Impact Factor (SJIF): 3.632

International Journal of Advance Research in Engineering, Science & Technology

e-ISSN: 2393-9877, p-ISSN: 2394-2444

Volume 3, Issue 9, September-2016

ESTIMATION OF CAPACITY FOR WEST ZONE (Paldi) OF AHMEDABAD

Smit Bhatt[1], Srinath Karli[2], Kartik Zala[3]

[1]M.E.Transportation semester-3rd student, Hasmukh Goswami College of Engineering
[2]Srinath Karli, Asst. Professor, Department of Transportation Engineering, Hasmukh Goswami College of Engineering
[3]Karitk Zala, Assistant Professor, Department of Civil Engineering, Aadishwar College of Technology

Abstract **— Every Transportation Facility should govened by a Qualitative and Quantitative Performance. Capacity is one of the Best parameter among all the functional parameters. Capacity is measure of the Road and Highways for efficient Performance. Capacity is fundamental to planning, design and operation of the roads. It is helpful for determination of numbers of lanes required considering volume of the vehicles, their composition and other traffic related parameters. If the capacity of the roads is measured in the field, the adequacy or deficiency of the road lane and other parameters can be evaluated. The present paper includes the estimation of capacity of West Zone Road of Ahmedabad city. The capacity is determined from the field data. Traffic volume and speed are determined for peak hours of the study area. The speed – volume relationship is developed for the study area. The capacity is determined and compared with suggested value by IRC and Level of Servies.**

Keywords- *Capacity of Roads, Capacity of Highways, Capacity of Major District Roads*

I. INTRODUCTION

Estimation of capacity is fundamental to planning, design and operation of the roads. It helps in determination of numbers of lanes to be provided considering volume of the vehicles, their composition and other traffic related parameters. If the capacity of the roads is measured in the field, the adequacy or deficiency of the road lane and other parameters can be evaluated. Capacity is defined as the maximum hourly volume (vehicles per hour) at which vehicle can reasonably be expected to traverse a point or a uniform section of a lane or roadway during a given time period under the prevailing roadway, traffic and control conditions. Capacity of the urban roads is fixed in relation to the Level of Service. IRC has recommended that normally LOS 'C' be adopted for design of the urban roads. At this level, volume of traffic will be around 0.7 times the maximum capacity. It is considered as the 'Design Service Volume' for the design of the urban roads. Due to rapid growth of the population and increment in vehicle ownership, the traffic is increased rapidly in the urban area. Traffic composition is also varying in the various parts of the urban area. The recommended design service volumes are required to update in the highly congested cities of the India.

II. LITERATURE REVIEW

Iin Irawati(2015) has studied "Delay evaluation as impact of side friction on heterogeneous traffic towards road performance with vissim simulation". Study was carried out for Mrageen city of Indonesia. Different data like amount of vehicles, composition of vehicles, road geometric, side friction etc. are calculated. This data were inputted with vissim software and analysis was done. He compared traffic simulation result without side friction and with side friction. He concluded that with side friction delay is 128.838 time per vehicle(s) and without side friction it is 96.310 time per vehicle(s).

Chetan R. Patel and G.J Joshi(2014) studied "Mixed traffic speed-flow behavior under influence of road side friction and non-motorized vehicles. They have done study of arterial roads in India. Study was carried out on six lane divided urban road in Patna and Pune city of India. Data was collected by videography method and extracted for one minute duration for vehicle composition speed variation and flow rate. Speed-flow relationship were developed for both the road section and flow parameter at mix flow level are derived and compared with the IRC Study was conducted on mid-block section. Traffic composition, Flow rate, peak hour factor and spot speeds of each vehicle category are calculated. Due to side parking , effective lane width in Patna city falls to 7.0m from 10.5m which result into 57% reduction in capacity, and 14% reduction in speed is observed due to presence of MNV.

Ahmad Munawar (2011) followed the Indonesian Highway Capacity (1997) to estimate the "Speed and Capacity for Urban Roads" capacity of the urban road in the Yogyakarta city during the peak hours also considered the effect of the characteristics they he takes as side friction. He takes the speed as the principle characteristics which effecting the capacity and for better understanding of the capacity standards case as geometric and environmental characteristics specified. After the actual data and predicted capacity they have derived multi regression formula which entitled the capacity of the urban road of Yogyakarta city. After getting the actual capacity from the data and they compare with predicted capacity by Indonesian HCM.

III. STUDY AREA

The study was carried out on West Zone Paldi Road of Ahmedabad city. First survey was done to find the capacity of road without considering the effect of side friction. The video camera is kept at the top of the building along the road side. The survey was done for hour many times. Second survey was done considering the effect of side friction on capacity. The survey was done during morning and evening peak hours.

IV. DATA COLLECTION AND ANALYSIS

Classified volume count was carried out. The one of the observed traffic composition is presented in Table 1.

Table 1: Observed Traffic Composition

In to Paldi							
Time Duration	Two Wheeler	Three Wheeler	Four Wheeler	Bus	Truck	Tractor	Cycle
10:30 to 10:35	278	46	54	13	4	0	11
10:35 to 10:40	262	55	51	11	3	0	13
10:40 to 10:45	260	61	48	10	4	1	10
10:45 to 10:50	257	63	49	12	3	1	9
10:50 to 10:55	263	69	42	11	7	0	14
10:55 to 11:00	271	61	39	14	4	1	16
11:00 to 11:05	261	56	51	9	2	0	17
11:05 to 11:10	259	52	45	12	2	0	12
11:10 to 11:15	251	55	40	14	3	1	13
11:15 to 11:20	264	59	52	11	2	1	11
11:20 to 11:25	269	56	49	13	3	2	11
11:25 to 11:30	258	51	48	10	2	0	9
Sub Total	3153	684	568	140	39	7	146
PCU value	**0.5**	**1.0**	**1.0**	**3**	**3**	**4.5**	**0.5**
PCU	1576.5	684	568	420	117	31.5	73
Total PCU	**3470**						

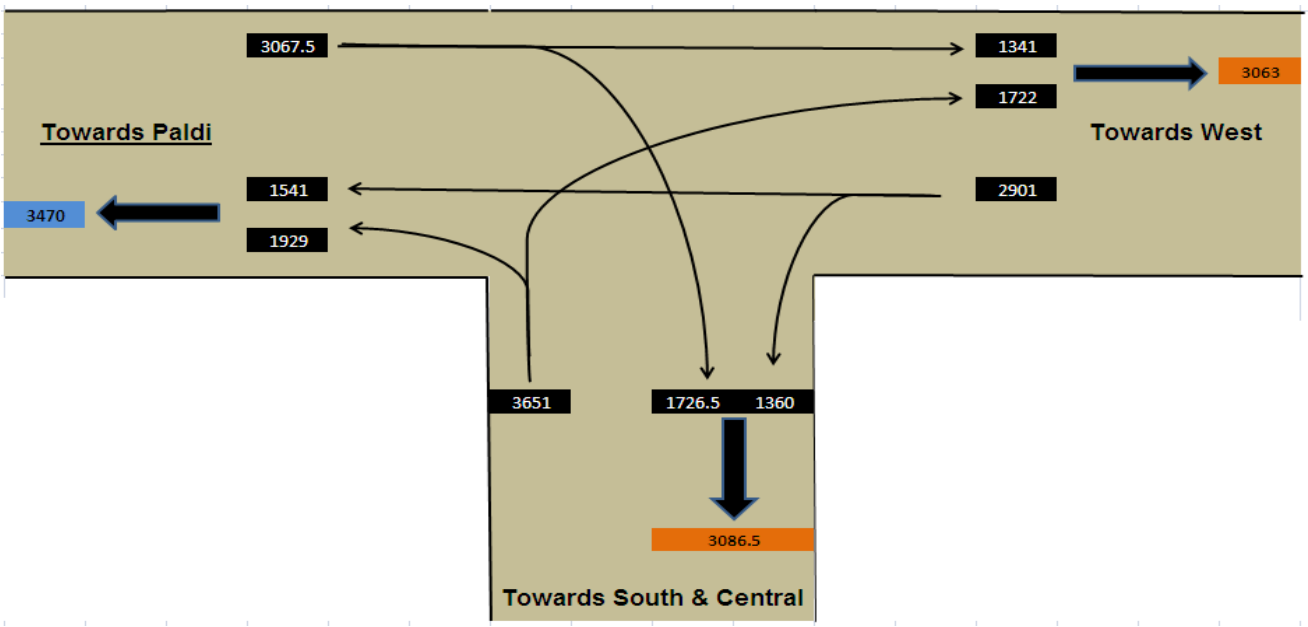

Diagram 1: Flow in and out from Paldi and other Parts

From the Data Collection we can clearly concluded that total flow going In to Paldi Region is 3470 PCU/Hour so these road where serving more than the Standard which are given in the LOS.

V. CONCLUSION

Followings are the major conclusion of the study

1. The actual capacity analysis is fundamental to plan and improve the existing traffic facilities and its also a greatful check for roads.
2. The suggested capacity by IRC is very less that the observed at Paldi road of Ahmedabad city..
3. The capacity is observed with the side frictions.
4. Traffic composition also effects on the capacity of roads.
5. The capacity analysis is also carried out using VISSIM Simulation. It is also more than the suggested capacity values by IRC.

REFERENCES

[1] Chapter: 21 Kadiyali L.R., Traffic Engineering, Khanna Publishers, Delhi.
[2] **Iin Irawati (2015)** research on "Delay Evaluation as the Impact of Side Friction on Heterogeneous Traffic Towards Road Performance with Vissim Microsimulation
[3] **Chetan R Patel , Dr. G. J. Joshi (2012)** A Dissertation Work On "Capacity And LOS For Urban Arterial Road In Indian Mixed Traffic Condition", Procedia - Social And Behavioral Sciences 48 (2012) 527 – 534
[4] **Ahmad Munawar (2011),** Research Paper On "Speed And Capacity For Urban Roads, Indonesian Experience", Stockholm, Sweden In Science Direct Journal On June 28 – July 1, 2011
[5] IRC 106-1990 **—**"Guide Lines For Capacity of Urban Roads in Plain Areas"