



## Chapter 3

### Traffic Forecast

#### 3.1 General

An in-depth analysis of the data collected as part of present study has enabled to assess the road improvements/capacity augmentation measures that have to be taken up to meet the future year travel demand. Future year traffic depends on many factors like socio - economic growth of the city. This chapter discusses about the methodology for forecasting the traffic for various horizon years. 2011, 2016, 2021, 2026, 2031 and 2036 is estimated and compared with existing LOS. The road network improvements required to meet the future traffic demand based on the forecasted traffic is discussed in the following sections.

#### 3.2 IRC Capacity Guidelines for Urban Roads

Capacity standards are fixed normally in relation to the Level of Service (LOS) adopted for the design. Design criteria for urban roads are unlike rural roads. The hourly variation of traffic on urban roads has at least two distinct peaks during morning and evening hours of the day. The urban peak hour traffic constitutes about 6-10% of the daily traffic depending on various factors including the importance of the road in the network. During peak periods, unidirectional traffic is also observed on several roads in urban areas. These factors coupled with other urban characteristics make it necessary to design the urban roads on the basis of peak hour traffic rather than average daily traffic (ADT) as in the case of rural roads.

#### 3.3 Recommended Design Service Volume for Urban Roads

Considering the need for smooth traffic flow, it is not advisable to design the road cross-sections for traffic volumes equal to the maximum capacity which will become available normally at LOS E. At this LOS, the speeds are rather low and freedom to manoeuvre within the traffic stream is very much restricted. Besides, even a small increase in traffic at that traffic volume would lead to forced flow situation and breakdown within the traffic stream. On the other hand adoption of a higher level of service like A or B, although enabling near free flow conditions would mean lower design service volumes necessitating higher number of traffic lanes to carry a specified traffic volume with implicit higher facility cost. As a compromise solution, it is recommended that normally LOS C be adopted for design of urban roads. At this level, volume of traffic will be around 0.70 times the maximum capacity and this is taken as the *design service volume* for the purpose of adopting design values.



Design service volume and capacity for different categories of arterial roads is presented in **Table 3.1**.

**Table 3.1 Design Service Volume and Capacity**

S. No	Type of Carriageway	Total Design Service Volume (PCUs/Hr.)	Capacity (PCUs/Hr.)
1	2-Lane (One-Way)	2400	3429
2	2-Lane (Two-Way)	1500	2143
3	3-Lane (One-Way)	3600	5143
4	4-Lane Undivided (Two-Way)	3000	4286
5	4-Lane Divided (Two-Way)	3600	5143
6	6-Lane Undivided (Two-Way)	4800	6857
7	6-Lane Divided (Two-Way)	5400	7714
8	8- Lane Divided (Two-Way)	7200	10286

Source: Indian Roads Congress 106:1990

### 3.4 Assessment of Growth Rates

Long term forecasting of traffic on the project road during the time horizon of the study is required for design of highway and assessing the economic and financial viability of the proposed investment. To establish the future traffic growth rates, following approaches are generally used.

- Past trends in traffic growth in the study area
- Growth of registered motor vehicles
- Transport demand elasticity approach

Consultants have also examined the growth of industrial infrastructure as well as the envisaged population growth in the study area. The details are presented below.

#### 3.4.1 Industrial Infrastructure in Nanded District

There are three MIDC areas in Nanded district. They are Dhanegaon, Nanded (Growth Center), Kondhar (Mini area) and Krushnor. These industrial areas accommodate about 499 SSIs and 5 Medium Scale Industries. The details about MIDC industrial areas are given in **Table 3.2**. Co-operative Industrial Estates are located at Nanded, Loha, Degloor and Dhanudabad.

These estates in all accommodate about 116 units and 4 more Co-operative Industrial Estates are proposed at Burud Taluka, Nanded, Bhokar Taluka Bhokar, Dabhod Taluka



Nanded and Tansa Taluka Hadgaon. The details about Co-operative Industrial Estates of Nanded district are given in **Table 3.3**. In order to harness the potential of industrial activities as well as promote industrial investment in Nanded Government of Maharashtra has taken a decision to develop five star industrial estates of 645.81 hectares at Krishnur.

**Table 3.2 Summary of MIDC Industrial Areas in Nanded**

Sl. No.	Name of the Industrial Estate	Total Area (In Ha)	No. of plots covered	No. of plots allotted to SSI	S.S. Units Functioning
1	Nanded	271.89	538	478	259
2	Degloor	71.56	30	18	1
3	Khandhar	11.39	51	1	-
4	Krishna	645.81	187	2	-

#### 3.4.2 Proposed Industrial Estates

- i. Dr. Babasaheb Ambedkar Gramin Co.op Industrial Estate, Barad, Nanded
- ii. Priyadarshini Co.op. Industrial Estate, Bhokar, Nanded
- iii. Dadhad Co.op. Industrial Estate, Dabhad, Nanded
- iv. Tamsa Co.op. Industrial Estate Tamsa, Hadgaon

**Table 3.3 Details of Co-Operative Industrial Estate**

Sl.	Name of the Industrial Estate	Urban/Rural	Area (In Acre)	No. of Plots	No. of Plots allotted	No. of SSI Units Functional
1	Nanded Co-operative Industrial Estate Ltd.	Urban	55.39	187	187	102
2	Dharmabad Co-op Industrial Estate	Urban	6.15	36	34	12
3	Mahatma Jyotiba Phule Co-operative Industrial Estate	Urban	5	26	3	2
4	Viswakarma Co-op. Industrial Estate	Urban	13.58	60	56	-

#### 3.4.3 Industrial infrastructure in Nanded City Limits



Presently the city has two Industrial Estates. The Co-operative Industrial Estate is within the city and the other MIDC just at the outskirts. MIDC has developed an industrial area of 271.90 hectares. Out of the 335 plots in this area 326 plots have been allotted to the various entrepreneurs. There are at present around 15 large-scale units and 900 odd small scale units engaged in the manufacturing activities. Some of the prominent ones include Sipta Coated Steels Limited, Shiva Fertilizers, Kohinoor Feeds and Fats that are functioning well.

### 3.4.4 Population Projection

The population projection in Nanded has been carried out as part of City Development Plan prepared in March 2006 and the results of the projections under two scenarios (trend based and assumed growth rates) is presented in **Table 3.4**. It may be observed from the table the assumed annual growth rate of population during 2005-2025 is about 4%.

**Table 3.4 Population Projections**

Year	Actual Population	Projected Population (Trend Based)			Projected Population (Assumed Growth Rate)	
		Population	Decadal Growth	Derived Annual Growth Rate	Assumed Annual Growth Rate	Population
1971	126,518					
1981	191,269		51%	4.22%		
1991	309,316		62%	4.92%		
2001	430,733		39%	3.37%		
2005		493,735		3.25%	4.00%	503,897
2010		575,730		3.04%	4.00%	613,067
2011		592,979	38%	3.00%	4.00%	637,590
2015		664,809		2.84%	4.00%	745,890
2020		760,971		1.67%	4.00%	907,489
2021		781,053	32%	2.64%	4.00%	943,789
2025		864,216		2.52%	4.00%	1,104,100

### 3.4.5 Growth Rate based on Past Traffic Data



Past traffic data as collected from PWD is available only for 2 years for three locations (Near Mondh Ghat Bridge, NTC Mill Nanded, Chaitanya Nagar and Taroda Naka). The growth rates were worked out for various categories of vehicles and presented in **Table 3.5**.

As the past traffic data on the project road is available only for last 2 years, one should not be guided by past traffic data for deriving growth rates. It can be observed from the table that the trend in growth rate is very erratic and cannot be used for assessing the future traffic growth.

**Table 3.5 Average Annual Growth Rate of Past Traffic**

Year	Location	Two Wheelers	Car/Jeep/ Van	Buses	Trucks	ADV	Cycles	Cycle Rickshaws
<b>2004</b>	Near Mondha Ghat Bridge	4191	4026	846	3175	215	571	684
	NTC Mill Nanded	328	393	38	369	241	329	173
	Chaitanya Nagar	1617	1969	177	1870	821	164	0
	Taroda Naka	2462	1921	231	1185	148	2609	62
<b>2005</b>	Near Mondha Ghat Bridge	4268	2931	286	1712	222	709	128
	NTC Mill Nanded	338	418	39	392	274	342	195
	Chaitanya Nagar	1627	2004	186	1905	125	1698	223
	Taroda Naka	2473	1921	228	1188	155	2723	75
<b>Average Growth Rate (%)</b>	Near Mondha Ghat Bridge	1.84	-27.20	-66.19	-46.08	3.26	24.17	-81.29
	NTC Mill Nanded	3.05	6.36	2.63	6.23	13.69	3.95	12.72
	Chaitanya Nagar	0.62	1.78	5.08	1.87	-84.77	935.37	
	Taroda Naka	0.45	0.00	-1.30	0.25	4.73	4.37	20.97

### 3.4.6 Growth Rate based on Vehicle Registration



An alternative approach is to explore the registered motor vehicles growth in the influence area and assume a growth rate equal to the average growth of vehicle registration. Such an assumption may not be correct, unless the area of influence is well defined and the general development pattern of influence area remains same. However, this would be an alternative approach in the absence of any additional information or usable past traffic data on the project road.

The registered vehicle population for various modes is tabulated in **Table 3.6**. The growth rate for various modes is presented in **Table 3.7**.

**Table 3.6 Registered Motor Vehicle Population in Nanded City**

SI No	Category	2004*	2005*	2006*
1	Motor Cycle	41842	54395	56490
2	Scooters	10446	10595	10613
3	Moped	17631	18875	19022
Total 2-Wheelers		<b>69919</b>	<b>83865</b>	<b>86125</b>
4	Motor Car	4107	4882	5088
5	Jeep	4462	4811	4808
6	St. Wagon	42	42	42
7	Taxi Cabs	131	188	194
8	A/R	9220	10674	10914
9	St. Carriage	409	409	409
10	a) Cont. Carriage	13	26	28
	b) Mini Bus	0	0	0
11	School Bus	24	24	24
12	Pvt. Service Vehicle	27	27	27
13	Ambulance	48	49	49
14	a) Truck & Lorry	5089	5427	5607
	b) MAV	1	1	1
15	Tankers	222	227	227
16	D. Van 4 Wheeler	873	1019	1120
17	D. Van 3 Wheeler	25	353	456
18	Tractor	2520	2791	2858
19	Trailer	2309	2448	2482
20	Others	3	4	4
<b>Total</b>		<b>99444</b>	<b>117267</b>	<b>120463</b>



\* As on 31<sup>st</sup> March

**Table 3.7 Growth Rate of Registered Motor Vehicles in Nanded City**

Years	2004-05	2005-06	Average
TW	19.95%	2.69%	11.32%
Auto	15.77%	2.25%	9.01%
Car	17.55%	1.84%	9.69%
Buses	25.00%	1.92%	13.46%
LCV	52.78%	14.87%	33.83%
Trucks	2.96%	1.11%	2.04%
Tractor	8.39%	1.89%	5.14%

It can be observed from the above Table 3.7, during the last 2 years, average growth of two wheelers is around 11.32%; growth of cars is about 9.69% and that of trucks is 2.04%. The high growth rate of more than 10% may not sustain in future.

Mode wise growth rates arrived at by different methods indicate that growth rate of two wheelers varies between 3.05% & 11.32%, while growth rate of cars varies between 6.36% & 9.69% and that of bus and truck varies between 2.63% & 13.46% and 6.23% & 2.04% respectively.

### 3.5 Suggested Traffic Growth Rates

The estimated growth rates based on past traffic data have no definite trend. Therefore registered motor vehicles growth in Nanded city is estimated. It showed a growth of 11.32% for 2-wheelers, 9.69% for cars and 13.46% for buses. Sufficient vehicle registration data is not available. However, these past growth rates based on these data cannot be used for estimating future traffic on the project roads. The future traffic may not follow these growth rates due to several reasons, like changes in price of new vehicles, fuel and taxes on several commodities. Consultants have been involved in many other traffic and transportation studies of Class I and Class II cities in India. Based on the envisaged growth in population and the growth in industrial infrastructure in the influence area of Nanded city, following traffic growth rates have been suggested. In line with the TOR, traffic growth rates have been suggested for three scenarios namely. Optimistic, Pessimistic and Most Likely Traffic Growth. The growth factors have been suggested at 5 yearly intervals and presented in **Table 3.8, 3.9** and **3.10** for Most Likely, Optimistic and Pessimistic scenarios respectively.



**Table 3.8 Suggested Traffic Growth Rates for Most Likely Scenario**

(%)

Years	2006-2011	2011-2016	2016-2021	2021-2026	2026-2031	2031-2036
<b>TW</b>	5.00	4.00	3.00	3.00	2.00	2.00
<b>Auto</b>	4.00	3.00	3.00	3.00	2.00	2.00
<b>Car</b>	5.00	4.00	3.00	3.00	2.00	2.00
<b>Buses</b>	2.00	2.00	2.00	2.00	2.00	2.00
<b>LCV</b>	4.00	3.00	3.00	2.00	2.00	2.00
<b>Trucks</b>	4.00	3.00	3.00	2.00	2.00	2.00
<b>Tractor</b>	4.00	3.00	2.00	2.00	2.00	2.00
<b>Cycles</b>	2.00	2.00	2.00	2.00	2.00	2.00
<b>Hand Carts</b>	2.00	2.00	2.00	2.00	2.00	2.00

**Table 3.9 Suggested Traffic Growth Rates for Optimistic Scenario**

(%)

Years	2006-2011	2011-2016	2016-2021	2021-2026	2026-2031	2031-2036
<b>TW</b>	8.00	6.00	4.00	3.00	3.00	3.00
<b>Auto</b>	8.00	6.00	4.00	3.00	3.00	3.00
<b>Car</b>	8.00	6.00	4.00	3.00	3.00	3.00
<b>Buses</b>	2.00	2.00	2.00	2.00	2.00	2.00
<b>LCV</b>	6.00	4.00	3.00	2.00	2.00	2.00
<b>Trucks</b>	6.00	4.00	3.00	2.00	2.00	2.00
<b>Tractor</b>	4.00	3.00	2.00	2.00	2.00	2.00
<b>Cycles</b>	2.00	2.00	2.00	2.00	2.00	2.00
<b>Hand Carts</b>	2.00	2.00	2.00	2.00	2.00	2.00



**Table 3.10 Suggested Traffic Growth Rates for Pessimistic Scenario (%)**

Years	2006-2011	2011-2016	2016-2021	2021-2026	2026-2031	2031-2036
<b>TW</b>	4.00	3.00	3.00	2.00	2.00	2.00
<b>Auto</b>	3.00	3.00	2.00	2.00	2.00	2.00
<b>Car</b>	4.00	3.00	3.00	2.00	2.00	2.00
<b>Buses</b>	2.00	2.00	2.00	2.00	2.00	2.00
<b>LCV</b>	3.00	3.00	3.00	2.00	2.00	2.00
<b>Trucks</b>	3.00	3.00	3.00	2.00	2.00	2.00
<b>Tractor</b>	3.00	3.00	2.00	2.00	2.00	2.00
<b>Cycles</b>	2.00	2.00	2.00	2.00	2.00	2.00
<b>Hand Carts</b>	2.00	2.00	2.00	2.00	2.00	2.00

### 3.6 Traffic Forecast

Long term forecasting of existing traffic on the road network is required for assessing the required improvement for existing roads. Forecasted traffic is estimated based on traffic growth rates in three scenarios presented in Table 3.9, Table 3.10 & Table 3.11 and considering diverted & generated traffic on various roads. Traffic is forecasted in terms of PCUs for the horizon years 2011 to 2036 at 5 year intervals for various roads. Base year (2006) existing traffic and forecasted traffic for the three scenarios are presented in **Table 3.11**, **Table 3.12** and **Table 3.13**. The forecasted peak hour traffic volume (Most Likely Scenario) on the important roads of Nanded City road network for the horizon years 2026 is shown in **Figure 3.1**.

In the overall road network analysis some of the major roads reach saturation level in the base year itself. Due to proposed new roads and widening of some of the existing roads, some percentage of the traffic will be diverted from the existing major roads resulting in reduction of traffic congestion. Horizon year traffic forecast on missing links and partially developed links has been worked out considering normal traffic, diverted traffic and new generated traffic depending on importance of road and connectivity to other roads. In consultation with the client for design of pavement, the base year traffic was estimated assuming diverted traffic, generated traffic and normal traffic for base year it self. This base year estimated traffic was not used for capacity analysis. Road wise traffic forecast details are presented in **Annexure 3.1**

For level of service and lane requirement analysis Consultants have considered forecasted traffic of Most Likely Scenario.



**Table 3.11 Forecasted Traffic (Most Likely Scenario)**

Road No.	Location Name	PCUs/Hour						
		2006	2011	2016	2021	2026	2031	2036
1	Near Vazirabad Police Station	2456	3000	3505	4053	4687	5175	5713
2	Near Khalsa Hallabol Chowk	2729	3368	3970	4596	5321	5875	6486
3	Near Bhagat Singh Chowk	1859	2289	2697	3118	3600	3975	4389
4	Near Bharki Chowk	2147	2624	3068	3547	4101	4528	4999
5	Near Bharki Chowk	2122	2562	2978	3425	3941	4351	4804
6	Near Darbar Masjid	909	1098	1276	1468	1689	1865	2059
7	Between Raj Bar and Workshop Chowk	6400	6311	7445	8607	9950	10985	12128
8	Between Dena Bank and Mahaveer Chowk	6150	7518	8811	10168	11737	12958	14307
9	Near Degloor Naka	1516	2941	3395	3875	4283	4707	5175
10	Near Mutha Junction	2627	3238	3820	4416	5106	5638	6225
12	Baryam Singh House to Gurudwara Gate No. 2	465	572	674	780	898	991	1094
14	Yatri Nivas to Crusher Road	341	415	485	557	625	688	758
17	Dena Bank	713	867	1015	1167	1334	1473	1626
18	Between Mahaveer and Gandhi Statue	3281	4008	4697	5419	6252	6903	7622
19	Near Hingoli Gate	2342	4453	5247	6060	6997	7726	8530
22	Nagina Ghat to Bhandra Ghat	428	520	609	700	800	884	976
23	Vazirabad Road to Bhandra Ghat	290	353	412	475	545	601	662
24	Degloor Road thru C.R.C. to Gyanamata School	1860	2254	2621	3018	3412	3767	4159
27	Near Navghat	143	284	332	381	434	479	529
28	Near Tower	2316	2790	3246	3726	4272	4717	5208
28A	Khalsa RUB Approaches	1082	1422	1663	1915	2205	2434	2687
29	Crusher Road	380	464	544	627	720	794	875



Road No.	Location Name	PCUs/Hour						
		2006	2011	2016	2021	2026	2031	2036
30	Between Latur Phata and Milk Dairy	538	654	763	878	997	1101	1215
31	Near Milk Dairy	143	270	316	362	412	455	502
32	Chaitanya Nagar	786	966	1135	1311	1500	1657	1829
34	Near Rest House	735	913	1079	1244	1435	1584	1749
35	Shivaji Nagar R.O.B.	518	636	750	865	998	1102	1217
37	Shivaji Statue to Degloor Road	1675	2023	2356	2706	3101	3423	3778
39	Between Bhagyanagar and Nayak Chowk	3649	4510	5339	6168	7121	7863	8681
40	Near Bhagyanagar Circle	3160	3891	4592	5301	6118	6755	7458
41	Between Chhatrapati Shivaji Chowk and Milk Dairy	751	913	1064	1215	1365	1507	1663
42	Near Chhatrapati Shivaji Chowk	2148	2607	3037	3498	3946	4356	4810



**Table 3.12 Forecasted Traffic (Optimistic Scenario)**

Road No.	Location Name	PCUs/Hour						
		2006	2011	2016	2021	2026	2031	2036
1	Near Vazirabad Police Station	2456	3552	4713	5712	6610	7649	8852
2	Near Khalsa Hallabhol Chowk	2729	3976	5298	6433	7450	8629	9996
3	Near Bhagat Singh Chowk	1859	2678	3542	4286	4954	5726	6620
4	Near Bharkhi Chowk	2147	3100	4111	4981	5764	6670	7719
5	Near Bharkhi Chowk	2122	2970	3870	4653	5364	6186	7134
6	Near Darbar Masjid	909	1273	1659	1994	2299	2651	3058
7	Between Raj Bar and Workshop Chowk	6400	7389	9794	11865	13727	15882	18378
8	Between Dena Bank and Mahaveer Chowk	6150	8787	11582	13997	16175	18695	21611
9	Near Degloor Naka	1516	3244	4044	4758	5301	6009	6819
10	Near Mutha Junction	2627	3794	5031	6097	7054	8163	9447
12	Baryam Singh House to Gurudwara Gate No. 2	465	669	885	1072	1237	1429	1652
14	Yatri Nivas to Crusher Road	341	463	587	695	784	892	1015
17	Dena Bank	713	984	1265	1510	1731	1984	2276
18	Between Mahaveer and Gandhi Statue	3281	4676	6155	7434	8589	9924	11468
19	Near Hingoli Gate	2342	4706	6208	7505	8674	10026	11589
22	Nagina Ghat to Banda Ghat	428	590	759	906	1039	1191	1365
23	Vazirabad Road to Banda Ghat	290	410	538	649	746	861	994
24	Degloor Road thru C.R.C. to Gyanamata School	1860	2535	3201	3786	4293	4871	5530
27	Near Navghat	143	459	579	686	782	893	1019
28	Near Tower	2316	3190	4115	4924	5659	6507	7483
28A	Khalsa RUB Approaches	1103	1550	2023	2434	2805	3234	3730
29	Crusher Road	380	540	709	855	984	1135	1311



Road No.	Location Name	PCUs/Hour						
		2006	2011	2016	2021	2026	2031	2036
30	Between Latur Phata and Milk Dairy	538	740	942	1118	1273	1449	1651
31	Near Milk Dairy	143	302	383	454	518	591	675
32	Chaitanya Nagar	786	1109	1440	1728	1982	2274	2610
34	Near Rest House	735	1052	1382	1667	1925	2223	2567
35	Shivaji Nagar R.O.B.	518	736	968	1169	1350	1560	1802
37	Shivaji Statue to Degloor Road	1675	2319	2999	3593	4129	4749	5464
39	Between Bhagyanagar and Nayak Chowk	3649	5239	6920	8370	9674	11182	12927
40	Near Bhagyanagar Circle	3160	4519	5957	7200	8318	9613	11110
41	Near Chhatrapati Shivaji Chowk	751	998	1236	1441	1623	1829	2062
42	Near Chhatrapati Shivaji Chowk	2148	2918	3668	4329	4895	5538	6270



**Table 3.13 Forecasted Traffic (Pessimistic Scenario)**

Road No.	Location Name	PCUs/Hour						
		2006	2011	2016	2021	2026	2031	2036
1	Near Vazirabad Police Station	2456	2867	3314	3699	4084	4509	4978
2	Near Khalsa Hallabhol Chowk	2729	3214	3721	4183	4619	5099	5630
3	Near Bhagat Singh Chowk	1859	2188	2529	2851	3147	3475	3837
4	Near Bharkhi Chowk	2147	2508	2899	3238	3575	3947	4358
5	Near Bharkhi Chowk	2122	2463	2830	3159	3488	3851	4252
6	Near Darbar Masjid	909	1055	1213	1354	1495	1651	1822
7	Between Raj Bar and Workshop Chowk	6400	6033	6972	7859	8677	9580	10577
8	Between Dena Bank and Mahaveer Chowk	6150	7200	8305	9315	10285	11355	12537
9	Near Degloor Naka	1516	2850	3251	3660	3936	4324	4752
10	Near Mutha Junction	2627	3096	3578	4032	4451	4915	5426
12	Baryam Singh House to Gurudwara Gate No. 2	465	547	632	713	785	866	956
14	Yatri Nivas to Crusher Road	341	399	458	521	568	625	688
17	Dena Bank	713	833	958	1084	1197	1321	1459
18	Between Mahaveer and Gandhi Statue	3281	3840	4428	4968	5486	6057	6687
19	Near Hingoli Gate	2342	4022	4642	5230	5775	6376	7039
22	Nagina Ghat to Banda Ghat	428	500	575	650	718	793	875
23	Vazirabad Road to Banda Ghat	290	338	390	436	479	529	583
24	Degloor Road thru C.R.C. to Gyanamata School	1860	2161	2489	2827	3121	3446	3805
27	Near Navghat	143	418	478	542	599	661	730
28	Near Tower	2316	2687	3082	3456	3816	4213	4652
28A	Khalsa RUB Approaches	1075	1254	1443	1619	1787	1974	2179
29	Crusher Road	380	445	513	576	633	697	769



Road No.	Location Name	PCUs/Hour						
		2006	2011	2016	2021	2026	2031	2036
30	Between Latur Phata and Milk Dairy	538	627	723	819	904	998	1102
31	Near Milk Dairy	143	261	298	339	374	413	456
32	Chaitanya Nagar	786	923	1067	1210	1336	1475	1628
34	Near Rest House	735	875	1008	1142	1261	1393	1538
35	Shivaji Nagar R.O.B.	518	610	703	794	877	968	1069
37	Shivaji Statue to Degloor Road	1675	1947	2235	2506	2764	3051	3367
39	Between Bhagyanagar and Nayak Chowk	3649	4314	4983	5643	6230	6879	7595
40	Near Bhagyanagar Circle	3160	3725	4299	4856	5361	5919	6536
41	Near Chhatrapati Shivaji Chowk	751	874	1009	1143	1263	1394	1539
42	Near Chhatrapati Shivaji Chowk	2148	2499	2880	3284	3626	4003	4420



### 3.7 Assessment of Lane Requirement

For assessment of lane requirement Consultants has considered Most Likely Scenario. Based on the forecasted link flows on each road in the study area and adopted design service volumes presented in Table 3.1, Consultants have proposed the required lane configuration for each road.

The Volume to Capacity Ratios (V/C) for all the roads for the *Do-Nothing* Scenario (Without improvements) are presented in **Table 3.14**. From the V/C ratios for the year 2006 i.e. Base Year, it can be inferred that, except six roads, almost all the roads are operating under V/C ratio less than 0.7 (LOS C), which is considered as acceptable level of service. Further, in the horizon years, with the significant increase in traffic, V/C ratios will increase beyond acceptable levels.

Considering level of service concept and IRC capacity guidelines, V/C ratios and number of lanes recommended by Consultants is presented in **Table 3.15**.

**Table 3.14 V/C Ratio – Do-Nothing Scenario**

Sl. No.	Road No.	V/C Ratio			
		2006	2016	2026	2036
1	1	1.56	2.23	2.98	3.64
2	2	0.80	1.16	1.55	1.89
3	3	0.36	0.52	0.70	0.85
4	4	1.37	1.95	2.61	3.18
5	5	1.35	1.90	2.51	3.06
6	6	0.58	0.81	1.07	1.31
7	7	1.49	1.74	2.32	2.83
8	8	1.79	2.57	3.42	4.17
9	9	0.41	0.91	1.15	1.39
10	10	2.04	2.97	3.97	4.84
11	12	0.36	0.52	0.70	0.85
12	14	0.27	0.38	0.49	0.59
13	17	0.45	0.65	0.85	1.03
14	18	0.96	1.37	1.82	2.22
15	19	0.91	2.04	2.72	3.32
16	22	0.33	0.47	0.62	0.76
17	23	0.23	0.32	0.42	0.52
18	24	1.45	2.04	2.65	3.24
19	27	0.11	0.26	0.34	0.41
20	28	0.54	0.76	1.00	1.22
21	28A	0.91	1.29	1.71	2.09
22	29	0.24	0.35	0.46	0.56



Sl. No.	Road No.	V/C Ratio			
		2006	2016	2026	2036
23	30	0.34	0.49	0.63	0.77
24	31	0.09	0.20	0.26	0.32
25	32	0.50	0.72	0.95	1.16
27	34	0.57	0.84	1.12	1.36
28	35	0.33	0.48	0.64	0.77
29	39	0.71	1.04	1.38	1.69
30	40	0.85	1.24	1.65	2.01
31	41	0.20	0.29	0.37	0.45
32	42	1.37	1.93	2.51	3.06

### 3.8 Summary

The methodology adopted for forecasting the traffic for various horizon years is discussed in this Chapter. Forecasted traffic is estimated for three scenarios viz. *Optimistic*, *Pessimistic* and *Most Likely*. Traffic forecast on missing links and partially developed links has been worked out considering Normal traffic, Diverted traffic and Generated traffic depending on importance of road and connectivity to the other roads. Traffic is forecasted in terms of PCUs for the horizon years 2011 to 2036 at 5 year intervals for various roads. The road network improvements required to meet the future traffic demand have been suggested based on the forecasted traffic.

Lane requirement for various horizon years is proposed based on future traffic forecast which includes normal traffic, diverted traffic and generated traffic. Consultants have not considered traffic generated due to forth coming mega-event in October 2008 that marks the Tercentenary of the establishment of the *Guru Granth Sahib* for predicting future traffic and recommending lane configuration. During such events, proper traffic management is required to enable smooth traffic flow.



**Table 3.15 Required Lane Configuration**

Sl. No.	Road No.	2011		2016		2021		2026		2031		2036	
		V/C Ratio	Proposed Lane Configuration	V/C Ratio	Proposed Lane Configuration	V/C Ratio	Proposed Lane Configuration	V/C Ratio	Proposed Lane Configuration	V/C Ratio	Proposed Lane Configuration	V/C Ratio	Proposed Lane Configuration
1	1	0.58	4-Lane Divided	0.68	4-Lane Divided	0.53	6-Lane Divided	0.61	6-Lane Divided	0.67	6-Lane Divided	0.74	6-Lane Divided
2	2	0.65	4-Lane Divided	0.51	6-Lane Divided	0.60	6-Lane Divided	0.69	6-Lane Divided	0.76	6-Lane Divided	0.84	6-Lane Divided
3	3	0.45	4-Lane Divided	0.52	4-Lane Divided	0.61	4-Lane Divided	0.47	6-Lane Divided	0.52	6-Lane Divided	0.57	6-Lane Divided
4	4	0.51	4-Lane Divided	0.60	4-Lane Divided	0.69	4-Lane Divided	0.53	6-Lane Divided	0.59	6-Lane Divided	0.65	6-Lane Divided
5	5	0.50	4-Lane Divided	0.58	4-Lane Divided	0.67	4-Lane Divided	0.51	6-Lane Divided	0.56	6-Lane Divided	0.62	6-Lane Divided
6	6	0.51	2-Lane	0.60	2-Lane	0.69	2-Lane	0.49	2-Lane	0.54	2-Lane	0.60	2-Lane
7	7	0.82	6-Lane Divided	0.97	6-Lane Divided	1.12	6-Lane Divided	1.29	6-Lane Divided	1.42	6-Lane Divided	1.57	6-Lane Divided
8	8	0.97	6-Lane Divided	1.14	6-Lane Divided	1.32	6-Lane Divided	1.52	6-Lane Divided	1.68	6-Lane Divided	1.85	6-Lane Divided
9	9	0.69	4-Lane Undivided	0.66	4-Lane Divided	0.50	6-Lane Divided	0.56	6-Lane Divided	0.61	6-Lane Divided	0.67	6-Lane Divided
10	10	0.63	4-Lane Divided	0.50	6-Lane Divided	0.57	6-Lane Divided	0.66	6-Lane Divided	0.73	6-Lane Divided	0.81	6-Lane Divided
11	12	0.27	2-Lane	0.31	2-Lane	0.36	2-Lane	0.42	2-Lane	0.46	2-Lane	0.51	2-Lane
12	14	0.19	2-Lane	0.23	2-Lane	0.26	2-Lane	0.29	2-Lane	0.32	2-Lane	0.35	2-Lane
13	17	0.40	2-Lane	0.47	2-Lane	0.54	2-Lane	0.62	2-Lane	0.69	2-Lane	0.47	2-Lane
14	18	0.52	6-Lane Divided	0.61	6-Lane Divided	0.70	6-Lane Divided	0.81	6-Lane Divided	0.89	6-Lane Divided	0.99	6-Lane Divided
15	19	0.58	6-Lane Divided	0.68	6-Lane Divided	0.79	6-Lane Divided	0.91	6-Lane Divided	1.00	6-Lane Divided	1.11	6-Lane Divided
16	22	0.24	2-Lane	0.28	2-Lane	0.33	2-Lane	0.37	2-Lane	0.41	2-Lane	0.46	2-Lane
17	23	0.16	2-Lane	0.19	2-Lane	0.22	2-Lane	0.25	2-Lane	0.28	2-Lane	0.31	2-Lane
18	24	0.44	4-Lane Divided	0.51	4-Lane Divided	0.59	4-Lane Divided	0.66	4-Lane Divided	0.49	6-Lane Divided	0.54	6-Lane Divided
19	27	0.13	2-Lane	0.16	2-Lane	0.18	2-Lane	0.20	2-Lane	0.22	2-Lane	0.25	2-Lane
20	28	0.54	4-Lane Divided	0.63	4-Lane Divided	0.48	6-Lane Divided	0.55	6-Lane Divided	0.61	6-Lane Divided	0.68	6-Lane Divided
21	28A	0.66	2-Lane	0.32	4-Lane Divided	0.37	4-Lane Divided	0.43	4-Lane Divided	0.47	4-Lane Divided	0.52	4-Lane Divided
22	29	0.22	2-Lane	0.25	2-Lane	0.29	2-Lane	0.34	2-Lane	0.37	2-Lane	0.41	2-Lane
23	30	0.31	2-Lane	0.36	2-Lane	0.41	2-Lane	0.47	2-Lane	0.51	2-Lane	0.57	2-Lane
24	31	0.13	2-Lane	0.15	2-Lane	0.17	2-Lane	0.19	2-Lane	0.21	2-Lane	0.23	2-Lane
25	32	0.45	2-Lane	0.53	2-Lane	0.61	2-Lane	0.29	4-Lane Divided	0.32	4-Lane Divided	0.36	4-Lane Divided
26	34	0.43	2-Lane	0.50	2-Lane	0.58	2-Lane	0.67	2-Lane	0.46	2-Lane	0.51	2-Lane
27	35	0.30	2-Lane	0.35	2-Lane	0.40	2-Lane	0.47	2-Lane	0.51	2-Lane	0.57	2-Lane
28	37	0.39	4-Lane Divided	0.46	4-Lane Divided	0.53	4-Lane Divided	0.60	4-Lane Divided	0.67	4-Lane Divided	0.49	6-Lane Divided
29	39	0.58	6-Lane Divided	0.69	6-Lane Divided	0.80	6-Lane Divided	0.92	6-Lane Divided	1.02	6-Lane Divided	1.13	6-Lane Divided
30	40	0.50	6-Lane Divided	0.60	6-Lane Divided	0.69	6-Lane Divided	0.79	6-Lane Divided	0.88	6-Lane Divided	0.97	6-Lane Divided
31	41	0.18	4-Lane Divided	0.21	4-Lane Divided	0.24	4-Lane Divided	0.27	4-Lane Divided	0.29	4-Lane Divided	0.32	4-Lane Divided
32	42	0.51	4-Lane Divided	0.59	4-Lane Divided	0.68	4-Lane Divided	0.51	6-Lane Divided	0.56	6-Lane Divided	0.62	6-Lane Divided



Sl. No.	Road No.	2011		2016		2021		2026		2031		2036	
		V/C Ratio	Proposed Lane Configuration	V/C Ratio	Proposed Lane Configuration	V/C Ratio	Proposed Lane Configuration	V/C Ratio	Proposed Lane Configuration	V/C Ratio	Proposed Lane Configuration	V/C Ratio	Proposed Lane Configuration
<b>Missing Links (New Links)</b>													
33	11		2-Lane		2-Lane		2-Lane		2-Lane		2-Lane		2-Lane
34	13		2-Lane		2-Lane		2-Lane		2-Lane		2-Lane		2-Lane
35	15		2-Lane		2-Lane		2-Lane		2-Lane		2-Lane		2-Lane
36	16		2-Lane		2-Lane		2-Lane		2-Lane		2-Lane		2-Lane
37	26		2-Lane		2-Lane		2-Lane		2-Lane		2-Lane		2-Lane
38	38A		2-Lane		2-Lane		2-Lane		2-Lane		2-Lane		2-Lane