	0.0369	0.0233	831.4	2006.8	206.9	1084.6	2006.8	173.1			
30	0+870	RHS	0.6235	0.16	0.0844	0.0613	0.0446	0.0377	0.0171	824.8	2000.0	241.7	828.5	2000.0	198.7			
31	0+900	LHS	0.3006	0.1096	0.0647	0.0498	0.0368	0.0261	0.0159	829.2	2006.8	288.0	1081.7	2006.8	231.6			
32	0+930	RHS	0.4336	0.1001	0.059	0.0485	0.0304	0.0195	0.0107	851.2	2006.8	375.8	1037.1	2006.8	290.8			
33	0+960	LHS	0.3749	0.1735	0.0863	0.0699	0.0451	0.0305	0.0192	805.0	2000.0	232.0	1050.1	2000.0	191.7			
34	0+990	RHS	0.3716	0.1475	0.0815	0.0538	0.0408	0.0302	0.0152	818.2	2000.0	268.9	996.9	2000.0	218.2			
35	1+020	LHS	0.3774	0.0926	0.0557	0.0482	0.0337	0.0244	0.0135	800.6	2006.8	323.8	1044.4	2006.8	256.2			
36	1+050	RHS	0.4113	0.1336	0.0768	0.0568	0.0401	0.0313	0.0168	840.2	2006.8	259.2	1023.7	2006.8	211.3			
37	1+080	LHS	0.4415	0.2139	0.1054	0.0748	0.0528	0.0462	0.0297	802.8	2000.0	173.8	1047.3	2000.0	147.7			
38	1+110	RHS	0.5453	0.1133	0.0704	0.0635	0.0349	0.0209	0.0141	807.2	2006.8	310.0	983.5	2006.8	246.8			
39	1+140	LHS	0.2845	0.1136	0.0721	0.0621	0.0435	0.0337	0.0191	798.4	2006.8	245.0	1041.5	2006.8	201.1			
40	1+170	RHS	0.4541	0.1392	0.0815	0.0599	0.0475	0.0422	0.0239	816.0	2000.0	207.3	994.3	2000.0	173.4			
41	1+200	LHS	0.382	0.1416	0.0803	0.061	0.0414	0.0376	0.0267	844.6	2000.0	209.4	1101.8	2000.0	175.0			
42	1+230	RHS	0.3258	0.1415	0.0805	0.0661	0.0439	0.0382	0.0267	816.0	2006.8	203.5	994.3	2006.8	170.5			
43	1+260	LHS	0.3419	0.1231	0.0738	0.0653	0.0442	0.0395	0.0139	831.4	2006.8	274.6	1084.6	2006.8	222.2			
44	1+290	RHS	0.3213	0.1565	0.0884	0.0682	0.0511	0.0379	0.0224	769.8	2000.0	207.8	938.0	2000.0	173.8			
45	1+320	LHS	0.3261	0.1087	0.0679	0.051	0.0291	0.0231	0.015	798.4	2013.7	310.8	1041.5	2013.7	247.3			
46	1+350	RHS	0.3567	0.1223	0.071	0.0558	0.0357	0.0327	0.0186	752.2	2000.0	254.0	916.5	2000.0	207.6			

47	1+380	LHS	0.3658	0.1968	0.1176	0.0811	0.0529	0.0409	0.0296	818.2	2006.8	172.4	1067.4	2006.8	146.7			
48	1+410	RHS	0.3811	0.1574	0.0939	0.0701	0.0476	0.0378	0.022	802.8	2000.0	206.5	978.2	2000.0	172.8			
49	1+440	LHS	0.3133	0.1594	0.0859	0.0661	0.0477	0.0341	0.0131	794.0	2020.5	279.6	1035.8	2020.5	225.7			
50	1+470	RHS	0.3967	0.1147	0.0714	0.0613	0.041	0.0328	0.0186	811.6	2013.7	247.4	988.9	2013.7	202.9			
51	1+500	LHS	0.3858	0.1826	0.0875	0.0674	0.0445	0.0373	0.0174	923.8	2000.0	234.4	1205.1	2000.0	193.4			
52	1+530	RHS	0.4283	0.1575	0.0557	0.0384	0.0261	0.0189	0.0087	800.6	2006.8	436.1	975.5	2006.8	329.5			
53	1+560	LHS	0.3433	0.1424	0.087	0.0681	0.0472	0.0356	0.0198	820.4	2000.0	221.9	1070.2	2000.0	184.3			
54	1+590	RHS	0.2915	0.1148	0.0813	0.0656	0.0505	0.0402	0.0203	824.8	2013.7	224.4	1005.0	2013.7	186.1			
55	1+620	LHS	0.3946	0.2458	0.1272	0.0862	0.0508	0.0395	0.0224	783.0	2027.4	192.4	1021.4	2027.4	162.1			
56	1+650	RHS	0.3477	0.0944	0.0681	0.0566	0.0476	0.0417	0.0238	969.2	2000.0	231.2	1180.9	2000.0	191.1			
57	1+680	LHS	0.2458	0.103	0.0666	0.0544	0.0392	0.0282	0.0196	963.3	2000.0	261.2	1256.7	2000.0	212.7			
58	1+710	RHS	0.3163	0.0568	0.0429	0.0339	0.0172	0.0088	0.0047	875.4	2013.7	781.4	1066.6	2013.7	532.3			
59	1+740	LHS	0.2475	0.0709	0.0454	0.042	0.0363	0.0259	0.0111	897.4	2000.0	379.7	1170.7	2000.0	293.3			
60	1+770	RHS	0.2825	0.0931	0.0586	0.0518	0.032	0.0159	0.0098	807.2	2000.0	403.9	1032.4	2000.0	309.0			
61	1+800	LHS	0.2643	0.1011	0.0596	0.0497	0.0386	0.0291	0.0074	941.3	2020.5	410.3	1228.0	2020.5	313.1			
62	1+830	RHS	0.2711	0.1038	0.0632	0.0503	0.0379	0.0318	0.0159	873.2	2006.8	282.7	1116.9	2006.8	227.9			
63	1+860	LHS	0.3224	0.0998	0.0598	0.0524	0.0391	0.0286	0.0177	750.0	2006.8	277.3	978.4	2006.8	224.1			
64	1+890	RHS	0.3203	0.1202	0.0757	0.0631	0.0419	0.033	0.0196	820.4	2000.0	238.3	1049.3	2000.0	196.3			
65	1+920	LHS	0.295	0.1187	0.0743	0.064	0.048	0.0352	0.0242	864.4	2013.7	220.1	1127.6	2013.7	182.9			
66	1+950	RHS	0.3869	0.1603	0.0857	0.0702	0.0479	0.0401	0.0243	791.8	2020.5	200.6	1012.7	2020.5	168.3			
67	1+980	LHS	0.3517	0.113	0.0771	0.0674	0.0434	0.0339	0.023	824.8	2027.4	222.3	1054.9	2027.4	184.6			
68	2+010	RHS	0.3398	0.1181	0.0731	0.0624	0.0459	0.0421	0.026	800.6	2013.7	214.5	1024.0	2013.7	178.8			
69	2+040	LHS	0.3825	0.0996	0.0718	0.0553	0.0388	0.0191	0.0129	798.4	2013.7	326.7	1021.2	2013.7	258.1			
70	2+070	RHS	0.3053	0.1125	0.0738	0.0649	0.0455	0.0343	0.0243	754.4	2000.0	221.2	964.9	2000.0	183.7			
71	2+100	LHS	0.2733	0.0905	0.0587	0.0438	0.0292	0.015	0.0075	807.2	2000.0	484.2	1032.4	2000.0	359.5			
72	2+130	RHS	1.0205	0.0741	0.053	0.0473	0.0201	0.0109	0.0055	910.6	2000.0	665.8	1164.7	2000.0	467.3			

73	2+160	LHS	0.2469	0.1036	0.07	0.0618	0.0465	0.035	0.0185	818.2	2006.8	247.5	1046.5	2006.8	202.9			
74	2+190	RHS	0.5457	0.2047	0.0952	0.0794	0.054	0.0396	0.0217	750.0	2000.0	200.1	959.3	2000.0	168.0			
75	2+220	LHS	0.245	0.0827	0.0577	0.036	0.0253	0.0185	0.0101	915.0	2000.0	407.8	1170.3	2000.0	311.5			