

# International Journal of Innovative Research in Science, Engineering and Technology

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## Traffic Study on Mid-Block Section & Intersection

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**ABSTRACT:** Traffic has grown in recently years with urbanization. In the recent scenario traffic is the major consent for any developing nation. Vehicle crashes are a major concern in rapidly growing urban agglomerations. They also have attracted the attention of researchers, academicians, and policy makers. Population growth in these areas has been more rapid in recently, due to the saturation of population within the city area and the consequent large-scale industrial development in the peripheral areas. Therefore it's necessary to give attention towards transportation and study the need for better geometric design, capacity, signals, roadway marking, street lighting etc. In this parametric study, level of service(LOS) of different segment has been practically carried out for stretch path of gold coin building to Dabhelcheck post& PWD building Cross Road between destination points facing heaviest traffic problems. Expected solution we get from outcome is lead to potential improvement of traffic in the form of either expansion of width of roads, construction of fly over or by-pass, improvement of signal design. The study would be basically divided into two phases with first phase focusing more on a mid-block section and the later phase on intersection mentioned above.

**KEYWORDS:** Pedestrian, sidewalk, mid-block, cross-flow, vehicular characteristics.

### I. INTRODUCTION

Vehicular use has always been the primary means of human. And that's why we considered the vehicular are the basic elements of transportation. In ancient ages there was a huge vehicular travelling take place and travelling is the mode of transportation. For every transport related to travel and journeys must begin and end. The vehicular travel is an effective mode of transportation for short trips and long trips. Travelling of vehicular is a major mode of transportation in cities also. In order to provide the best design spaces for human motion or circulation like at move for travelling the hill station and travelling the work aspect and work the travelling to tour etc. for that vehicular motion is studied empirically in all aspects. It is carried away by two levels. At macroscopic level one can analyse the basic flow parameters like speed, density of vehicular motion and at microscopic level one may track the paths followed by individual vehicular while moving respectively. From this it is clear that the vehicular may create own paths in their journey trip. Coming to the vehicular crosswalks there were several cross road like intersection are designed for a road, provide gainful work to assist the vehicular to move from one side to the other side of road, and which plays a significant role in the mobility and safety mode of signalized intersections. In some other places like where the busy traffic takes place, vehicular choose the mid blocks to cross the road. But there is no safety as compared to signalized intersections. Even many vehicular cross roads are taking place in these midblock sections. Depend on the vehicular travel motion demand road width is defined. Some existing manuals are published about the road width, but they do not provide clear specifications for the required road width, vehicular regarding different demand volumes and properties. Vehicular flow consists of two types, unidirectional and bidirectional. In unidirectional flow, vehicular motion is in one direction only, whereas in bidirectional vehicular can travel from the both direction and interact with each other. Vehicular road safety is one of the major aspects of transportation engineering in urban areas. The illegal crossing behaviour of the vehicular is a major fact in the road safety issue. The thesis here is focused on developing vehicular motion which can describe the vehicular interaction at the cross sections. For that vehicle flow interaction at several intersections was collected from Vapi. These experimental studies will be discussed.

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## II. PROBLEM STATEMENT

The problem of this thesis can be broadly stated as “understanding vehicular, flow interactions in varied situations.” In some situations, vehicular motion is observed empirically. This the following describes

1. Crossing time for vehicle travel will be measured to evaluate the maximum vehicular flow, crossing speed, density, and the adequacy of the geometry and location of signalized crossroad. The signal timing for pedestrian and motorists will also be examined.
2. To analyze and study the effect of various factors related to vehicular interactions and road site parking characteristics, vehicular movements, traffic conditions, road conditions.
3. The signalized road performance will be examined if it can handle the road traffic safely and efficiently.
4. These are part of the overall study aim of providing a general characterization of vehicular travel for slow speed and problem for technical problem crossing behavior at signalized intersections based on field observations. And road site no parking zone are strictly allowed.

## III. AIM AND OBJECTIVE

To improvement of mid-block section and road intersection at junction of Vapi,Gujarat barrage to control the traffic volume and its problem by traffic design.

The objectives of the present study are as under:

1. To study the traffic volume of the mid-block section and intersection
2. To study the road condition.
3. To study the existing drainage condition of the mid-block sectionRoad sites.
4. To study the existing condition of residence living near the site of study area who can have the problem with the work.
5. To perform record search, site investigation and data collection to identify existing utilities in the area.

## IV. GOALS OF STUDY

1. Climate protection
2. Healthy and safe communities
3. Reduces intersection crash types.
4. Transportation system effectiveness
5. Improved traffic flow by avoiding collisions and blocking congestion delays.
6. Facilitates complex and risky traffic movements at 'X' and 'T' intersections.
7. Attenuates or reduces disturbing noise generated by vehicle horns and automatic warning devices.

## V. LIMITATION OF STUDY

1. To analyze the mid-block road condition of the site.
2. Prepare Geotechnical report based on in-situ testing as necessary to support the track design.
3. Study of microscopic traffic flow characteristics like headway, clearance etc.
4. Estimating and costing of overall project.

## VI. PROBLEM SPECIFICATION

### **Problem caused at road crossing**

1. Huge traffic congestion due to intersection.
2. Traffic jam creates long queues of vehicles.
3. Increase travel time and fuel consumption.

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4. Air pollution and noise pollution.

### Accident causes at road site

1. Most crashes happen at intersections.
2. Accident cause due to some technical Problem of vehicles

## VII. LITERATURE SURVEY

**Vinayaraj VS, A.R.Chaudhari, Shriniwas S. Arkatkar, Guarang Joshi** Present study mainly emphasizes on the behavioural characteristics of individual pedestrians at two different locations in the western part of India, having diverse conditions, city characteristics and geographical conditions. The survey was carried out at Bandra in Mumbai and Anthodia in Ahmadabad. Out of the video graphic extracted data, pedestrian variables such as demographic composition (gender and age), crossing speed, vehicle speed, pedestrian crossing pattern, traffic gaps, etc. were found to be significant. Multiple Linear Regression (MLR) model and Binary Logistic Regression (BLR) techniques were used in order to analyse the impact of different parameters on the traffic gap accepted by pedestrian and the decision of pedestrian. Thereby, to cross the street or not respectively. It was found that the accepted gap depends on the pedestrian rolling gap, pedestrian platoon size, pedestrian speed vehicle area and incoming vehicle speed. In this model, vehicle speed and pedestrian speed were more sensitive. Here, corresponding to increase in vehicle speed, pedestrian speed gets reduced. Binary logistic regression (BLR) technique revealed that the decision of the pedestrian whether to cross the street depends on the gap size of vehicle, area of vehicle, vehicle speed, gender, group size of pedestrian, crossing path change and crossing speed change. Furthermore, as vehicle speed increases the probability to cross the road decreases (disutility). This might be the effect of their age-related crossing capabilities as well as their higher safety consciousness. Pedestrian's individual characteristics were found to be insignificant and only gender was found to have impact of gap acceptance. The present study also observes that the pedestrians are accepting vehicular gaps with respect to vehicle speed.

**Nate Vander Broek** in summary, a midblock crosswalk provides pedestrians a safer and more visible way to cross a street than crossing at a random and often dangerous location. Midblock crosswalks are most useful in suburbs and areas where it's common to find long stretches without intersections. Midblock crosswalks should be located where there is heavy pedestrian traffic and major destinations, such as schools, shopping centres, or transit stops. While all midblock crosswalks must be marked, they can also be enhanced with medians, refuge islands, signals, signs, lighting and curb extensions. Before considering a midblock crosswalk, view the regulations as stated in the MUTCD to see if the midblock crosswalk is necessary and what features, such as signalization, should be used. And finally, consider elderly and disabled individuals in the design of the midblock crosswalk. The use of passive sensors instead of push buttons helps pedestrians who have trouble reaching or pushing buttons, and an audible indicator helps the visually impaired.

**B RaghuramKadali, TadiChiranjeevi, Rankireddy Rajesh** The vehicular flow characteristics were studied at un-signal sized mid-block Pedestrian crossing and pedestrian unrestricted crossing in Guntur, India. The vehicular speeds were implicitly affected with pedestrian crossing when compared to without pedestrian crossing location undermined traffic conditions. The theoretical capacity is significantly reduced with pedestrian crossings for car. However, increase in capacity is observed with pedestrian crossings in case of two-wheeler. The underlying fact is the variation of the speed of the car and two-wheeler. In case of auto rickshaw (three-wheeler) also there is a significant drop of speed value. From this study, it concluded that the car and auto rickshaw driver yielding to pedestrians in terms of speed is more when compared to the two wheeler drivers. The increase in reduction of vehicle speed significantly affects the travel time of vehicular drivers and it further has influence on the fuel consumption. However, the driver yield behaviour is the trade-off between pedestrian safety and vehicular flow characteristics. This study clearly indicates that the importance of pedestrian crossing facilities and the barrier effect on the vehicular flow characteristics. The judgment of segregating pedestrians from vehicular traffic should be based on the number of pedestrian accidents, illegal pedestrian crossing and demand of pedestrian as well as vehicular flow. However, this study has some limitations, in this study the effect of pedestrian crossing on the heavy vehicle is not addressed because of less heavy

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vehicle flow at selected location. This study result is restricted to single location of 4-lane divide roadway characteristics. There is a need to study the other crosswalk locations with varied roadway geometry and crosswalk types. It is also important to address the effect of pedestrian behavioural characteristics (change in pedestrian speed as well as crossing path) on vehicular characteristic under mixed traffic condition. In spite of these limitations, this study result has great inferences for pedestrian crossing facilities for urban planning policies and design practices for controlling the pedestrian crossings as well as proper location for the pedestrian crossing under mixed traffic conditions.

## VIII. METHODOLOGY

### Data Collection:-

1. The Traffic Volume at Vapi barrage mid-block section, VapiChala will be carried out.
2. The Traffic Flow Survey at mid-block section From Time 8 AM To 11PM. Also evening 4 PM To 7 PM.
3. The Traffic at Junction Mostly In Early Morning and In Afternoon.

Most Traffic Problems of Junction Is occurred By Animals, Pedestrian, and Heavy Vehicle & Parking. To Solve Problems of Traffic the bridge or underpass should be provided.

### Traffic Counting Method:

Two methods are available for conducting traffic volume counts:

- (1) Manual count and
- (2) Automatic count

Manual counts are typically used to gather data for determination of vehicle classification, turning movements, direction of travel, pedestrian movements, or vehicle occupancy. Automatic counts are typically used to gather data for determination of vehicle hourly patterns, daily or seasonal variations and growth trends, or annual traffic estimates.

The selection of study method should be determined using the count period. The count period should be representative of the time of day, day of month, and month of year for the study area. For example, counts at a summer resort would not be taken in January. The count period should avoid special event or compromising weather conditions (Sharma 1994). Count periods may range from 5 minutes to 1 year. Typical count periods are 15 minutes or 2 hours for peak periods, 4 hours for morning and afternoon peaks, 6 hours for morning, midday, and afternoon peaks, and 12 hours for daytime periods (Robertson1994). For example, if you were conducting a 2-hour peak period count, eight 15-minute counts would be requiring.

### Manual Count Method:

Most applications of manual counts require small samples of data at any given location. Manual counts are sometimes used when the effort and expense of automated equipment are not justified. Manual counts are necessary when automatic equipment is not available. Manual counts are typically used for periods of less than a day. Normal intervals for a manual count are 5, 10, or 15 minutes. Traffic counts during a Monday morning rush hour and a Friday evening rush hour may show exceptionally high volumes and are not normally used in analysis; therefore, counts are usually conducted on a Tuesday, Wednesday, or Thursday.

### Manual Counts Recording Methods:

Manual counts are recorded using one of three methods: tally sheets, mechanical counting boards, or Electronic counting boards.

### Tally Sheets:

Recording data into tally sheets is the simplest means of conducting manual counts. The data can be recorded with a tick mark on a pre-prepared field form. A watch or stopwatch is necessary to measure the desired count interval.

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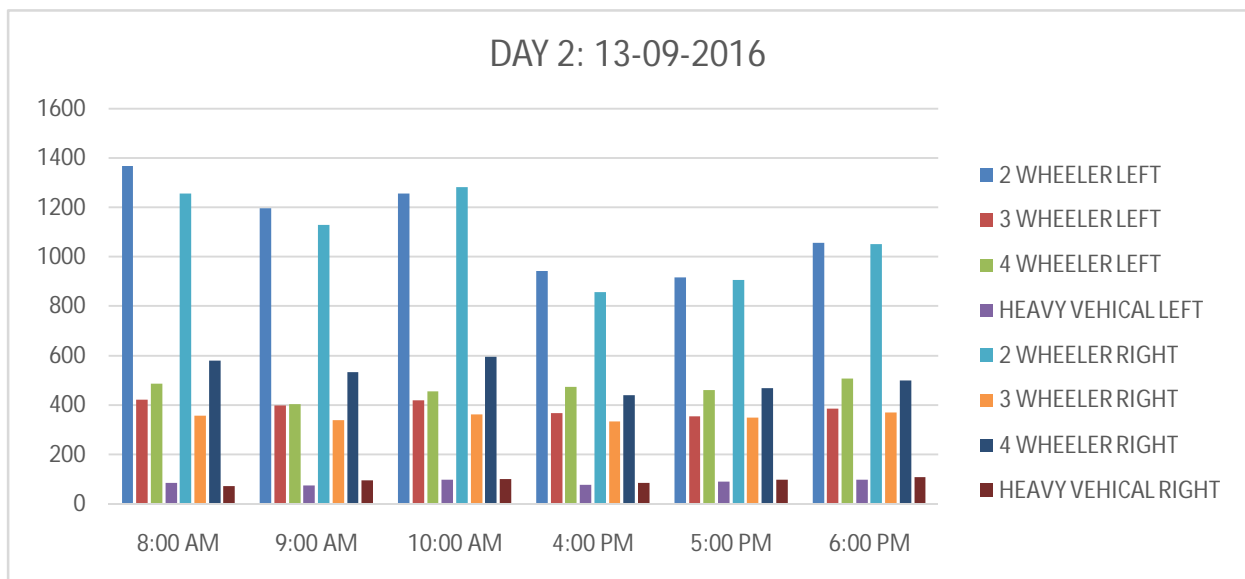
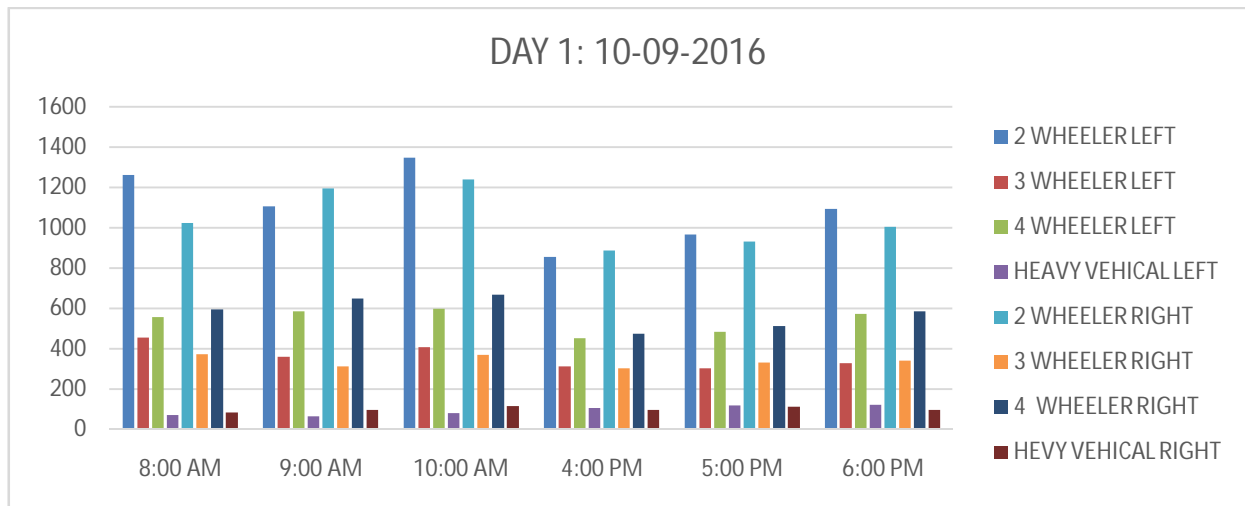
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## IX. EXPERIMENTAL WORK

### Vehicles Counting:-

The various data collected in the form of vehicles counting is represented as per the following Bar graphs, Day 1 to Day 4 data are represented as follows:

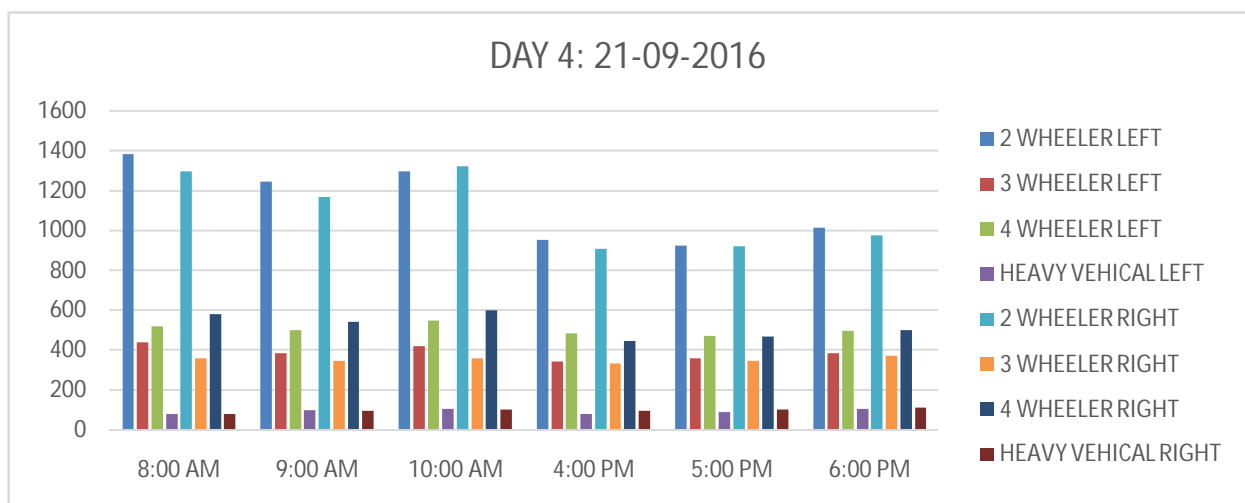
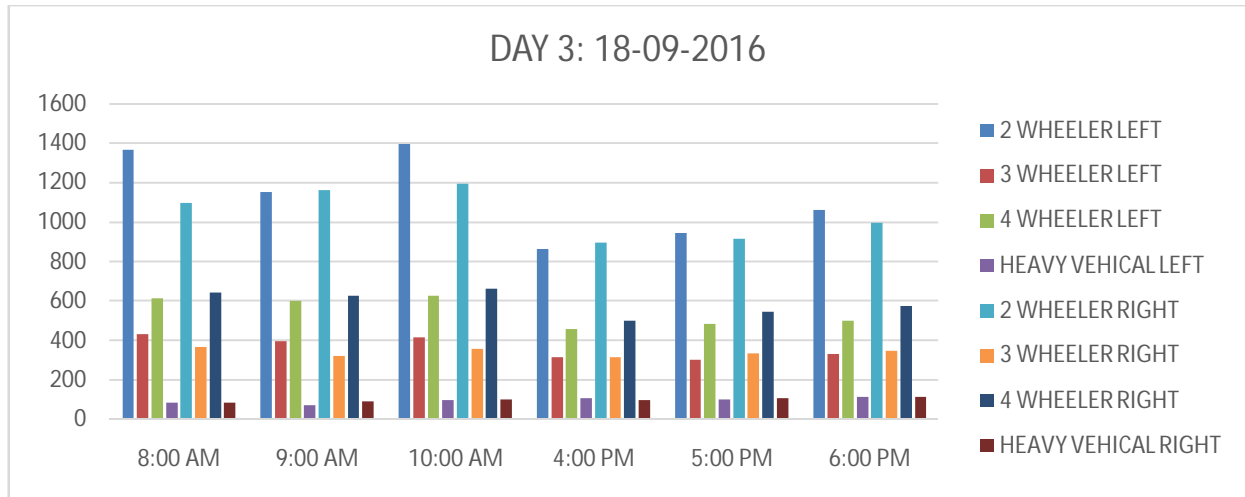


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In above graph, presented time verses volume density in different days (i.e. Day 1, Day 2, Day 3 and Day 4). The vehicles counting peak hour's morning and evening different types of vehicles i.e. two wheeler, three wheeler four wheeler and heavy vehicles are counting left side and right side.

## X. IMPLEMENTATION OF STUDY

Road controlling is given the authority to erect regulatory signs which include Give Way and Stop signs. Associated road markings are required by the Traffic Regulations signs and markings must be present to have legal effect, except where the surface type of it impractical to provide markings, unsealed roads. The required markings are detailed in Guide to Urban Road Marking. It should be noted that the current edition of the Manual of Traffic Signs and Markings shows the "Stop" or "Way" letters starting a maximum of 10 meter from the limit line. To make sure the Traffic Regulations are complied with the whole of the word should be within 10 meters. Further guidance given in the Signs Manual. Duplication of signs may be desirable as outlined in these guidelines. This is specified in the definition of 'Intersection' in the interpretation clause of the Traffic Regulations of mid-block section and intersection. They are

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necessary to ensure uniform national standards and to avoid confusion. Legal aspects of speed reduction devices are discussed in Guidelines for Use and Construction of Speed Control Humps.

Procedures for the choice of traffic control at a particular uncontrolled crossroad are discussed in a new Ministry publication Guidelines for the Implementation of Traffic Control at Cross roads. It provides a convenient reference to matters such as visibility distance, approaching vehicle speeds of road, appropriate legal matters and practical aspects. In particular it contains new criteria for the installation of Stop signs based on the safe approaching speed. Relevant information can also be found in the Manual of Traffic Signs and Markings. It has been agreed that the section of the Manual dealing with Give Way and Stop signs will be amended to give effect to this policy and be consistent with the guidelines. However, the implementation of this policy should be undertaken by road controlling authorities using their own staff or consultants.

**Road Width:** Traffic controls are reducing for implementation of road width for improper road and side of parking facilities provide.

**Signal:** Traffic signals are provided at road intersection this are control device which could alternatively direct traffic the traffic to stop and proceed. Traffic signals are worked from the automatic and manually. Sometime the signals are not work properly so the traffic are produce to the signal the maintenance and special control room are provide for better work of traffic control reduce and some small place of road intersection the battery of signal provide to maintained the traffic flow.

**Sign:** Road sign are provide for road side corner to inform the road user of certain laws, and regulation. This sign are inform the road user for proper guidance so the vehicular are proper way so the traffic are reduce.

**Marking:** The road marking to reduce the traffic control for improper parking of vehicles the marking sign of road side provider of yellow colour of line parking to provide the vehicle are park and marking sign implementation of road marking of redline are provide to implement the road at night vision of road clearly show .

**Island:** The road intersections of island are providing for bigger size so the traffic is reduced.

**Traffic signal:** Traffic signals are electrically operated traffic control devices which alternately direct traffic to stop and to proceed. This discussion tells what factors enter into traffic engineers' decisions to install traffic signals. Because there is a common belief that signals are the answer to all traffic problems at intersections, this is offered in the interest of developing broader public understanding about what signals will do - and what they won't do. A number of definitions and notations need to be understood in signal design. They are discussed below:

•**Interval:** Thus it indicates the change from one stage to another. There are two types of intervals change interval and clearance interval. Change interval is also called the yellow time indicates the interval between the green and red signal indications for an approach. Clearance interval is also called all red is included after each yellow interval indicating a period during which all signal faces show red and is used for clearing off the vehicles in the intersection.

•**Green Interval:** It is the green indication for a particular movement or set of movements and is denoted by GI. This is the actual duration the green light of a traffic signal is turned on.

•**Red Interval:** It is the red indication for a particular movement or set of movements and is denoted by RI. This is the actual duration the red light of a traffic signal is turned on.

•**Phase:** A phase is the green interval plus the change and clearance intervals that follow it. Thus, during green interval, non-conflicting movements are assigned into each phase. It allows a set of movements to flow and safely halt the flow before the phase of another set of movements start.

•**Lost Time:** It indicates the time during which the intersection is not effectively utilized for any movement. For example, when the signal for an approach turns from red to green, the driver of the vehicle which is in the front of the queue will take some time to perceive the signal (usually called as reaction time) and sometime will be lost here before he moves.

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A complete series of stages during which all traffic movements are served in turn is known as a cycle. The cycle time is the sum of each of the stage times.

## XI. CONCLUSION

On the junction the three phase signal is provided and the signal cycle time is 40 second. As this mid-block section is on the route of the Vapi-Chala most of the traffic going towards the Jayshree Theater, HDFC bank, or some other school have to cross the road so the design criteria of this signal should be as per guidelines.

1. To provide zebra crossing across approaching traffic end of the corner's radius for people can safely crossing the road among three phases.
2. To provide signal with traffic police
3. Traffic marking and islands should be provided as per requirement.

## REFERENCES

- [1] Ashalatha, R, and Chandra S, "Critical gap through clearing behavior of drivers at un-signalized intersections." *KSCE Journal of Civil Engineering* 15, no. 8, 1427-1434, 2011
- [2] Asaithambi et al "pedestrian road crossing behavior under mixed traffic conditions: A comparative study of an intersection before and after implementing control measures" *TIDE Journal of Civil Engineering* 15, no. 8, 16-23, 2016.
- [3] Bradu,D., Mundlak Y. Estimation in lognormal linear models. *Journal of the American Statistical Association* 65, pp. 198-21,1970
- [4] Brewer, Marcus, Kay Fitzpatrick, Jeffrey Whitacre, and Dominique Lord. "Exploration of pedestrian gap-acceptance behavior at selected locations." *Transportation Research Record: Journal of the Transportation Research Board* 1982, 132-140, 2006
- [5] Brilon, Werner, Ralph Koenig, and Rod J. Troutbeck. "Useful estimation procedures for critical gaps." *Transportation Research Part A: Policy and Practice* 33, no. 3, 1999
- [6] Chandra, Satish, RajatRastogi, and Vivek R. Das. "Descriptive and parametric analysis of pedestrian gap acceptance in mixed traffic conditions." *KSCE journal of civil engineering* 18, no. 1, 2014
- [7] Cherry, C. and Moore, S.E. "Characterizing illegal midblock pedestrian crossings in China. Jerusalem, Israel": *International Conference on Safety and Mobility of Vulnerable Road Users: Pedestrians, Motorcyclists, and Bicyclists* (2010).
- [8] DiPietro, M., and King, L., Pedestrian gap-acceptance, *Highway Research Record* 308, pp. 80-91, 1970
- [9] Hamed, M. M. "Analysis of pedestrians" behaviour at pedestrian crossings." *Safety Sci.*, 63-82, 2001
- [10] Highway capacity manual, Washington, DC: Transportation Research Board, 2010.