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# Traffic Survey and Road Safety for VITA TASGAON Road

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**ABSTRACT:** A Traffic management system is needed to assure safe and effectual movement of people, goods and transportation. Safe and effectual movement of people, goods and transportation depend on the effectiveness of the traffic management system. Without effective planning and traffic management of the city, the existing road infrastructure cannot meet the future traffic demands of the city. Understanding the traffic volume is one of the most important elements of the traffic management system. This study was conducted to determine traffic flow characteristics and safety measurement through primary traffic flow surveys as well as skilled observations at Vita Sangali Haighway in Tasgaon. Determination of the traffic volume was counted by manual counting method and the level of service was measured by Peak Hour Factor (PHF) method is the range of 0.64-0.70 that is D category. Moreover, calculation of Passenger Car Units (PCU's) for different types of vehicle had been made. An attempt has been completed to know the traffic patterns of the different time periods are indicated that Bus is most common vehicle. Throughout observation, Near Petrol Pum this work has been found the average lane width and the average widths of shoulder are 9.5 feet (two lane) and 2.5 feet respectively. Due to insufficient lane and shoulder widths as well as no existence of signaling are caused negative impact such as congestions, accidents as well. Some of the remedial measures to increase the traffic safety by providing adequate lane number (4 or 6) and width, proper signaling and restricted scattered parking can be recommended based on the outcomes of the work.

## I. INTRODUCTION

Transportation is carrying civilization to a brighter future. In the recent years, 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 simply the number of vehicles passing a section of a roadway. Expressing traffic volume as number of vehicles passing a given section of road or traffic lane per unit time will be inappropriate when several types of vehicles with widely varying static and dynamic characteristics are comprised in the traffic. The problem of measuring volume of such heterogeneous traffic has been addressed by converting the different types of vehicles into equivalent passenger cars and expressing the volume in terms of Passenger Car Unit (PCU) per hour. The interaction between moving vehicles under such heterogeneous traffic condition is highly complex. Again, volume is not constant. It increases with time. So, a continuous method of calculating volume is a matter of great importance for smooth functioning of transportation system. If volume data is not found on a continuous basis then the transportation system may fail and the economy of the country may face a great difficulty.

## II. LITERATURE REVIEW

A Review paper on study of traffic volume and it's safety measures on national highways : Abrar Ul Haq Bhat, Dr. Rakesh Gupta Civil Engineering: 07 | July 2018 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 Traffic Congestion at Toll Plaza: A Case Study of Khed-Shivapur, Pune Mrs. Shruti Shinde, Hrishikeshz Pokharkar, Yugandhar Shinde, Pritam Kashid| Oct 2019
The delay and queue are mainly due to two different charging methods namely known as 'Manual Toll Collection (MTC)' and 'Electronic Toll Collection (ETC)'. At this toll plaza, all the lanes are having mixed lane system that is both MTC

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and ETC vehicles pass through the same lane. Furthermore, with the help of data collected and visual on-site survey, some added causes for the traffic congestion were noticed.

## III. METHODOLOGY

To meet the objectives of the study traffic survey was conducted by manual counting method and the LOS is estimated by Peak Hour Factor (PHF) method. There are two effective methods of counting vehicle for volume survey. They are (a) Manual L Method; (b) Automatic counting method. In this study we used the Manual Counting Method instead of Automatic Counting Method due to lack of instruments which are required for automatic counting. Manual Counting Method is divided into categories are (i) Direct method, and (ii) Indirect method

Direct Method

By this method data is counted by using hand tally and manual counter. We can obtain the traffic volume as well as vehicle classification. We have used this method during off peak hours. Road way geometry has been taken directly with hand tools.

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 have used this method because of high traffic flow.

2.3 Peak Hour Factor Method

Traffic engineers focus on the peak-hour traffic volume in evaluating capacity and other parameters because it represents the most critical time. The analysis of level of service is based on peak rates of flow occurring within the peak hour because substantial short-term fluctuations typically occur during an hour. Common practice is to use a peak 15-minute rate of flow. Flow rates are usually expressed in vehicles per hour, not vehicles per 15 minutes.

Table 1: LOS with respect to its PHF

| Peak Hour Factor Value | Level of Service (LOS) |
|---|---|
| 0.7 or less. | A |
| 0.8 or less | B |
| 0.64 or less | C |
| 0.70 or less | D |
| 0.75 or less | E |
| 0.85 or less. | F |

The relationship between the peak 15-minute flow rate and the full hourly volume is given by the Peak Hour Factor (PHF) as shown in the following equation (Authority, 2003). Peak Hour Factors in urban areas generally range between 0.80 and 0.98. Peak-Hour Factors over 0.95 are often indicative of high traffic volumes [4]. PHF was evaluated by the equation, Peak Hour Factor, PHF= (Hourly Volume ÷ (4* Volume count at highest 15 minutes) Passenger Car Units Passenger Car Unit (PCU) is a metric used in Transportation Engineering, to assess traffic-flow rate on a highway. The PCU values given in the geometric design of Highways are given in Table 2 cited from **Motorcycles**

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*Table 1 PCU factors as per IRC: 64 – 1990 "Guidelines for Capacity of Roads in Rural area"*

| Sr. No: | Vehicle Category | | PCU Factors |
|---|---|---|---|
| 1 | Car, Jeep and Van | | 1 |
| 2 | Two Wheeler | | 0.5 |
| 3 | Auto Rickshaw | | 1 |
| 4 | Goods Vehicles | Minibus | 1.5 |
| 5 | | Government Bus | 3 |
| 6 | | Private Bus | 3 |
| 8 | | LCV | 1.5 |
| 9 | | 2 - axle Truck / Bus | 3 |
| 10 | | 3 - axle Truck / Bus | 3 |
| 11 | | MAV up to 6 - axles | 4.5 |
| 12 | | Oversized Vehicles (MAV more than 6 - axles) | 4.5 |
| 13 | Heavy Machinery & Earth Moving Equipment | | 4.5 |
| 14 | Tractors | Without Trailer | 1.5 |
| 15 | | With Trailer | 4.5 |
| 16 | Slow Moving Vehicles | Cycle | 0.5 |
| 17 | | Cycle Rickshaw | 2 |
| 18 | | Animal Drawn Cart | 6 |
| 19 | Exempted Vehicles | Exempted Car | 1 |
| 20 | | Mini bus / Ambulance | 1.5 |
| 21 | | Bus | 3 |
| 22 | | LCV | 1.5 |
| 23 | | Truck | 3 |

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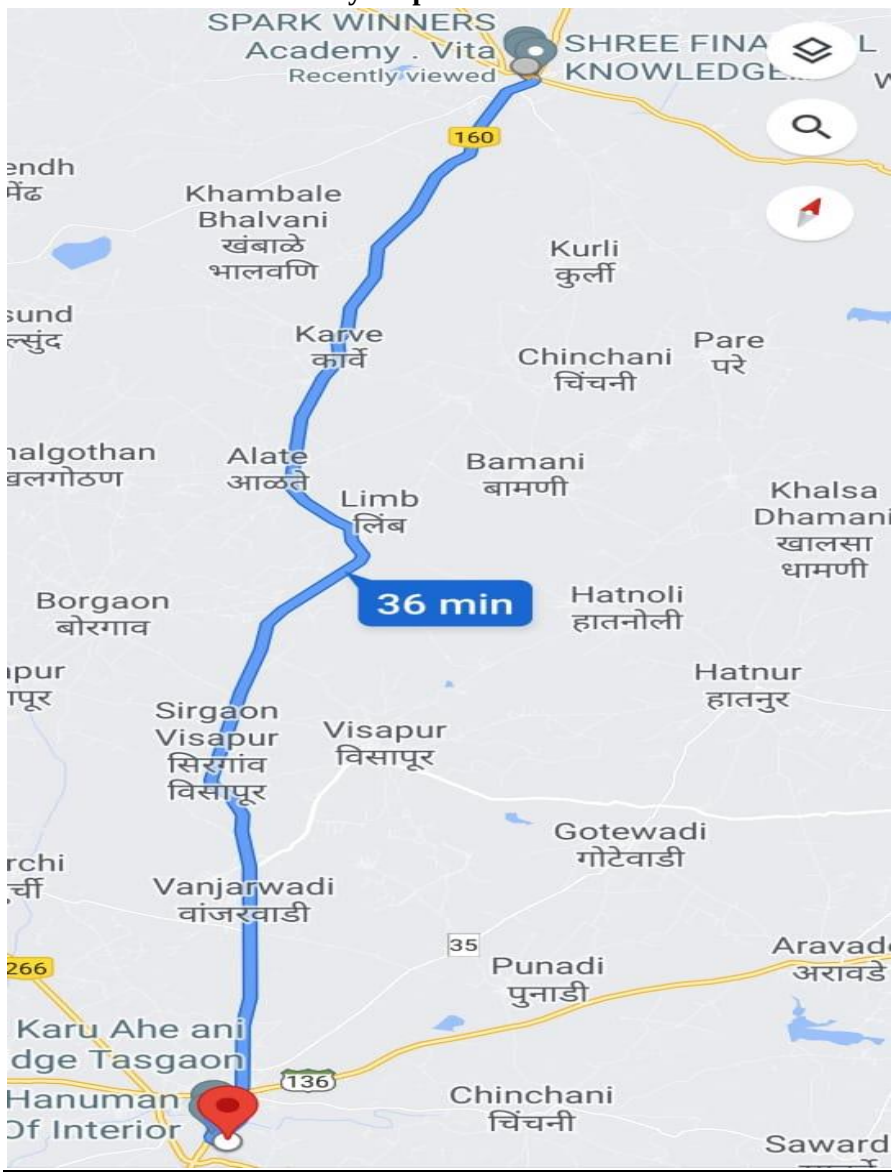
**Key Map of Location**




## IV. EXPRIMENTAL WORK

Classified traffic volume count analysis

Average Daily Traffic (ADT) current

Day wise traffic count of the period to 2022

Data collection

The data collection for traffic volume study was conducted on 06 March 2019. It was Tuesday and it was a weekday. Time of data collection 01 (one hour) was divided into four time interval for volume study. That day was Sunny and clear day with the dry pavement condition. The observation for counting was conducted according to classification of vehicles with help of Stop watch, Tally sheet, Clip board and Video camera was used to record which is attached to a tripod stand. Number of enumerators on observation in this research was four.

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Data Analysis
Both manual and video camera method (photographic) were used for the calculation of traffic volume of that location. By using Video camera, video was recorded for 15 minutes interval and the video was played again and again for the data analysis with accuracy.

## V. CONCLUSION

The traffic flow behavior in heterogeneous traffic in Vhanga-Faridpur highway is observed that is absolutely complex. The findings of the research work concluded below in brief:
a) Most of the vehicle in the traffic flow was bus
b) The number of Auto Rickshaws and cars are more when compared to buses.
c) So, if numbers of buses are increased, then the dependency on public transports increase.
d) The number of personal vehicles will decrease after increasing buses.
e) Hence the congestion gets reduced and free flow of traffic will be possible.
f) By reducing scattered parking, proper signaling, improving level of service will reduce traffic fatality

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