

Analyzing the indicators walkability of cities, in order to improving urban vitality

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Abstract: Urban design is a technique and knowledge seeking to organize and improve urban qualities and increase the quality of citizenship life. Based on the perspectives and objectives of urban design, the dominant intention in all urbanism activities is to reach high humanistic and social dimensions. In fact, what give meaning to a city are the social aspects raised in recent urban activities, in addition to the physical and visual body of it. Over the past decade the quality of the walking environment has become a significant factor in transportation planning and design in developed countries. It is argued that the pedestrians' environment has been ignored in favors of automobile. The purpose of this study was to examine the effects of walkability on property values and investment returns. Research method is descriptive. The method of collected data is field. Also, were used questionnaire tools in order to collecting data. On the other hand, was referred to municipality 9 region due to, studied area was located in this urban region.

In continue, was used SWOT technique in order to analyzing questionnaire. At finally, proposed strategies in order to improving urban space qualify.

Key words: Workability, Urban qualities, KALANTARI highway, Mashhad

I. Introduction

One of the major goals of urban design is to reduce automobile dependency, in order to address issues of viability and sustainability (Newman, & Kenworthy, 2006). For many years, urban designers have focused on planning the cities based on the existence of automobile, as a result, streets are often over scaled and inhospitable to pedestrians (Southworth and Ben- Joseph, 2004). This type of urban development has been a great threat to the historical identity of old urban fabrics and as a result the character and function of those places have changed and in many cases diminished (Habibi, 1999).

Urban design is a technique and knowledge seeking to organize and improve urban qualities and increase the quality of citizenship life. Based on the perspectives and objectives of urban design, the dominant intention in all urbanism activities is to reach high humanistic and social dimensions. In fact, what give meaning to a city are the social aspects raised in recent urban activities, in addition to the physical and visual body of it. In recent researches conducted in the field of urban design, social qualities in conjunction visual, functional and spatial qualities are emphasized. In this study, based on extensive studies regarding urban qualities, social qualities are focused on as the parameter influenced by social relationships which is lost in most urban designs. Urban qualities as a tool for urban planners to promote and organize the environment have the ability to provide substrates for shaping and promoting the social spaces.

This study examines the walkability of KALANTARI highway which is one of the most important designed spaces. Mentioned area is main structure in urban fabric. This area was located in Mashhad as second cities after Tehran in Iran.

II. Literature Of Workability

The definition of walkability has been varied according to various disciplines. Southworth (2008) defines a walkable environment from the perspective of the urban design. He believes that the emphasis on health in the discourse of walkability deviates the attention from other types of walkable environments and

meanings of walkability. He has suggested five other types of walkable environments beside walkable as being associated with encouraging physical activity type of environment:

- Close: A walkable environment that provides a short distance to a destination, particularly where driving is inconvenient or people are without cars. This is the perspective rooted in transportation planning. This definition has a great deal to do with an individual's cost-benefits calculation.
- Barrier-free: A walkable environment that is crossable, without major barriers. Walkability can be refined for the ease of children, elderly and disabled people.
- Safe: A walkable environment is safe in terms of perceived crime or perceived traffic.
- Full of pedestrian infrastructure and destinations: A walkable environment visibly displays full pedestrian infrastructure such as sidewalks or separated trails, marked pedestrian crossings, street furniture and street plantings.
- Upscale, leafy or cosmopolitan: A walkable place is somewhere that the pedestrian environment is pleasant for upper middle-class professionals, who have other choices for getting around.

Another definition offered by Southworth (2008) which seems more comprehensive and appropriate to be used in the current study is the extent to which the built environment supports and encourages walking by providing for pedestrian comfort and safety, connecting people with varied destinations within a reasonable amount of time and effort, and offering visual interest in journeys throughout the network. Walkability can be evaluated at various scales, at site scale, at a street or neighborhoods level and at the community level (Southworth, 2005). The factors that affect the walkability of urban area are varied and they are influenced by many variables including the aesthetics, attractiveness and pleasurability of the environment. This relates to how much the environment gives joy to the users aesthetically, attracts pedestrians to use the space, and pleases them with opportunities offered (Owen et al, 2004; Shay et al, 2004). Previous literature suggests how to evaluate an environment based on its ability to accommodate these qualities. Pleasant atmosphere, attractive architecture and streetscape on well-lit public areas, outdoor seating in residential and commercial areas was mentioned by Shay et al. (2003) and Shriver (1997) as variables affecting walkability. Others have also noted the presence of historical buildings, well-maintaining, and keeping the environment clear of garbage, litter, broken glass or graffiti (Southworth, 2008; Hoehner et al, 2004).

A variety of measures have been used to represent the built environment in studies of land use and travel behavior. In a study by Berrigan and Troiano (2002), a simple measure of neighborhood age is used as a proxy of walkability. Crane (1996) used three variables to describe the local environment: population density, land use mix and street pattern. And, a more comprehensive array was used by Craig et al. (2002), where 18 environmental measures described characteristics of destinations, aesthetics, and traffic. However, the research has thus far been unable to establish a definitive characterization of the elements that comprise a walkable environment or are influential in affecting rates of pedestrian activity (Crane, 2000; Vernez-Moudon and Lee, 2003). The lack of micro scale environmental data has been a limitation but the collection of detailed information about non-motorized activity has been overlooked in many transportation studies, further hampering these efforts.

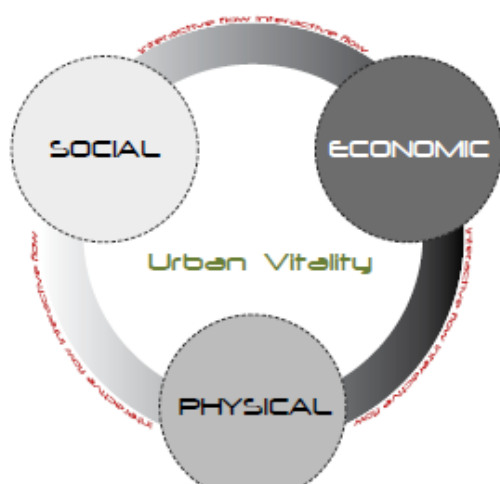
Also, many studies concerned with walking behavior evaluate the environmental attributes by their degree of accommodation for pedestrians and the correlations with levels of walking (Aultman-Hall et al., 1997; Greenwald and Boarnet, 2001). Considering this issue and making efforts to improve the quality of walkable environment in neighborhoods as it is shown in the results of the present study would lead to increase in the social capital among a society.

III. Defining Urban Vitality

Vitality as a term has become widely used in the field of city planning and urbanism in the last decades. In recent years it has gained a particular interest and considerations. But before we go on exploring pathways to defining and measuring Urban Vitality it is necessary to mediate its original meanings and identify some generic characteristics and multi component.

In the urban field, the discussions on Urban Vitality started in 1960s picking up speed towards the 1980s on the background of scientific ideas from natural and social sciences. The classic definition of the word is widely used in the scientific world when referring to a property of a system that makes it able to survive, grow and develop. It is important to note that this property refers to some crucial aspects of the phenomenology of complexity and is a result of some basic characteristics and processes inherent to it. Cities are extraordinarily complex organisms, but their complexity derives from a simple formula. So to ensure their future as living organisms we have understand some of the generic drivers behind their complex phenomenology. For that we need to know the determining factors of the phenomena associated with it and then to recognize them within the functioning of our urban environments. The mathematician, John Casti (1986, 1994) identifies some characteristics of

complex systems which he considers typical of human systems and contemporary life. First of all, complex systems express a condition of numerous elements with it that are characterized by the “presence of many interactions of different kinds, and numerous feedbacks and feed forward cycles which allow the system to restructure or ... modify the pattern of interactions between the variables”(John Casti, 1994). Secondly, he derives two fundamental aspects of complex phenomenology: synergy and self-organization. In other words, complex systems possess the capacity to respond to stimuli from the external environment, redefinitions far from equilibrium. In this connection there are three important characteristics crucial to the vitality of such a system:



- **diversity** of elements and
- **interconnections**,
- their **synergy** and
- **self-organization**.

Now, as we attempt to take a step forward, we shall try to see in what way these characteristics of complexity are manifested in urban systems. We know that the very large number and the variety of integration and interrelation processes are some of the fundamental factors of complexity in urban systems. What is more these relations extend across several layers – functional (physical), economic social, political, etc. Each of these layers includes smaller or larger number of elements creating among each other numerous, different and changing interactions. It implies that the well-being of the urban form, the efficiency of its performance and therefore its vitality are dependent of how smooth the interactive flow between these elements is (Figure 10). This also means that specific conditions, Layouts and circumstances can facilitate or hamper the interactions between the elements.

One of such conditions is the ability or disability for self-management or self-organization of urban territories. If we think of urban system as a result of the locational choices of a large number of individuals, we are presented with the democratic type of system where the wide dispersion of authority and decision making make these systems more stable, more elastic and have a greater capacity to resist unexpected environmental fluctuations (John Casti, 1994).

Many critics of modernist city (Jacobs, 1961, Salingeros, 2005) have advocated the quality of urban areas to maintain its own order and referred to the process of self-organization as a “bottom-up” process involving a large number of people who in some way demonstrate respect for a set of rules, producing nevertheless non-predetermined outcome characterized by a high degree of diversity. The

Diversity that results is then overlaid with historical processes (time-factor) and added a critical mass becomes a real asset of cities that makes them viable and strong .

IV. Problem Statement

In the United States, great emphasis has been placed on planning for smart growth, bicycle, and pedestrian in the 90's, while in Northern Europe, the decline of modernist planning and automobile dependent transportation system occurred somewhat earlier with the energy crises of the 70's. Unfortunately in many Asian countries despite having great history in architecture and urban planning, the modernist planning era and automobile dependency continue to flourish and even grow very fast in recent years (Hutabarat-Lo, 2009).

Iran as a developing country is also struggling with the impacts of auto dependence urban design. Many historical cities of Iran have been affected by this trend. According to the local officials of the Mashhad city, the city suffers from traffic and air pollution and while this is a growing trend in the city, the issue has not been seriously addressed. One of the ICOMOS (International Council on Monuments and Sites) members stated that cultural-historical fabric of Mashhad is in danger because of the development of the Mashhad city.

Sidewalk in Mashhad does not have meaning. In the mind of citizens of this city, sidewalk is a messy path where you will encounter many problems walking there, from bike passing, bumping into other people, shops which locate their stuffs in the walkways and occupy the space, and much of these problems also occur KALANTARI highway.

In order to improving urban qualify, was studied main urban axis. There are some problems in this area. They are:

- 1- There is air and sound pollution
- 2- There isn't vitality
- 3- There isn't identify

Thus, the research hypotheses are:

- It seems, there isn't vitality in this sidewalk.
- It seems, mentioned location isn't safe position (light).
- It seems, citizen don't satisfaction from position.

V. Methodology

Research method is descriptive. The method of collected data is field. Also, were used questionnaire tools in order to collecting data. On the other hand, was referred to municipality 9 region due to, studied area was located in this urban region.

In continue, was used SWOT technique in order to analyzing questionnaire. At finally, proposed strategies in order to improving urban space qualify.

VI. Studied Area

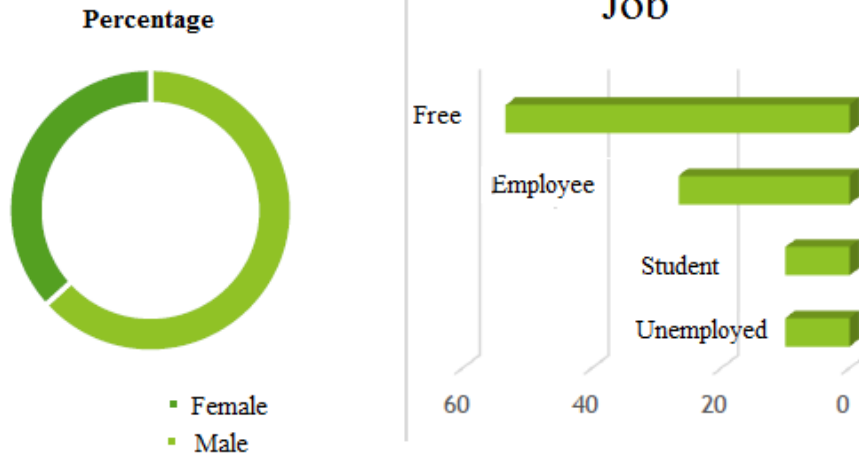
Mashhad has been located between Hezar Masjed & Binaloud Mountains. The city is located at 36.20° North latitude and 59.35° East longitude, in the valley of the Kashaf River near Turkmenistan, between the two mountain ranges of Binalood and Hezar-masjed. Mashhad divided 7 parts in planning based on environmental, physical, economical, social indicators. This area consists of natural and physical opportunities. Thus, middle area is one of the main economical and physical areas in Mashhad. This area has some factors (ebrahimpour, 2014:230). Mashhad has 12 municipality regions. Studied area was located in 9 municipal regions.



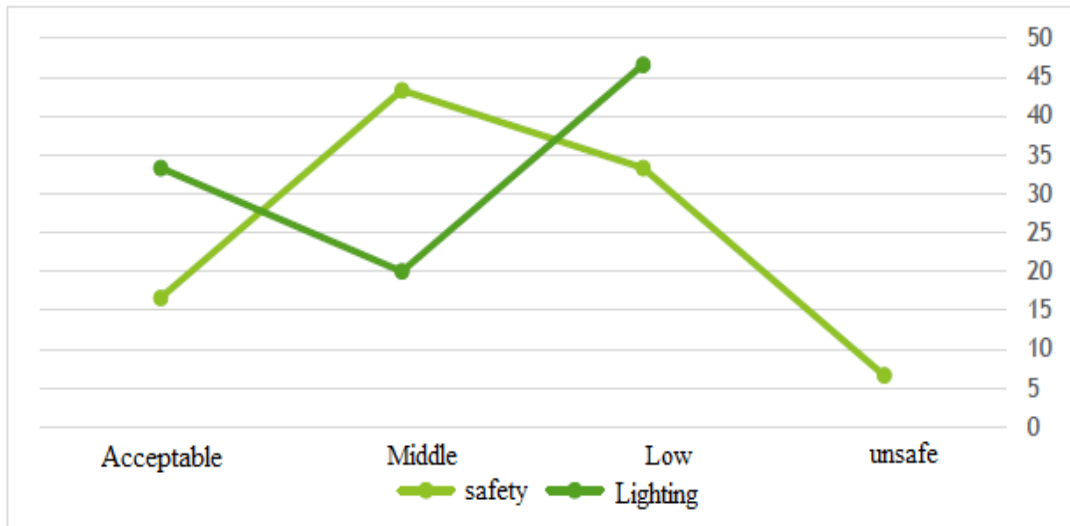
Figure 1: studied area

VII. Result

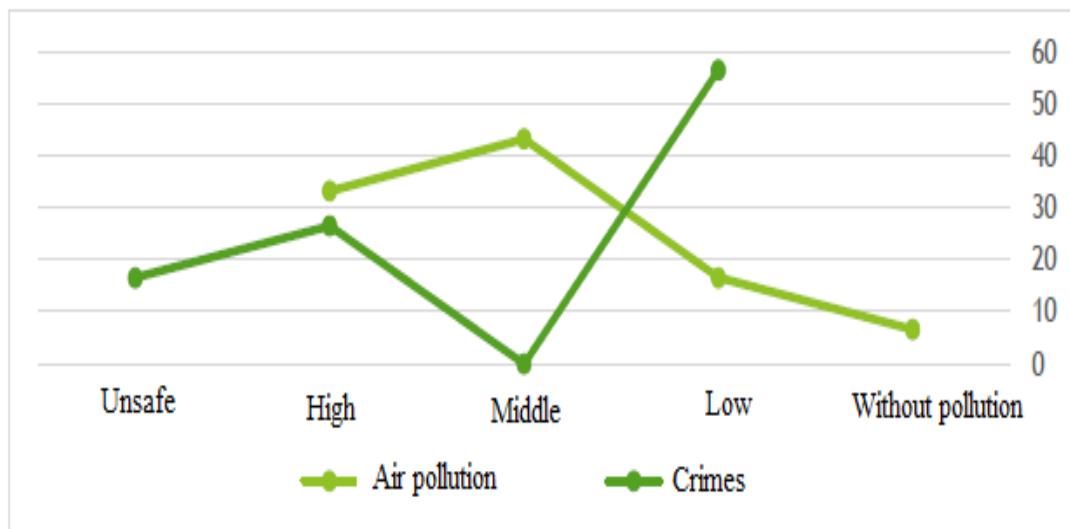
In order to concluding descriptive data, was used questionnaire tool. So findings have been shown as graphs.



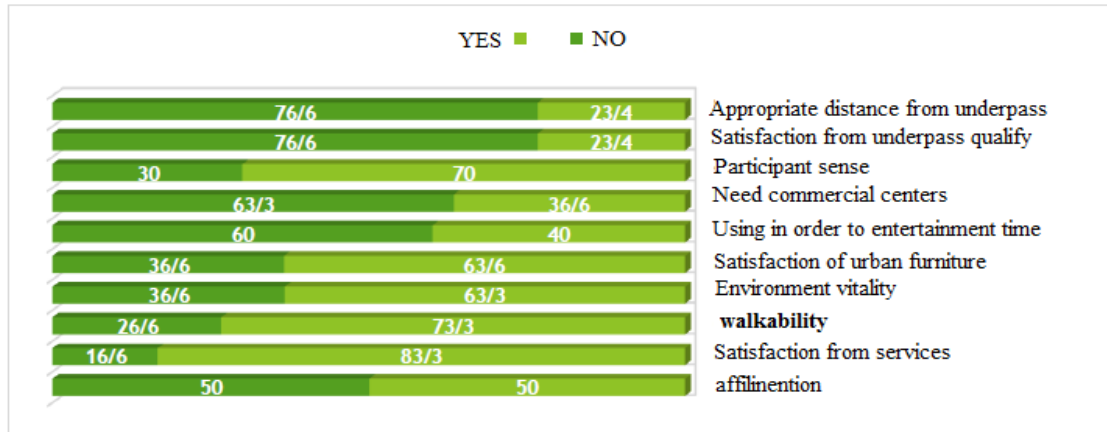
Graph 1: descriptive data



Graph 2: descriptive data



Graph 3: descriptive data



Graph 4: At finally was used SWOT technique in order to analyzing data.

SWOT analysis (alternatively **SWOT matrix**) is a structured planning method used to evaluate the **strengths, weaknesses, opportunities and threats** involved in a project or in a business venture. A SWOT analysis can be carried out for a product, place, industry or person. It involves specifying the objective of the business venture or project and identifying the internal and external factors that are favorable and unfavorable to achieve that objective. Some authors credit SWOT to Albert Humphrey, who led a convention at the Stanford Research Institute (now SRI International) in the 1960s and 1970s using data from Fortune 500 companies. However, Humphrey himself does not claim the creation of SWOT, and the origins remain obscure. The degree to which the internal environment of the firm matches with the external environment is expressed by the concept of strategic fit.

- Strengths: characteristics of the business or project that give it an advantage over others.
- Weaknesses: characteristics that place the business or project at a disadvantage relative to others
- Opportunities: elements that the project could exploit to its advantage
- Threats: elements in the environment that could cause trouble for the business or project

Identification of SWOTs is important because they can inform later steps in planning to achieve the objective. First, the decision makers should consider whether the objective is attainable, given the SWOTs. If the objective is *not* attainable a different objective must be selected and the process repeated.

Users of SWOT analysis need to ask and answer questions that generate meaningful information for each category (strengths, weaknesses, opportunities, and threats) to make the analysis useful and find their competitive advantage.

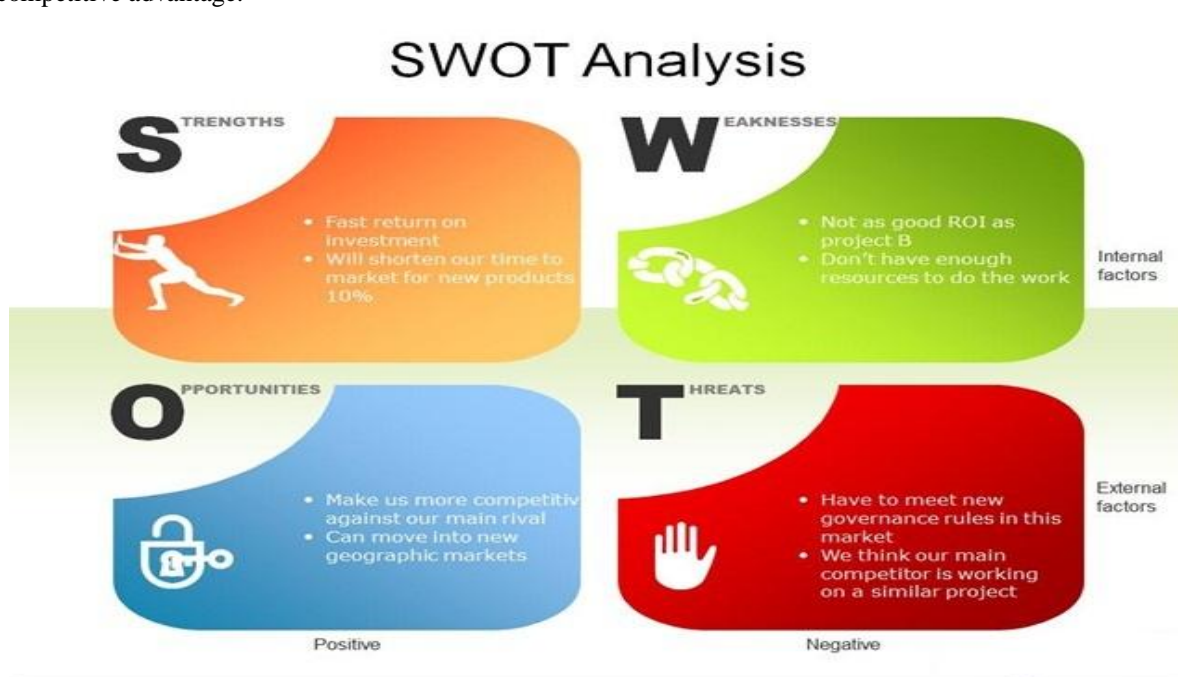





Table 1: SWOT technique

Strengthens	Weakness
<p>There is path especially for physical people</p>	<p>There is narrow walk side There isn't adequate light</p> <div style="text-align: center;">  </div> <p>There isn't safety urban space (especially in under path)</p>
<p>There is classification ways</p>	<p>There is soundless pollution</p> 
<p>There is new urban fabric</p>	
<p>There is high density</p>	
Opportunities	Treats
<p>There is potential in order to creating green space and parks</p>	<p>There is possible that the wide of walk side narrow due to growth of high way</p>
<p>There is appropriate urban furniture</p> 	

VIII. Conclusion

Sustainable transportation is a prerequisite for urban sustainable development .According to international organizations, the promotion of urban life quality could be obtained through a transportation that is compatible with economy, society, and environment aspects. Creating walkable neighborhoods is one of the strategies to achieve urban sustainability .This component not only accounts for a sustainable development pattern, but also pays attention to other development patterns such as public transportation-based development patterns as well as smart growth. In studying was studied side walk of KALANTARI highway condition. There is three hypotheses. They are:

- It seems, there isn't vitality in this sidewalk.
- It seems, mentioned location isn't safe position (light).
- It seems, citizen don't satisfaction from position.

According to analyzed data, there isn't vitality in this location. Also, citizen doesn't satisfy condition. So studied area need planning such as walkability in order to improving qualify.

REFERENCES

- [1]. Aultman-Hall, L., Roorda, M., & Baetz, B. (1997). Using GIS for evaluation of neighborhood pedestrian activity. *J. Urban Plan. Dev.*
- [2]. Berrigan, D., Troiano, P. (2002). The association between urban form and physical activity in U.S. adults. *Am. J. Prev. Med.*, 23 (2S).
- [3]. Crane, R. (2000). The influence of urban form on travel: an interpretive review. *J. Plan. Lit.*, 15(1).
- [4]. Ebrahimpour, Maryam (2014) Social safety's women in urban public space (Case study: Mashhad metropolitan), *American Journal of Engineering Research*, Volume-03, Issue-08
- [5]. Greenwald, Michael J., Boarnet, & Marlon G. (2001). The built environment as a determinant of walking behavior: analyzing non-work pedestrian travel in Portland, Oregon. *Transportation Res. Rec.*, 1780, 33–43.
- [6]. Habibi, M. (1999). Walkways for Tourism. *Honarhaye Ziba*, 9, 43-51.
- [7]. Hutabarat-Lo, R. (2009). Walkability: What is it? *Journal of Urbanism*, 2(2), 145-166.
- [8]. Hoehner, C. M., Brennan Ramirez, L. K., Elliott, M. B., Handy, S. L., & Brownson, R. C. (2004). Perceived and objective environmental measures and physical activity among urban adults. *American Journal of Preventive Medicine*, 28 (2S2), 2-15.
- [9]. Newman, P., & Kenworthy, J. (2006). Urban design to reduce automobile dependence. *polis*, 2(1), 35-52.
- [10]. Owen, N., Humpel, N., Leslie, E., Bauman, A., & Sallis, J. F. (2004). Understanding environmental influences on walking. *American Journal of Preventive Medicine*, 27(1), 67-76.
- [11]. Shay, E., Spoon, S. C., & Khattak, A. J. (2004). Walkable environment and walk inactivity. US, Chapel Hill: University of North Carolina.
- [12]. Shriver, K. (1997). Influence of environmental design on pedestrian travel behavior in four Austin neighbourhoods. *Transportation Research Record*, 1578, 64-75.
- [13]. Southworth, M., & Ben-juseph, E. (2004). Reconsidering the Cul-de-sac. *Access*, 24, 28-33.
- [14]. Southworth, A. F. (2008). Guest Editorial: Cities afoot-pedestrians, walkability and urban design. *Journal of Urban Design*, 13(1), 1-3.
- [15]. Southworth, M. (2005). Designing the walkable city. *Journal of Urban Planning and Development*, 131, 246-257.
- [16]. Vernez-Moudon, A., & Lee, C. (2003). Walking and bicycling: an evaluation of environmental audit instruments. *Am. J. Health Promot.*, 18(1).