International Research Journal of Engineering and Management Studies (IRJEMS)
Volume: 03 Issue: 04 | April -2019 ISSN: 1847-9790 || p-ISSN: 2395-0126

Study On Vehicular Congestion At Red Light Spot

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Abstract This research paper presents measurement of vehicular traffic at an intersection. Red light spot is hot spot for traffic congestion .Maximum vehicles are in idle condition at red light spot creating many discomfort and harm to human beings. This paper consist of idle vehicular count study and classified vehicular count study for an intersection. By concluding different alternatives for traffic congestion the real problem of idle vehicle congestion at red light spot vehicular traffic can be reduced.

***Key Words*: Traffic intersection, idle vehicle, vehicular congestion.**

1. INTRODUCTION

According to the recent report by RTO Gujarat the vehicle count in 2017 is 20,361,296 which is very high. Currently the traffic on the road rises constantly and traffic volume overdoes normal limit. Intersection is the hub for vehicular pollution emission. Due to stoppage at intersection the vehicle emission is maximum.

In last 10 years,Amdavadi's have added 24.59 Lakh more vehicles on city road. Red Lights Air Pollution Hot Spots:waiting at an intersection is not just frustrating if are running late but also it affects health of an individual.The study has found that waiting at spotlights and then accelerating increases exposure to pollutants.

Increasing vehicles in this era creates a very rapid difference in recent traffic scenerio.vehicular flow has slower down due to rapid increase in the vehicular

2. LITERATURE REVIEW

2.1 Dr. Adekunle J. Aderamo The paper examined traffic congestion problems and their causes at selected road intersections in Ilorin, Nigeria.

The characteristics of the intersections that predispose them to congestion problems and the spatial pattern of traffic congestion at the road intersections were also identified. In addition, traffic volume and delays were estimated and causes of delays identified. Data were collected through direct field survey on intersection characteristics, traffic volume and composition, traffic delay and causes and land use activities. Data were also collected from past research reports, journals, textbooks, maps and the Internet. The analysis of data collected revealed that spatio-temporal variations exist in traffic flows and delays at the studied intersections. Also, traffic wardens and parking problems were found to be the greatest causes of delays at the road intersections in the city. The study therefore recommends that the road intersections be signalized and vehicle parking be strictly prohibited at road intersections to reduce traffic congestion and delays at road intersections in the city.

2.1 Bass, Patricia Due to the heavy use of the University

corridor and Smelling Avenue, their junction is a key intersection for St Paul. The resulting traffic congestion can be both a burden and a benefit to the Hamline Midway neighborhood. This was brought to the attention of the media in 2006, when the city of St Paul published the

Selling/University Capacity Study, proposing that the level of traffic congestion is high enough, and the level of service of the intersection low enough that action should be taken to increase the transportation capacity there. This study provokes several questions. First, how can an 'acceptable' level of congestion be determined and measured? Also, how can the quality of an intersection be determined? What criteria did the city use, and what alternate criteria exist? These questions can be explored using literature that addresses the two main transportation issues of the neighborhood: traffic congestion and heavily-used intersections. This review addresses traffic congestion first, with literature that determines its effects - both positive and negative -on neighborhoods, residents, and business, as well as methods to measure and rate these effects. Second, the review address intersections by listing the factors that affect users‟ intersection experiences, and the ways these factors can be used to make a measurement of intersection quality. Last, some of the literature reviewed is briefly applied to the St Paul area. This paper provides a context for transportation issues and their connections to the Hamline Midway neighborhood. Background knowledge of congestion and intersections is not only necessary for understanding and responding to city transportation action, but for discovering and pursuing one‟s own transportation goals.

2.2 Geethu Lala,*, Divya L. G.a , Nithin K. J.a , Susan Mathewa , Bennet Kuriakosea

The spectacular increase of number of motor vehicles on the road is mainly attributed ingeneration of traffic problems like accidents, congestions, delays etc., especially in the urban premises of developing countries. This paper examines the traffic problems and sustainable improvement ofroad intersection at Ettumanoor, India. The special and temporal constitutions of the vehicle as well as pedestrian traffic at the intersections were examined and the characteristics of the junction indoctrinating the delay problems are identified. Data regarding the traffic volume, land use and pedestrian movement activities are collected through direct field surveys. Analysis of the collected data revealed that the improper planning of the junctions, lack of traffic signals and unauthorised parking are the major factors contributing to the traffic congestions. Various remedial measures are also proposed, focusing on junction improvement, alternative operation plan and junction signalisation.

2.3 Han Zhi Study on Traffic Congestion Pre-Control of Link between Non-Signalized Intersections 2017 10th International Conference on Intelligent Computation Technology and Automation (ICICTA)

Capacity is defined as the maximum traffic flow passing through a section of a road per hour, which is not related to the length of the link or the traffic characteristics of the upstream and downstream intersections. The traffic condition cannot be accurately expressed when the road is congested. The concept of Link Capacity was proposed in the paper, and the Link Capacity calculation model was established according to Traffic Wave Theory. All influences on Link Capacity were analyzed and ranked in impact. Traffic can be pre-controlled in order of the volume of downstream intersection, the speed of passing through the link, the length of the link, the time of passing through the downstream intersection, the speed of passing through the downstream intersection, and the optimal pre-control method of the link congestion without building more roads is proposed.

3.STUDY AREA

Briefing of the Location

Panjrapole area is situated in Ahmedabad city,gujarat India.Panjrapole intersection is near the main university area.Panjrapole is 120 feet ring road.Panjrapole intersection is of 4 phase signalised intersection consisting of BRTS lane.The signal cycle is for 1 minute and 17 seconds.The roads are First phase of panjhrapole intersection is gujarat university to nehrunagar.Gujarat university,cept university, L.D.college of engineering and different major educational institutes are located near panjhrapole which adds upto to the traffic flow from phase gujarat university to nehrunagar road.

Fig-3.1 pollution emission at Panjrapole intersection.

4.DATA COLLECTION

IDLE VEHICLE SURVEY AT AN INTESECTION

One of the fundamental measures of traffic on a road system is the volume of traffic using the road in a given interval of time.Intersection is a component of road.Intersection are of two types signalised intersection and non-signalised intersection.on intersection there is maximum congestion of traffic and also maximum amount of traffic.vehicles are at idle possition when are at intersection if the signal is red.the survey contains of different types of vehicles.

This are classified comprising of smaller vehicles:Motorised two-wheeler,variouse type of sedan or four wheelers are considered as a single unit i.e,car,jeep and van,while all types of trucks whether they are single axle or double axle or three axle are considered as a single classified volume category. This survey is for the vehicles which are in idle position when signal is red.

This survey is conducted by taking the cycle length of the traffic signal.For this survey 10 red light phase are taken in every direction of the intersection.when the signal is red the vehicle is being counted in classified form. The survey is conducted mannualy

DATE:4 DEC 2018 TIME:6 PM	PANJRAPOLE INTERSECTION	UNIVERSITY ROAD	Mitisha vadodaria

RED PHASE	TWO WHEELER	THREE WHEELER	LCV	FOUR WHEELER	BUS	TRUCK
1	94	39	2	34	4	0
2	104	48	5	42	3	1
3	234	54	3	62	5	0
4	246	72	1	75	6	1
5	206	66	2	68	5	1
6	217	49	2	56	5	0
7	172	55	1	37	3	1
8	222	38	2	32	2	0
9	196	59	4	44	4	1
10	98	41	2	28	2	1
Total No.	1789	914	24	972	39	6

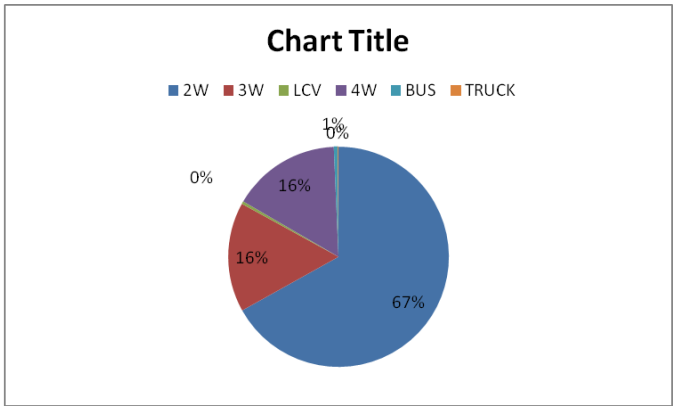

Chart 4.1 vehicular classification

CLASSIFIED VOLUME COUNT.

Traffic data collection is basic requirements for transport planning. Traffic data forms an integral part of national economics and such knowledge is essential in drawing up a rational transport policy for movement of passengers and goods by both government and the private sectors. Classified volume count is counting of number of vehicles passing through a road over a period of time .it is usually expressed in terms of passenger car unit and measured to calculate level of service of the road and related attributes like congestion, carrying capacity, v/c ratio, identification of peak hour or extended peak hour etc.

Table 4.3 CVC of CORRIDOR 1 at panjrapole intersection

UNIVERSITY ROAD(Ahmedabad)					
Time Duration	Two Wheeler	Three Wheeler	Four Wheeler	Bus	LCV
10:00-10:15	420	124	162	6	11
10:15-10:30	426	137	170	4	5
10:30-10:45	412	150	158	2	4
10:45-11:00	392	142	147	1	7
Sub Total	1650	553	637	13	27
PCU value	0.5	0.8	1.0	3.5	0.2
PCU	825	442.4	637	45.5	5.4
Total PCU	1955.3				

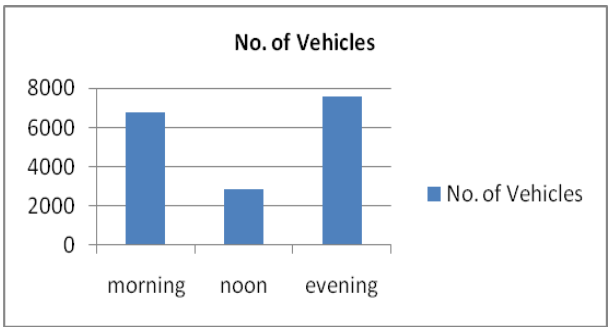

Chart 4.2 Showing Time Vs No. of vehicles

5.CONCLUSION

The rapid increase in vehicles is corrupting the condition of roads and environment. According to the study, the red light spot is main junction for vehicles creating enormous amount of pollution and congestion. Also creating dangerous accidents as more vehicles are idle more they speed when is signal light turns green.Idle vehicle count suggests that peak hour for idle vehicle is morning and evening and it is increasing day by day. Hence following remedies could be taken:-

- Existing PUC system should be made more authentic and reliable or replaced by comprehensive inspection and maintenance system which is user friendly
- Use of concrete roads in place of tar road to avoid maintenance and dust emission
- Provide timers at all traffic points where movements of vehicles are highFully ensure that it works 24x7.
- Encouraging and provide public transport systems like BRTS
- Continuous emission monitoring stations to be set up in all major cities at all locations where traffic intensity is high

6.ACKNOWLEDGEMENT

I'm Heartily Thankful to **Prof. Srinath Karli** & **Dr. P J. Gundaliya** for giving tips, every possible help, moral support, suggestions, and constant guidance during the entire span of my post- graduation study. I'm Grateful to have **Prof. Srinath Karli** as my Guide for the post-graduation study.

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