

Analysis of Traffic Nodes on Expressway: A Case Study of Pune –Ahmednagar Corridor

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Abstract- Traffic congestion is one of the most visible, pervasive, and immediate transport problems plaguing not only India's but also most of the cities of the world on a daily basis. It affects all modes of transportation especially roads and all socioeconomic groups. Rapid population growth, increasing urbanization, inadequate/unplanned transport infrastructure, poor public transport systems and the rising number of personnel vehicles are some of the primary causes of congestion. This article reviews the findings of studies based on road traffic congestion Traffic Congestion or traffic jams is one of the major issues in most metropolitan cities like Pune. As we know Pune city is a well-developed and popularly known for Oxford for east for its education many students come from different cities secondly many young people come for jobs because of booming IT companies. Due to this city has become densely populated. Today the Pune's population is around 35 lakhs. Registered vehicles are 36.2 lakh which is exceeding the human population. During the peak hours i.e. 09:00 to 11:00 in the morning and 6:00 to 8:00 in the evening traffic situation gets worst and chaotic

Indexed Terms- Traffic Jams, Conjunction, Double Tier Elevated Highway Corridor (DTEHC)

I. INTRODUCTION

For the Increasing Traffic widening of road is not only the solution as there is land to be accured in the cities. Land acquisition is a tedious and time consuming process which is not feasible in the cities as well as in the outskirt, so we have to find the sustainable solution for the increasing traffic i.e Construction of Double Tier Elevated Highway

Corridor including provision for metro (section from Pune to Shirur of NH-753F (from Km. 0.000 to Km. 56.000)) in the State of Maharashtra.

The Starting Ch. 0+000 takes off near Kharadi Bypass Junction on Pune-Ahmednagar Road and Project end location to be considered at Shirur bypass end on Pune-Aurangabad Highway i.e. near at Bridge over Ghod River. Hence, the total length of the project corridor shall be 59.60Km

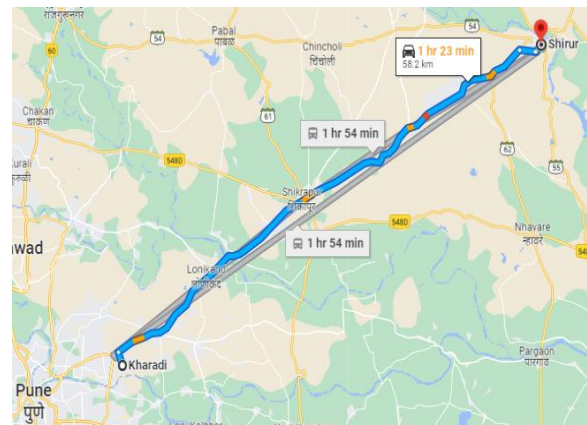


Image - Map of Project Section

II. SCOPE OF PAPER

The scope of the Paper is to Conduct Traffic Survey (like Transport Data Base, Vehicle Registration Data, Demographic Data etc.) across the Project corridor as we know the importance of the entire corridor is. It connects to the Major cities like; Pune, Shirur, Ahmed Nagar, Mumbai Nashik etc. and also, along this project highway there is the presence of Maharashtra Industrial Development Corporation (MIDC) areas by which the traffic of Mumbai,

Chakan, Nashik and Ahmed Nagar are using this corridor for the movement to MIDC areas.

III. METHODOLOGICAL FRAMEWORK

The paper presents a description of our Technical Approach and Methodology for performing the assignment keeping in view the Terms of Reference, available related data of the project parameters from the site visit

The provisions of “Manual of Specifications and Standards for Six laning of Highways” (IRC: SP: 87-2019), “Manual on Road Safety Audit” (IRC: SP: 88) and various relevant standards published by Indian Road Congress, shall be followed wherever required in the project preparation activities

3.1 Vehicle Registration Data

The Transport Commissioner office of the Government of Maharashtra publishes annual report on vehicle registration. This publication, together with the Ministry of Road Transport & Highways (MoRT&H), Government of India publication on Transport Statistics, will provide necessary information on the growth rates of individual vehicles for this area, which will be used for the estimation of the growth rates for traffic flow.

3.2 Demographic Data

Population growth trends in each of the districts / traffic zones in the influence area, and other associated areas, will be obtained from the census hand books to compute population growth rates.

IV. LOCATION OF TRAFFIC SURVEY STATION

As per the TOR the minimum number of traffic survey stations shall be as follows

Sr No	Description	Number of survey stations
1	Classified Traffic Volume Count	3
2	Origin Destination and Commodity Movement Characteristics	2

3	Axle Loading Characteristics	2
4	Intersection Volume Count	All Major Intersection
5	Speed Delay Characteristics	Project Road Section
6	Pedestrian/Animal cross traffic count	All Major Inhabitation along the highway
7	Turning movement surveys	For all Major Intersection

V. LOCATION OF TRAFFIC SURVEYS FOR PUNE -SHIRUR SECTION

S. No.	Type of Survey	Name of Locations	
		Chainage	Place
1	Turning Movement Count (TMC) & Intersection Volume Count Survey	Km. 0+550	Kharadi Bypass
2		Km. 6+000	Wagholi Bazar
3		Km. 6+200	Kesnand Phata, Wagholi
4		Km. 13+500	Lonikhand
5		Km. 22+400	Sanaswadi
6		Km. 26+500	Shikrapur Phata / Chakan Road
7	Classified Traffic Volume Count (CTVC) Survey	Km. 0+000 to 6+200	Between Kharadi to Wagholi
8		Km. 6+200 to 26+500	Between Wagholi to Shikrapur
9		Km. 26+500 to 40+600	Between Wagholi to Ranjangaon
10		Km. 40+600 to 53+000	Between Ranjangaon to Shirur Bypass
11	Origin-Destination (O-D) & Axle load Survey	Km. 6+000 to 27+000	Between Wagholi to Shikrapur
12		Km. 26+000 to 41+000	Between Shikrapur to Ranjangaon
13	Speed-Delay Characteristi	From Km. 0+000 to Km.	Between Shikrapur to

	cs	59+600	Ranjangaon
14	Pedestrian/ Animal Cross Traffic Count	-	At Major Junction Locations

VI. START & END POINT PHOTOGRAPHS



Image: - At Km. 0+000 (Near Kharadi Bypass Junction)



Image: - At Km. 59+600 (Near Shirur Bypass End)

VII. EXISTING CARRIAGEWAY AND PAVEMENT

The entire project corridor is having both 6-lane divided carriageways with a carriageway width of 11 mt either side & 4-lane divided carriageway with a carriageway width of 7.5m wide carriageway either side. The surface of the carriageway is having Bituminous. However, at some location the existing carriageway surface is Cement Concrete (CC).



Image: - Existing Carriageway of Pune to Shirur



Image: - Existing Carriageway of Pune to Shirur



Image: - Existing Carriageway of Pune to Shirur

VIII. AT GRADE INTERSECTIONS

Since the project corridor connects various built-up sections by major district roads and village roads. All along the corridor there are 07 numbers of Major Junctions and 89 nos. of Minor Junctions (among 89 Nos., for this paper we have taken 8 Minor junctions) connecting various towns, villages and MIDC areas and roads leading to cluster of villages and hamlets. List of Major & Minor Junctions tabulated below

Table for List of Major Junctions:-

Sr. No.	Existing Chainage (Km.)	Type of Junction	LHS	RHS	Remarks
1	0+550	T	--		SH-27
2	5+330	T	WRd	--	
3	6+000	X	Wag	Aw	
4	6+200	T	--	Kes	
5	6+200	T	--	Kes	
6	22+400	X	Krnd	TD	
7	26+500	X	C-T	Nhava	

Abbreviations for above table are as:-	
M-S	Magarpatta- Solapur

Aw	Awhalwadi
Kes	Keshnand
TD	Talegaon Dhamdhare
Nhav	Nhavare (NH-548D)
WRd	Wagholi Rd.
Wag	Wagholi
Krnd	Karandi
C-T	Chakan- Talegaon (NH-548D)

Table for List of Minor Junctions:-

Sl. No.	Existing Chainage (Km.)	Type of Junction	LHS	RHS
1	0+040	T		NR
2	0+110	T	CN	
3	0+710	T	CR	
4	1+160	T		FR
5	1.170	T		Kr
6	1+310	T	PB	
7	2+080	T		Gr
8	2+640	T	KN	

Abbreviations for above table are as:-	
CN	Chandan Nagar
CR	Colony Road
PB	Patil Basti Rd.
KN	Khandve Nagar Rd.
NR	Niwas Road
FR	Fountain Rd.
Kr	Kharadi
Gr	Grant Rd.

8.1 Photographs of Junctions:-



Image: - Junction towards MIDC area @ Karegaon (LHS Side)



Image: - Junction towards Jagtap Basti



Image: -Junction towards MIDC Area @ Sanaswadi



Image: - Junction towards Wagholi village @ Wagholi (LHS Side)



Image: -Junction towards MIDC area @ Karegaon (LHS Side)



Image: - Junction towards Alandi



Image: - Junction towards Shirur Village (LHS)

It is observed that, the existing highway connected with huge nos. of junctions (Major and minor junctions as well) at these junctions Traffic jam occurs when there are more vehicles than the road can handle. As such the vehicles are not able to move fast. Traffic congestion occurs when a volume of traffic or modal split generates demand for space greater than the available street capacity; this point is commonly termed saturation. There are a number of specific circumstances which cause or aggravate congestion; most of them reduce the capacity of a road at a given point or over a certain length, or

increase the number of vehicles required for a given volume of people or goods.

CONCLUSION

In this paper in-depth study of Traffic Survey Station, Location of Traffic Surveys, the study of Existing Carriageway and Pavement and major & minor junctions across the said section of highway (i.e. Pune to Shirur Section) are studied.

It is found that the existing highway connected with huge nos. of junctions (Major and minor junctions as well) with a heavy traffic, which lead to the problems of Traffic congestion issues. On the basis of Traffic Survey of Existing highway, a sustainable Solution for increasing traffic can be introduction of double tier elevated highway corridor with a provision of future expansion.

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Link:-

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