Solving Traffic Congestion and Urban Transportation Systems with Special Reference to Madhya Pradesh

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Abstract **- Traffic congestion is among the most vexing city issues and also calls for many elements which cannot be dealt with without an alternative approach. Congestion cannot be directly tackled at the price of a city's quality of life. Traffic in a metropolitan community will become congested the moment there is a crucial number of vehicles of the network. In order to enhance traffic operations, build new congestion mitigation techniques, and lessen damaging site traffic externalities, understanding the standard laws governing the network's crucial selection of cars as well as the network's traffic capability is actually essential. As conveyance networks are actually the lifeline of the cities of ours, the findings of ours have profound implications regarding how to create as well as operate our cities a bit more efficiently.**

Index Terms **- Traffic, Congestion, Techniques, Roads.**

I.INTRODUCTION

Congestion is primarily induced by the heavy usage of autos, which in recent decades are commonly held in Madhya Pradesh. Private cars have benefits in terms of improving personal mobility, providing a sense of protection and even higher status, especially in developed countries. The results of limited traffic facilities including lane, parking area, road signals and efficient traffic control can be seen as an inevitable consequence of congestion. Urban pollution impacts air travel and freight traffic using the same facilities. The intensive usage of road facilities is therefore beyond its capability as the product of traffic congestion within road networks. Traffic jamming is marked by slower rates, longer drive times and prolonged queuing of cars. A congestion of the traffic happens where the traffic level is greater than the road space. This is widely regarded as excess. The situation of congestion is created by reducing the traffic ability at or over a certain period at a certain point or by raising the number of vehicles needed to transport people and goods. The fast economic development has contributed to significant growth of the amount of motor vehicles overwhelming transport infrastructure in different economies. In metropolitan centers, pollution is mostly attributed to movement trends and little to lorry movement. Parking is another aspect that adds to pollution. Road parking uses up a huge amount of room for travel. Therefore, the need for urban space has evolved to a land problem that creates congestion in towns. Strong urban mobility often adds to the threat of pollution. The massive usage of cars not only affects road pollution, but also contributes to a reduction in the quality of public transport. In reality, the metropolitan population's over-dependence on vehicles has raised the transport infrastructure demand immensely, although an improvement in transport infrastructure availability cannot increase over a limited period of time, in line with the rise in mobility needs. As a consequence, many cars invest much of the day in transit, resulting in obstruction in traffic.

Traffic congestion may lead to the following issues:

- Road rage: Road rage is a senseless reaction to traffic that is common in congested traffic areas. “If someone is not driving as fast as the person behind him thinks he should, or someone cuts in front of someone else it can lead to an incident that is dangerous to the offender and those around him on the road.
- Delays: During the morning commute there is an additional stress because delays caused by traffic can make people late for work or other places. Then, at the end of the day, the afternoon rush hour is again frustrating because the workday is done, and people want to go home to relax, and traffic is preventing it.

II. APPROACHES FOR TACKLE CONGESTION

The most logical solution is to combat congestion by means of transport supply steps, that is to say, by growing the availability and efficiency of transport infrastructures, automobiles and their management. The existing urban road networks have several deficiencies which have to be rectified: the construction of crossings needs to be changed, the paths have to be made properly and signs have to be marked and traffic lights have to be updated for instance. The traffic movement in the major avenues will be even likely during peak hours. These steps will considerably reduce congestion and typically cost little, as information about traffic engineering is the key prerequisite.

A traffic lights device operating from a central machine will achieve massive savings. In the view of several communities, the very high costs of the scheme may render it advisable to initiate the program in many phases only in some areas of the region, starting with the incremental replacement of newer, outdated traffic lights adjusting to the required technologies. The machine will explain its virtues and win citizen interest for its greater usage in the fields of heavy traffic where required and practicable within the framework of a harmonious mode of urban planning that allows for sufficient spaces for pedestrian and retains architectural patrimony, the construction of new highways or the expansion of established ones should not be stopped. However, it is important to bear in mind that constructing more and more bridges, underpass and roads and urban expressways may be inefficient in the medium to long term and can, as we sadly witnessed in some cities implementing that approach, potentially worsen much more congestion.

III. METHODOLOGY ADOPTED

Research Method

After selecting the respondents, we do the survey of highly congested roads of major metropolitan cities of Madhya Pradesh (Bhopal, Indore, Ujjain, Sagar and Jabalpur) and select the major intersections of roads and further analysis is done on the effect of Road Geometrics on the commuters.

Sources of Data

The objective of the study has been verified with the use of primary as well as secondary data. The secondary data required for the study have been collected from various published works such as books, reports, journal articles, periodicals, and electronic web materials.

Sample Description

For the purpose of this study 25 respondents were selected from the study area.

IV. ANALYSIS OF DATA

Traffic Congestion on Daily Journey Faced by Respondents

Table below shows the problem of traffic congestion in daily journey of the respondents between residence and destination.

Table 1: Traffic congestion problem in daily journey of the respondents between residence and destination

Traffic Congestion	Automobiles Owned			Total
	Two-Wheeler	Four-Wheeler	Both	
Yes	(36.1)	(3.1)	(60.8)	(100.0)
	[92.9]	[100.0]	[92.1]	[92.6]
No	(34.6)	(0.0)	(65.4)	(100.0)
	[7.1]	[0.0]	[7.9]	[7.4]
	126	10	214	350
Total	(36.0)	(2.9)	(61.1)	(100.0)
	[100.0]	[100.0]	[100.0]	[100.0]

Note: Figures in the brackets indicate column percentage

Figures in the parenthesis indicate row percentage

It is found that 92.6 percent of the automobile users face traffic congestion in their daily journey between residence and destination whereas 7.4 percent automobile users do not experience traffic congestion problem. Among the different types of Two-wheeler users, all the four-wheeler users (100 percent) face the problem of traffic congestion. Though it is very difficult to make a distinction among the Two-wheeler users with regard to traffic congestion, one thing is clear that nine out of every ten Two-wheeler users face the traffic congestion problem every day in their journey between residence and destination.

Extent of Traffic Congestion Problem

The extent of the traffic congestion problem according to the different types of automobile users is shown in Table.

Table 2: Traffic congestion problem in daily journey between residence and destination

Traffic Congestion	Automobiles Owned			Total
	Two-Wheeler	Four-Wheeler	Both	
Very High	(32.7)	(4.2)	(63.1)	(100.0)
	[43.7]	[70.0]	[49.5]	[48.0]
High	(39.7)	(1.9)	(58.3)	(100.0)
	[49.2]	[30.0]	[42.5]	[44.6]
Normal	(33.3)	(0.0)	(66.7)	(100.0)
	[4.8]	[0.0]	[5.6]	[5.1]
Less	(33.3)	(0.0)	(66.7)	(100.0)
	[1.6]	[0.0]	[1.9]	[1.7]
Very Less	(50.0)	(0.0)	50.0)	(100.0)
	[0.8]	[0.0]	[0.5]	[0.6]
Total	(36.0)	(2.9)	(61.1)	(100.0)
	[100.0]	[100.0]	[100.0]	[100.0]

Note: Figures in the brackets indicate column percentage

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The scale of traffic congestion between very high and very low indicates that 48.0 percent of the automobile users face traffic congestion in the category of very high. The next highest representation of 44.6 percent is in the category of high. The other scales in the order of normal, less and very less are in 5.1, 1.7 and 0.6 percentages respectively. Four-wheeler users are found more in the very high rating of (70.0 percent) as compared to both two-wheeler and four-wheeler users and two- wheeler users having the representation of 49.5 and 43.7 percentages respectively. Four-wheelers users and both four- wheeler and two-wheeler users have the maximum share in the highest rating scale of very high while the two-wheelers are found maximum (49.2 percent) in the rating scale of high.

V. CONCLUSION

This particular analysis outlines the various procedures utilized to relieve traffic congestion of cities ranging from improved traffic capability via the provision of public transport and additional roads, to control of visitors need via congestion fees as well as restrictions on car license plates, as well as to indirect command through the integration of land use and transport. It discovers that relieving congestion necessitates reducing the need for vehicular transport and encouraging active transportation modes by getting the traveling origins as well as destination closer to one another via integrating land use as well as transport preparation. The root cause of congestion lies in the inability of the transport phone system to deal with the ever-increasing motor-driven traveling demand produced from inefficient land use patterns which segregate uses and lengthen traveling distances.

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