

Study of Traffic Volume and its Safety Measurement at Surajpole & Sevashram Road in Udaipur

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Abstract:- Udaipur is famous around the world as the City Of Lakes or the Venice of the East. The knowledge of traffic volume is an important basic input required for planning, analysis and operation of roadway systems. A significant effort has been made in order to study the Traffic Volume of Surajpole & Sevashram Road in Udaipur. The M.B. College Chauraha is an important road, connecting major institutional area with Sewashram. The stretch is flanked by institutional land use on one side and mixed land use on the other, combining a Gurudwara at Surajpole road, commercial and residential space. The area is highly trafficked therefore the cause much delay to the vehicles and travellers due to the passing of goods & passengers. Therefore the problem is quit critical.

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

Keywords: PCU, Venice,

1. Introduction

The traffic volume study is carried out to get following useful information: Magnitudes, classifications and the time and directional split of vehicular flows. Magnitude is represented by volume of traffic. Vehicles are classified into some predefined classes based on vehicle size and capacity. In a two-way road, vehicles moving towards two directions are counted separately to get the proportion. Time and directional split is useful to identify tidal flow. Proportions of vehicles in traffic stream. Proportion of vehicles indicates whether public or private transport dominates the traffic system. It also indicates the choice of road users. Hourly, daily, yearly and seasonal variation of vehicular flows. These variations are needed to establish expansion factors for future use.

2. Review of literature

Main problem is the speed flow relationship. The vehicle all types produce different impedance which is varied to the static & dynamic characteristics. Hence by simply adding the vehicle does not give the accurate or authentic speed flow relationship. So, to come out from this situation passenger car is adopted as a standard vehicle and term is used a passenger car unit (PCU). Before finding out the traffic volume we have to traffic survey of particular given place the purpose of traffic survey is, traffic monitoring management, model calibration & traffic control, etc.

3. Needs of Study

To find out the traffic volume at Surajpole & Sevashram Road in Udaipur. It is necessary to fulfil the following purpose:

- 1) The ultimate aim of travel
- 2) The future rate of growth of traffic is made possible.
- 3) To determine the traffic volume passing in and out to the given area.
- 4) Traffic monitoring and traffic control.

4. Objectives

The main objective of the traffic study is as follow

- To find out the PCU values with various traffic volume on selected section on Surajpole & Sevashram Road in Udaipur.

- Need to improve the transport facilities & pavement conditions with safety measures
- To find out the traffic flow pattern on weekdays and weekends for 15 minutes interval variation
- How to minimize and safety measure the traffic through different ideas.
- Study for flyover and underpass design purpose.
- For safety measures.
- Traffic monitoring.

5. Traffic Characteristics:

The different type of vehicles Characteristics presents at Surajpole & Sevashram Road in Udaipur:

- 1) Four wheelers which includes cars and jeeps.
- 2) Motorized three wheelers (M.Th. W) which includes auto rickshaws and tempos.
- 3) Motorized two wheelers (M.T.W) which includes bikes and scooters. With helmet and without helmet.60% road user not wear helmet so safety measure it's most important and we need to aware the road user for wear the proper helmet.
- 3) Light commercial vehicles (L.C.V) which includes small vans and four wheelers.(pickup)
- 4) Truck
- 5) Bus
- 6) Bicycle
- 7) Pedestrian
- 8) Ambulance
- 9) Fire fighter.
- 10) Heavy machines like JCB/Hydra

6. Methodology

Before start the traffic volume study Firstly, we study the location of Surajpole & Sevashram Road in udaipur & traffic field to have traffic volume & speed data in Surajpole & Sevashram Road in Udaipur..

Methods are available for traffic counts is below

- A- Manual methods
- B- Automatic method

Manual counting methods are

- i) Direct method.
- ii) Indirect method

We don't have any type of instrument so we used the manual method with Photographic methods

At evening time the rush is more so we used indirect method while in morning we used the direct manual method.

By standing the side of towards the surajpole roads. Towards the Sevashram Chauraha road the road different vehicles were counted by survey team members. We have selected one member who was in charge of time, he commanded us

when we have to Stop and Start our time watch. We stood by the side of the road and different vehicles were counted by different persons.

Direct Method: - By this method data can be collected immediately by help of four enumerator we noted in rough sheet the traffic volume & vehicle classification in tabular forms.

Indirect Method: - In this method we use smart phone with 12 Megapixel camera with video recorder and the traffic volume count is collected by the Video is captured & after that data is collected by rewinding & posing the video.

Location: We have chosen the location from surajpole roads and Sevashram Chauraha road.

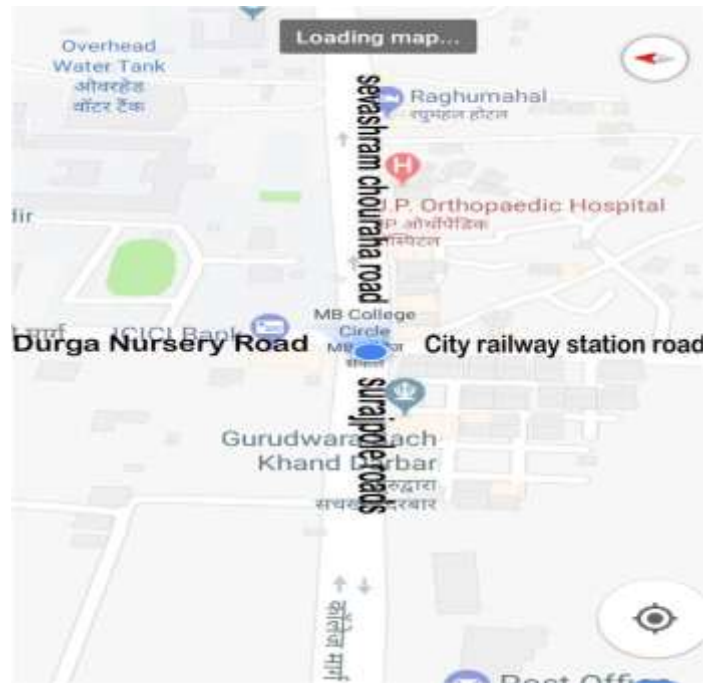


Fig 3.1: Map of Location of traffic volume counts

Date: Data for volume study was collected on 9 July 2018. It was Monday and it was a week day.

Time: Time of data collection for volume study was divided in four times and the time interval is 15 minutes.

Weather Condition: It was Sunny day.

Observation: Classified vehicle counts in tabular forms

Duration: 15 minutes (short term counts)

Equipment: smart phone with 12 Megapixel camera (Video recorder) Stopwatch, pen, pencils eraser and sharpener safety shoes, helmet, rough sheet, mobile tripod stand etc

Number of Team members: Four.

Method: Direct Manual Method.

7. Data collection and analysis

We have selected one member who was in charge of time, he commanded us when we have to Stop and Start our time watch.

The data is collected after carefully studying the location area. The study was conducted on a Monsoon day when the pavement was dry and no repairing & maintenance were going at that time.



Figure 12 A real time snapshot of the road while counting the vehicles (towards Surajpole)



Figure 13 A real time snapshot of the road while counting the vehicles (towards Sevashram)

For the calculation of traffic volume we note down the number of vehicles with their categories in rough sheet with tabular forms at our location area both manual and video camera method (photographic) were used. A smart phone camera was used to make of traffic at given location. The smart phone was mounted on a tripod stand with the opening of camera. By this the video is made in 15 minutes interval. Later this video is reminded and viewed again for the data analysis with the help of Smart phones, Smart T.V. and Computers. From the applied manual method these are the following data were observed:

Table1: PCU factors used for traffic signal design

Types of Vehicles	PCU Factors
Car, Tempo, Pickup	1
3-wheeler	1
2-wheeler	0.5
Bus/Truck	3
Rickshaw	1.5
Cycle	0.5
Agriculture Tractor	4.5
Horse Drawn vehicles	1.5

Table2: No. of vehicle (towards surajpole)

No. of vehicle	8:00-8:15am	1:00-1:15pm	4:00-4:15pm	8:00-8:15pm
2-wheeler without helmet	302	222	290	404
2-wheeler with helmet	152	180	260	270

3-wheeler	60	48	68	54
Car	88	73	74	102
Bus/Truck	12	8	8	6
House drown vehicles	1	0	1	0
Cycle	20	12	16	09
Tractor	3	2	1	0
Pedestrian	65	47	41	78

Table3: No. of vehicle (towards Sevashram)

No. of vehicle	8:00-8:15am	1:00-1:15pm	4:00-4:15pm	8:00-8:15pm
2-wheeler without helmet	360	232	292	450
2-wheeler with helmet	148	172	248	260
3-wheeler	78	58	69	60
Car	93	79	80	110
Bus/Truck	16	12	9	8
House drown vehicles	0	1	1	0
Cycle	10	06	09	05
Tractor	2	3	1	1
Pedestrian	45	32	28	62

Table4: Converted no. of vehicle (PCU)(towards surajpole)

Type of vehicle	No. of vehicle	PCE	PCU	%PCU
2-wheeler without helmet	4872	0.5	2436	27.70
2-wheeler with helmet	3448	1	3448	39.21
3-wheeler	920	1	920	10.46
Car	1348	1	1348	15.33
Bus/Truck	136	3	408	4.64
House drown vehicles	8	1.5	12	0.14
Cycle	228	0.5	114	1.29
Tractor	24	4.5	108	1.22
Total		-	8794	100

Table5: Converted no. of vehicle (PCU) (towards Sevashram)

Type of vehicle	No. of vehicle	PCE	PCU	%PCU
2-wheeler without helmet	5336	0.5	2668	28.92
2-wheeler	3312	1	3312	35.90

with helmet				
3-wheeler	1060	1	1060	11.49
Car	1448	1	1448	15.69
Bus/Truck	180	3	540	5.85
House drown vehicles	8	1.5	12	0.13
Cycle	120	0.5	60	0.65
Tractor	28	4.5	126	1.36
Total		-	9226	100

Conclusion

It can be concluded that vehicle composition most of the vehicle in the traffic stream were motor cycles & Cars. Percentage of two wheelers is higher than other vehicle. And most important thing is that Percentage of running two wheelers by wearing helmets and not wearing helmets is almost equal. So it's dangerous and we need to aware the public for wearing the helmet for safety purpose. After volume study as we observed that more traffic is in the peak hours i.e. in morning and evening. The area is highly trafficked therefore the cause much delay to the vehicles and travellers due to the passing of goods & passengers. Thus, the solution lies not in installation of traffic signals and increase in number of traffic police, but in constructing underpass or flyover at the MB College Chauraha.

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