

Analysis of Traffic Flow at Selected Mid-Block Locations in Amravati City

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Abstract - Traffic on streets comprises of street regulars like people on foot, vehicles, trolleys, transports, and different movements. The traffic design on Indian Roads is profoundly varying in nature. With the expansion in rush hour gridlock, blockage is an unavoidable condition in huge and developing metropolitan urban areas. Traffic control is a fundamental segment in the sheltered and proficient activity of any transportation framework. While traffic control can be considered at first as a need to control enormous quantities of vehicles, understand that traffic is comprised of countless individual administrators who on the whole should settle on predictable choices all together for the frameworks to work securely and effectively. In this parametric investigation, information was gathered from two diverse mid-square areas for various time spans for seven days. Traffic investigation at these mid-square areas prompts the conceivable advancement of arrangement as the development of either flyover or sidestep, an extension of the width of streets, improvement of a sign structure, or arrangement of a planned sign if essential, giving traffic checking and signs.

Key Words: Pedestrian, Mid-square, Volume check, vehicular qualities, Mixed Traffic

1. INTRODUCTION

In transportation provision aim, the examination of the relationship between adventurer (tallying individuals by walking, cyclists, drivers, and their vehicles) and establishment (checking interstates, signage, and traffic control devices), with the purpose of comprehension and working up the best vehicle coordination with compelling advancement of traffic and insignificant traffic blockage issues. In regular day to day existence traffic clogs' a normal issue in urban territories and enormous towns which results as a result of the fast improvement of people in the growing number of vehicles. According to the review of 2019, there are around 40 million vehicles in India, which are developing at the pace of 16-18%. Along these lines, the vehicle request is set to develop by 1.5 occasions in the following ten years. Traffic normally streams in a mind-boggling and nonlinear way, dependent upon the relationship of a colossal number of vehicles. Traffic is additionally incredibly hampered by the nature of asphalt and asphalt upsets like pot-gaps, breaks,

rutting, and so forth. Frequently clogs on the lanes is the aftereffect of deficient width of accessible carriageway. Mid-square traffic crossing points enable walkers to safely go over the street in a square, rather than making an outing consummately convergence or convergence at erratic mid-square territories. The two basic sorts of mid-square traffic crossing points are medians and mid-square signals. It is fundamental to know the traffic volume and particular vehicle classes' structure in any roadway for key masterminding, upgrades, and upkeep. It similarly recognizes the Average Daily Traffic, Peak Hour Traffic, and its structure.

This investigation incorporates getting vehicle-turning advancements and its creation in a combination. This information is fundamental for all key Junction Improvements, Signaling, Planning the Pedestrian Crossing, and so forth. Furthermore, it gives the pinnacle hour turning improvement information. This survey evaluates the idea of the traffic advancement along a course and perceives the zone, cause, and level of the deferrals in a comparable course. These license coordinators to make updates. Similarly, it might be used as a gadget to take a gander at the pre and post effects of any improvement. We use different strategies like skimming vehicle methodology, moving-vehicle procedure, ANPR, chronicles, and GPS to inspect the specific Travel Time and Delay surveys. Halting a diagram is a gadget to perceive the intrigue and breaking point of halting by masterminding pros. Halting audit is taken out both ON Street and Away the road. This audit gives a report on the range of remain, turnover, repeat, conglomeration, unlawful halting, and salary and breaking point consider. We use manual, video, ANPR to isolate the key information.

1.1 Aim and Objectives

To advance of mid-square fragment and road improvement at the crossing point of explicit spot to control the traffic volume and its anxiety.

1. To decide the traffic volume of the mid-square segment and crossing point

2. To timepiece the asphalt condition.
3. To perform record search, site examination and information assortment to distinguish existing utilities in the region.
4. To examine and study the impact of different variables identified with vehicular communications and street site stopping attributes, vehicular developments, traffic conditions, and street conditions.

1.2 Objectives of Study

1. Atmosphere security
2. Sound and safe systems
3. Lessens union accident types.
4. Transportation structure ampleness
5. Improved traffic stream by keeping up a key good ways from effects and blocking blockage delays.
6. Encourages unusual and perilous traffic advancements at 'X' and 'T' combinations.

1.3 Issues Related In Crossing

An issue caused at a road crossing

1. Monstrous traffic stops up due to the intersection point.
2. The blocked street makes long queues of vehicles.
3. Augmentation travel time and fuel use.
4. Air defilement and uproar sullyng.

Mishaps cause a road site.

1. Most crashes happen at combinations.
2. The setback (mishap) caused due to some specific issue of vehicles.

2. WORK PERFORMED

These are 2 choose location in Amravati city. Traffic amount at Sai Nagar Square and Gandhi Chowk.



Figure 1 Location of Sai Nagar

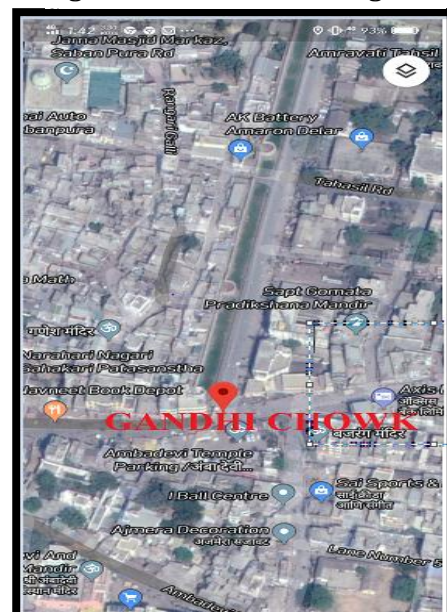


Figure 2 Location of Gandhi Square

3. METHODOLOGY

3.1 Data Collection

1. The Traffic Volume at Sai Nagar Square 25th January to 2nd February and Gandhi Chowk Amravati 11th February to 17th February mid-square area, data are dispensed.

2. The traffic stream study at the mid-square area from time 09 AM to 11 AM. Furthermore evening 05 PM To 07 PM.

3. At a traffic convergence, the automobile overload is for the most part in the early morning and in night. Most traffic issues of the intersection are happened by huge vehicle and leaving and passerby, and to determine issues of traffic the flyover, tram ought to be given or the width of the street ought to be expanded.

Traffic investigation procedures are lead by traffic volume checks:

(1) Manual check and

(2) Automatic check

Manual checks used to decide or gather data of vehicles consuming the space and there turning developments and heading of going of vehicle and passerby developments on the street. Programmed checks are generally adjusted to gather data for occasional contrasts, auto hourly examples, yearly traffic evaluations, or development patterns, or every day.

This investigation material is controlled by utilizing the absolute volume tally. The tallying sum ought to be spoken to by day of month, time of day, and month of the year for the examination, for instance, including vehicles in the long stretch of March, April i.e in summer ought not to be taken in the period of January. The tallying of vehicles can be kept away from when there are occasions, rally, climate conditions, and so on (1994 Sharma).

The checking of vehicles ought to be done 05 min to 1 year. As a rule, the tallying of the vehicles is from quarter-hour for example 15 minutes to 2 hours for the pinnacle hour, 04 to 05 hours for evening and morning top time, 06 hours for evening, late morning and morning top time, and 12 hours for the day time frames (1994 Robertson). For example on the off chance that we are leading an overview of 02 hours, we should take at any rate 08-15 minutes of checking.

3.2 Manual tally technique

Most utilization of manual checks requires little case of information at some arbitrary territory. Manual counts are conventionally used once the trouble and cost of machine-driven instrumentation aren't even. Manual counts are fundamental once arranged instrumentation isn't accessible. Manual checks are normally used for times of yet

consistently. Standard between times for a manual check is 5, 10, or quarter-hour. Traffic counts all through a Monday morning time of day and a weekday evening time of day could show astoundingly high volumes and aren't comm. only used in the examination.

Tally Sheets

Recording information into tally sheets is that the least troublesome suggests that of driving manual checks. The information is as often as possible recorded with a tick blemish on a pre-orchestrated field type. A watch or clock is basic to live the important check between times.

4. RESULTS

4.1 Counting of vehicles- 1) Sai Nagar Square, Amravati (09:00-11:00am)

Table 1 Traffic Volume count at Sai Nagar Square (09:00-11:00 am)

Days	Two Wheelers		Three Wheelers	Four Wheelers			
	Bicycles	Bike /Moped	Auto rickshaws	Car	Bus	City Bus	Truck
Day 1	32	1056	89	161	39	34	25
PCU	16	792	44.5	161	117	102	75
Day 2	40	1059	107	179	42	35	64
PCU	20	794.25	53.5	179	126	105	192
Day 3	44	1104	136	115	38	31	73
PCU	22	828	68	115	114	93	219
Day 4	26	1041	77	78	31	28	46
PCU	13	780.75	38.5	78	93	84	138
Day 5	47	1180	73	80	31	22	65
PCU	23.5	885	36.5	80	93	66	195
Day 6	33	883	91	79	17	24	37
PCU	16.5	662.25	45.5	79	51	72	111
Day 7	44	1062	74	77	34	26	45
PCU	22	796.5	37	77	102	78	135

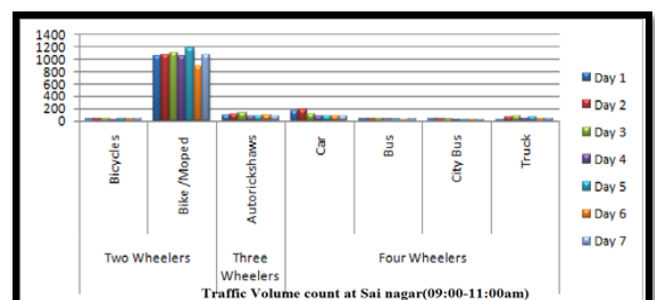


Figure 3 Traffic Volume count at Sai Nagar Square (09:00-11:00 am)

Average Daily Traffic (ADT) = 1339.4 (veh/day)

PHF for Bicycle $133/4 \times 15 = 2.21$

PHF for Bike $5538.75/4 \times 15 = 92.31$

PHF for Autorickshaws $323.5/4 \times 15 = 5.39$

PHF for Car $1264/4 \times 15 = 21.06$

PHF for Bus $696/4 \times 15 = 11.6$

PHF for City bus $600/4 \times 15 = 10$

PHF for Truck $1065/4 \times 15 = 17.75$

4.2 Counting of vehicles- 2) Sai Nagar Square, Amravati (05:00-07:00pm)

Table 2 Traffic Volume count at Sai Nagar square (05:00-07:00 pm)

Days	Two Wheelers		Three Wheelers	Four Wheelers			
	Bicycles	Bike /Moped	Auto rickshaws	Car	Bus	City Bus	Truck
Day 1	47	1480	117	110	23	20	45
PCU	23.5	1110	58.5	110	69	60	135
Day 2	42	1206	132	118	29	14	45
PCU	21	904.5	66	118	87	42	135
Day 3	71	864	106	119	23	20	53
PCU	35.5	648	53	119	69	60	159
Day 4	39	1068	70	65	17	23	37
PCU	19.5	801	35	65	51	69	111
Day 5	52	1214	108	66	18	22	49
PCU	26	910.5	54	66	54	66	147
Day 6	27	755	117	70	23	28	41
PCU	13.5	566.25	58.5	70	69	84	123
Day 7	31	746	160	118	29	36	53
PCU	15.5	567	80	118	87	108	159

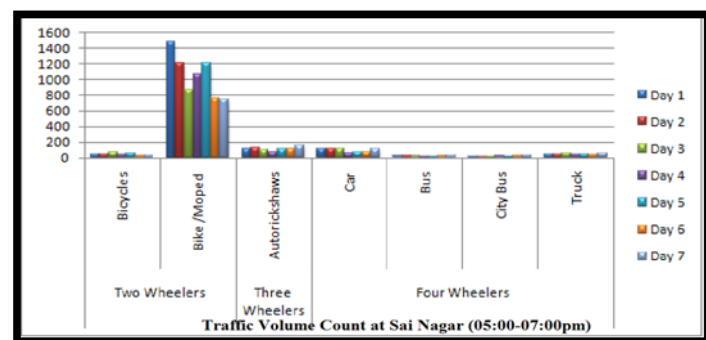


Figure 4 Traffic Volume count at Sai Nagar square (05:00-07:00 pm)

Average Daily Traffic (ADT) 1362.2 (veh/day)

PHF for bicycle $154/4 \times 15 = 2.56$

PHF for Bike $5507.25/4 \times 15 = 91.78$

PHF for Autorickshaws $402/4 \times 15 = 6.7$

PHF for Car $666/4 \times 15 = 11.1$

PHF for Bus $486/4 \times 15 = 8.1$

PHF for City bus $489/4 \times 15 = 8.1$

PHF for Truck $969/4 \times 15 = 16.15$

4.3 Counting of vehicles- 3) Gandhi Square, Amravati (09:00-11:00am)

Table 3 Traffic Volume count at Gandhi Square (09:00-11:00 am)

Days	Two Wheelers		Three Wheelers	Four Wheelers			
	Bicycles	Bike /Moped	Auto rickshaws	Car	Bus	City Bus	Truck
Day 1	44	480	80	32	0	0	19
PCU	22	360	40	32	0	0	57
Day 2	82	637	91	40	0	0	28
PCU	41	477.75	45.5	40	0	0	84
Day 3	62	565	96	50	0	0	46
PCU	31	423.75	48	50	0	0	138
Day 4	75	716	74	51	0	0	29
PCU	37.5	537	37	51	0	0	87
Day 5	59	467	100	54	0	0	22
PCU	29.5	350.25	50	54	0	0	56
Day 6	77	623	67	58	0	0	18
PCU	38.5	467.25	33.5	58	0	0	54
Day 7	78	601	97	56	0	0	31
PCU	39	450.75	48.5	56	0	0	93

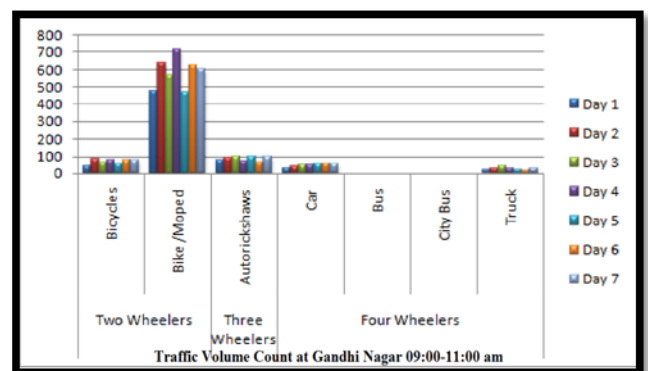


Figure 5 Traffic Volume count at Gandhi Square (09:00-11:00 am)

Average Daily Traffic(ADT)= 802.97 (veh/day)

PHF for Bicycle $238.5/4*15=3.97$

PHF for Bike $3066.25/4*15=51.10$

PHF for Autorickshaws $302.5/4*15=5.04$

PHF for Car $341/4*15=5.68$

PHF for Bus $0/4*15=0$

PHF for City bus $0/4*15=0$

PHF for Truck $569/4*15=9.48$

4.4 Counting of vehicles- 4) Gandhi Square, Amravati (05:00-07:00pm)

Table 4 Traffic Volume count at Gandhi Nagar Square (05:00-07:00 pm)

Days	Two Wheelers		Three Wheelers	Four Wheelers			
	Bicycles	Bike /Moped	Auto rickshaws	Car	Bus	City Bus	Truck
Day 1	94	549	94	33	0	0	11
PCU	47	411.75	47	33	0	0	33
Day 2	112	613	56	49	0	0	23
PCU	56	459.75	28	49	0	0	69
Day 3	94	684	64	66	0	0	22
PCU	47	513	32	66	0	0	66
Day 4	89	989	51	87	0	0	21
PCU	44.5	741.75	25.5	87	0	0	63
Day 5	69	885	65	61	0	0	29
PCU	34.5	641.25	32.5	61	0	0	87
Day 6	89	842	64	87	0	0	35
PCU	44.5	631.5	32	87	0	0	105
Day 7	80	688	57	87	0	0	33
PCU	40	516	28.5	87	0	0	99

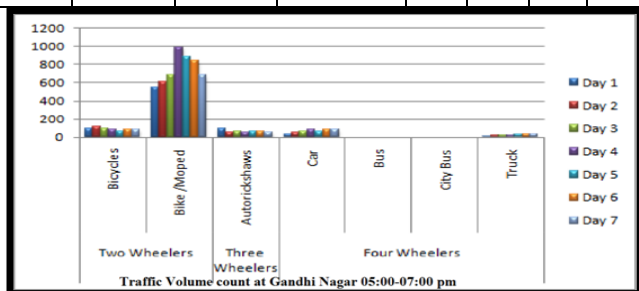


Figure 6 Traffic Volume count at Gandhi Nagar Square (05:00-07:00 pm)

Average Daily Traffic (ADT)= 988.07(veh/day)

PHF for Bicycle $313.5/4*15=5.22$

PHF for Bike $3573/4*15=59.55$

PHF for Autorickshaws $225.5/4*15=3.75$

PHF for Car $470/4*15=7.83$

PHF for Bus $0/4*15=0$

PHF for City bus $0/4*15=0$

PHF for Truck $522/4*15=8.7$

5. TRAFFIC DATA ANALYSIS

In this, we come to realize that, the information which has been gathered between two-stage for example morning 9 am-11 am and night 5 pm-7 pm, the aggregate sum of vehicles which went through the chose area is less toward the beginning of the day than the night and it continues expanding gradually from 9 am-11 am. At night the traffic is more when contrasted with the morning.

As indicated by my investigation, I came to realize that the traffic from time 11 am-2 pm is more and it continues diminishing from 2 pm-5 pm and the traffic level is at a normal from 5 pm-7 pm and it continues expanding after 7 pm to 9 pm.

The aggregate sum of vehicles going through the chose areas makes roads turned parking lots which is the fundamental driver. So as indicated by our investigation, we come to realize that,

- 1) There ought to be traffic flags on some traffic-blocked territories.
- 2) The nearness of traffic police can likewise be a useful method to watch out for the traffic.

6. CONCLUSION

As indicated by our physical visit to the chose area (site) just as per information examination and perception we reach the determination that there is a need to adjust a few standards to maintain a strategic distance from car influx issues at mid-square segments. A few activities which can be useful for controlling the traffic at mid-square areas are as per the following:-

Sai Nagar Square

1. To avoid the traffic congestion we can give zebra crossing across approaching traffic end of the corner's radius for people can safely crossing the road among three phases.
2. Traffic marking and road signs.

Gandhi Square

1. To avoid the traffic congestion we can put FRB (Fiber Reinforced Plastic Road Divider)
2. Traffic marking and road signs.

7. REFERENCES

1. Ashish Dhamaniya et. al. "Influence of Undesignated Pedestrian Crossings on Midblock Capacity of Urban Roads", Transportation Research Record: Journal of the Transportation Research Board, No. 2461, Transportation Research Board of the National Academies, Washington, D.C., pp. 137–144, 2014.
2. Meruga Siva Parvathi , et. al. "Classified Traffic Volume Study at Ghatekesar Junction", International Journal of Engineering and Techniques - Volume 3 Issue 6, pp 420-435, 2017.
3. Arunesh Tiwari, et. al. "Traffic Study on Mid-Block Section & Intersection", IJRSET, Vol. 6, Issue 5, p-p 7632-7639, 2017.
4. Miss. Anjali. M. More et. al. "Road Traffic Accident Analysis on NH-6 of Amravati City (Maharashtra)" International Research Journal of Engineering and Technology (IRJET) Volume: 05 Issue: 12, pp149-152, 2018.
5. Victor.L.Knoop et.al, "The Effect of Crosswalks on Traffic Flow', EJTI, 18(2), pp. 145–157, 2018.
6. Lakhan Verma¹ et. al., "Traffic Study on Mid-Block Section & Intersection 'International Research Journal Of Engineering And Technology (Iret) Volume: 06 Issue: 03, Pp 3233-3277, 2019.