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# Case Study of Warje: Causes and Solutions

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**ABSTRACT:** Traffic condition in most of the cities are very complex. The high increase in number of vehicles on road and increasing urbanization leads to the problem of traffic congestion, which further leads to complications and hazards on the city roads. Many arterial roads in Pune city are suffering from this problem, especially during peak traffic hours. In this work, we witnessed actual traffic congestion problems. For further analysis, we conducted traffic volume survey through manual counting of vehicles and converted this data in to the PCU coefficients. After analyzing all the work, we pinned the root problem of road and proposed a solution to avoid traffic congestions.

## I.INTRODUCTION

There are some traffic problems of Pune City which needs to be attended to as soon as possible so as to maintain the actual growth in terms of basic development. Most arterial roads in the city are facing the problem of traffic congestion especially during peak hours. This as a result causes delay to the road users as well as an increase in the accidents on road.

Traffic jams is a major transport problem in Pune. Due to traffic jams, there is possibility of accidents because of poor traffic management. We all know that Pune is a developed city and densely populated. But there are some basic traffic problems of Pune which needs attention and solution as soon as possible so as to maintain the actual growth in terms of basic development. The traffic problem in city like Pune is increasing with every passing day. Whenever we talk about Pune's traffic we hear words like disgusting, chaotic, unsafe, infamous, etc. The fatality rate is one person a day or 10 to 15 a week which is very high. Thanks to very unorganized, undisciplined traffic of city with zero traffic sense in the population. Every time we cross the city we find ourselves standing frustrated in traffic jams and criticizing the government.

Warje Chowk is a busy intersection located in the city of Pune, India. It connects several major roads, including the Mumbai-Bangalore highway, and serves as a key transportation hub for the area. A case study of Warje Chowk could be conducted to analyze traffic volume, congestion, and other issues related to the intersection.

The study could begin by defining the study area and selecting the data collection method. For example, traffic data could be collected using video cameras or automated traffic recorders placed at strategic locations around the intersection. The study period could be determined based on the specific objectives of the study, such as examining weekday traffic patterns or peak-hour traffic volume.

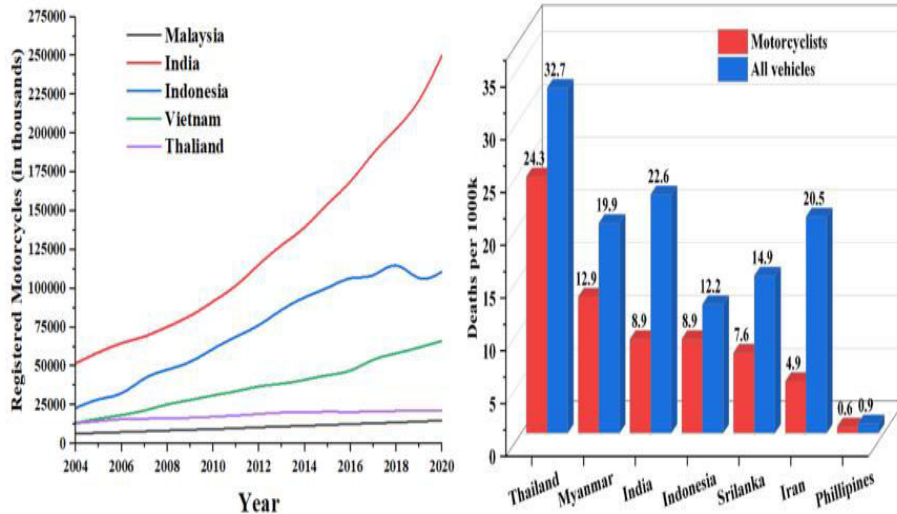


Fig. 8. a) MTW registration trends in the last decades, and b) Motorcyclists death per 100 K in 2018 for Asian Countries

In the past, numerous studies related to EMCL have been carried out in many Asian countries. However, a comprehensive review of all these studies showing a combined analysis of geometric design, flow characteristics, and traffic control devices for EMCL is not available. Therefore, the present study aims to fill the literature gap by systematically reviewing existing literature on EMCL. This paper provides an essential insight into the research consummated on EMCL in several countries, which would be helpful to transport planners, government agencies, and researchers.

## II.LITERATURE REVIEW

We have collected so many research paper regarding the Traffic Problems & its control measures in Pune and while studying the paper we have understand most of the traffic problems such as illegal parking, hauling, violating traffic rules road side hauling, not proper space for parking and the major one which has been reflected in most of the research paper is the Increase of the Motorcycles in the Pune and not following the traffic rules. We have also collected some research paper regarding the motorcycle lanes which are of two types a) Non-exclusive motorcycle lane & b) Exclusive motorcycle lane.

### Traffic Congestion- Cause and Solutions: A Case Study of Hadapsar Road, Magarpatta, Pune

They presented research paper on encouraging public transport use to Reduce Traffic Congestion and Air Pollutant. They stated that motorcycle was the premier means of transport because of its features in terms of convenience and flexibility to travel and the degradation of bus service quality and insecurity of bus transport. They give the conclusion about Vietnam city, there would no negatively environmental effects from shifts from motorcycle to public bus transport.

### Solution on traffic gestion for Pune

This paper presents a mathematical theory for modeling the hysteresis phenomenon observed in traffic flow. It proposes that acceleration, deceleration and equilibrium flow should be distinguished in obtaining speed – concentration and/or occupancy relationships, such that the phase transitions from one phase to another can be correctly identified. The analysis shows that the speed ± concentration curves obtained following this approach are hysteresis loops, as predicted by the theory. The paper also gives a discussion of the general properties of the proposed modeling equations and examines the relationship between traffic hysteresis and stop start waves observed in traffic flow.

### Pune Traffic Congestion: Reality, Cause And Regulation A Case Study

The main cause of traffic jams in Pune is road side parking which should be banned and penalized. Traffic jams can be improvised on various strategies such as road broadening, improved road infrastructures, penalty to the traffic law breakers

and application of Fly over, properly planned traffic junctions, no hawkers zone etc. To lessen the traffic problems there should be effective traffic management system and proper implication of traffic rules and system. ICT will make real transformation in Traffic Congest.

#### **Traffic Congestion: Causes And Solutions Case Study: Hinjewadi, Pune**

The results obtained from these surveys and observations led to the investigation of the causes and solutions to the congestion in this area. Traffic congestion curbs can be refurbished by undertaking several strategies like road widening, providing contra-flow lanes, infrastructural changes, increasing the occupancy factor of vehicles and creating awareness among travellers. Most importantly, Improvement in the Metro-zip services along with public awareness of the adverse effects of low occupancy rate is necessary to mitigate the problem of congestion in Hinjewadi.

#### **Pune Traffic Problems & Control Measures**

The present topic is related with a social problem and provision for prevention of accidents & traffic jams on the roads which are controlled by state government and municipal corporation. Under this, the traffic road signals provision is very critical and important for the authorities. An entire responsibility of implementing these provisions goes to state government and municipal corporation. To study this traffic signal provisions and the avoidance accident rate, a data and material facts have been shown in this research paper. It is a social research for the guidance of the public at traffic signals for “happy journey” to their respective destinations.

### **III.METHODOLOGY OF PROPOSED SURVEY**

#### **Visual Analysis**

Analyzing of traffic data is an important task for urban planners and managers. Traffic data have the spatio-temporal characteristics, which can reflect the variation of the presence of vehicle in different places over time as well as traffic flow dynamics among different places. The analysis of large-scale GPS trajectory data is a very challenging research due to the complexity of data and the need to extract useful information under cover in data.

#### **Traffic Congestion Survey**

To conduct a "Traffic Congestion Survey" with the help of pedestrians and road users, you can follow these steps:

1. Identify the survey location: Choose a specific area or intersection with high traffic congestion where pedestrians and road users can be easily approached.
2. Recruit survey participants: Approach pedestrians and road users in the identified location and ask if they are willing to participate in a brief survey about traffic congestion. Explain the purpose of the survey and assure them that their responses will remain anonymous.
3. Provide instructions: Briefly explain the questionnaire and how to answer each question. Answer any clarifications they may have regarding the survey.
4. Distribute questionnaires: Hand out the printed questionnaires to the participants and provide pens or pencils for them to fill out their responses. If feasible, you can also provide tablets or smartphones with a digital survey form.
5. Monitor and assist: Observe the participants while they complete the questionnaire, offering assistance if they encounter any difficulties or have questions.
6. Collect completed questionnaires: Once participants have finished filling out the survey, collect their completed questionnaires or ensure they submit them electronically if using a digital survey form.
7. Analyze the data: Gather all the collected questionnaires and enter the responses into a spreadsheet or statistical software for analysis. Summarize the data to identify trends and patterns.
8. Draw conclusions and report findings: Analyze the survey results to draw conclusions about the causes and impacts of traffic congestion, as well as potential solutions. Prepare a report summarizing the findings and present them in a clear and concise manner.

#### **Traffic Volume Study**

Traffic data are needed in research, planning, designing and regulation phases of traffic engineering and are also used in establishing priorities and schedules of traffic improvements. The traffic engineer must acquire general knowledge of traffic



volume characteristics in order to measure and understand the magnitude, composition, and time and route distribution of volume for each area under his jurisdiction.

- **Volume/flow:**  
The total number of vehicles that pass over a given point or section of a lane or roadway during a given time interval is called volume. It is the actual number of vehicle observed or predicted to passing a point during a given interval.
- **Rate of flow:**  
The equivalent hourly rate at which vehicles pass over a given point or section of a lane or roadway during a time interval less than 1hr. usually 15 min.
- **Average Daily Traffic (ADT):** The average 24-hr volume at a given location over a defined time period less than one year. The common application is to measure an ADT for each month of the year. Others are: → Planning of highway activities → Measurement of current demand → Evaluation of existing traffic flow

### General Interview with Road Users and Pedestrians

A general interview was also conducted by us with the pedestrians and road users on Warje Chowk.

In this interview, the pedestrians were free to express their thoughts and views on the traffic problems.

This interview coincided with the traffic congestion survey through questionnaire prepared by us.

The response from this interview was helpful for analysis of various problems which lead to traffic congestion, as well as for pin-pointing the main problem. Most complaints were made to, how various vehicle classes disturb the other classes, especially in case of two wheelers causing disturbance to four wheelers and heavy vehicles as well. By communicating with the pedestrians, most felt that the provision of the cycle track was unnecessary.

### Non – Exclusive Motorcycle Lane

According to our survey from the above table we have known that the most of the traffic is of motorcycles. Which are always flowing and is very common in the warje. Most of the citizens also prioritize the use of motorcycle for their daily use of transport or while using the Warje Chowk are travelling through it. Due to the highest traffic at the warje chowk we recommend that there should be an Inclusive Motorcycle lane which will allow the flow of traffic smoothly. By separating the motorcycles and the other vehicles which will allow to flow the traffic smoothly.

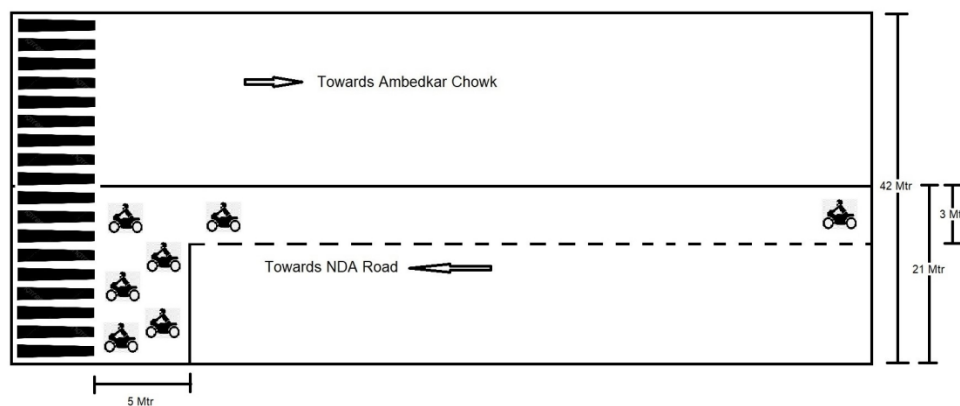


Fig. 57. Line Plan of the Non – Exclusive Motorcycle Lane

The above figure shows the design of the inclusive motorcycle lane on the warje road passing through the warje chowk to the NDA road. The separate lane for the motorcycle will be provided from the Ambedkar chowk. The bike should start segregating from the Ambedkar chowk itself. The motorcycle lane provided is of 3 Mtr. Width in which the two motorcycle according to the IRC norms will be able to ride side by side. At the signal of the warje chowk the motorcycles will be provided another 2 Mtr. Width for stopping behind the zebra crossing so that the motorcycle riders who wants to go to the

right side should be able to cross the lane without disturbing the traffic safely. The other vehicles traffic should be stop by the marking provided behind the signal for the distance of 5 Mtr.

#### IV.CONCLUSION AND FUTURE WORK

As per our studies and research we suggest solution on traffic at Warje chowk that there is need to segregate the motorcycle traffic from main traffic. By considering the current conditions and traffic data and analysis we suggest the implementation of Inclusive motorcycle lane (IMCL). IMCL is method of segregation of motorcycle traffic from main lane traffic which subsequently reduce the traffic at area.

- By implementing the solution of N- EMCL at Warje chowk is effective in point of view of construction and maintenance. N - EMCL will not disturb the main flow of traffic and allow continue flow of vehicles. The movement of main lane traffic will be smooth and flexible and traffic will not face any delay in time. The N - EMCL solution will not required any extra construction at Warje.
- The lane width of 3–4 m was suggested as the comfortable width for N - EMCL, which is approximately equal to the standard lane width (3.5 m) of a single-lane road.
- A motorcyclist's eye height differs from the standard value of eye height (1.2 m) for designing the vertical curves, whereas the response time is not significantly affected by the vehicle category Therefore, it is suggested that a motorcyclist's eye height should be considered in designing vertical curves for N - EMCL, as it affects the length of the vertical curves.

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