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A REVIEW PAPER ON STUDY OF TRAFFIC VOLUME AND ITS SAFETY MEASURES ON NATIONAL HIGHWAYS

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Abstract - *Transportation engineering uses engineering methods and techniques to achieve safe and time efficient movement of people and goods on the roadways. Safe and time efficient movement of people and objects depends on traffic flow, which is directly related to traffic characteristics. The three main parameters of traffic flow are volume, speed and density. In the absence of city's effective planning and traffic management, the current road infrastructure cannot meet the city's future needs. Due to the change in economics of middle class families, there has been a significant increase in the quantity of pedestrian and vehicle in the last decade. The present work studies the traffic characteristics in Panchkula in a selected priority junction. This work was emphasized on the quantity of traffic and analysis was done through the primary traffic flow survey from Majri Chowk to Ramgarh. The flow of traffic is done by manual methods. For better understanding of the current state of traffic flow in the junction, traffic surveys are organized. With the help of data collection, an attempt was made to understand traffic patterns during different time periods. Traffic control on that junction is also dependent on traffic flow characteristics. Therefore, the results of the current study help in controlling traffic on tampering and some measures also suggest measures to improve traffic safety in this area.*

Key Words: **Volume, Demand, Road Capacity, Average Daily Traffic, Average Annual Daily Traffic (AADT), PCU/PCE**

1.INTRODUCTION

Transportation is carrying civilization to a brighter future. Currently transportation is one of the most burning problems in every territory of the globe. Every country is approaching as per their desires and try to resolve transportation issues as per the capabilities and resources they owe. While designing any structure it is necessary to calculate the loads coming on it to determine the reinforcement to be provided for safe functioning of the structure. In transportation volume serves the identical purpose. For planning, designing, scheduling, safe operation and development of transportation system the prime requisite is traffic volume. Traffic volume is the number of vehicles passing a section of a roadway at some stage in precise unit of time. Traffic volume researches are performed to determine the count, movement and classification of roadway vehicles at a given location so as to become aware of critical time flow periods, the influence of heavy vehicles or pedestrians on vehicular traffic flow or traffic volume trends. The length of the sampling duration depends on the count being taken and the future use of the information recorded. In case of heterogeneous traffic it has always been problem to determine the traffic volume as most of the vehicles have varying speeds and body dimensions. This difficulty has been addressed by the way of converting the unique variety of vehicles into equal passenger cars, called passenger car unit and expressing the volume in terms of passenger car unit per hour. As traffic volume isn't always steady, so a continuous method of calculating traffic volume is a matter of top notch importance for smooth functioning of transportation vehicles. If traffic volume isn't measured continuously then the transportation system may fail and the economic system of the country may additionally face a difficulty.

The Nagpur Road Plan of 1943 has broadly defined the national highways as the roadway that run throughout the latitudinal and longitudinal extent of India, linking different states, various ports, state capitals, major cities, large industrial places and the roads required for country's defense. In India national highways have a total length of 111,111 km constituting 2.7% of total road network as of March 2018. All the national highways are assigned the respective numbers for example the highway connecting Ambala-Nariangarh-Haridwar is denoted as NH-72. The national highways of our country are managed and maintained by Central Public Works Department, an organization of the Government of India. Indian government led by Prime Minister Shri Narinender Modi has undertaken to double the highway length from 96,000 km to 2,00,000 km. The National Highways Authority of India is the nodal agency accountable for construction, upgrading and maintaining most of the national highways. It functions under the Ministry of Road Transport and Highways. The National Highways Development Project is the major effort to expand and upgrade the network of highways. For route development, maintenance and toll collection NHAI usually applies private-public model.

Road traffic safety in simple terms means safe traffic operations which involves measures and methods to prevent road users from being injured or killed. It is not only gaining knowledge and understanding safety but changing attitudes and behaviors towards road usage. If we do this, we are definitely going to save lives. As per report of World Health Organization more than 1.25 million people throughout the

world loss their lives per year due to traffic related incidents. Road accidents are one among the reasons for deaths on Indian roads. As per media statistics, in India one person dies in a road accident every four minutes. The main reasons for India's high rate of on-road casualties are bad road conditions, careless user behavior, defective road planning and designing, poor control of traffic rules and emergency services. The Motor Vehicle Act of 1988, the sole act that governs the road safety in India, has been ineffective in tackling the various traffic related issues. The road safety continues to be not seen as a priority issue within the country.

Hence it is necessary to evaluate the various factors causing inconvenience to the road traffic such as congestion, travel time delays etc. The study of traffic volume will give us an idea of various locations where the congestion is prevailing leading to unsafe travel experience and consequently the various measures will be suggested to safeguard the road users.

Traffic volume is simply the number of vehicles passing a section of a roadway during specified unit of time. Traffic volume studies are conducted to determine the number, movements and classifications of roadway vehicles at a given location in order to 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.

2. LITERATURE REVIEW

Hall & Pendleton (1990) [1] examined the relationship between hourly crash rates and the ratio of traffic volume to capacity on rural highways. They found that the rate of traffic crashes on roadway sections increases with increasing traffic volume. However, data which was needed in order to support this relationship were highly scattered. According to the authors, the assumption of a relationship between traffic crash rates and traffic volume is valid but the exact nature of the relationship is unknown.

Chandra, S Kumar and V Sikdar (1995) [2] made a comprehensive study on capacity of urban roads. It was emphasized that passenger car unit values for vehicle type is dynamic in nature and depends on all factors affecting the behavior of vehicle in traffic stream. Data collected at various mid-block sections of Delhi were used to study the dynamic nature of passenger car unit for a vehicle type. They observed that the passenger car unit for a vehicle decreases with increase in its own proportion in traffic stream.

Andrew P. Tarko, Rafael I. Perez –Cartagena (2005) [3] recommended that peak hour flow should be estimated based on several days of vehicle counting to improve the precision of the average PHF estimate. Where counting is not possible, the model developed as a part of the presented study can be used. It requires the hourly volume, the community population and the time of day as input. The precision of the model seems to be reasonable when considering the temporal variability. A graph was provided as a convenient means of peak hour flow prediction.

Birva B. Shah, Prof. N. G. Raval (2016) [4] concluded that the actual capacity analysis is fundamental to plan and improve the existing traffic facilities. In their studies, they found out the suggested capacity by Indian road congress is very less that the observed at C.G. road of Ahmedabad city. There is need to update the capacity value for the cities like Ahmedabad.

3. METHODOLOGY

Firstly, traffic volume at study stretch of national highway will be determined. After that traffic safety measures along national highways will be discussed. We don't have an instrument so we will be using the manual method of counting the vehicles.

Manual counting method

i) Direct method.

ii) Indirect method.

Direct Method: - By this method data can be collected immediately and we can obtain the traffic volume as well as vehicle classification. We will be using this method during off peak hours.

Indirect Method: - In this method the traffic volume data is collected by the video camera. Video is captured & after that data is collected by rewinding. At morning and evening time, we will be using this method because of high traffic flow.

After calculating the traffic volume data of the selected national highway stretch the data will be used for implementing various safety measures by suggesting the means to reduce the congestion on the highway. Moreover various means to enable the smooth movement of vehicles and pedestrians on the road could be suggested to avoid the delay in travel time. Thus, limiting the possible conflicts within the traffic.

4. OBJECTIVES

The main objective of the traffic study is as follow

1. To find out traffic volume on selected sections of National Highway.
2. To find out the traffic flow pattern on weekdays and weekends for 15 minutes interval variation.
3. To minimize the traffic congestion through different ideas and provide more on-road security features.

4. To decide about the measures for the safety of moving traffic.

5. FUTURE SCOPE

- For a longer duration of traffic survey data can be achieved.
- More important national highway can be selected for the study.

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