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TRAFFIC PARAMETERS: VOLUME COUNT, SPOT SPEED STUDY, SATUARATION FLOW

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Abstract - *The information of diverse plainly visible parameters of traffic volume count is a critical fundamental input required for arranging, examination and operation of roadway frameworks. Communicating activity volume as number of vehicles passing a given segment of street or activity path per unit time will be improper when a few sorts of vehicles with broadly shifting inactive and energetic characteristics are comprised within the activity. The issue of measuring volume of such heterogeneous activity has been tended to by changing over the diverse sorts of vehicles into proportionate traveler cars and communicating the volume in terms of PCU (Traveler Car Unit) per hour, spot speed ponders and immersion stream. The vehicles of profoundly heterogeneous activity with broadly shifting physical and operational characteristics such as the one winning on Indian streets, possess based on the accessibility of space, any helpful horizontal position on the street without any path teach. The interaction between moving vehicles beneath such heterogeneous activity condition is profoundly complex.*

Key Words: Keywords: Passenger Car Unit (PCU).

1. INTRODUCTION

Most road accidents have the possibility to occur at road turnings or we can say at intersections. With the rapid growth on the road of the number of various types of vehicles, the amount of traffic accidents in the numbers is also rising sharply. Road safety is a major issue in developing countries due to its impact on the global economy and people's well-being. Due to population growth, traffic risks increase, especially in developing countries such as India, as infrastructure can no longer cope with the growing traffic.

Traffic volume is defined as the number of vehicles passing through a given cross-section per unit time. It is measured in vehicles per minute, vehicles per hour and vehicles per day. In order to represent the traffic flow on the road per unit time, it is necessary to convert the traffic flow of different vehicle classes into a unified vehicle class, the so-called car unit.

2. LITERATURE REVIEW

Various methods for analysis and evaluation are available in various literatures. Also, numbers guidelines, toolbox and research papers are available for reference which concentrate on unique intersection problems and its countermeasures.

Literature review presents brief idea about most of sever problems and related countermeasures, which can collectively apply to reduce severity of various elements of intersection which can further be used for improving safety. All the technical papers are referred as an attempt has been made to highlight the problems and serious concerns related to road safety and advancements in intersection design in western countries and discuss several various options, remedies and countermeasures to tackle this issue with the fulfillment of this dissertation. The details of the methodologies of analysis, design & development of various parameters for heterogeneous conditions of traffic are presented in next chapter.

3. METHODOLOGY

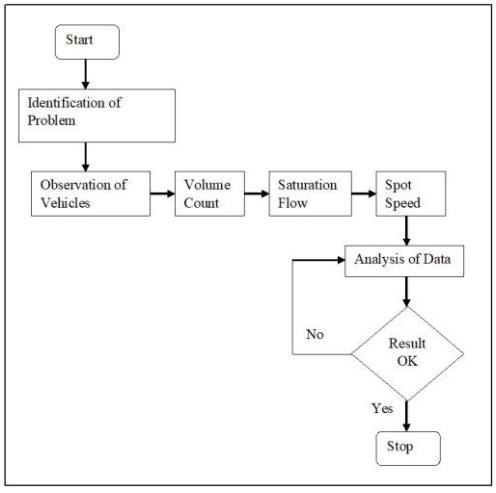

Fig -1: Traffic Analysis Chart

A key step in establishing any safety improvement plan is to take the available data and discern the key safety problems and their root cause. In some cases, it may be a lack of driver compliance with the stop signs. At other locations, the speeds of approaching vehicles may make it difficult for minor road drivers to adequately judge gaps. Problems are likely to be different in an urban area versus a rural one, such as access management and issues based upon roadway cross sectional characteristics. It is important to not approach the problem with a preconceived notion of what is required, but rather to investigate high-crash locations and have a clear understanding of the problem before beginning to identify a solution. Intersection problems are identified to assess whether intersection improvements are needed.

In some instances, improvements may be justified regardless of the crash rate including locations with a relatively low rate, but high percentage of severe crashes that are correctable. In identifying the crash cause, consider the following sources of information for improving data reliability:

• Conduct field observations to assess the intersection operations.

• Contact the local law-enforcement officers for information regarding the study intersection.

• Interview local drivers stopped at the intersection to gain additional motorist perspective of the problem.

• Obtain the actual crash reports to verify the accuracy of the crash data.

4. ANALYSIS

4.1 Volume Count:

Activity tallies in street transport can be both manual and mechanized (utilizing acceptance circles within the street surface) tallies. Both result in numbers of street vehicles on a few streets connect that ordinarily recognize between trucks (buses) and cars. The acceptance circle information can too be utilized to calculate travel times, but in this information there more often than not is no refinement between trucks, buses and cars. Tallies of trains, ships and airplanes are in rule moreover conceivable, but the collection and utilize of such information is exceptional exterior major centers, such as railroad stations, airplane terminals or seaports. With modern innovation getting to be accessible, activity tallies for all modes of transport can be based on approaches, such as disciple perception, GPS area administrations, activity cameras, Bluetooth communication and cellular phones. This opens up presently conceivable outcomes to form a total picture of activity streams in regions that were already troublesome to map.

4.2 Flow:

Number of vehicles passing through the road can be counted as follows.

Flow or volume: The total number of vehicles passing through a point on a highway during a specific time interval. Total number of vehicles are manually calculated or automated as well (n) which are passing a particular point on road in a specific time period (t). The flow (q) calculated in vehicles/hour is given by:

$$q = nt/n$$

Flow is calculated by designing and planning and field which takes a day in the measurement of time.

4.3 Speed

Vehicle passengers are more worried with the speed of the journey as it depends upon multiple factors. Speed also determines the quality of travel travelled by the passengers. It can also be calculated as distance travelled in per unit time. Scientifically speed or velocity v is given by,

$$S=d/t$$

Where,

'S' = speed of the vehicle (m/s),

'd' = distance travelled (m),

't' = time (seconds).

Speed of different vehicles will vary with respect to time and space.

5.3.3 Spot Speed

The instantaneous speed of a vehicle at a certain point is referred to as spot speed. for creating the road's shape, super elevation, etc. Spot speed data, safe speed and speed zone determination, location and size of signage, and signal design are all necessary. Spot speed data is the key input utilized in the analysis of accidents, road maintenance, and traffic congestion. Spot speed can be determined using an endoscope, pressure contact tubes, radar speedometer, or time-lapse photography. By keeping track of the distance all vehicles go between a specific pair of frames, it may be calculated from the speeds that can be retrieved from video images.

4.4 Density

Density can be defined as the number of vehicles occupying a given length of road or lane. It can be expressed as vehicles per KM. Photograph of a length of road x can be

taken, Number of vehicles on the road can also be counted, nx at that point of time and the density can be calculated as

$$\rho=nx/x$$

The density is the number of vehicles between the point X and Y divided by the distance between X and Y. Although from a different perspective, density is similarly significant to flow because it is the indicator of traffic demand that is most closely related to it. Vehicle proximity on the road is measured by density, and this has an impact on how freely one can drive comfortably.

5. CONCLUSIONS

The following important conclusions are drawn from this study:

•Vehicles like sedans, jeeps, XUVs, vans, etc. are accounted.

• The proportion of 2-wheelers is relatively very high as compared to other vehicles.

• The share of public transport is small and needs to be strengthened.

• Roads need to be widened in more congested areas so as to reduce traffic rush.

• A vehicle's PCU can vary significantly with traffic volume.

• When the traffic volume is maximum, the spot speed at the same point is minimum. Traffic in India is mixed in nature, with safety levels ranging from "6" to "1, 2, 3, 4, 5, 6". Therefore, we need to improve the loss on "3". Therefore, we need to build a new equation for heterogeneous flows in India.

• On-street parking should be modified or appropriately organized in accordance with rules and regulations.

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