



Chapter 2

Traffic Surveys and Analysis

2.1 Introduction

This chapter presents various traffic surveys conducted as per TOR and their analysis. The results of analysis will form input for future planning of road network improvements, lane requirement, designing the pavement and road cross section, etc.

2.2 Traffic Surveys

Following traffic surveys were carried out at various locations on Nanded road network to establish the traffic flow characteristics, travel pattern and delays on the corridor.

- Classified Traffic Volume Count Survey
- Classified Turning Movement Count Survey
- Pedestrian Count Survey
- Speed and Delay Survey

The locations for carrying out traffic surveys were selected after site reconnaissance and in discussion with the client. Surveys at 11 additional intersections, as suggested by the Client, were also carried out. The traffic survey locations along with the schedule are presented in **Table 2.1**. The traffic survey locations are shown in **Figure 2.1**.

Table 2.1 Traffic Survey Locations and Schedule

Type of Survey	Duration	Name of the Road	Location	Date of Survey
Classified Traffic Volume Count Survey	3 Days	Purna Road (SH-44)	Waman Nagar	15.05.06 to 18.05.06
		Malegaon Road (NH-222)	Hotel Sourab	
		Necklace Road (Road No. 7)	S.P Office	
		Latur Road	Near Koutha	21.05.06 to 23.05.06
		Degloor Road	Tyre Board	
		Hingoli Road Near Airport	Hotel Bagicha	
	16 Hours	Raj Bar Corner	Road No 7	18.05.06
		Workshop Corner	Road No 7	18.05.06
		Bhagyanagar Circle	Road No 39	19.05.06



Type of Survey	Duration	Name of the Road	Location	Date of Survey
Classified Turning Movement Count Survey		Mutha Chowk	Road No 7	19.05.06
		Ambedkar Chowk, Near Railway Station	Road No 1	19.05.06
		Old Monda (Tower)	Road No 8	26.05.06
		Junction on Shivaji Nagar R OB	Road No 7	19.05.06
		Maharana Pratap Chowk	Degloor Road	22.05.06
		Bafna T-point	Degloor Road	25.05.06
		Degloor Naka	Road No 8 & 9	24.05.06
		Hingoli Naka	Road No 19	24.05.06
	12 Hours	Bharki Chowk	Road No 8	25.05.06
		Kalsa Hallabhol Chowk	Road No 19	24.05.06
		Gurudwara Chowk	Road No 3	25.05.06
		Bhagat Singh Cross	Road No 3	25.05.06
		Chhatrapati Shivaji Chowk	Road No 41 & 42	23.05.06
		Mahaveer Chowk	Road No 8	24.05.06
		Latur Phata (Ambedkar Chowk)	Latur Road	23.05.06
		Gurudwara Chowk at Dena Bank	Road No 8	25.05.06
	8 Hours	Milk Dairy Chowk	Latur Road	23.05.06
		Taroda Naka	Road No 32	25.05.06
		I.T.I Chowk	Road No 7	23.05.06
		Rest House Chowk	Road No 7	23.05.06
		Register Office Chowk	Road No 7	23.05.06
		Nayak Chowk	Road No 39	22.05.06
	Pedestrian Volume Count	12 Hours	Gurudwara Gate No. 1 Junction	Road No 2
Gurudwara Chowk at Dena Bank			Road No 8	25.05.06
Ambedker Junction			Road No 1	19.05.06
Speed & Delay Survey	Peak Period	Major project corridors	Speed & Delay Survey	Peak Hours

2.2.1 Classified Traffic Volume Count Survey



3-Day (24 hours) Classified Traffic Volume Count survey was carried out at six locations as mentioned in Table 2.1. Traffic counting was carried out manually in three eight-hour shifts on each day by trained enumerators. The count data was recorded at 15-minute intervals and total vehicles for each vehicle category were computed. The traffic volume count data was processed using the commonly used spread-sheet package. The processed hourly traffic volume data has been compiled direction-wise.

Data collected from site was analyzed to study daily variation and hourly variation of traffic, peak hour share, traffic composition and ADT at all the survey locations. The various vehicle types having different sizes and characteristics were converted into equivalent passenger car units. The equivalent PCUs of different vehicle categories do not remain constant under all circumstances. Rather, these are a function of the physical dimensions and operational speeds of respective vehicle classes. In urban situations, the speed differential amongst different vehicle classes is generally low, and as such the PCU factors are predominantly a function of the physical dimensions of the various vehicles. Nonetheless, the relative PCU of a particular vehicle type will be affected to a certain extent by increase in its proportion in the total traffic. Consultants have considered the Passenger Car Unit (PCU) factors based on the percentage composition of vehicle type in traffic stream recommended by Indian Road Congress in *Guidelines for Capacity of Urban Roads in Plain Areas* (IRC: 106-1990) (**Table 2.2**).

Table 2.2 PCU Factors for Different Vehicle Categories

Vehicle Type	PCU Factor
Two Wheeler	0.75
Auto	
3 – Seater	2.00
6 – Seater	2.00
Goods Auto	1.40
Car	
Car	1.00
Jeep/Van	1.00
Govt. C/J/V	1.00
Passenger Jeep	1.00
Buses	
Mini Bus	1.40
Private Bus	2.20
ST. Bus	2.20
LCV	1.40



Vehicle Type	PCU Factor
Trucks	2.20
MAV	
Semi Articulated	4.00
Articulated	4.00
Tractor	4.00
Tractor Trailer	4.00
Non-Motorised Vehicles	
Cycle	0.50
Cycle Rickshaw	1.50
Hand Cart & Animal Drawn Vehicle	2.00
Others	3.00

Source: Guidelines for Capacity of Roads in Urban Areas (IRC 106-1990)

Average Daily Traffic (ADT)

Daily traffic volume by vehicle type and direction is added separately and averaged to determine the Average Daily Traffic. ADT, at all the six locations, by vehicle type are presented in **Table 2.3**.

The Average Daily Traffic (ADT) observed on the six major roads varied in the range of and 11,748 - 55,448 PCUs (10,865 - 46,871 Vehicles). The detailed daily traffic flows and hourly variation observed on the six major roads are given in **Annexure 2.1**.

From the base year (2006) traffic figures at the six survey locations (Table 2.3), it can be observed that the maximum ADT is observed at S P Office on the Necklace Road i.e. 55,448 PCUs and minimum traffic is observed on the Purna Road i.e. 11,748 PCUs.

Table 2.3 Average Daily Traffic (ADT) on Major Roads



Vehicle Type	Purna Road	Malegaon Road	Latur Road	Necklace Road	Degloor Road	NH-222 (Airport Road)
Two-wheeler	4839	6689	11113	20310	4566	5085
3-Seater Auto	2210	3241	6458	15516	2848	956
6-Seater Auto	13	3	1	1	3	544
Goods Auto	127	487	351	240	498	457
Car	427	744	1261	2264	585	959
Jeep/Van	345	564	940	687	648	1064
Govt. C/J/V	22	90	107	359	45	54
Passenger Jeep	39	66	300	0	194	365
Mini Bus	70	9	30	15	231	105
Private bus	36	17	149	63	107	205
Standard Bus	44	118	281	11	471	359
LCV	264	263	754	256	408	437
Trucks	194	268	399	27	2841	1743
Semi Articulated	26	15	96	2	991	1222
Articulated	4	7	3	4	47	56
Tractor	20	105	25	10	27	92
Tractor-Trailer	42	92	18	1	39	82
Cycles	2012	1960	4026	5927	1631	1033
Cycles Rickshaw	93	150	139	909	372	20
ADV / Hand	38	135	119	270	141	16
Others	0	0	0	0	0	0
Total in Vehicles	10865	15023	26571	46871	16695	14851
Total In PCUs	11748	17271	30300	55448	25787	22110

Daily Variation of Traffic

Daily traffic variation in terms of vehicles as well as in PCUs observed at each of the survey locations is shown in **Figure 2.2** to **Figure 2.7** and variation of traffic in terms of minimum and maximum traffic (PCUs) on various roads is presented in **Table 2.4**

Table 2.4 Daily Variation of Traffic



Location	Max Traffic (PCUs)	Min Traffic (PCUs)	Average Traffic (PCUs)	% Variation of max. traffic w.r.t. average	% Variation of min. traffic w.r.t. average
Purna Road	12807	11072	11748	8.3%	-6%
Malegaon Road	18492	15229	17271	6.6%	-13%
Latur Road	32324	28924	30300	6.3%	-5%
Necklace Road	62254	51608	55448	10.9%	-7%
Degloor Road	26212	25528	25787	1.6%	-1%
NH-222 (Airport Road)	23112	21593	22110	4.3%	-2%

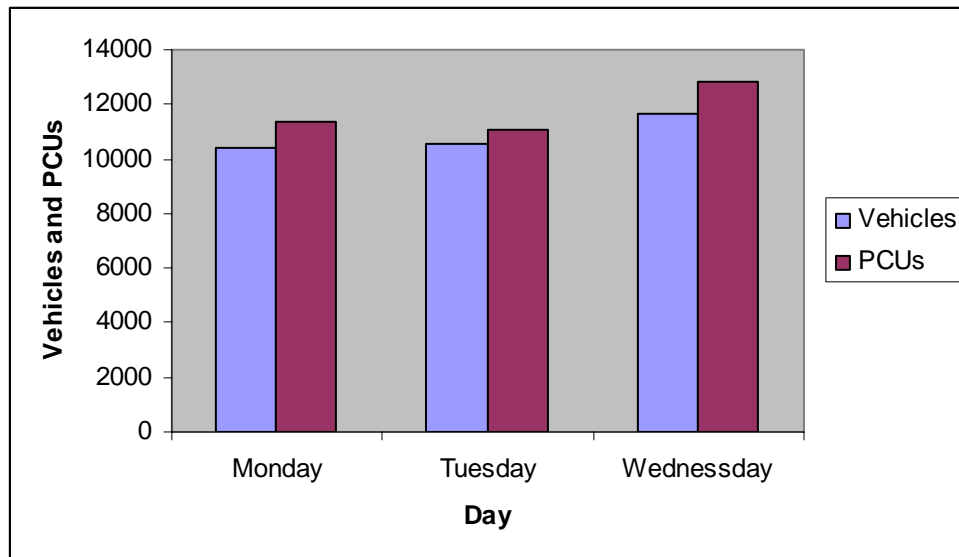


Figure 2.2 Daily Variation of Traffic on Purna Road

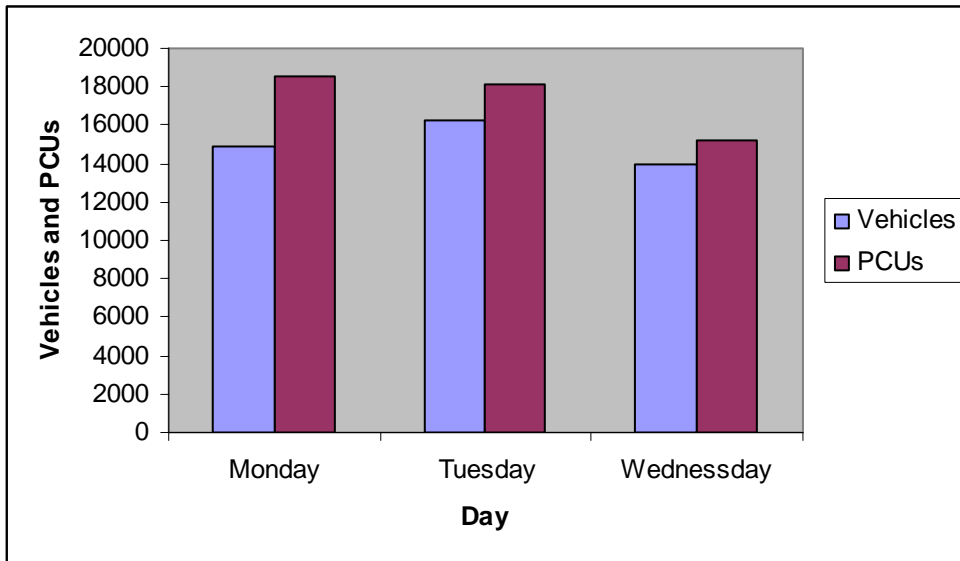


Figure 2.3 Daily Variation of Traffic on Malegaon Road

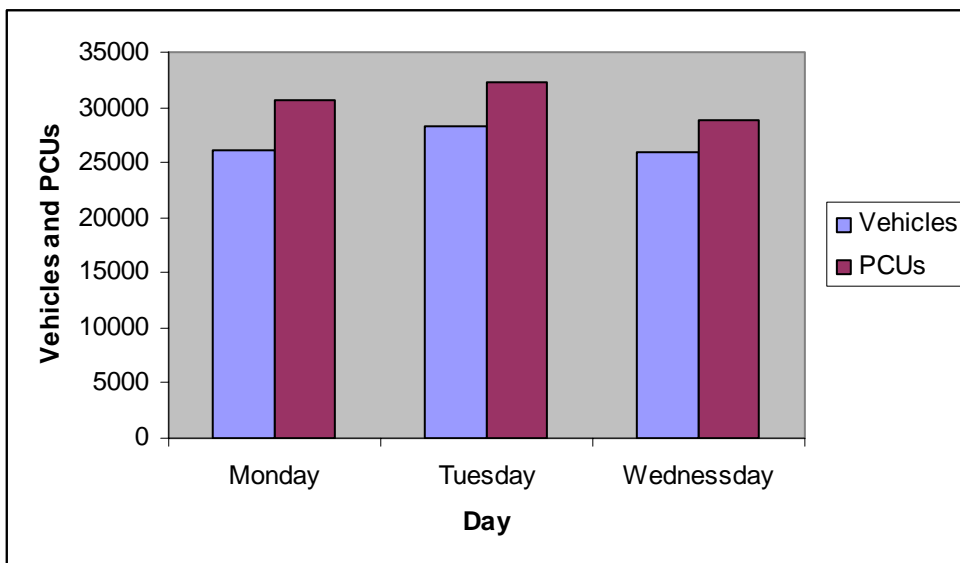


Figure 2.4 Daily Variation of Traffic on Latur Road

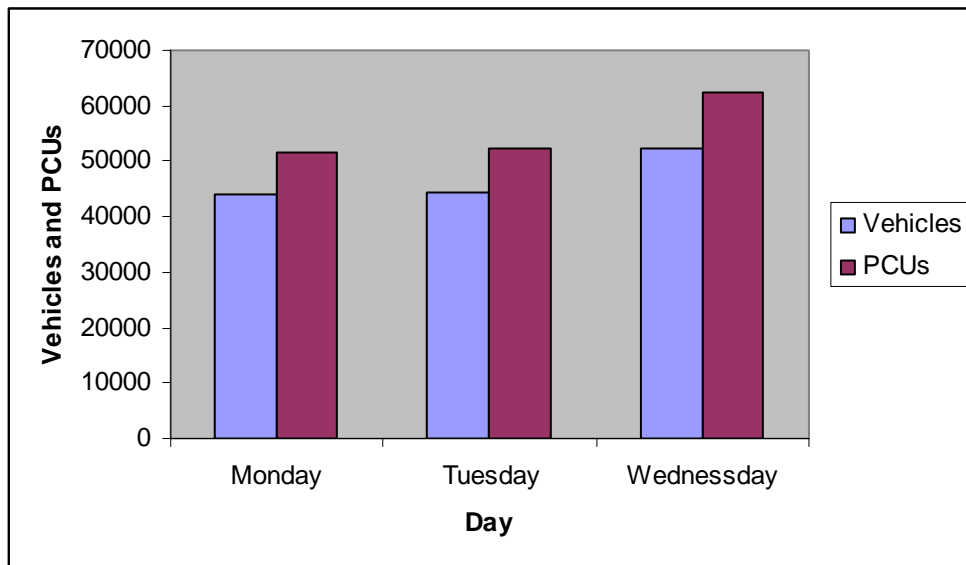


Figure 2.5 Daily Variation of Traffic at S.P Office on Necklace Road

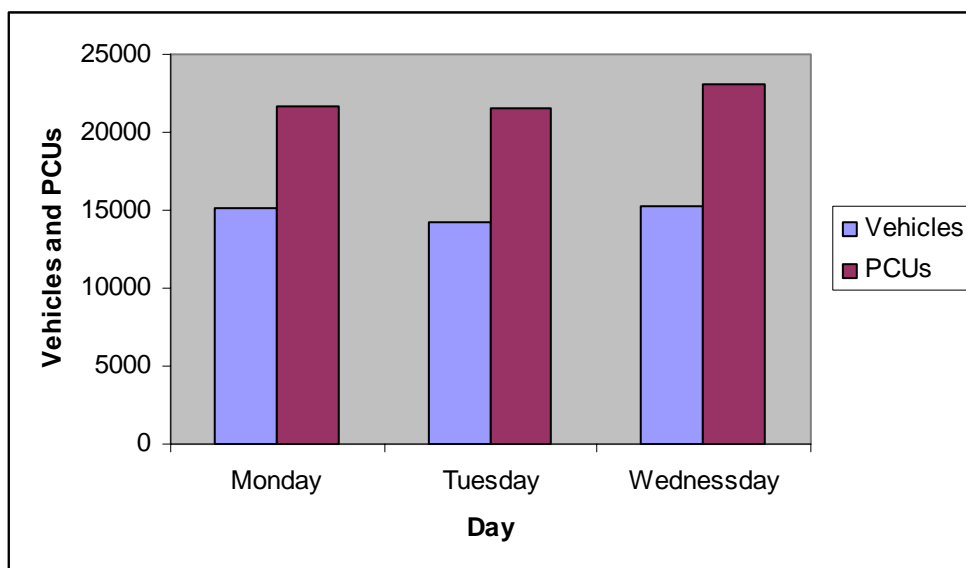


Figure 2.6 Daily Variation of Traffic at Hotel Bageecha on NH-222

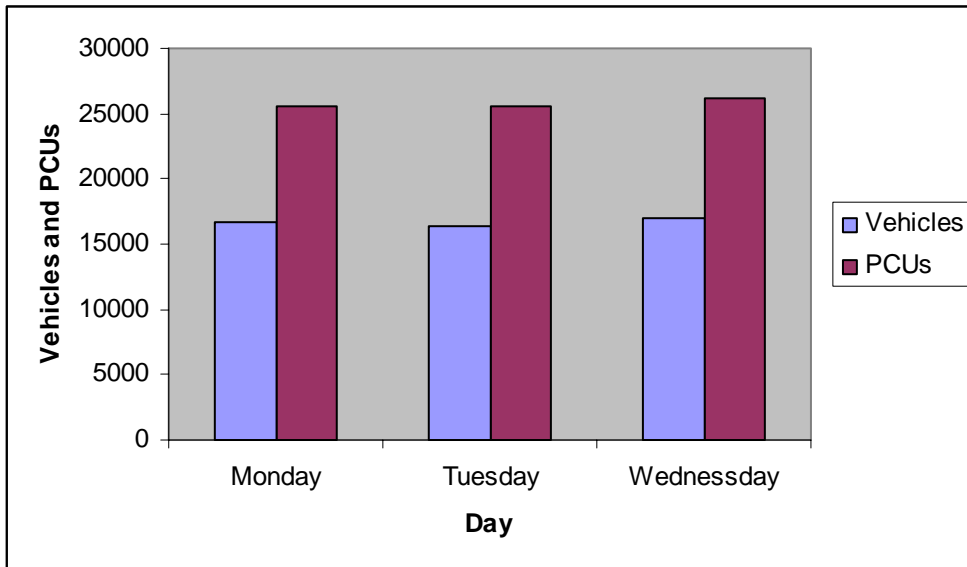


Figure 2.7 Daily Variation of Traffic at Tyre Board on Degloor Road

Hourly Variation of Traffic

Hourly traffic observed on an average day is presented in **Annexure 2.1** for six locations. These figures indicate the hourly variation of total traffic in terms of vehicles and PCUs. Important findings of data analysis are discussed below:

It may be observed that peak hour traffic share varied in the range of 6.1% to 8.5%. Morning peak period (7.00 to 13.00 hours) traffic varied between 696 – 4190 PCUs, evening peak period (17.00 to 22.00 hours) traffic varied between 977 – 4717 PCUs. The minimum peak hour traffic was observed on Purna Road and maximum at S P Office on Necklace Road.

Directional Distribution

Directional distribution of traffic is an important input for capacity analysis. The directional split observed on the Degloor Road (Nanded/Degloor), Malegaon Road (Malegaon/Nanded), Necklace Road (Workshop/Mutha) and NH-222 (Nanded/Ardhapur) was 51:49, whereas for Latur Road (Tower/ CIDCO) and Purna Road (Purna/Nanded) it was 52:48. This indicates that the directional distribution of traffic on all the major corridors is nearly uniform and a value of 50:50 is adopted for all the sections for capacity analysis.



Traffic Composition

Composition of traffic (on a typical working day) as observed at the volume count stations on various roads are given in **Annexure 2.1**. From the analysis, it was observed that the share of Two-Wheeler traffic is high (27% to 45%). The composition of Motorised and Non-motorised vehicles in the traffic stream observed at all the survey locations compiled in **Table 2.5** brings out the following inferences for the Necklace Road and rest can be viewed in the Table 2.5.

- Passenger vehicles (Car/Jeep/Van) on Necklace Road constitute over 7% while Mini buses & Buses are negligible, since heavy vehicles are not allowed on this road
- Two Wheeler, Auto Rickshaw and Cycle traffic constitute about 43%, 33% and 13% of total traffic respectively.
- LCVs constitute only about 1%, while 2-Axle/3-Axle trucks and MAV vehicles are not allowed on Necklace Road.
- Government vehicles constitute only about 1%.

Table 2.5 Composition of Motorized Traffic

Mode	Composition					
	Purna Road	Malegaon Road	Latur Road	Necklace Road	NH-222	Degloor Road
Two Wheeler	45%	45%	42%	43%	34%	27%
3-Seater Auto Rickshaw	22%	22%	24%	33%	6%	17%
6-Seater Auto Rickshaw	0%	0%	0%	0%	4%	0%
Goods Auto	3%	3%	1%	1%	3%	3%
Car	5%	5%	5%	5%	6%	4%
Jeep/Van	4%	4%	4%	1%	7%	4%
Govt C/J/V	1%	1%	0%	1%	0%	0%
Passenger Jeep	0%	0%	1%	0%	2%	1%
Mini Bus	0%	0%	0%	0%	1%	1%
Pvt Bus	0%	0%	1%	0%	1%	1%
Stand Bus	1%	1%	1%	0%	2%	3%
LCV	2%	2%	3%	1%	3%	2%
Truck	2%	2%	2%	0%	12%	17%
Semi Articulated	0%	0%	0%	0%	8%	6%



Mode	Composition					
	Purna Road	Malegaon Road	Latur Road	Necklace Road	NH-222	Degloor Road
Articulated	0%	0%	0%	0%	0%	0%
Tractor	1%	1%	0%	0%	1%	0%
Trailer	1%	1%	0%	0%	1%	0%
Cycle	13%	13%	15%	13%	7%	10%
Cycle Rickshaw	1%	1%	1%	2%	0%	2%
Hand Cart & ADV	1%	1%	0%	1%	0%	1%

2.2.2 Turning Movement Count Survey

Turning Movement Survey was conducted at 25 important intersections in Nanded City to obtain information on direction wise and mode wise turning movement of traffic. The survey was conducted for 8/12/16 hours covering both morning and evening peak periods. The peak hour directional movement data was used to generate mid-block count data on each road. **Annexure 2.2** presents the peak hour traffic flow diagrams for all the 25 intersections.

Table 2.6 presents intersection-wise peak hour traffic and corresponding peak hour, as observed at the intersections.

Table 2.6 Summary of Peak Hour Traffic at Intersections

Sl. No.	Intersection	Peak Hour Traffic		Peak Hour
		Vehicles	PCUs	
1	Raj Bar Corner	5860	6415	19.00 – 20.00
2	Work Shop Junction	6697	7335	19.00 – 20.00
3	Rest House Junction	3057	3365	16.00 – 17.00
4	ITI Junction	3999	4431	16.00 – 17.00
5	Junction on Shivaji Nagar ROB	5906	6374	10.00 – 11.00
6	Mutha Junction	6310	7466	19.00 – 20.00
7	Mahaveer Junction	5523	6273	12.00 – 13.00
8	Gurudwara Dena Bank Junction	2146	2419	10.00 – 11.00
9	Tower	4007	4500	12.00 – 13.00
10	Bharki Junction	2859	3544	12.00 – 13.00
11	Degloor Junction	4067	2020	12.00 – 13.00



Sl. No.	Intersection	Peak Hour Traffic		Peak Hour
		Vehicles	PCUs	
12	Bhagya Nagar Circle	4924	5029	20.00 – 21.00
13	Nayak Junction	4355	4556	19.00 – 20.00
14	Register Office Junction	2689	2723	19.00 – 20.00
15	Taroda Junction	2285	2501	10.00 – 11.00
16	Ambedker Junction near Railway Station	2645	3797	12.00 – 13.00
17	Kalsa Hallabhol Junction	4830	5658	19.00 – 20.00
18	Gurudwara Gate 1 Junction	2043	2292	13.00 – 14.00
19	Bhaghat Singh Cross	2429	2859	13.00 – 14.00
20	Bafna T-Point	3259	5006	9.00 – 10.00
21	Maharana Pratap Chowk	2846	3502	20.00 – 21.00
22	Hingoli Gate Junction	5057	5840	11.00 – 12.00
23	Ambedker Chowk (Latur Phata)	2342	3041	9.00 – 10.00
24	Milk Dairy Chowk	863	1264	16.00 – 17.00
25	Chhatrapati Shivaji Chowk	1511	2290	10.00 – 11.00

From the analysis of turning movement survey data the following inferences are made:

- Maximum peak hour traffic was observed at Mutha Chowk 7466 PCUs (6310 vehicles) followed by Work Shop Junction 7335 PCUs (6697 vehicles)
- Minimum peak hour traffic was observed at Milk Dairy Junction 1264 PCUs (863 vehicles).
- The composition of traffic observed at Mutha Chowk and Milk Dairy Chowk are shown in **Figure 2.8** and **2.9**. The hourly variation graphs for all the junctions and traffic composition figures for the rest of the Junctions are presented in **Annexure 2.2**.
- High percentage of right turning traffic has been observed at Mutha Chowk, Raj Bar Corner and Hingoli Gate Junctions.
- Minimum percentage of right turning traffic has been observed at Kalsa Hallbhol Junction.
- High percentage of turning traffic has been observed at Hingoli Gate Junction and Tower (Old Monda) Junction.
- Minimum percentage of turning traffic has been observed at Shivaji Nagar ROB junction.

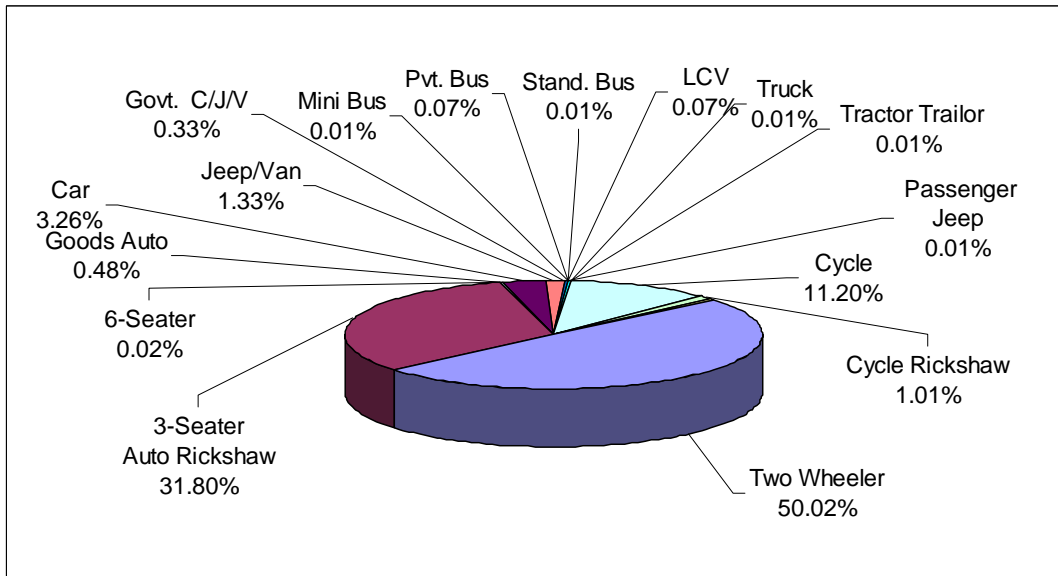


Figure 2.8 Traffic Composition at Mutha Chowk

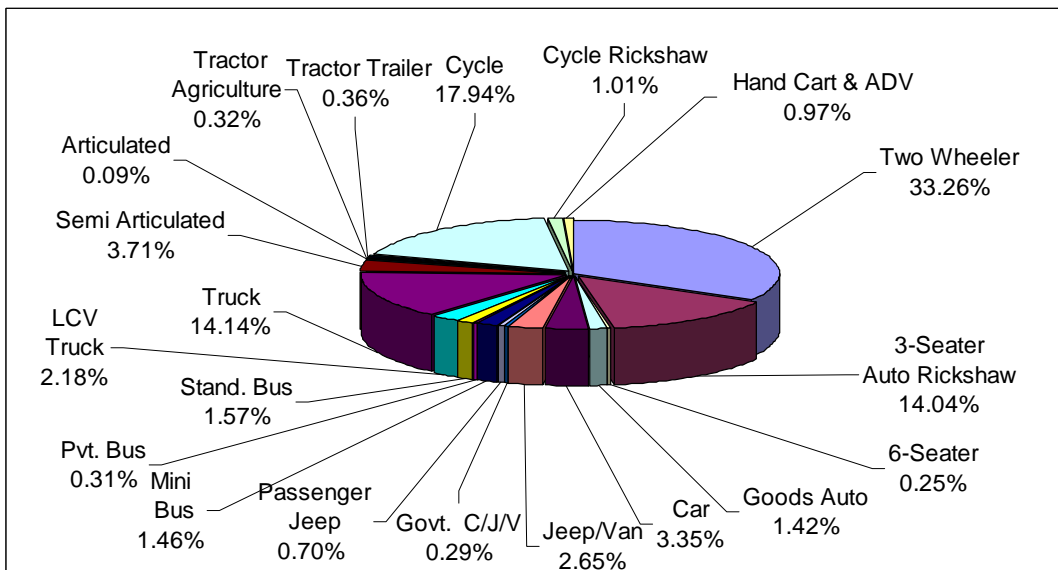


Figure 2.9 Traffic Composition at Milk Dairy Chowk

2.2.3 Pedestrian Count Survey



In order to study and assess the requirement of pedestrian facilities in areas of intense pedestrian movement, Consultants have conducted pedestrian count surveys at the following locations:

- Ambedker junction near Railway Station
- Gurudwara Gate No. 1
- Dena Bank near Gurudwara

All the three junctions are four legged junctions. The minor road at Ambedker junction is a small road leading to railway station and pedestrian movement was observed on this arm. Both the junctions near Gurudwara are having two minor roads leading to Gurudwara Gate No. 1 and Nagina Ghat and pedestrian movement was observed on these two minor arms. Hence, pedestrian count survey was conducted at these three locations. On Gurudwara Road, carriageway from Gurudwara Gate No. 1 to Dena Bank Junction is encroached by shops and hawkers. Considering the importance of the uninterrupted flow on Necklace Road and Railway Station Road (Hingoli Gate to Bus Station), studying the necessity of exclusive signal phase for pedestrians or grade separated pedestrian facilities is important, which would eliminate the traffic problems. To study the requirement pedestrian facilities, pedestrian count surveys were carried out for 12 hours (8:00 hrs to 20:00 hrs) at Gurudwara Gate 1 & Dena Bank Junction and for 15 hours (from 8.00 to 23.00 hours) at Ambedkar Junction near Railway Station. Pedestrians crossing the road in both the directions were counted manually.

The peak hour and 12/15 hours pedestrian flow observed across the road in both directions is presented in **Table 2.7**.



Table 2.7 Pedestrian Traffic

Location	Gurudwara Gate 1 Junction			Dena Bank junction			Ambedker Junction		
	Gate 1 to Dena Bank	Dena Bank to Gate 1	Peak Hour	Nagina Ghat to Gate 1	Gate 1 to Nagina Ghat	Peak Hour	Railway Station to Shivaji Chowk	Shivaji Chowk to Railway Station	Peak Hour
Peak Hour Pedestrians	218	295	18.00 to 19.00	247	230	11.00 to 12.00	490	397	20.00 to 21.00
12/15 Hours Pedestrians	1640	1821		1547	1280		4189*	4262*	

* 15 hours count

Hourly variation of pedestrian flows observed at the three count locations is shown in **Figure 2.10**, **Figure 2.11** and **Figure 2.12** respectively.

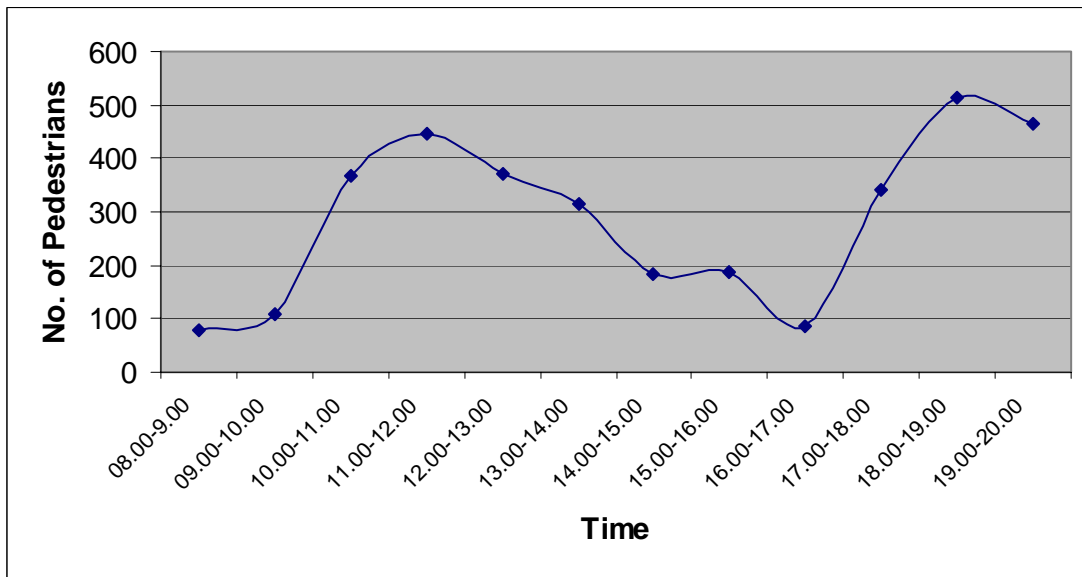


Figure 2.10 Hourly Variation of Pedestrian Flow at Gurudwara Gate No. 1

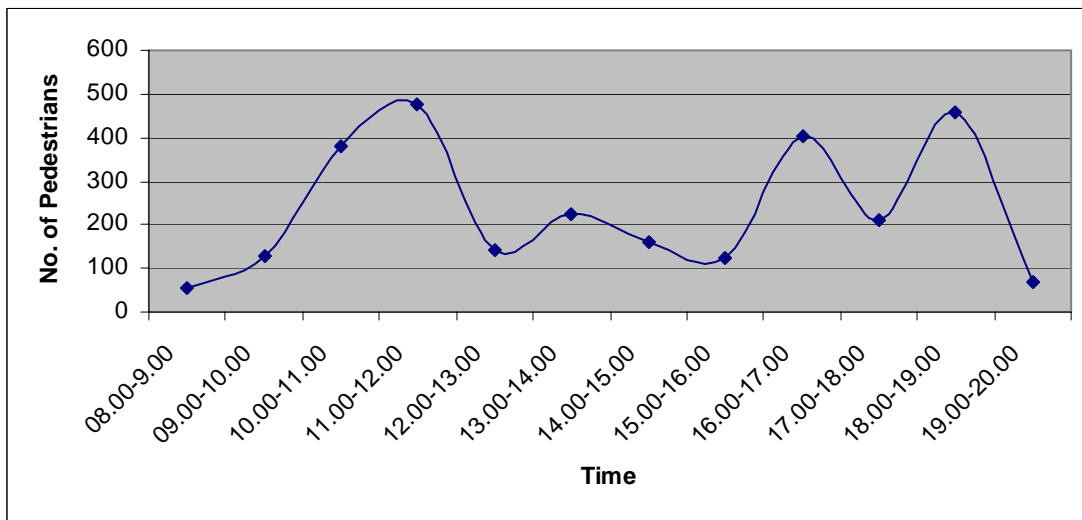


Figure 2.11 Hourly Variation of Pedestrian Flow at Dena Bank Junction

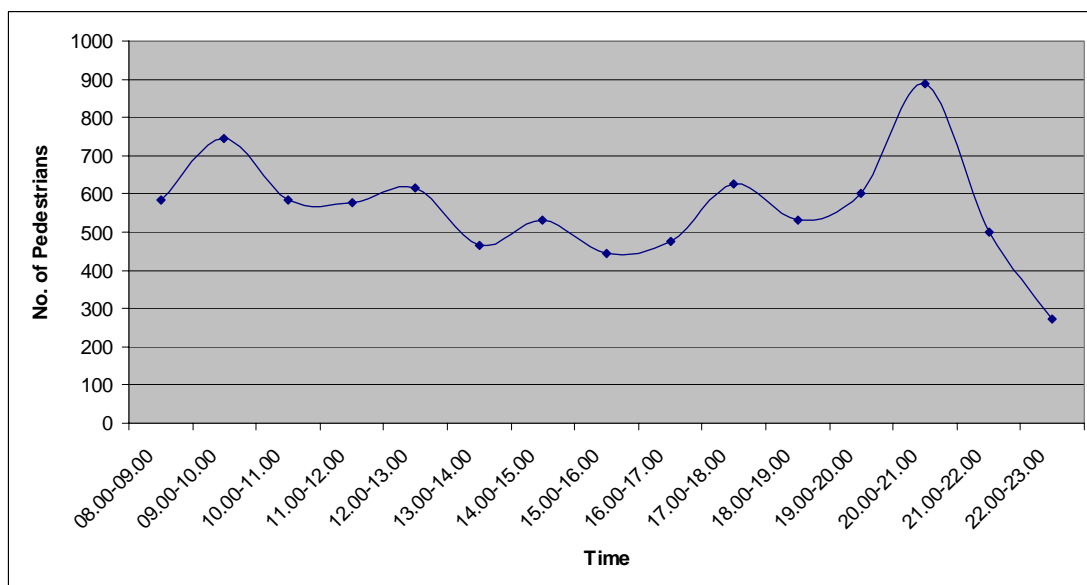


Figure 2.12 Hourly Variation of Pedestrian Flow at Ambedkar Junction

IRC:103-1988 provides the following guidelines for controlled pedestrian crossing facilities at mid-block locations in the form of traffic signals in situations if:

- i) Peak hour pedestrian volume (P) and vehicles (V) are such that, $PV^2 \geq 1 \times 10^8$ for undivided carriageways, and $PV^2 \geq 2 \times 10^8$ for divided carriageways
- ii) Approach speeds of vehicles exceed 65 kmph
- iii) Waiting time for pedestrians/ vehicles becomes too long



- iv) Accident records indicate 5 or more injuries to pedestrians in a year due to collision with vehicles

IRC:103-1988 provides the guidelines for grade separated pedestrian facilities at the signalized intersections in situations if one or more of the following conditions exist:

- a. Volumes of pedestrians and vehicular traffic are so large that insertion of an exclusive pedestrian phase will increase the cycle time for the traffic signals beyond 120 seconds.
- b. Vehicular traffic demands uninterrupted flow as associated with major arterial roads and expressways
- c. Control at-grade pedestrian crossing decisively fails to mitigate the problems of pedestrian-vehicle collisions. Viability of grade separated pedestrian facility must be checked against the delay cost for both pedestrians and vehicle drivers/users including increase in vehicle operating costs inflicted by increased delays.

Based on the following considerations, exclusive signal phase for pedestrians is proposed at the three locations.

- For the present traffic conditions with the growth in vehicular traffic and pedestrian traffic at the three locations, the cycle time required at the three locations may not exceed beyond 120 seconds. Signal controlled pedestrian crossings would serve the purpose without increasing the delays and waiting time for traffic as well as pedestrians.
- PV^2 values are more than 2×10^8 for all the three locations (Refer **Table 2.8**).

Table 2.8 PV^2 Values at Various Locations

Location	Peak Hour Vehicular Traffic (V)	Pedestrian Volume (P)	PV^2 (1×10^8)
Gurudwara Gate No.1	2043	513	21.41
Dena Bank Chowk	2146	477	21.96
Ambedkar Chowk	2645	887	62.05

2.2.4 Speed and Delay Survey

The speed and delay survey was conducted to know the journey speed of traffic on the major roads of the study area. For this purpose, the project roads have been divided into various sections. Total two runs were made on the project network roads.



Information on journey time along with the delays was recorded during the survey. The results of the survey analysis are presented in **Table 2.9**. Speeds are generally low because of the bad condition of the roads. However, the average stopped delay on the major roads is negligible.

Table 2.9 Average Speed on the Project Corridor

Road Name	Section Name	Distance (km)	Average Travel Speed Kmph	Average Running Speed Kmph
Road No 7	Raj Corner to Mutha	3.36	20.34	20.66
Road No 8	Bharki to Mutha Chowk	2.80	14.74	14.98
Road No 32 (NH 222)	Airport to Taroda Junction	2.60	16.59	16.59
Purna Road	Waman Nagar to Taroda Junction	1.20	31.16	31.16
Road No 39	Workshop Junction - Nayak Junction	2.06	28.07	28.07
Road No 40	Bhagya Nagar Junction- Railway Station	2.10	19.40	19.40
Road No 1,2&3	Ambedker Chowk-Keli Junction	1.92	17.00	17.00
Chikkalawadi Road	Mahaveer Chowk - Hingoli Chowk	1.70	20.52	20.71
Bhaghat Singh Road	Tower – Bafna Petrol Bunk	1.27	12.34	12.44
Degloor Road (Airport to Chhatrapati Chowk to Milk Dairy)	Forest Naka – Chhatrapati Shivaji Chowk - Milk Dairy	8.20	29.13	35.21
Crusher Road to Keli Market	Degloor Road to Keli Market	0.80	11.10	11.33
Hingoli Gate to Railway Station	Hingoli Gate to Railway Station	0.60	13.73	16.08

From the analysis of Speed and Delay survey data the following inferences are made:

1. Maximum speed was observed on Purna Road.
2. Minimum speed was observed on Crusher Road due to the very bad condition of the road.



2.2.5 Road Characteristics

Road No. 1: Railway Station to Vazirabad Police Station

It originates from Nanded railway station and runs perpendicular to the station complex towards Vazirabad Police Station. It passes near District Court, Shivaji Statue, Post office and ends at Vazirabad Police Station. Majority of abutting land use is commercial or residential between railway station and Vazirabad Police Station. The carriageway width varies from 7.0m to 10.5m with a paved shoulder of 2.0m on either side.

Traffic

Mid block peak hour volume of 2456 PCUs (1742 vehicles) was observed on this road. It is observed that morning peak occurs during 12.00 to 13.00 hours and evening peak during 17.00 to 18.00 hours. Maximum composition of traffic was of two wheelers followed by cycles and autos. Commercial traffic is minimum on this road. The traffic on this road is two-way.

Road No. 2: Vazirabad Police Station to Gurudwara Gate No. 1

This road starts from Vazirabad Police station and ends at Road No. 17 near Gurudwara Gate No.1. The road touches the entrance (Road No. 12) to Gurudwara Gate No. 2. Majority of abutting land use is commercial or residential between Vazirabad Police Station and Gurudwara Gate No. 1. The carriageway width is 7.0 with a paved shoulder of 1.5m to 2.5m on either side. The carriageway has unpaved shoulder of 1.5m to 2.5m on both sides.

Traffic

Mid block peak hour volume of 2729 PCUs (2726 vehicles) was observed on this road. It is observed that morning peak occurs during 12.00 to 13.00 hours and evening peak during 17.00 to 18.00 hours. Maximum composition of traffic was of two-wheeler followed by autos and cycles. The traffic on this road is one-way.

Road No. 3: Gurudwara Gate No. 1 to Keli Market

This road is a concrete road and starts from Road No. 17 near Gurudwara Gate No. 1 and crosses Bhagat Singh Road and ends at Keli market. The overall condition of the



road is poor. Majority of abutting land use is commercial or residential throughout. At few locations, encroachments have been seen on both the sides of the road.

Traffic

Mid block peak hour volume of 1859 PCUs (1589 vehicles) was observed on this road. It is observed that morning peak occurs during 13.00 to 14.00 hours and evening peak during 17.00 to 18.00 hours. Maximum composition of traffic was of two wheelers followed by autos and cycles. The traffic on this road is one-way.

Road No. 4: Keli Market to Bharki Chowk

The bituminous road starts from Keli market and meets Road no. 8 at Bharki Chowk. The road touches temple & mosque at the start and end of the road. Majority of abutting land use is commercial or residential. The carriageway width is 5.5 m and has paved shoulder on both sides.

Traffic

Mid block peak hour volume of 2147 PCUs (1604 vehicles) was observed on this road. It is observed that morning peak occurs during 12.00 to 13.00 hours and evening peak during 18.00 to 19.00 hours. Maximum composition of traffic was of two wheelers followed by autos and cycles. The traffic on this road is one-way.

Road No. 5: Bharki Chowk to Mosque to Navghat

The road length is 720 m and the DP width is 18 m. The road starts from Bharki Chowk and ends at Navghat. This road is combination of bituminous and concrete pavement. The first 110 m stretch from Bharki Chowk and the last 70m from Navghat are bituminous and the remaining stretch is concrete road. The road touches two temples and one mosque. Majority of abutting land use is residential and the remaining land use is commercial cum residential. The average carriageway width of the road is 5.0 m to 6.0 m.

Traffic

Mid block peak hour volume of 1485 PCUs (1246 vehicles) was observed on this road. It is observed that morning peak occurs during 11.00 to 12.00 hours and evening peak during 18.00 to 19.00 hours. Maximum composition of traffic was of two wheelers followed autos and cycles. The traffic on this road is mainly local.



Road No. 6: Darbar Masjid to Fort

This is basically a missing link. The proposed road starts from Road No. 5 at Darbar Masjid and passes through the graveyard and ends at Fort. Majority of abutting land use is residential.

Traffic

Since the road is a missing link, the traffic coming to the Fort is estimated, which is about 637 PCUs (534 vehicles) during peak hour.

Road No. 7: Regional Workshop to Mutha Chowk

The bituminous Road No. 7 starts from Mutha Chowk (which is at the heart of the city) passes through the busy residential and commercial area and crosses Manmad-Mudkhed Railway line through ROB near ST Bus Depot and ultimately is connected to the National Highway No. 222 at Raj Bar Corner near Regional Workshop. The road passes near the office of Superintendent of Police, Kalamandir, PWD Rest house and ST workshop. Majority of abutting land use is commercial or residential throughout. The road is having a four-lane carriageway divided by 0.3m median. The total length of the road is 3.36 km and majority of the road has footpath, which varies from 2.0m to 4.5m in width.

Traffic

The complete road is a two-way road. Three (3) day volume count survey was conducted at SP Office near Mutha Chowk and turning movement count survey was conducted at six junctions on this road. Five out of six junctions are 3-legged and Mutha Junction is a 4-legged junction. Mid block peak hour traffic volume observed near Workshop Corner is 6400 PCUs (7889 vehicles). It is observed that morning peak occurs during 10.00 to 11.00 hours and evening peak during 18.00 to 19.00 hours. Maximum composition of traffic was of two-wheeler followed by 3-seater autos and cycles. Heavy commercial traffic is not allowed on this road.



Road No. 8: Mutha Chowk - Mahaveer Chowk - Bharki Chowk - Degloor Naka

The undivided bituminous road starts from Mutha Chowk and passes through Old Munda, Bharki Chowk and ultimately is connected to Degloor Road at Degloor Naka. Majority of abutting land use is commercial. The road from Degloor Naka to Bharki Chowk is of single/intermediate lane. The road width varies from 3.3 m to 5.0 m.

Traffic

Maximum peak hour traffic of 6150 PCUs (5326 vehicles) is observed at Dena Bank on this road near Gurudwara. Only one-way traffic is allowed on this road.

Road No. 9: Degloor Naka to Hingoli Road

The road starts from Degloor Naka and ends at Hingoli Road. The road is partially metalled and partially earthen. Majority of abutting land use near Degloor Naka is commercial cum residential. The remaining stretches are mainly agricultural land. The road width varies from 8.0m to 13.0m and the overall condition of the road is bad.

Traffic

The existing mid block peak hour traffic volume is 1516 PCUs (1414 vehicles), It is observed that morning peak occurs during 11.00 hours to 12.00 hours and evening peak during 19.00 to 20.00 hours. Maximum composition of traffic was of two wheelers followed by cycles and autos. Presently this road is partially exists, after full development, there would be new generated traffic and diverted traffic ply on this road. For future traffic forecast on this road carried out considering the same.

Road No. 10: Mutha Chowk to Govardhanghat

The existing road starts from Mutha Chowk and ends at Godavari River. The exiting road is proposed to be extended over the river with bridge and finally will connect to Latur Road. Majority of abutting land use is commercial or residential. The road is undivided with intermediate lane carriageway and has unpaved shoulders of width 1.0m to 1.5m on both sides. The overall condition of the road is good.



Traffic

Mid block peak hour traffic volume of 2627 PCUs (2896 vehicles) is observed on this road. It is observed that morning peak occurs during 10.00 to 11.00 hours. Maximum composition of traffic was of two wheelers followed by auto and cycles.

Road No. 11: Gurudwara Parikrama

The road length is 260 m and the DP width is 15m. This road is concrete road and starts from Road No. 12 near Baryam Singh house and passes through Gurudwara Gate No.1 and ends at Road No. 16. The overall condition of the road is poor. Majority of abutting land use is residential. The existing carriageway width is 3.6m to 4.0m.

Road No. 12: Baryam Singh House - Gurudwara Gate No. 2 - Yatri Niwas

The first 90m stretch of this Road No.2 is concrete and the remaining stretch is bituminous. The road starts from Baryam Singh house and ends at Yatri Niwas on Road No. 14. The road touches Gurudwara Gate No. 2. Majority of abutting land use is residential and partly commercial.

Traffic

The existing mid block peak hour traffic volume on this road is very low (465 PCUs) and maximum is local traffic.

Road No. 13: Chikhalwadi Road to Bhagat Singh Road

The road starts from Yatri Niwas and ends at Bhagat Singh Road. It crosses Road No. 12. Majority of abutting land use is residential. The road from Yatri Niwas to Bhagat Singh Road is of single/intermediate lane and width varies from 3.0m to 5.0m. The carriageway has unpaved shoulders on both the sides.

Traffic

The existing traffic on this road is very low and maximum is local traffic.



Road No. 14: Yatri Niwas to Crusher Road

The existing bituminous road starts from Yatri Niwas and ends at Bhagat Singh Road and proposed to be extended to Crusher Road. It crosses Road no. 12. Majority of abutting land use is residential. The existing road from Yatri Niwas to Bhagat Singh Road is of single lane carriageway and the carriageway width varies from 3.0m to 3.5m.

Traffic

Mid block peak hour traffic volume of 341 PCUs (288 vehicles) is observed on this road. It is observed that morning peak occurs during 11.00 to 12.00 hours and maximum composition of traffic was of two-wheeler followed by cycles and auto.

Road No. 15: Gurudwara Gate No. 3 to Bhagat Singh Road

The existing bituminous road starts from Gurudwara Gate No. 3 and ends at Bhagat Singh road. The length of the road is 150m and majority of abutting land use is residential.

Road No. 16: Gurudwara Gate No. 4 to Gurudwara Road

The road length is 210m and the DP width is 15m. This concrete road starts from Gurudwara Gate No.4 and connected to Road No. 3. The overall condition of the road is poor. Majority of abutting land use is residential. The carriageway width is 5.0m.

Traffic

The existing traffic on this road is very low.

Road No. 17: Gurudwara Gate No.1 to Nagina Ghat

The road starts from Gurudwara Gate No. 1 and ends at Nagina Ghat. The first 350 m stretch from Gate No. 1 is bituminous, the next 340 m is concrete road and the remaining stretch is metalled road. The road touches one temple on Right Hand Side and *Dharamshala* and shops. The average carriageway width is 6.5m.



Traffic

Mid block peak hour traffic volume of 713 PCUs (641 vehicles) is observed on this road. It is observed that morning peak occurs during 11.00 to 12.00 hours and evening peak during 19.00 to 20.00 hours. Maximum composition of traffic was of two wheelers followed by cycles and autos.

Road No. 18: Gandhi Statue to Mahaveer Chowk

The existing bituminous road starts from Mahaveer Chowk and connects to Road No.2 at Gandhi Statue. The road touches one *Dargah* on LHS and Forest office on RHS. The length of the road is 230m. The existing road carriageway width is 7.0m

Traffic

Mid block peak hour traffic volume of 3281 PCUs (2952 vehicles) is observed on this road. It is observed that morning peak occurs during 12.00 to 13.00 hours and evening peak during 20.00 to 21.00 hours. Maximum composition of traffic was of two wheelers followed by autos and cycles. Only part of the road is two-way and the rest is one-way.

Road No. 19: Hingoli Gate (RUB) - Forest Office - Banda Ghat

The road length is 1700m and the DP width is 18m. The bituminous road starts from Hingoli Gate and crosses through a RUB and ends at Banda Ghat. The 100m stretch of this road from VIP road is 6 lane carriageway with 0.6m depressed median. The carriageway width within the RUB portion is 8.0m. The 740m stretch from Degloor road junction is four lane divided carriageway

Traffic

Mid block peak hour traffic volume of 2342 PCUs (2122 vehicles) is observed on this road. It is observed that morning peak occurs during 11.00 to 12.00 hours and evening peak during 18.00 to 19.00 hours. Maximum composition of traffic was of two wheelers followed by autos and cycles.



Road No. 22: Nagina Ghat to Banda Ghat

The road length is 370m and the DP width is 20m. This road is a concrete road and starts from Nagina Ghat and ends at Banda Ghat. The carriageway width varies from 5.5m to 10.0m.

Traffic

The present observed peak hour traffic on this road is very low (428 PCUs). There is no regular traffic on this road and only pilgrim traffic is observed.

Road No. 23: Vazirabad Road to Banda Ghat

The existing road is combination of bituminous and concrete road. The road starts from Vazirabad Road and ends at Banda Ghat. Majority of abutting land use is residential. The existing road is single lane carriageway and the average carriageway width is 3.5m.

Traffic

The peak hour traffic observed on this road is very low (290 PCUs). Mainly the traffic using this road is local.

Road No. 24: Degloor Road through C.R.C to Gyanamata School

The existing road is basically a cart track. The road starts from Degloor Road and crosses the railway line and ultimately meets Hingoli Road. Majority of abutting land use is agricultural. The existing cart track is in bad condition. The road width varies from 4.0m to 12.5m.

Road No. 26: Mahadeo Dalmill to Gorakshan Chikalwadi road

The road length is 550m and the DP width is 30m. The road partially exists. The road is proposed to start from Mahadeo Dalmill and ends at railway level crossing. The majority of abutting land use is residential on the existing portion. The abutting land use on the missing link portion is a combination of residential and paddy fields.



Traffic

This is a proposed road and the traffic on the partial existing road is very low.

Road No. 27: Dr. Savirkar Building to Navghat

The road length is 740m and the DP width is 15m. The road starts from Dr. Savirkar Building and ends at Navghat. Majority of abutting land use is residential. The carriageway width varies from 3.5 to 7.5m.

Traffic

The present peak hour traffic on this road is very low (143 PCUs) and the major proportion of traffic is two wheelers followed by cycles and autos.

Road No. 28: Bafna Petrol Pump - Old Munda - New Bridge On Godavari

The road starts from Bafna Petrol Pump and ends at starting of Godavari Bridge. This road is a combination of bituminous and concrete pavement. The road passes near old Monda statue. The majority of abutting land use is commercial. The first 600 m of the road is four lane divided carriageway. The next 280m stretch is undivided two lane carriageway and the last 290m is combination of intermediate and two lanes. The carriageway width varies from 5.5m to 7.0m and the carriageway width around Old Monda is 15.0m.

Traffic

Mid block peak hour traffic volume of 2316 PCUs (2063 vehicles). It is observed that morning peak occurs during 12.00 to 13.00 hours and evening peak during 17.00 to 18.00 hours. Maximum composition of traffic was of two wheelers followed by cycles and autos, fair amount of commercial traffic is also observed on this road.

Road No. 28A: Khalsa RUB Approaches

The proposed RUB location is on the east of Khalsa School across railway track. It connects Degloor Road on southern side of railway track and Hingoli Road on northern side. The BT carriageway width is 5.5m with unpaved shoulder of 1.0m on either side. The northern approach has metal road of 3m to 4m width.

Traffic



Mid block peak hour volume of 1082 PCUs (942 vehicles) is observed on this road. It is observed that morning peak occurs during 12.00 to 13.00 hours and evening peak during 17.00 to 18.00 hours. Maximum composition of traffic was of two wheelers followed cycles and autos.

Road No. 29: Crusher Road (From Degloor Road to Keli Market)

The road starts from Degloor Road and ends at Keli Market. This road is a combination of bituminous pavement and metalled road. The 220m in length road is a two lane undivided newly constructed carriageway. Majority of abutting land use is agricultural land.

Traffic

The traffic on this road is very less (380 PCUs). A few commercial vehicles use the road and the rest of the traffic comprises of two wheelers and cycles.

Road No. 30: Latur Road to Milk Dairy

The road starts from Road No. 31 at Milk Dairy and ultimately connects to Latur Road. It passes near the TV center and temple. This road is a bituminous road. The majority of abutting land use is agricultural land. The carriageway width varies from 3.5m to 4.2m.

Traffic

The observed peak hour traffic on this road is very low (538 PCUs). The major composition of traffic consisted of cycles and two wheelers followed by autos.

Road No. 31: Navghat Bridge to Milk Dairy (Latur Road)

The road length is 1200m and the DP width is 30m. The road starts from Milk Dairy and ends at Navghat Bridge. The majority of abutting land use is agricultural land. The average carriageway width of the bituminous stretch is 3.5m. The carriageway has unpaved shoulder of 1.5m width on both sides. The overall condition of this road is bad.

Traffic



Mid block peak hour traffic volume of 143 PCUs (176 vehicles) is observed on this road. It is observed that morning peak occurs during 9.00 to 10.00 hours and evening peak during 17.00 hours to 18.00 hours. Maximum composition of traffic was of two wheelers followed by cycles.

Road No. 32: Airport (Forest Naka) to Chhatrapati Nagar

The road length is 3900m and the DP width is 30m. This road is part of NH No. 222. This road is a bituminous road with a two lane undivided carriageway. The carriageway has paved shoulder on both sides up to a distance of 2km from Chhatrapati Nagar. The majority of abutting land use is agricultural land.

Traffic

The maximum mid block peak hour traffic volume of 786 PCUs (651 vehicles) was observed at Chaitanya Nagar near to Airport. It is observed that morning peak occurs during 12.00 to 13.00 hours and evening peak during 18.00 to 19.00 hours. Maximum composition of traffic was of two wheelers followed by cycles and autos, and a fair amount of commercial traffic is also observed on this road.

Road No. 34: Pawdewadi Naka to Rest House

The road length is 900m and the DP width is 18m. This existing bituminous road starts from Pawdewadi Naka and ends behind PWD rest house. The existing road is to be extended up to Road No.7. The road is single lane carriageway and the carriageway has unpaved shoulder of width 1.5m on both sides. The overall condition is bad. The abutting land use of the existing road is residential. The land use of the missing link is residential.

Traffic

Mid block peak hour traffic volume of 735 PCUs (770 vehicles) is observed on this road. It is observed that morning peak occurs during 10.00 to 11.00 hours and evening peak during 19.00 to 20.00 hours. Maximum composition of traffic was of two wheelers followed by cycles and autos.

Road No. 35: Shivaji Nagar to Nasratpur



The road length is 5000m and the DP width is 15m. The existing bituminous road starts from ROB and up to a distance of 820m from ROB it is under part of Road No. 35. The road takes left turn at Dr. Kabde Hospital. This road is a combination of bituminous, metal and concrete pavement. The 100m approach viaduct portion is 3-lane carriageway. The carriageway width of next 720m varies from 5.5m to 7.0m. The 5.5m intermediate carriageway has paved shoulder of 0.5m width on both sides. The 7.0m carriageway has unpaved shoulder of 1.0m width. The majority of abutting land use is residential. The other land use is commercial in the metalled road portion and agricultural land in the missing link portion.

Traffic

Mid block peak hour traffic volume of 518 PCUs (531 vehicles) is observed on this road. It is observed that morning peak occurs during 11.00 hours to 12.00 hours and evening peak during 20.00 to 21.00 hours. Maximum composition of traffic was of two wheelers followed by cycles and autos. Commercial traffic is almost negligible on this road.

Road No. 37: Shivaji Statue to (Through Z P Girls School) to Degloor Road

The DP width of this partially existing road is 15m. The existing road starts from Degloor road and exists up to a distance of 220m from Degloor road. There is a proposal to extend the existing road and connect Road No.2 at Shivaji Statue. The 100m approach viaduct portion is a 3-lane carriageway and the carriageway width of next 720m varies from 5.5m to 7.0m.

Traffic

Mid block peak hour traffic volume of 1033 PCUs (1338 vehicles) is observed on this road. It is observed that morning peak occurs during 13.00 to 14.00 hours and evening peak during 15.00 to 16.00 hours. Maximum composition of traffic was of two-wheeler followed cycles and autos.

Road No. 38A: Part of Western Bypass

The existing road length is 1060m and the overall DP width throughout the corridor is 30m. This bituminous road starts from Latur Road up to a distance of 1060m. The remaining stretch is partly cart track and partly missing link up to Godavari River. The bituminous pavement is a newly constructed road. The abutting land use of the



existing road is agricultural land. The road is two-lane carriageway. The cart track is in bad condition.

Road No. 39: Anandnagar Road

The road length is 2060m and the DP width is 30m. The bituminous road starts from Road No.7 near ST Workshop and runs through the busy residential and commercial area and ultimately connects Hingoli Road. The road mainly passes near the Municipal drinking water refilling station, polytechnic college and temple. Majority of abutting land use is commercial or residential. The 440m stretch of this road from ST workshop is two lane undivided carriageway with unpaved shoulder of 2.5m and paved shoulder of 1.5m on both sides. The remaining stretch is four lane carriageway divided by 1.0m median without barrier.

Traffic

Mid block peak hour traffic volume of 3649 PCUs (3520 vehicles) is observed on this road. It is observed that morning peak occurs during 10.00 hours to 11.00 hours and evening peak during 20.00 to 21.00 hours. Maximum composition of traffic was of two wheelers followed by autos and cycles.

Road No. 40: Bhagyanagar to Yashwant College to Railway Station

The road length is 2100m and the DP width is 18 to 22m. The bituminous road starts from railway station and runs perpendicularly towards Bhagyanagar and cross the VIP Road and ultimately connects Anandnagar Road. The road mainly passes near Yashwant College, stadium. Majority of abutting land use is commercial or residential. The 100m stretch form railway station is two lane undivided carriageway with unpaved shoulder of 2.5m and paved shoulder of 1.5m on both sides. The remaining stretch is three lane carriageway.

Traffic

Mid block peak hour traffic volume of 3160 PCUs (3144 vehicles) is observed on this road. It is observed that morning peak occurs during 11.00 hours to 12.00 hours and evening peak during 20.00 to 21.00 hours. Maximum composition of traffic consisted of two wheelers followed by autos and cycles. Commercial traffic is minimum on this road.



Road No. 41: Milk Dairy to Degloor Road Junction (Milk Dairy to Chhatrapati Shivaji Chowk)

The road length is 1840m. The bituminous road starts from Milk Dairy and connects Degloor Road. Majority of abutting land use is agricultural land. The road is three lane undivided carriageway with unpaved shoulder of 2.5 m on both sides. The condition of the majority of the road is bad.

Traffic

Mid block peak hour traffic volume of 751 PCUs (422 vehicles) is observed on this road. It is observed that morning peak occurs during 12.00 to 13.00 hours and evening peak during 17.00 to 18.00 hours. Maximum composition of traffic was commercial traffic followed by two wheelers and autos. This road is used as a bypass between Degloor Road and Latur Road.

Road No. 42: Degloor Road Junction (Chhatrapati Shivaji Chowk) to Old Bridge

The road length is 1160m. The bituminous road starts from Old Godavari River Bridge to Degloor junction. Majority of abutting land use is agricultural land throughout the project corridor. Little encroachment has been observed near the approach of bridge. The road is a two lane undivided carriageway with unpaved shoulder of 1.5m to 2.0m on both sides. The majority of road is in bad condition.

Traffic

Mid block peak hour traffic volume of 1629 PCUs (634 vehicles) is observed on this road. It may be observed that morning peak occurs during 12.00 hours to 13.00 hours and evening peak during 18.00 to 19.00 hours. Maximum composition of traffic consisted of Commercial vehicles followed by two wheelers and cars.

2.3 Peak Hour Traffic on Various Roads

The mid block peak hour traffic volume on the important roads of Nanded City road network is shown in **Figure 2.13**. The road wise mid block peak hour traffic volume in the base year (2006) is also presented in **Table 2.10**.

Table 2.10 Peak Hour Traffic on Various Roads (2006)

Road No.	Location Name	PCUs/Hour
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Road No.	Location Name	PCUs/Hour
1	Near Vazirabad Police Station	2456
2	Near Khalsa Hallabol Chowk	2729
3	Near Bhagat Singh Chowk	1859
4	Near Bharki Chowk	2147
5	Near Bharki Chowk	2122
6	Near Darbar Masjid	636
7	Between Raj Bar and Workshop Chowk	6400
8	Between Dena Bank and Mahaveer Chowk	6150
9	Near Degloor Naka	1516
10	Near Mutha Junction	2627
12	Baryam Singh House to Gurudwara Gate No. 2	465
14	Yatri Nivas to Crusher Road	341
17	Dena Bank	713
18	Between Mahaveer and Gandhi Statue	3281
19	Near Hingoli Gate	2342
22	Nagina Ghat to Bhandra Ghat	428
23	Vazirabad Road to Bhandra Ghat	290
24	Degloor Road thru C.R.C. to Gyanamata School	1860
27	Near Navghat	143
28	Near Tower	2316
28A	Khalsa RUB Approaches	1082
29	Crusher Road	380
30	Between Latur Phata and Milk Dairy	538
31	Near Milk Dairy	143
32	Chaitanya Nagar	786
34	Near Rest House	735
35	Shivaji Nagar R.O.B.	518
37	Shivaji Statue to Degloor Road	1675
39	Between Bhagyanagar and Nayak Chowk	3649
40	Near Bhagyanagar Circle	3160
41	Between Milk Dairy and Chhatrapati Shivaji Chowk	751
42	Near Chhatrapati Shivaji Chowk	2148