

# A Review of Walkability and Neighborhood Design

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## Abstract

The major style of urbanization in Isfahan has been always conventionally based and focused on pedestrianism. This city whose frame and structure is organized and nearly completed in the Seljuk and Safavid eras, still (particularly in the old areas) is under a system based upon evaluation of the qualitative properties of districts and maximum connection between people and environment. Though from early 20th century and the start of modern transformations in architecture and urbanization in Iran, building new and modern districts with central focus being on maximum usage of land to build infrastructure and paths for passing cars, the pedestrians are less valued. Regarding this point that city development and description of new necessities by humans has inevitably new activities and utilizations in definition of districts, by comparing the new and old districts of Isfahan we can significantly come to the conclusion that how each one's frame work properties can satisfy today human beings' requirements and interactions and what the strategies for their adjustment and promotion are. This article compares the capacity of pedestrianism and social interactions between an old and a new-fashioned district in Isfahan in order to discuss the strengths and foibles of them. The discussed titles are: aim of research and the way of that, reviewing the supplies about new urbanization and walkability, checking pedestrianism in two districts of Isfahan, and the results of the research. The final parts discuss the results of the review and physical position of two intended districts. Finally, the implications will be presented as guidance principles to design new-fashioned neighborhoods in order to improve the quality of neighborhood and social interactions due to the walkability.

**Key words:** Walkability, Social Interaction, Neighborhood Design, Isfahan City

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## 1-Introduction

Walking and Walkability are the terms that are increasing in prevalence in both the planning and health field. However, these terms do not have the same meaning; walking is different from walkability in that walking refers to a form of physical activity while walkability is used to describe the physical environment in which walking takes place. The portion of the build environment often referred to when studying walkability is the space that is created by the streets, streetscapes, and building present in a neighborhood. A walkability audit is a tool for the assessment of the build environment to determine how it accommodates walking either by all of its residents or a specific target group such as the elderly.

There are a number of reasons for studying walkability, but the two most prominent issues center around maintaining or increasing human health (leisure walking) and sustainability (utilitarian walking). While the distinction between leisure and utilitarian walking maybe easy to define, it has been noted that defining walkability is not as simple. Forsyth & Southworth (2008, 28) state that “Researchers are now grappling with the concept of ‘walkability’ – what it is, how to measure it and might it mean for the design of cities ”. One reason for the difficulty in defining walkability is that the concept of environments within the urban design profession has not been the prevalent force behind design decisions rather cities and their neighborhoods have been tailored to meet the demands of the automobile and it has been this way since the automobile began taking center stage during the first half of the 1900s. There have been nearly 75 years of planning for motorized transportation (Brown, Morris & Taylor, 2009) with little to no thought about the pedestrian environment. (Southworth, 2005)

This paper will have two main components. The first part will establish an understanding of what walkability is, how it measured, and how social interaction is influenced by neighborhood design and walkability. The second part is a case study which seeks to compare the amount of walking and social

interaction between two types of residential neighborhoods in Isfahan; the traditional neighborhood of Jolfa and the modern neighborhood of Malek-Shahr. The addition of social interaction in a research on urban design and walkability is intentional as a couple of referenced articles (i.e. “Designing a walkable city” by Michael Southworth (2005); “Pedestrian environment and sense of community” by Hollie Lund (2009)) indicate that social capital (which social interaction is a component of) may be strongly affected by walkability.

## 2-Purpose of study and research methods

### 2-1- Purpose of the study

New Urbanism focuses on three level of development; regional, neighborhood and street. At the street level New Urbanism may go by the name Traditional Neighborhood Development, Neo-Traditional development, or Transit-Oriented development; it is the neighborhood level that is the focus of this research. This research compares a traditional and modern neighborhood to determine if the amount of walking and social interaction by the residents increases when the design of the neighborhood is based on New Urbanism principles.

The fact that the two districts each have been built in different eras causes a difference in comparison of their social and physical changes. The objective of this research is not for one of the two districts to choose the other as its design pattern, but to establish a principal of urbanization which brings about reconstruction and revitalization of traditional districts alongside construction and development of new districts in a way that employs every means from the form and style of streets to their pavement and every other architectural detail to encourage more social interaction in the people. The results of this research however, indicate that modernism gaining entry into urbanization, more specifically during the second half of the 20th century, has caused a decline in social interaction.

## 2-2- Research Questions

While this research seeks to answer questions about comparability between specific variables (design, social interaction and walking) it does not intend to establish causality. The following are the questions being addressed in this research:

- Does the amount of social interaction differ between a traditional and a Modern neighborhood development?
- Do residents walk more often when the neighborhood design is based on New Urbanism principles?
- What is the relationship between the social interaction, walkability and neighborhood design?

## 2-3- Case Study Background

Two districts in Isfahan have been chosen for this research: Jolfa and Malek-Shahr.

The Jolfa district is located in the southern part of the city, in the area surrounded by Chahar-Bagh, Nazar, Hakim-Nezami and Daneshgah streets. This district has been built nearly 400 years ago (1028 AH) by Shah Abbas I in order to house the Armenian popula-

tion of Isfahan (Figure 1). Its most significant public places are the churches and the amusement and shopping centers.

The Malek-Shahr district is located in the north-western part of the city, in the area surrounded by Robat, Baharestan and Mofateh streets. This district has been built 40 years ago (the general project of 1974 (1353 RIC) (Figure 2) and its most important public places are commercial buildings and the amusement park. This district has been built over farmlands and is still expanding northwards; empty lands can still be seen between neighboring units.

## 2-4- Research Methods

Four types of research methods were used to gather information for this research; literature review, surveys, a walkability audit, and field observations of the two neighborhoods. For data on social interaction a written survey was mailed to households in the Jolfa and Malek-Shahr neighborhoods. The survey was divided into three sections which included questions regarding interaction with neighbors, frequency of walking in the neighborhood, neighborhood satisfaction and demographics. Participants are not



Fig.1- Jolfa neighborhood



Fig.2- Malek-shahr neighborhood

identified in the results; however, in order to know which neighborhood the survey came from an identifier number was used on each survey;

To obtain information on the walkability of each neighborhood a walkability audit was completed for several streets in each of the two neighborhoods as well as photographs were taken of the areas. The walkability audit instrument is used to create an inventory of items as they related to sidewalk availability, location of house from street, handicap accessibility from the street, and presence or absence of people.

This audit focused on elements and conditions that were readily observable which have the potential to influence a person's decision to walk. A number of conditions and elements include: Surface conditions of the paved walking surface, Path obstructions that would interfere with the ability to walk on the paved surface referenced above, Segments features that may add to or detract from a person's desire to walk such as bus stops, street trees, street lights, and on-street parking, Presence of litter, graffiti, or deterioration present in the observed area (condition of surroundings), The type of litter and disorder that may be present, Whether people were visible and/or active in the observed area, What, if any, crossing aids exist for aiding in the crossing of streets in the

observed area, The types of buildings and land used that were observable, The walking/cycling environment of the street segment which includes observing whether there were neighborhood watch signs, if there are bicycle lanes present, density of street trees, visibility of items such as trash cans or benches, and the depth of the building setbacks from the sidewalk, Rating the overall attractiveness of the street segment which ranged from not attractive to very attractive.

The features and conditions mentioned above work together to create an environment that a person may or may not find attractive to walk in and more importantly these can create an environment that a person would not feel safe in which in turn may deter a person from being outside.

### 3- Literature Review of New Urbanism and Walking

In 1929, Clarence Arthur Perry introduced his plans for the Neighborhood Unit (Figure 3). The features of the Neighborhood Unit had at its core public space that included schools, churches, and open space for recreation. The distance each resident had to travel to reach the core or perimeter commercial space was important and was to be no longer than a quarter-mile walk. The types of streets used within the development were also regulated so that the main arterial streets were along the perimeter which allowed for residents to walk with less fear of traffic (Glanz,



Figure 3: Clarence Perry's 1929 Diagram of the Neighborhood Unit.

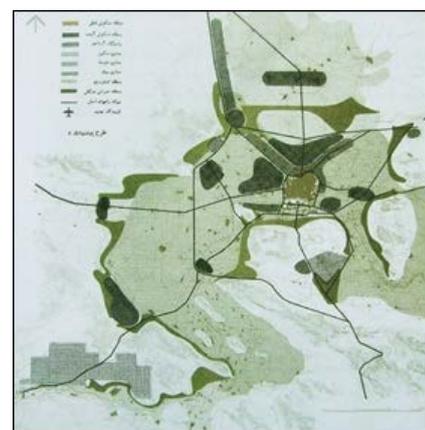


Figure 4: The General Organic Project of Isfahan in 1966

2011).

While the New Urbanism movement began in the 1980s, the concept of developing neighborhoods that are pedestrian-friendly and socially-oriented is not new. The majority of the articles published on walkability and neighborhood design have been since 2005, however, based on an observation of the available literature in recent years from the planning field and health related fields the trend appears to be bringing pedestrian planning out of the shadows of transportation (automobile) planning.

The General Organic Project of Isfahan City in 1966 (1345 RIC) was also established to secure the same objectives (Figure 4), but unfortunately it has been unsuccessful in either protection of the old neighborhoods or expanding the new ones due to insufficient administrations.

### 3-1- Urban Design and Walkability

The city of Isfahan is designed by the combining the urbanization patterns of the two Seljuk and Safavid eras using a structure branching from the Chahar-Bagh and the Zayandeh Rood river axis with the watercourses through the neighborhoods is considered one of the best examples of cities defining neighborhood units and considering the importance of walking in cities.

During the final years of the Qajar era, the developments of the 20th century and automobiles entered

the urban structures, the Chahar-Bagh street, Naghshe-e-Jahan square, the alleys inside neighborhoods and even the old bridges over the Zayandeh Rood were unfittingly designed in a way that cars should be able to pass through. This inconsistency of design was somehow controlled during the 70s and 80s but still automobiles had to enter the neighborhoods and subsequently the city has never regained its primary appearance; an example of it being the daily entrance of cars into narrow alleys of the traditional neighborhoods and disturbing the peace of the residents and disrupting their walks.

New neighborhoods are however designed to separate the sidewalk from the streets but mostly due to incompatibility with the main city structure and having low Walkability standards, do not fully satisfy the pedestrians. Therefore Walkability possibilities should be reconsidered in both neighborhood styles. (Figure 5).

But, how does design influence decisions to walk? Studies have shown that the presence or absence of macro-scale (i.e. block length and number of interactions) and micro-scale features (i.e. street amenities, sidewalks, and conditions of the buildings in the neighborhood) can affect the design of the neighborhood which in turn can affect the desire for physical activity by the residents (Alfonzo et al, 2008;

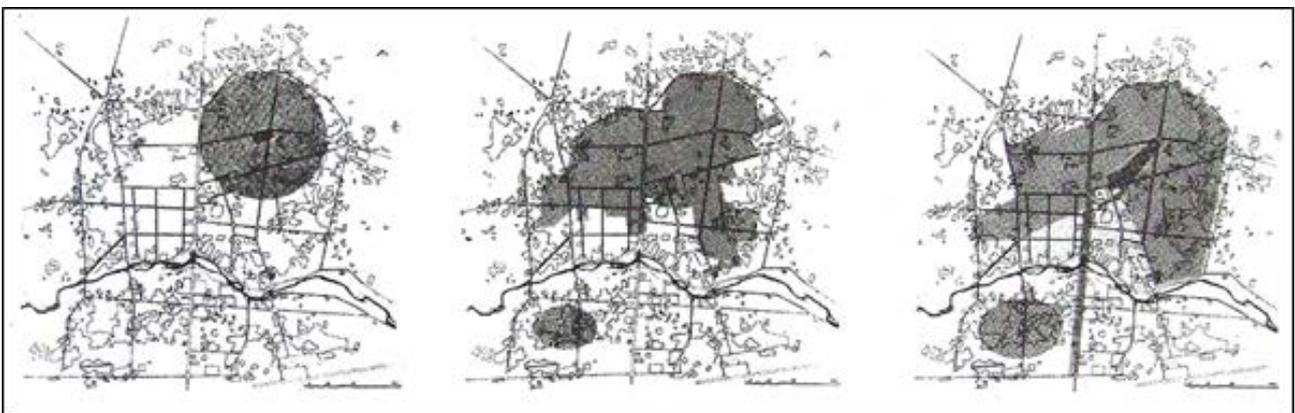


Figure 5: Development of Isfahan city in different eras  
The General Project of Isfahan, Tehran Organic consulting engineers and Paris Eugène-Boudin Urban planners- 1966

Rodriguez et al, 2006). Together the macro-scale and micro-scale features can affect how the residents perceive the environment (safety, pleasantness, accessibility etc). In addition to the previous features, New Urban communities seek to include in their design the following: A street system that uses a grid or undulating design to maximize connectivity, A mix of compatible land uses that includes housing, retail, and public facilities, Single family homes set close to the street, with front porches, and garages set to rear, Pedestrian amenities and public open space (Rohe, 2009, 225-226).

Several studies have questioned whether new urbanism "... is too concerned with appearance... while ignoring social concerns..." (Southworth, 1997, 28). The claim for decreasing car dependency seems to have some merit (Rohe, 2009), However, the claims increasing socializing and sense of community seem to be harder to prove. To be fair, there are indications within the literature on New Urbanism that studies regarding the increase in sense of community are relatively few when it comes to the study of the influence of the physical environment on creating sense of community (Lund, 2009).

### **3-2- Measuring for Walkability**

Measuring walkability is done either through the assessment of the physical environment (objectively) and/or through the gathering of personal perceptions (subjectively) of a specific location. The predominate method of gathering information for determining degree of walkability is done through the auditing of the physical environment which commonly includes features such as "building height, block length, and street and sidewalk width (Ewing, 2009, 65)".

A second method of measuring for walkability is done through the gathering of perceptual information. This type of measuring examines a range of perceptual qualities held by the residents or users of the physical environment. This allows the researcher to understand how perceptions affect the experience of walking and to gain an understanding of the relationship between perceptions and the physical environ-

ment (Ewing, 2009; Wood et al, 2010).

Reid Ewing and Susan Handy (2009, 71) have described five qualities that have particular important when researching environmental perceptions; imageability, enclosure, human scale, transparency, and complexity (Ewing and Handy, 2009, 78).

In the book "Inclusive Urban Design: Streets for Life" by E. Burton and L. Mitchell there are six components discussed that promote walkability in a community that includes; Familiarity, Legibility, Safety, Comfort, Accessibility, and Distinctiveness. These components build on and expand the qualities mentioned by Ewing and Handy and they are a mix of the physical as well as the perceptual.

As indicated by the above listed categories for researching walkability it becomes clear that an in depth study on walkability cannot be accomplished through only using observable physical characteristics. A study of environmental perception is as important in determining walkability since a researcher cannot determine how a person feels about the environment they are in which is the ultimate indicator of whether a neighborhood is walkable or not.

### **3-3- Linking Social Capital to Design and Walkability**

Kevin Leyden (2003, 1546) defines social capital as "...the social networks and interactions that inspire trust and reciprocity among citizens" and proposes that mixed-used, pedestrian oriented neighborhood support the development of social capital.

A particular type of mixed-used, pedestrian oriented neighborhood receiving increasing attention are those created by New Urbanists which are based on the physical and social concepts of the earlier pre-zoned neighborhoods. One of the claims made by proponents of new Urbanism is this type of urban design (mixed-use, compact, and pedestrian friendly) increases the sense of community through implementation of certain design features which are intended to facilitate walking. Walkability, in turn, enhances the development of social capital (or sense of com-

munity) as it allows for international or accidental socialization opportunities to occur.

The design characteristics of New Urbanist communities, that are believed to enhance the physical and social environment include "...higher densities, a diversity of housing types, a concentrated core of retail and employment, a pedestrian oriented environment, dedicated public and open spaces, and connected street networks (Lund, 2003, 301)". It is assumed that through the proper implementation of these design characteristics that social capital can be improved, but there is no agreement in the published literature that this actually does increase social capital as studies determining the link between the physical environment and social capital in a New Urbanist community are relatively understudied.

An important point that is made in regards to social interaction and the design of a neighborhood may have less to do with the physical features and more to do with an assumption that socially oriented people may choose the type of neighborhood that fits their needs rather than neighborhoods instilling the need for social interaction of the people that live there (Leyden 2003, du Toit, 2007). At present time it is difficult with certainty that design creates social capital.

What this implies is that further research is needed to 1) understand what physical characteristics are prevalent throughout walkable neighborhoods in these two case studies, 2) to make the link between social capital and walkability and 3) to see if people actually choose a neighborhood because it fits their lifestyle or if a neighborhood can create a lifestyle.

#### **4- Neighborhood Walking and Social Interaction Results**

As stated this research has been conducted in two different districts of Isfahan City so that the results of the theoretical studies can be evaluated according to the two neighborhoods: Jolfa and Malek-Shahr. The two neighborhoods are designed differently while most of the houses in both neighborhoods are approximately designed in northern – southern style.

The streets of Malek-Shahr are designed rather geometrically and reticular while the streets of Jolfa are more organically made; yet the slope in the area between street and the front of the buildings are almost the same in both neighborhoods and most houses have parkings facing the alleys or the street on the ground floor. Since the objective of this research is to indicate that neighborhoods with different physical properties are accordingly different in their walking measure and social interaction, in order to gather data in this field surveys have been mailed to the residents asking for information about the residents and the environment of each neighborhood.

#### **4-1- Neighborhood Demographics**

Sixty three surveys have been mailed, 44.4 per cent of which returned (n=28). The demographic results show that the differences are centralized in 3 areas: the average age, the number of children in households and the total family revenue. The average age of the Jolfa residents is slightly above 54.6 years and around 42.1 years in Malek-Shahr. The number of children in each household in Malek-Shahr neighborhood is almost 2.3 times that of Jolfa. A common demographic property in both neighborhoods is that almost 60 per cent of the residents have college degrees, working in cultural, educational or administrative fields. The rest were self-employed or ran private businesses. The family revenue in Jolfa was almost 1.08 times that of the average Malek-Shahr households. Even though the difference in the range of income in the two neighborhoods is not emphasized in this research, it could be helpful in comparison against the common value of houses in each neighborhood. While the average price of houses in Jolfa is higher, the extension of construction and modern living facilities in Malek-Shahr brings us to the conclusion that the average price of houses in Malek-Shahr is not much lower than that of the houses in Jolfa.

#### **4-2- Building Façade Constructions and Sidewalk Styles**

In Jolfa, houses of both traditional lower heights with brick and thatched exteriors and multi-story new apartments with brick and stone exteriors can be seen. In parts of this neighborhood which were reconstructed in recent years, sidewalks, streets and bicycle paths are efficiently separated by using materials of different color, type or level. But the sidewalks are considered of rather less importance in the reconstructed areas of Jolfa. (Figures 6 & 7). In

Malek-Shahr, both newly built suburban houses and the high-rise apartment buildings have exteriors of factory-made bricks, stone and clear glass surfaces. The overall height of buildings in Malek-Shahr is higher than that of Jolfa. Sidewalks of the interior parts of the neighborhood are mostly done without any accurate design, while the sidewalks around main streets and the central neighborhood park are much better executed (Figures 8 & 9).



Figure 6: Separating the sidewalk from the roadway, a variety of flooring (Jolfa)



Figure 7: The newly constructed Sector (Jolfa)



Figure 8: the villas and apartment houses, irregularities in sidewalk flooring (Malek-Shahr)



Figure 9: Flooring of Main Street sidewalk (Malek-Shahr)

### 4-3- Neighborhood Satisfaction and Social Interaction

The administrated residential survey sought to determine how satisfied the residents were with their neighborhood and the amount of social interaction and walking that took place.

The survey was divided into three sections with questions that focused on neighborhood interaction, neighborhood satisfaction, and demographics.

The neighborhood interaction section asked questions about placement of garage and driveway usage, presence of front porch and usage, amount of acquaintance/friends in the neighborhood, amount of and frequency of social interactions with other residents, and how often and where dose walking take place. The section on neighborhood satisfaction asked questions regarding satisfaction with the neighborhood crime rate, public transportation accessibility, relationship(s) with other residents, traffic noise and speed, and as the neighborhood as a good place to live/rise children. The final section asked questions regarding age, gender, educational

background, annual household income and number of adults and children in the surveyed household.

Results of the neighborhood satisfaction survey showed that 60 per cent of the Jolfa population was satisfied with their access to the public transportation services while 55 per cent of the Malek-Shahr residents were dissatisfied. 85 per cent of Jolfa residents and 63 per cent of Malek-Shahr residents thought that their neighborhood was a pleasant place for walks. Residents of both neighborhoods found their neighborhood equally suitable for living. Jolfa residents were happier with the number of their friends and families living nearby and felt more protected against crimes. About 82 per cent of Malek-Shahr residents believed their neighborhood to possess more modern and suitable facilities to raise children while this scale in Jolfa was only around 70 per cent. In the social interaction survey and Walkability, Jolfa residents were more informed about their neighbors while like Malek-Shahr residents, people didn't have much interaction with their neighbors. This could be a result of these residents' longer habitation in their neighborhood. The questions of walkability showed



Figure 10: Walking safety through the street (Jolfa)



Figure 11: Walking carefully through the separating surfaces of street (Malek-Shahr)

that 70 per cent of people who took part, walk 5 days a week while 60 per cent of Malek-Shahr residents walk 2 or 3 days a week and that Jolfa residents see more people while walking in the neighborhood than the Malek-Shahr residents.

It was also asked that how far the residents walk; the answers provided in the survey including: from home to a friend's place, a nearby store, religious buildings (mosque, church), parks and green areas and finally they walked outside the neighborhood. The answers were almost similar for both neighborhoods, but more Malek-Shahr residents had stated that they don't walk in their neighborhood. Undoubtedly the difference in social interaction and walkability of the two neighborhoods is not strictly limited to the physical structure of the neighborhood and the duration of their residence is also effective.

#### **4-4- Walkability Audit Findings**

In order to understand the physical properties affecting the social interaction and walkability, another survey was conducted, its objective being the walkability audit. Overall, the sidewalks of the residential, commercial and religious areas inside the Jolfa structure were in better condition compared to the sidewalks in Malek-Shahr (Figure 10). Even though in some areas of Jolfa, walking is rather harder due to the narrow passages. In Malek-Shahr, mostly parking entry ways interfere with the sidewalks.

The sidewalks by the main streets of both neighborhoods are almost of the same width. Some streets of the interior structure of Jolfa are paved with cobblestones therefore making it hard for the cars to pass quickly and according to the residents' responses they can even walk freely in the middle of the streets while Malek-Shahr residents found no street safe enough to walk along, they stated that the only time that they'd choose the street for a walk is in the absence of a sidewalk by the street (Figure 11).

### **5- Discussion and Conclusion**

#### **5-1- Review of the Results**

The answers to the survey for the two neighborhoods

showed that the social interaction of the residents of the two neighborhoods with their neighbors is almost the same, more importantly the residents of Jolfa are more satisfied with their neighbors, while 80 per cent of Jolfa residents were satisfied with the safety of the neighborhood while this scale was only 61.1 per cent in Malek-Shahr. It could be guessed that greater satisfaction with safety measures in a traditional neighborhood could be due to more satisfaction with social interactions. 82 per cent of Malek-Shahr residents and only 70 per cent of Jolfa residents thought their neighborhood to be suitable for raising kids probably due to more and newer educational facilities in the Malek-Shahr Neighborhood. However it should be noted that the average age of the traditional neighborhood residents is slightly higher than that of the new one. In addition to higher satisfaction with social interactions, this survey shows an absolute increase in walking scales in the traditional neighborhood in comparison with the new one. 70 per cent of the people who took part in the survey living in Jolfa walk five days a week while 60 per cent of Malek-Shahr residents walk two or three days a week.

Jolfa residents see more people (about 80 per cent) walking in the neighborhood compared with Malek-Shahr (about 55.6 per cent). This could be due to a higher number of commercial and amusement centers in Jolfa neighborhood, which is consistent with what has previously been published in other articles about walkability and expansion of traditional neighborhoods. Although this survey shows that walking is more popular in the traditional neighborhood, it doesn't indicate if the decision of going for a walk is due to the design of the neighborhood or the reason why the residents are more prone to taking walks compared to the residents of the new neighborhood. Commercial buildings in Malek-Shahr are primarily designed and built for this purpose, but in Jolfa some residential properties have been re-designed as commercials. This combined model is Jacobs' favorite design of the urban life: combination of residential and commercial usages. And so she came to make up the phrase: eyes on the street which brings about

more feeling of safety and plurality.

If presence of sidewalks or their lack cannot explain the differences in the amount of walkability, other social aspects of the neighborhood should be studied in greater detail. This survey shows that social factors such as satisfaction with social interactions and safety from the threat of criminals can help explain why walks are more popular in some neighborhoods than others. As Alfonzo writes in his article: "It is unlikely that the built environment affects decisions to walk... rather... the built environment may support decisions to walk through the accumulation of several discrete features that together create a particular character or quality (safety, pleasantness, etc.)." (Alfonzo et al. 2008, 31)

### 5-2- Limitations of This Survey

The small size of the areas of this survey is one of its limitations and limited number of residents taking part in the survey has not led to a precise connection among walkability, social interaction and neighborhood design. To reach this end, a greater demographic and a survey of residents' preferences according to neighborhood and choices of lifestyle are needed. This limitation did not affect other aspects of the survey.

### 5-3- Conclusion

In spite of passing 4 decades of proffering of the comprehensive organic projection of Isfahan and all efforts in second decade of post-revolution age, unfortunately it is not sensible in politics of Isfahan urbanization to pay attention to protection and revival of the old areas, creating an appropriate pattern in development of new areas, creating a city garden, giving more priority to pedestrian than cars and cessation of city development on northern agricultural lands. Nevertheless there are no politics, seriously committing the programmers to design and create complex and multipurpose districts to encourage hiking. In addition to nonchalance of policymakers and executives, the information about public view on complex districts is not adequate. If a district is supposed to have a nice design, programmers have

to understand who is more attracted to this district, why they are attracted and actually who will live in these districts. Despite all limitations, regarding the increase in energy supply prices, it is time to inform people by programmers about how the appropriate principles (if they run) can affect the individual lives in hygienic and economic issues.

Also the concept and importance of districts with better social interactions should be conveyed to the people who may be interested in these kinds of districts but are not cognizant about the possibility to create them. Largely both traditional and modern districts discussed, should be reconstructed or designed according to the current situation and future developments:

- People with different ages and income levels could live in security and welfare.
- Social and personal relations have their real value.
- Plenty of daily needs of humans should be satisfied through pedestrianism.
- The districts should be accepted with unique and gracious identities.
- Natural environment and beautification should be respected.
- People's needs should be given priority over that of the traffic.
- The districts should accept different kinds of living from singles people to families and retired life.
- The districts should be places that people choose to live for themselves and the oncoming generations.
- The noble sense of architectural patterns and urbanization of Isfahan should be present in the entire city.

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