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REAL TIME ANALYSIS OF TRAFFIC AT PERUNGALATHUR TO URAPAKKAM

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ABSTRACT: The Traffic congestion in a city are a serious issue that hinders the population's mobility. This study examines traffic congestion between Perungalathur to Urapakkam during peak and nom-peak hours. The QGIS application was used to analyses the study area at G.S.T road for a stretch of 6.03kmfrom Perungalathur to Urapakkam. To gain a better knowledge of the causes of traffic and congestion, the number of vehicles travelling along GST Road was studied using video surveillance. The video survey was conducted through out peak and non-peak hours for three consecutive weekdays (Tuesday, Wednesday and Thursday). Finally, for Perungalathur to Urapakkam, a traffic and analysis is done, and a risk ranking is established for the above highway stretch.

Keywords: **Traffic management system, Congestion, Vehicle counting and QGIS**

1. INTRODUCTION

The cities' populations are growing at a rapid pace. In many locations, traffic systems are currently an issue and a source of high traffic density. The growing number of automobiles on the road and increase the accident becomes more. The travel time also increases during the high density of the traffic on the road. Nowadays the two-wheelers are increasing very high. The two-wheelers are causes the most of traffic on the roadsides. The People have used the public transport to reduce the traffic density. The traffic congestion on road not only increasing the fuel consumption but consequently leads to increase in carbon dioxide emission, outdoor air pollutions as well as increasing in the time of the passenger Different experiments are used to reduce the traffic like the image detectors, Sensors are used to calculate traffic density, and sensors are utilized to manage the timing of traffic signals. The traffic is controlled via video surveillance. To examine the traffic density on the road, software such as (Image processor) is employed.

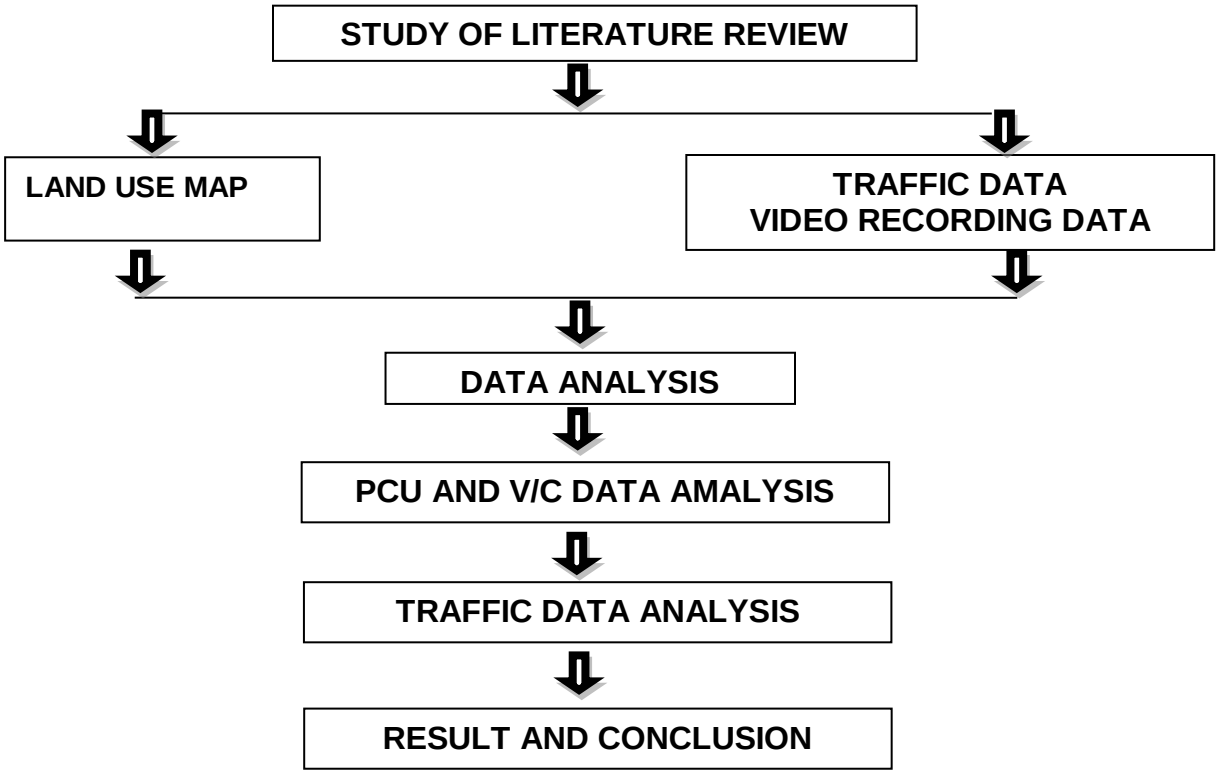
This project analyzes the real-time traffic of the perungalathur to Urapakkam. The total stretch of the project is 6.03 km and the total road stretch numbers of bridges, road crossings, and signals are calculated using the GIS map. To study the highway stretches to obtain the travel behavior, traffic density, and types of vehicles traveling on the road. Video surveillance is used to the analysis the traffic density at a particular time. For the highway stretch, we selected the 3 junctions to monitor the traffic for the three working days. Using the GIS to information about the place name, address of the street, junctions, bridges, crossings and township of the latitude and the longitude sections. The video surveillance is used to monitor the real-time traffic counting, which takes place during peak and non-peak hours on three weekdays (Tuesday, Wednesday, and Thursday). The number of vehicles on the road In video counting, we just point the camera at a specific location and count it at the end of the day. Traffic counting is done exclusively during peak and non-peak hours in the mornings, afternoons, and evenings for this project, and human counting is used to complete the study. Counting vehicles during peak and non-peak hours to calculate vehicle volume. Two-wheelers, cars, autos, buses, and lorries are among the vehicles counted. The v/c ratio is used to figure out how many vehicles and what kind of cars are on the road. The volume to capacity ratio is a method of calculating the number of traffic accidents and the volume of traffic on the road. The number of lanes on the road, the width of the road, and the gradient of the road are all factors to consider.

1.1. SOFTWARE USED FOR REAM TIME TRAFFIC ANALYSI

Using a computer, a "geographic information system" (GIS) is a tool for creating, manipulating, analyzing, showing and storing data depending its location. GIS enables the integration of numerous forms of geographic information, including satellite photographs, digital maps, and GPS data, as well as accompanying information from a tabular database containing "attributes" or characteristics relating to geographical features spatial information (also known as land data or spatial data) is data that may be associated with a place name, an address on a specific street, a sector or township, a zip code, or latitude and longitude coordinates

2. METHOLOGICAL FLOWCHART

The methodology can be broke down into the different layers of parameters such as literature survey, map collections, data collections and video analysis. The Selected Zone is 27.05 km2 and extends from Perungalathur to Urapakkam. The total distance of Perungalathur to Vandalur is 6.03Km. Intersection are present at these points vandalur (for kelambakam road), Perungalathur (for maduravoyal road), Urapakkam (for Keerapakkam road)



3. SITE LOCATION

The Selected Zone is 27.05 km2 and extends from Perungalathur to urapakkam. The total population of the zone is 127414 people, and there are 32587 households in the area. The above data was gathered from the website http://www.census2011.co.in/. Perungalathur to Urapakkam is an 6.03-kilometer length.

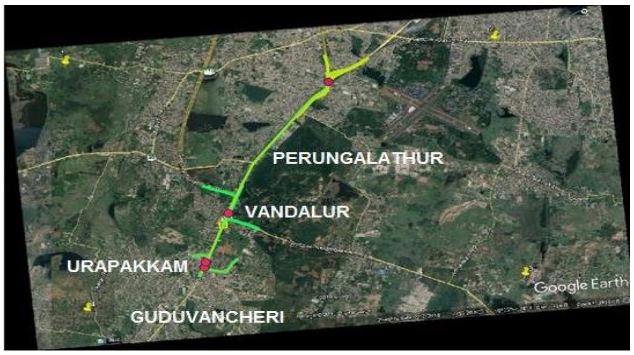


Figure 3.1 Site View of above the stretch

4. PHYSICAL INFRASTRUCTURE

4.1. ROADS

Urapakkam is a small town in the Kanchipuram district in the Chengalpattu Taluka. The town is 34 kilometres from Chennai on the national route to Trichyform Chennai and urapakkam located north side to the Chennai on another side towards chengalapttu is located at a distance of 21km. the road facilities in the urapakkamcovers with mud road, bitumen road for the main roads, it has two NH services roads and concrete roads in some street. Still some of the places in urapakkam have not provided with proper road.

Vandalur is a taluka in Vandalur that is located in the Kanchipuram district. The town is 33 kilometres from Chennai to Trichy on the national route. form Chennai and Vandalur located north side to the Chennai on another side towards chengalapttu is located at a distance of 29km. the road facilities in the Vandalur covers with mud road, bitumen road for the main roads, it has four NH services roads and one outer ring road also provided. The concrete roads in some street. Still some of the places in Vandalur have not provided with proper road.

Perungalathur is a suburb in Vandalurtaluka, located in the Kanchipuram district. The town is 31 kilometres from Chennai on the national route to Trichy. form Chennai and Perungalathur located north side to the Chennai on another side towards chengalapttu is located at a distance of 31km. the road facilities in the Perungalathur covers with mud road, bitumen road for the main roads, it has Three NH services roads and concrete roads in some street. Still some of the places in Perungalathur have not provided with proper road.

Table 1: Collective data on number of vehicles in Perungalathur)

Road Name	Width	Lanes
Perungalathur	**60 m**	**8**
Vandalur	**45m**	**8**
Urapakkam	**45m**	**8**

4.2 .ACCIDENT DATA

The traffic accident has come to be considered as the third dead list killer. The growth in the number as well as the speed of motor vehicles has far outpaced improvements to the road and other traffic facilities. The heavy toll of deaths, injuries and property damage in motor vehicles accidents on streets and roads is an international problem. As the road users are increasing it must follow by the increase in accidents. When vehicle population increases every day, the extent of transportation space in Urapakkam to Perungalathur area is static.

Table 2: Collective data on number of vehicles in Perungalathur)

Place	Guduvancheri		Otteri		Perungalathur	
	No of Accident	No of Dead	No of Accident	No of Dead	No of Accident	No of Dead
2017	312	43	21	4	27	18
2018	183	17	43	72	107	32
2019	73	9	20	9	329	66
2020	232	24	82	17	42	12
2021	26	3	20	8	22	4

4.3. PARKING

Perungalathur to Guduvancheri is a mixed residential area in Chennai. The commercial hub, mofassel bus stand and railway junction at intersection have created a major demand for parking. Most of the adjoining properties do not have off- street parking space. Provision of dedicated off-street parking space in Perungalathur area may serve to relive some problems, but land availability is the constraint.

Table 3: Collective data on number of vehicles in Perungalathur)

Sl.No	Roads	Hierarchy	Width of the roads M	Parking Type
1	Perungalathur	Arterial Road	10	On – two wheeler parking
2	Vandalur	Arterial Road	10	ON – car & two wheeler parking
3	Urapakkam	Arterial Road	10	ON – car & two wheeler parking

4.4. ENVIRONMENT

When we look at the current state of carbon emissions by sector, we can see that the transportation sector accounts for a significant portion of total carbon emissions, accounting for 26% of total emissions when compared to other sectors such as energy, manufacturing, residential, commercial, and so on. In additional, when it comes to transportation-related emissions, road transport accounts for 65 percent of all emissions, compared to rail, air, and water transportation. Vehicles and two-wheelers account for the majority of fuel consumption and emissions, with the exception of cities with populations above 8 million, where bus fuel consumption is higher

Table 4: Collective data on number of vehicles in Perungalathur)

Type of Vehicle Vehicle	Passenger per vehicle	Pollution Load Effect in gm/pass.- km	Congestion effect in PCU/Pass.
Two-stroke two-wheeler petrol engine	2	7.13	0.375
Four-stroke two-wheeler petrol engine	4	4.76	0.375
Car with catalytic converter petrol engine	4	0.93	0.25

Note: PCU = Passenger Car Unit where 1 car = 1 PCU, 1 bus = 2.5 PCU, 1 scooter = 0.75 PCU,etc.

5. FINDINGS

Table 5: Collective data on number of vehicles in Perungalathur(Outgoing Traffic):

VEHICLES	8am to 9am (Peak)	11am to 12pm (Non peak)	3pm to 4pm (Non peak)	6pm to 7pm (Peak)	TOTAL VEHICLES	
					PEAK	Non PEAK
2W	471	458	439	495	996	897
3W	126	91	119	115	245	210

LMV	825	670	630	735	1560	1300
HMV	912	205	212	255	1167	417

As per table Total number of 2W are 1461 during the peak hour 495 and non peak hours 966. The LMV flow was very high at the morning time. The total number of HMV are 1422 and the highest HMV flow was during the peak hour (8to9Am) 912.

Table 6: Collective data on number of vehicles in Perungalathur(Incoming Traffic):

VEHICLES	8am to 9am (Peak)	11am to 12pm (Non peak)	3pm to 4pm (Non peak)	6pm to 7pm (Peak)	TOTAL VEHICLES	
					PEAK	Non PEAK
2W	854	607	415	928	1782	1022
3W	610	302	437	495	1105	739
LMV	1825	1045	1532	1634	3459	2577
HMV	1084	716	640	1145	2229	1356

A per table Total number of 2W are 2804 during the peak hour 1782 and non peak hour 1022. Total number of LMV 6036 the LMV flow during the peak hours are 1825 (8 to 9am) and 1634 (6 to 7pm). Total number of HMV 3585 the HMV flow during the peak hours are 1085(8 to 9am) and 1145(6 to 7pm

Table 6: Collective data on number of vehicles in kelambakkam to urapakkam (left turn):

VEHICLES	8am to 9am (Peak)	11am to 12pm (Non peak)	3pm to 4pm (Non peak)	6pm to 7pm (Peak)	TOTAL VEHICLES	
					PEAK	Non PEAK
2W	552	240	260	336	888	500
3W	36	20	24	36	72	44
LMV	96	140	76	132	272	172
HMV	20	16	32	36	68	36

As per table : The total number of 2W are 1388 and the highest 2W flow was during the peak hour (8 to 9 Am) 522. Total number of LMV 444 the LMV flow during the peak hours are 140 (Afternoon) and 132 (Evening). Total number of HMV 104 the HMV flow during the peak hours are 36 (6 to 7pm) and 32 (3 to 4).

Table 7: Collective data on number of vehicles in kelambakkam to vandalur (Right turn):

VEHICLES	8am to 9am (Peak)	11am to 12pm (Non peak)	3pm to 4pm (Non peak)	6pm to 7pm (Peak)	TOTAL VEHICLES	
					PEAK	Non PEAK
2W	836	284	492	908	1744	776
3W	32	16	28	48	80	44
LMV	360	284	228	448	808	512
HMV	144	80	72	148	292	152

As per table: The total number of 2W are 2520 and the highest 2W flow was during the peak hour (8 to 9 Am) 836. Total number

of LMV 1320 the LMV flow during the peak hours are 448 (Evening). Total number of HMV 444 the HMV flow during the peak hours are 144 (8 to 9am).

Table 8: Collective data on number of vehicles in Urapakkam to kelambakkam (Right turn):

VEHICLES	8am to 9am (Peak)	11am to 12pm (Non peak)	3pm to 4pm (Non peak)	6pm to 7pm (Peak)	TOTAL VEHICLES	
					PEAK	Non PEAK
2W	1008	288	160	376	1384	448
3W	48	16	28	24	76	40
LMV	108	152	80	172	324	188
HMV	24	32	24	36	68	48

As per table : The total number of 2W are 2520 and the highest 2W flow was during the peak hour (8 to 9 Am) 836. Total number of LMV 1320 the LMV flow during the peak hours are 448 (Evening). Total number of HMV 444 the HMV flow during the peak hours are 144 (8 to 9am) and 148 (6 to 7pm)

Table 9: Collective data on number of vehicles in Vandalur to kelambakkam (Left turn):

VEHICLES	8am to 9am (Peak)	11am to 12pm (Non peak)	3pm to 4pm (Non peak)	6pm to 7pm (Peak)	TOTAL VEHICLES	
					PEAK	Non PEAK
2W	760	360	128	548	1308	448
3W	60	32	44	52	112	76
LMV	364	332	204	272	696	476
HMV	176	136	100	84	312	184

As per table : The total number of 2W are 1796 and the highest 2W flow was during the peak hour (8 to 9 Am) 760. Total number of LMV 1172 the LMV flow during the peak hours are 364 (morning). Total number of HMV 496 the HMV flow during the peak hours are 176 (8 to 9am) and 136 (11am to 12pm).

Table 10: Collective data on number of vehicles in Vandalur to Urapakkam (Straight line traffic):

VEHICLES	8am to 9am (Peak)	11am to 12pm (Non peak)	3pm to 4pm (Non peak)	6pm to 7pm (Peak)	TOTAL VEHICLES	
					PEAK	Non PEAK
2W	432	200	216	784	1216	416
3W	48	32	20	64	112	52
LMV	287	216	140	276	563	356
HMV	173	152	164	228	401	316

As per table : The total number of 2W are 1632 and the highest 2W flow was during the peak hour (6 to 7 pm) 784. Total number

of LMV 919 the LMV flow during the peak hours are 287 (morning). Total number of HMV 717 the HMV flow during the peak hours are 228 (6 to 7pm) and 173 (8 to 9am

Table 11: Collective data on number of vehicles in Urapakkam(Incoming Traffic) :

VEHICLES	8am to 9am (Peak)	11am to 12pm (Non peak)	3pm to 4pm (Non peak)	6pm to 7pm (Peak)	TOTAL VEHICLES	
					PEAK	Non PEAK
2W	854	607	415	928	1782	1022
3W	610	302	437	495	1105	739
LMV	1825	1045	1532	1634	3459	2577
HMV	1084	716	640	1145	2229	1356

A per table Total number of 2W are 2804 during the peak hour 1782 and non peak hour 1022. Total number of LMV 6036 the LMV flow during the peak hours are 1825 (8to9) and 1634 (6 to7pm). Total number of HMV 3585 the HMV flow during the peak hours are 1085(8to9am) and 1145(6to7pm).

Table 12: Collective data on number of vehicles in Urapakkam(Outgoing Traffic):

VEHICLES	8am to 9am (Peak)	11am to 12pm (Non peak)	3pm to 4pm (Non peak)	6pm to 7pm (Peak)	TOTAL VEHICLES	
					PEAK	Non PEAK
2W	921	502	436	872	1784	938
3W	637	276	315	421	1058	591
LMV	1485	927	1232	1894	3379	2159
HMV	991	612	583	1258	2249	1195

A per table Total number of 2W are 2722 during the peak hour 1784 and non peak hour 938. Total number of LMV 5538 the LMV flow during the peak hours are 1894 (6 to 7pm) and 1485 (8 to 9am). Total number of HMV 3444 the HMV flow during the peak hours are 991(8 to 9) and 1258(6 to 7pm).

zone	2W		3W		LMV		HMV		PCU Peak	PCU Non Peak	V/C Peak	V/C Non Peak
	Peak	Non Peak	Peak	Non Peak	Peak	Non Peak	Peak	Non Peak				
Perungalathur (Outgoing Traffic)	996	879	245	210	1560	1300	1167	417	8404	2039	1.60	1.12
Perungalathur (Incoming)	1006	673	432	174	1382	1167	1299	407	7917	2898	1.099	0.40
kelambakkam to urapakkam (left turn)	888	500	72	44	272	172	68	36	992	574	0.66	0.38
kelambakkam to vandalur (Right turn)	1744	776	80	44	80	44	292	152	2636	1400	1.75	0.93
Urapakkam to kelambakkam (Right turn)	1384	448	76	40	324	188	68	48	1296	596	0.86	0.39
Vandalur to kelambakkam (Left turn)	1308	448	112	76	696	476	312	184	2398	1328	1.59	0.88
Vandalur to Urapakkam (Straight line traffic)	1216	416	112	52	563	356	401	316	2486	1564	1.65	1.04
Urapakkam (Outgoing Traffic)	1782	1022	1105	739	3459	2577	2229	1356	11340	7435	1.67	1.03
Urapakkam (Incoming)	1784	938	1058	591	3379	2159	2249	1195	12076	6804	1.67	0.945

Table 12: Volume of Capacity Ratio

7. ANALYSIS

- For a regular flow, the v/c ratio should be lower than 1..
- The calculated v/c ratio of Perungalathur ranges between 1.60 to 0.42 and 1.09 to 0.44.
- The v/c ratio of Kelambakkam to urapakkam (Right turn) ranges between 1.75 to 0.93.
- The v/c ratio of Vandalur to Kelambakkam (Left turn) ranges between 1.59 to 0.88.
- The v/c ratio of Vandalur to urapakkam (Stright line) ranges between 1.56 to 1.04.
- The v/c ratio of Urapakkam ranges between 1.05 to 1.03 and 1.6 to 0.95.
- The v/c ratio is more than 1, which suggests traffic congestion in that location, according to the data shown above.

8. CONCLUSION

This paper essay discusses the difficulties and problems that stand in the way of increasing traffic from Perungalathur to Urapakkam. This study provides a detailed explanation of the problems that operate as obstacles, including traffic congestion, parking problems, and pedestrian activity. The alternative roads are provided to reduce the traffic congestion at this area.

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