

FEASIBILITY STUDY OF FLYOVER BRIDGE AT INTERSECTION

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Abstract - India being a developing country, the vehicle population growth within the country observed within last couple of decades is hiked by an unexpected number. Especially, the urban regions of the country are facing congestion issues, and the overall scenario is getting even worse day by day

In the present study, an attempt is made to study the on-site operational efficiency of a signalized junction from Nashik city of Maharashtra state in India. Trimbak Naka junction in the central business district area of the Nashik city which was selected as the study site. Trimbak Naka junction is situated near to Central Bus Station (CBS) which is a mid-point for all the city-wide commuter buses and the transport buses of Maharashtra State Road Transport Corporation (MSRTC) across the city

The aim of the study is to minimize the accident and reduce the travel time and Queue Line at the selected intersection.

Key Words: flyover, selection of site study area, TVC, inventory survey, TMC, study stretch, vehicle delay etc.

1. INTRODUCTION

1.1 Selection of the study area

Due to heavy traffic or capacity of the road this signal junction is selected since high saturation value and delay in that particular section. The delay leads to present traffic conditions. This following are the reasons for selection of location Trimbak naka Signal. In all day's heavy traffic can be seen especially on week days because it is situated at the centre of city and which connects to market and CBS.

Especially in peak hours there will be maximum delay due to heterogeneous traffic. Through volumes expected at the intersection because it is a signalized intersection operating 4 phases on this road. Thus, Number of NMC and MSRDC buses are more since during peak hours number of bus users are more.

1.2 Objective of the Study

The main objective of this study is to evaluate the functional effectiveness of the existing signal crossing and assess how far they are successful in mitigating congestion and enhancing mobility in Nashik city.

1. To find the usage of flyover spaces by non-motorized vehicles and public transport.
2. To study of the present situation of traffic at the intersection.
3. To analyse the present situation.
4. To study the turning movement count

1.3 The Study stretch

To carry out research work, Trimbak Naka Signal, Old Agra Road located in developing city located in Nashik, was selected. People have to wait for Signal. The study area deals with obstacles making it difficult for easy movement of vehicles from heavy traffic.

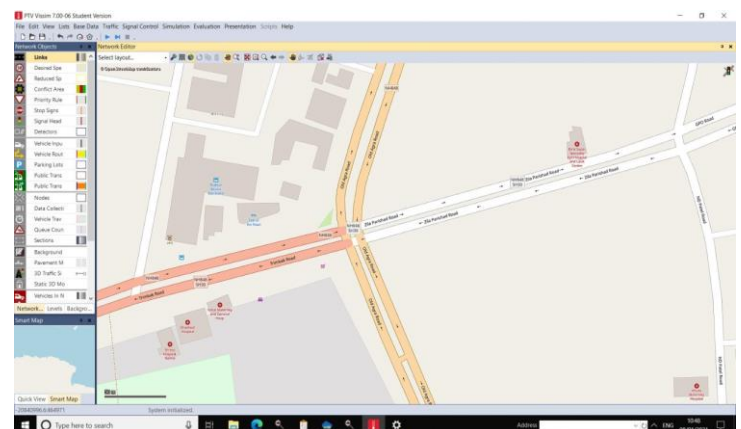


Image no. 01- study area stretch

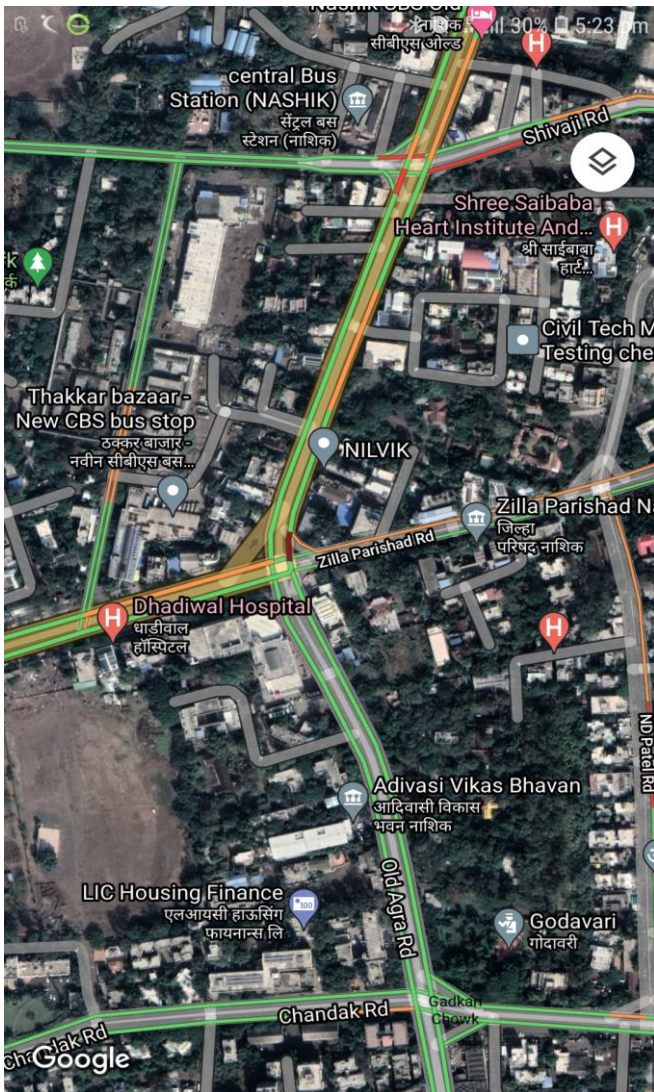


Image no. 02- Intersection study area

2. TRAFFIC VOLUME COUNT

2.1 Data collection

Traffic data were collected during morning peak period (8:00AM-12:00AM) and evening peak period (4:00PM to 8:00PM) on two-week days and two weekends. Monday, Tuesday, Saturday and Sunday. Conducted the classified traffic volume count to determine the average delay at the intersection.

When the highway crosses another at grade capacity is reduced to that of Intersection. Furthermore, some or all of the vehicles must slow down or stop to permit the passage of crossing and turning traffic which will cause delay

All the data converted to PCU values. To carry out research work trambak naka signal Junction, at trambak road located in developing city Nashik, was selected. People have to wait long enough to pass through this signal Junction. The study area deals with difficult for easy movement of vehicles. People wait at the intersection signal.

2.2 Inventory survey

Road Inventory survey was carried on the selected road network. Road inventory data provides the details of the existing road network. The purpose of the survey was to obtain the necessary information regarding the road features along the project road, condition and performance of drainage structures and other secondary road features like footpath, median, kerb etc. An integrated program to carry out surveys and investigations were developed, using IRC SP: 19 as a general guide the information's collected from road inventory survey.

Trimbak Naka is the study junction considered for the present study. It has two major approaches intersecting each other namely, Trimbak road and old Mumbai Agra Road. As the junction location is situated at one of the busy landmarks among the city, junction faces a mix use of traffic from local commuters and Highway traffic both. In order to meet the traffic demand, analyses are performed in the present study to assess the current scenario and future scenario with warrant analysis for traffic volume thresholds whether to consider a signalized intersection or a flyover.

Component	Towards Trambak Road	Towards Zilla Parishad Road	Towards CBS	Towards Gadakari chowk
Carriage way	14 m	14 m	14 m	14 m
Road Sign	Yes	Yes	Yes	Yes
Bus Stand	No	No	yes	No
Rikshaw stand	Yes	Yes	Yes	Yes
School	No	Yes	Yes	No
Temple	Yes	No	No	Yes

Table no. 01- Location Inventory Survey

following categories of vehicles were recorded during the survey.

- Two-Wheeler
- Three-wheeler/ Auto Rickshaw,
- Cars (both old and new technology) / Jeeps
- Van/ Tempo/ Minibus
- Light Commercial Vehicles
- Buses
- Agricultural Tractor,
- Trucks
- Agricultural Tractor - Trailer

3. TURNING MOVEMENT COUNT

Turning Movement counts helps to design capacity analysis, traffic signal timing, and phasing, turn lanes, parking and turning restrictions. Turning movement count was conducted manually where each individual stood at each corner of the trambak signal junction. A multi-counter application was used in order to calculate a number of vehicles moving left, straight and right in an easy way the surveys have been conducted for successive 15 minutes interval for a period 16 hours.

Based on traffic growth rate of 7.5% used in this report all junctions had been analyzed to understand the need of grade separation, signalization or any other traffic calming methods at these junctions as per IRC 92 and IRC SP 41. An interchange may be justified when an at-grade intersection fails to handle the volume of traffic resulting in serious congestion and frequent choking of the intersection.

Intersecti on	Type	Volume vehicles	Volume PCU	Cap acity	V/C
Trimbak Naka	4 arm Signal ized	8916	8172	115 50	0.71

Table no. 02- Detailed Analysis of Junction Traffic for Present Condition and Future Projections



Image no. 04- turning movement from peak Hrs.

4. CONCLUSIONS

- It is very clear that the urban area is facing increase in the population, which is also leading to increase the no of vehicles which leads to traffic congestion issues at busy corridors and the intersections through the city.
- It also gives rise to number of possible road crashes, queue line, travel time and traffic delay. To encounter this issue, construction of flyover is recommended at the study intersection.
- On the basis of the analysis performed on the collected traffic data, if a flyover is considered, it will take care of the traffic congestion issue at the study site location for the next 30 years safely.
- Based on the analysis performed and the results obtained, following key points were concluded.

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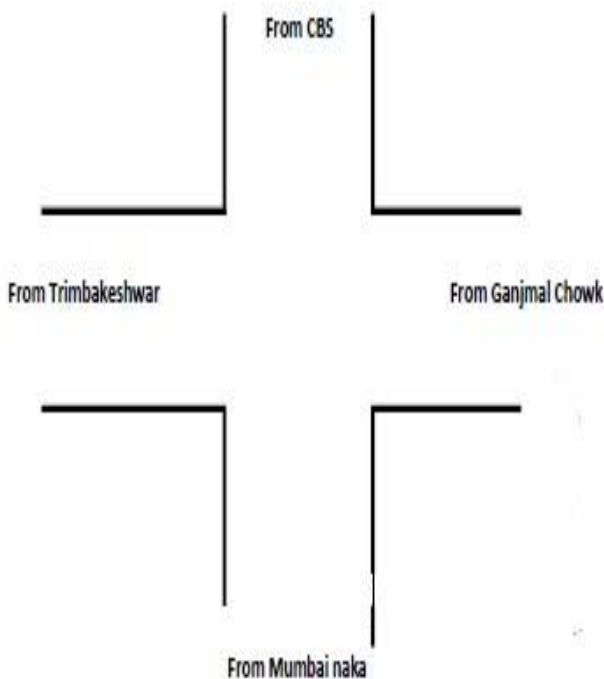


Image no. 03- layout of intersection

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