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# Case Study on Traffic Management for Rectification of Congestion on a Road Stretch

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***Abstract:*** *This case study emphasis on the British technique of design of traffic lights to reduce congestion by using traffic management. According to present study the population is increasing, so that the number of vehicles is running more on the field or on the road it affects the traffic flow & because of that congestion. occur at intersection. Traffic signals are one of the most effective and flexible active control of traffic and is widely used in several cities worldwide. This is effective and economical method to improve congestion considering the importance of Highway as a vital part of civil engineering; it helps us to find out the losses at different junctions of Landran, Chandigarh, Sirhind & Kharar considered for future improvement purposes and to make the perfect plan for the road. I have considered this case study for improvement of congestion of traffic when coming from Chandigarh side towards landran.. The study conducted on road Chandigarh –Landran and Sirhind –Kharar & Landran – Banur and Sirhind –kharar intersection. intersection. The existing traffic data is analyzed and proper improvement proposals is given to reduce congestion.*
***Keyword:*** *Congestion, Signaling, Traffic Volume Study,*

## I. Introduction

**Traffic volume study**: It is used to determine the number of movements, pedestrian on vehicular traffic flow & classification of roadway vehicles & it also helps to identify critical flow & time period. The traffic volume data should be collected during peak & non-peak hour with time interval 30 min. This study is conducted to examine the existing traffic data and to identify any improvement necessarily to accommodate existing or projected traffic volume and traffic calming device[1,2]. After analyzing the date we proposed the design of traffic lights to rectify the congestion. This study is done because traffic volume is useful in design of pavement, geometric design, computing road capacity, planning one way street, regulatory measures, sidewalks cross walks, subways, pedestrian signals, intersection and deciding on signal timing and channelization. It has seen that the future traffic projection based on previous or present day traffic volume studies in necessary for an estimate of the existing facilities[3,4,5]. It also seen that the projection of traffic can lead to policy decision with respect to the requirement of bypasses to the city and increase the road capacity. The purpose of this study is to analysis the traffic pattern and trends for the planning of traffic operation and controls of signaling.

## II. Formulation

| | |
|---|---|
| The capacity is determined by, | C=1000V/S |
| Traffic Volume, | Q=KVs*Q |
| Saturation Flow**,** | S=525w PCU/hr |

## III. Methodology

There are different types of method is used for collecting the data like Manual count & Automatic count[6,7]. In this study we used manual count. The data is collected on road Chandigarh Landran – Banur and Sirhind –kharar . Two points in considered in every road A & B, the distance between each point is 1km. On those two points the two students one stand at the start of the line and other will stand at the end of the line. If the different types of vehicle is used for collecting the data the number of students or person will increase. The number of vehicles has to be counted manually, the data collected for different types of vehicles like Bull Carts, Two Wheelers (TW), Four Wheelers (FW), Low Motor Vehicles (LMV) and High Motor Vehicles (HMV)[8,9,10,11]. The time interval is taken 30 min & it is a two lane road. Figure 1; show s the layout plan of the different types of road stretch. The design hour flow is taken from PWD and PIDB departments. The traffic volume data is collected for this study. The data which is collected is shows in the followings figures.

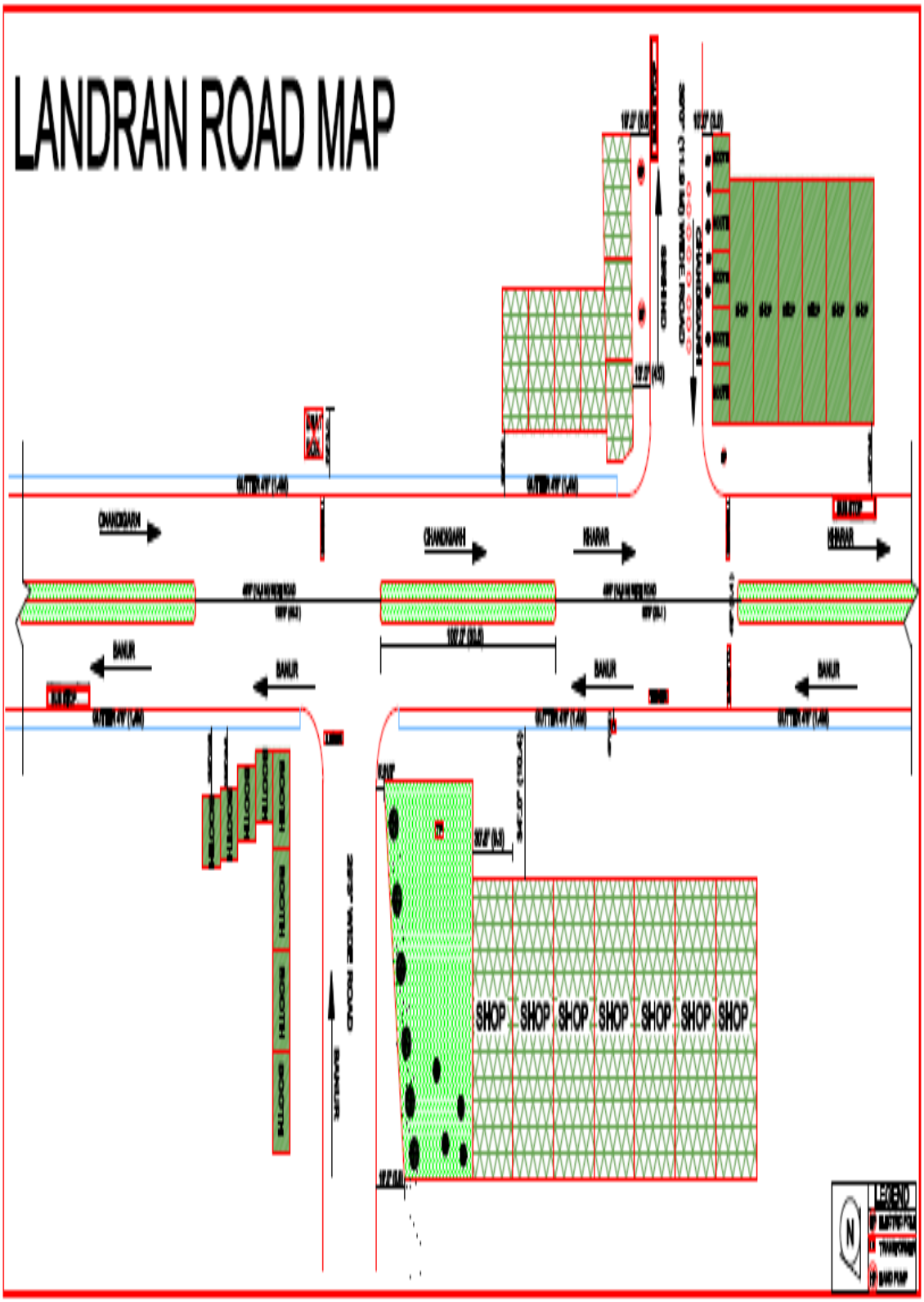



**Fig.1.** Layout Plan of Landran Road Map

## IV. Result

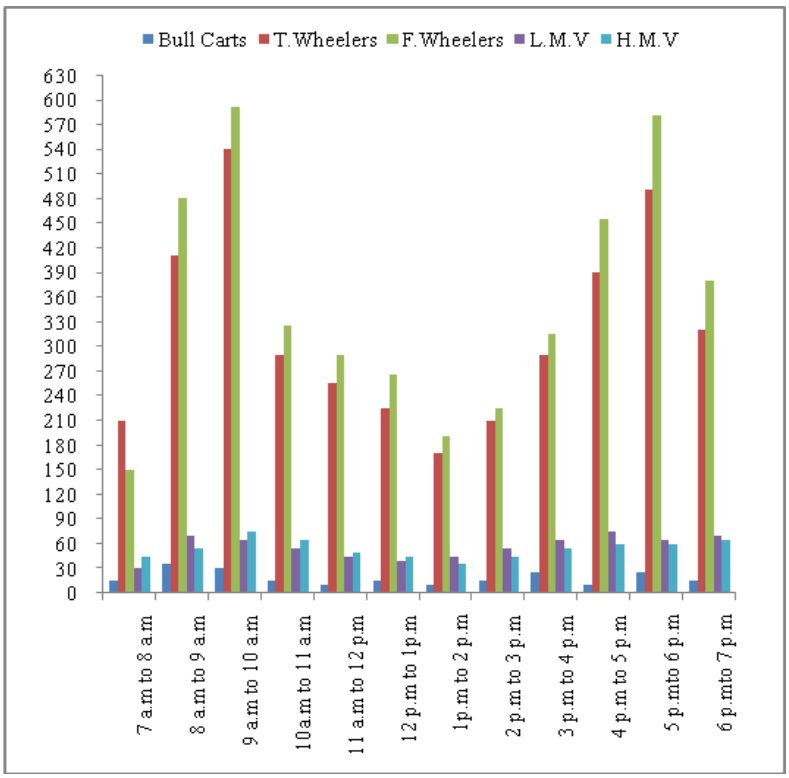



**Fig.2.** Traffic Volume Landran to Chandigarh (Peak Hour 9-10am, 5-6pm)

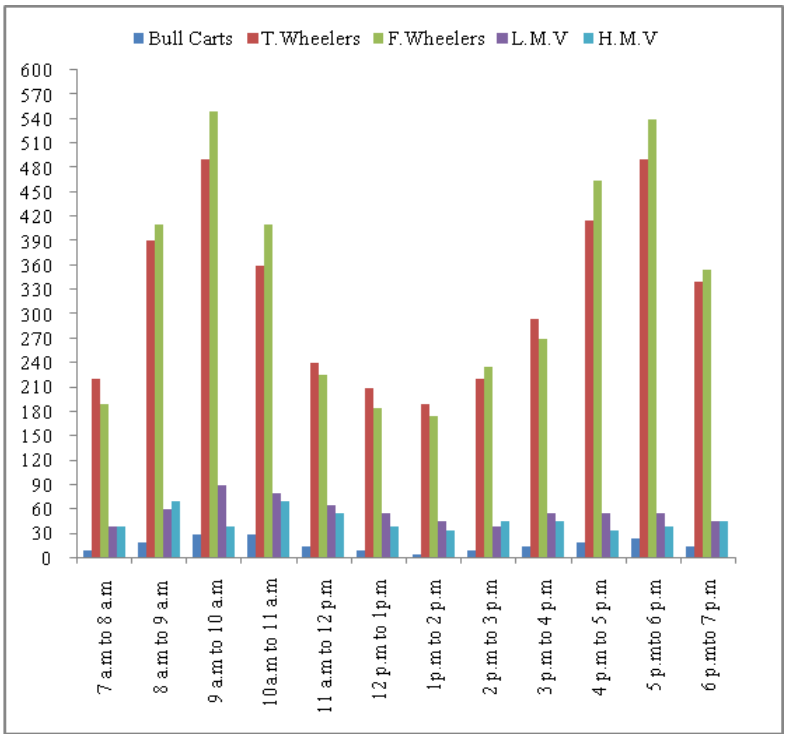



**Fig.3.** Traffic Volume Chandigarh to Landran (Peak Hour 9-10am, 5-6pm)

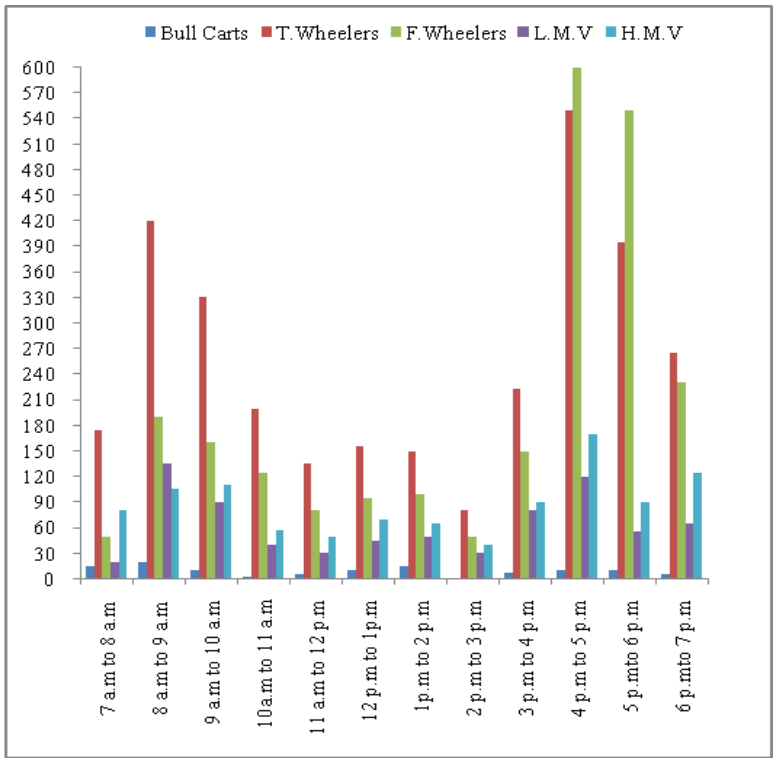



**Fig.4.**Traffic Volume Banur to Landran (Peak Hour 9-10am, 5-6pm

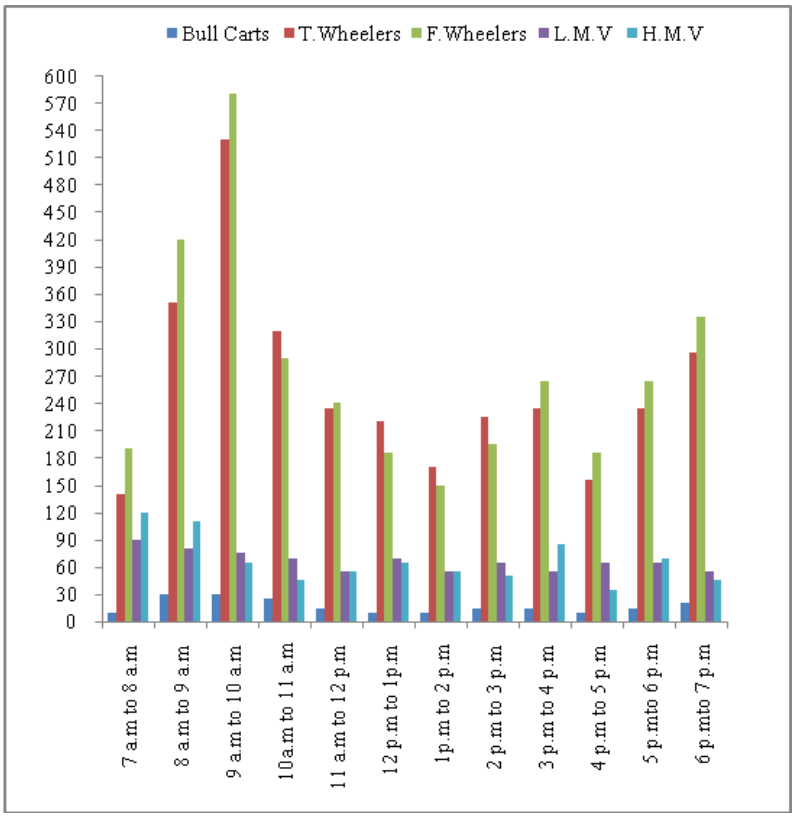



**Fig.5.** Traffic Volume Landran to Banur (Peak Hour 9-10am, 6-7pm)

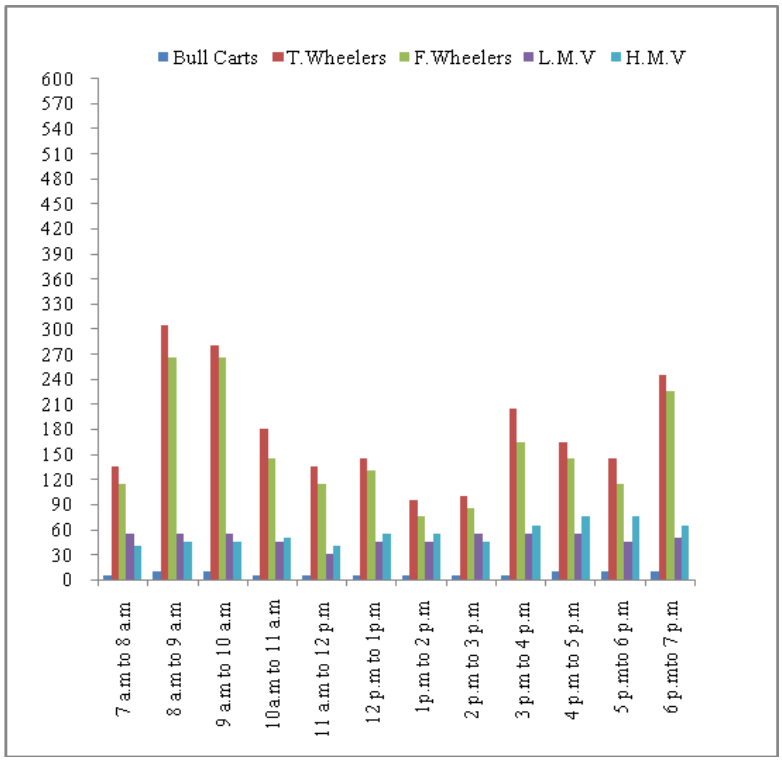



**Fig.6.** Traffic Volume Kharar to Landran (Peak Hour 9-10am, 5-6pm

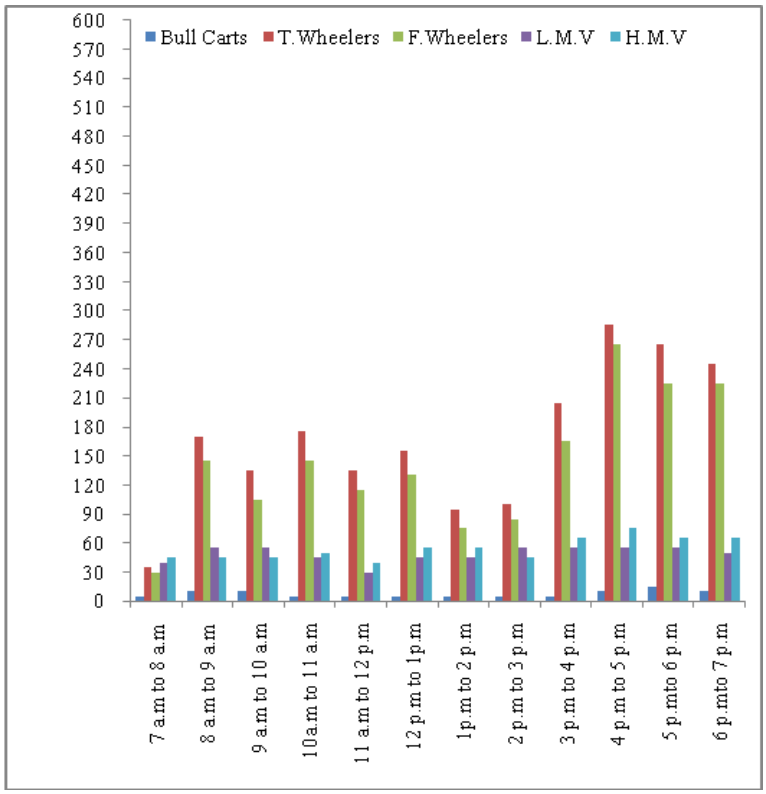



**Fig.7.** Traffic Volume Landran to Kharar (Peak Hour 9-10am, 5-6pm)

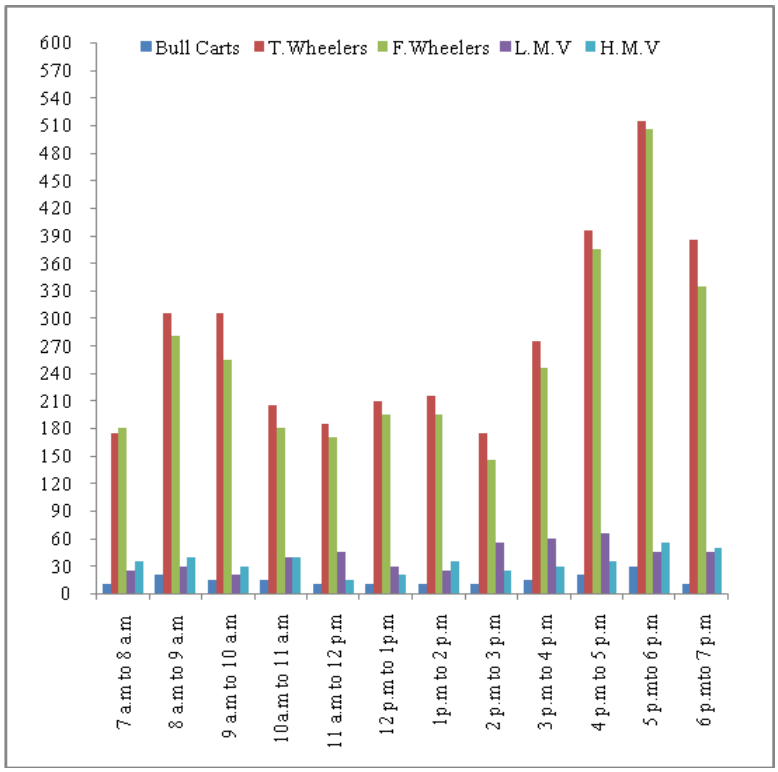



**Fig.8.** Traffic Volume Sirhind to Landran (Peak Hour 8-9am, 5-6pm)

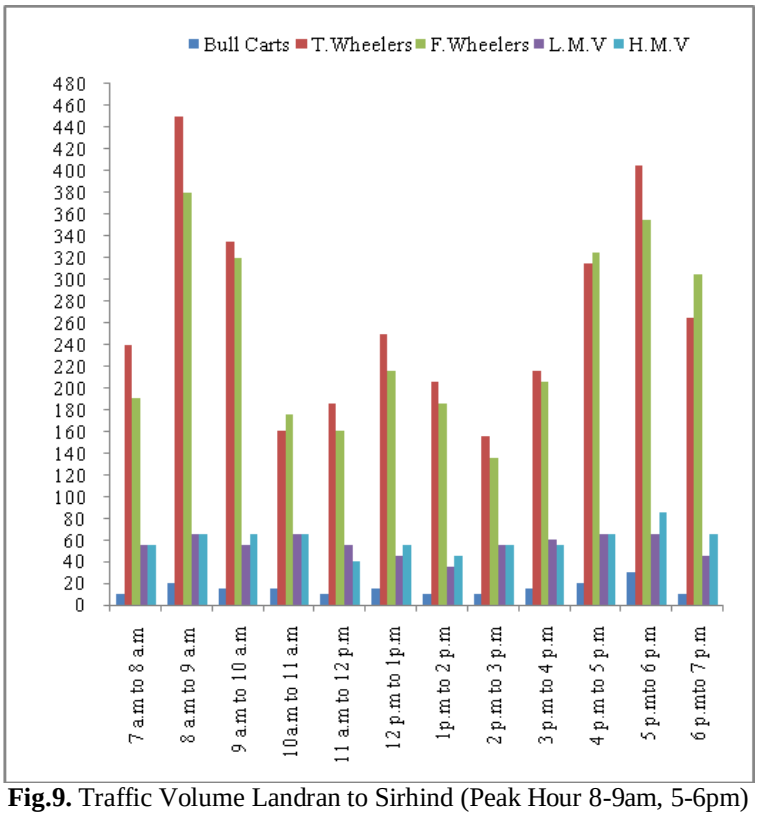



**Fig.9.** Traffic Volume Landran to Sirhind (Peak Hour 8-9am, 5-6pm)

**Above data shows the traffic volume on different roads stretches. The traffic signal design is given below according to above data,**

Table 1. Design of Traffic Lights

| **Direct on** | **Chandigarh(C)** | **Sirhind(S)** | **Banur(B)** | **Kharar(K)** |
|---|---|---|---|---|
| Design hour flow | 2300 | 1500 | 2700 | 990 |
| Saturation on flow | 4672 | 6247 | 7770 | 7770 |
| Y | .49 | .19 | .37 | .14 |
| Y(max) | .49 | | .37 | |

Table 2. Signal Time

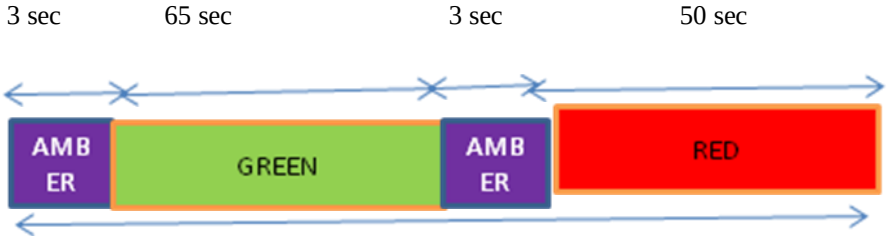
| **Signal** | **Time In Seconds** |
|---|---|
| time loss | 8 |
| red | 67 |
| green | 48 |
| red/amber | 3 |

Table 3. Signal Time

| **Signal** | **Time In Seconds** |
|---|---|
| time loss | 8 |
| red | 65 |
| green | 50 |
| red/amber | 3 |

**Fig.10.** Signal Time Interval

CHANDIGARH -SIRHIND PHASE




121sec

BANUR -KHARAR PHASE

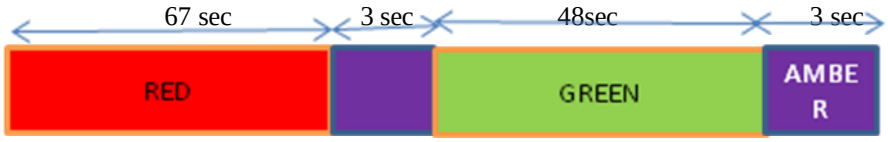



Fig.11.With Traffic Lights

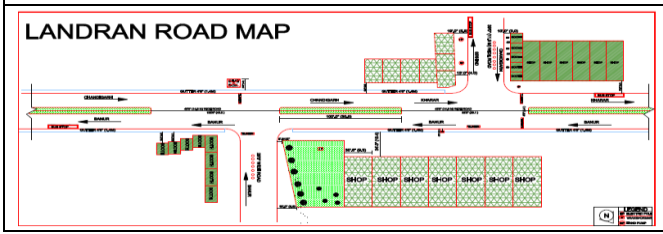
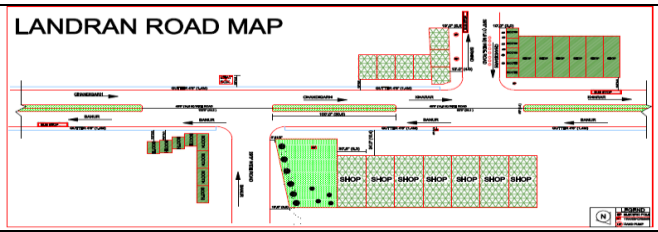



Fig.12. Without Traffic Lights




Above figure shows the traffic time interval at junction. The amber time, green & red time for CHANDIGARH to SIRHIND road is 3 sec, 65 sec, 50 sec & for the BANUR to KHARAR road 3, 48, 67 sec is designed. The figure 11, show the layout plan on which the traffic light or signal is designed & the figure12, shows the layout plan without traffic lights.

## V. Conclusion

It has seen that the main reason behind the traffic jams on landran road is that roads are damaged i.e. broken and presence of patches & the point where the buses stop is not right which makes the traffic slow to move and further results in jams. Landran to Sirhind, people park their cars on road side which gets in the way of people passing by the State Highway which violation of traffic rules-there is a total violation of rules on landran road, which makes a ruckus on the road further results in traffic jams. Auto ricksaw stops-the points where auto ricksaw stop is not right College timings-all the colleges get over at 4:30 p.m which results in a sudden traffic and further leads to traffic jams Checking of H.M.V andL.M.V-checking of trucks and buses is done the roads which results in a standstill of traffic leading to traffic jams. So we have design the signal which helps to move the traffic is proper flow. By introducing of traffic signs and sign boards. Sign boards should be placed on kharar to landran road i.e, sign boards should be placed near chapar -chiri village for the traffic going to Mohali via kharar. It will further reduced the traffic on landran road and hence traffic jamms. Bus stop should be moved forward to an extent by which the traffic can continues without a glitch.

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