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Case study on traffic congestion at erode(gh signal)

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ABSTRACT-Traffic congestion has been one of the major issues that metropolises are facing in spite of measures being taken to mitigate and reduce it. This study aimed to analyze traffic congestion in urban road networks. In the recent past traffic congestion has emerged as one of the main challenge for engineers, planners and policy makes in urban areas. Modern social and economic structure shaped by car-oriented urban development and rapid growth in vehicle ownership have established congestion as an inescapable reality of urban life. The main focus of the study is aimed at understanding the recurring urban congestion, its measurement and mitigation. In this project we documented the studies on how to measure congestion and recommended for better solution. This include speed, travel time, volume and level of service etc. Subsequently data collection requirement and technologies for this metric becomes an important part of this study. The study is plan at the location of ERODE district government hospital signal to analysis the traffic congestion and its effects.

I.INTRODUCTION

Traffic congestion has been one of the major issues that most metropolises are facing and thus, many measures have been taken in order to mitigate congestion. It is believed that identification of congestion characteristics is the first step for such efforts since it is an essential guidance for selecting appropriate measures. Congestion –both in perception and reality –impacts the movement of people and freight and is deeply tied to the history of high levels of accessibility and mobility. Traffic congestion wastes time and energy, causes pollution and stress, decreases productivity and imposes costs on society.

Road traffic congestion detection and management has been a challenge and several countries have come up with new concepts and ideas to detect congestion. Today, number of vehicles is increasing at an alarming rate and improvement of road infrastructure, which has its limitation, has not been able to ease the problem. Over the decade, many innovative concepts and technologies have been developed in relation to collecting real time traffic data and use it for gaining knowledge regarding the various aspects of traffic flow. Both quantitative and qualitative information can be collected using such techniques.

Measures aimed at reducing congestion can be either demand or supply side oriented. It is therefore important to distinguish both types of measures. Three main factors influence the supply side of road travel. Firstly, capacity is one of the most important elements of road space supply. For example, the total kilometers of roads and the number of lanes determine the capacity of the road network. Secondly, the operation of the road network influences supply. Maximizing the efficiency of operations, such as optimizing signals improves "supply". Thirdly, the supply of the road transport equation is also affected by incidents such as accidents or road works. Importantly, the last two aspects can be influenced by traffic management approaches. It is thus the supply –side of the road network that can be optimized by traffic management tools. Supply of road space is mainly determined by past investment decisions and current operations. Changes in the supply side of road space thus involve construction of new road space or reductions in existing road space. Changes in traffic operations are also considered to be supply side measures.

This paper discuss the existing practices in different countries, the contributions by individuals and prevailing methodologies for measurement of the congestion along with the critical review of the methods. Review has also been done with reference to Indian conditions. The critique and the suggested methodology may be useful for similar developing countries.

II. STUDY AREA

Erode: Erode is a city, a municipal corporation and the headquarters of Erode district in the South Indian state of Tamil Nadu. It is situated at the centre of the South Indian Peninsula, about 400 kilometers southwest from the state capital Chennai and on the banks of the river Cauvery and Bhavani, between $11^0$19.5" and $11^0$81.05" North latitude and $77^0$42.5" and $77^0$44.5" East longitude. As per Census 2011 alignments. It has population around 156,953. Erode Local planning Area extends up to 54sq.km. Within the city, and will be extended to109 km^2. The roadway connects all the parts of the state and nearby states such as Kerala, Karnataka and Andhra Pradesh with the city. The city has both local and mofussil(city-to city) bus services with connections to nearby towns and villages. Plenty of city buses are help to connect all parts of the city. In Erode, we choose GH Roundana because it is the main area to connect five roads.

III. REASONS BEHIND TRAFFIC CONGESTION

Inadequacy of traffic police: All the cross roads need at least four traffic police at a time whereas in Erode it is seen that the number of traffic police are always short and due to the lacking of proper instruction the vehicles are getting trapped in traffic. Only two traffic police are working in the city which is inadequate.

Narrow roads: Streets of Erode are not that wide spread, due to illegal possession on the road they are getting narrow and becoming a reason behind traffic jam. So every possibility is there to expand the road as per their right of way to reduce traffic congestion. Moreover this will be less expensive and less time consuming due to land acquisition won't be required in this process.

Illegal Parking: Illegal parking on the road has been creating congestion every day from bus stand road to GH roundana. On-road parking of vehicles is one of the main reasons behind serious traffic congestion on different parts of the Erode city.

Increasing number of population: All the areas under Erode city are facing an increasing number of population which is a bad indicator for the traffic management and this could be a vital reason behind traffic.

Higher Purchasing power of the public: Due to the higher purchasing power of the citizen of Erode city the popularity of private transportation is increasing and but existing roads and highway are not supportive or changing according to the increasing number of vehicle. As a result vehicle congestion is increasing at an alarming rate.

Improper planning of city development Development Plan has its long term city development planning. But that planning is not proper. Most of the time it is seen that some illegally ceased roadside land, but due to the vague development plan these kinds of movements are going in vain.

IV. IMPACTS OF TRAFFIC CONGESTION

Congestion involves queuing, slower speeds and increased travel times, which impose costs on the economy and generate multiple impacts on urban regions and their inhabitants. Congestion also has a range of indirect impacts including the marginal environmental and resource impacts of congestion, impacts on quality of life, stress, safety as well as impacts on non-vehicular road space users such as the users of sidewalks and road frontage properties

V. DATA COLLECTION METHODS

The data should be collected from the Highways Department. In this data flow of vehicles and density of traffic are noted. We prepare a Questionnaire form for getting suggestions from the public and also police officers. The traffic congestion data can be collected by both methods, to know about the traffic flow in that road.

VI. DETECTING TRAFFIC CONGESTION

The first step in mitigating traffic congestion is to estimate the amount of traffic on the link at any given point of time. A common method is to place sensors on the road and count the number of times they are actuated by the passing wheels of a vehicle.

Day Time Congestion: During the daytime, the underlying intuition is that when there is no traffic on the road, it appears gray in color irrespective of the natural day light. When the road is filled with traffic, the amount of visible gray(empty road) in the picture reduces because of the majority of vehicles attributing a varied level of non gray color

Night Time Congestion: Night time congestion detection is a harder problem because of multiple extraneous factors. Absence of light eliminates typical vehicle feature estimation techniques. The next contender for vehicle identification becomes headlight counting, which suffers from light reflection/refraction and alternate light sources such as billboards and traffic signal lamps.

VI .IDENTIFICATION OF THE CONGESTION MEASUREMENT

Speed: The prevailing traffic speed at any section of a roadway affects the quality of traffic at the time. Whereas excessive speeds affect the severity of road traffic accidents, crawling speeds in the urban environment are also indicative of congestion. Nowadays, efficient vehicle monitoring can be achieved by integrating Global Positioning System (GPS) derived traffic data such as vehicle speed and direction of traffic flow into a Geographical Information System (GIS) environment.

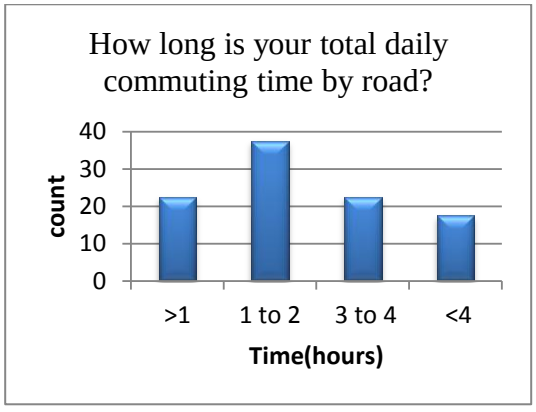
Travel Time and Delay: Congestion is a travel time or delay in excess of the normally incurred under light or free flow travel conditions (Lomax et al., 1997). Unacceptable congestion is travel time or delay in excess of an agreed-upon norm. The agreed-upon norm may vary by type of transportation facility, travel mode, geographic location, and time of the day. The authors of the study conducted using the U.S. Census data to analyze the unacceptable congestion, concluded that the unacceptable congestion is when less than half of the population can commute to work in less than 20 minutes or if more than 10% of the population can commute to work in more than 60 minutes.

VII. QUESTIONNAIRE SURVEY

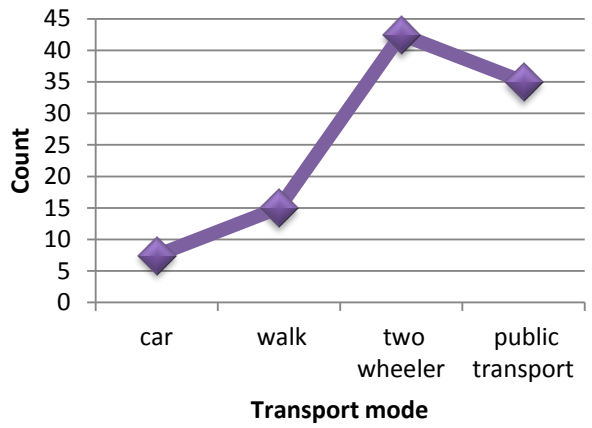
The questionnaire survey provides for an extensive quantitative research method by the collection of primary data on characteristic, behavior and attitudes by administering a standardized set of questions. For this study, the questionnaire survey has been used to explore people's perceptions, attitudes, experiences, behavior and spatial interactions to road traffic congestion and travel behaviour.

VIII. QUESSTIONNAIRE ANALYSIS

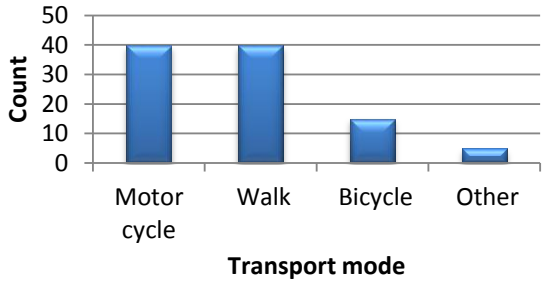
The questionnaire was analyzed using Excel 2007. This allowed the date to be summarized into graphs, statistics and table and then transferred into Microsoft word document.



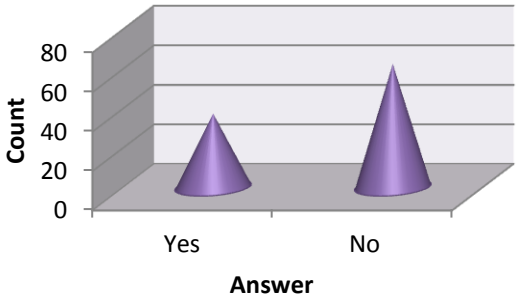
How do you typically travel to work?



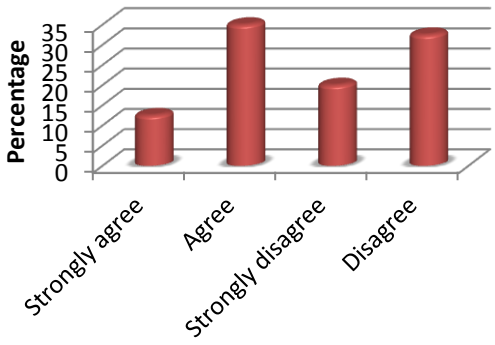
What mode of transport do you use to reach public transport facilities?



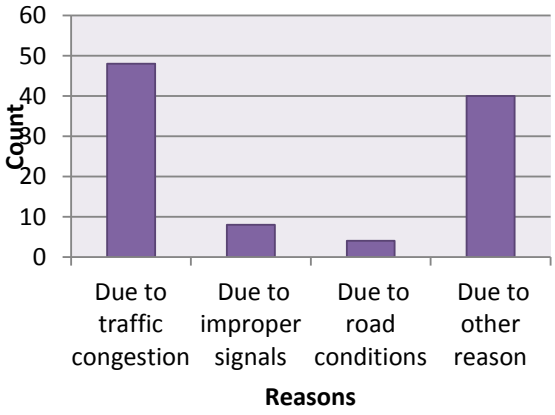
Are you reaching correct time for your work?



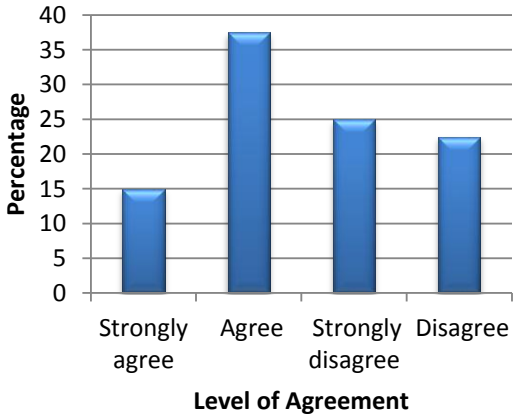
Are you satisfied with public transport facilities?



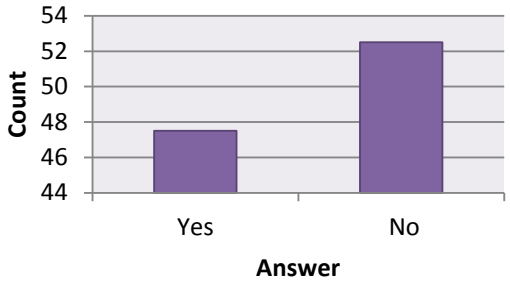
If No, what is the reason?



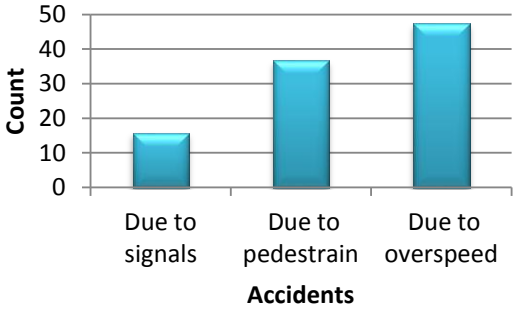
Whether you think that speed breaker is provided ro ruduce traffic over speeding?



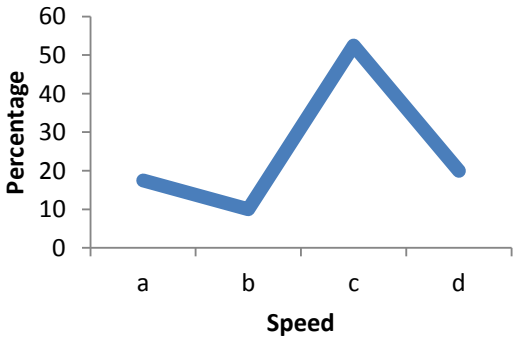
Whether you are facing any accidents in this road, which distrubs your travel in day to day life?



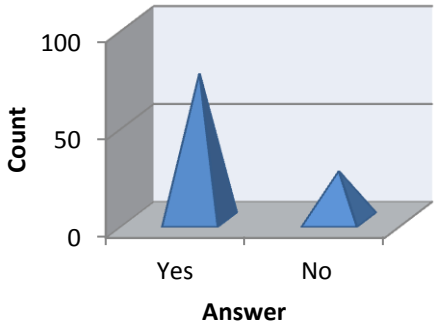
If Yes, what type of accidents do you face?



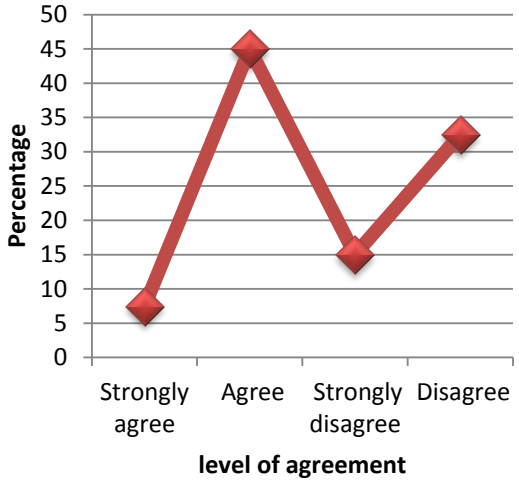
At what speed do you travel in this road?



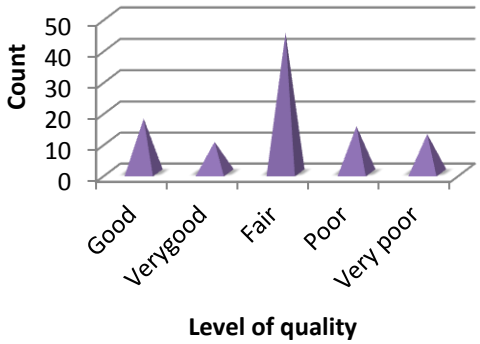
Do you feel that provision of ringroad or infrastructure will reduce traffic congestion?



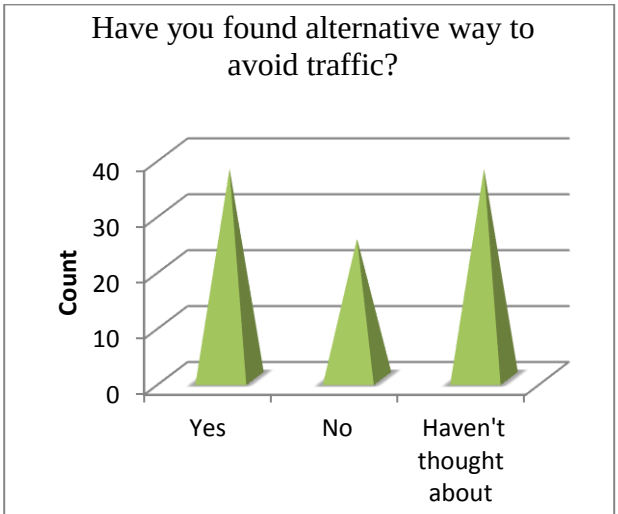
Is there a proper system of traffic signals?

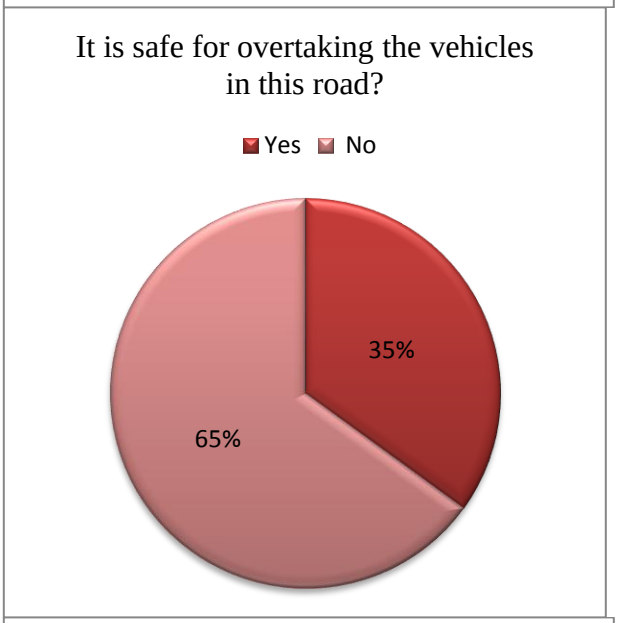


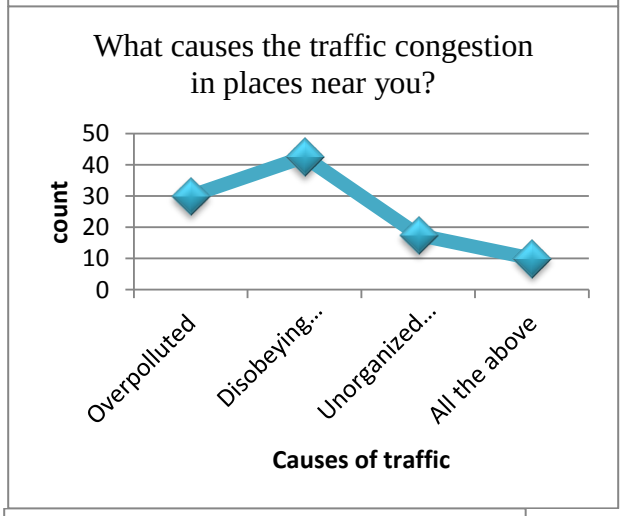
Can you describe the quality of public transport?

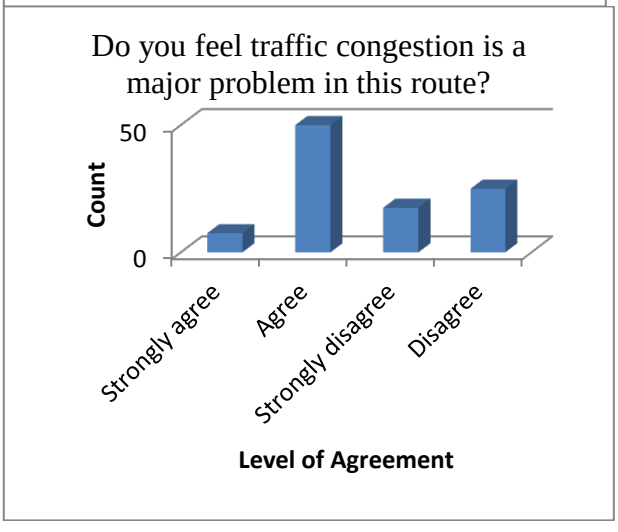


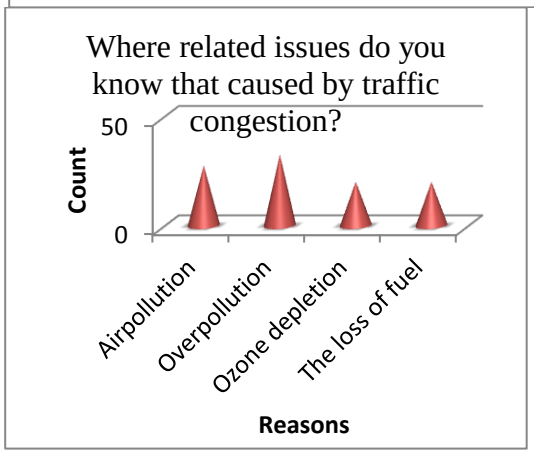

Are you Satisfied withthe guidence of the Police officers?
30
25
20
15
10
5
0
Count
Strongly agree
Agree
Strongly Disagree
Disagree
Level of Agreement

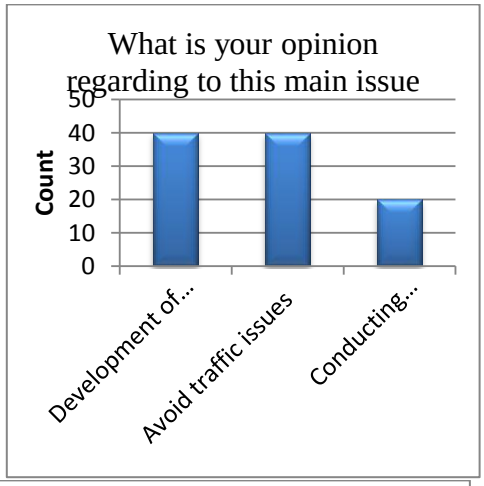

Have you found alternative way to avoid traffic?
40
30
20
10
0
Count
Yes
No
Haven't thought about

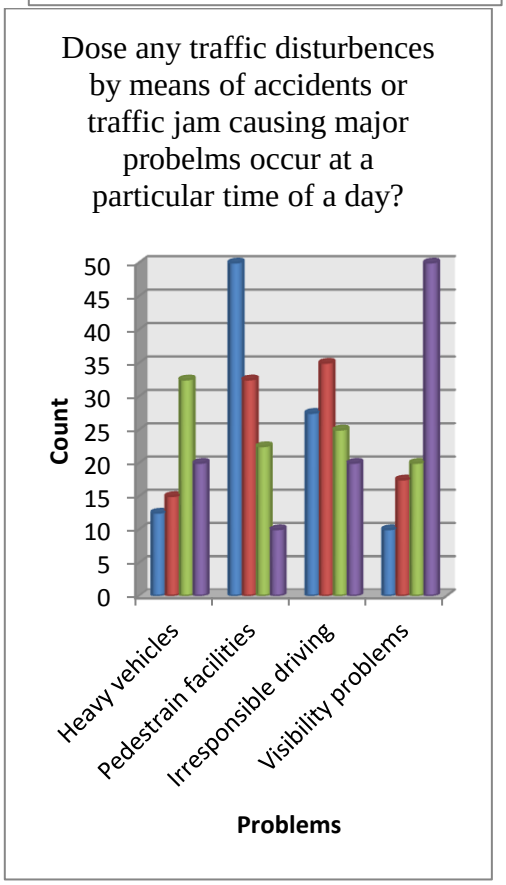

It is safe for overtaking the vehicles in this road?
Yes
No
35%
65%


What causes the traffic congestion in places near you?
50
40
30
20
10
0
count
Overpolluted
Disobeying...
Unorganized...
All the above
Causes of traffic


Do you feel traffic congestion is a major problem in this route?
50
0
Count
Strongly agree
Agree
Strongly disagree
Disagree
Level of Agreement


Where related issues do you know that caused by traffic congestion?
50
0
Count
Airpollution
Overpollution
Ozone depletion
The loss of fuel
Reasons





IX ANALYSIS AND DISCUSSION

The analysis is focused on data collected from the questionnaire and interviews. From it we gain a understanding of transport habits and people's perception of transport system. The investigation focuses on the different views of private and public transport users.

X CONCLUSION

Traffic congestion is a global as well as local problem. Different infrastructural and managerial projects are granted for reducing traffic jam. Traffic congestion constraints can be ameliorated by embarking on various strategies such as road capacity expansion, improved road infrastructures, financial penalty to the traffic law breakers and application of Fly over. Mostimportantly, proper traffic management system along with appropriate implementation of traffic rules is necessary to mitigate the problems of traffic congestion in GH signal Erode .Not only to develop the infrastructure to reduce traffic congestion but also provide proper traffic monitoring system in that road.

Most urban areas have poorly managed traffic networks with several traffic hot-spots or potential congestion areas. In this paper, we study the problem of road traffic congestion in main area of the city.Our suggestion is also to provide CCTV camera to regulate the traffic congestion. Our hope is that localized de-congestion mechanisms are potentially easier to deploy in real-world settings and can enhance the traffic flow at critical hot-spots in road traffic networks. The future work lies towards deploying a real time proof of concept to analyze instantaneous traffic density. The paper discussed a means to detect and curb congestion in a localized setting. Although, the solution is feasible to affect local congestion, it is still not able to curb the congestion extending for miles due to the localized focus of the approach. The analysis can thus be improved with multiple sequential cameras along a highway which in addition to localized congestion control analyzes the congestion buildup.

XI REFERENCES

1.Haribandhu Panda& RS Pundir, "Problems and possible solutions for better traffic management: A case study of Vadodara- Ahmadabad section of national highway eight", Research Paper 19, August 2002, Institute of Rural Management, Anand(IRMA).

2.ManujDarbari Sanjay Medhavi and Abhay Kumar Srivastava, "Development of effective Urban Road Traffic Management using workflow techniques for upcoming metro cities like Lucknow (India) ", International Journal of Hybrid Information Technology, Vol.1, No. 3, pp. 99-108, July, 2008 .

3.RijurekhaSen& Bhaskaran Raman, "Intelligent Transport System for Indian Cities".

4.Amudapuram Mohan Rao, KalagaRamachandraRao, "Measuring Urban Traffic Congestion – A Review".

5. S. Kadiyali "Highway and transportation Engineering"

6.The University of Manchester 1824 "Solution to Traffic Congestion in greater Manchester: Policy and Practice".