

# STUDY OF TRAFFIC VOLUME AND LEVEL OF SERVICE OF VEJALPUR CROSS ROAD, AHMEDABAD

<sup>1</sup>Parth Viroja,<sup>2</sup>Falguni Thakur,<sup>3</sup>Srinath Karli

<sup>1</sup>Student of M.E. Transportation,<sup>2</sup>Assistant Professor,<sup>3</sup>Assistant Professor,

<sup>1</sup>Department of Transportation Engineering,

<sup>1</sup>Hasmukh Goswami College of Engineering, Ahmedabad, India.

*Abstract:* In this study presents to study of traffic volume and Level Of Service at vejalpur cross road in Ahmedabad, which is one of the fastest developing city of India. Ahmedabad is a rapid growing city suffering from traffic jam. The increasing of traffic volume at unsignalised intersection has been arising problems like road accidents, conflicts and congestions. The objective of this study to analyze prevailing traffic condition at vejalpur cross road. The traffic volume count is carried out at intersection for each approach and regarding Level of Service calculated. In this study Traffic Volume Count is carried out by video graphic method. Due to mixed nature of traffic it gets difficult to accommodate all the sorts of traffic on these roads. The essential problem arises during the height hours of the day when the traffic volume is highest on the road. The data was analyzed for the peak hour of traffic.

**Index Terms**–Traffic congestion, Peak Hour, Traffic Volume, Level of Service.

## I. INTRODUCTION

Rapid industrialization and the consequent urbanization is taking place since last few decades in all over the world; India is no exception. Ahmadabad is one among the fastest growing city of India. Ahmedabad is a rapid growing city affected by traffic jam. Due to the continuing expansion of Ahmedabad city with the development of societies and technology through the ages make the existing road and transportation systems are not sufficient to meet the increasing demands due to the difficulty and the complexity of daily movements of people and goods. To provide the traffic flow of traffic freely and safely from one place to another without any congestion problem, it might be necessary to improve the existing traffic control facilities or to provide new facilities. There is a requirement for defining traffic jam on rational bases and use that for measurement LOS (Level of Service) of roads.

This study involves traffic volume count, capacity and determine Level Of Service of the important route in city of Ahmedabad which is connected S.G Highway to core Ahmedabad (like Paldi/Vasna/Kalupur etc.) via Vejalpur cross road . Presently Vejalpur area is the nearest location to S. G. Highway which is vast corporate culture with many big offices. It is developing like CBD in Ahmedabad city. Road users are using Vejalpur cross road route for going core location of city instead of other routes. So the traffic flow is enormously increasing year by year and traffic control in necessary to avoid congestion and accidents. Additively the other problem like encroachment, uneven parking, very poor road surfaces and less carriage way occur at each approach of Vejalpur cross-road. Due to these problems the traffic congestion increase and the safety of vulnerable road users decrease. At Vejalpur cross road for control the traffic the best option is provide the traffic signal.

## II. OBJECTIVE OF STUDY

1. To carry out various traffic volume count on every approach of Vejalpur cross road.
2. To evaluate the capacity and level of service

## III. STUDY AREA

Study area selected for the analysis is comes under Ahmedabad city. Ahmedabad city is the commercial capital of Gujarat State in India. Because of its wide spread commercial, industrial, government, private and other activities, it is the India's seventh largest city and poised to be a financial hub in western India.

This is mainly 4 approach intersection. The four approaches coming from (1) But Bhavani temple, (2) Vejalpur village,(3) Sarkhej and (4) Jivraj Park. Major portion of the vehicle passing from this intersection are two wheelers, auto rickshaws and cars. Road condition is not so good and road width is limited of incoming S.G. highway approaches as well as oversaturated

during peak hours. The mainly is situated residential and commercial hub, hospitals, temples, number of schools as well as many new mega commercial project which is under construction hence traffic and traffic problems will increase in future and also mega project which is nearby each other.



Figure 1: Google image of the intersection (Source: - Google Map)

#### IV. DATA COLLECTION AND ANALYSIS

The classified volume count was carried out with video graphic method. The volume count carried out for 13.00 hr. which is 8.30 AM to 9.30 PM. In this study, we take peak hour volume of each approach for morning and evening slot. The problem of measuring volume of such heterogeneous traffic has been addressed by converting the various sorts of vehicles into equivalent passenger cars and expressing the volume in terms of passenger car Unit (PCU) per hour. The PCU is that the universally adopted unit of measurement of traffic volume, derived by taking the passenger car as the standard vehicle. The PCU factors are consider from INDO HCM 2017 from urban area.

Table- 1 PCU Per HOUR

PCU Per HOUR			
No. of Approach	Name of Approach	PCU/Hr. (Morning peak hour)	PCU/Hr. (Evening peak hour)
Approach 1	But Bhavani temple Approach	1551	1550
Approach 2	Vejalpur village Approach	301	360
Approach 3	Sarkhej Approach	1838	1801
Approach 4	Jivraj Park Approach	1720	1823

#### VEHICLE COMPOSITION

Table- 2 Vehicle Composition

Types of Vehicles	But Bhavani temple Approach	Vejalpur village Approach	Sarkhej Approach	Jivraj Park Approach
2 Wheeler	58%	36%	52%	46%
3 Wheeler	14%	23%	18%	23%
Car/Jeep	23%	24%	25%	26%
Bus/Truck	2%	0%	2.5%	2%
LCV	2%	6%	1%	3%
NMV	1%	11%	1.5%	1%

The practical capacities are showing in Table- 1 and Basic capacity are shown in Table 3 & 4. For 4-lane divided for sub-arterial road is 2900 PCU/hour for both direction. For one direction consider 1450 PCU/hour. Basic capacity is taken from IRC:106-1990 clause 8.3, table 2. The Approach 2 (vejalpur village approach) is collector two lane ( two way ) so Basic capacity taken 900 PCU/hour for both direction and 450 PCU/hour for one direction. The Approach 3 (Sarkhej Approach) is sub-arterial 4 lane undivided road, so Basic capacity taken 2400 PCU/hour for both direction. For one direction consider 1200 PCU/hour taken.

**LEVEL OF SERVICE**

Table 3- Level of Service in Morning

Level of Service In Morning					
No. of Approach	Name of Approach	PCU/Hr. (V) (Morning peak hour)	Basic Capacity (C)	V/C	L.O.S
Approach 1	But Bhavani temple Approach	1551	1450	1.06	F
Approach 2	Vejalpur village Approach	301	450	0.66	D
Approach 3	Sarkhej Approach	1838	1200	1.53	F
Approach 4	Jivraj Park Approach	1720	1450	1.18	F

Table 4 - Level of Service in Evening

Level of Service In Evening					
No. of Approach	Name of Approach	PCU/Hr. (V) (Evening peak hour)	Basic Capacity (C)	V/C	L.O.S
Approach 1	But Bhavani temple Approach	1550	1450	1.06	F
Approach 2	Vejalpur village Approach	360	450	0.80	E
Approach 3	Sarkhej Approach	1801	1200	1.50	F
Approach 4	Jivraj Park Approach	1823	1450	1.25	F

**V. CONCLUSION**

The present study has been conducted to analyze the traffic characteristics of Vejalpur Cross Road, Ahmedabad. The following main conclusions are drawn from the work:

1. As per the data collected from the traffic volume study, it was found that the maximum practical capacity which arrives at morning peak hours at Sarkhej Approach 1838 PCU/hr.
2. The traffic composition of the vehicles which arrives and leaves the road intersection constitutes of 23-26 percent of cars/jeep, 14-23 percent of 3-wheelers and 36-58 percent 2-wheelers.
3. The level of service as calculated for each approach of intersection was found to be of "F" level of service against three approach peak hour and the level of service at approach 2 (vejalpur village approach) was found in morning D and at evening peak hour it was LOS E.

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