

**TO STUDY MIX TRAFFIC FLOW CHARACTERISTICS ON MORARJI DESAI
ROAD IN SEMI URBAN REGION OF BILIMORA CITY**Y Yatin N. Patel¹, Kuldip B. Patel², Hardik H. Patel³¹U.G. Student, Civil Engineering Department, Government Engineering College, Valsad²Assistant Professor, Civil Engineering Department, Government Engineering College, Valsad³U.G. Student, Civil Engineering Department, Government Engineering College, Valsad

Abstract-Urbanization is taking place with higher rate in last 3 decades due to development of more industry in the city area. Due to development of industry, people is migrating from village to city area. People is moving with using various transportation service from one place to other place which ultimately leads to traffic problem in city area. Study of vehicular characteristics, its effect on quality of traffic operation is quite complex in mix traffic condition prevailing in Indian roads. Particularly for arterial roads, it is necessary to understand traffic stream flow characteristic of different vehicles moving in different lanes has become necessary for proper assessment of quality of service available to road user in semi urban region. Composition of the traffic in terms of slow moving & fast moving has significant effect on mix stream speed. Bilimora is one of the fastest growing city of Gujarat, experiencing high growth of regular traffic. In the present study, The efforts are made to carry out traffic survey at arterial road of Bilimora city and observation was collected for that area and after that traffic flow analysis was done, which will be useful for any civil engineer for understanding the traffic flow behaviour in future for that area.

Key words: MixTraffic, People, Bilimora, Hourly Traffic

I. INTRODUCTION

Vehicular traffic is continuously increasing around the world, especially in large urban areas due to increase in automobile industries. The resulting congestion has become a major concern to transportation specialists and decision makers. The existing methods for traffic management, surveillance and control are not adequately efficient in terms of performance, cost, maintenance, and support. The continuous increase in the congestion level on public roads, especially at rush hours, is a crucial problem in many countries and is becoming a major concern to transportation specialists and decision makers.

This project city is located in the Navsari district. It is 27 km away from the Navsari city railway line passing through this city. National highways No.-8 is 9 km away from the city.

An understanding of traffic flow characteristics is important requirement in the field of traffic engineering. The knowledge of traffic is an essential component of traffic engineering projects related to geometric design of roads, regulation and control of traffic operations, accident analysis, before-and-after studies of road improvement schemes, assessing journey times, congestion on roads and in correlating capacity with speeds. It is one of the components of the fundamental relationships of traffic flow theory other than density and volume.



Figure 1. showing Morarji Desai Road Traffic Scenario

The specific objectives of the project were as follows:

- To study the classified vehicular flow behavior.
- To study the mix traffic flow on stream flow profile .

II. METHODS & MATERIALS

The current classified traffic volume study has been carried out on a Morarji Desai Road in Bilimora city from College to Station area for sixteen hour (16-hour Classified Volume Count survey) by manual approach in both directions. 16 hour classified traffic volume count is carried out from 6:00 AM to 10:00 PM. Also Daily Traffic Variation of Vehicle on Morarji Desai Road on both the side (i.e. towards station & towards College) was prepared. Variation of traffic flow towards station & towards college was also prepared with modewise. For this, the Plan Map of Bilimora was collected from Nagarpalika and then obtained data were analyzed.

Table 1 : Showing Hourly Traffic Volume Count towards Station

Hourly Traffic Volume Count: Towards Station										
Time	Fast Moving Vehicle						Slow Moving Vehicle			P.C.U.
	Two Wheeler	Auto Rickshaw	Four Wheeler	Bus	LCV	Truck	Bicycle	Other NMV	Others	
6:00-7:00	582	125	43	15	23	15	59	0	0	590.5
7:00-8:00	1131	282	103	15	29	4	70	0	0	1063.5
8:00-9:00	837	312	189	26	43	47	96	1	0	1213.5
9:00-10:00	1255	306	195	9	45	24	93	3	0	1332.5
10:00-11:00	876	217	157	29	44	27	79	4	0	1048
11:00-12:00	798	186	150	27	47	46	93	10	0	1045.5
12:00-13:00	646	169	117	34	21	37	38	4	0	827.5
13:00-14:00	830	233	150	31	34	25	34	5	0	995
14:00-15:00	795	229	153	17	31	16	40	10	0	934.5
15:00-16:00	558	175	140	23	25	19	73	5	0	767
16:00-	851	259	188	22	35	12	218	4	0	1109

17:00										
17:00-18:00	1555	210	182	13	29	11	95	6	10	1402
18:00-19:00	1702	495	330	49	32	46	60	20	0	1995.5
19:00-20:00	818	159	134	11	27	10	44	1	0	812.5
20:00-21:00	611	138	111	10	27	3	40	2	0	642
21:00-22:00	423	104	85	13	12	7	27	0	0	472.5
Total	14268	3599	2427	344	504	349	1159	75	10	16251

Table 2 : Showing Hourly Traffic Volume Count towards College

Hourly Traffic Volume Count: Towards College										
Time	Fast Moving Vehicle						Slow Moving Vehicle			P.C.U.
	Two Wheeler	Auto Rickshaw	Four Wheeler	Bus	LCV	Truck	Bicycle	Other NMV	Others	
6:00-7:00	297	109	35	18	11	8	38	0	0	379
7:00-8:00	758	239	93	14	19	8	101	3	0	839.5
8:00-9:00	1067	240	115	7	63	5	33	2	3	1052
9:00-10:00	1450	326	171	9	38	11	49	2	4	1385
10:00-11:00	1384	241	149	9	32	8	63	2	9	1274
11:00-12:00	1275	213	214	9	60	7	22	1	6	1249.5
12:00-13:00	1174	189	189	11	39	9	25	3	4	1116
13:00-14:00	1138	235	229	5	56	10	11	4	6	1214
14:00-15:00	1235	224	152	14	37	17	27	3	5	1179
15:00-16:00	1041	200	153	7	30	14	39	4	9	1068.5
16:00-17:00	1421	148	237	8	44	17	33	3	5	1285.5
17:00-18:00	1734	259	178	5	32	17	44	2	3	1459.5
18:00-19:00	1586	240	168	11	20	14	65	2	2	1341
19:00-20:00	1375	220	119	9	25	15	29	0	8	1201
20:00-21:00	1232	99	124	7	16	6	4	0	1	901.5
21:00-22:00	835	26	31	3	11	6	14	0	4	552.5
Total	19002	3208	2357	146	533	172	597	31	69	17497.5

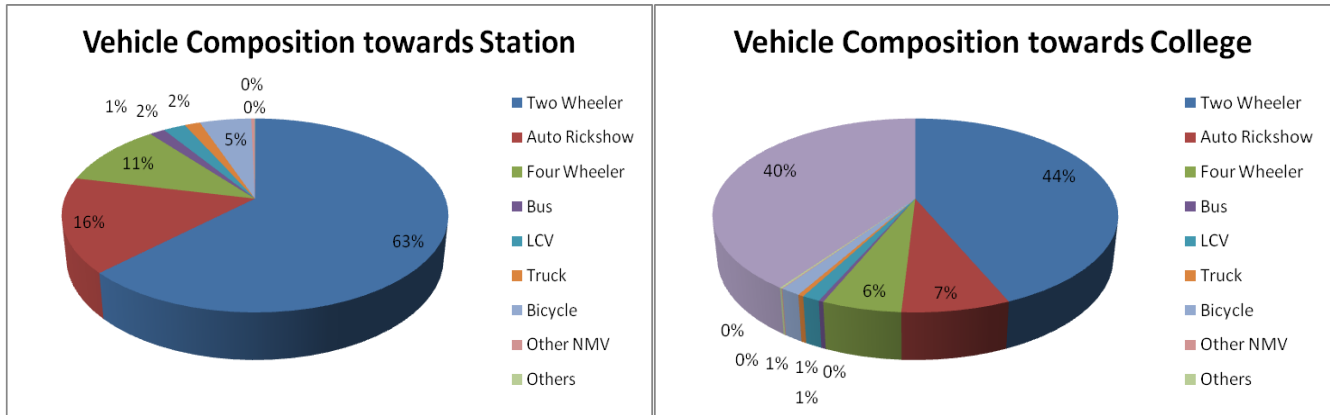


Figure 2. showing Vehicle composition both on towards station & college

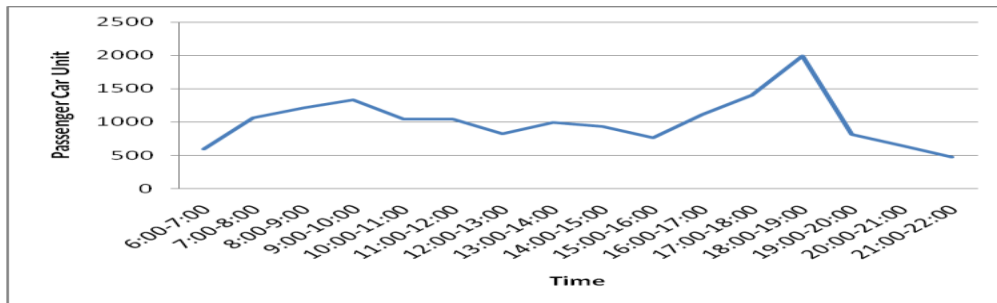


Figure 3. Showing Hourly Traffic Volume Count towards Station

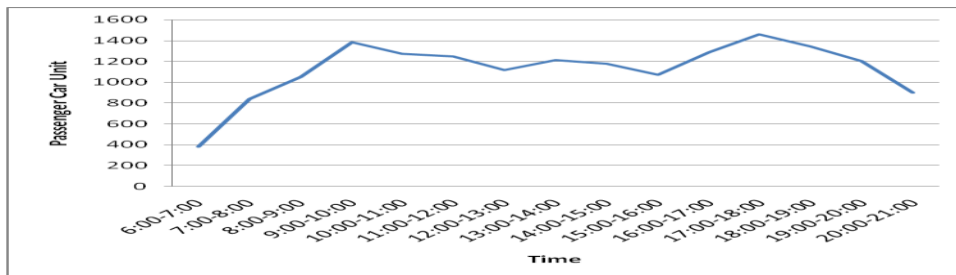


Figure 4. Showing Hourly Traffic Volume Count towards College

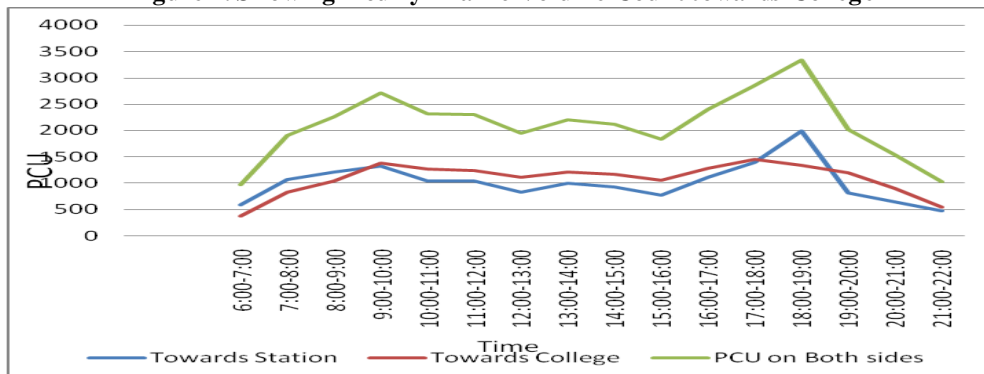


Figure 5. Showing Daily Traffic Variation on Morarji Desai Road

The methodology adopted in this project has been shown below through the Flow-chart.

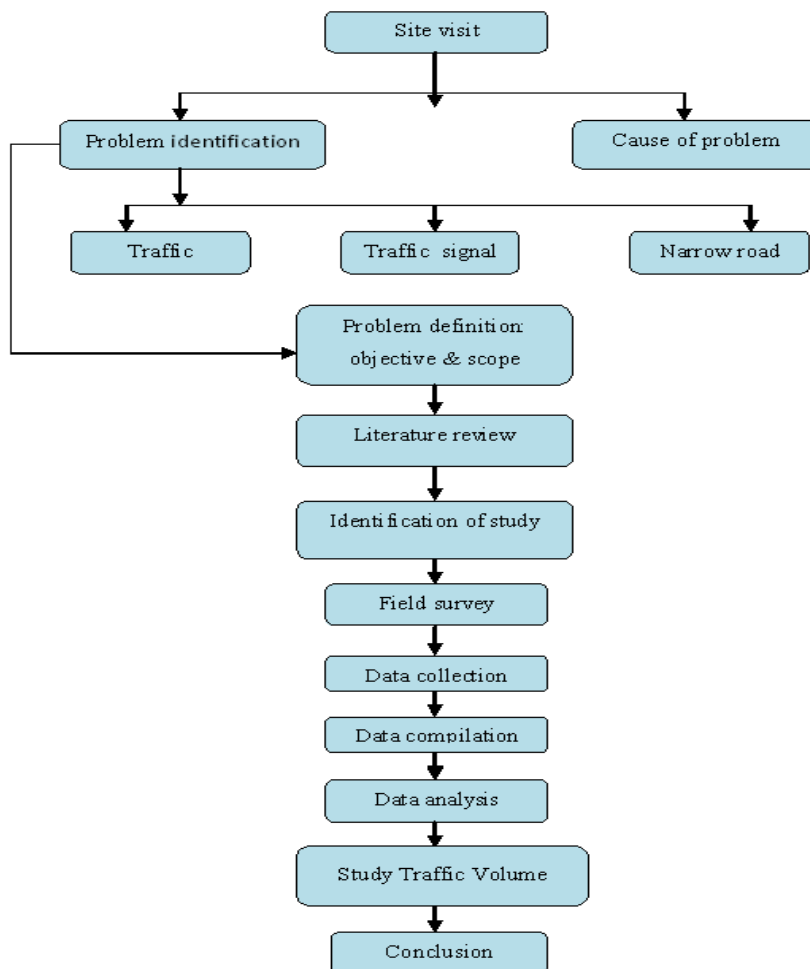


Figure 6 Flowchart of Methodology

III. RESULTS AND DISCUSSION

After completing the site inspection and traffic survey, other relevant data were collected and analyzed. By seeing the Vehicle composition, it is observed that 63% share of whole traffic is constituted by two wheeler towards station and 44% share of whole traffic constituted by two wheeler towards college. It is observed that the maximum hourly flow was 1930 vehicles per hour in the morning peak hour between (09:00-10:00 am) & the maximum hourly flow observed in the evening peak hour (06:00 to 07:00 pm) was 2734 vehicles per hour towards station. On a contrary It was also observed that the maximum hourly flow-rate was 2060 vehicles per hour in the morning peak hour between (09:00-10:00 AM) & the maximum hourly flow-rate observed in the evening peak hour (5:00 to 6:00 PM) was 2274 vehicles per hour towards college. Also 5 min. flow rate histogram was prepared for both the towards station & college area for morning as well as evening peak hour.

Table 1: Showing Hourly flow Rate towards Station

Duration	Flow-Rate (vph)									Total Flow Rate (vph)
	2w	3w	4w	Bus	LCV	Truck	Bicycle	ONMT	Others	

MPH	1255	306	195	9	45	24	93	3	0	1930
EPH	1702	495	330	49	32	46	60	20	0	2734

Table 2: Showing Hourly flow Rate towards College

Duration	Flow-Rate (vph)									Total Flow Rate (vph)
	2w	3w	4w	Bus	LCV	Truck	Bicycle	ONMT	Others	
MPH	1450	326	171	9	38	11	49	2	4	2060
EPH	1734	259	178	5	32	17	44	2	3	2274

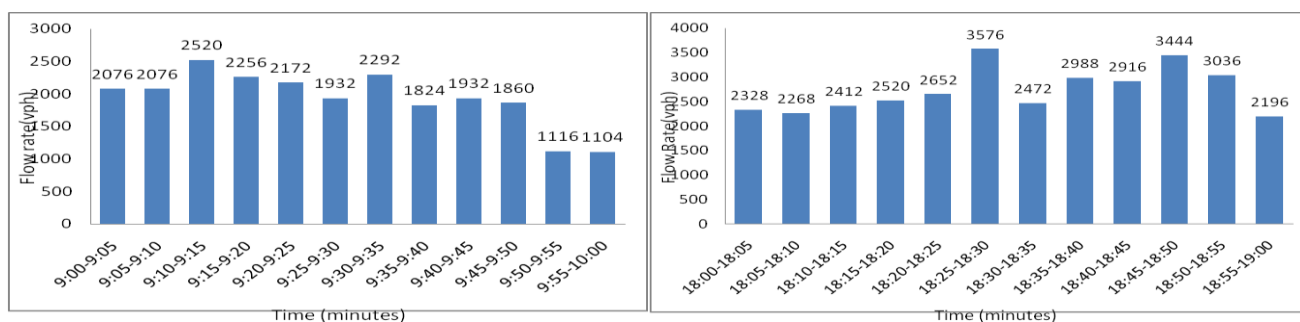


Figure 7. Showing 5min. flow rate Histogram towards station for MPH & EPH

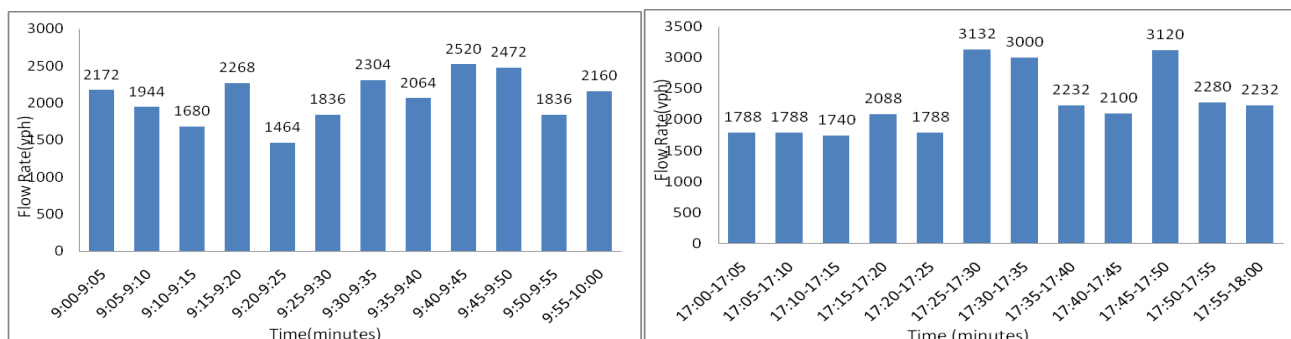


Figure 8. Showing 5min. flow rate Histogram towards College for MPH & EPH

IV. CONCLUSION

This study has led to the following conclusions:

- From the above study, it was concluded that Traffic was maximum in morning as well as in evening peak hour on both the side (i.e. towards Station & towards College).
- From, the directional split survey, it was concluded that vehicular traffic flow was observed 47% towards station area & 53% towards college area.
- From, 5 min. flow rate histogram, it was observed that for a morning as well as evening peak hour there was slight deviation observed in traffic flow both towards station & towards college.
- The results of this study will be useful for any civil engineer for understanding the traffic flow behaviour in future for that area.

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