

A REVIEW PAPER ON TRAFFIC REGULATION AT HIGHWAY INTERSECTION

Ramanjeet singh¹, Dr. Rakesh Gupta²

¹M.Tech Scholar, Civil Engineering Deptt; SRMIET, Bhurewala, Ambala, Haryana, India

²Assistant Professor, Civil Engineering Deptt. SRMIET, Bhurewala, Ambala, Haryana, India

Abstract A sound understanding of the importance of intersections within a road network is a key factor for the efficient and effective management and control of transport networks when traffic operations are saturated. Conventional indices (e.g. level of service, degree of saturation, capacity or delay) reflect only the states of an intersection itself, but lack the ability to describe the influences among the intersections within a road network.

To reduce traffic congestion at an grade intersection, one method is construction of flyover at intersection. The flyover facilitates the traffic flow in the direction of bridge, but the infrastructure cannot fully solve all of the problems especially on the secondary roads. Channelized intersection provides more safety and efficiency. It reduces the number of possible conflicts by reducing the area of conflicts available in the carriageway. If channelizing is not provided the driver will have less tendency to reduce the speed while entering the intersection from the carriageway. The presence of traffic islands, markings etc. indicates the driver to reduce the speed and becomes more cautious while passing through the intersection. A channelizing island also

serves as a safety for pedestrians and makes pedestrian crossing safer.

Traffic congestion :on major roads depend upon existing bottlenecks at intersections is a major problem in India.

1. INTRODUCTION

An intersection is a general area where two or more roads cross at the same or different elevations. Interruption of traffic flow is a daily experience in urban centers of the world and it occurs primarily at intersections.

This study helps us to evaluate the importance of an intersection within a road network. Intersection at Mauli is between the roads SH-1(Chandigarh-Dehradun) and NH-73 (Panchkula -Yamunagar) is at a distance of 26.9kms from panchkula is identified as one of the critical intersections during a reconnaissance survey and as such selected for study. Traffic control measures have been developed that can improve the operational efficiency and safety of intersections. Traffic control mechanisms at intersections include prioritization, traffic personnel

control, channelization, signalization, rotary intersections and by grade separation (interchanges).

1.2 Traffic Signals at Intersection

Traffic signals are offering a maximum control to any road intersections. These relay messages of both what you must do and what not to do as a driver. The primary function of the traffic signals as we know is to assign the right of way to the contradicting movements of traffic in an intersection. This is actually done by allowing the conflicting traffic streams to share the same intersection by way of separating the time.

1.3 Classification of Traffic Signals

Traffic signals are the control devices which alternately direct the traffic to stop and proceed at intersections using red and green traffic light signal automatically.

The signals are classified into the following types:

- Traffic Control Signals
- Fixed time signals
- Manually operated signals

A Fixed Time Signal

These signals are set to repeat regularly a cycle of red, amber yellow and green lights. Depending upon the traffic intensities, the timings of each phase of the cycle is predetermined. Fixed time signals are the simplest type of automatic traffic signals which are electrically operated.

B Traffic Actuated Signals

In these signals the timings of the phase and cycle are changed according to traffic demand.

In **semi-actuated signals**, the normal green phase of a traffic stream may be extended upto a certain period of time for allowing the vehicles to clear off the intersection.

In **fully-actuated signals**, computers assign the right of way for the traffic movement on turn basis of traffic flow demand.

C Manually Operated Signals

In these types of signals, the traffic police watches the traffic demand from a suitable point during the peak hours at the intersection and varies the timings of these phases and cycle accordingly. When the vehicular traffic remains stopped by red or stop signal on the traffic signals of the road intersection, these signals give the right of way of pedestrians to cross a road during the walk period.

1.5 Channelized Intersection

Channelization is an integral part of at grade intersections and is used to separate turning movements from through movements where this is considered advisable and hence helps reduce the intensity and frequency of loss of life and property due to accidents to a large extent. Proper Channelization increases capacity, improves safety, provides maximum convenience, and instils driver confidence. Improper Channelization has the opposite effect and may be worse than none at all.

1.6 Grade Separated Intersection

It is a bridge that eliminates crossing conflicts at intersections by vertical separation of roadways in space. Grade separated intersections are otherwise known as Interchanges. Grade separated intersection design is the highest form of intersection treatment. This type of intersection cause least delay & hazard the crossing traffic and is superior to intersections at grade from the point of view of traffic safety. Uninterrupted flow is possible for the crossing traffic.

3 LITREATURE REVIEW

Parsonson and Walker (1992) [1] conducted by the Georgia Institute of Technology to investigate malfunction flash operation. This research was prompted by a serious accident that occurred after a tripped conflict monitor initiated flashing operation at a signal. The research effort for this study focused primarily on the effect that sight distance has on safety at flashing signals.

Al- Masaeid and Faddah (1997) [2] developed an empirical model for estimating entry capacity as a function of circulating traffic and geometric characteristics in 1997. Ten roundabouts located throughout Jordan were studied. Regression analysis was used to develop the entry-capacity model and its performance was then compared with results of German, Danish, and French capacity models.

H. J. Ruskin and R. Wang (2002) [3] studied traffic flow at urban un-signalised intersection using cellular automata by simulating the heterogeneity and inconsistency of driver behaviour. The study exposed the driver distribution having a noticeable impact on capacity of major and minor traffic streams.

Al-Omari et al. (2004) [4] developed a model for estimating roundabout delay as a function of traffic and geometric factors. A total of twenty hours of field traffic and geometric data were collected from fourteen rotaries located throughout Jordan. Data were collected on sunny days from locations with good pavement conditions and during times when there were no policemen in the area.

Taylor and Knight (2012)[5] gives assessment criteria available to priorities metropolitan level crossings for grade separation. That include conventional economic, social and environmental measures and a „strategic fit“ criteria that reflect the relative importance of different roads to the transport network overall.

Keeping in view the above literature, in this work, it has been found that traffic signals, channelized intersection and grade separation is necessary for the efficient movement of traffic, which causes delay and a number of accidents.

REFERENCES

- [1] *Parsonson and Walker* “conducted a study on a serious accident tha occurred after a tripped conflict monitor initiated flashing operation at a signal”*George institute ,1992*
- [2] *Al-Masaeid, H.R., and M.Z. Faddah*, “Capacity of Roundabouts in Jordan,” *Transportation Research Record 1572, Transportation Research Board, National Research Council, Washington, D.C. (1997) pp. 76-85.*
- [3] *H. J. Ruskin and R. Wang*), “Traffic flow at urban un-signalised intersection using cellular automata”2002.
- [4] *Al-Omari et al., (2004)* “ developed a model for estimating roundabout delay as a function of traffic and geometric factors” *International Journal of Advance Engineering and Research Development.,2004.*
- [5] *Taylor, Jonathan, and Sinclair Knight.* “Prioritising Road-Rail Level Crossings for Grade Separation Using a Multi-Criteria Approach 2. The Four-Stage Approach,”2012.