Pedestrianisation of Streets

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ABSTRACT **- From the historic perspective street is a meeting place for the people. Jan Gehl said "there is much more to walking than walking", which means other activities such as public meetings, street entertainment, playing etc. are associated with it . 'Man is man's greatest joy' (Havamal-Icelamdic Eddic poem) which means that the man can be happy, sad, nervous and all type of emotions after watching, meeting, interacting with other man which can be achieved on streets. To achieve user-friendly streetscape there is a great need to address lost control on automobile traffic, lack of infrastructure and increasing environmental issues. Aim of the research is to understand the significance of pedestrianisation in dynamic urban space. The research paper is divided into two parts: First part deals with the understanding of behavioural perception and factors responsible for pedestrianisation. Second part emphasizes on various study models to represent and analyze the data. Paper concludes with the importance of policy making for pedestrianisation, to achieve social sustainability and open-democratic society.**

Key words – Pedestrianisation, streetscape, behavior perception, urban spaces

I. INTRODUCTION

A new field of Active Living Research has emerged in recent years, and researchers are paying special attention to walking as a primary means of getting the daily recommended levels of physical activity. Like any other human behavior walking is largely influenced by cultural factors, environmental factors and individual and group circumstances and characteristics. People are the foundation of the social and economic structure of any place and hence it is the movement of people that is indicative to the vibrancy of the place. From a study in San Francisco, it was found that the community interactions were more in areas with less traffic and people had more chance to meet and had good social activities in these areas [1]. Urban areas are becoming dependent on motorized travel with a consequent reduction of non-motorized modes. Increasing vehicular traffic results in increasing noise and decreasing safety in the environment. This will result into decrease the liveliness and sustainability of urban spaces and sense of place will also get lost because of of unsuitable in spaces. It is curial to study the approaches for understanding and predicting pedestrian movement. This analytical study will result in proper street designing for pedestrianisation.

Fig 1. Main Streets during nineteen century
Source: V. Dokmeci (2007)

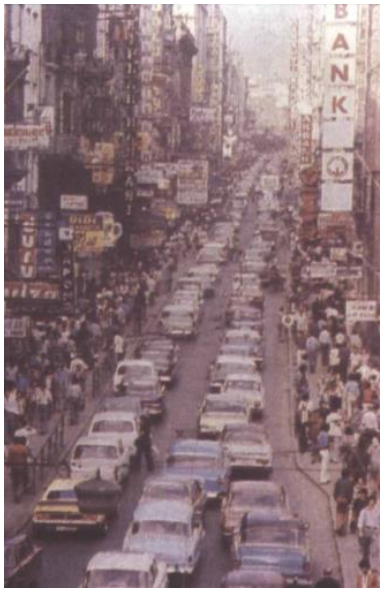


Fig 2. Main Street during 1980's
Source: V. Dokmeci (2007)

II. BEHAVIOURAL PERCEPTION FOR PEDESTRIANISATION

Primary physical activities of children and adults include play, walking or cycling to work, school or the other purposes such as parks, playgrounds or recreational centers. As motorization and consumer culture developed, walking environments evolved.It is evident that the pedestrian district is characterize d by pedestrian priority, since the behavior and related perceptions of that environment are clearly differentiated from those of its surroundings. A unique set of behavior and perception can be seen related with walking environment.

Characteristics of the environment should be considered and studied. Environmental qualities that make for better places to walk for the sensorial and experiential pleasure and not only as a physical activity. In the planning literature, the most common research areas dealing with aspects of the environment that affect walking behavior comprise the three ‘‘Ds’’ of the built environment – density, diversity, and design [2].

Most studies aim to relate of walking as an environment, considering aspects such as the compactness of development patterns, residential and employment density, access to and diversity of land-use mix, and design features such as shade, scenery, aesthetic characteristics of the local environment, local shopping, distance to retail, and the presence of attractive stores and houses [3]. Other built environment measure studied in relation with walking behavior are the transportation infrastructure, access to transit, , access to recreational facilities, the accessibility of facilities, intersection density, the presence of sidewalks, recreation space in the neighborhood, street pattern and connectivity, and the neighborhood type[3].

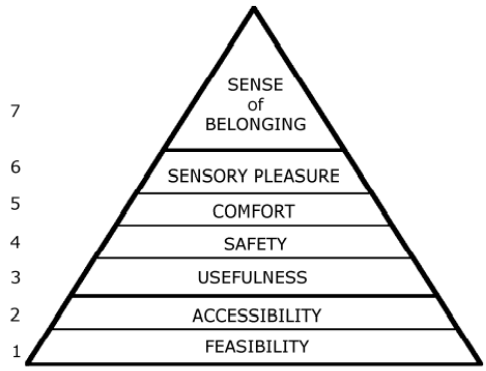


Fig 3. Hierarchy of walking needs
Source Alfonozo (2005)

III. FACTORS RESPONSIBLE FOR PEDESTRIANISATION

A. Improved Street lighting for crime, fear and pedestrian use afterdarkness

Most people avoid going out after dark, because "crime on the street" is the reason. Growing crime in urban areas is a realistic threat especially after dark. Researchers have examined range of cues within the environment which arouse anxiety irrespective of actual risk. Research suggests that there are three cues which indicate potential risk and heighten fear for personal safety: darkness, disorder and finding oneself alone or in the presence of others who are perceived to be threatening [4]. Dark or dimly lit streets create an infinite source of blind spots, shadows and potential places of entanglement[4]. Consequently, to the extent that good quality street lighting ameliorates one of the root causes of fear, darkness, it can make a substantial contribution as a fear reducing strategy [4].

B. Commercial and retail areas effects on pedestrianisation

Outside of newly built, gated residential and commercial areas, improved car access has generally resulted in poorer access for walkers [5]. The increase in the motorization has reduced the business of small shops within the neighborhoods; large department stores are easily accessible by car and also provide sufficient, usually free, parking. Pedestrianisation has a positive effect on the businesses in the area of implementation. The effect is usually in the form of increased turnover, increased property values and streets attracting the wealthier, thereby benefiting the overall retail sales and drawing economic advantage to the area [6]. Pedestrianisation also encourages local people to buy utilities in their own neighborhoods and attracts more customers from a wider area, increasing the community relations [6].

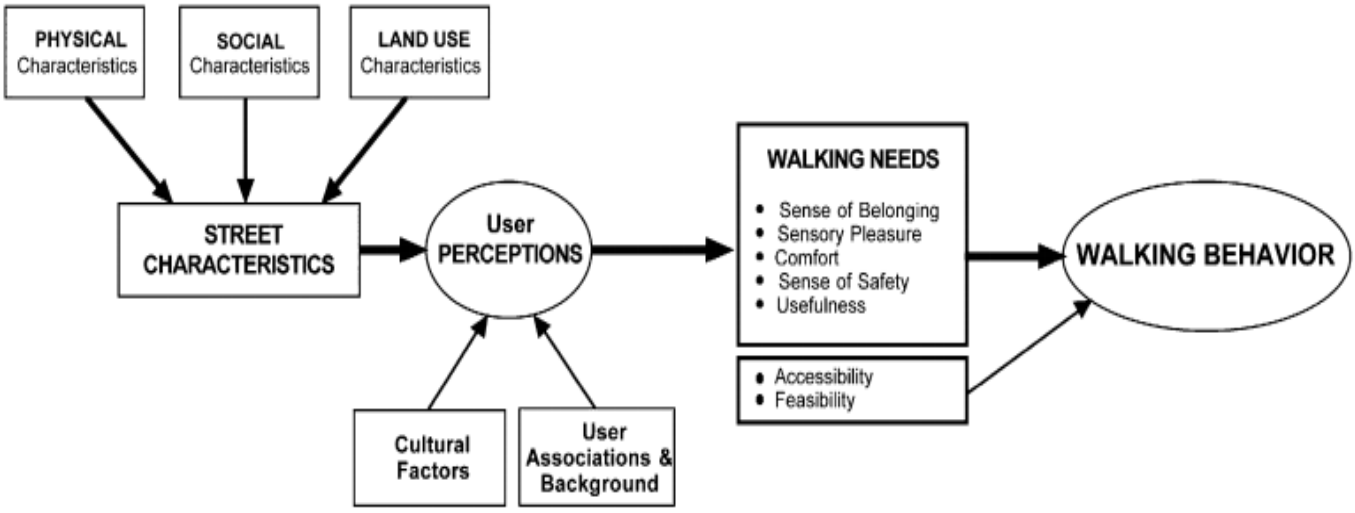


Fig4 . Conceptual Framework of walking needs on Main Street Source: V. Mehta (2008)

Table 1.

	Description	Criteria	Measuring Techniques
Accessibility and Savings	Closeness to goods, and Savings services and activities, public transportation, cost savings.	Extent that non-motorized transit providing mobility for transit poor	Modeling, analysis, and surveys of consumer expenditures related to travel
Health	Sum of dynamic transportation and net impacts on public health	Physical workout given to more often than not dormant people	Travel and well-being studies to decide the number of individuals who advantage from strolling exercise
Efficient Land use	More efficient land uses associated with more non-vehicular transportation-oriented land use patterns.	The level of car oriented infrastructure i.e. more roads or overpasses for cars	Identifying the social, economic and environmental benefits of more non-motorized transit-oriented development
Livability	The quality of the local environment and community interactions	Change in appeal of the implemented areas	Property values, business activities, consumer preference surveys.
Economic Development	Impact on commercial establishments and shift in consumer expenses	Change in sales in the commercial sectors and the decrease in expense for fuel and vehicle.	Market surveys and property assessments.

Source: Litman, 2004

C. Pedestrian Safety

Being unprotected, pedestrians are exposed to severer consequences of road accidents than are other road users, with society bearing a high economic burden generated by pedestrian fatalities and injuries [7]. As the pedestrian safety problem is well known in many countries and has been studied for many years, the research and professional literature has accumulated extensive knowledge regarding the efficiency of various infrastructure and other treatments to deal with the problem [8]. The majority of both fatal and other pedestrian injuries are associated with two types of locations: non-signalized crosswalks and when a pedestrian crosses an urban street section not at a pedestrian crosswalk [9]. Measures are important for increasing pedestrian and driver safety awareness and for improving their interactions. The public information, education and enforcement measures have a potential of enhancing the effects of infrastructure-related measures, as it was demonstrated by many community-based programs and targeted-group campaigns [9].

D. Pedestrian Health

Urban air quality in many large cities is affected by many contaminated pollutants. The extent of tree canopy coverage, the traffic density, the aspect of the street's deepening and the street's ventilation, as well as the thermal effect of each variable, should be considered. Urban vegetation is a potential mean for passive cooling hence is considered as a renewable heat sink. In urban environment urban environmental sustainability is becoming very important hence urban microclimate becomes essential in both terms human comfort and energy implication. Urban heat islands are caused by reduced greenery and high buildings with wide open spaces. There is significant literature on the role of urban parks, but little has been written about microclimate conditions in streets close to pedestrian height or under the vegetation canopy in greener streets. [10].

IV. MODELS FOR STUDY APPROACHES

A. Agent-based Model

It is a two stage model for investigating pedestrian behavior in urban centers. Pedestrian movement is influenced by configuration and location of attractions. Agent-based models show that this approach is well suited to integrate these aspects. A brief of the two stages of the STREETS model is presented, focusing on the division between the two stages: the first using GIS-based socio-economic data to populate the second stage which is an agent-based dynamic model of pedestrian activity[11].

B. Modeling Aggregate Movement

1) Topological Models of Movement System.

Planning pedestrian environments requires balancing pedestrian flow throughout the system as well as the distribution of pedestrians across more complex arrangements. As the pedestrian area develops, individual path segments adopt a certain degree of pedestrian presence and simultaneously a range of associated activities [12]. This is the generally accepted model for pedestrian space which inspired research into the fundamental mechanisms and mathematical descriptions of activities [12].

2) Microscale Movement

Likelihood structure moreover underlie thinks about of the direction of total development through space. How individuals move in circumstances of emergency and in hude, brief-together are the settings and circumstances for these models of development. [12].

3) Metric Models

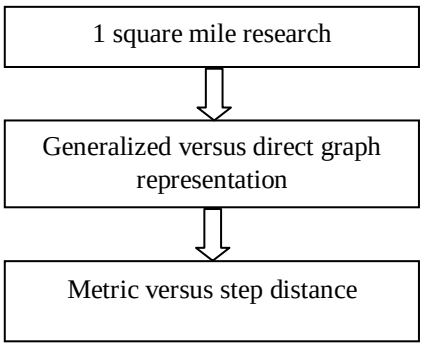
The dissemination of people on foot over a development framework is related to the concentrated of commercial misuse and so the sort of commercial action. [13]. Planned extensions or internal structural modified public presence [12], isolating the pedestrian space from the communication channels of the city.

C. The urban microclimate model Green CTTC

The Green-CTTC model is an analytical model using a cluster thermal time constant for predicting the air temperature variations in the urban canopy layer components [14]. The model is an extended version of the CTTC model originally formulated by Swaid and Hoffman which has been used successfully in predicting air temperature in various urban clusters without vegetation components [14]. The Green-CTTC show, joining extra warm impacts, of sun powered radiation reflected by the taking part elements surfaces, and of the shade trees and other sorts of vegetation, has been approved in different considers with great understanding against observation information, without vegetation components.[14].

D. Primal Approach

Recently, urban design has brought its contribution by means of the `space syntax' methodology. All these ways - under various terms like `accessibility', `proximity', `integration' `connectivity', `cost', or `effort'- focuses on the thought that a few paces are more critical than others since they are more central. Multiple centrality assessment (MCA), a methodology for geographic network analysis, is defined and applied to four 1-square-mile urban street networks. MCA provides a different perspective from space syntax in that: (1) it is based on primal, instead of double, road charts; (2) it works inside a metric, instead of topological, structure; (3) it explores a majority of peer centrality records instead of a single index.[15]



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