



Intelligent transportation system sustainable in Oman.

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This project is conducted to identify the effects of traffic congestion Burj Al sahwa Roundabout following different methods to collect data such as data analysis, Interview and Questionnaire. By increasing the number of vehicles, Traffic congestion increased in Muscat in many places. The reasons behind this saturation is population, driver behavior, road condition “infrastructure”, that’s why the government needs some solutions to solve this saturation to make the roads more comfortable for drivers and to reduce the traffic congestion in Muscat.

Depending on a study that showed, most of Omani people are using private cars instead of using public transportation. One of the most places in Muscat that has a big traffic congestion is the Burj Al sahwa Roundabout in all of four intersection surrounding it. The situation in this street needs to be solved by making some improvements for the street and to enhance the performance of the traffic flow and traffic capacity. this area is one of important place in Sultanate of Oman because it is a center for all roads in the capital Muscat as well as for various states around the sultanate of Oman, so it needs a better road to serve it.

Every day a lot of students, teachers, Doctors, workers... etc, are facing many problems such as delaying for 10 min to 15 min. To know more about this problem towards Sahwa roundabout region will make some interviews with “police of Seeb traffic department” and I will collect some data by giving the public and drivers a questionnaire to get more information about the traffic congestion towards Burj Al sahwa roundabout . The expected outcomes from the project is to Evaluate traffic congestion towards Al sahwa, reduce traffic congestion and to make Recommendation by removing the sahwa tower roundabout and creating a large intersection involving the inclusion of four main axes and organized using smart traffic light to helping the people who working in this area.

Keywords: Traffic congestion, Sahwa roundabout, Smart traffic light, Traffic Department, Muscat.

Introduction

Because of the highest percentage of cars used around Oman the problem of traffic congestion occurred, which has become a major obstacle to promote the streets of Oman and the world as it may not have been feeling this problem only recently, so it was necessary to stand in front of this problem and wrestling in finding measures and solutions to address them. And because the sahwa Zone is a big center for various trends road in, the area transit many of thousands of cars daily and you can see the problem of congestion especially in the morning due to the highest number of cars gathering around it, it was necessary to use the traffic smart light to apply it in this region to get some simulations.

public transportation system is available in sahwa tower and may will be the reason of congestion due to the volume that taken in the road such as buses or taxi etc., however the capacity of people around this area that using the public transportation are not high. so it was necessary study all the elements that can effect the condition of road and cause problems and that’s why I study the area before five years ago to see how the road condition change and dedicate exactly the problems which happened and will probably need techniques that will be used to treat the problem if I change the design plan of the area.

The main causes of traffic congestion and their urban disadvantages are the increase in population, private cars and the low level of public transport in all areas, car accidents, driver behavior, poor weather conditions and poor road planning, causing environmental and economic disadvantages to the environmental and economic community from air pollution and toxic gases. Resulting in noise and disturbance of others, in addition to the exhaustion of large quantities of oil because of the increase in the number of vehicles used and the loss of time of drivers due to waiting for congestion until traffic becomes available.

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This study will focus on how to explore the problems that may face many ways in the Sultanate of Oman using one of the modern techniques that will explain the most important problems that may suffer from a specific area and seek solutions to them, whether to find an alternative plan as a new design helps to eliminate it or initiate At work to try to reduce problems. I chose one of the most important areas in the Sultanate, namely the Sahwah Tower, which is a major center in Muscat for data extraction and analysis. Many countries in the world may face road problems as the biggest problems due to the highest percentage of accidents and congestion, which impedes the movement and efficiency of the road. This study will focus on congestion problems and improve the efficiency of the road and try to raise the level of illiteracy for road users. (IEEE, 2015)

In recent years, the traffic situation in Muscat has deteriorated due to the increasing population and the number of vehicles. We may notice traffic congestion in the study area in the morning when employees go to work towards Sultan Qaboos University, so traffic analysis will be discussed and analyzed to try to improve and find solutions. (Revenio C. Jalagat,2015)

The urban transport system is currently facing many problems. Traffic congestion and accidents may be the biggest problem, given the failure of governments to take the necessary measures to improve and develop roads as well as to control driver behavior. In this chapter, specific procedures will be followed in order to complete the study in the form of important points, by determining the area studied and why selected it, adding the type of research, adding the method of collecting data, show the way of collected data , knowing the opinions of the peoples surrounding the area and by their opinion on the solutions that I will provide, Results to reach a suitable design. (P. B costa. Morais Neto,2016)

Figure 1

The area selected located in Muscat, the largest city in the Sultanate, with an area of 3500 square kilometers and divided into 6 states inside the population of Muscat is currently estimated at 1.28 million according to a census conducted in 2015 .The study area is located near the Seeb (wiki,2015). One of the most important reasons for choosing the area study are respondents, around

Road condition is not highly efficient, Setting the region as a major hub focused on access to all areas of Muscat as well as outside of Muscat for other states, Traffic congestion due to the proximity of the region from all governmental institutions, educational and industrial, Driver behavior. The interview was conducting with the four employees in the AL-Seeb police traffic department office to asking about their opinion of traffic congestion in study area with knowing the reasons and how the smart traffic light can an effect on this problem and I also I established my questionnaire was to public people, student in middle east collage and educational facilities nearest to area study to find the suitable solution to improve the traffic volume roads and driver behavior. After collecting the data by using Qualitive and quantitative method will be using SPSS program version 25.0 to analysis the data by classified and coded the two method and concluded that in types of charts and tables all the charts and tables in chapter 4 will analysis the data to see the possibility of their impact after that in solving the problem of congestion during the Al-shahwa tower.



figure 1: sahwa roundabout area

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Figure 2. show the traffic congestion.

Results

After the questionnaires were conducted for specific preparation targeted at certain categories of students in middle east collage, sultan Qaboos university and public car driver people to know their opinion about the problem of congestion and its causes. by using SPSS program version 25 for analyzing the data about reasons of traffic congestion. cross-tapes explain to us important parts which key causes of any plan are where it was used here to analyzing the questionnaire for traffic congestion by looking at 6 key questions depending on 3 important parts which are Gender, Age group, and driver experience period to see how this can affect our problem.

1.High vehicle density duo to the presence of few traffic corridors:

24 from male respondent said strongly agree of the high vehicle density will an effect duo to presence of a few traffic corridors, 16 respondents said that they agree, and the total was around 40 males have been completed the answer of this question. For female respondents, around 10 respondents said that strongly agree, 2 respondents said that they agree vehicle density will an effect duo to presence of a few traffic corridors and the total was around 12 females have been completed the answer of this question. that show the percentage of male and female strongly agree than agree respondents.

2.High vehicle density due to the presence of a few traffic corridors:

Between age group 18-25 years 13 respondents said strongly agree High vehicle density due to the presence of a few traffic corridors: 7 respondents said that they agree on that and the total was around 20 people in this Age have been completed the answer of this question. For age group between 26-33 years

13 respondents said that strongly agree, 4 respondents said that they agree High vehicle density due to the presence of a few traffic corridors and the total was around 17 persons. For age group between 34-41 years 6 respondent said strongly agree and 4 persons also said agree when the total number of this age group about 10 people. For age group more than 41 around 2 respondents said strongly agree, 3 respondents said agree and the total number was around 5 persons. This shows that the younger age group is largely supportive for this reason because it is one of the most important causes congestion, the table below illustrate this.

3.Smart traffic light can save time for drivers:

Between (one to five years), (one to six years), and more than 12 years, 12 respondents said to the license experience between one to five years they strongly agree smart traffic light can save time for drivers, 6 respondents said that they agree, and the total number of respondents in this age about driving experience period was 18 persons. 11 respondents for license experience between one to six years said strongly agree about smart traffic light can save time for drivers, 7 respondents said that they agree and the total number of respondents in this age about driving experience period was 22 persons. 7 respondents to license experience more than 12 years said that they strongly agree to the question 8 and total number of respondents in this age about driving experience period was 12 persons. This summarizes the respondents between one to five years had highest proportion strongly agree of approval for this reason as an influential factor in congestion than other experience years groups, this indicates that they are greatly affected by this problem because they do not have enough experience.

Table 1.

Table1 ;showing the statutes of questionnaire.

	Distributed	Rejected	Received	Completed
Mawaleh regions	25	2	21	19
SQU	15	2	13	11
MEC	15	2	15	13
Car drivers	15	2	11	9
Total	70	8	60	52

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Discussion

At the end of this project I will explain in a simplified way the various molecules that have been completed to this project. In the beginning, the intelligent transport system was defined and used in the road system globally and the extent of Oman's need for this system to develop and raise the level of transport, which keeps pace with the advanced countries in the infrastructure and contributes to the elimination and reduce the problems experienced by the Sultanate especially after Oman occupied a high position in The problems of road accidents and congestion as key elements in the Middle East. Therefore, it was necessary to define what the intelligent transport system and what the main systems it contains and in what is used and then address the knowledge of how to create a smart transport system and where it started and how it was developed up to the time This is us. Then, the countries in the use of intelligent transportation system technology around the world were studied through four countries: China, Japan, Germany and India, and monitoring the details of the system and how these countries benefited through the application of this system in several places then moved to clarify the most important techniques and programs implemented according to the system Intelligent transportation around the world and talk about the details of each technology and use and then focus on the technology of smart traffic signals, which will be linked to the main objective of the project after that in an attempt to address the congestion problem in one of the Sultanate of Oman, which was chosen to be the Al sahwa region. .After that, it was defined what is the technology of the system of smart traffic signals and its importance and way of work exciting in creativity in measuring the size of vehicles in a particular way by the alerts used by the system and then allow the crowded axes to cross and stop other axes for a short period of time until the elimination of congestion in that area and also Help emergency cars to find entries to them when congestion intensified by this technique as in the study that was explained for this part. Thus, several studies were conducted on the means of public transport used in Amman and the obstacles faced by roads of congestion and accidents and the impact on the future state. All these points were summarized in part of literature review in project.

After that, I discussed the study of the work area and discuss the reasons for choosing the region because of the overcrowding in Oman. The data was collected either in qualitative or quantitative manner after conducting a personal interview with the traffic center in the state of Seeb, which summarized the interview that the reasons for the traffic congestion of that region is due to its strategic position, which is the point of arrival of many governmental and private bodies, In addition to the personal interview, I have conducted a questionnaire to discuss the causes of traffic congestion to see whether they are with those causes of congestion or not ,52 of the 70 distributed at Sultan Qaboos University, Middle East College and two drivers were collected in Al-Mawlaeh area. The reasons for traffic congestion were discussed. This was the way to accomplish my project before moving on to the analysis of data and results.

Conclusion

In analyzing and monitoring the data collected from the questionnaire, I used the SPSS version 25 to help me study the collected data by creating tables and graphs illustrating the numbers and percentages used to analyze the questions in the questionnaire. I have already focused on three main elements Focus on them when you get the answers to the questionnaire age, gender and driving experience and then you have identified three main questions that are mainly related to the ways of congestion and treatment by focusing on the system of smart traffic signals as an important factor in the concealment The congestion and maintenance of the driver's time and also focus on the condition of the road and the number of little passages that cause a large volume in the density of cars as the main causes in the congestion At the end of the monitoring of the results, it was found that most age groups of different sex and driving experience, where very few were available, were not convinced of these reasons. The major percentage was that the condition of the road and few traffic corridors were a major cause of congestion, the provision of smart traffic lights and their application in the Sultanate of Oman will significantly reduce the congestion problem and regulate the roads in a high technical manner that respects the rules and traffic

system and achieves the safety and safety principle of the driver.

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