

TRAFFIC CONGESTION- CAUSES AND SOLUTION: A STUDY OF AHMEDABAD CITY

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Abstract : Ahmedabad is the largest and smart city of Gujarat state. The population of Ahmedabad city is estimated as 8.412 million (2018). High growth in number of vehicles has increased congestion on the road network and worsened air population in this city. There is a lack of parking space and road jam encroachment on road. To solve this problems we should take a step for road capacity expansion, improved road Infrastructure, restricting routes for auto rickshaw, financial penalty to the traffic law brokers and application of fly over most importantly, proper traffic management system along with appropriate implementation of traffic rules is necessary to mitigate the problem of traffic congestion.

IndexTerms - Smart city, Population growth, Traffic congestion, Mitigation.

I. INTRODUCTION

1.1 General

Ahmedabad city is one of the most important business centers in the western part of India. It also has well connected bus based public transport such as Bus Rapid Transit (BRT) system and city bus service. Metro rail is also under implementation in this city. The number of vehicles on roads is increasing in Ahmedabad. There were 2.38 million registered vehicles in the city in 2009-10. But now it has increased to 3.66 million (2016). As it contains the business centers, so it attracts the people for employment. Population is increasing day by day with that number of vehicles is also increasing. In this paper we have discussed about the possible solutions for traffic congestion and parking facility in Ahmedabad.

II. LITERATURE REVIEW

2.1 Sougata Maji et. al. November 2017 In this paper the first factor under taken was to describe the factor of causation of congestion of city road and after that presented some recommended measures like rationalize the design of road, implementation of the regulation for road uses.

The advantage of the paper is the recommended solutions is supportable by financial condition, less harassment to common people, safety from accident, reducing trip delay, and welfare for city environment.

2.2 Shekhar K. Rahane, U.R. Saharkar et. al. October 2014 Main focus in this paper to found out the urban traffic congestion. There is a possibility of accidents due to poor traffic management system. In this paper traffic congestion problem in talegaon Dabhade, Tal- Maval. Dist-Pune is indentified and studied for finding out the causes and proposed solution for it.

This paper concludes that the main reason of congestion is on-street parking. Traffic congestion constraints can be ameliorated by embarking on various strategies such as road capacity expansion, improved road infrastructures, restricting routes for rickshaw and application for fly over etc.

2.3 Md Aftabuzzaman In this study found out the measurement of traffic congestion. Many measures have developed to represent the magnitude of traffic congestion on roadways in urban areas.

This research found that the primary objective of this paper is to propose a framework for developing a measure of public transport congestion relief. In this paper, it is suggested that none of the measures of traffic congestion provides information on how much traffic congestion is relieved by public transport.

2.4 D.K. Choudhury, Siddharth Gupta. May 2015 According to the studies, the present traffic congestion problem in different main roads of Delhi, and to offer possible solutions to resolve the issue of traffic congestion, and also find out the different safety measures undertaken by Delhi traffic police to ensure the safe flow of traffic in Delhi.

III. DEFINITION, IMPACTION AND CAUSATION OF CONGESTION

3.1 Definition of congestion

Traffic congestion occurs when vehicle travel at slower speeds because there are more vehicles than the road can handle. This makes travel time longer, slower speed and increase vehicular queuing which is also known as traffic jam.



Figure 3.1 Congestion in Kalupur area of Ahmedabad city

3.2 Impaction of congestion

Motorists and passengers waste time ("cost of opportunity"). Congestion reduces regional economic health as a non-productive activity for most people. Delays that can lead to late arrival for work, meetings and education, leading to lost business, disciplinary action or other personal losses. Inability to accurately forecast travel time, which means that drivers allocate more time to travel "just in case" and less time for productive activities. As a result of increased idling, acceleration and braking, waste fuel increases air pollution and carbon dioxide emissions.

Wear and tear on vehicles due to traffic idling and frequent acceleration and braking, which leads to more frequent repairs and replacements. Stressed and frustrated drivers, encouraging road rage and reducing drivers' health. Emergencies: Blocked traffic can interfere with the passage of emergency vehicles to their destinations where they are needed urgently. The effect of spill over from congested main arteries to secondary roads and side streets is attempted as alternative routes ("rat running"), which can affect neighbourhood amenities and real estate prices. That's right. Higher probability of collisions due to tight spacing and constant stop - and - go.

3.3 Causation of Congestion

3.3.1 Narrow Roads :- Some old streets of Ahmedabad city are not that wide spread, due to illegal possession on the road they are getting narrow and becoming a reason behind traffic jam. So there is a possibility to expand the roads to reduce the traffic jam. Moreover this will be less expensive and less time consuming due to land acquisition won't be required in this.

3.3.2 Illegal Parking :- It is the main reason behind the traffic congestion on different areas of Ahmedabad. For example, in Kalupur railway station, Bheed bhanjan in Bapunagar, Lal Darwaja market, Meena Bazar Ratna Sagar circle etc mostly people parked their vehicles on road.

3.3.3 Increment of population :- As already discussed that the population of Ahmedabad is increasing at fast pace which is a bad indicator of traffic management. Ahmedabad is a business hub and lots of employers are employed with this business hubs.

3.3.4 Improper planning of the city development: - Ahmedabad city is very old city. There is no planning is done in development of the city which is not proper. Most of the time, it is seen that some illegally ceased roadside land, but due to improper development plan these kinds of movement are going in vain.

3.3.5 Improper lane management: - Lane management is very important for the management of traffic in Ahmedabad city. Many types of vehicles try to overtake the vehicles even in the single undivided road. This is the main reason that the city roads are unequipped with the lane dividers which divide the lane into incoming and outgoing traffic.

3.3.6 Moving cattles :- Sometimes moving cattle is a big reason for traffic congestion. Many a time they become the reason for road accident and cause of death and injury.

IV. SOLUTIONS OF TRAFFIC JAM

- 4.1 Strict lane management:** - Different lanes for different types of vehicles should be marked on the roads and law i.e. financial penalty should be imposed to make the drivers maintain the lane discipline.
- 4.2 Restricting routes for Rickshaw:-** Rickshaw should not be allowed in all the routes of the city. R.T.O should take some responsibility to control the increasing number of rickshaws by imposing registration fee and legal documentation.
- 4.3 Financial penalty to the traffic law breakers:** - Government can take such a strict step as to impose financial penalties on drivers who disobey the law. They should be made to dissuade drivers from certain habits caused by Congestion, such as mistaken overtaking, driving one way. Mobile court should be introduced to fine truck drivers for disobedience to traffic law and unfit truck driving. This type of law involvement can mitigate traffic jam in short run, but in long run all the people should be involved to create awareness and responsible to the society. Otherwise traffic jam solution is impossible.
- 4.4 Supply and Demand:-** Congestion can be reduced either by increasing road capacity (supply) or by reducing traffic (demand), which shows that road capacity can be increased in a number of ways, such as increasing capacity over the entire route or at bottlenecks, creating new routes and improving traffic management. Demand reduction may include parking restrictions, parking and ride, pricing of congestion, road space rationing, incentives to use public transport and introduction of e-education, e-shopping and home based working options will reduce the number of people traveling.
- 4.5 Road widening:** - Road widening have been undertaken. However some research indicates that road widening provides only slight reductions in urban traffic congestion.

V. PROBLEM AND SOLUTION AS PER AREA OF CITY

- 5.1 Kalupur Fruit market (market nearby railway station):** Fruit vendors and shopkeepers keep their goods and goods in front of their shops, which cover the maximum part of the roads and leave less room for driving vehicles, which leads to increased parking problems such as parking space shortages and traffic jams.

Solution: All fruit vendors should be transferred to the new fruit market where they can easily sell out their fruits without disturbing traffic flow and impound the traffic intruders.

- 5.2 Lal Darwaza super market:** In this market all types things is available at cheap rate. There is a problem of parking. Many of the vehicles are parked in front of the shops and because of these unplanned parking, delays occurs.

Solution: To solve this problem, a systematic parking space is required which is available at the starting of the market.

- 5.3 Bheed bhanjan cloth market:** Almost shopkeepers occupy one lane to keep their vendors and items. The private vehicles and public buses use the other one lane left for them to travel. Roads become narrow for the road users.

Solution: Shift this cloth market to a new place and develop the parking lot for the shopkeepers and consumers.

- 5.4 Income tax ashram road:** Highly business hub and educational institutes are present over there. The employers those are employed in these business hub, they park their vehicles in front of the buildings in which they are working. Students park their vehicles near the institutions.

Solution: Parking space must be provided in these business hubs, so they won't occupy the road lane. Students must park their vehicles in the parking area provided by the institutions.

- 5.5 Bapunagar under bridge market:** It is the core area of Ahmedabad city or it can be said that it is the place where you can find all branded show rooms.

Solution: In this area under ground or basement parking can be provided. It can solve the problem of traffic flow and delays.

VI. CONCLUSION

Traffic congestion is both a global problem and a local one. The main cause of traffic congestion throughout the world is street parking. Traffic congestion in Ahmedabad is now a common problem like Mumbai, Delhi. For the reduction of traffic jams, different infrastructural and management projects are granted. However, this type of policy has not yet been addressed in Ahmedabad.

Restrictions on traffic congestion can be improved by embarking on various strategies such as expansion of road capacity, improved road infrastructure, restriction of routes for Rickshaw, financial penalties for traffic breakers and the application of Fly over. Most importantly, it is necessary to mitigate proper traffic management and appropriate implementation of traffic rules to reduce the problems of traffic congestion in smart city Ahmedabad.

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REFERENCES

JOURNALS

- [1] Sougata Maji November 2017, Traffic Congestion And Possible Solutions- a case study of Alanson, published in Journal of Research in Humanities and Social Science . ISSN: 2321-9467
- [2] Shekhar K. Rahane, Prof. U.R. Sahekar October 2014, Traffic congestion- Causes and solutions: A study of Talegaon Dabhade city published in Journal of Information, Knowledge and Research in civil engineering. ISSN: 0975-6744
- [3] Md Aftabuzzaman, Measuring Traffic Congestion- A Critical Review published in 30th Australasian Transport Research Forum
- [4] D.K. Choudhury, Siddharth Gupta. May 2015, An In-Depth Study of Traffic Congestion Detection and Management in Delhi published in Prabandhan: Indian Journal of Management

BOOKS

- [1] Kadyali, L. R. and Lal, N. B. 2007, Traffic Engineering and Transport Planning, Khanna Publishers, New Delhi-110006
- [2] S. K. Khanna, C. E. G. Justo, A. Veeraragavan, Highway Engineering, Nem Chand & Bros., Roorkee 247667, India, ISBN 978-81-85240-80-0