



Redesign of At Grade Intersection and Comparison with Proposed Underpass By Government at Manterwadi Chowk, Pune

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ABSTRACT-This paper presents the redesign of intersection at Manterwadi chowk on Saswad Kondhwa road, Pune and it also give advantages over underpass which is proposed to be constructed by PWD Pune at Manterwadi chowk on Saswad Kondhwa road. Intersection is an area on highway where two or more roadways join or cross each other, to control traffic in that area. The number of facility per year is steadily increasing as the number of vehicles on the road. Hence vehicles moving in different direction want to occupy same space at the same time which may cause traffic busy condition. To overcome such type of difficulties intersection is designed which provides channelization of route direction. It gives exact idea to a driver to turn to different directions and to reach their desired destinations. It also gives comfort to pedestrians to cross the road. The performance of intersection affects the traffic flow, capacity of road in urban areas and accident rates. The performance of an intersection controls the performance of urban roads meeting at that intersection narrowing the width of all lanes to keep total road widths the same, in heterogeneous traffic.

KEY WORDS: Intersection, Traffic flow, Channelization, Heterogeneous traffic.

I. INTRODUCTION

An Intersection is the most complex location on any highway, where two or more roadways join or cross each other, which facilitate orderly movement of traffic in that area. The number of facility per year is steadily increasing as the number of vehicles on the road. A well-functioning road-transport system is vital to the well-being and prosperity of any country. While the main goal of intersection design is to facilitate the safe and efficient movement of vehicles and road-users through the intersection, in highly motorized countries, intersection design is often driven primarily by capacity and performance considerations that prioritize vehicular traffic. Other objectives such as safety, the conservation of transport energy, the minimization of harmful emissions and the needs of pedestrians and other vulnerable road-users are often given a lower priority.

One of the most effective and efficient methods of controlling the traffic on a highway is the adoption of high intersection geometrics design standards. 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 instills driver confidence.

II. LITERATURE SURVEY

Now-a-days, due to increase in traffic intensity and to minimize the accident rate on highway intersection design is adopted. It gives exact direction to turn a vehicle and comfort to driver. Canale S. Leorordi S. Papalardo G. presented Safety in Rural Intersections. In this paper he formulated an equation $ISD=0.278V.G$ which helps to determine sight distance at intersections to avoid collision. The result of experimental survey allowed to differentiate the critical gap for crossing right turn, and left turn. He also concluded that evaluation of sight distance at grade intersection controlled by stop sign. [2] Karl Bang &GaoHai-long presented paper on Traffic performance modeling for intersections on interurban and township roads. In this paper he concluded performance of unsignalized intersection is poor than signalized intersections. This paper also concluded that intersection delay was primarily function of total intersection traffic flow, split between major minor road flow and width of intersection road. [3] *Kevin RILEY and Joe BARED, FHWA* presented paper on the design of interurban intersection (1998).It gives technical guidelines for design of at grade intersection. Bruce Hellinga and Zeeshan Abdy presented a report on Signalized Intersection Analysis and Design- implication of day-to-day variability in peak hour volume on delay. This paper presents finding of a study that of day to day variability of intersection peak hour approach volume on intersection. He concluded that the no of days of observation of peak hour volumes required to estimate intersection average performance during peak hour of a typical weekday was established as function of the desired level of accuracy. [5]

III. METHDOLOGY

To design safe intersection, required data is collected according to IRC SP-41 and manual design is carried out using IRC SP-41.Comparison of above designed intersection with Government proposed underpass at Manterwadi chowk, Pune by considering its estimated cost.

A. Design of T type road Intersection- The information required to design intersection is collected from PWD Pune. And intersection is designed by using IS SP-41.

This data collected to design intersection is as follows:

- Index plan of intersection.
- Traffic density according to survey carried out by PWD Pune in December 2014.
- Radius of curve.
- Type of road and intersection.
- Study regarding traffic conflict.
- Drawing of underpass proposed by Government.

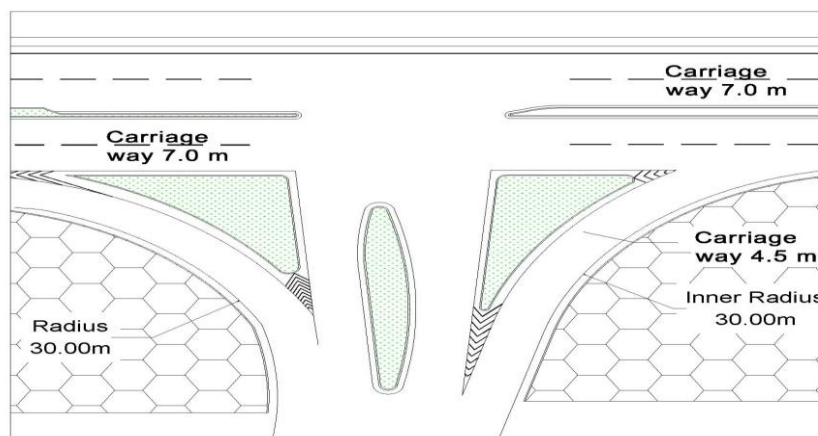


Fig.1.-Suggested T type Road Intersection

B. Comparison of suggested intersection T type road intersection with underpass proposed by Government at Manterwadi chowk, Pune.

In this paper comparison of underpass which is proposed by Government and suggested T type intersection at Manterwadi chowk , Pune is shown. This comparison is shown by calculated estimated cost of proposed underpass and suggested intersection. The estimation of both the proposed underpass and suggested T type road intersection is calculated by center-line method and rates are taken from DSR 2014-2015. An approximate estimated cost of underpass proposed by Government is one crore seventy three lakhs rupees. An approximate cost of suggested road intersection is ten lakhs rupees.

IV. RESULTS AND DISCUSSION

The following graph shows the comparison of proposed underpass by Government and suggested T type road intersection at Manterwadi chowk, Pune. In this graph estimated cost of proposed underpass by Government and suggested intersection is given in rupees. According to, following graph an estimated cost of proposed underpass is greater than suggested road intersection. According to, this graph we can say that suggested intersection is more economical than underpass which is going to be constructed at Manterwadi chowk , Pune.

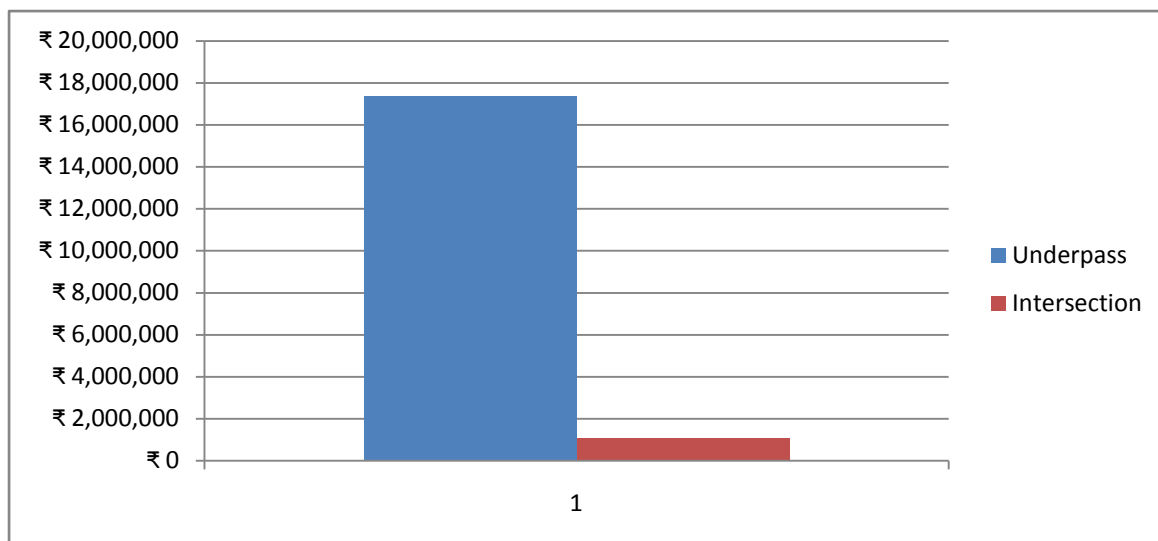


Fig.2 Comparison of underpass with intersection

V. CONCLUSION

From above results of graph we can concluded that suggested road intersection is more economical than underpass proposed by Government at Manterwadi chowk, Pune. This channelization at intersection can divert traffic flow efficiently and economically.

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ISSN: 2350-0328

International Journal of Advanced Research in Science, Engineering and Technology

Vol. 2, Issue 5 , May 2015

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