TRAFFIC VOLUME STUDY AND CONGESTION SOLUTIONS

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ABSTRACT *: Congestion is one of the biggest issues that many Indian cities, as well as other countries, confront. Congestion has a detrimental influence on the economy, the environment, and the overall quality of life. Some of the common characteristics that may be noted include traffic jams, road accidents, and an increase in pollution levels. As a result, it is past time to address the issue of traffic congestion. This article explains the identification of problems or difficulties that create traffic congestion, determining when traffic is most congested, which zones have the greatest traffic, and providing appropriate ideas and recommendations based on the findings in order to improve traffic congestion in Lucknow.*

KEYWORDS: *Congestion, traffic, automobiles, public transit, infrastructures, urban transportation system*

INTRODUCTION

Traffic congestion occurs when cars drive at a slower speed, trips take longer, and there is more waiting of vehicles. They are sometimes referred to as traffic jams. With increased affordability and purchasing power, it is now possible for the average individual to purchase a vehicle. The number of automobiles sold in India last year was significantly larger than the number of cars sold 20 years before. Though this has resulted in a more pleasant lifestyle, many commuters are plagued by traffic congestion on a daily basis, resulting in the loss of important time, and time is money. Traffic congestion happens when the number of cars on the road exceeds the capacity of the road. Traffic congestion is a big issue in most Indian cities. Individual occurrences such as road accidents, road construction, poor road design, or unexpected braking of a car amid a steady flow of heavy traffic can all produce traffic jams. As a result, efficient traffic management is required. Congestion management might involve a mix of physical infrastructure, new smart technology, and new ways of thinking. Smart traffic management systems, smart parking, and smart mobility are all gaining popularity. To make traffic routing decisions, these smart traffic control systems employ advanced technologies such as Smart traffic lights or Intelligent traffic lights with cameras and wireless sensor networks, big data, Automatic Fare Collection System/cashless payment, Smart Parking System/Parking Mobile App, image processing, computer vision, intelligent controls, and artificial intelligence, which are typically performed by traffic officers. Surveillance, administration of highway and arterial networks, intersection traffic signal control, congestion, and incident management are some of the other applications.

AREA OF STUDY

The current work investigates traffic characteristics in the city of Lucknow at one selected priority intersection. The analysis was carried out by a complete primary traffic flow assessment at the IIM Road, Bhitauli crossing.

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OBJECTIVE OF THE STUDY

The current research is being conducted with the goals of measuring traffic volumes and noting other traffic features (e.g., flow composition, flow fluctuations etc.). calculating hourly volume in terms of passenger car equivalents (PCE) Determine vehicle composition in traffic flow, compare results to standard design service volumes, and offer solutions.
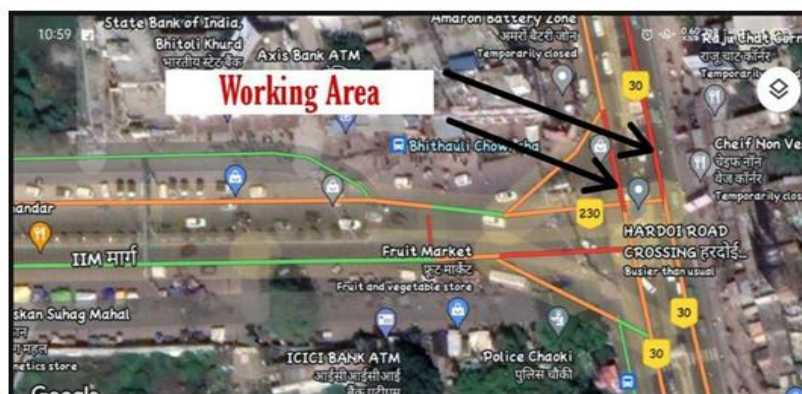
METHODOLOGY

Figure 1: Map and length of our study zone

Location: IIM Road, Bhitauli Crossing were chosen as the location for the traffic volume survey. We stood by the side of the road as several people counted the automobiles. We each chose one enumerator to be in charge of time.

Date: On April 21, 2022, data for the volume study were gathered. It was a Thursday and a workday.

Time: The time of data collection for the volume study varied per group, but for group it was between 10:00 and 10:15 a.m.

Observation: Classified Vehicle Counts.

Method: Direct Manual Method.

Duration: 15 minutes (Short Count)

Equipment: Stop watch, Tally sheet, Clip board etc.

DATA ANALYSIS

(A) Volume/Flow (15 minutes):

Vehicle	Number of Vehicles	PCE	PCU	Total
Bus	18	3	54	
CNG	82	0.5	41	244/15min
Motor cycle	105	0.1	11	
Car	85	1	85	
Pickup	53	1	53	

Table 1: Detailed data

(B) Service flow rate :(veh/hr) from IIM road Bhitauli crossing (Up)

Time	09:00-10:00	10:00-11:00	11:00-12:00	12:00-13:00	13:00-14:00	TOTAL
BUS	180	164	156	144	132	776
CNG	508	440	380	424	376	2128
MOTOR CYCLE	240	172	240	320	220	1192
Private Car	1052	1048	992	904	880	4876
NMT	108	1192	24	.	64	388
Pickup	.	.	.	52	.	52
PCU/hr	1920	1877.2	1686	1632	1518	8633.2

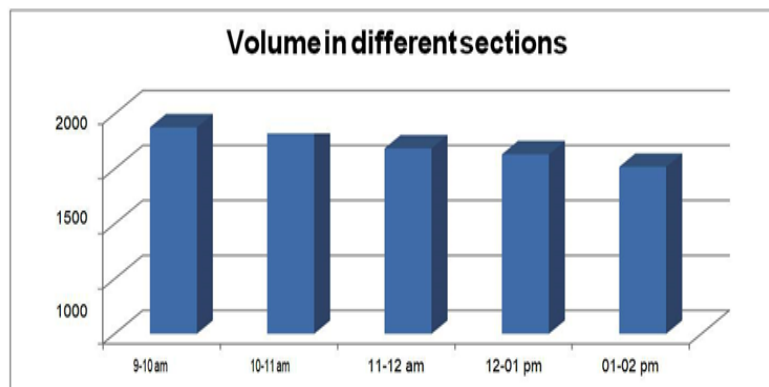**Table 2: (veh/hr) service flow rate from IIM road Bhitauli crossing (Up)**

Fig 2: Volume in different time section

(C) Service flow rate: (veh/hr) from IIM road Bhitauli crossing (down)

Table 3: Service flow rate (veh/hr) from IIM road Bhitauli crossing (down)

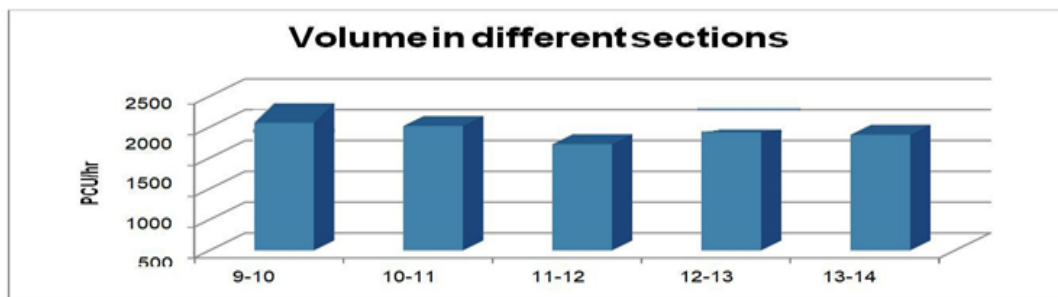| Time	09:00-10:00	10:00-11:00	11:00-12:00	12:00-13:00	13:00-14:00	TOTAL
BUS	192	140	100	96	128	656
CNG	568	444	528	500	420	2460
MOTOR CYCLE	248	352	296	440	244	1580
Private Car	1304	1260	1128	1304	1256	6200
NMT	28	160	-	-	-	188
Pickup	-	-	-	60	-	60
PCU/hr	2248.8	2017.2	1721.6	1848	1874.4	9710

Fig 3: Volume in difference time section

Table 4: Calculation for directional distribution

| From IIM Road, Bhitauli Crossing (Up)		From IIM Road, Bhitauli Crossing (Down)	
Time	PCU/hr	Time	PCU/hr
09-10 am	1920	09-10 am	2248.8
10-11 am	1877.2	10-11 am	2017.2
11-12 am	1686	11-12 am	1721.6
12-01 pm	1632	12-01 pm	1848
01-02 pm	1518	01-02pm	1874.4
Average = 1726.64 PCU/hr		Average = 1942 PCU/hr	
47.3%		52.7%	

*Directional distribution ranges from 55 to 80 percent for rural roads and typically is about 67%

From **IIM Road, Bhitauli Crossing (Up):**

$$\frac{1726}{1726.64 + 1942} * 100 = 47.3\%$$

From **IIM Road, Bhitauli Crossing (Down):**

$$\frac{1942}{1726.64 + 1942} * 100 = 52.7\%$$
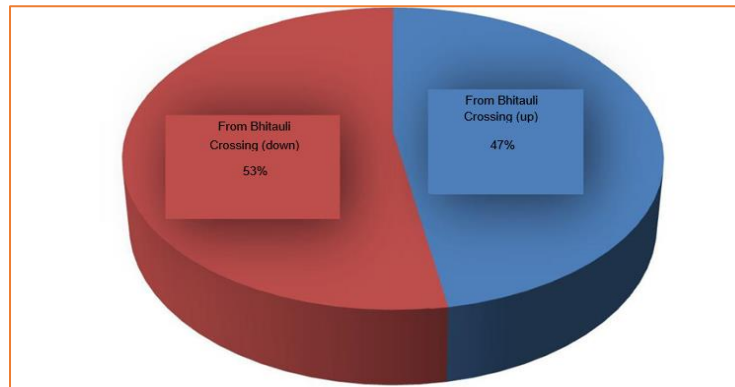
CONCLUSION

The vehicle composition demonstrates that light autos made up the majority of the traffic flow. Only 27% of the total was made up of buses. The considerable quantity of light automobiles is explained by the location's proximity to the high-income group's residential region. There were no overcrowding in the light vehicles. Buses, on the other hand, were practically full, and some passengers were forced to stand due to a lack of seats. Though their incidences were modest, it may be presumed that more individuals travelled by bus. We agreed on the idea that increasing the number of buses would improve the efficiency of the traffic system. Again, we saw that the buses were rather ancient, and several of them lacked smooth front windows. As a result, a significant change in the public transportation system is advocated.

Acknowledgements

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