

TRAFFIC ANALYSIS ALONG ONE MAJOR ROAD IN NASIK CITY BY STATISTICAL METHOD

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Abstract: A significant effort has been made in order to study the Traffic Volume of Canada corner to old CBS road, Nashik. In Nashik along that section attracts a lot of vehicular population. The old CBS to Canada corner road section itself becomes a major traffic generator in a way. Along this section of road contains places to work, learn, socialize and live each with its own trip purpose. In recent years, usage of automobiles has increased considerably. In addition to going to class, students also are likely to use vehicles for employment, recreation, shopping and social activities. The objective of the study is to analyze the prevailing traffic conditions on the road. Traffic Volume study is carried out in the section of road and existing level of service is calculated. Due to mixed nature of traffic it gets difficult to accommodate all the kinds of traffic on these roads. The basic problem arises during the peak hours of the day when the traffic volume is highest on the road. The volume study were done at CBS signal and Canada corner signal which are the major entry points in the road section. The data was analyzed for the peak hour of traffic.

Key words: traffic volume, Capacity and Level of Service.

I. INTRODUCTION

With the increase in the growing population in the Nashik, the number of motorized vehicles registered alone is approximately 1.5 lacs. If we add the floating vehicular population from the adjoining cities the situation becomes grimmer. The old CBS to Canada corner road itself becomes a major traffic generator in a way. The section of road is large and contains places to work, learn, offices, shops, socialize and live — each with its own trip purpose. Four main types of traffic exist around this road: the traffic that would be there regardless of the presence of educational areas, the traffic composed of faculty and staff as they travel to and from work, the traffic from commuting students as they arrive and depart for classes and then leave for home,

and the traffic from students as they travel between different places. In recent years, usage of automobiles has increased considerably. In addition to going to class, students also are likely to use vehicles for employment, recreation, shopping and social activities. With vehicular traffic on the campus becoming chaotic every day. The long-standing problem of cars parked on roads on to traffic snarls and chaos.

A. Study area

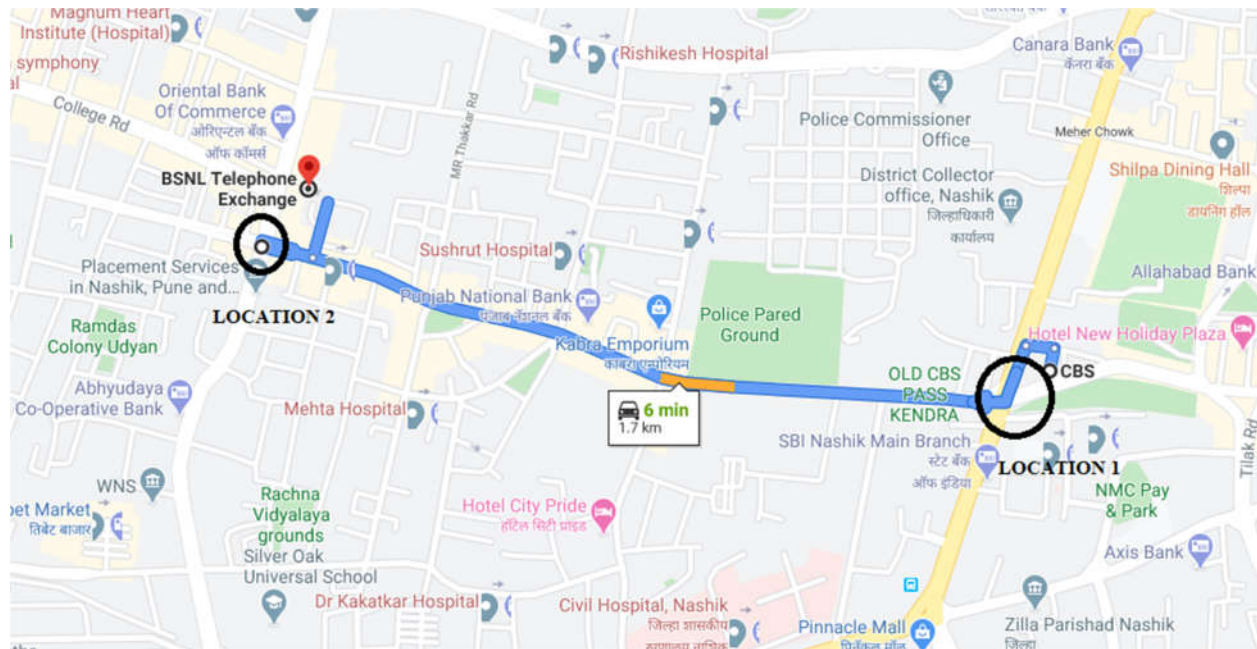


Fig 1. Location map of study road

The study area includes the major entry points of the vehicle in the old CBS to Canada corner signal. These roads are the V5 roads which meanders through the sector giving access to its inner lands. This study aims at collecting and analyzing the volume and determine the level of service of road.

II. OBJECTIVE AND METHODOLOGY OF THE STUDY

The main objectives of the study are:

- To carry out various traffic volume on selected section of Sharanpur road.
- To study the traffic flow pattern on weekdays and weekends for hourly and daily variations.
- To evaluate the capacity and level of service of the road.

Study methodology has the following steps:

- Pilot Survey: Pilot survey was conducted in order to understand the road network and the existing problems in that area.
- Selection of critical points: This was done based on the Pilot survey. The critical points were decided based on the stretches carrying the maximum traffic.
- Data Collection: The Data was collected for the volume studies, for the purpose of designing or improving planning and management.
- Traffic Volume Study: The traffic volume counts were done manually and by videography technique at the selected points.
- Data Analysis: Data collected was then analyzed to determine the traffic composition, daily and hourly traffic variations on weekdays and weekends, to determine capacity and Level of Service.
- Conclusions and Recommendations: After the analysis was done conclusions were drawn and recommendations were made for the same.

III. DATA COLLECTION AND ANALYSIS

The data collection was done after carefully studying the Study Area. After doing the pilot survey particular roads were taken. It was made sure that the roads under study were free from all the obstructions like signals, stop signs and excessive kerb parking etc. The study was conducted on a clear weather when the pavement was dry and no repair work was under operation at that time. Traffic volume study was conducted on the working days i.e. from Monday to Saturday on both the signal points (old CBS signal and Canada corner signal). The counting of vehicles going inside road section and coming out of road section was done for both the signal points continuously for 10 hours from 08:00 am to 06:00 pm as from pilot survey it was observed that these were the busiest hours during which the traffic was high as compared to the other part of the day. The physical characteristics of the two gates at which volume study was done were measured with the help of measuring tape.

For the calculation of volume at these signals, both Manual method and Videotape or video camera method (photographic method) were used. A digital camera was used to make a count of

the traffic at each gate. The camera was mounted on a tripod stand and the video was made for the required number of hours. Later this video was rewinded and viewed again was for data analysis with the help of computer and required data sheets were made. In the present study, 1 hour time interval is chosen for the variation of traffic coming in and going out of the campus. Different data sheets are then made for hourly and daily variation in the traffic and also for the weekly variation in traffic. PCU equivalent data sheets were also made. The peak hour of the traffic coming in and going out was computed which is then used for capacity computation. The value of PCU Equivalent for Urban roads as per IRC: 106-1990 is taken as:1 for Cars/Jeep (4-wheelers), 0.75 for scooter (2-wheelers) and 1.2 for Auto rickshaws (3 wheelers).

Table 3.1: Hourly and daily traffic volume variation near CBS signal

COUNT HOUR	MONDAY		TUESDAY		WENSDAY		THURSDAY		FRIDAY		SATYURDAY	
	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
8 am – 9 am	400	364	438	395	504	437	565	378	343	283	127	89
9 am – 10 am	696	784	731	787	761	819	920	872	803	502	302	271
10 am- 11 am	533	504	577	520	595	633	680	534	793	523	335	302
11 am – 12 am	563	492	600	515	646	563	604	546	552	508	271	260
12 am – 1 pm	478	456	542	535	627	558	586	574	578	652	284	274
1 pm – 2 pm	661	466	715	501	773	667	719	649	741	747	339	275
2 pm – 3 pm	693	741	687	791	768	778	751	725	877	731	260	238
3 pm – 4 pm	713	697	822	766	791	756	506	699	679	679	238	224
4 pm - 5 pm	772	780	777	830	823	845	652	750	744	781	210	254
5 pm – 6 pm	533	605	603	659	652	752	530	650	599	703	240	310
Total volume	6036	5910	6492	6291	6940	6808	6513	6390	6709	6109	2606	2505

From the hourly variation plot for near CBS signal for 6 days a week as shown in Table 3.1, it is seen that the maximum number of vehicles which arrive in the campus are 920 vehicles during 09:00 am to 10:00 am on Thursday while a maximum of 872 vehicles leaves the campus at the same time on Thursday.

Table 3.2: Hourly and daily traffic volume variation at Canada corner signal

COUNT HOUR	MONDAY		TUESDAY		WENSDAY		THURSDAY		FRIDAY		SATYURDAY	
	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT	IN	OUT
8 am – 9 am	400	364	438	395	504	437	565	378	343	283	127	89
9 am – 10 am	696	784	731	787	761	819	920	872	803	502	302	271
10 am- 11 am	533	504	577	520	595	633	680	534	793	523	335	302
11 am – 12 am	563	492	600	515	646	563	604	546	552	508	271	260
12 am – 1 pm	478	456	542	535	627	558	586	574	578	652	284	274
1 pm – 2 pm	661	466	715	501	773	667	719	649	741	747	339	275
2 pm – 3 pm	693	741	687	791	768	778	751	725	877	731	260	238
3 pm – 4 pm	713	697	822	766	791	756	506	699	679	679	238	224
4 pm - 5 pm	772	780	777	830	823	845	652	750	744	781	210	254
5 pm – 6 pm	533	605	603	659	652	752	530	650	599	703	240	310
Total volume	6958	6349	7296	6791	7181	6442	6719	5989	6363	5991	2500	2687

From the hourly variation plot for Canada corner signal for 6 days a week as shown in Table 3.2, it is seen that the maximum number of vehicles which arrive in the campus are 918 vehicles during 02:00 pm to 03:00 pm on Tuesday, while a maximum of 874 vehicles leave the campus at the same time on Tuesday.

The composition of vehicles which arrives in the road from CBS signal comprises of 43 percent 4-wheelers, 5 percent 3-wheelers and 52 percent 2-wheelers while from Canada corner signal the traffic composition comprises of 44 percent 4-wheelers, 5 percent 3-wheelers and 51 percent 2-wheelers. The average composition of vehicles arriving in the campus comprises of 43 percent of 4-wheelers, 5 percent of 3-wheelers and 52 percent of 2-wheelers

From the hourly variation plot combined for 6 days a week as shown in Table 3.3, it is observed that the maximum number of vehicles going inside the campus are 1749 vehicles 09:00 am-10:00 am on Thursday and the maximum number of vehicles coming out of the 1655 vehicles 04:30 pm-05:00 pm on Wednesday.

IV. LEVEL OF SERVICE COMPUTATION

Capacity was calculated along the road from the CBS to Canada corner. These are the major roads section in the Nashik corporation as every person coming in or going out from that section of road.

Using the results from volume analysis, peak hour flow can be determined for both the for traffic going inside and coming out as shown in Table 4.1.

Table 4.1: Peak Hour PCUs at both the signal points

LOCATION	PERIOD	Vehicles/hr	PCU/hr
CBS signal road point	Peak Hour For Traffic Going In(09:00am-10:00am) on Thursday	920	805
	Peak Hour For Traffic Coming Out(09:00am-10:00am) on Thursday	872	755
Canada signal road point	Peak Hour For Traffic Going In(02:00 pm-03:00 pm) on Tuesday	918	811
	Peak Hour For Traffic Coming Out(02:00 pm-03:00 pm) on Tuesday	874	779

For the calculation of level of service, the Volume/Capacity ratio was first determined and then the level of service is computed as shown in Table 4.2.

Location	Time	Peak Hour Traffic in PCU/hr (V)	Total Width Of Road (m)	No. Of Lanes	Design Service Volume (C)	V/C RATIO	Level Of Service
CBS signal road point	Peak Hour For Traffic Going In (09:00am-10:00am) on Thursday	805	13.5	4	1500	0.53	C
	Traffic Coming Out(09:00am-10:00am) on Thursday	755	13.5	4	1500	0.51	C
Canada signal road point	Peak Hour For Traffic Going In(02:00 pm-03:00 pm) on Tuesday	811	12.8	4	1500	0.54	C
	Peak Hour For Traffic Coming Out(02:00 pm-03:00 pm) on Tuesday	779	12.8	4	1500	0.52	C

V. CONCLUSIONS

The present study has been conducted to analyze the traffic characteristics of Sharnpur road, Nashik. 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 number of vehicles which arrives in the road is on Wednesday i.e. 6940 vehicles from CBS and 7181 vehicles from Canada corner point giving a total of 14121 vehicles, while on leaving the campus, it is seen that 6808 vehicles leaves from CBS and 6442 vehicles leaves from Canada corner giving a total of 13250 vehicles.
2. The minimum traffic is observed on Saturday i.e. on arriving 2606 vehicles arrives from CBS and 2687 vehicles arrives from Canada corner giving a total of 5293 vehicles, while during leaving the campus 2502 vehicles leaves from CBS and 2500 vehicles leaves from Canada corner giving a total of 5002 vehicles.
3. The traffic composition of the vehicles which arrives and leaves the road section constitutes of 43 percent of 4-wheelers, 5 percent of 3-wheelers and 52percent of 2-wheelers from both the locations.
4. The peak hour of the traffic going in the campus is found be between 09:00 am – 10:00 am on Thursday (920 vehicles) from CBS and 02:00 pm – 03:00 pm on Tuesday (918 vehicles) from Canada corner.
5. The level of service as calculated for both the roads opposite to old CBS and Canada corner were found to be of C level of service against all the peak hour traffic.

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