

Feasibility Study and Rapid Construction of Flyover at Sahakari Zin Intersection on NH-8, Himmatnagar

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Abstract— Development of the any urban or suburban area is depends on the efficient delivery of urban services. Major cities throughout the nation are experiencing considerable population Growth and consequently the traffic demands on each city's transportation infrastructure also Increase With these increased traffic demands comes decreased Mobility. At this junction number of accident occur due to high speed of vehicle, traffic delay, risk of pedestrian life , lack of proper facility like symbols, signals, and marking. So it can need the improvement. At Sahakari zin Intersection National Highway-8 and state Highway145 are crossed. On the NH-8 vehicle design speed is 80 km/h. due to high speed vehicle no of accident occurs. And delay on state highway. At this intersection Traffic Flow about 30,000 PCU/day. The improvement of the intersection by the different alternatives like provide rotary, signal or construction of the flyover, divert the traffic at the intersection. Out of this alternative, Flyover suggested for the current traffic flow at this intersection and during the construction of flyover minimize traffic delay by the road safety Audit and using the rapid construction method for the construction of the flyover at intersection.

Keywords—Traffic volume count, Traffic demand, Road safety Audit, Rapid Construction .

I. INTRODUCTION

At Sahakari Zin intersection, NH-8 Connected Ahmedabad and Udaipur. And State Highway 145 connected himmatnagar city and Rural area. On this intersection no of accident occurs due to high speed vehicle on NH-8. And heavy traffic flow in both direction. traffic delay, risk of pedestrian life, lack of proper facility like symbols, signals, and marking are major problem at this junction. this problem we have four alternatives are Flyover, Rotary intersection, signalize intersection, Divert Traffic on other Road. Out of this four alternatives construction of flyover is advantageous at this intersection. Increasing population growth about 15.5% per decade. And Avg 48157 no of vehicle are increase per year so that rapid construction of flyover at this intersection

II. OBJECTIVES OF STUDY

- 1) To study of the present situation of traffic at the intersection.
- 2) To analyze the present situation.
- 3) To predict No. vehicles for future next 10 year.

- 4) To suggest the flyover, their dimensions, construction aspect, good aesthetic view of flyover with maximum use of green material.
- 5) Feasibility of using waste material use in construction to minimize the pollution.
- 6) Minimize traffic delay during the construction with the road safety audit.

Aim of Study

The aim of the study is to minimize the accident at the selected intersection of himmatnagar by improving it. Suggesting techniques of rapid construction of flyover to minimum traffic delay during the construction of the flyover and make the view of flyover aesthetic.

METHODOLOGY

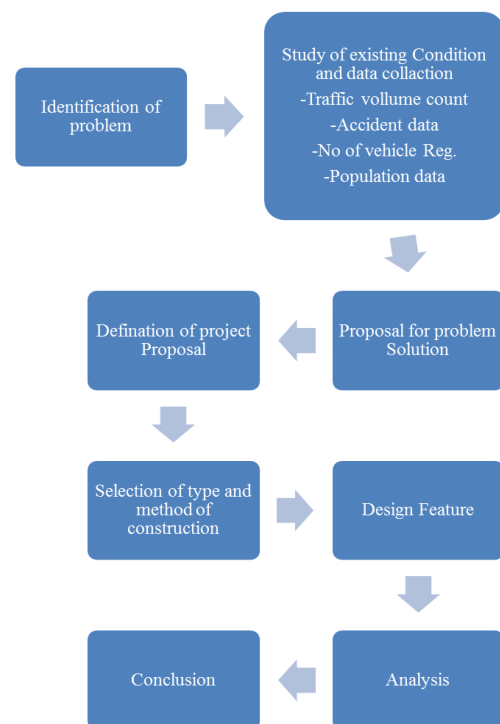


Fig. 1: Methodology flow chart

STUDY AREA

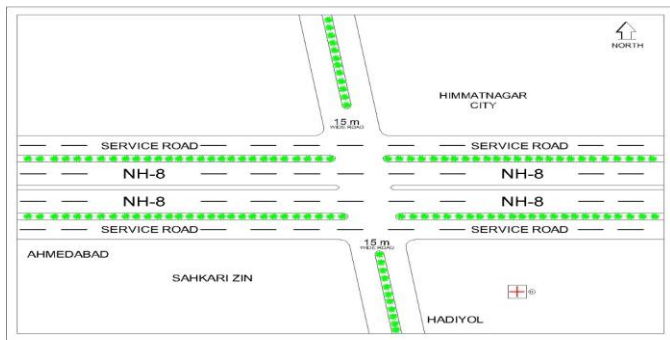


Fig.2 Location of Intersection

At this intersection 20 m wide four lane national highway cross the 15m wide four lane state highway. Heavy traffic flow on NH cross the intersection that is influence to pedestrian, traffic delay on SH.its lead to accident occur.

DATA COLLATION

Population Growth in Himmatnagar

Himmatnagar is an developing city and progress to urbanization. Increasing population of city with growth rate 15.17 % per decade. So congestion of people with increasing in no of vehicle.

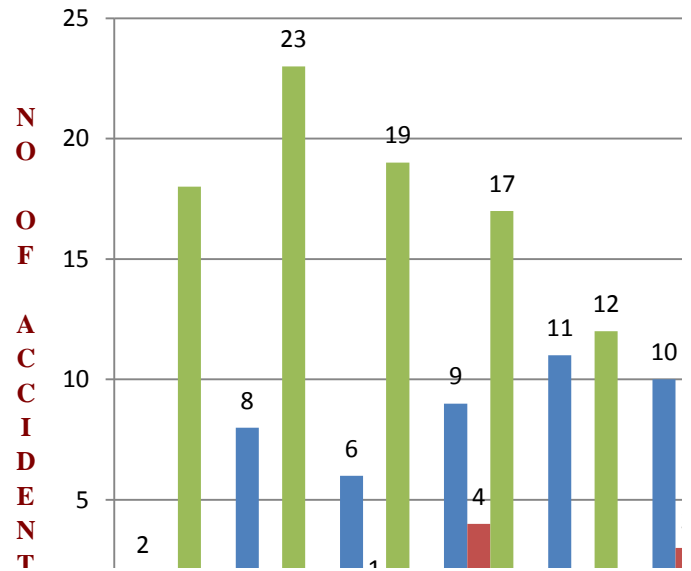
Table-1. [Population growth]

Year	Population	Growth Rate %
1981	39959	-
1991	51561	28.76
2001	56464	9.7
2011	61339	8.8
	Avg.Growth Rate	15.75

Accident Data

Table-2 [No.Accident]

Year	Fatal	Major	Minor
2009	2	0	18
2010	8	0	23
2011	6	1	19
2012	9	4	17
2013	11	0	12
2014	10	3	13



The Accident data are collected from himmatnagar police station A-division. This no of Accident occur at this intersection. Base on this data fatal accidents are increase per annum. So it can be reduced by the construction of flyover at this intersection.

No of Vehicle Registered

Table-3 [No vehicle Registration]

Sr.No	Types of vehicle	2011	2012	2013	2014
1	Two wheeler	35170	36330	33805	34380
2	LMV	5399	5212	5012	5256
3	Taxi	5280	5600	5083	18
4	Maxi cab	20	30	35	72
5	Auto	140	150	130	1630
6	Buses	35	18	19	35
7	LGV	1100	1649	1640	1200
8	HGV	506	523	451	359
9	Tractor	330	270	129	210
10	Trailer	13	20	13	240
11	Contract carriage	17	38	38	56
12	Ambulance	7	10	8	14
Total		48017	49850	46363	48401

This data collected From the RTO himmatnagar. The avg. total 48157 No of vehicle Registered per year. About 60% share Traffic two wheeler 25% Traffic share by LMV and Maxi. Other share traffic about 15%.

Traffic Volume

At this intersection Himmatnagar to Udaipur approach very heavy traffic flow about 30000 PCU/day both direction. It is cross this intersection with high speed so number of accident occur at place and it is influence to pedestrian and disturb the low traffic on other approach(SH-145) compare to NH. So that smooth traffic flow on both approach construction of flyover needed. And construction of flyover complete in short time because of minimum traffic disturbance and safety of pedestrian during the construction of flyover.

Method of Rapid construction of flyover

1. cast- in situ method
2. pre-cast method

Pre-cast method is more advantageous over the cast in situ. But in pre-cast method having large investment and it is economical for the large project. Precast method is rapid construction method of flyover. It is accelerate the bridge construction. And better quality control maintain in precast method. In precast method prefabricated bridge element cast in casting yard than transported to site so reduction time in cast in place, curing etc. prefabricated element placement by the various method by longitudinal launching, vertical launching, and very fast track construction by the SPMT's (Self prop modular Transporter) but in india it is not economical for the small project. For this project we have suggest the prefabricated box section launching by the vertical lifting.

Pre-cast method Impact on ;

- Reduce Total project delivery time
- Increase Site constructability
- Maintain Material quality and its durability
- Reduce Traffic impacts
- Reduce Onsite construction time
- Eliminate Weather related delays
- Accelerated Bridge construction can also minimize Environmental impacts.
- Reduce Impact to existing roadway alignment
- Utility relocations

CONCLUSION

It is very clear to in urban area increasing the population and also increasing the no of vehicle it lead to traffic congestion. At sahakari zin intersection occur number of accident, and traffic delay for this problem construction of flyover is needed at place.

- By analysis of collection of data we have The suggested flyover bridge will also carry the future traffic safely 30 year.
- The construction of flyover is accelerated by the prefabricated bridge element.
- To minimize the accident by construct flyover and smooth traffic flow in both direction.
- The aesthetic view of flyover is increase view of city and increase the land value near the intersection.
- In future there is a scope as providing this flyover as a toll road for a generating revenue and maintaining the speed of various vehicles.
- In Himmatnagar number of ceramics so we can ceramic waste use in construction(embarkment) to minimize the pollution.

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