

DEVELOPING SUSTAINABLE STRATEGIES TO ENHANCE CYCLING IN
RESIDENTIAL NEIGHBORHOODS: A CASE STUDY IN KERMAN, IRAN

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To my beloved mother and father

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ABSTRACT

Nowadays, global warming has become one of the main concerns of our world. The role of transportation is significant as it emits 15% of the total emission of CO₂. As an environmental friendly mode of transportation, cycling is considered as an alternative for cars and other motorised vehicles, especially for short journeys. In this research, a survey was conducted on cycling in Kerman (Iran) to assess the possibility of developing cycling as a sustainable transportation, particularly in residential areas. In order to gather information besides literature review, a structured questionnaire was used to collect data about the three main objectives of this research: namely: attitudes of people towards cycling, obstacles of cycling, and demand of the people for cycling in Kerman. After gathering the data, a descriptive analysis was performed with the help of SPSS (version 19) in finding 'mean' values and their significance level ($\alpha = 0.05$) for each questions. From the results, five main factors were identified as the main findings, which were: necessity to propagate cycling culture; needs for high quality road surfaces; lack of control of vehicle speed; lack of bicycle parking spaces; and needs for exclusive continuous bikeways. Based on these findings, some solutions were proposed to improve the attitude, solve the obstacles, and meet the demands to promote cycling in residential areas of Kerman so that a high level of sustainability can be achieved.

ABSTRAK

Pemanasan global merupakan satu isu semasa yang amat membimbangkan. Peranan pengangkutan dalam isu global ini adalah penting kerana 15% daripada jumlah pelepasan CO₂ sebenarnya dihasilkan oleh pelbagai kenderaan. Sebagai sejenis kenderaan yang mesra alam, basikal boleh dianggap sebagai alternatif untuk kereta dan kenderaan bermotor yang lain, terutamanya untuk perjalanan singkat. Dalam kajian ini, satu kajian selidik telah dijalankan ke atas budaya berbasikal di Kerman (Iran) untuk menilai kemungkinan pembangunan budaya berbasikal sebagai salah satu kaedah pengangkutan yang mampan, terutamanya di kawasan perumahan. Selain menjalankan kajian sastera, usaha mengumpul maklumat telah dilaksanakan melalui soal selidik untuk mengumpul data yang berkaitan dengan tiga objektif utama kajian ini, iaitu: sikap orang ramai terhadap budaya berbasikal, halangan-halangan yang dihadapi, dan permintaan orang ramai terhadap pembangunan budaya berbasikal di Kerman. Data-data ini kemudian telah dianalisis dan lima faktor utama telah dikenalpasti, iaitu: keperluan untuk menyebarkan budaya berbasikal; membina jalan yang berkualiti tinggi; membina laluan basikal yang eksklusif dan berterusan; kekurangan kawalan had kelajuan kenderaan; dan kekurangan tempat meletak basikal. Berdasarkan penemuan ini, beberapa penyelesaian telah dicadangkan untuk memperbaiki sikap, mengatasi halangan, dan memenuhi permintaan untuk menggalakkan budaya berbasikal di kawasan perumahan Kerman supaya tahap kemampanan boleh ditingkatkan.

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CHAPTER 1

INTRODUCTION

1.1 introduction

Nowadays global warming is one of the main concerns of our world. Role of transportation is significant among other factors, as it emits harmful Carbon Dioxide (CO₂).

Rapid development of cities in last decades especially in developing countries caused rapid development of urban transportation sectors too. Consequently number of motorised vehicles such as automobiles and motorcycles increased rapidly in urban areas and led to people dependency on them. These vehicles by using fossil fuels and releasing CO₂ have affected life of all organisms such as humans, plants and animals.

Cycling as a clean and sustainable type of transportation without any pollution can be considered as an alternative for cars and other motorised vehicles especially in short journey.

In this research a survey was conducted on cycling in the context of Kerman (Iran) and possibility of cycling development as a sustainable type of transportation, particularly in housing areas was explored. In other word, this investigation is the

about role, obstacles, demands, potentials and solutions of cycling in residential areas of Kerman.

1.2 Background study

A search for clean and sustainable transportation is significant not only because of emission of harmful CO₂ by currently popular vehicles but also because of limited source as their fuel. Encouraging people to walking and cycling besides using public transportation such as metro and bus instead of private cars and motorcycles in urban areas is one of solutions that had been supported by governments. Allocating subsidies for fee of public transportations and preventing cars to enter some areas base on some schedules are examples of measures to reduce fuel consumption.

Advantages of bicycles to other vehicles convinced authorities to think for solutions to encourage cycling among people. Designing bicycles suitable for different people, age, gender and location was one of those solutions. New bicycles are being designed to make cycling easily for cyclists. Utility bicycles for common usage, mountain bicycle for cycling in mountainous condition, touring bicycle for travel, folding bicycle for mix mode transport and more other types of bicycles are examples of different kinds of bikes suitable for different purposes.

Besides industrial designers, who are trying to design different bicycles for different tests, urban planners and designers also have tried to propose some ideas to provide safe environment for cyclists. Woonerf or The Homezone Idea is one of the primary concepts which was applied first in Dutch cities. Early progress in the Netherlands in creating homezones seems to have been sparked by a 'revolutionary' response. Towards the end of sixties, residents, objecting to commuters filling their (mostly narrow) streets with cars, began putting out flower box and taking tables and chairs out onto the street. Their idea was to reoccupy the space that was being used as

parking space by non-residents. The aim of the subsequent policy of reconstruction and reclassification of streets was to restrict the strain placed on residential areas by increasing levels of motorised traffic.

The homezone is for every one and everywhere. The essential elements of homezone be established in most residential streets and area. The shared surface street operates most successfully in lower traffic speed and low traffic volume streets (CROW, 1989). In urban area most streets a little distance from the center are predominantly residential. It is the characteristic of majority of urban area in Netherlands, Germany and elsewhere that most residential streets are planned to be reconfigured so that 'pedestrians and cyclists come before cars'.

Because of safe and friendly environment that woonerf propose to pedestrian and cyclists, it was developed also in other countries like England, Denmark and even in Asian countries such as South Korea, but it seems that no example of that haven't been tested in Iranian cities.

History of cycling in Iran returns to one decade before Second World War, when bicycle entered Iran for the first time. Although at early years it was an expensive vehicle allocated to reach people, but gradually it changed to a popular and affordable type of transportation for all groups of people.

By the popularity of cars to cities and their rapid development in urban spaces, streets turned to dangerous areas for cyclists. As the result bicycles left at storages of houses and usage of them was limited to play of children, until 1989 when the idea of healthy city in Iran was expressed for the first time by experts through an international conference. After that some programs for developing cycling proposed, which most of them allocated to big cities like Tehran, Esfahan and Shiraz. Efforts for improvement of cycling condition in Kerman was limited to a

few parks and entertainment complex around the city, which are not related to cores and housing areas of the city.

1.3 Problem statement

Despite all advantages of cycling and all efforts in developed countries for development of cycling in urban areas as a sustainable type of transportation, there isn't enough experience about cycling in context of Kerman. Bicycles are being left at homes and cars are taking their places every day more and more. If this process will probably continue we would not see any single cyclist in that city. In order to stop this process this research tried to find problems of cycling in Kerman city and solutions of them.

Due to lack of such research about cycling in the context of Kerman, in both aspects of practical and academic, this research was carried out.

1.4 Research aim

Proposing suitable solutions to develop cycling in urban areas (particularly residential areas) of Kerman was the main aim of this research, which at first needed to identify peoples' attitudes, problems and prerequisites in case of cycling.

1.5 Research objectives

The aim was broken down to three objectives:

- Understanding attitudes of citizens toward cycling in city of Kerman.
- Finding obstacles of cycling in urban spaces of Kerman.
- Being aware of peoples' demands for cycling in the city.

1.6 Research sub-questions:

The objectives were then transformed into three research sub-questions:

- What is attitude of people toward cycling in Kerman?
- What are the obstacles of cycling in Kerman?
- What are demands of people for cycling in Kerman?

1.7 Methodology

A methodology was formed in order to find the answers of the research sub-questions. Literature review and questionnaire were the main tools of research in this thesis. Electronic documents like E-books and websites relate to cycling beside printed books, paper and journals were useful sources for advance of this dissertation. In additional to document review, which is necessary for each research, using questionnaire helped us to gather useful data about cycling in Kerman. Through this questionnaire, which was distributed online, opinions of people about the three objectives were asked. The questionnaire included four types of questions;

demographic questions, questions related to attitude of people toward cycling, questions about obstacles of cycling and finally questions about demands of people for more cycling. Data gathered from these parts was classified and analyzed separately to answer questions of research and was qualitatively interpreted with a list of possible solutions being given at the end.

1.8 Significance of the research

Bicycle, as the cleanest vehicle compared to the others considers in the best alternative for transport in urban area particularly in neighborhood scale. Bicycles are not only environmental friendly, but also are suitable for health. Losing weight, releasing stress and strengthening muscles are some of health benefits of cycling.

Another great advantage of bicycles is their flexibility in heavy traffics. When most of the cities involve with heavy traffic in rush hours, riding a bike removes the worry about traffic, because low volume of bicycle let our move between cars easily.

Low cost of bikes is also another reason that makes it affordable for all groups of people. Finally there are a lot of environmental, financial, social and individual benefits in riding a bike rather than driving a car.

Cycling benefits for individual and public has attracted attentions of researchers, who concerns about future of the world, during last decades. Although nowadays significance of cycling as a clean and sustainable kind of transportation is obvious, but still only a few people use their bicycles for that purpose in Kerman. It means that there are some problems in case of cycling in Kerman. In this research, the objective was to find the obstacles and then propos some solutions appropriate to citizens' demands and attitudes.

1.9 Scope and limitation of the research

As it was explained before, Kerman is the context of this study. Kerman is a flat city in east-south of Iran with a population of around 600,000 persons. This city is considered as the capital city of the province of Kerman and because of its climate condition, it has a dense urban fabric.

Due to long distance between location of researcher (University Technology of Malaysia) and the context of study, some limitations existed throughout the research related to communication, For example, lack of direct access to citizens of Kerman as respondents of questionnaire forced the researcher to do survey online. Because of that, a questionnaire was designed in 'esurveycreator.com' and was sent to Kermani internet users. Furthermore, because most of internet users in Iran are people between 16 to 40 years old, our respondents are mostly from these ages.

Limited time of semester (based on UTM calendar September 2012 to January of 2013) was another limitation through doing this survey. This study is also limited to just residential areas of Kerman.

In summary, the limitations of study included:

- Long distance between location of researcher and context of study (Kerman, Iran)
- Lack of direct access to samples of study
- Limitation in age of respondents
- Limitation in time of research

1.10 Structure of thesis

This thesis has been proposed in six chapters:

Chapter 1 is **Introduction** (this chapter); in which the research framework was briefly discussed.

Chapter 2 is **Literature review**; consist of background of cycling in world and Iran, concepts of cycling concepts in housing area and brief comparison between bicycle and other vehicles

Chapter 3 is **Context of study**; this chapter includes some general and specific information about context of study, Iran and Kerman.

Chapter 4 is **Research methodology**; in this chapter where the methods of data collection, data analysis and data interpretation were explained.

Chapter 5 is **Data collection and data analyze**; data gathered through questionnaire have been classified, analyzed and interpreted in this chapter to address objectives of research.

Chapter 6 is **Findings**; includes findings of survey. Besides, some suggestions and solutions for improving cycling in Kerman was provided, based on data analyze and interpretation.

Chapter 7 is **conclusion**; In this chapter a summary of whole thesis including problem statement, objectives and methods of collecting, analyzing and interpreting data in additional to limitations of study and suggestions for future planning have been presented briefly.

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