

**FACTORS THAT INFLUENCE PEOPLE'S BEHAVIOR USING PUBLIC
TRANSPORTATION IN KERMAN CITY, IRAN**

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DEDICATION

Most importantly; I would like to dedication this thesis to my husband, Hamed Mirzaei for his sincere love, patience, sacrifice, inspiration, understanding and constant help and encouragement. Also my appreciation dedicated to my beloved parents, Dr. Bagher Bahreini and Sedighe vahidi for their patience, invaluable supporting, encouragement and praying for me, as well as my lovely sister, Matin bahreini and my lovely brother Mohamaad Reza Bahreini for valuable helping and encouragement. Also I want to dedication to my husband's family for their constant support and encouragement. I could not have done it without you!

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ABSTRAK

Tujuan kajian ini ialah untuk mencari faktor-faktor yang menggalakkan orang ramai menggunakan pengangkutan awam berbanding kereta persendirian. Ia juga bertujuan untuk mencari faktor-faktor yang mempengaruhi tingkah laku manusia dalam penggunaan pengangkutan awam di bandar Kerman, Iran. Kajian kes untuk penyelidikan ini ialah bandar Kerman di Iran. Bandar Kerman dipilih kerana bandar ini kekurangan infrastruktur pengangkutan awam yang baik dan sesuai yang menyebabkan orang awam cenderung menggunakan kereta persendirian. Kecenderungan ini juga disebabkan oleh kenyataan bahawa pemilikan kereta adalah lebih mudah dan selesa, cepat, dan boleh diharap berbanding dengan pengangkutan awam. Kajian ini cuba mencari masalah pokok dari segi alam sekitar, ekonomi, dan psikologi. Pemahaman faktor-faktor ini boleh menjimatkan masa dan wang yang dibelanjakan oleh orang awam setiap hari untuk pengangkutan dan turut mengurangkan pencemaran udara. Kajian ini cuba mencari faktor-faktor ini dengan menggunakan kaedah kualitatif dan kuantitatif berdasarkan rekabentuk soal selidik yang ditanyakan kepada masyarakat bandar Kerman. Dalam kes ini, borang soal selidik diberikan kepada 100 orang responden untuk mereka menjawab soalan-soalannya. Berdasarkan jawapan mereka, masalah-masalah yang menyebabkan tingkah laku manusia dalam penggunaan pengangkutan awam boleh difahami. Tambahan pula, faktor-faktor yang mendorong orang ramai untuk menggunakan pengangkutan awam juga akan disiasat. Analisis data deskriptif telah dilakukan dengan menggunakan *Statistical Package for Social Studies (SPSS)* untuk mencari faktor-faktor yang mempengaruhi tingkah laku manusia berkaitan penggunaan pengangkutan awam. Berdasarkan analisis ini, beberapa faktor telah ditemui. Faktor-faktornya termasuklah; maklumat yang tidak lengkap tentang jadual pengangkutan awam, jarak yang jauh, dan bas yang tidak menarik dan tidak boleh

diharap. Berdasarkan keputusan kajian ini, kerajaan haruslah menumpukan perhatian untuk menyelesaikan masalah-masalah pokok sistem pengangkutan awam. Tindakan ini akan meningkatkan kadar penggunaan pengangkutan awam dalam kalangan rakyat.

ABSTRACT

This research aims to find the factors which encourage people to use public transport instead of private car. It also finds the factors that influence people's behavior regarding the use of public transport in Kerman city of Iran. The case study of this research is Kerman city in Iran. The reason behind selecting Kerman is because of the lack of good and suitable public transportation infrastructure which leads to people's tendency to use their own car. This tendency is resulted from the fact that car ownership is more convenient, speedy and reliable than public transport. This research tries to find underlying environmental, economic, and psychological problems. By understanding these factors people can save their time and money they spent per day for transportation and also decrease air pollution. This research tries to find these factors by using qualitative and quantitative method based on designing questionnaire to ask from the people of Kerman city. In this case the questionnaire will be given to 100 respondents to answer the questions. Based on their answers, the problems resulting in people's behavior on using public transportation can be understood. Furthermore, the factors which motivate people to use public transportation will be investigated. Descriptive data analysis was done by using Statistical Package for Social Studies (SPSS) to find the factors that influence people's behavior regarding the use of public transportation. Based on this analysis there are several factors have been found. Some of these factors include: poor information about schedules of public transportation, long distance, and buses not being attractive and reliable. According to these results, government should concentrate on solving the problems underlying the public transportation system. This will result in higher rate of public transportation usage among the people.

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CHAPTER 1

INTRODUCTION

1.1. Introduction

All national positions in the world have different definitions of Low Carbon Society because all countries have different level of progress to produce pollutions. For developed countries, in the middle of the 21st century, with decreasing the CO₂ emissions they can gain a low-carbon society. Also it can be extended to lifestyle and institute with the spread and development of low-carbon technologies. For developing countries, by the accomplishment of broader development objectives, they can attain to a low-carbon society. The level of CO₂ can be a sign of progress in developed countries. This basically means that the concentration of CO₂ is inversely proportional with the level of progress in each developed country (Skea and Nishioka, 2008).

By definition Low-Carbon society involves the concept of sustainable development which ensures the satisfaction of all the needs related to all group of people in that society. This can be done by reduction in global emission to reduce the atmospheric CO₂ emission and GHGs (Skea and Nishioka, 2008). Also reduction policies regarding climate change aren't just helping to control GHG concentrations

but also they result in better national energy security and also mitigation of local air pollution concentrations. Then, it is important in the developing countries to be informed about the direct and indirect advantages of GHG reduction policies and also the potentials for GHG mitigation (Shrestha and Shakya, 2012).

One of the continents in the world that greenhouse gas (GHG) emissions are rapidly growing on it and also is predicted to have 40-54% of CO₂ concentration in 2050 is Asia. One way to decline CO₂ concentration is Low-Carbon Society. Here there are three principles for substantiation LCS: (i) through structural alteration that can reduced demand to decline service energy demands; (ii) improvement and using energy production technologies; (iii) and to remove carbon from energy sources (Strachan et al., 2008).

Transportation can be a cause for a great part of environmental problems. For this problem to be understood, or basically diminished, information must be obtained about both the genuine issues and their effects (i.e. air pollution, CO₂-emissions, water and noise pollution, etc.) and also the significance of transportation for community and each person (Jensen, 1999).

Nowadays the use of energy in transportation has been increased. Forty years ago, total energy use in transportation was between 15% and 20%, but today energy utilization is around 35% and it is still increasing. Transportation is the biggest cause of greenhouse gases in the world, and it was addressed by the 1997 Kyoto services. The purpose has been to decrease greenhouse gas concentration by 5.2% from 1990 to 2012 (Chapman, 2007).

One of the fuel sources which are to be used for production of 81% of total energy use in the transportation sector is oil. Hence, the use of fossil fuel transport is one of the important factors in greenhouse gases and also in industrial parts; it is one of the parts which are still growing. The effects of transportation on global climate

are not only a result of fuel use but it can also be the result of the manufacturing and repartition of fuel (Weiss et al., 2000). For instance, from total CO₂ mitigation of the car, 76% were from fuel use, 9% were in the structure of the car, and 15% were for emission and losses in supply system. The similar studies from numerous nations have indicated that the absence of effective and dependable transportation can intensely effect the economic development (Crafts and Leunig, 2005).

Unfortunately, the growth of energy use in urban public transport is less than in private transport. Also today most of the people are dependent on car travel (Anable, 2005). Some documents show that most people not only drive out of needs but also drive by choice (Handy et al., 2005). Thus to decrease private transport dependence for driving it is essential to increase policies which provide an alternative to driving. These policies might result in increase in public transport and also in change to slower modes of transportation such as cycling or walking. Therefore to decrease the attractiveness of car use it is important to increase proceedings (Garling et al., 2000).

Transportation is a significant consumer of energy and unlike other sectors its energy demand is constantly on the rise. This is a common result of development in the roads of transportation where energy effectiveness is lower than other segments and causes more pollution. Development in the road transportation is related to reasons such as freedom of consumers and completion of domestic markets in western countries. There are solutions to reduce energy consumption, pollution and using private car, through finding factors that influence on people's behavior in using public transportation (Verdinejad, 2010).

The studies illustrate that transportation is not the most common mode choice between policy makers or transport users. The choice of transportation is affected by many effects which are: the personal's characteristics and lifestyle, the type of trip, the understanding of service efficiency of each transport mode and different position (Beirão and Sarsfield Cabral, 2007). The differentiation between driving by decision

and need is more complex to be investigated as the daily decision and it greatly is dependent on residential situation, job situation and intercommunity activities (Handy et al., 2005).

1.2. Problem Statement

One of the most important factors in producing pollution is private car that most of the people of Iran are using for every purpose such as shopping, recreational, work and education. In addition, this is the main factor that increases the demand of energy in Iran and also produces air pollution. Energy consumption defines the relationship between people's behavior and facility of public transportation in neighborhood structures and this relationship determine measures of pollution at neighborhood and global levels. Moreover, the main problem which results in global warming and ozone discharge is people's behavior. Most of time, the neighborhood has basic facilities of public transportation; however people tend to use their private cars and this will be resulted in an increased consumption of energy and pollution in the environment (Verdinejad, 2010).

Usage of private cars in large cities causes an increase in the pollution and it is a serious problem. Based on the statistics, four thousand people are going to die from related diseases that came from air pollution each year in Iran. One of the important actions from the Iran's government to reduce demand for refined products and lower air pollution is to introduce CNG (compressed natural gas) vehicles. This factor doesn't have enough effects on decreasing pollution based on researcher's opinion. This factor declined the demand of energy less than 1% in 2030 (Verdinejad, 2010).

Another problem that causes people not to use public transportation is spending a lot of time on traveling by public transportation. This problem leads people to use private cars which results in an increase in demand of energy consumption, as well as an increase in air pollution which destroys the environment in the neighborhood. Saving time is one of the important factors that can help to change people's behavior. This problem has clearly seen in all types of public transportation in Iran, which has a lot of effects on people's behavior in using public transportation (Verdinejad, 2010).

According to the table 1.1 the rate of vehicle usage in Iran based on 1,000 populations is more than the mean for China, South Asia and Africa, which is increasing number of vehicles in recent years in Iran. Total number of vehicles was increased to about six million by the end of the Iranian year 2006-07. Meanwhile, the number of vehicles had increased from 1.8 million in 1991, to about 2.45 million in 1996 and to 3.68 million in 2001. The utilization of private cars is even now expanding and has turned into a unified part of both current social order and of the life for people and families. It has a part to play as a method of transport as well as in social and also social life. Also enhancement of vehicles show that people do not use public transportation and it's because of a series of problem that come from lack of development in public transportation's infrastructures in each neighborhood's cities of Iran. In addition this factor illustrate dire environment situation that has effects on quality of life. Due to the fact that environmental situation of Iran indicates that Iran has poor environment and this problem causes to increase the speed of pollution (Verdinejad, 2010).

Table 1.1: Number of vehicles for different regions and countries

Country/region	Total number of vehicles (million)	Number of vehicles in 1,000 populations	Saturation level
US	218	774	High: limited potential, stable
OECD region*	628	550	High: limited potential, stable
OECD region: North America*	269	640	High: limited potential, stable
OECD region: Europe*	286	430	High: limited potential, stable
OECD region: Pacific*	93	460	High: limited potential, stable
Latin America*	43	100	Medium: relatively high growth potential
Africa*	18	20	Low: relatively high growth potential
Asia*	104	30	Low: relatively high growth potential
Middle East*	19	120	Medium: relatively high growth potential
Iran*	4.99	75.4	Low: relatively high growth potential
Developing countries*	202	40	Low: relatively high growth potential
China*	16	12	Low: relatively high growth potential
World*	830	130	Medium: relatively high growth potential

Source: for those with (*): Dargay et al; for Iran: Iran Statistical Center; for US and China: OPEC's statistics office, Vienna, 2005; information is for 2000

In addition to the problems of density, energy and resource utilization and harmful environmental impacts such as noise, shake and the dispersion of diverse pollutants, increasing global warming is another negative result of using private car. Undoubtedly, using private car is one of the most important sectors consuming fossil fuel in Iran. Energy demand in transportation sector is more than 50% of the total energy demand in Iran. Although, the number of vehicles in 1,000 populations has greatly increased in the past few years but public transportation has not developed in Iran. These problems have led to enhanced GHG emission (greenhouse gases) and resultant environmental problems for flora and fauna as well as populations of cities in Iran (Verdinejad, 2010).

Nonetheless, travel behavior is of special attributes. In every trip, individuals have the decision between diverse transport modes, every one having particular attributes, points of interest and disservices. The rapid growth of people and the subsequent usage of urban facilities and foundations have come to be simultaneous with urban improvement criteria and additionally have accelerated new challenges in the space of urban transport and likewise environmental problems in Kerman (Allen, 2013).

1.3. Research Questions

This research is conducted to find out the appropriate answer for below questions:

1. What are the main factors that affect people's choice of travel mode?
2. What are the people's attitudes towards public transport?
3. Which changes would encourage people to use public transport for traveling?

1.4. Objectives of Study

1. To examine the main factors that affect people's choice of travel mode.
2. To evaluate the people's attitudes towards public transport.
3. To generate the changes this would encourage people to use public transport for traveling.

1.5. Scope of Study

This research provides a literature review of ideas, concepts and theories based on public transport to determine the original functions and roles of it on people's behavior in the Kerman city and how the public transport can be effective on changes on people's attitude to use public transport. It also tries to address the question of determining the main factors that influence people's behavior using public transport in urban area. The scope of the study is focused on following aspect:

- i. To review literatures including the factors that influence people's behavior using public transport.
- ii. To conduct a case study on the factors that influence people's behavior using public transport in Kerman city, Iran.
- iii. To analyze factors which will influence people's behavior about their preferable modes of transportation and their suggestion about the measures that can affect people's behavior in using public transport.
- iv. To Examine the current functions of public transport in Kerman city, and its potential effects on people's behavior.

1.6. Study Area

The present study has been carried out in the city of Kerman, Iran. Kerman city is the center of Kerman state which is located in the south east of Iran. At the 2011 census, its population was 621,374, in 171,389 households, making it the 12th most populous city of Iran. The Kowsar neighborhood has been selected for this research. The main factor that causes to select this neighborhood is that this street connected with three or four main streets and then it cause to increase traffic congestion in this neighborhood. More detail about this case study and neighborhood will be discussed in chapter 3.



Figure 1.1: Iran, Kerman

Source: Google

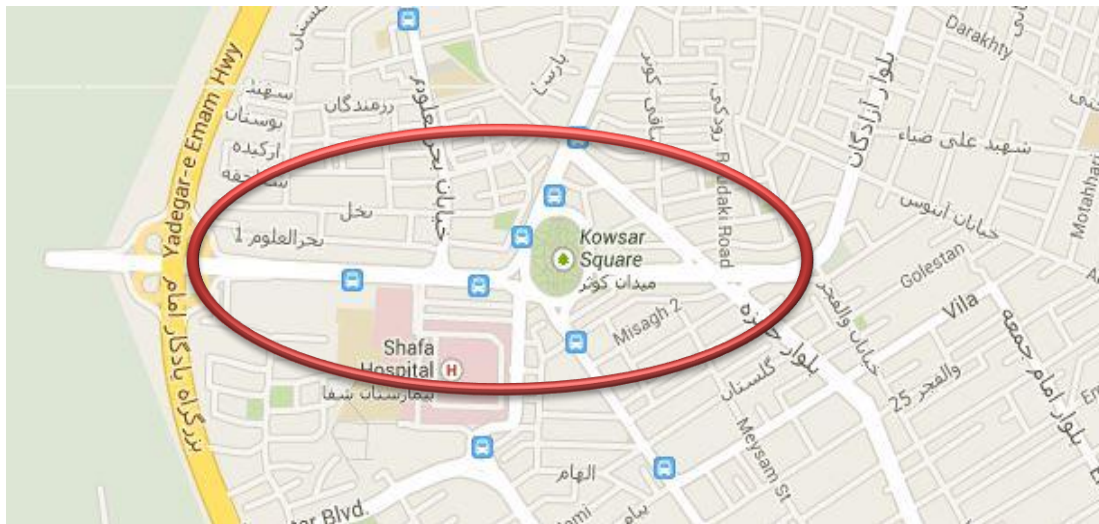


Figure 1.2: Kowsar neighborhood

Source: Google map

1.7. Significance of Study

Everyone is, somehow, either directly or indirectly influenced by transport. Its accessibility and receptiveness directs how, where and when we travel. The transport's mode decision affects numerous parts of our lives incorporating our work, relaxation and health. Transport is a major social and environmental issue all over the world (Kingham et al., 2001).

The environmental issues beginning from the transport part are massive and in spite of the fact that the most recent decade has conveyed an extraordinary number of reports and activity programs, just a little advancement has been made to decline these issues in genuine living. The utilization of private cars is yet enhanced and has turned into a united sector of both modern community and of the life of people and families. It has a duty to play as a method of transport as well as in cultural and social life. One needs to understand and comprehend this entire picture if the plan is

to vary the example of transport so as to take care of the environmental issues inside and from the transportation part (Jensen, 1999).

The key discoveries demonstrate that so as to expand public transport utilization, the service ought to be composed in a manner that obliges the levels of service needed by customers and by competing to absorb potential users (Shrestha and Shakya, 2012). Moreover, attitude towards public transport is an essential determinative of transportation mode decision. It is not expected that all car users change their mode from driving a car to utilize public transport only by enhancing the public transport system (Jensen, 1999).

Some advantages of public transport are: public transport is acknowledged as cheaper than car even by car users, no need to drive and an opportunity to relax and less stress also the possibility of socializing in bus travel, and finally, it causes less pollution (Beirão and Sarsfield Cabral, 2007). This research aims to study transportation in Kerman city. However, Kerman is one of the developed cities in Iran and it is important for this reason. One of the important things which will discuss in this project is that there is not a lot of bus in each neighborhood, which results in a long waiting time in bus stops. Furthermore, the buses are not very convenient and also they are very crowded because the number of buses is very low. Also this research have been tried to find the factors that encourage people to use public transport.

1.8. Chapter Summary

The present chapter highlighted introduction, problem statement along with the research question and objectives of the study. The case study area which is Kowsar neighborhood in Kerman city of Iran has been briefly discussed also the

scope and significance of the research is highlighted. The following chapters will discuss the factors that influence people's behavior in using public transportation in literature and research methodology. Furthermore, results will be presented and discussed along with recommendations about factors to encourage people to use public transportation in Kerman city of Iran.

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