

Pedestrianization: A Step toward urban sustainability



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Abstract

During the past half century undisputed dominance of the automobile in the city has caused major predicament such as environmental degradation, air pollution, and low quality urban spaces. On the other hand has caused decreased access to urban services, the high volume of traffic, pollution and insecurity in cities. With rising of these setbacks, in recent decades the approach of urban planning is formed to make urban areas more humane by increasing pedestrianization, due to the required mobility of pedestrians in the city. On the other hands, walking is one of the sustainable methods of transport, and can make urban areas more full filling on physical, social, environmental, cultural, political and economic aspects of sustainability.

The purpose of this paper is to review and recognize the increasing task of pedestrianization as a model of sustainable development. The paper will first review the concept of walking and pedestrianization in city and influencing attitudes and factors on it, and then review the role of pedestrianization in sustainability. Recommending strategies would introduce to promote pedestrianization in future cities, in order to achieve the sustainability criteria. The methodology selected would be archival and qualitative. The results of the study shows that attention to the pedestrian-oriented transportation and increased pedestrianization in urban areas in recent decades that have direct relation to the vitality, safety, attractiveness of space, is basic. They are valuable steps towards reducing environmental pollution and less automobile dependence and fossil energy, and would increase quality of life and finally would cause sustainability, liveliness and vibrant cities.

Key words:

Pedestrianization , Sustainability, Sustainable cities, Sustainable transport

1. Introduction

In recent century during the urbanization revolutions, the expectations of life, immigration and the population is one of its results. The concentration of a large population in one or several cities has negative results especially in developing countries such as Iran. Heavy traffic, air pollution, noise pollution and unsuitable environment for living are some of its results.

There are different meanings regarding pedestrianization. The simplest meaning of it is the removal of vehicular traffic from city streets .pedestrianization is an important concept in sustainable urban design approach. It is a measure of how friendly an area is for pedestrians. pedestrianization has many health, environmental, and economic benefits. Better pedestrianization has shown many individual and community benefits, such as opportunities for increased social interaction, reduced crime, increased civic sense and responsibility. One of the most important benefits of pedestrianization is the decrease of the automobile footprint from the community. Thus ‘carbon emissions’ can be reduced if more people choose to walk. Increased pedestrianization has also been found to have many economic benefits both to individuals and to the public with increased efficiency of land use including accessibility, increased livability, transportation cost savings, economic benefits from improved public health and catalyses economic growth. In developing countries, like India, majority of the people have to walk or use public transportation.

On the contrary, we observe rapid growth of vehicles on road, new proposals for flyovers or widening of roads and encourage more vehicles and the process continues, sometimes even at the cost of footpaths and pedestrian convenience and safety; thus discouraging pedestrian movement.

2. Research Methodology

The methodology of this research is archival and qualitative. At the beginning we will first look at the notion of sustainability and related concepts of sustainable development and sustainable transport. The first step is to identify the importance and benefits of incorporating sustainability into our daily lives; in terms of transport this means having sustainability issues taken into consideration when planning and implementing transport related measures.

Then we will look at the definition and objectives of pedestrianization in general to evaluate and see whether pedestrianization represents a good strategy in enhancing sustainability in terms of being a transportation tool.

Finally we will evaluate how pedestrianization could cause sustainable development and make recommendations as to what can be done to further improve such schemes so as to gain more benefits socially, economically and environmentally through pedestrianization.

3. Defining sustainability

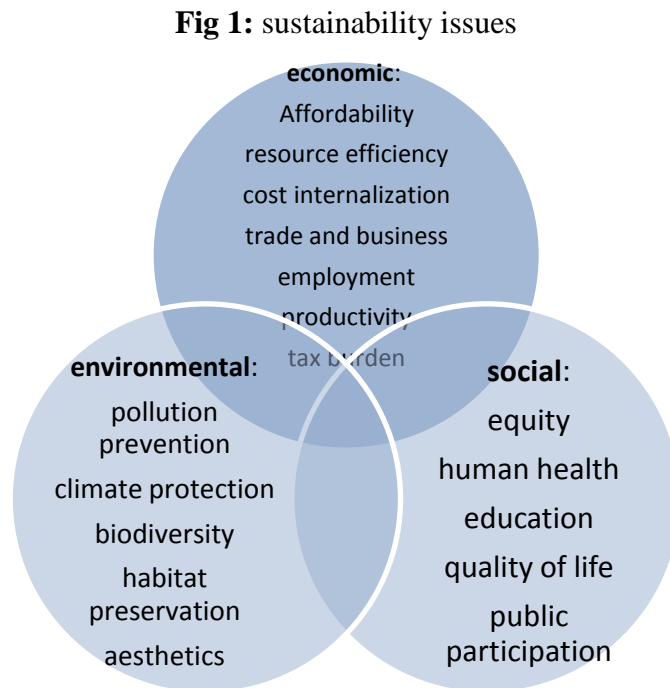
There is no universally accepted definition of sustainability, sustainable development or sustainable transport. Definitions include:

- "Sustainable development "meets the needs of the present without compromising the ability of future generations to meet their own needs"

- "Sustainable development is the achievement of continued economic development without detriment to the environment and natural resources" (themes Sustainable development, 2004)

Sustainability is sometimes defined narrowly, for example, by focusing on resource depletion and air pollution problems, on the grounds that these represent the greatest long-term ecological risk and are prone to being neglected by conventional planning (committee for study on transportation and a sustainable environment, 1997). But sustainability is increasingly defined more broadly to include the issues in figure 1.

Although figure 1 implies that each issue fits into a specific category, in practice they often overlap (a social concern), and fishing and tourism industries (economic concerns). (Litman, 2006)



3.1. Transportation impacts on sustainability

Until recently, most economists assumed that whatever it's social and environmental costs, increased mobility provides net economic benefits. But new research indicates that beyond an optimal level, increased motor vehicle travel can have overall negative economic impacts because the marginal productivity of increased travel is declining, and vehicle use imposes external costs that can offset direct economic gains (Boarnet, 1997; Helling, 1997). This implies that sustainability planning does not always require tradeoffs between economic, social and environmental objectives, but rather a matter of finding strategies that help achieve all of these objectives over the long term by increasing transportation system efficiency.

Conventional planning tends to assume that transport progress is linear, consisting of newer, faster modes that displace older, slower modes as illustrated below. This *series model* assumes that the older models are unimportant, and so, for example, there is no harm if increasing automobile traffic causes congestion delay to public transit or creates a barrier to pedestrian travel. From this perspective, it would be backward to give public transit or walking priority over automobile travel.

Walk → Bicycle → Train → Bus → Automobile → Improved automobiles

Sustainable reflects a *parallel model*, which assumes that each mode can be useful, and strives to create balanced transport systems that use each mode for what it does best.

Transport progress therefore involves improving all useful modes, not just the newest mode, as illustrated below. For example, in many cities, the most beneficial strategies may involve improving walking and cycling, more support for public transit, and restricting automobile travel in congested urban areas. This does not assume that *improved transport* necessarily means faster travel or more mileage; improvements may increase comfort and safety, provide cost savings, or even reduce the total need for travel. (Litman, 2006)

Walk → Improved walking conditions

Bicycle → Improved cycling conditions

Train/Bus → Improved public transit service

Automobile → Improved automobile travel conditions

4. Defining pedestrianization

A. pedestrian: A pedestrian is a person traveling on foot, whether walking or running. In some communities, those traveling using roller skates or skateboards are also considered to be pedestrians. In modern times, the term mostly refers to someone walking on a road or footpath, but this was not the case historically. (Wikipedia, 2012)

B. Pedestrianization: There are various different meanings regarding pedestrianization. In its simplest and earliest form it means the removal of vehicular traffic from city streets through road closures and other restrictions (Hass-Klau, 1990). North American cities like New York City or Toronto Canada have a broader sense of the term, defining it as a concerted effort to make the city walkable (Lee, hau-kwan, 2004).

Some activists advocate large auto-free zones where pedestrians only or pedestrians and some non-motorised vehicles are allowed. Many urbanists have extolled the virtues of pedestrian streets in urban areas. In the U.S. the proportion of households without a car is 8%, but a notable exception is New York City, the only locality in the United States where more than half of all households do not own a car (the figure is even higher in Manhattan, over 75%).(Michael E. Arth,2003) The use of cars for short journeys is officially discouraged in many parts of the world, and construction or separation of dedicated walking routes receives a high priority [citation needed] in most large European city centers - among other places - often in conjunction with public transport enhancements.

C. Pedestrian zone: Pedestrian zones (also known as auto-free zones and car-free zones) are areas of a city or town reserved for pedestrian only use and in which some or all automobile traffic may be prohibited. They are instituted by communities who feel that it is desirable to have pedestrian-only areas .Converting a street or an area to pedestrian only use is

called pedestrianisation. Pedestrian zones have a great variety of attitudes or rules towards human powered vehicles such as bicycles, inline skates, and skateboards and kick scooters. Some have a total ban on anything with wheels, others ban certain categories, others segregate the human-powered wheels from foot traffic, and others still have no rules at all. Many of the Middle Eastern examples have no wheeled traffic, but use donkeys for freight transport. Towns in many low-income countries are effectively largely pedestrian only simply because cars are uncommon in those countries.



Fig 2: Copenhagen's pedestrian zone

4.1. Objectives of pedestrianization

There are various reasons for having pedestrianization schemes. First of all, pedestrianization aims to improve pedestrian's safety and mobility. Another important benefit is related to the environment. These schemes can help to reduce both noise and pollution by discouraging or restricting access of non-essential vehicles. Furthermore it helps to promote walking as transport mode by making the walking experience more enjoyable. Characteristics of walkable streets are as listed in the *Table 1*. While streets do not necessarily need to be closed off to traffic in order to be walkable, pedestrianization does play an important role in the process.

Sidewalks and intersections with pedestrian friendly designs
Well connected with other transport modes, especially cycling and public transport
No barriers in a continuous pedestrian network between destinations
Purposeful destinations within walking distances (housing, shops, parks, recreation, etc)
Store fronts at street levels, close to the sidewalk
Pedestrian facilities well matched with the overall streetscape
Unaffected by weather factors like sun or rain
Not exposed to excessive dirt, air or noise pollution
Provided with various facilities (street furniture, signage, litter containers, etc)
Opportunities for people to interact and carry out various social activities

Table 1: Characteristics of Walkable Streets

Source: (Lee, hau-kwan, 2004)

Pedestrianization also provides a more pleasant environment whereby people can engage in different social, cultural and tourist activities. As we will see later pedestrianization also promotes economic growth; many retailers found that businesses increased following the implementation of some form of pedestrianization schemes.

4.2. Justifications for Pedestrianization

After looking at the definition and objectives of pedestrianization in this section we will discuss whether there are any justifications for its implementation. For the purpose of our evaluation the concept of “Win-Win Transport Solutions” as described earlier will be used here. To recapitulate, they are those strategies that have positive or neutral results on environmental, economic and social objectives (Litman, 1999).

	Benefits and advantages of pedestrianization
environmental impacts	<ul style="list-style-type: none"> - Pedestrianization can help to alleviate and reduce air and noise pollution, as there would be a reduction in the number of cars and reliance on motor vehicles. - Pedestrianization can promote walking as a transportation mode without any need to oil, so we can save fuel as well.
Economical impacts	<ul style="list-style-type: none"> - For most large cities with heavy motor vehicle traffic, with less motor vehicle traffic and less pollution after Pedestrianization, there can be a reduction in costs incurred. - by Pedestrianization, with the less air pollution causes the less related medical expenses. - on the retail income in that district - Pedestrian can shop and watch shop-windows easier and enjoys without any fear of vehicles.
Social impacts	<ul style="list-style-type: none"> - it helps to promote walking as a transport mode, people often do not walk when walking itself doesn't include a good experience with heavy vehicle traffic and crowded narrow walkways. - Pedestrianized streets in many cities also served as cultural and entertainment plazas where people meet and greet not only during ordinary days but also during holidays and festive seasons as well. - With segregation of people from vehicles, the safety of pedestrian and transportation abilities can be improved.

Table 2: the advantages of Pedestrianization

4.3. Kinds of pedestrianization

Commonly we can have three kinds of pedestrianization:

- I. **Full time pedestrian streets:** in this design arrival of vehicles into street is fully forbidden and usually services are in the back of street. In most cases only emergency service vehicles are allowed to enter. is the elimination of motor vehicle traffic at all times and on all days by means of formal traffic orders. On this, continuous is my choice keyword, being descriptive of a situation where the absence of cars is unbroken in the context of time. When this scheme is implemented, it becomes common for affected businesses to become creative with how they deliver their goods and supplies to and from their establishments. Sometimes, it becomes necessary to ease on the definition and allow small motor vehicles within the premises during "off-periods" such as very late in the evening or very early in the morning. (Lee, hau-kwan, 2004)

- II. **Part-time pedestrian streets:** part-time pedestrian streets are those where vehicular access is allowed only specific periods. There is no on-street parking spaces allowed but however loading bays are available.
- III. **Traffic calming streets:** the third form of pedestrianization is traffic calming streets. They serve to reduce the dominance and speed of road vehicles. There are no restrictions to vehicle access, but footpaths are widened and parking spaces are reduced. Various traffic calming measures are used to slow down the speed of vehicles. They include speed tables, narrower traffic lanes and use of different road textures and colors to remind drivers that they are within traffic calming zones.(Iranmanesh, 2008)



Fig 3: kinds of pedestrianization

4.4. The role of pedestrianization in sustainability

From our analysis in the preceding sections it was found that pedestrianization could have positive environmental and economic impacts to a society. For social impacts though the outcome might be less obvious. While there were social benefits for pedestrians there were also disadvantages with less equity from the point of view of other groups like drivers and those living or working within and near to such schemes. Thus in my opinion weighting the overall effects to different groups the impact on this front can be regarded as neutral.

To conclude, as pedestrianization did not have any negative impact in the three areas being evaluated, or in other words a strategy that when carefully planned and implemented could help to achieve more sustainable transport.

5. Evaluating pedestrianization and recommendation

Evaluating pedestrianization is challenging as it requires consideration of many subjective factors. Basically pedestrianization Index comprises of three components: safety and security, convenience, and degree of government policy support. Assessing and measuring pedestrianization through the walking audit is most common method.

There are several ways to make a community more walkable. Preferably design considerations are to be observed from users' perspective. In some city like Tehran and Mashhad where pedestrians are already high, pedestrian facilities are needed to be designed considering pedestrian behavior.

5.1 General pedestrian infrastructure design parameters

A: Safety and Security

Pedestrian safety design must be the prime objective of pedestrian infrastructure. The pedestrian-vehicular conflicts must be avoided.

- Place to walk is missing from major pedestrian zones. These areas should be provided with sidewalks, and with minimum standard design considerations. The sidewalks should avoid any obstructions, barriers and too much of level difference to be provided for comfortable walking space.
- Barrier free pedestrian infrastructure design approach is needed for sidewalk design considering safety for disabled, elderly as well as children.
- Safe road crossing infrastructure is needed especially for major work and commercial centres of city for safe pedestrian movement. Therefore depending on number of footfalls crossing the streets skywalks and subways must be proposed to avoid pedestrian vehicular conflict.
- Rescue islands must be an essential part of pedestrian safety if pedestrians are made to walk across the zebra crossing median.

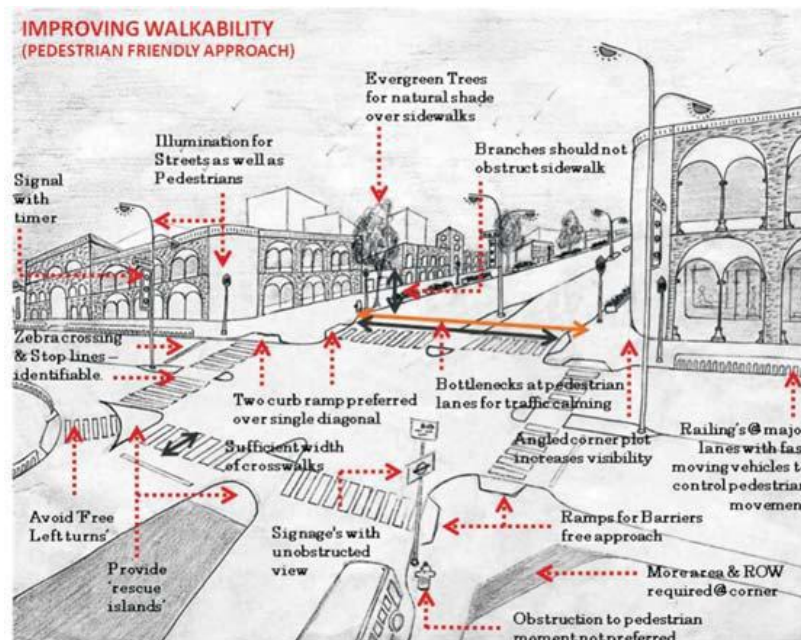


Fig 4: improving pedestrianization (pedestrian friendly approach)

- Street lights with adequate illumination along walkways ensure psychological security to pedestrians.
- Since most of the pedestrian zones are close to commercial districts or work centres, fire safety measures must also be taken under mandatory design considerations.

B. Convenience and Attractiveness

To making pedestrian zone in public areas like work, commercial and recreational areas, pedestrian facilities and amenities would be required.

- Provision of basic street hardware and street furniture must be assured for the convenience of pedestrians.
- Regulation of street hawkers (their number and location) will provide convenience for pedestrians as well as utilize existing pedestrian infrastructure.

- Pedestrian friendly landscaping guidelines must be adopted to provide natural shade and environment without causing obstruction for pedestrians and sufficient trees must be planted. Selection of trees must be considered to avoid any obstruction due to low branching.
- Maintenance drive of walkways should be regularly conducted. This will not only ensure safe movement but also provide time for commuters and consumers to appreciate urban environment and have a glance on commercial display thus increasing sales.
- Urban Aesthetics and details are well appreciated in areas with walkable environment.

C. Policy Support

Success of any planning project essentially requires government policy support. Pedestrian planning guidelines under 'IRC 103: guideline for inclusive pedestrian facilities (august 2009)' has already been revised to improve pedestrian infrastructure in Indian conditions by Transportation Research and Injury Prevention Programmed (TRIPP). Also National Urban Transport Policy (NUTP) has been requested to formulate Unified Metropolitan Transport Authority for all major cities. These guidelines and policies must be adopted to achieve safe and sustainable transit plan. Hence, role of a transport planner thus becomes important especially in metropolitan transport planning authorities.

- Setting a legal framework to protect right to walk for pedestrians must be considered to support social and equity concerns in mobility planning.
- Pedestrian movement plans should be made mandatory with traffic planning.
- Traffic regulations must be made strict with penalties to control vehicular as well as pedestrian movement to ensure safety for both.
- Free left turns must have traffic control especially in high pedestrian zones with speed lanes. In Indian conditions usually left turn is always free. This increases the risk for pedestrians if skywalks/subways are not provided as traffic from one direction is free movement, mostly a blind turns. Under such conditions in major pedestrian areas fully pedestrian crossing time must be synchronized within signal system.
- Involvement of public to be made in decision making and planning pedestrian infrastructure.
- Safety audits and pedestrian safety education program must be conducted regularly.
- Policy planning for public mobility must also look into environment friendly approach.

6. Conclusion

Improving pedestrianization ensures easiest way for improving liveability concerns. World is walking towards urban sustainability. pedestrianization enhances urbanity, social interactions, community health and sustainable environment. It can also resolve social and equity concerns in mobility planning.

Pedestrianization can promote the green mode of walking and represent part of a sustainable transport system for our city. While having environmental and economic benefits, on the whole it does not have negative effects socially. When compared with some other countries with successful pedestrianization, Iran is a relative latecomer.

The walking strategy should be properly marketed to the public such that merchants, residents and businesses would be less likely to oppose to the closing of streets to traffic. When the plan is successfully promoted, it will also be easier to implement other measures that facilitate pedestrianization after people fully realize its benefits. These measures are at the same time in line with existing overall transport strategies in Hong Kong. These include the co-ordination of various transport modes with railway as the backbone supported by road

transport, and the reduction of motor traffic through road pricing. Greater public understanding can also result in more active participation of the public and local groups like district councils in formulating local schemes.

More resources and better co-ordination among governmental departments and various agencies are also needed. Ideally one governmental department or perhaps a new central agency should be responsible for all matters related to walking and pedestrianization.

The goals are to have better environmental protection, more pedestrian safety and community livability through larger and better executed pedestrianization schemes.

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