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# APPLICATIONS AND SUGGESTION OF ADVANCED TRAFFIC MANAGEMENT SYSTEM (ATMS) FOR REDUCING CONGESTION ON ROADS

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**Abstract:** The Advanced Traffic Management System (ATMS) field is a primary subfield within the Intelligent Transportation System (ITS) domain. The ATMS view is a top-down management perspective that integrates technology primarily to improve the flow of vehicle traffic and improve safety. Real-time traffic data from cameras, speed sensors, etc. flows into a Transportation Management Centre(TMC) where it is integrated and processed and may result in actions taken with the goal of improving traffic flow.

**Keywords:** ITS (Intelligent Transport System), ATMS (Advanced Traffic Management System), TMC (Transportation Management Centre)

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## INTRODUCTION

Due to the ever-increasing traffic demand, modern societies with well-planned road management systems, and sufficient infrastructures for transportation still face the problem of traffic congestion. This results in loss of travel time, and huge societal and economic costs. Constructing new roads could be one of the solutions for handling the traffic congestion problem, but it is often less feasible due to political and environmental concerns. An alternative would be to make more efficient use of the existing infrastructure. The goal of an Advanced Traffic Management System (ATMS) is to efficiently manage existing transportation resources in response to dynamic traffic conditions. An advanced traffic management system must incorporate all modes of transportation if it is to provide an effective management solution. Increasing traffic congestion coupled with improved.

The objectives of ATMS are to increase capacity and operational efficiency, increase productivity of commercial vehicle, improve safety, increase traveller control and convenience, improve public transportation services and operations, improve cooperation amongst transportation operators, reduce environmental and energy impacts.

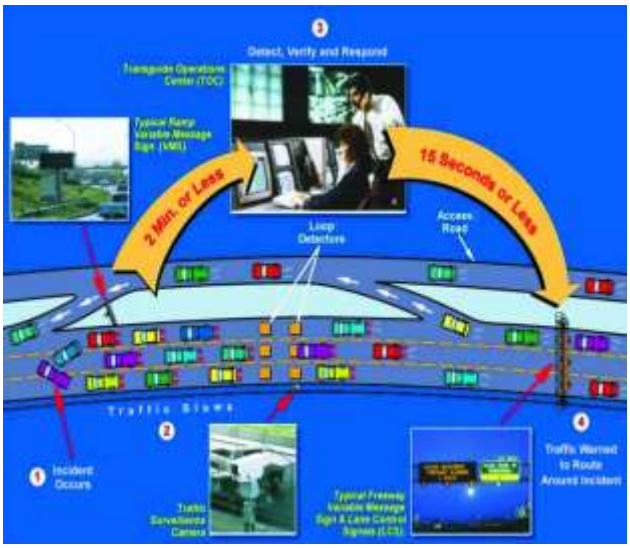


**Fig. Control system of ATMS**

**STUDY AREA**

Study area is an area or route which taken for the survey and study. We had choosen the path which is from ((IRB) Toll Plaza to Badnera station square.) route, we had studied about the traffic, traffic volume , density of traffic ,congestion problem, collision. There are number of intersections has been provided throughout the path and flyovers are also provided to distribute the traffic. But although people have to face numbers of problems due to congestion of traffic on road. According our survey we had realized that traffic or congestion problem are different at different intersections like on our study path for e.g., panchvati to Irvin and Irvin to rajkamal there is a major difference in traffic in between this two intersections.

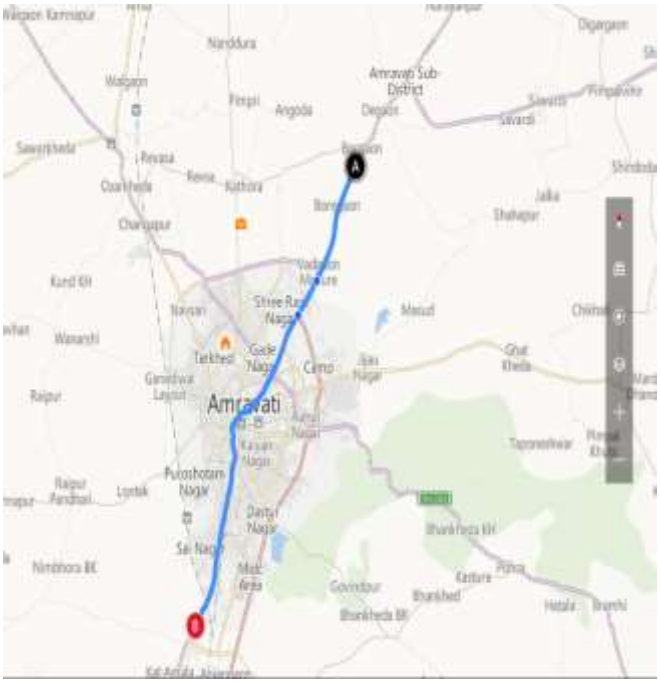


**Fig. Study route (IRB toll plaza to Badnera station square)**

**II. LITERATURE REVIEW**

"Reference [1]", Presented a comprehensive study of all available ITS systems, including both research prototypes and deployed systems and also pose a set of interesting open research problems in the context of Indian ITS. They make a comprehensive list of ITS literature, to give an overview of all existing techniques. Also follow it up with a set of open research questions in the context of Indian roads and traffic. Finally, they list a set of public and private sector

organizations and academic institutions, which are active in research or application in this field, as meaningful collaborations and technology transfer should happen if research has to make any practical impact. Also suggested the number of sensors and applications of ITS for Indian cities.

"Reference [2]", In this literature different control methodologies have been presented for controlling and managing a traffic network in which vehicles are driven by humans. They presented a survey of traffic control frameworks for IVHS that integrate the intelligence of both the roadside infrastructure and the IVHS to improve the traffic performance and to discuss the potential application of control design methods that are currently used for traffic control purposes to IVHS-based traffic management and control systems. They presented existing IVHS frameworks that combine roadside infrastructure and vehicles for efficient traffic management, and provide a comparative analysis of these frameworks also briefly sketches how the currently used control design methods presented and could potentially be applied in these IV-based traffic control frameworks.

## III. DATA COLLECTION

**1) Traffic volume studies** are conducted to determine the number, movements, and classifications of roadway vehicles at a given location. These data can help identify critical flow time periods, determine the influence of large vehicles or pedestrians on vehicular traffic flow, or document traffic volume trends. The length of the sampling period depends on the type of count being taken and the intended use of the data recorded. For example, an intersection count may be conducted during the peak flow period. If so, manual count with 15-minute intervals could be used to obtain the Turning Movement Count.

**2) Spot Speed** - Speed is an important transportation consideration because it relates to safety, time, comfort convenience, and economics. Spot speed studies are used to determine the speed distribution of a traffic stream at a specific location. The data gathered in spot speed studies are used to determine vehicle speed percentiles, which are useful in making many speed-related decisions for speed at a signalized intersection a sample size of at least 50 Preferably 100 vehicles is obtained.

**3) Road Geometries-** The width of a traffic lane governs the safety and convenience of traffic and has a profound effluence on the capacity of road generally a width of 3-4 meter is adopted for each traffic lane. In India, single lane pavements are generally 3.75M wide where two lane pavements (without raised curbs) are 7 M wide.

**4) Road side interview –** It is an economic method of survey and yields accurate and reliable data. Road side interview survey can be done either by directly interviewing drivers of the vehicles at selected survey points or by issuing prepaid post card containing the questionnaire to all or a sample of the driver. For the dual carriageway of roads with very little traffic the traffic in both the directions is dealt with simultaneously.

## IV. APPLICATIONS OF ATMS

1) Central Control Room

• Ability to not only monitor but also track the lifecycle of the product

• Brings about the standard operating procedure(SOP) for any incident by triggering all the support systems and tracking their outcome

• Provides real time predicted traffic analysis to the road users based on an incident

2) Variable Message Sign (VMS)

• The speed limit, and traffic flow or congestions

• Diversions, road closures, or alternative routes

• Hazardous situations, work ahead, in-coming traffic situation

• The weather condition, the date, time, temperature

• Availability of public transport

3) Automatic Traffic Counter and Classifier (ATCC)

ATCC detects, counts and classifies all traffic passing where it is installed. It measures the speed of vehicles and sends a report at interval time periods. Both the ATCC and LPR (License Plate Recognition) Systems can function simultaneously for the implementation or charging roadside levy or for monitoring highway occurrences.

4) Speed Enforcement

Speed Enforcement cameras with video analytics and radars are used to accurately determine the speed of the over speeding vehicle along with the number plate for the same.

## V. RESULT AND SUGGESTIONS

Traffic count:

On the basis of data collections at the various locations throughout the study route ( IRB toll plaza to Badnera station square)

There are mainly four major intersections with highest traffic volume and peak hour factor( PHF) are as follows. :

| Intersections | Traffic volume | PHF |
|---|---|---|
| 1) Panchvati | 2116.60veh/hr. | 0.98 |
| 2) Irvin | 2249.89veh/hr. | 0.94 |
| 3) Rajkamnal | 3283.94veh/hr. | 0.92 |
| 4) Rajapeth | 3504.60veh/hr. | 0.99 |

Spot speed observations are :-

**Formula -:**

Spot Speed =Distance/time

Spot speed at Panchvati intersection ranges from 18km/hr to 58km/hr.

Spot speed at Irwin intersection ranges from 16km/hr to 54km/hr.

Spot speed at Rajkamal intersection ranges from 10km/hr to 41km/hr.

Spot speed at Rajapeth intersection ranges from 21km/hr to 42km/hr.

**ATMS Suggestions:**

1)Speed enforcement

2) Automatic Traffic Counter and Classifier (ATCC)

Road Geometries and Road Side Interviews :

Carriage way width and total road way width are measured throughout the study route. There are mainly two lanes provided having different lane widths due to which the congestion problems are occurred at the peak hour. Also the road side interviews are taken about 100

people and their problems are taken into account. To minimize congestion and to allow the traffic to move with the design speed some ATMS applications are suggested such as:

1) Close Circuit TV (CCTV)

2) Cooperative Systems like Mobile Apps

3) Speed Enforcement

**CONCLUSION:**

In this paper various traffic problems are observed throughout the study area and ATMS suggestions are given which are will be effective for the growing needs of traffic and to reduce the congestion s and collision on roads.

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