

ANY EVIDENCE OF SUSTAINABLE TRAVEL BEHAVIOR IN LIBYA AN INVESTIGATION

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Abstract

Although there have been a large number of research investigations into travel behavior in Western countries, there is a huge lack of studies in this area in some countries, such as Libya. The purpose of this study was to carry on an investigation and model travel behavior and attitudes for households in Libya. A household survey was used to collect data on household travel patterns and socio-economic variables of 283 residents in the city of Tripoli in Libya. The analysis shows that 87% of residents use car as their main travel mode to do various activities, while only 7% use buses. In addition, the study found that traffic congestion is the most faced issue by 61.9% of citizens when travelling around the city. Further analysis shows that 65.6% of the surveyed people admitted their choice of mode depended on the current gas prices in the country and 72.4% are not willing to accept the increase the price of gas to reduce the traffic congestion or air pollution. The overall analysis of the study suggests the need of urgent intervention from both transport planner and decision makers in the country for a better sustainable travel behavior.

Key words: Travel behavior, sustainability, Libya.

1 INTRODUCTION

Among the most important future challenges we may face is sustainable urban transport. It is therefore necessary to reduce the reliance on single-occupancy vehicles dependent on fossil gases, which can only be achieved by creating and developing a range of appropriate solutions that can be adopted to meet this challenge, as well as by encouraging individuals to change their traveling behavior. In this respect, various ideas have been made to motivate individuals to dispense with the private car in their daily travel and to adopt new attitudes [1]. The most significant points on which these

ideas focus are raising people's awareness of the importance of making new changes to the daily habits they follow when moving from one place to another, and informing them of the benefits they will gain in the future, so that these new habits become a voluntary part of their daily lives. Sometimes more dissuasive initiatives, such as sanctions or economic incentives, are adopted. Among the examples that can be quoted are travel awareness campaigns, provision of enhanced travel information and plans [2]. These measures, as reported, have had positive results despite their limitations and despite the fact that people continue to use the car and are not reluctant to use it [3]. However, they often show good intentions to comply with the measures taken and are willing to adopt new habits. As a matter of fact, it seems that turning words into a living reality remains a difficult task [4].

Numerous papers have been published to investigate and analyze the travel behavior in many western countries, however, there is a huge gap regarding this issue in developing countries. For this purpose, this paper shall at a certain level analyzes the travel behavior and investigates the sustainable travel behavior in Libya. The land uses adopted within the urban environment is one of the main factors which affects the travel behavior of individuals. Before 1950's, only 27% of Middle East and North African regions population were urban, the rest were living in rural areas. By the year 2000, the size and spatial distribution of population was significantly changed. In 2013, between 60 percent and 80 percent of the population of the population of the four Maghreb sub-regional countries (Libya, Tunisia, Morocco and Algeria) was urban [5]. According to [6], Libya has the highest percentage of its population (more than 80 percent) living in cities. Until the date of writing this paper, the authors have only found one article explaining the issue of travel sustainability in Libya. [7] attempted to analyze the existing public transport system and whether there is a potential for future sustainable public transport system in Libya. The author first gave an overall view on the transportation status in the country supported by some facts, then discussed the issues related to the passenger transport before concluding with suggestions and recommendations for more sustainable public transport system in the country.

This paper presents an investigation and modeling of travel behavior and attitudes for households in Libya. This is a very motivating and promising area of research that will help the decisions makers and urban planners to understand the travel behavior of people in the country. In the next section, the study area and data collection are explained. Section 3 analyses the results from the collected data. In section 4, the conclusion summarizes the paper and gives some future recommendations.

2 STUDY AREA AND COLLECTION

Tripoli is the capital of Libya and is located in the West of the country along the Mediterranean Sea shown in fig.1. The capital has population of 1.3 million residents [8], and it attracts many nearby cities residents daily because of the location of the government offices. A questionnaire was used to collect the data from random households living in different areas of the capital. The sample of this study was selected from the population of the selected region by considering the citizens who are 18 years old and over, the Solvin's formula

is used. In total, 400 surveys were distributed throughout Tripoli in the months of November and December of 2020, 282 household completed the surveys which gave an overall response rate of 70%. The survey questionnaire contained four different sections. The first section of the questionnaire was designed to collect the socio economic characteristics of the individuals and the households (e.g., age, gender, income, family size, education, etc). for the second section of the questionnaire, households were asked about their current travel patterns including the mode of transportation they use to go work, travel time, home departing time, and whether they have flexibility in departing home earlier or later than their normal departing time. In the third section responds were asked to provide their opinions on their current transportation mode and other alternative modes. The goal here was to investigate the willingness of the responds to switch their current transportation mode. The final section of the questionnaire investigated respondents' attitudes to a number of a number of transport, policies and environmental policies.



Fig. 1 Location of Tripoli in Libya (Map by Worldometer)

3 RESULTS AND ANALYSIS

3.1 Current travel patterns

Fig.2 shows the patterns of travelers' purposes and their regularity of using different modes for traveling. From the survey data, it is clear to notice that males generally make more trips for different purposes. It was found a total of 74.1 percent (209) of respondents indicating that they commute to work at least once a day, and 85.6 percent out of these trips are male commuters, while only 57 percent (30) of the females responders go to work daily. The second most purpose of traveling for the responders was shopping, males were also the dominates in doing shopping, which is usually the case in the Libyan society for males to do most of the groceries shopping of the house, with 58.7 percent of the trips. It can also be noticed that as least 53.5 percent of the males surveyed go to work and do shopping on daily basis. School trips come next as the third frequent daily purpose trips with 30.14 percent followed by with people and personal trip at 24.8 percent and 10.6 percent, respectively. On the contrary, around 50 percent of the responders, both males and females, said that they rarely or never commute to school, hospital or escorting children or needed people. When it comes to the trips both genders make once or twice a month, males overcome females by 50 percent in Hospital trips, 72.6 percent in personal trips and 57.9 percent in visiting trips.

The unavailability of other modes option was deemed the most important factor when choosing the mode of travel, with a total of 73.6 percent of drivers choosing this as a determining factor in their decision making. The second most important factor affecting the car as the mode chosen was the low running cost of this mode, with 41 percent of respondents signifying this as a determining factor. Frequency, flexibility and meeting the family requirements were other factors which influenced the decision making process, with approximately 27 percent of respondents selecting these factors; however, it is interesting to notice that only 4 percent indicated that they chose their mode because it was environmentally friendly.

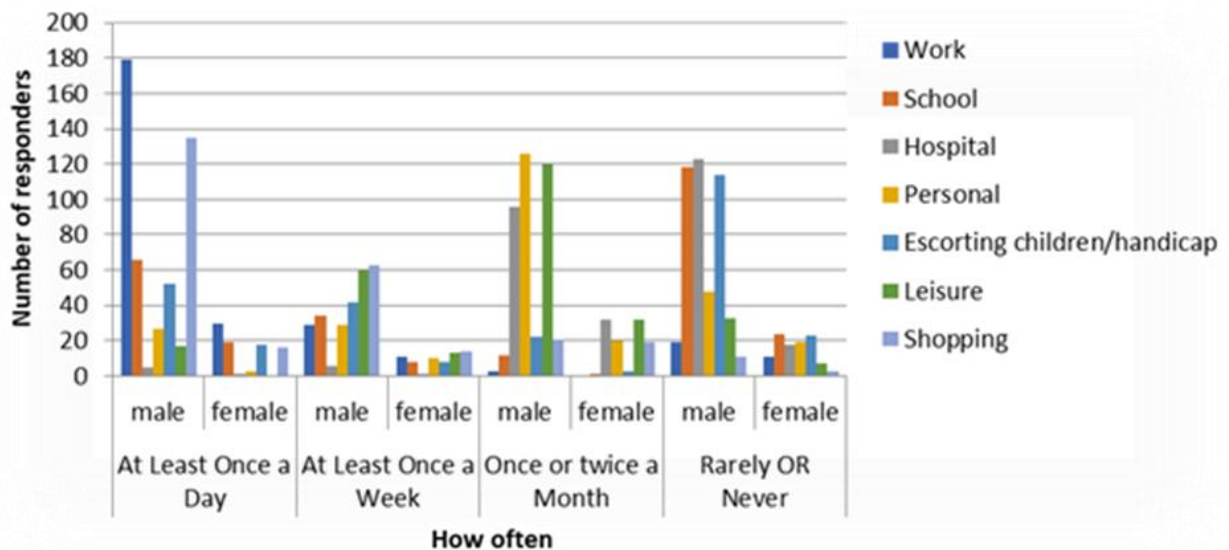


Fig. 2 Trips purposes frequency between men and women.

From data provided by the respondents, it was found that most citizens (50 percent) have a journey time between 30-90 minutes when commuting to their work place in the morning, while only 29.4 percent would spend less than 30 minutes on the road. The last 20.6 percent of citizen spend more than 90 minutes when traveling, These long travel times indicate that there is traffic congestion in the city during the morning time since the car is the dominate mode in the city, however, it seems that the travel time is not the most challenging issue citizens face on roads since only 36 percent of them recognized it as an issue.

3.2 Views on modes of travel

The next section of the questionnaire dealt with individuals’ overall travel behavior and their views about modes of transport in general. Initially the questionnaire asked about modes of travel used for any purpose over the last year. During the analysis of these data, we have found that the amount of people who take taxi are the least, while the car mode is the dominate in Libya. When we take a further look at this individual’s reason for choosing this mode, we see that they needed their car before or after work, which was one of the main influences on their mode choice. In addition, buses are the second most used mode followed by the walk mode. As shown in figure 2, the car is used by 87 percent of the surveyed citizens as their daily traveling mode with men making up around 95 percent of these car trips. The public transportation is not favored by residents in the city of Tripoli as only 7 percent use buses to travel around the city, similarly, people barely walk (4 percent) to their work places.

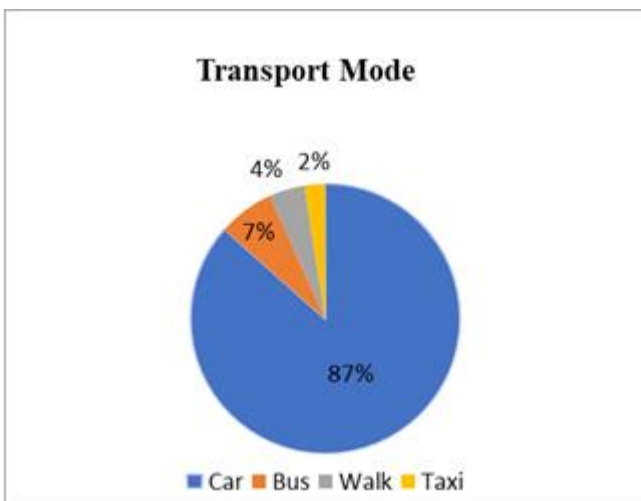


Fig. 3 The percentage of transportation modes used.

3.3 Changes to travel time

We can see that the majority of the travelers surveyed begin their work between the hours of 07:00 and 09:00 hours with a total of 65.6 percent of individual starting at this time, while only 4.3 per cent starting before 07:00 hour. A further 13.5 percent starting after 09:00 hour and 16.67 percent go to work at different times during the week. When asked about returning home after finishing work, 47.9 percent, the highest representative, stated that they do not have a specific time, 36.9 percent return home after 2:00 hours while 13 percent

will be home between 12:00 and 2:00 hours at noon. Based on these start and finish times, it is clear that these individuals will be sharing the road network during the peak early morning traffic times with many other commuters. Should these individuals have the flexibility of changing their start and finish times, then their overall journey time may be reduced, subsequently, lower traffic volumes will be built up in the network.

When asked about the flexibility of changing their home departure and return times, approximately one third (35.8 percent) of individuals indicated that they would be capable of changing their home departure time if they wish to do so. 32 percent of the responders admitted that do not have the flexibility when departing home in the morning as they are restricted to specific work schedule along with the need to transport children to school. The last 31.9 percent of individuals stated that they sometimes have the flexibility to either departure the home either earlier or later than their usual home departure times.

With reference to returning home times, it was seen that 45.7 percent of individuals are not capable of changing the home return times as they are mostly restricted to their children finishing school time. On the other hand, only 32.6 percent answered that they have the flexibility of returning home at any time. Furthermore, 21.6 percent are sometimes capable of changing their home return times. It is clear that the family commitments and lack of flexibility within the workplace are the main factors preventing any alterations in the finishing time of certain individuals.

3.4 Attitudes to travel impacts

Initially in this section the respondents were asked about their perceptions of the issues they face when commuting to work or other activities. From the survey, it has been found that a large percentage feel that congestion in the network is an issue that affects them in some way (61.90 percent), followed by limited traveling option of modes and traveling cost with 54.95 percent and 43.22 percent, respectively. Furthermore, 36.26 percent of the responders felt that traveling time is a serious issue followed by parking cost at 21.92 percent and not enough parking spaces at 20.51 percent. With regard to air pollution, only 11.72 percent stated that it is an issue they face when travelling around the city. Since Libya is one of top exporting countries when it comes to oil, the oil price (0.15 LBY per liter) is among the cheapest in the world. Subsequently, more Libyans are willing to own their private cars instead of using the public transportation when travelling in the city. As was pointed out earlier, traffic congestion is viewed as a major problem within the city and any steps to alleviate it will be surely welcomed. The respondents were also asked for their view on the ways in which the revenue generated by these charges could be used, and it was seen that the majority wished for it to be reinvested in initiatives aimed at further reducing congestion. We asked the surveyed citizens whether the price of the oil affects their choice of travel modes, 65.6 percent of responders believed so, while 14.3 percent did not think it affects their decisions. In addition, when asked about their opinions on traffic congestion and whether the increase of oil price would reduce the traffic on roads, 72.9 percent did not feel this would help and 9.9 percent answered they did not care.

Regarding the environmental concerns, we asked the sample population three questions, the first one was on whether citizens believe it was time to go green with transportation modes (electrical cars, buses, smart buses, etc), expectedly, the majority (91.2 percent) felt that it was indeed the time for more intelligent transportations modes, while 6.2 percent stated that it was not their concern. Another question investigated the reaction of the responders when they were asked about the idea of charging drivers during morning and night peaks hours for using highways in order to protect the environment, almost half (49.1 percent) of answers were against the proposal, 32.6 percent found the idea convincing while 19.4 percent felt it was not their concern. The last question was connected to a previous question about congestion but this time residents were tested on whether they would prioritize the cost of gas over environmental concerns. Approximately 74 percent of the population sample rejected the idea of increasing the price of gas to protect the environment from Carbon Dioxide emitted by both cars and buses.

It was found that the majority of respondents occupying the 26-35 age profile with an average age of 30 years old. The majority, representing 48.23 per cent of respondents, were the head of the family, with the wife representing 23.08 percent and oldest sons, daughters and sons representing 12.8, 12.8 and 7.2 percent, respectively. Married individuals represented 64.7 percent, with 35.3 percent indicating that they were single. University (including undergraduate, masters, and PhD) graduates represented 56.03 percent of the sample group, followed by those possessing a high school degree at 30.14 percent. Both responders with primary education or no education (illiterate) were 3.19 percent of the sample size. The most common income level was represented by those family who earning less than 1,500 LYD per month accounting for 70.57 percent of respondents, followed by 24.82 percent earring between 1,500 and 6,000 LYD, a further 2.48 and 2.13 per cent occupying both the above 9,000 LYD and the 6,001-9,000 LYD ranges.

As for car ownership, nearly half (48.6 percent) of the responders stated that they possess at least a car in their household. These are usually small sized families with medium monthly income. For families with more than a car, the data showed 29.79 percent own 2 cars while 11.70 percent own 3 cars. It is worth mentioning that 2.84 percent of responders own 5 or more cars, these families are typically large sized families, with working members and high monthly income.

When asked about the ownership of a valid driving license, 76.6 percent (216) of the 282 respondents indicated that they were in possession of one. The other 23.4 percent (66) are representative of women and men who are either do not possess or drive without a driving license. In this study, all women drivers possess a driving license; this indicates their better safety awareness over men, at the same time, it indicates that there is a lack of concern for the possible implications of being found driving without holding a valid driving license for men. This also leads us to question how good the driving of these individuals might be if they have not achieved the standard of driving capability necessary to possess a license.

3 CONCLUSION

The purpose of this study was to carry on an investigation and model travel behavior and attitudes for households in Libya. The results analysis showed that the car mode is the dominate mode when traveling around the city of Tripoli, public transportation (buses) is only used by a small portion of the population sample. There are various reasons for that including the current cheap price of gas, the unavailability of other travel modes, the quality of services provided by public transportation companies and others. Even though the traffic congestion is the most challenging obstacle citizens face on the roads, the proposed solutions in this study were all rejected by most of the responders. The environmental concerns, air pollution for example, is not well recognized as a serious problem by most of the surveyed people due to lack of knowledge. All of this research analysis declares the urgent need for an intervention from both transport planner and decision makers in the country for a better sustainable travel behavior in Libya.

REFERENCES

1. Batty, Paul, Palacin, Roberto, González-Gil, Arturo, 2015. Challenges and opportunities in developing urban modal shift. *Travel Behav. Soc.* 2 (2), 109–123
2. Skoglund, Tor., Karlsson, I.C. MariAnne, 2012. Appreciated—but with a fading grace of novelty! Traveller's assessment of, usage of and behavioural change given access to a co-modal travel planner. *Procedia – Soc. Behav. Sci.* 48, 932–940.
3. Scheepers, C.E., Wendel-Vos, G.C.W., den Broeder, J.M., van Kempen, E.E.M.M., van Wesemael, P.J.V., Schuit, A.J., 2014. Shifting from car to active transport: a systematic review of the effectiveness of interventions. *Transp. Res. Part A: Policy Pract.* 70, 264–280
4. Strömberg, Helena, Oskar Rexfelt, IC MariAnne Karlsson, and Jana Sochor. "Trying on change—Trialability as a change moderator for sustainable travel behaviour." *Travel Behaviour and Society* 4 (2016): 60–68.
5. A. I. Abubrig, "Urban Growth and Sustainability in Tripoli - Libya," *Azzayatuna Univ. Bull.*, no. 18, pp. 259–280, 2016.
6. WPDS, "Annual report on the world's demographic, health, and environmental progress and challenges," Washington, DC, 2014.
7. A. M. Alhodairi, "Is Public Transport System in Libya Sustainable? Car ownership," no. February 2012, 2012.
8. B. of Statistics, Bureau of Statistics and Census. Tripoli, Libya, 2020.

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