

The Assessment of Urban Furniture for the Disabled (Case Study: Shiraz City and Large Park)

Masood Davarinezhad^{1*}, Meysam Rahnama²

¹PhD Student of Geography and Urban Planning, Ferdowsi University of Mashhad and Faculty Member of Binaloud Higher Education Institute, Mashhad, Iran

²MA student of urban planning, Imam Reza International University, Mashhad, Iran

*Corresponding author's E-mail: masood.davarinezhad@stu.um.ac.ir

ABSTRACT: Suiting urban area for physical and motor disabled is considered as justice-centered approaches in planning and urban management. However, many urban public areas such as streets, parks and city centers in most cities like Shiraz face with the problem of inappropriate spaces for the disabled. In this regard, the purpose of this article is to analysis and pathology of urban furniture in downtown and Shiraz Grand Park and present strategies for suiting these spaces to the Disabled. Methodology of this study is applicable with the aim of research and analytical-descriptive with the framework research that has been made in downtown and the Grand Park of Shiraz in the gauging method. Data collection tools are providing questionnaires, interview and observation.

Keywords: Urban Furniture, Suiting Space, Disabled, Shiraz

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INTRODUCTION

It shouldn't assume the city just as a location for bunch of people and contracts center but also it is interaction area of people with abilities, mood, thoughts, customs, beliefs and different feelings¹. Hence, the safe city is one in which all citizens can benefit services of that society. This urban environment should be able to provide more services to vulnerable groups of the population that do not fade of society and be forgotten. Suiting urban spaces is mould context to reach equal opportunities for all people in society in order to mobility in the city and access of everybody to urban spaces and considered as community development requirements. According to UN estimates, more than ten percent of the world population suffers from disabilities.

In the society like our country in which a significant number of people with disabilities comprise the war veterans- those who sacrifice in defence of their homeland – addressing this problem is felt more². Suiting urban spaces and improving accessibility and mobility of people with disabilities play an important role in planning and urban designing. All the disabled in developing country specially our country suffer of poverty prevalence and inaccessibility to social and economic equal opportunities and consequently from poor urban areas. One of the important urban areas is public spaces which always has maximum users and as a part of the city responds to the needs of citizens in various aspects. In the importance of the public areas sufficient to say that these spaces will crystallize as civil life mould context and the spatial crystallization of public area concept, this is an essential element of civil society. Totally, there is a connection between human being and the surrounding areas environment, partially and completely, various forms of social- individual, temporary and permanent⁴. Disabled access to buildings and municipal facilities,

transportation network, entertainment center and other varied urban applications not only cause to make appropriate use of their talent and forces but also considered as a kind of prevention of new disabilities incidence⁵. Thus achieving the three main goals of urban planning, namely health, comfort and beautiful⁶ is in gage to full attention of all social group's needs, specially groups such as the disabled, the elderly, etc.. Urban furniture equipment is essential part of urban area and make possible to understand it perfectly.

Designing and proper layout of each components of urban furniture can be very effective in making connection between citizen and urban area for relaxation and comfort⁸. Hence, it is good that in planning and designing urban furniture make more efforts by planners and urban designers toward suiting area in order to increase participation of the disabled in society, especially in public spaces. Thus, the aim of this study is also to assess and study of urban furniture and suit urban area in regard to needs of disabled in Shiraz city center and Grand Park of this city.

MATERIAL AND METHODS

Universal Declaration of Human Rights in 1924, according to the coverage and inclusion of all people, has expanded the range of human sight to the people with disabilities. The United Nation approves the rules of equal opportunities for the disabled at 1994, in which providing international framework by Human Right advocates and lawmakers was used to fix problems of the disabled and has offered guidelines for conducting programs relating to equal access for all people.

Charities lender institutions such as Development Bank and the World Bank, has played significant role in developing and expanding solving problems and difficulties related to the disabled and presenting policies

of the transportation system, especially in different urban projects.

This process continued by the organization including in Britain and Sweden. In the developing countries expanding services provision for the disabled is still largely depended on the state and civil society. Human rights approach to disability is like any ordinary citizen who has the right to enjoy economic, social and cultural opportunities in society. This process accepted by some developing countries slowly and gradually. In some developing countries, especially in Latin America and Asia, have taken some methods in related to this approach, namely the acceptance of disability in civil society and suiting urban spaces and transportation systems.

One of the most important problems in country's urban area is inappropriate area associated with people with disabilities that this consideration is significant in behavioral and mould domain. The first is due to incorrect conclusions and practical action of urban planning and the second one is cultural- social consequences of the first.

The part of society which has been excluded practically of using urban areas due to physical-mobile disability, search for reason not only in the city but also in itself and forbids this part approaching to these areas¹². What is the value in the knowledge of urban planning for urban space is the social and interactive role that space does in the lives of the citizens' group¹³. Providing life situation is of the most important factor in attracting disabled in society, that it is only possible through suiting urban areas¹⁴ and specially its furniture.

In our country - Iran, defining urban area suiting and services to the disabled seems so necessary, because of one side conditions of our cities, streets, sidewalks, public spaces, amenities, bathrooms, transportation vehicles in urban and suburban are so that don't provide possibility of using for disabled and on the other hand, according to country's official statistics, there are two million 700 thousand disabled, 500 thousand with blindness disorders, 120 thousand blind and the other are partially sighted, 400 thousand with hearing disorders, 120 thousand absolute deaf and other are hard of hearing, a million and 250 thousand is included physical and mobile disabled.

While according to experts, 110 people daily, 3300 monthly and yearly 4 million 500 thousand people, is increasing to the country's disabled population. It should be noted that in addition to the disabled, from the country's elderly population of 4 million 500 thousand, a million people are disabled¹⁵. Shiraz is one of the populous cities in country which include significant number of disabled in itself.

According to country's official statistics in 1385, the number of disabled people in the country is 1,012,222¹⁶ that are disabled¹⁷ and of these, 88, 853 people is Fars province share and 31,575 number is for Shiraz. Therefore, this article will try to check compliance of city center urban furniture and equipment with needs and abilities of persons with disabilities, consider some of the suiting strategies in this regard.

Introducing Shiraz and studied area

Shiraz the capital of Fars is located on a long plain at the length of 120 km. and width of 15 km. at 52 degrees east longitude, 29 to 36 minute and 29 degrees north

latitude, 33 to 41 degrees at a distance of 900 km from Tehran. According to 1385 statistics, the city had a population of approximately 1,306,927 people, of which 31,575 equal to 4/2 percent have physical and motor disabilities. Two areas of city center and Grand Park of Shiraz is one of the main reasons of choosing this area as a case study due to widespread and presence of the disabled.



Figure 1. Shiraz map and showing downtown location and Grand Park

RESULTS AND DISCUSSION

Standards and suiting criteria of urban furniture design for the disabled

Evaluating the existing communication means

Urban facilities refer to a set of fixed or semi-mobile devices with specific application which have been possessed for citizens with the government license permanently or seasonally in the public space of the city. Urban facilities are the integral element of urban environment and make possible identification and full understanding of the city. Moreover, they have other responsibilities include determining orientation and providing information for citizens, providing regulations, distribution and collection of goods, leisure, lighting, cultural appliances etc.

- Major urban equipment includes:
- Transportation appliances: bus station
- Informational tools: billboards, advertising sign, signpost
- Signs
- Person by person communication tools: post box, telephone box
- Cleaning equipment: trashcan
- Recreation equipment and furniture: benches
- Utility: water fountains

A. Bus station

Generally, public transportation appliances have two problems associated with the disabled person: first, entryway of motor disabled into the bus and second, their location. The first problem can be solved by lifts in bus which the bus driver makes it work when the disabled ride, then raise him/her until bus floor. Also, it could be enjoying same level stations with bus floor or using woody inclined level stations to solve this problem that actually make possible get off and get into bus of disabled. The second issue is also solvable by allocating motor disabled special seats location in vehicles. Since,

most mobility problem refer to disabled use wheelchairs, and the most troublesome assistance tool in terms of size, weight and space occupied is also wheelchair¹⁸, in designing or suiting bus station for disabled, with considering this groups of people certainly semi-mobile disabled problems solved, hence the wheelchair due to the maximum limit among other motion tools has been based.

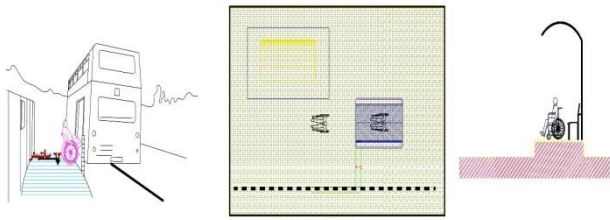


Figure 2. Section, plan and images of suiting station for the disabled person

B. Informational tools and signs: billboards, advertising sign, signpost

Signposts are very important in determining as written or graphic symbols on the street for the disabled that can find their ways faster and easier. Boards with good plans, which fixed in a suitable place, are more important for those who want to find their way inside or outside the building. Design and installation place of boards is very important for people with blindness or hearing disorders and also children. Signs, symbols and texts should present in a way that its reading and understanding be easy. In buildings that are likely to be used by people with blindness disorders, we can utilize supplementary written in Braille.

C. Informational tools and signs: billboards, advertising sign, signpost

The major problem related to the boards include: few number, inappropriate installation and fixed place, locating at high altitude and poor viewing angle, less color difference of board with the background, heterogeneity of the figure on board with transfer information, small and illegible writing on the board, no specific colors for transferring information.

D. Telephone box

One of the instruments can be used to meet the immediate needs of everyday life, and prevent extra come and go, is phone. The disabled need phone more than other people in society due to certain physical conditions and mobility limitations. Unfortunately, due to lack of facilities of communication tools, phone available in the urban areas of Shiraz, not be usable for people with disabilities. The most important problem for disabled in using public phone in urban and sample areas is high level of phone box compared to sidewalks that this issue is one of the most basic problems. Low width in a phone box, lack of enough space into box for wheelchairs enters and exits and install phone on high altitude than to box floor are of other problems, which the disabled mentioned them.

E. Post box

The main problem for disabled related to post box is at first inappropriate height of post box for disabled

person and then no enough space in front of the box and long-being of fixed location of it.

F. Recreation equipment and furniture: benches

Resting for the elderly and disabled, when they are moving is needed. It should be 200m maximum distance between two resting places. Since the act of sitting down and getting up is difficult for those with disabilities, it should be considered kind of benches for installation that they do not have dent on their surface.

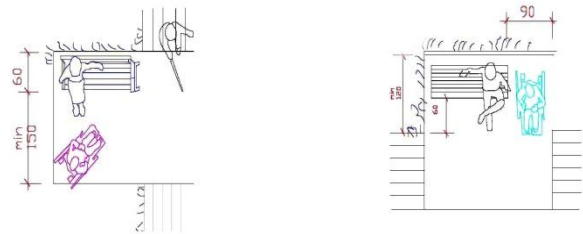


Figure 3. suitable plan sitting location for the disabled

It is recommend that to help the elderly and the disabled, in city centers, bus stops and other places, install resting equipment. Chairs and benches must have a height of about 45 cm from the ground to be easily used by the disabled. And also they should be at a height of approximately 70 cm from the ground, to have back for arms. Rest bench area can be marked with making taller of sidewalk surface, which feel by foot¹⁹.

G. Trashcan

Trashcan should be useful for persons with disabilities. It could be pointed to problems in this regard, like inappropriate height, being in a location that isn't accessible to persons with disabilities, lack of stability.

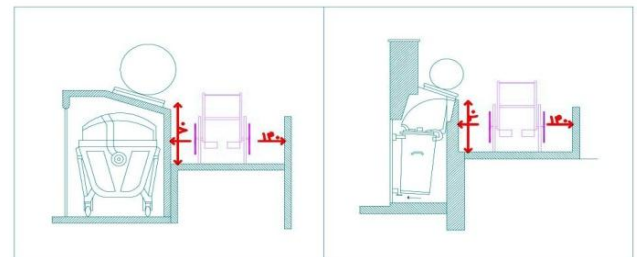


Figure 4. Executive details of trashcan locating

H. Utility: water fountains

Water fountains that are located in different areas of city should be accessible for the disabled. The main problems in this area are: Being in a place that is not accessible to the disabled person, improper height, lack of stability, being unavailable cooler buttons, being unusable cooler buttons (requires power and pressure), locating water cooler in wall dent.

Suiting solutions for urban facilities

a) For bus station:

- Making ramps with appropriate steep (up 8%) for access to the bus station.
- Urban furniture should be placed so that the crosswalk net width not to be less than 90 cm.

- Width of the one bus gate should be one meter so it is possible to achieve a disabled person. In the middle of the entrance shouldn't be a rod as a handle.
- The next station is announced via audio tape.
- To transferring the disabled in buses or stations, considering lift.

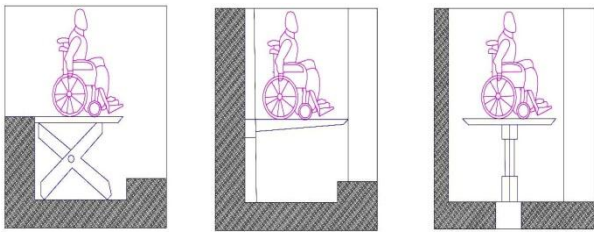


Figure 5. Different models of lift to level bus floor surface with the station.

- Buses should be suited for transporting the disabled (considering sliding metal plate under the bus floor above the upstairs).
- Buses design applicable for the disabled with wheelchair.
- In inside-city bus terminal, city center and near to public busy buildings, constructing bus station waiting area in at least 140 cm width and flat with bus floor is required.
- Appropriate width of shelter at the bus stop (at least 10/1 cm) should be considered.
- Access conditions of the passengers to the waiting area in urban bus stations should be in accordance with the conditions of connecting sidewalk to the roadway.
- In the accessible stations for the disabled, expecting shelter, protection and bench at height of 45 cm from the floor is required.

b) for urban panels and signs

- Panels' text should be written with embossed letter at least 3 inches thick to be readable when they are moving.
- All the urban spaces and part of public buildings that is designed and equipped for the specific usage of the disabled shall be identified by disabled international signs.

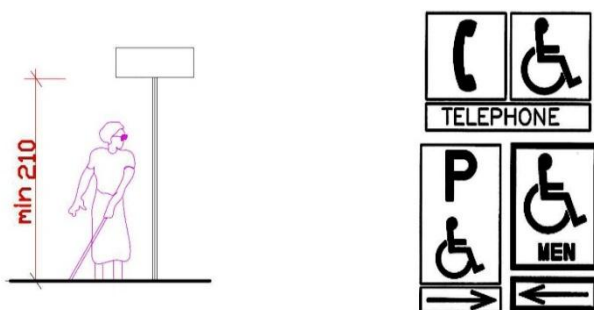


Figure 6. The disabled special panels, appropriate height for installing panel (from right to left)

- Signs and posts should be clear, without reflection the light and in sharp contrast with their background. Such bright texts on dark background and vice versa.

- Data must be clear and specified o people who have limited vision can easily understand signpost.
- Information panel should be installed at a height of 140 to 160 cm.
- Fixed panels that introduce streets name must be located at the maximum height of 5/2 meter.
- For people who are visually impaired, install signs perpendicular to their vision line.

c) For phone box and postbox

- The disabled specific phones should be provided in a way that environment sound doesn't create additional inconvenience.
- Width of the area that phone has been installed on, shouldn't be less than 60 cm and its exterior part should be used as a handle.
- In an area that some public phone box provided, at least one should be accessible for the disabled with wheelchairs and one dedicated to people with low hearing equipped to the audio amplifier system.

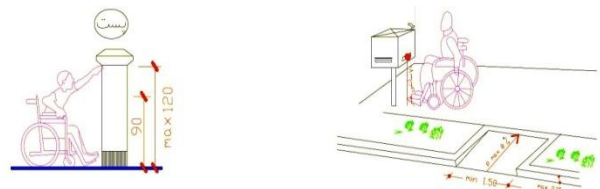


Figure 7. Location and proper height of box

- Telephone wires length should not be less than 72 cm.
- Maximum Height 20/1 cm must be considered to the top of the box office.
- In the inside city bus terminal, city centers and near to public busy buildings and specific to the disabled, predicting public phone and usable postbox with the following specifications is required.
- The maximum height for slot to insert coins or cards, phone dial and earpiece is 100 cm from the floor.
- Predicting the counter at a height of 80 cm and a depth of at least 20 cm for using by disabled people in public phone area is essential.
- Accessing postbox and open space in front of public telephone box should be in a same level or proper slope for the disabled, otherwise improving available space must be done.
- Predicting free space and flat of at least 140 x 110 cm in front of the phone or postbox is required.
- Minimum width of public telephone box "door" is 80 cm without threshold.

Bench designing criteria

- If possible, in the area such as crossroads, intersections and adjacent to public telephone, water fountains, ramps and a stairway should provide benches to sit.
- Sitting areas should be 60 cm. back of moving flow.

d) For trashcan

- The maximum height of trashcan is 100 cm. from the floor. Thus, it can be in the dents.

- Front space of trashcan is at least 110 * 140 cm.
- Accessibility to the trashcan at the same level or with proper slope for the disabled people.

Water fountains designing criteria

- Water fountains should have free space for knee at the height of 70 cm from the floor and depth between 45 to 50 cm.
- It is required to be free space 175 x 129 cm. in front of water fountains for a wheelchair to move, so when there is no free space for the knees, a wheelchair can use it in parallel.
- Fountain height shouldn't be higher than of 90 cm from the floor.
- Access to water fountains should be easily and conveniently be used with a one hand movement.
- Water fountains should be stable enough not to tip over when a person relies on, hence it must be controlled by hand or foot and hand. Also have a fountain in the front part.

CONCLUSION

Status quo of urban furniture of the disabled point of view in the city center of Shiraz

Study obtained results from the questionnaire; refer to the major problems of the disabled person associated with the existing furniture and equipment in the center of Shiraz, primarily is the lack of places and areas to sit and relax when walking in the area, and then inappropriate stairs discussion and lack of inclined surfaces (ramps) in the entrance of public areas and spaces. It is noted that the factor which make the minimum problem related to urban furniture was lighting conditions at night, that other obtained information are noted in the Table 1.

Table 1. Assessment and urban equipment in city center of Shiraz

Intervals to compare variables	Percent
Inappropriateness and lack of accessible places to sit and relax for the disabled	26.2
Inappropriate stairs and lack of inclined surfaces (ramps) in the input spaces and public areas	20.6
Inappropriateness and no access to urban equipment such as trashcan, phone box, water fountains and post-box	17.5
Inappropriateness and no access to health services	12
Lack of specific signs for the disabled in urban areas and public spaces	14.1
Sidewalks lighting conditions at night	9.6
Total	100

Most of the disabled believed that if they want to rest after a while walking, in fact they don't have any spaces for that, and generally the streets in the downtown don't have any spaces to sit and relax.

This issue when considering that we know according to the regulations, in each 200 meter it is expected benches and resting equipment for the disabled. Although it shouldn't ignore few numbers of benches in Zand Street, the disabled believed that these benches are inappropriate for them and there is no possibility for using.

Status quo of urban furniture of the disabled point of view within the City Park

In relation to furniture status at Azadi Park and surrounding streets, of the main important problem which the disabled pointed, is inappropriateness of stairs and lack of inclined surfaces (ramps) at the entrance and public areas and then the lack of specific symptoms in public places and urban spaces for the people with disabilities. In Azadi Park crossing like the downtown, the disabled satisfied of light situation relatively and this case has created a little problem for them. At the following table, existing problems of the disabled in relation to the furniture at the Azadi Park and its crossing have been presented based on the priorities.

Table 2. Assessment and urban equipment within the City Park

Intervals to compare variables	percent
Inappropriate stairs and lack of inclined surfaces (ramps) in the input spaces and public areas	28.2
Lack of specific signs for the disabled in urban areas and public spaces	20.2
inappropriateness and no access to urban equipment such as trashcan, phone box, water fountains and postbox	17.1
inappropriateness and no access to health services	15.1
inappropriateness and lack of accessible places to sit and relax for the disabled	13.6
Sidewalks lighting conditions at night	5.5
total	100

As mentioned, according to the majority of the disabled people the first problem which they face within a Grand Park of the city is the stairs existing discussion and non-standard inclined surfaces. At the most entries of city Grand Park is built various and inappropriate stairs or improper, steeply and non-standard inclined surfaces (ramps). After stairs and improper inclined surfaces, most problems in these two areas is the lack of specific symptoms and interviewees believed that these symptoms have not predicted sufficiently quantitatively and qualitatively have some problems such as being unreadable and inappropriate and excessive height. Some strategies should be conceder to able people with disabilities to live in society without assistance. They have the right to have facilities that can live independently in the community. It is not enough for them to live in a comfortable house but be isolated and far away the others, they can:

- Be able to go to work without others help
- Present in cultural center, for example go to the theatre
- Visit relatives and friends and to move independently.
- Disport themselves in free spaces and benefit of the blessings which using them is normal for the healthy people.

In the area of urban furniture, we can mention lack of some elements against high density of others such as furniture, location, orientation and improper distribution, in a way that these urban facilities make some problems for the disabled. Based on the obtained results, the major problems of the disabled in relation to existing furniture, at first is the places and spaces for sitting and relaxing

after walking, and then inappropriate stairs and lack of inclined surfaces (ramp) in the entry and public areas. By doing this research, it was clear in the current study that Shiraz has not desirable situation in designing and suiting urban spaces for the disabled than developed city in the world. Final result shows that the studied locations of this research are in the downtown of city, and has

critical conditions and lots of problems in the field of urban furniture and equipment. This unfavorable situation needs correct and coherent planning to improve this condition and increase safety and comfort to create lovely and cheerful social environment by participating disabled people.

Table 3. Assessing the situation and formulate appropriate conditions of urban furniture with disabled participation in Shiraz

Urban furniture	Existing problem	Formulating condition
station	<ul style="list-style-type: none"> Differences of station surface with bus floor Lack of proper communication between the sidewalk and the street at the station Discontinuity of the middle of roadway station with suitable slope to street surface 	<ul style="list-style-type: none"> Leveling all the station with bus floor Making proper connection between sidewalks and street at the station via installing standard communicative bridge Connecting middle roadway station with proper slope and width to street surface
Parking garages	<ul style="list-style-type: none"> Lack of public parking garages in the downtown Existing kerb and stair between the parking and sidewalk No communicative bridge and existing stream between the parking and sidewalk 	<ul style="list-style-type: none"> Increasing number of public parking as required Removing stair and kerb between parking and sidewalk by making ramp have proper slope and width Installing metal bridge to create temporary connection between sidewalk when the stream prevents accessing to the sidewalk
Public phone	<ul style="list-style-type: none"> Being high the public phone box than the sidewalk Low width in public phone box Not enough space inside a public phone box to enter and maneuver a wheelchair Installing phone device on the high altitude than the bottom of the box 	<ul style="list-style-type: none"> Leveling up the box floor with sidewalk The width of the entrance must be increased to at least 75 cm. Interior space must be at least 110 * 140 cm Phone device must have the distance of at least 100 cm from the bottom
post-box	<ul style="list-style-type: none"> Shortage of postbox in the city Height of postbox from the sidewalk surface Lack of adequate space in front of the box 	<ul style="list-style-type: none"> Increase the number of boxes in the city Boxes should be installed at a height of 120-100 cm from the floor.
Water fountains and coolers	<ul style="list-style-type: none"> Being unusable water fountain in the city for the disabled Non-compliance with standards of the water fountains Not access to the fountain in water fountain 	<ul style="list-style-type: none"> It is required for all the installed water fountains in city to be available for the disabled Water fountains must have free space for the knee at height of 70 cm to the floor and have 45 to 50 cm depth
Panels and signs	<ul style="list-style-type: none"> Low number of panels and signs in the city Inappropriateness of panels locating and high altitude and improper angle Heterogeneity of the shape of the boards with Transition Information Small and unreadable text on the board 	<ul style="list-style-type: none"> Installing panels and signs in the city to the required number Signs should be installed at a height of 140 to 160 cm Coordinate shape of the panel with information Panel text should be written with embossed lettering at least 3 inches thick

REFERENCES

- Babaye Ahromi, A. (1994), carefulness in designing, suiting buildings and urban spaces for the disabled, the United Nations, translation of Tehran Engineering and Technical Consulting organization
- DFID. (2000). Disability. Poverty and Development. London
- Eghbali, R. (2006), suiting urban environment with emphasis on the possibility of using pedestrian, national conference on suiting Tehran urban environments.
- Habibi, S.M. (2005), Civil Society and Urban Life, Fine Arts (7). Pp. 6-9
- Malek, N. (2006), suiting urban furniture and facilities, Conference of Urban Environment, Tehran, p 5
- Moees. R. 1968. Urban sociology. New York
- Moradi, Z. and Salehi. A. (2006), suiting museum environment and monuments for visitors with disabilities
- Nasr Abadi, M. (2003), understanding the disabled situation in urban spaces, municipalities Monthly magazine. No. VIII, page 24
- Pakzad, G. (2004), the square knot, square, study semantic of three words in urban planning, municipalities magazine.
- Pier Moure, J. (1993), urban spaces, translation by Hossein Rezai, Tehran Municipality CH.
- Qaem, G. (1988), the city and the disabled, Building and Housing Research Center
- Stanbury, J. and Hugo J. S. 2000. Formulation of policy for transportation of Special Needs Passengers. Proceedings: CODATUIX. Mexico City
- Statistical Yearbook of Fars province, (2006), published by the Statistical Center of Iran
- Statistical Yearbook of the country (2006), published by the Statistical Center of Iran
- Taghvayi, M, and Moradi. G (2005), study the status of Isfahan city streets based on existing criteria to access for the disabled, sphere magazine, Volume XV, Issue 57, Page 9.
- Taj Aldini, L, and Musa. Sh. A. (2006), suiting living environment for the physically disabled, the Conference of Suing Urban Environment of Tehran. The United Nations, the accuracy of the design (suiting directory of buildings and urban spaces for the disabled), (1994), translated by Mehdi Babaei Ahari, Tehran Engineering and Technical Consulting Organization
- Zangi Abadi, A. (2004), Designing and planning of urban furniture, Publication: Sharia Toos