Journal of Engineering and Applied Sciences 11 (8): 1747-1751, 2016
ISSN: 1816-949X

Examining and Evaluating Pavements and Conformity Urban Streets by the Notice to Movement of Physical Handicapped (Case Study: Kerman Parastar Blvd. and Shafa Streets)

Amirali Mohseni
Department of Urban Planning, Islamic Azad University, Kerman Branch, Kerman, Iran

Abstract: Pavements are pathways which have an effective role in social interaction of people in society and their designing should be so that their accessibility and use to be provided for all people in the society such as handicapped citizens and attention to various factors in designing pavements can promote access ease and traffic for handicapped citizens and the aim of this study is to address how various factors such as appropriate slope, appropriate width, obstacles removal, leveling of the surfaces, creating ramps and so on are influential in designing and developing appropriate pavements. Analyzing their relation through correlation method and size grade based on the performed studies of urban conditions improvement are considered among important criteria of assessing the quality of urban pavements access for handicapped. This study is analytical-descriptive in regard of objective and is considered among applied research type. Data collecting method is field and documentary method. This study tries to collect data using field method and address the existing obstacles and problems in pavements around Kerman Parastar Blvd. and Shafa Streets which prevent from handicapped presence and the results obtained from the study show that comparing the existing status of the mentioned pavements based on influence of the urban planning standards, the left side pavement of Shafa St. has the highest rank for handicapped traffic. In the second stage, the left side pavement of Parastar Blvd. St. and after that the right side pavement of Parastar Blvd. St. and finally the right side pavement of Shafa St. were ranked.

Key words: Pavement, handicapped, urban planning standards, address, rank

INTRODUCTION

Regarding the formation of a new approach in urbanism and consideration of pavements for achieving healthy and sustainable cities and also human-based cities, we can recognize the significance of pavements. There are many problems such as asymmetric and uneven surface, inappropriate and non-standard carpeting which is turned to motorcycles and bicycles parking which is a factor encouraging people to use the street margin instead of the pavement path in itself.

Today, due to unavailability of required infrastructures for handicapped and physical disabled people, their access to urban facilities has encountered problems (Hakimi, 1964). In Iran, there are about 2 million and 100 thousands handicapped from which 100 thousand ones live in Kerman (Iranshahi, 2003). Unorganized urban space and their maladjustment with these people needs and demands has caused them becoming isolated, then, organizing and appropriating these spaces is in fact returning these people to social life and a new activity. And this question is raised that whether designing pavements influences the handicapped presence in the society and how to design the pavements so that it doesn't create problems for the handicapped movement.

One of the most important problems of the handicapped is their plying in the city. There are many obstacles in the pavements and pathways. Non-continuity of easy movement in pavements is among these problem.

Problem statement: Making the urban spaces especially the pavements appropriate is a skeletal bed for achieving equal opportunities for all people in society for mobility and movement in the city surface and each person access to all urban spaces is among the necessities of the society growth and development (Masoud and Golshan, 1964). Improving access capability and mobility through making traffic part appropriate and improvin pavements for physical-handicapped people is very important in reducing their lack of access. Many countries of the world by making this important urban part appropriate by promoting awareness and enough training

Corresponding Author: Amirali Mohseni, Department of Urban Planning, Islamic Azad University, Kerman Branch, Kerman, Iran

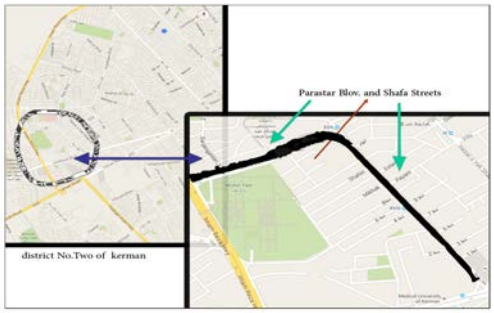

Fig. 1: The studied range

in relation to consequences of lack of accessibility for the handicapped and their deprivation from the existing facilities in urban spaces have increasingly noticed the budgets relating to constructing urban inactive regions and lack of access capability for the handicapped people. In various countries of the world including our country, the handicapped due to lack of access to urban spaces especially inappropriateness of the pavements and traffic have been deprived from the existing opportunities in the civilized society. Then, many fundamental needs of the handicapped such as their access and mobility are ignored due to the urban pavements inappropriateness. Generally, what is examined in this study is evaluation and making Kerman city pavements (Kerman Parastar Blvd. and Shafa Streets and Shariati Street) appropriate for optimal usage of physical handicapped. This matter points to one of the most important today social issues in all the world countries. One of the urban cities problems is their spaces inappropriateness in relation to handicapped people. This matter is considerable in both skeletal and behavioral cases. The first is due to planning results that the handicapped are deprived from practically using urban spaces because of physical and motor disabilities and search the reason in the city dysfunction than his own dysfunction and impede himself from approaching the urban cities (Gisou, 1947).

Literature review: The universal declaration of human rights in 1924 regarding to its inclusion of all humans, extend the humanistic look at the handicapped people. The United Nations Organization approved the laws of equal opportunities for handicapped people in 1994 in which intentional frameworks presentation by human rights defenders and legislators were applied for solving the issues of disabled and handicapped people and provided some instructions for guiding the programs relating to equal access (Stanbury and Hugo, 2000). Welfare and lender institutions such as the Development Bank and the World Bank have played a significant role in solving the problem and issues relating to the disabled and handicapped and propounding policies relating to transportation system and especially various urban projects. This trend and process continued by some organizations such as Britain and Sweden.

In 1390, Bahmani and Berenji in have written an article under the title of feasibility study and designing the pavement path of Darabad Jamshidieh. In this research, using environmental studies like topography, plant cover, water sources, soil erosion and landscape view, four stations are suggested and designed in the mountaineering route.

In 1385, Javani and Tavakoliin an study under the title of Principles of Designing Pavement with Focus on Motor Limitations of Handicapped and Disabled Veterans, pointed to the problems and obstacles present in the urban pathway access network and non-continuity of easy movement in pedestrian routes which create difficulty for some people. In this study, various people with limitation have been analyzed and various groups are introduced. Also, it has been tried that the country's current rules and regulations about the method of designing pavements appropriate for usage of people with motor limitations to be collected and provided in the article. Optimal methods and urban equipment in pavements have been examined and in all of them, some suggestions have been provided for removing handicapped limitations in moving in urban pavements that in case of their observatio much of limitations of this people would be removed. In the conclusion, it has been tried to provide some rules and regulations which could be applied practically so that the handicapped enjoy some facilities to be able to live independently in the society. Also, it has been suggested that regarding to the prepared plans in many countries stylist in urbanism, providing the handicapped guide mapalong with other activities of planners was a part of services in the services statement of urban plans presentation.

Studied range: Kerman city is located in southeast of central plateau and between 53 and 26 min to 59°C and 29 min east length and 25°C and 55 min to 32°C north width. From north, this province is confined to provinces of South Khorasan and Yazd, from east to Sistan and Baluchistan province, from west to Yazd and Fars and from south to Jiroft. The province area is equal to 181714 (Fig. 1)

MATERIALS AND METHODS

This study is descriptive-analytical in regard of objective and it is of applied research type. Data collecting method is field and documentary method. This study aims to collect data using field method and also addresses obstacles and problems existing in pavements around Kerman Parastar Blvd and Shafa Streets which prevent from the handicapped presence.

Theoretical fundamentals

Pavement definition: Pavement is a pathway which is constructed alongside the street and for passing pedestrian passengers. Sometimes, the pavements are separated from the street by grooves and or gardens with plant coverage. Sometimes, the pavements are only a flat way for walking and quite independent from the street and are made for example for plying of passengers in a park. The needs of pedestrians have a wide range and the special facilities of pedestrians are successful when they have the flexibility for meeting needs of all passengers groups (Rahman, 1965).

RESULTS AND DISCUSSION

Main factors in pedestrian paths plans

Continuity: Continuity of the pedestrian path, whether as pavement or as sidewalk, has great importance. Perhaps, many pavements which have been reformed by spending high costs but in part of route due to various reasons like construction operation, low width and specifying the total width to the roadway, incorrect installation of urban equipment or even newspaper shop and so on their intersections with main or secondary streets have been blocked.

As a result, the passengers in the pathway continuation have to use roadway surface that this matter reduces the pavement function level and encounter the passengers with risk and reduces the constructed sidewalk acceptability and in fact, the cost used at the beginning of the path practically loses its value in the route continuation. This is while if someone proceeds in blocking a part of the roadway, he will face a violent encounter. But, this same person easily blocks part or all pavement path and unfortunately, no encounter is accomplished.

Therefore, in construction of pavements or sidewalks, it is necessary to notice continuity of the created routes between pavements, public transportation stations, tourist attracting centers like big commercial or service centers and so on and in places where lateral passing from main or secondary streets is inevitable, based on the pathway gradation a safe passing place to be supplied.

Shortness: The pedestrians are highly sensitive to the route distance and tend to reach their destination from the shortest route. Therefore, in the design of pedestrian paths or pavements or the pedestrian passing places from the street width this principle should be addressed. For example, in determining the pedestrians passing places from the intersection, it should be tried that the pedestrian passing place doesn't space >10-15 m from each side of the pavement.

Beauty and safety: In the design of pedestrian paths or pavements, the pathway beauty and safety should be emphasized. This means that if the pedestrian paths lack appropriate lighting and pass from solitude places or its green space cover is so that, the passing pedestrian is not observable by the passing cars or the neighboring buildings, the passenger doesn't feel safe in this path and doesn't use it. Also, the existence of various uses proportionate to urban environment or existence of beautiful landscapes and the setting prettification along the pavements or sidewalks route considerably help pedestrian's attraction for using this route.

Safety: Safety is an important factor in the pedestrian pathways and pavements, since in case of the route unsafety, citizens? tendency for using these routes and selecting walking method as a movement method is reduced.

Some factors like insufficient sidewalk or pavement width, inappropriate maintenance and reduction of pavements or sidewalks surface quality, vehicles parking inside the pavement or sidewalk and inappropriate adjustment of pedestrians lateral passing places are considered among important factors in safety reduction.

Convenience: Convenience is an important factor in encouraging people to walking. The following cases can be mentioned as factors relating to convenience of pavement or sidewalk route:

Slope: Slope is considered one of the most important factors in route convenience. If the slope becomes more than the permissible amount or the path with maximum permissible slope continues more than a given length, people using it will become tired and lose their tendency to choose this route and perhaps due to lack of appropriate alternative route, use other transportation means like private vehicles for their travel.

Slipperiness: The route slipperiness when it is raining and especially when snowing can cause serious hurt of the pedestrian passengers. Type of materials used in surfacing the pavement or sidewalk plays role in its slipperiness and the type of materials used in the route surfacing should be noticed. For example, in some bridges or significant administrative, commercial or service canters entrance, granite is used in their stairs or entrance ramp that because of being located in open space is not usable at all when it snowing and its surface is glaciated (Table 1-4).

One of other similar cases is using metal plates in overpass bridges floor which is fully slippery in cold

Table 1: The obstacles of pavements around Kerman Parastar Blvd and Shafa Streets

Physical obstacles	Permanent obstacles	Lack of ramp besides the bridges	Pavement 1	Pavement 2	Pavement 3	Pavement 4
		Existence of linkwork and other obstacles	3	5	2	3
		Existence of installation	5	7	4	5
		Existence of bumpiness	5	5	4	7
	Temporary obstacles	Existence of pit	6	5	5	7
Problems relating	Slope		6	5	4	5
to pedestrian	Slippery and un-level floor	7	7	5	7	
passenger network	Existence of lateral furrow in ramp surface	3	2	2	3	
	Width		7	7	4	7
Total			42	43	30	45

Table 2: Providing suggestions for the handicapped access betterment in Kerman Parastar Blvd. and Shafa Streets

Type of space	Considered measurements for making the pavement appropriate
Pavement	It should be wide, its floor stuff and slope should be noticed and its space should be void from obstacles
	In pavements flooring, the slits between bricks, parquets should be <3 cm
	In the handicapped walking pathway, latticed valves, trabeculate valve and railing should exist
	Guiding signs, mailboxes and whatever blocks traffic should be transferred to another place
	The pavements floor cover should be from solid and non-slippery materials
	For preventing from the handicapped weariness, some rest positions should be created in every 30 m distance
Stairs	For some handicapped to be able to pass from stairs, some rails should be installed in both sides of the bridges as a tight handhold
	The stairs should be designed so that to be recognizable for everybody
	Also, the surfaces on the handhold rod should be continuous and uninterrupted
Ramp	The ramp slope should be reduced to maximum 8%
	Minimum ramp width should be considered 120 cm
	Some rails or handholds should be installed around ramps

Table 3: Evaluating the existing status and codifying the pavements desirable status with handicapped and disabled veterans' participation

Topic	Existing problems	Codifying the desired status
Pavement	Little pavement width	Widening very narrow pavements by removing its
	diversity of consumed materials	margin crofts or adding some of roadway
	in pavement floor	width to the pavement is possible
	pavement slipperiness	Preventing from floor coverage differences in
	existing ups and downs	The routes and unifying all parquets for preventing from
	in the pavement	slipperiness risk and falling of the handicapped and disabled veterans
	pavement digging for developing urban	The existing pavements surface should be
	installations and disconnecting	made appropriate with non-slippery
	movement route	and solid planes
	peddling in the pavements and people	Filling cavities and ups and downs
	crowd in the pavements	which cause falling of handicapped people
	movement of vehicles in the pavements	especially those who have wheelchairs
	and spoiling passengers safety especially	Fixing metal bridges for passing
	the handicapped	from the dugout channels
	existence of stairs in the pavement	Preventing from peddling in pavements
	inappropriate lateral and linear slope	and strict execution of law in this regard
		Preventing from vehicles, especially motorcycles
		and bicycles movement and law execution in this regard
		Turning the existing stairs to ramp
		Observing required standards about linear and lateral slope
Communication bridges between	Non provision of communication bridge in a	Installation and or construction of communication
the pavement and the street	long path between the pavement and the street	bridges in required places
	Bridge construction, without	Installation and or construction of communication
	considering the pedestrian	bridges in pedestrians passing place
	passenger lining place	Widening of the narrow bridges
	Low width of the bridge	Observance of bridge standard slope
	High bridge slope	Obviating the difference level between the bridge
	Level difference between	and the street by creating suitable communication ramp
	the bridge and the street	Turning all metal bridges to
	Slipperiness of metal bridges	concrete and cement bridges
Pedestrians	Low width of pedestrians	Widening of pedestrian lining in required places
passing place	passing place	Observance of the bridge
	High slope	standard slope
	Slipperiness of passing place	Using concrete and cement for
	Pavement juncture with grooves	preventing from pavement slippery
	Existence of rail or linkwork between the	Removing the grooves between the pavement
	pavement and the street in the pedestrian	and the street in the place of pedestrian lining
	lining place	Removing rail or linkwork which blocks
	Lack of pilot in the pedestrian lining place	passing from the pavement to street in the lining place
		Putting pilot in the pedestrian lining place

Table 4: Providing approaches

Disability type	Problems	Approaches
People with wheelchair	The level difference between the street and the pavement	Groove ramp installation
	Connecting levels with height difference that usually ramp is connected to the stair	Providing lift or elevator ramp
	Movement in limited spaces	Construction of paths and spaces with suitable dimensions
	Passing from entrance doors with low width and high threshold	Using entrance doors with suitable width, without threshold or with threshold in suitable height
	Access to control equipment like lift bottom which are installed in unsuitable height	Installing control equipment in suitable height
	Movement in lavatories	Using handhold rods in lavatories and bathrooms

season and when freezing and for solving this problem, these plates surface should be covered with especial materials or other materials should be used instead of metal plates in flooring footbridges.

Regarding the performed filed studies in the studied region based on urban planning standards in order to assessing and ranking 4 pavements (the left side pavement of Parastar Blvd. St., the left side pavement of Parastar Blvd. St., the right side pavement of Shafa St., the right side pavement of Shafa St.), the following results have been obtained.

CONCLUSION

The research results: The results obtained from study shows that comparing the existing status of studied pavements based on the influence of urban planning standards, the left side pavement of Shafa St. has the highest rank for handicapped traffic. In the second step, the left side pavement of Parastar Blvd. St. and after that the right side pavement of Parastar Blvd. St. and finally the right side pavement of Shafa St. have stood.

REFERENCES

Gisou, G., 1947. City Space and Handicapped. Housing and Building Research Center, Tehran, Iran.

Hakimi, F., 1964. Pedestrian Facilities Guidance. Tehran Municipal Traffic and Transportation Organization, Tehran, Iran.

Iranshahi, A., 2003. Principles of designing pavements for handicapped and disabled veterans. Sabzineh, The Country Municipal Organization, Tehran, Iran.

Masoud, T. and M. Golshan, 1964. Studying the Status of Isfahan City Pathways Based on the Existing Criteria and Regulations for Handicapped and Disabled Veterans Access. Sepehr Publication, Tehran, Iran,.

Rahman, E., 1965. Making urban environments appropriate with focus on pavements. National Congress of Making Urban Environment Appropriate, Tehran, Iran,

Stanbury, J. and J.S. Hugo, 2000. Formulation of policy for transportation of special needs passengers. Proceedings of the International Conference on Urban Transportation and Environment Codatu IX, April 11-14, 2000, AA Balkema, Mexico City, Mexico, ISBN:91-5809-128-7, pp: 701-715.