

OPTIMIZATION OF TRAFFIC RELATED TO URBAN TRAFFIC CONGESTION

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Abstract: The main focus of this study is aimed at understanding the recurring urban congestion, its measurement and mitigation. Literature review on this problem reveals some interesting insights. One of the important outcome was that there is no single, broadly accepted definition of traffic congestion. Traffic congestion can generally be defined as excess of demand for road travel. Many professionals and organizations have defined congestion in different ways based on variety of criteria. There have been attempts to develop congestion measurement indices for heavily motorized countries. In less motorized countries, there are not many documented studies on how to measure congestion and plan for its mitigation. Identification of traffic congestion threshold is an essential requirement for defining the congestion and suggesting appropriate mitigation measures.

Keywords- Traffic, Traffic Congestion, Urban, Impact, Optimization.

1. INTRODUCTION

Traffic congestion has been one of the major issues that most cities are facing now, even though Proper measures are being taken in order to mitigate and reduce its impact. In the recent years, traffic congestion is becoming one of the main challenge for engineers, which is a problem for pedestrians and other road users. There are many reasons behind this scenario. One of the main reason is the existence of structures along the main roads of the city and other illegal possession of shops on footpaths, who attract a huge amount of visitors and they form a long queue in search of parking their vehicle. Rapid growth in vehicle ownership, being the other reason states congestion as an inescapable reality of urban life. The growing impact of congestion is seen in terms of deteriorating urban air quality, increase in travel time & other adverse effects on quality of urban living.

2. LITERATURE REVIEW

2.1 International Status:

The study named "A Traffic Congestion Assessment Method for Urban Road Networks Based on Speed Performance Index" in Beijing aimed to analyze traffic congestion in urban road networks. The speed performance index was adopted to evaluate the existing road network conditions of congestion, then road segment and network congestion indexes were introduced to respectively measure the congestion levels of urban road segment and network. This study also carried out a traffic congestion analysis for Beijing expressway network, based on the speed performance data collected from January 1 to November 1, 2012, by Beijing Traffic Management Bureau (BTMB).

The foreign countries are making use of software tools for analysis of traffic. For example, Transportation Institute at 'University of Florida' has developed its own software named 'Highway Capacity Software'. There are many more tools like Signalized and Unsignalised Intersection Design and Research Aid (SIDRA) is an intersection-based program developed by ARRB Transport Research, Ltd., in Australia as an aid for capacity, timing and performance analysis of isolated intersections.

2.2 National Status:

There has been rapid urbanization in the cities of India which has led to an increase in demand for mobility. Public transport has not been able to satisfy the transportation needs of the population leading to rise in vehicle ownership. The huge numbers of private vehicles, heterogeneous traffic and limited road space have led to the problem of congestion on the Indian city roads. Kolkata has a high population density. The road space in Kolkata is only 6 per cent compared to Delhi and Mumbai, which have greater road space. High demand for mobility coupled with low road space leads to high congestion on the roads of Kolkata.

3. RESEARCH METHODOLOGY

3.1 Literature Review:

Many optimization techniques have been used in the past to reduce the traffic congestion. A review of all these techniques is necessary. Literature review helps in understanding the developments in the proposed area and finding gaps so as to carry further research.

3.2 Traffic Volume Study and Survey of Identified Locations:

The study of methods available for traffic survey will be carried out. This will help to select the appropriate method of analysis and also will help in understanding the parameters affecting the analysis.

3.3 Analysis & Suggestion of Mitigation Strategies:

After identifying the root cause of traffic congestion, the analysis of traffic will be carried out with the help of any one software tool like HCS, SIDRA, and SOAP etc. so as to suggest a proper mitigation strategy, which will help in reducing the traffic congestion.

3.4 Results & Discussions:

The basic aim of the study is to provide an efficient, flexible and Un-interrupted traffic flow for the road users, which will not only reduce the total travel time but also reduce the noise pollution to some extent.

4. CONCLUSION

Traffic congestion is a condition on transport networks that occurs as use increases, and is characterized by slower speeds, longer trip times, and increased vehicular queueing. When traffic demand is great enough that the interaction between vehicles slows the speed of the traffic stream, this results in some congestion. When vehicles are fully stopped for periods of time, this is known as a traffic jam or traffic snarl-up. Traffic congestion can lead to drivers becoming frustrated and engaging in road rage. Mathematically, congestion is usually looked at as the number of vehicles that pass through a point in a window of time, or a flow. Currently, there are number of software's used to analyze the traffic around the world. This proposal is an approach to redesign the existing signals by making use of the software tools.

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