International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 07 Issue: 02 | Feb 2020 www.irjet.net p-ISSN: 2395-0072

Review Paper on Study on Traffic Congestion in National Highways

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Abstract - In today climatic changes, lack of stable ground for development of infrastructures is very common. In fact of this, construction of buildings on unsuitable ground is unavoidable and making a suitable ground before constructions is real difficult issue for Geotechnical Engineers. To overcome the difficulties experienced with problematic soil in geotechnical applications on one side and safe disposal of solid wastes on the other side, an attempt is made in this investigation to explore the possibilities of utilizing wastes to improve the engineering behavior of problematic soil. In this, in this present investigation the type of waste namely Rice Husk Ash for stabilization is selected to study the effects of same on the properties of problematic soil.

Key Words: Rice husk, Alluvial soil, clayey soil

1. INTRODUCTION

Road became important means of transportation during the reign of Roman Empire. At that time man, animal, chariot was used as major carrier in road transportation. But the invention of the motor vehicle meant that roads were no longer meant for pedestrian, chariot and animal. This lead to the construction and improvements of roads.

Cities and traffic have developed hand-in-hand since the earliest large human settlements. Rapid industrialization and the consequent urbanization is taking place since last few decades in all over the world, India is no exception. Transport demand in most Indian cities has increased substantially due to increase in population as a result of both natural and migration from rural areas and small towns. Availability of motorized transport has also increased. But the demand and the construction of new highway capacity to accommodate this growth has not kept pace leading to congestion. There is no single, broadly accepted definition of traffic congestion. One of the principal reasons for this lack of consensus is that congestion is both:

I. A physical phenomenon relating to the manner in which vehicles impede each other's progression as demand for limited road space approaches full capacity.
II. A relative phenomenon relating to user expectations *vis-□-vis* road system performance.

Both operational and user perspectives are important in understanding congestion and its impacts. 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 queuing. When traffic demand is great enough that the interaction between vehicles slows the speed of the traffic stream this results in some congestion. Congestion is a possibility for any mode of transportation. As demand approaches the capacity of a road or of the intersection along the road, extreme traffic congestion sets in. When vehicles are fully stopped for periods of time, this is colloquially known as traffic jam or traffic snarl-up.

Most of us at some point in our lives have had the misfortune of experiencing the effect of a congested roadway. For a majority of commuters, traffic congestion has become something that they endure on a regular basis during their morning and evening commutes. However, aside from the frustration and aggravation of creeping through slow moving traffic, congested roadways exert both private costs in wasted time and fuel and social costs in the from increased travel times for all commuters as well as the release of pollutants and greenhouse gas emissions into the air.

Traffic in developing countries like India, is however very different in its form and characteristics. Two-wheeler motorbikes, three-wheeler auto-rickshaws, four-wheeler cars and heavy vehicles likes buses and trucks ply together on the same road intermingled with each other without any lane discipline. Such non-lane based disorderly traffic with high heterogeneity of vehicles cause traffic congestion.

Traffic congestion may be of two types:

I. **Recurrent Congestion:** This congestion generally occurs at the same place, at the same time every weekday or weekend day. This is generally the consequence of factors that act regularly or periodically on the transportation system such as daily commuting or weekend trips. Recurrent congestion is predictable and typically occurs during peak hours. It displays a large degree of randomness in terms of duration and severity.

II. **Non-Recurrent Congestion:** This congestion is the effect of unexpected, unplanned large events like road works, accidents, special events and so on that effect transportation system more or less randomly. This type of congestion cannot be predicted easily.

2. LITERATURE REVIEW

Measuring congestion is a necessary step in order to deliver better congestion outcomes. The purpose of this literature review is to understand what researchers know about traffic congestion. Below is the list of some researches that were helpful in this study:

Lighthill and Whitham (1955) introduced the continuum model LWR model based on fluid dynamics, which builds the continuous function between traffic density and speed to capture the characteristics such as traffic congestion formation.

Dewees (1978) used a simulation program to estimate the external time costs that an additional vehicle using a congested city street imposes on other motorists on that street. This study demonstrated the usefulness of a traffic simulation program for estimating congestion costs.

Meyer and Gomez-Ibanez (1981) stated that the travel demand for public transport is highly concentrated on morning and evening peak hours.

Lindley (1987) developed the congestion severity index (CSI) originally to measure freeway congestion in terms of total delay (vehicle-hours) per million vehicle miles of travel (VMT).

Lindsey, C. Robin Verhoef, and Erik T., (1999) discussed the principles of static anddynamic equilibrium on a road network in a deterministic environment, and thenidentifies equilibrium concepts that account for stochasticity in demand andcapacity. Finally, conceptual and practical issues regarding congestionpricing and investment on a network will be addressed.

3. Traffic Congestion Causes:

I. Too many cars for roadway due to inadequate mass transport system.
II. Obstacles in the road causing a blockage like double parking, road work, an accident etc.
III. Malfunctioned traffic signals.
IV. Too many pedestrian crossings not permitting cars to turn.
V. Overdevelopment in areas where the mass transport system is already overcrowded.
VI. Inadequate road system.

4. Traffic Congestion Effects:

i. Loss of valuable time due to unexpected traffic.
ii. Increase in travel time.
iii. More consumption of fuel thereby causing fuel loss.
iv. One of the most harmful effects of traffic congestion is its impact on environment.
v. Drivers who become impatient may be more likely to drive aggressively and dangerously causing accidents.
vi. Negative impact on people's psychological state, which may affect productivity at work and personal relationships.
vii. Increase in vehicle maintenance cost due to wear and tear on mechanical components of vehicle.
viii. Decrease in road surface lifetime.

The summation of all these effects yields a considerable loss for the society and the economy of an urban area. The overall effects of traffic congestion can be broadly be categorized under; Health effects, Environmental effects and Economy effect. Roads serve the important function of carrying people and goods around the city. These are like blood vessels circulating nutrients to feed our body. If we do nothing to contain congestion, it will continue to erode the environment, sustainability, quality of life and competitiveness of our city.

5. References

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