

Is Tehran's Public Spaces Disability Friendly?

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Abstract. Public space act like a living spaces of the cities where people gather to socialize, communicate with each other and where urban activities being carried out. It defined the character of the city and play important role to connect people to the city. Comfortable and accessible public spaces lead to vitality and livability to the city. Lack of the maintenance and attention to public spaces could reduce the comfort level and livability to the city. United Nations Convention emphasized that the people with disability have the same rights to access the public spaces, where World Health Organization declare that about 10% of world population are disabled. The eight years war between Iran and Iraq had increased disability rate among the citizens. Tehran as capital of Iran and the most populous city in Iran need to improve facilities and accessibility in order to support the need of the people with disability to live actively in the society. The purpose of this paper is to analyze the need of urban public space for people with disability in Tehran. Among the identified obstacles for people with disability in Tehran are related to lack of application of Universal Design (UD) elements on the urban spaces and public facilities. This study is based on applied theory and quantitative method for evaluating satisfaction of people with disability. This research focused on two type of disability group, visual impairment and wheelchair users. One of the city district in Tehran is chosen as a case study. The findings of this study obtain will be analyses to provide UD solutions in urban public spaces for them.

1. Introduction

The number of disability population increased because of the wars in different parts of the world [1]. In addition, the World Health Organization (WHO) explained that about 500 million people equating 10% of global population are disabled [2]. According to [3,4], during eight years of Iran and Iraq war, many victims in Iran experience disability and based on National population survey in 2006 the population of disability in Iran is 2.514.744 people [5]. In addition, Iran has record of high traffic accidents in the world and has the highest rate of mortality that is 400 per week due to it [6].

The performance of public spaces is vast and various and considered as a place for social and cultural exchanges of different people [7]. People's public life occurs in urban public spaces in a complex set of forms and functions, therefore these spaces must be capable to contain diverse behavior, uses and activities such as shopping, walking, conversation, using the facilities to entertain, relax or even passing the time as daily, and periodic festivities and events [8].

United Nations rules gives equal opportunities for people with disabilities and provided the framework of international human rights by the lawmakers and advocates to address disability issues and problems for establishing a guideline for conducting programs related to equal access for all



people. Based on [9], many authors and studies emphasis on the vulnerability of environment without acknowledge the accessibility of people with disabilities, that noted the significance of barrier free environment in the world. According to [10] the most impressive and important way for creating livable urban environment is to consider barrier free and UD principles. The requirements for community development include the establishment of appropriate physical and spatial contexts, services and facilities to the benefit of all segments of society including the disabled [11]. Based on [7] physical barriers could limit the use of public spaces for groups of citizens like people with disability, elderlies, pregnant women, etc.

The needs to design for people with disability are critical as they have obvious and different problems to access some parts of cities. Urban planners and designers have to address the needs of people with disability and remove the barriers that banned them from having enjoyable time on urban public spaces. By applying UD standards, it is believed that the people with disability could achieve their rights for using city more comfortable and friendlier for them with less dependency to others. This research defined urban public spaces for people with disabilities and the need for UD application to improve comfort level.

2. Literature Review

2.1 *Universal Design (UD)*

Ronald Mace in 1985 was the first person who introduce and coined the UD concept as a design of environments and products that are usable for everyone with high possibility, without any need for specialized design or adaptation [12]. According to [13] UD is an approach of social sustainability, that provide equality among all generations and groups. [14] examined that build environment can be designed to provide for people with disability by promoting universal accessibility. International Classification of Functioning, Disability and Health (ICF) and WHO describes disability as the result of relationship between health condition and personal and exterior factors of and individual which showed the circumstances in the individual lives [9]. A recent study by [15] conclude that UD implementation is a way forward of barrier free design, that fulfill the needs of various degree of people with disability. UD is a design for all and not only specific needs of users or thinking exclusively of barrier free environment. According to [13,16] there are 4 category of design requirement which are used for accessible environment within and between buildings and in outdoor environments.

Table 1. The category of design requirements

Requirement	Component
Sensory	Tactile warnings, guide ways and information
Outdoor environment	Obstructions, signage, street furniture, pathways, kerb ramps, pedestrian crossing, alarms
Horizontal areas	Doors, entrances areas and lobbies, corridors, handrails and railings, bridges
Vertical areas	Ramps, lifts and stairs

Note: Category of design requirement in Universal Design

2.2 *Feeling of Comfort*

The feeling of comfort is the statement for wellbeing of individuals in their environment. For the some urban environment, comfort could vary according to a composition of physical, physiological, psychological, sociological and cultural factors of people [17,18]. The feeling of comfort in public

spaces could depend on different factors such as perceived levels of safety, weather, familiarity of the setting and people, physical conditions and convenience [19–21]. In addition, comfort is a part of subjective well-being is effected by basic needs of people including physiological, safety, cognitive and aesthetic needs [22].

3. Methodology

Quantitative research is typically considered to be the more “scientific” approach for social science. The focus is on using specific definition and carefully operationalizing what particular concepts and variables mean [23]. This study is based on applied theory and quantitative method for evaluating satisfaction of people with disabilities. This research focused on two type of disability group, visual impairment and wheelchair users. Questionnaire survey has been chosen in this study to explore the satisfaction of people with disability in terms of urban public spaces and their improvement in relation with UD. Tehran, the capital of Iran with population around 8 million and the largest city in Iran is chose as the research area in this study. Considering street as one of the components of urban public spaces, Vali-Asr junction was chosen for the questionnaire survey for this study (**Figure 1.**). The junction is the intersection of Vali-Asr Street which is the main and the longest street in Tehran with 18 kilometer connection. It has the high pedestrian volume and act as one of the commercial and recreational places for citizens. Respondents of this survey were collected from two categories of people with disabilities, who are believed to have more physical problems in using urban public spaces that have barrier independently. The categories are the blinds and the wheelchair users. According to Statistic Organization of Iran in 2011, the population of disabled people in Iran is approximately 2.5 million people with more than 5% i.e 133,000 of them are living in Tehran. This study has been done via the process of the survey with 6 percent sample error with 277 respondents representing the population. The answers of the factors are measured by 5-point Likert scale of highly satisfied, satisfied, uncertain, dissatisfied and highly dissatisfied. Likert scales gives opportunity for respondents to answer not simple yes/no but permit them for stress their opinion and the quantitative data could be analyzed with relative ease.



Figure 1. Location of Vali-Asr junction that have diverse of activities.

4. Result and Discussion

4.1. Personal attributes

The statistical descriptive analysis occupied for assessing the satisfaction of people with disabilities about feeling comfort in Vali-Asr junction. They were asked to complete the questionnaires according to their perceptions and experienced of the comfort during using the street. 277 completed questionnaires were considered for the data analysis. 62.8% of respondents were male with disabilities and 37.2% were females with disabilities.

4.2. Main constructs of questionnaire

Based on Table 2, the Safety and Security part of the questionnaire has high level of dissatisfaction from respondents. The means and standards deviation of main constructs are depicted in Table 2.

Table 2. The means and standards deviation of main constructs

Constructs	Mean	Std. Deviation
Amenities	3.96	0.59
Safety and security	4.15	0.49

Note: Means and standards deviations of main constructs

4.3. Safety and security

Safety and security are important for living in the city and there are a key to provide comfortable urban spaces at all time. Safe environment for pedestrians is one of the important factors for encouraging people to use urban public spaces. The majority of those who responded to safety and security part felt that safety and security of Vali-Asr junction is not sufficient, in relation with the uncomfortable feeling during crossing the street and the insufficient way finding (**Figure 2**).

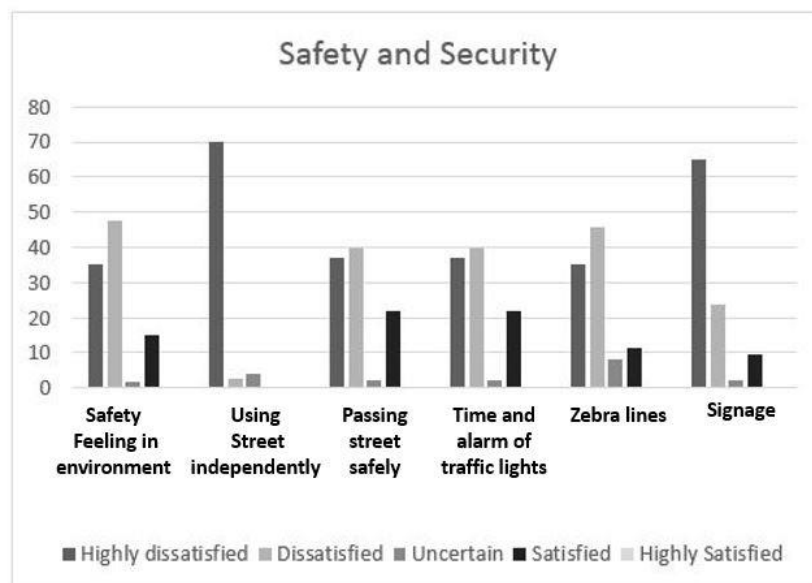


Figure 2. Satisfaction of people with disability in terms of Safety and security in Vali-Asr junction

48% of people with disability are dissatisfied about having safe feeling in Vali-Asr junction. In addition 45% of respondents are dissatisfied about using Vali-Asr junction alone without dependency to others help. In other part, people with disabilities were dissatisfied about condition of the street

crossing. This part showed that 37% highly dissatisfied and 39.70% are dissatisfied and feeling not comfortable with the condition of the traffic lights alarm and timing. The quality of zebra lines in Vali-Asr junction are not providing comfort for people with disabilities especially for blind people. There are about 80% of highly dissatisfied and dissatisfied among the disability about existing zebra lines in Vali-Asr junction. Signage and directional maps as well as way finding are other elements of street scape, which have important contribution on accessibility and stability of the walking environment. There are 65% highly dissatisfied about signage in Vali-Asr junction (**Figure 3**).



Figure 3. Quality of safety and security in Vali-Asr junction

The good quality of walkways and street will allows people to explore the city pleasantly. People with disability are among the most vulnerable street users. The current condition and safety of Vali-Asr junction need to be address accordingly in order to prevent street injuries especially among the people with disability. The implementation of UD elements can be the solution to the existing condition. Existence of the underpass in Vali-Asr junction was aim to facilitate the movements from each part of the junction. However, from the observation, the underpass was designed without any standard of UD for people with disability. There is lack of amenities inside of underpass like tactile pavement for blind people and platform lift for wheelchair users. The fence banned the way outside of underpass. Existence of fences around Vali-Asr junction had limit the accessibility and lack of signage result confusion among the users. The people with disability are not provide with sufficient facilities to the able to access the underpass, which lead them to use on-ground crossing line (**Figure 4**).

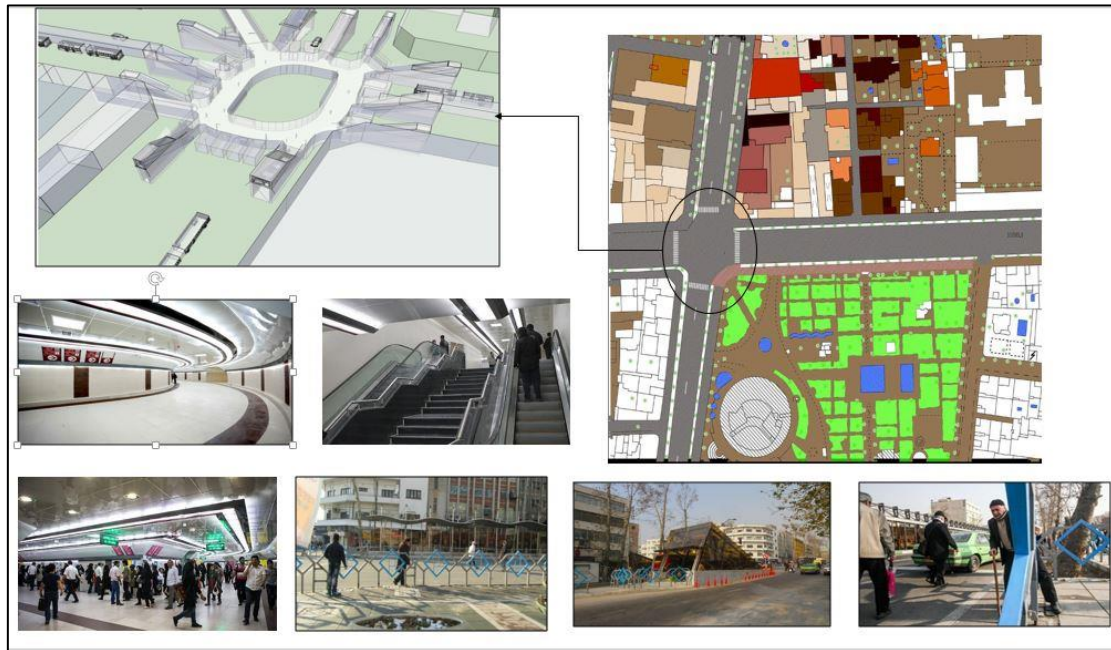


Figure 4. Inside and outside problems of underpass in Vali-Asr junction

4.4. Amenities

Amenities in walkways is one of the significant aspect for comfortable environment. Urban public spaces with higher density of users and streets should be facilitate to meet the needs of both pedestrian groups and vehicle users. Vali-Asr junction is one of the main nodes in Tehran, with high diversity due to the buildings and open spaces around it. According to questionnaire survey for amenities part, most of the people with disability are dissatisfied with the amenities and facilities in this area (**Figure 5**).

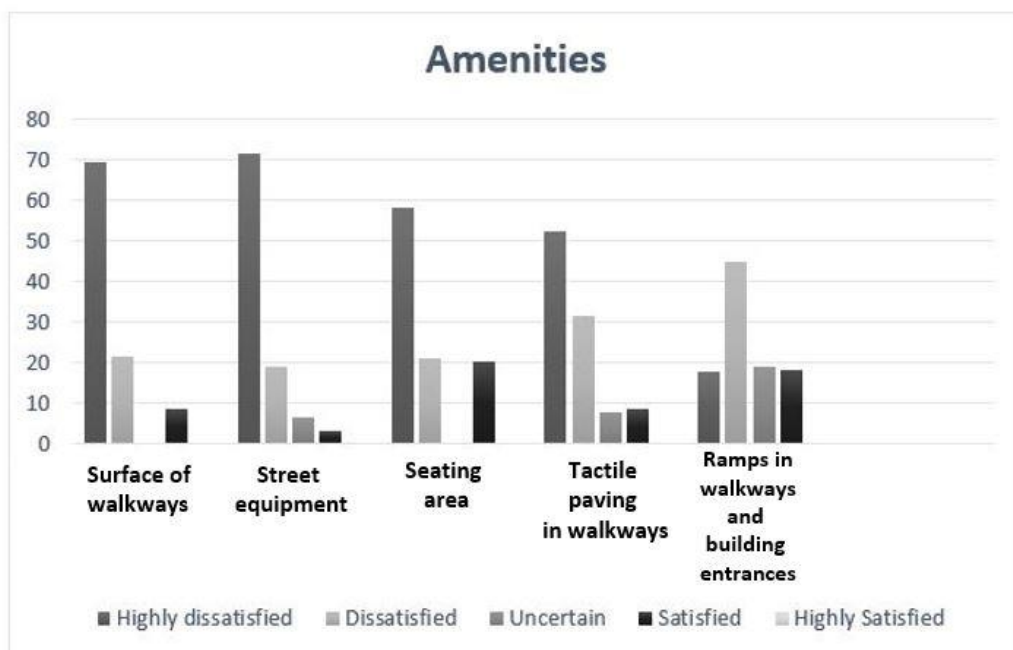


Figure 5. Satisfaction of people with disability in terms of amenities in Vali-Asr junction

The expression among the people with disability regarding the urban public spaces is the insufficient facilities to meet their need. A walkable place where the urban public spaces are facilitate with the needs of the pedestrian, will allows people to experience the city. The surface and suitable pavement for walkways will effect on quality of pedestrian environment and rate the comfortability and accessibility. 69% of respondents were reported highly dissatisfied with the surface of walkways in Vali-Asr junction. 71% of respondents are highly dissatisfied about the street facilities in the area. 58% of the participants in this study are highly dissatisfied about seating area provided in Vali-Asr junction. Another important aspect of comfortable urban public spaces for people with disabilities is the tactile paving in walkways for people with visual impairments. 52% of blind people are highly dissatisfied about quality of tactile paving in walkways of Vali-Asr junction. One of the amenities that are important for group of wheelchair users is quality of ramps in walkways and in entrance of buildings. In this regard, 45% of people with disabilities are dissatisfied about ramps in Vali-Asr junction.

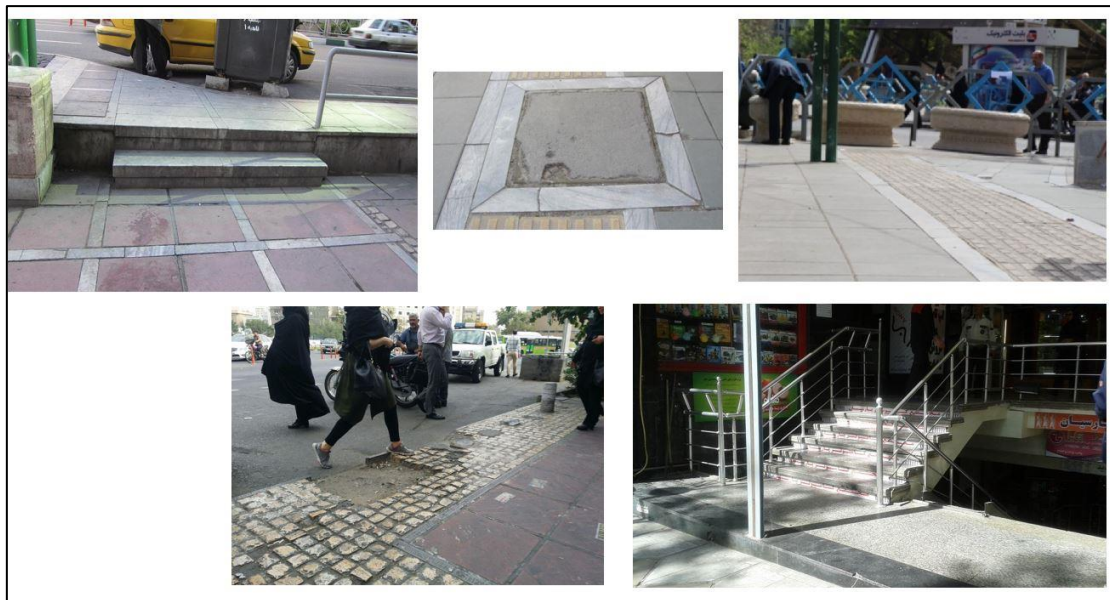


Figure 6. Amenities among Vali-Asr junction

According to Figure 6, amenities in Vali-Asr junction like surface of walkways, tactile paving, ramps are not comfortable for people with visual impairment disability and wheelchair users. Tactile pavement and ramps are important item to be consider while designing for people with visual impairments and wheelchair users.

5. Conclusions

Based on the questionnaire and observation done in Vali-Asr junction it can be conclude that the people with disabilities had difficulties in accessing the space. Poor design, lack of maintenance and lack of implementation of UD elements had led to the result. Therefore, this study proposed some recommendation by applying UD standards in Vali-Asr junction that could improve quality of this urban space for people with disabilities.

- Walkways: Improve quality of walkways by using pavement with suitable material that have resistant during rainy and snowy days and hot weather in summer days. Walkways should be free of any holes and cracks in order to make movement easily for people with disabilities.
- Obstruction: Walkways should be free of any obstruction. Tactile paving should be widely introduced and free of any obstacles and disconnectivity to assist pedestrians who are visually impaired to move around the urban spaces.

- Zebra lines: This item have effect on safety of users for crossing streets. Zebra lines should have special paving with detection of sensory for blind people and also they should be free from any barrier such as street island.
- Traffic lights: Must have suitable timer and sound alarm to take into account the time needed for people with disabilities to cross the street.
- Signage: Signage and other way finding facilities should have braille script with suitable dimension that is usable by people who are blind, deafblind or have low vision. By provided the braille script with suitable dimension signage in all public accessed spaces, the people with disabilities are able to move safety and independently around the urban spaces .
- Ramps: The sidewalks and entrance of public buildings should have suitable ramps that will help wheelchair users for easy access.

By applying UD in urban public spaces, urban designers and managers of city could improve the satisfaction of people with disabilities and this group of people could able to use city and urban public spaces like other people, easily and without dependency to others.

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