Implementation of Intelligent Transport System in Vishrantwadi Chowk-Pune (*Maharashtra*)

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ABSTRACT

In the developing world traffic congestion is the principal challenges faced by every developing city. Smart Transport system (ITS) has been provided the platform to integrate traffic management and also overcome this traffic incident and traffic congestion issue in cites. A wide range of diverse technologies known collectively as Smart Transport System hold to answer many of our transportation problems Traffic incident and congestion take heavy toll on lives, productivity and waste energy, ITS help to move more securely and efficiently. The security of road infrastructure is also enhanced by ITS solution. Traffic management can take security concern into account while seeking the local network wide traffic optimum. Speed measuring camera system and over speed warning sign stimulating the driver to comply with security replications by collecting data of the vehicles. In this document ITS has solution with impact on road security like traffic congestion and traffic incident have been collected and classified of Vishwanath wadi (Maharashtra). This document had given the strategic objectives have been evolved and evaluated according to complex criteria with analytical method This document deals with the study of intelligent transportation system (ITS), and its application in urban management. The methodology used in this study is a practical analytical and descriptive method. The document highlights the conclusions extracted from the studies of different systems and also gives the future scope in the field of ITS to make it more user friendly and accessible.

Keywords: Intelligent Transport System, Management

INTRODUCTION

Intelligent transport system (ITS) is advance technology which help to improve and implementation of new techniques to improve road safety and better traffic management. It is system which will integrate data and technology together to keep the traffic flow go smoothly with the help of electronic computing data and advance communication and sensor system for monitoring traffic. Project will help us to analyse the different traffic survey, data collection and analysis of road traffic in area of intersection and also provided better traffic management solutions in vishrantwadi chowk, Pune.

The primary reason for traffic congestion in India is that the road space and infrastructure have not kept pace with traffic. The gravity of issues is evident in the World Bank report estimating the economic losses due to congestion and inadequate roads alone, which amount to as much as $36 billion annually in India. The direct resolution for this issue through infrastructure improvement is restricted by space availability and other logistical challenges. Hence, there is an immediate necessity to investigate and develop superior traffic management alternatives to alleviate traffic congestion.

This comprehensive overview discusses Intelligent Transportation Systems (ITS) and their potential benefits in optimizing transportation, reducing fuel consumption, and improving energy efficiency. It highlights various technologies and their applications, such as route planning, congestion reduction, and vehicle transmission adjustments. Additionally, it acknowledges the ongoing research in this field to better understand the impacts and benefits of ITS. Overall, it provides a strong foundation for further exploration and development of these technologies.

STUDY AREA

In this study, Proposed study intersection is located on Vishrantwadi Alandi road in Pune city. It is a four-arm junction

with traffic movement on total 8 directions as follows:

METHODOLOGY

A. Gathering traffic data from the intersection offset of the Vishwanath Wadi area (Maharashtra, India).

Figure.1 Vishrantwadi junction

Proposed study intersection is located on Vishrantwadi Alandi road in Pune city. It is a four-arm junction with traffic movement on directions. Queue length survey was done through open sourced data from Google using Google traffic intensity maps. The average queue lengths were identified for morning and evening. The data under consideration for the study was of weekdays i.e., from Monday to Friday.
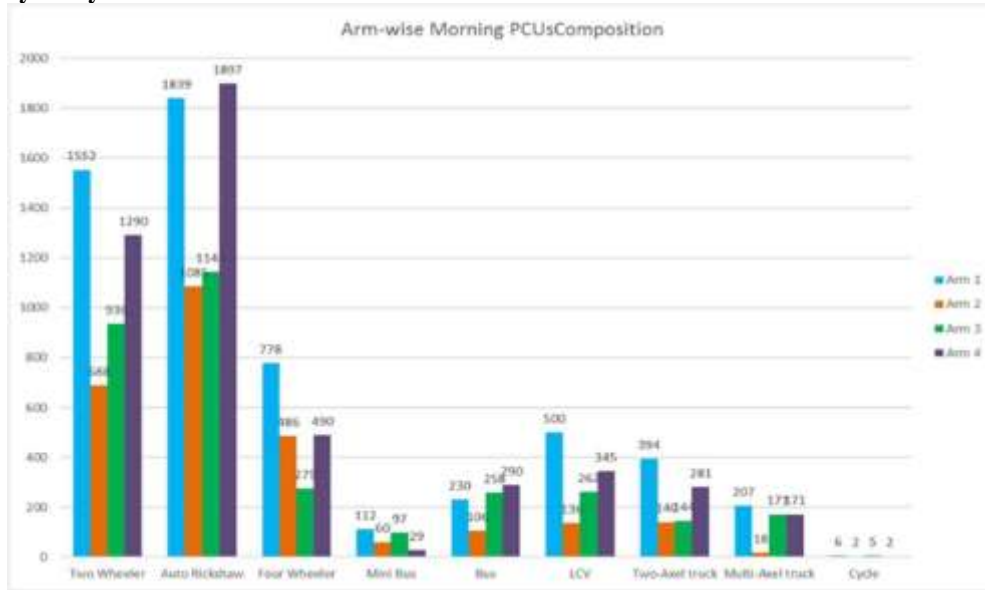
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Figure 2. Morning Queue Length

Figure 3. Evening queue length

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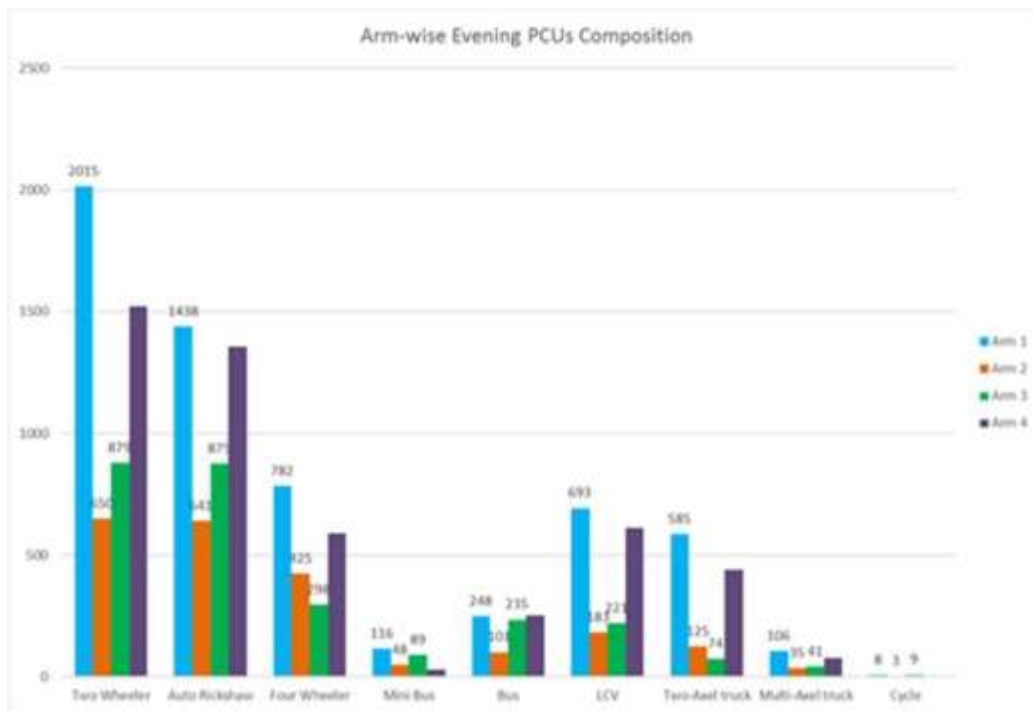**Presented at "ICRETETM-2024", Organized by GSMCOE, Pune, on 22nd - 23rd April 2024**

B. Road capacity analysis traffic volume count

Graph 1. Morning peak hour arm wise modal PCU composition

Graph 2. Evening peak hour arm wise modal PCU composition

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Morning PCUs Composition		Evening PCUs Composition	
Mode	PCUs	Mode	PCUs
Four Wheeler	4466	Four Wheeler	5066
Two Wheeler	5963	Two Wheeler	4308
Auto Rickshaw	2028	Four Wheeler	2095
Mini Bus	298	Mini Bus	282
BUS	883	BUS	837
Two-Axel truck	959	Two-Axel truck	1225
Multi-Axel truck	566	Multi-Axel truck	260
Cycle	16	Cycle	24
Total PCUs	15180	Total PCUs	15804

C. Signal cycle survey

The signal cycle survey was conducted for all the signals in the junction on site. The signal timings for red, amber and green were noted down on site It was observed that the signal timings are not sufficient to clear the queue of traffic that is created after every red signal during peak hours.

D. Identifying the primary issues based on the collected data.

1) Vishrantwadi intersection is one of the busiest intersections with heavy traffic volume count. The intersection is four arm intersection with skewed intersection arm alignment of arms. The Alandi Yerawada route is one of the BRTS corridor.

2) It has been observed that along the intersection commercial activities are happening such as commercial shops Vegetable market, on street vending etc which attract multiple local trips and as Vishrantwadi intersection is one of the important nodes providing connectivity to PCMC & PMC areas.

3) It was observed that due to intersection geometry intersection with existing geometric alignment hard to manage traffic during peak hour where intense efforts required by traffic police to stream line the traffic.

4) Greater queuing observed during peak hour period which causing congestion, delay and pollution.

5) Pedestrians are crossing at grade with high risk as the exiting foot overbridge is underutilised where elevators are not functional. The pedestrians find more convenient to cross at grade as no physical barriers installed at site such as railings etc.

6) Unauthorised on street parking causing greater congestion due to reducing in carriage way space by single and sometime double lane parallel parking.

7) Traffic congestion can increase the chances of road accidents.

8) The ambulances face Problem while travelling.

E. Selecting appropriate techniques to address the main challenges of the region using traffic control system methods.

• Traffic Management and Control
• Traffic Information Systems
• Advanced Traveller Information Systems (ATIS)
• Public Transportation Management
• Parking Management Systems

• Adaptive Traffic Signal Control
• Variable Message Signs (VMS)
• Traffic Incident Management
• Dynamic Route Guidance Systems

F. Offering optimal recommendations to resolve the challenges encountered by the of the Vishwanath Wadi region through the proposed intelligent transport system

1) It is required to improve traffic management of intersection.
2) Removing of encroachment is very important physical and temporary as well. The on-street parking and to be strictly banned with help of traffic police and parking arrangements to be made for hawking area.
3) ATIS provides travellers with personalized route guidance and travel advisories based on their specific destinations and preferences.
4) These systems use real-time traffic data to recommend the most efficient routes to drivers.
5) ITS facilitates quick detection and response to traffic incidents such as accidents or breakdowns. 6) VMS display real-time traffic information, including congestion warnings, lane closures, and alternative route suggestions. 7) Adaptive signal control systems continuously monitor traffic flow and adjust signal.
8) It can provide real-time information on parking availability in areas, helping drivers find parking spaces more efficiently and reducing traffic congestion caused by vehicles searching for parking.

STUDY PROCESSES

• Clarification of study goals and scope.
• Examination of existing literature.
• Analysis of ITS components.
• Field inspection and data gathering
• Data interpretation.
• Recommendations for ameliorating traffic issues.
• Deliberation on findings.
• Conclusion and suggestions

SCOPE OF STUDY

This investigation aids in examining and seeking to comprehend the issue of traffic congestions in urban mobility through a survey. To conduct the analysis, vital traffic data was gathered from Vishwanath Wadi This locality features a junction, leading to persistent traffic congestion during peak and off-peak hours. Intelligent Transportation Systems (ITS) assist in alleviating congestion at intersections and enhancing traffic management.

PRACTICAL IMPLICATION

The study aims to have favourable implications on the region:
☐ The outcome facilitates to enhance the present state of traffic flow and it also guarantees the safety of the traffic users. ☐ It is indisputable that implementing an ITS system in our study area would be highly prudent decisions as it will assist in reducing the congestion in pune area and also will advantage the town here with smoother traffic flow. ☐ Enhancing the traffic condition ensures greater safety for people.
☐ A green corridor is a special route cleared out for an ambulance that facilitates restored organs meant for transplant or to transfer an unwell patient to succeed in the destined hospital, airport or any destination.

CONCLUSION

This chapter presents the thesis, encompassing the introduction and background, definition of ITS (Intelligent Transportation Systems), significance of ITS, study necessity, study objectives, methodology, study progression, study extent, practical ramifications, and thesis overview.

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