

COPY RIGHT



ELSEVIER

SSRN

2024 IJEMR. Personal use of this material is permitted. Permission from IJEMR must be obtained for all other uses, in any current or future media, including reprinting/republishing this material for advertising or promotional purposes, creating new collective works, for resale or redistribution to servers or lists, or reuse of any copyrighted component of this work in other works. No Reprint should be done to this paper, all copy right is authenticated to Paper Authors

IJEMR Transactions, online available on 19th Dec 2023. Link

[:http://www.ijiemr.org/downloads.php?vol=Volume-13&issue=Issue4](http://www.ijiemr.org/downloads.php?vol=Volume-13&issue=Issue4)

10.48047/IJEMR/V13/ISSUE 04/30

TITLE: TRAFFIC VOLUME STUDY AND ANALYSIS AT INTERSECTION IN SRIKAKULAM

Volume 13, ISSUE 04, Pages: 266-269

Paper Authors **N.V.L.N Pavan kumar¹, J.Vivek², S.Muddukrishna³, Ch.Saikartheek⁴**



USE THIS BARCODE TO ACCESS YOUR ONLINE PAPER

To Secure Your Paper As Per **UGC Guidelines** We Are Providing A Electronic Bar Code

TRAFFIC VOLUME STUDY AND ANALYSIS AT INTERSECTION IN SRIKAKULAM

N.V.L.N Pavan kumar¹, J.Vivek², S.Muddukrishna³, Ch.Saikartheek⁴

¹Assistant professor Sri Venkateswara college of engineering and technology dept of civil engineering

²Btech student Sri Venkateswara college of engineering and technology dept of civil engineering

³Btech student Sri Venkateswara college of engineering and technology dept of civil engineering

⁴Btech student Sri Venkateswara college of engineering and technology dept of civil engineering

Abstract - The lifeline of a city depends upon the evaluation and performance of the traffic planning, design, operation and the maintenance of the traffic flow which is necessary for the city in the future. The objective of the study is to improve the operation performance in the urban road network operation by proposing the proper alternatives to enhance the traffic capacity. To achieve this objective, a complete methodology for analyzing the mixed traffic flow in 300m long stretch is selected and analyzed for 15 days covering the 4 different routes which are the intersected to the KOTHA ROAD junction, In the Srikakulam city the traffic congestion has become a major problem at the KOTHA ROAD (jn). The manual technique is used for collecting the data on vehicular volume and speed selected road intersection, The data is analyzed for the peak hour traffic. The results are used for the calculation of capacity, level of service of road and distress of pavement.

Keywords: PCU, Level of service, traffic volume, capacity analysis

I. INTRODUCTION:

The control of traffic congestion plays a crucial role in the urban areas like SRIKAKULAM (KOTHA ROAD). The causes of traffic congestion of mixed traffic at the intersections is due to the traffic overload, accidents, travelling of more multiaxial vehicles, occupation of roads by the shopvenders, and even pedestrians crossing the road incorrectly or holding up the vehicles. The traffic delay problems are due to the increase in population which leads to the growth in the vehicle usage and also due to the unproductive use of road section. Urban road intersections are the major bottleneck and are the major strike of traffic delays. This is because at the road intersections the vehicles approaches from different manoeuvring movements such as right turn, left turn, U-turn movements which seeks the same space at the same time by vehicles and the pedestrians. Thus, urban road intersections are the major strike of the traffic delays.

In the developing cities the more traffic distribution around the rotatory is observed according to the populations work time. The main

reason for the traffic congestion and damage of roads at the KOTHA ROAD junction, SRIKAKULAM is due to the movement of huge number of vehicles during the morning (10-11 am) and evening (6-7pm) which is sudden and in a short period along the narrow roads. The rotatory covers residential buildings, showrooms, hospitals and educational institutions. In order to reduce the traffic congestion and the damage of roads around the rotatory necessary and effective steps should be taken.

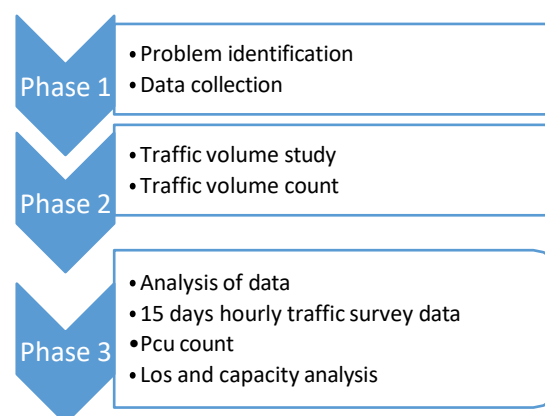
LITERATURE STUDY:

1.C.V.Yeramwan, A.A.Laley Tham KM Bambade (2009)Evaluation of Capacity and level of service of Ready Conclusion - Signalized intersections typically form the Capacity bottlenecks in Urban road networks. Signal timings plans are developed in order to plans segregate potentially conflicting movements at a signalized intersection.

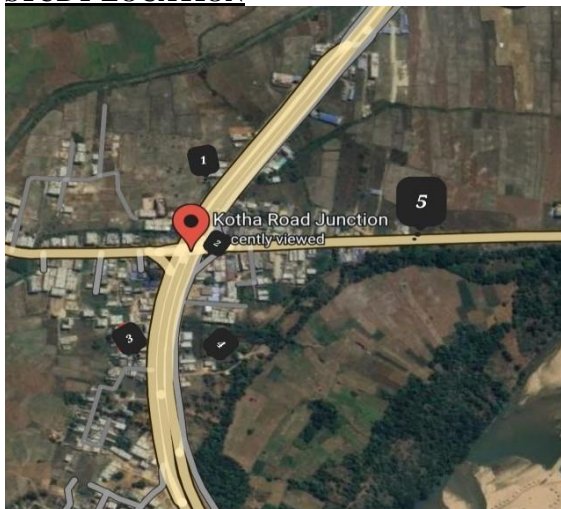
2.Harsh Si shah, Jay dip Jadia, grinath Karli (2020)Determination of Road Capacity and Traffic flow at sola Rock. They proposed that we can determine from study the observed peak hour capacity is 30%-10.65% more than base capacity which is Critical issue as line is limited. well as boundary.

3.Rajanikant Suthar, Mr. Viney Deulkar (2021)Traffic volume study of signalized intersection, at Delhi Gate circle. They proposed that Two wheelers traffic volume .2w vehicles is more compare to other class of vehicles. The traffic Composition of vehicles at Delhi gatecircle54% 2-wheelers, 147. 3- wheelers, 31% 4-wheelers and only 1% cycles.

METHODOLOGY :



STUDY LOCATION



Credits: google maps

Data collection has been carried out in Srikakulam city at kotha road jn the study area has railway station at amadalavalasa connecting to Srikakulam which is in between NH-16 Narasannapeta highway and vizag route.

- Mixed traffic flow
- Continues traffic flow

PCU (Passenger Car Unit):

The passenger car unit is a measure used in the transportation engineering to quantify the traffic flow of vehicles with varying sizes and capabilities in terms of an equivalent number of standard passenger cars. Larger or multiaxial vehicles such as buses, tractors, trucks etc., are assigned a PCU value based on the space they occupy relative to a passenger car. The PCU values assigned to each vehicle type is based on its acceleration, deceleration, size, speed and manoeuvrability. The PCU concept is used in various traffic engineering applications, including capacity analysis, level of service evaluations, traffic impact assessments, and traffic simulation modelling. By converting different vehicle types into common unit, transportation engineers can better understand and manage traffic flow, optimize road design and traffic signal timings, and plan for future transportation infrastructure improvements.

PCU VALUES (SP 041) :

VECHILE CATEGORY	PCU
Bikes	0.5
Car	1
Auto	0.8
Truck	3.5
Tractor	3.5
Bus	3.5
Rickshaw	0.3
Bicycle	0.2

LEVEL SERVICE CRITERIA FOR UNSIGNALISED INTERSECTION (HCM2000):

Level of service	Average control delay (sec/Veh)	Description
A	0-10	Free flow
B	>10-15	Stable flow(slight delays)
C	>15-20	Stable flow(acceptable delays)
D	>25-35	Approaching unstable flow
E	>35-50	Unstable flow
F	>50	Forced flow(congested and queues fail to clear)

CAPACITY ANALYSIS:

The capacity analysis is used in the determining of the maximum output capacity of the urban roads which are functioning along the road side fringe conditions. The recommended fringe conditions are assumed;

Arterials	No standing of vehicles, no access to the footage, crossing of traffic is very low
Sub-arterials	Bus stops, side roads, no standing of vehicles, waiting restrictions
Collectors	Access to the front side footage, bus stops, parked vehicles, no waiting restrictions

EXPERIMENTAL STUDY:

The study was carried out using the manual method for the figures of number of vehicles, traffic moment.

- 15 days traffic volume data
- 12 hours hourly data is carried out (7am to 7pm)
- Peak hour data is collected
- Examining of infrastructural data is collected using videography
- LOS is observed
- PCU values are calculated





TRAFFIC VEHICULAR COUNT:

Day	2w	3w	4w	BUS	MULTIAXIAL
1	14358	3844	3867	912	936
2	13138	4748	4901	996	648
3	12022	4941	6033	798	683
4	12791	4900	4990	789	683
5	10631	3450	4389	789	438
6	12202	5071	7407	1011	535
7	14334	5500	5373	954	585
8	11405	5308	7511	939	532
9	12754	5292	3874	799	569
10	12298	4510	5593	648	613
11	9091	3575	3446	449	524
12	8621	2477	2929	386	368
13	9821	4107	5040	1525	986
14	10807	4078	5495	1065	736
15	7927	3934	6101	725	2802

LEVEL OF SERVICE AND CAPACITY ANALYSIS:

15/02/24 WEEK 1

Morning Evening

23/02/24 WEEK2

Morning Evening

SI.NO	Observed peak pcu/hr	Base capacity IRC106 1990	V/C	LOS	%Increase
WEEK1 15/02/24	2243	1200	1.86	F	86%
WEEK2 23/02/24	2446	1200	2.03	F	100%

Base capacity IRC 106:1990 clause no 8.3 table no 2 2-lane (two way) divide – sub arterial road (1200)

V/C ratio of peak hour is more than 1 hence LOS(IRC 106:1990) for existing road stretch is “F” force flow.

CONCLUSION AND RECOMMENDATION

From the intersection in Srikakulam(kotha road jn) the maximum capacity 3415 vehicles per hour during peak hours with a highest performance of level of service “F”. when compared PCU count per hour in week 1 is 2243 and week 2 is 2446. clearly we can observe the level of service the capacity of intersection is getting congested with 3W,4W,BUSES and HEAVY VEHICLES increasing the traffic flow. Due to continuous mixed traffic flow the intersection getting heavy traffic volumes which leads to traffic jam conditions during peak hour.

- a) When compared the 2W traffic volume is greater than evening here we can exclude the 2W traffic volume in case of pavement distress but we have to take into account regarding traffic conditions.
- b) The vehicle count of 2W is more when compared to other class of vehicles.

In this study we focused about traffic volume conditions (12 hr study-7AM to 7PM excluding night traffic) for 15 days the pcu per hour values and level of service values states that the traffic conditions of intersection in Srikakulam at kotha road jn needs some recommendations

- 1) Widening of roads at both sides(srikakulam to amudalavalsa)
- 2) To avoid mixed traffic there is a need in future to establish traffic signal
- 3) Diversion of vehicles not merging into the intersection roads.
- 4) There is need of road safety audit report which gives clarification about increment in traffic volume, accident studies and

analysis due to heavy traffic flow, and to know the regulatory measures to be taken to decrease heavy traffic flow in future.

- 5) Due to rapid urbanization it is recommended that to develop a 20mt road or 4 lane from Amudalavalasa jn to Srikakulam viceversa.

REFERENCE:

Ravinder Kumar “Traffic Analysis and Design of Flexible Pavement With Cemented Base and Subbase”, IJERT, vol3, issue 7, 2014.

ii. **V.K.Chakravarthi, Chaitanya Mycherla**, “Modelling of Distress in Flexible Pavements using Ansys: A Case study in Visakhapatnam”, TYReS, NIT Warangal, 2015.

iii. **Ankit Gupta**, “Comparative Structural Analysis of Flexible Pavements using Finite Element Method”, PEAT, Vol.15, pp.11-19, May 2014.

iv. **Pho Thanh Tung Road**, “Vulnerability Assessment for Earthquakes: A Case study of Lalitpur Kathmandu-Nepal, International Institute for Geo-information Science and Earth Observation, March 2004.

V. Shradhesh R. Marve, M. P. Bhorkar, “Analysis Of Traffic Congestion of Hingna Region In Nagpur City”, International Research Journal of Engineering and Technology, April 2016.

Vi. Rajesh Gajjar, Divya Mohandas, “Critical Assessment Of Road Capacities On Urban Roads: A Mumbai Case Study”, 11th Transportation Planning And Implementation Methodologies For Developing Countries (Sciencedirect), December 2014.

Vii. Pratik U. Mankar and Dr B.V Khode, “Capacity Estimation of Urban roads under Mixed Traffic Condition” International Research Journal of Engineering and Technology, April 2016.

Viii. Highway Capacity Manual. TRB, National Research Council, Washington, D.C., 2000

Xi. A Policy on Geometric Design of Highways and Intersections. AASHTO, Washington, D.C., 2001

X. Dowling, R. G. Use of Default Parameters for Estimating Signalized Intersection Level of Service. In Transportation Research Record 1457, TRB, National Research Council,