

Pedestrian-Oriented City:

**Assessing the Impact of Environment on Pedestrian
Movement in Tehran**

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Chapter I-Introduction

1-1-General background of the study

Walking is the oldest form of human movement. With today's technological advances in transportation, walking needs to be promoted, and for that, it must be safe and easy (Berke *et al*, 2007). In this research, "*Pedestrian*" is a person who travels in the public right of way by means of a wheelchair, electric scooter, legs, crutches or other walking devices or mobility aides. "*Walking*" is defined as pedestrian movement toward a destination regardless of motive or intention. 'Walkable' environment also pertains to the environment that encourages people to walk when they have a choice for an alternative mode of transport.

After World War II, many communities neglected the needs of pedestrians, as the car spawned growth and inner cities began to decay. The increased use of motorized modes of transport has started to show negative consequences. It has contributed to a range of different problems such as damage to the social fabric of communities, pollution, energy consumption, and wastage of natural resources. The noise level in cities has increased and many land sites have been adversely changed. In addition, a car takes up fifty times as much space as a pedestrian (Zuckerman, 1993).

In the contest between different groups of users of the streets (pedestrians, residents, and automobile drivers), the weaker groups such as pedestrians - and especially youngsters, the old and the disabled people- were the main losers. Consequently, those who were not able to drive or own a private car and were living in the city periphery felt the major negative impact of cities designed around cars.

For centuries, most cities provided a relative level of safety and comfort for pedestrian movement. However, pedestrian rights of way for citizens are being neglected in our era due to the invasion of cities by cars. In effect, pedestrian routes have gradually lost their importance, and as motor vehicles and transportation technology advance, the interaction of people with their surrounding physical urban environments has been reduced. (Madanipour 2003; Hall and Pfeiffer 2000)

Prior to the advent of the car the place of work was necessarily closer to the place of residence. Historically, human settlements such as towns and cities therefore evolved and were constructed on a "human scale", because much of the movement within the settlement was on foot. This pedestrian-orientated movement resulted in a much slower pace of life, providing adequate opportunity to enjoy the surroundings and to interact with

fellow citizens, and resulting in enhanced social relationships and a strengthened sense of community. This pattern of life has been transformed by the motor car and sorely neglected in more recent urban development plans.

In the last few decades, as the result of dissatisfaction with the dominance of cars in urban environments, the plans prepared for many European and North American cities have placed much more emphasis on the subject of pedestrian movement. This emphasis has been necessarily complemented by research which aims to provide a better understanding of the attitude and behaviour of citizens in relation to pedestrian movement. In recent years, and following extensive research, advanced countries have become more concerned with the presence of people in public spaces and in encouraging them to walk. Cities such as Ottawa, Washington, London, Paris, Denver, Oakland, Wisconsin, Portland, Delaware, New Jersey and Maryland have attempted to prepare a Pedestrian Master Plan.

Many cities around the world have started preparing Pedestrian Master Plans, with provisions to contain the effects of car use and to incorporate pedestrian walk space in the urban environment. Transport for London (TfL) declared that its aim is to get people out of cars promote walking as a means of transport (TfL, 2004), and reduce health-related problems due to lack of physical activity. It intends to decrease walking hazards by designing safer pedestrian networks to schools, workplaces, libraries, parks, neighbourhoods, and commercial districts. One of the components of such transport planning is to encourage the movement of pedestrians for short distances. According to Transportation for London in Greater London, for example, walking accounts for 26% of all the trips made and 80% of trips under a mile. (TfL, 2004)

Most research into pedestrian issues has been undertaken by urban planners and architects whose goal has been to increase pedestrian share for short distance transportation. However, it is worth noting that in the last decade the interests and concerns of pedestrians have attracted research from wider disciplines: various faculties of medicine in the U.S. have conducted research focused on health issues arising from the existing relationship between physical activity and the built environment.

The problematic relationship between cars and pedestrians has been widely discussed in the west. However, while the cities of the developing countries are also shaped and transformed by the motor car, the needs of pedestrians have not come to the agenda of city planners and managers. Despite more than five decades of discussion in this area, the amount of research conducted in Asia has been insignificant. An evaluation of the various parameters that influence pedestrian movement in a city like Tehran, based on similar work

carried out for other large cities, would be urgently needed. Such a study, identifying various physical and socio-cultural factors that might affect the attitude and behaviour of Tehranis with respect to walking as opposed to motor car utilization, would be a positive and useful contribution to on-going discussions related to the preparation of a balanced spatial plan for the city. Most participants in these discussions agree that if pedestrian-orientated design is not totally and absolutely possible, then at least adequate attention should be granted to pedestrian movement.

Rapid population growth in the City of Tehran in recent decades has caused the expansion of the city and the development of the transportation network. Iranians are very sociable and very likely aim to walk around to see friends and places and spend their time in the street. But pedestrian movement is greatly hampered in the City of Tehran due to the increase in the travelling distance between work place and residence, lack of attention to the required infrastructure, and the appeal of the automobile to family members. The problem is also exacerbated by an inadequate public transport system. All in all this has caused the subject of walking to be neglected both by city officials and city dwellers. In the absence of serious academic work on the subject, particular attention is required to restore the balance between a rapidly growing metropolitan centre and the need for planning which will make Tehran a walkable city.

Urban planners and decision-makers in Tehran during the 1930s used Haussmann's 19th century plan for Paris as a model. He made sweeping changes by building wide "boulevards" in place of previously narrow streets. Tehran's planners also used as a model the wide street designs of Daniel Burnham's 1909 Plan of Chicago.

In Tehran, following such models, the old city walls around the medieval city were brought down. This was followed by laying out straight and wide streets which severed tight-knit neighbourhoods. Overall, Tehran began to lose its Middle Eastern identity for the sake of easier vehicle movement. Pedestrian walkways were only considered when all other land uses had been decided upon, i.e. as leftover segments. Since then, the quality of life, and the movement, safety and security of pedestrians in Tehran have been greatly compromised due to the ever-increasing domination of cars. In many parts of Tehran, the absence of a sympathetic view towards pedestrian movement by the city authorities has caused most existing pavements to be laid to a width incapable of accommodating the average volume of pedestrian **traffic** that crosses them each day. Furthermore, these pavements are not safe because of a multitude of physical obstacles and barriers. Thus

even the existing space becomes cluttered and most pedestrians are effectively deprived of enjoyable walking.

Like many other exploding megalopolises Tehran's planning schemes have long been influenced and dominated by the motor car. As a consequence acute traffic and pollution are rampant and typical problems. The City of Tehran has had three comprehensive master plans (two in the past thirty-five years and the last just recently issued). None of these master plans paid much attention to the pedestrian movement in the city.

1-2-Research Goals & Objectives

To be able to improve the pedestrian experience in urban environment, this research is conducted by identifying and testing those criteria relevant to walking and the physical condition of particular places in Tehran. This research not only provides new empirical information about Tehran but it also presents new analytical attempt about the conditions of pedestrian movement in the city of Tehran.

In order to assess the factors which affect the level of walkability in Tehran, this research investigates pedestrian attitudes/behaviours in relation to pedestrian routes, especially in residential areas and mixed-use areas (i.e. comprising both residential and commercial properties). The main goal of this research is to:

Explore the main factors which affect walkability, and evaluate how the behaviour/attitude of pedestrians in Tehran corresponds to these factors.

The objectives of this research are as follows:

1. Identify the main parameters influencing pedestrian movement.
2. Assess the impact of these parameters upon an individual's decision to walk.
3. Determine the relative relationship between pedestrian behaviour/attitude and these parameters in the case study location.

This research also makes some recommendations for public and private decision-makers which would enhance walkability and reduce or optimally balance the use of automobiles within the City of Tehran.

1-3 -Research Questions

The factors related to walking depend on human beings and their surroundings. We need to identify and evaluate the factors which affect the decision-making process and impact subsequent action. In order to assess "the impact of environment on pedestrian movement"

in Tehran, and to understand the nature of that behaviour or attitude, several relating questions must be formulated:

1. What are the main parameters? (Identify the main parameters influencing pedestrian movement).
2. How is the impact measured? (Assess the impact of these parameters upon the people's motivation to walk).
3. Why does this interrelationship exist? (Determine the relative relationship between the parameters and walkability).

1-4-Research Methodology

In preparation for the empirical research, the relevant academic literature and policy documents, such as *Pedestrian master Plans*, were reviewed. Theories regarding urban development in the last two decades or so, such as *New Urbanism*, *Smart Growth*, and *Sustainable Development* place a strong emphasis on *Pedestrian-oriented* or pedestrian movement. Pedestrian Master Plans are usually drawn up based on these concepts, and with the goal of facilitating pedestrian movement in the city. Therefore the review of the parameters and criteria for pedestrian movement in such plans can be used as the basic elements of a model for describing pedestrian movement.

In addition to theoretical and empirical studies, local conditions and characteristics were also taken into consideration. This enabled us to select appropriate criteria (indicators) to analyse and measure the walkability of the city for the purposes of this research, and to categorize them within two major parameters: physical parameters, and socio-cultural parameters.

Ten criteria were identified to measure walkability: *safety (C1)*, *pleasantness/attractiveness/amenity (C2)*, *choice of transportation (C3)*, *accessibility (C4)*, *education/public health (C5)*, *street connectivity (C6)*, *sustainability (C7)*, *link between land use and transportation (C8)*, *local socio-cultural behaviour (C9)* and *personal security (C10)*. In addition, some other socio-economic factors were taken into consideration, including age, gender, job, and education. The details of selected criteria and their meaning are explained in Chapter III (see Table 3-4). The table below shows the ten criteria within their corresponding parameters.

The quantification of each criterion, as well as its associated importance, provides us with a framework for isolating/aggregating the effect(s) of the individual or combined

influences of different factors on walking attitudes or behaviour. Accordingly, the level of walkability in an environment can be defined as a general function of the following factors:

$$W = f(M, N, U \dots),$$

Where: W is the degree of Walkability and M, N, U etc. are the defined criteria.

This relationship can be expressed as $W = a C_1 + b C_2 + c C_3 + d C_4 + \dots + k C_n$,

Walkability Assessment	
Physical Parameter	Socio-Cultural Parameter
- <i>Safety (C1)</i> - <i>Pleasantness/attractiveness/amenity (C2)</i> - <i>Choice of transportation (C3)</i> - <i>Accessibility (C4)</i> - <i>Street Connectivity (C6)</i> - <i>Sustainability (C7)</i> - <i>Link between land use and transportation (C8)</i>	- <i>Education/public health (C5)</i> - <i>Local socio-cultural behaviour (C9)</i> - <i>Security (C10)</i>

Table 1-1: Two parameters and corresponding criteria (summary of selected criteria to measure walkability)

Where C_1 , C_2 , C_3 , etc. are the quantified criteria influencing walking behaviour and coefficients a, b, c etc. are their respective “weights”, indicating the level of importance attributed to each.

With a view to the scope of the research, namely the analysis of pedestrian movement in a Case Study Area in central Tehran, the overall strategy of the research may be summarized as follows:

1. Identifying parameters & criteria influencing pedestrian movement and adapting such criteria to Tehran.
2. Selecting a Case Study Area that adequately represents the City of Tehran and which is suitable for the investigation at hand.
3. Differentiating between land use characteristics of the case study area, predominantly residential and/or commercial areas, with a more mixed land usage.
4. Understanding attitudes and behavioural patterns of three categories of potential pedestrians (Residents, commercial/business related citizens, and

passers-by), to pedestrian walking activity in the Study Area, by means of collecting responses to questionnaires designed specifically for this purpose.

5. Generation of a comprehensive database based on results obtained from the survey.
6. Application of statistical and geospatial (GIS) analysis techniques with a view to determining the relative importance of the various criteria influencing walkability in Tehran.