

UDC: 712.25:711.523(55Teheran)  
DOI: 10.5379/urbani-izziv-en-2020-31-02-005

Received: 10 July 2020  
Accepted: 4 Dec. 2020

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## The role of user preferences in urban acupuncture: Reimagining leftover spaces in Tehran, Iran

The article deals with the fragile connection that public spaces often have with their context. In this regard, the use of urban acupuncture in leftover space can be an opportunity to revitalize the urban fabric through small-scale interventions developed in accordance with community preferences. This study evaluates interventions in vacant plots based on both residents' preferences and experts' opinions. Using the example of leftover space in Tehran, this article explores public preferences and priorities regarding urban acupuncture from a social, design, and aesthetic perspective, applying a descriptive-analytical

method. The opinions of six experts were examined and categorized in the first phase. In the second phase, the topics and subtopics extracted from the first phase were incorporated into visual questionnaires to evaluate preferences, from which 165 valid responses were obtained. Following the analysis of the questionnaires, twenty-two personal interviews were carried out. The results show which interventions are preferred over others.

**Keywords:** leftover spaces, urban acupuncture, urban intervention, user preferences, Iran

## 1 Introduction

Leftover spaces are part of infrastructure that can improve social situations and ecological conditions (Kremer et al., 2013), and they present an alternative to contemporary public spaces (Kamvasinou, 2011). In addition, a better appreciation of the public value of urban vacant land is vital for better understanding its value in terms of ecological and social benefits (Kim, 2016). In order to convert unsafe areas and aesthetically displeasing landscapes into opportunities for enhancing social and ecological systems (Folke, 2006; Wals & Wals, 2015), there is still a need for research on how to intervene in social and environmental conditions, management practices, land uses, and vacant land (Kremer et al., 2013).

The primary advantage of community involvement in regenerating leftover spaces is that the final design of areas reflects residents' concerns and ideas (Kim et al., 2020). Despite the importance of developing effective engagement strategies to increase public support for redeveloping leftover spaces, much remains to be investigated regarding public attitudes toward vacant land (Kim & Miller, 2017). From this perspective, applying the urban acupuncture approach to vacant land can present a convenient opportunity to reduce social challenges. Modern cities often have to be designed with macro-structural interventions (Kermani, 2016), leading to high vacancy rates in cities with social challenges (Zhang et al., 2019). Urbanism focuses on the micro experiences of urban spaces. Urban acupuncture provides a macro lens and produces small-scale but ecologically and socially catalytic development in the built environment (Casagrande, 2015). Moreover, future cities will face limited urban spaces and resources. In this regard, vacant land is an opportunity (Németh & Langhorst, 2014; Dubeaux & Cunningham Sabot, 2018) that can be transformed into useful space (Newman et al., 2018) to balance and stabilize neighbourhoods. In the twentieth century, leftover spaces were mostly seen as voids in the urban structure (Newman & Kim, 2017). Today, voids are constitutive elements of urban structure, and the magnitude of the impact of small-intervention designs as urban acupuncture is evaluated for a precise function (Kim, 2016). Because studies of abandoned spaces refer to users' key roles and preferences (Lynch, 1977; Trancik, 1986; Thompson, 2002), considering these preferences is useful in choosing the type of intervention. The gap between theory and practice has been noted for some time. Thus, this study addresses an area developed in Tehran. To improve the relationship between urban intervention characteristics and residents' priorities in Tehran, leftover spaces have been identified as an opportunity for urban revival.

The following paragraphs provide the theoretical background to examine what the significant intervention factors are in people's priorities and preferences regarding residual spaces. This study therefore investigates user preferences and priorities to enhance the relationship between urban intervention characteristics and community preference in public spaces. First, a literature review is provided, followed by a presentation of the materials and methods used and the main findings. The conclusion discusses the key findings concerning the central research question and recommendations for future research.

## 2 Literature review

Understanding the role of vacant land as a potentially valuable natural and community asset can improve environmental quality in the surrounding neighbourhood (Kim, 2016). Leftover spaces have been defined very differently: as cracks in the urban structure (Loukaitou-Sideris, 1996), undesirable urban areas (Trancik, 1986), no man's land (Mariani & Barron, 2014), vacant land and unoccupied places available for spontaneous utilization (Lokman, 2017), and urban voids (Newman & Kim, 2017), which are perceived as public spaces (Kamvasinou, 2011; Kim, 2016).

According to de Solà-Morales (2014), vacancy constitutes strange places with spatial disorder potential, leading to new spatial qualities (Mariani & Barron, 2014). Nevertheless, an entirely unregulated environment would encourage improper social behaviour (Unt et al., 2014). However, a growing body of literature suggests that the regeneration of leftover spaces may lead to logical and inevitable courses of activity (Drake & Lawson, 2014; Pearsall & Lucas, 2014) for various applications, such as recreational areas (Johnson et al., 2014). Having become detached from their previous functions, these spaces have become open and empty, waiting to be filled with new utilization (Franck & Stevens, 2007). De Solà-Morales (2014) suggested empty places as the evocative potential of the city. They are latent places with special qualities that should be understood and respected to create predictable designs (Armstrong, 2006).

There is an assumption in the twenty-first century that claims cities' minimal interventions are the most relevant design strategies of urban development (Enia & Martella, 2019). In this regard, the concept of urban acupuncture presents small-scale interventions (Colorni et al., 2017). Urban acupuncture is a new way of understanding the catalysis of urban regeneration (Casanova & Hernandez, 2015). It is a strategy for approaching urban renewal or development projects to address social, ecological, and environmental issues (Daugelaite et al., 2018) and create shared common spaces for the local population.

**Table 1:** Features of intervention.

Feature	References
Small scale micro-intervention	Marzi & Ancona, 2004; Acebillo, 2006; Cheng & Niu, 2010; Radstaak, 2012; Casagrande, 2015; Aouad, 2016; Campelo & Fontenele, 2017; Colorni et al., 2017; Grifoni et al., 2017; Bugaric, 2018; Cerro, 2018; Daugelaite et al., 2018; Rau & Hutchison, 2019
Accuracy	Shieh, 2006; Campelo & Fontenele, 2017
Catalytic for the entire surroundings	Shieh, 2006; Cheng & Niu, 2010; de Solà-Morales 2014; Campelo & Fontenele, 2017; Colorni et al., 2017; Grifoni et al., 2017
Quick implementation	Marzi & Ancona, 2004; Colorni et al., 2017; Enia & Martella, 2019
Low cost	Cheng & Niu, 2010; Rau & Hutchison, 2019
Bottom-up	Unt & Bell, 2014; Gadanho, 2015; Aouad, 2016; Campelo & Fontenele, 2017; Bugaric, 2018
Local	Tortosa et al., 2010; De Wit, 2014; Unt & Bell, 2014; Casagrande, 2015; Houghton et al., 2015; Aouad, 2016; Grifoni et al., 2017; Lastra & Pojani, 2018
Tactical	Unt & Bell, 2014; Casagrande, 2015; Gadanho, 2015; Houghton et al., 2015; Aouad, 2016; Lastra & Pojani, 2018

Community engagement is a crucial part of urban planning and design because previous studies emphasize that different urban design guidelines are required by local needs and aspirations (Polat & Tümer Yıldız, 2019). Because urban acupuncture interventions consider residents' involvement, this strategy can address social aspects. Moreover, the application of urban acupuncture follows the strategy of well-targeted and minimal interventions (Daugelaite et al., 2018) considering residents' needs and their perspectives to change public space and improve residents' quality of life (Bugaric, 2018). A wide range of urban acupuncture examples can be found, from introducing a new tradition to changing habits (Lerner, 2014), which landscape architects and urban planners can use as a model to improve residents' quality of life. The design perspective of urban spaces seeks to create an observable organizing structure and a sense of human scale (Behzadfar et al., 2014). In this regard, numerous authors argue that producing smart and small interventions in a given site can positively affect the surroundings (Lydon et al., 2015). Having claimed that they are "interventions" in the built environment, Frampton believed that new projects have a moral obligation to catalyse the renovation of their surroundings (Shieh, 2006). This approach has been recognized as important in urban managed environments, with an emphasis on natural dynamics and low implementation costs (Daugelaite et al., 2018). It is beneficial in the developing world, where governments and institutions have limited resources, and it increases the direct participation of those living in such areas.

Acupunctural interventions in urban spaces create more comprehensive changes than initially intended (Lydon et al., 2015; Lastra & Pojani, 2018). Employing the "right measure" architectural approach to interventions, appropriate and necessary adjustments can be made to a place (Enia & Martella, 2019). Based on the literature review, small-scale interventions in urban spaces, such as spaces between blocks, building frontages,

pocket parks, and small pieces of vacant land, should have specific features, which are presented in Table 1.

The main benefit of community involvement in regenerating leftover spaces is that the final design areas reflect residents' preferences, and so it is useful to increase such involvement (Kim et al., 2020). Despite the significance of developing effective engagement strategies to increase public support for redeveloping leftover spaces, there is still a lack of research on public attitudes toward vacant land (Kim & Miller, 2017). Past perception research on landscapes and sites has generally focused on environmental characteristics that influence landscape perception (Lafortezza et al., 2008; Hofmann et al., 2012; Svobodova et al., 2012; Ruelle et al., 2013). Several recent studies have suggested the integration of visual preferences with ecological site rehabilitation (Hands & Brown, 2002; Tveit et al., 2006) and landscape planning and design (Ahern, 1999; Greenberg & Lewis, 2000; Ruelle et al., 2013), but the investigation remains mostly untested in leftover spaces. Visual preference evaluation is a significant factor in evaluating residents' acceptance and desire to participate in the urban modernization intervention process (Zhao et al., 2020). Although a photo display has certain limitations (Daniel, 2001; Palmer & Hoffman, 2001; Steinitz, 2001), it is a significant public visual preference evaluation method.

### 3 Materials and methods

#### 3.1 Study area

Although public spaces in Tehran are not very user-friendly, they possess porous characteristics that make possible embodiments of place bearing spontaneous events and experiences (Khorshidifard, 2014). Despite the scenarios of responsible organizations to enhance environmental quality and develop green spaces, the city has not been able to restore its ecolog-



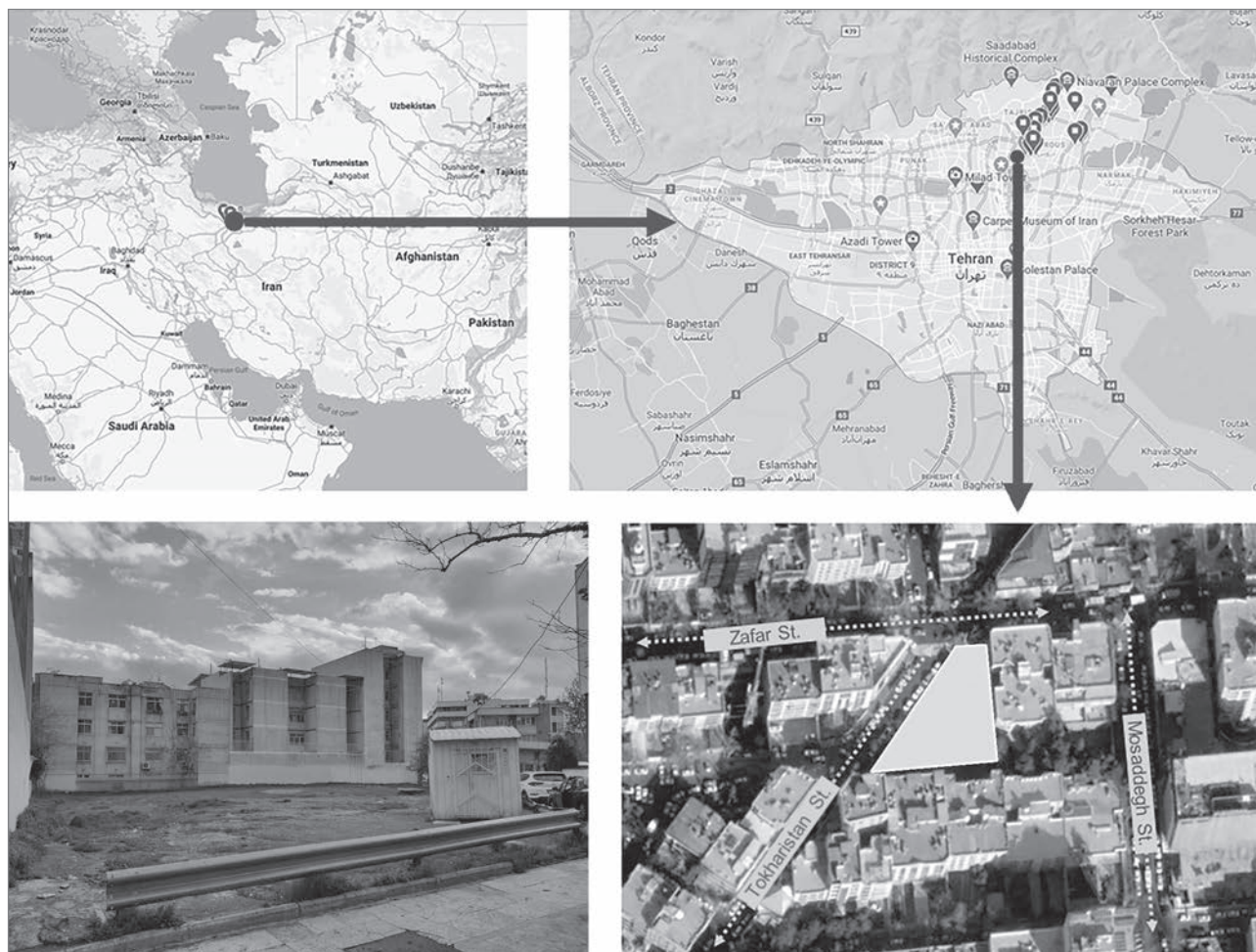


Figure 1: Site location (illustration: authors; source: Mapdata 2020).

ical network due to fragmentation resulting from unplanned growth (Bahrami et al., 2012). Because of the demolition of valuable natural structures in Tehran, numerous problems have arisen. Moreover, because Tehran is a metropolitan city that suffers from limited space, considering urban acupuncture in leftover areas can be useful. The diversity of leftover spaces in Tehran encouraged the researchers to choose this city as a study area. Due to the available facilities and to improve possible projects through public involvement, the main idea behind this study was to investigate urban acupuncture interventions on micro-leftover areas in Tehran. The criteria for selecting this case study included small open, empty, and underused spaces in residential neighbourhoods. Preliminary interviews were conducted with residents to select a site as a leftover space. The study area is located in Zafar, a neighbourhood in northern Tehran with a population of 70,677. As shown in Figure 1, this site is bounded to the north by Zafar Street and to the west by Tokharistan Street.

### 3.2 Research methodology

Research was carried out in several stages. First, photos of urban interventions were chosen from various urban spaces, which could be redesigned for the selected leftover space. Second, the selected scenes were classified into three categories: social, design, and aesthetic. Then each expert was asked individually to select three photographs that best represented each scene’s categories and subcategories. In the end, an AHP-based visual questionnaire was conducted to determine residents’ preferences.

The AHP decision-making method is used when there are several evaluation factors to complicate the decision-making process. This gives decision-makers a thorough understanding of issues in specific situations for a non-independent “hierarchical structure” (Nekhay & Arriaza, 2016; Saaty & De Paola, 2017). It is crucial to achieve a hierarchy among different interventions in micro-leftover areas and to distinguish the key factors that influence residents’ preferences in public spaces. This strategy will help measure the effects of improvements at both the neighbourhood and urban scales (Mondini et al.,

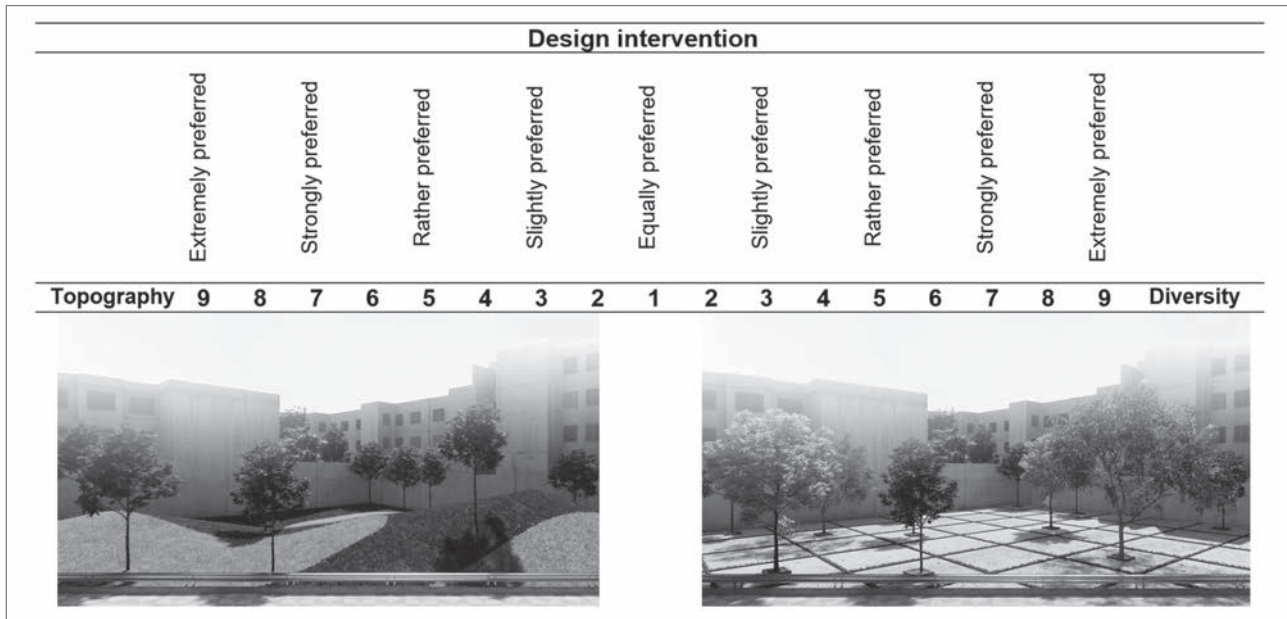


Figure 2: Example of pair comparison in AHP (adapted from Peng, 2019).

Table 2: Hierarchical structure of assessment factors.

Goal	Assessment category	Sub-category
Urban intervention	Social	Relaxing, restorative
		Playground
		Leisure in a café
		Gallery
		Table-top games
		Sitting
		Exercising
	Design	Topography
		Regular
		Diversity
		Density
	Aesthetic	Irregular
		Colour
		Pattern
		Sculpture
		Installation
		Mural

2018). After the online questionnaires were distributed among residents, an online interview was conducted with twenty-two residents.

### 3.3 Survey design

In the first phase, the researchers chose 114 photos of urban interventions in various urban spaces that could be redesigned for the selected leftover space. In order to aid the researchers in the decision-making process for the photo selection, six experts

Table 3: Demographic characteristics of interviewees.

		Sex		
		Female	Male	Total
Age	20–40	9	8	17
	41–60	2	1	3
	> 60	1	1	2
Total		12	10	22

with at least nine years of related experience (including three architects, one urban designer, and two landscape architects) were asked to select the scenes that best represented the acupuncture features based on the definitions in Table 1. In the first round, seventy-two scenes were selected. The frequency of the scenes most often selected by the experts was recorded. Features with a frequency of about four times were selected.

As shown in Table 2, these seventy-two selected scenes were classified into the three categories mentioned above. Then, the form of simulation employed to depict changes in the neighbourhood (Norouzian-Maleki et al., 2018) and each of the experts' selected interventions was modelled with the SketchUp software. The AHP method was used to select the appropriate interventions for the leftover space. The first section of the questionnaire comprised residents' demographics characteristics (Table 3) and current place of residence to ensure the respondents were local people. The second section included visual preference with an AHP-based assessment of thirty-seven questions, which the respondents were asked to rate on a seventeen-point rating scale.

**Table 4:** Respondents' demographic characteristics.

		Sex		Occupation				
		Female	Male	Employed	Housewife	Student	Retired	Unemployed
Age	20–40	78	51	12	10	29	1	77
	41–60	10	11	2	1	1	5	12
	> 60	6	9	1	2	0	7	5
Total		94	71	15	13	30	13	94

**Table 5:** Relation between education and participation in urban intervention.

		Education	Participation
Education	Correlation	1	-.164*
	Sig. (two-tailed)		.035
	n	165	165

Note: \*Correlation is significant at the 0.05 level (two-tailed)

### 3.4 Data collection

To assess the relationship between urban intervention characteristics and community preferences, this study used an AHP-based visual survey. Before adopting the final full-scale study, additional pilot testing was performed to refine the attributes. The respondents were selected using a snowball technique. The online questionnaires were distributed among residents during April and May 2020. A message was randomly sent to two hundred residents, asking them to complete the online questionnaire. The analysis was performed based on the data collected from the survey using Excel, SPSS, and expert-chosen software. The results were rated and presented in the form of descriptive and inferential statistics. Afterward, qualitative data from an open-ended survey were used to complement the study.

A personal online interview was also conducted with twenty-two resident participants to determine residents' preferences for the three categories of urban interventions. The age and sex distribution of the respondents was representative. Therefore, the interviewees were selected following random routes (similar to stratified sampling). Using this process, twelve women and ten men were interviewed with the age distribution in Table 3. Each interview took approximately fifteen to twenty minutes, and the results are described separately in each section.

## 4 Results and discussion

One hundred sixty-five valid responses were selected out of 189 received. Then, ninety-four women and seventy-one men responded to the questionnaire with the following distribution of demographic characteristics as presented in Table 4.

### 4.1 Results of the first section of the survey

This research investigated the correlation between education, usage, and participation in urban interventions. Using a correlation rank ( $p < 0.05$ ), it was demonstrated that the more educated a person, the more he or she intends to participate in urban interventions. Thus, Table 5 presents the correlation between participation in urban intervention and education.

Urban acupuncture is a bottom-up approach, and so this study also asked about respondents' willingness to participate in developing their neighbourhood. As shown in Table 6, a large number of respondents spend their free time in public spaces, one to two days per week, and they are also more likely to participate in the design intervention of the space: 86.6% of residents would like to be involved in creating their surrounding environment, and only 6.6% would not like to be involved in creating their living environment.

Based on Figure 3, the most common activity is walking (63.63%), followed by connecting with nature (52.12%), leisure in a café or restaurant (48.48%), and sitting and relaxing (44.84%). Walking and connecting with nature seem suitable because most participants were unemployed. Attending events (6.66%) and leisure with children (9.69%) are mostly restricted due to crowded environments.

### 4.2 Results of the second section of the survey

The weight per intervention type was derived and presented through AHP and pictures from *pairwise comparison per scene, respectively* (Tables 7–9). In this regard, assuming the criteria and  $w$ , which represents the scores on a nine-point scale, the next pairwise comparison matrix is defined as below:

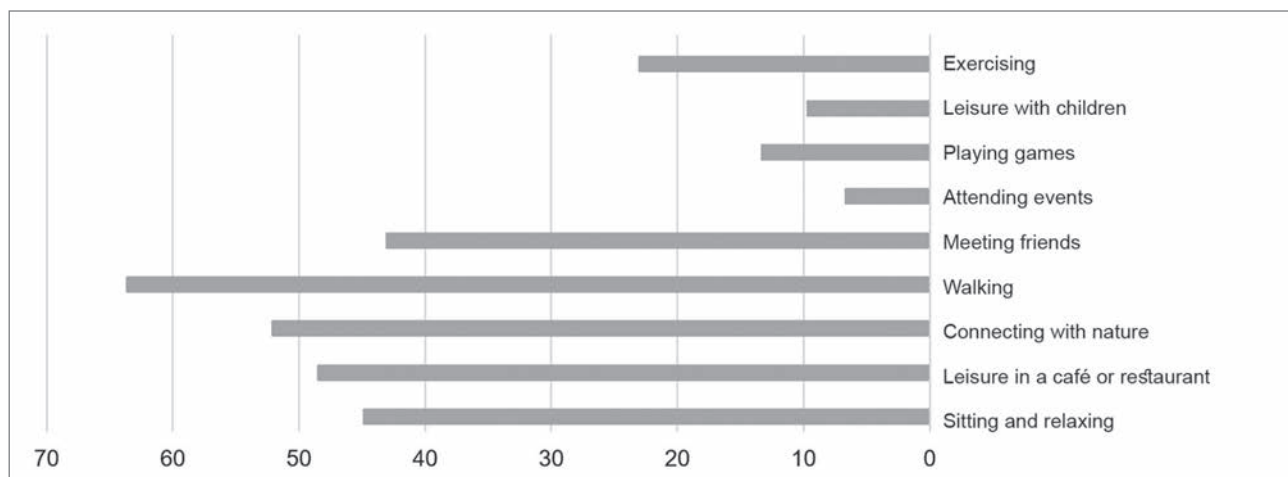
$$\begin{pmatrix} w_1/w_1 & w_1/w_2 & \dots & w_1/w_n \\ w_2/w_1 & w_2/w_2 & \dots & w_2/w_n \\ \dots & \dots & \dots & \dots \\ w_n/w_1 & w_n/w_2 & \dots & w_n/w_n \end{pmatrix} \times \begin{pmatrix} w_1 \\ w_2 \\ \dots \\ w_n \end{pmatrix} = \begin{pmatrix} w_1 \\ w_2 \\ \dots \\ nw_n \end{pmatrix}$$

The solution for a numerically analysed eigenvalue was applied to obtain the relative weight for each subcategory, thus acquiring the maximum eigenvalue ( $\lambda_{max}$ ) of the comparison matrix and the corresponding eigenvector. Saaty (1990) introduced the use of a consistency test on pairwise evaluation as follows:



**Table 6:** Correlation between residents' willingness to participate in design interventions.

Participation	Usage (days per week)				Total
	> 4	3-4	1-2	0	
Difficult to say	1	3	5	2	11
Don't want to at all	1	3	4	3	11
Somewhat inclined	8	7	45	13	73
Very much want to	12	7	43	8	70
Total	22	20	97	26	165

**Figure 3:** Activities chosen (multiple choice).

The consistency index (CI) is calculated as:

$$CI = \frac{\lambda_{\max} - n}{n - 1}$$

and the consistency ratio (CR) is calculated as:

$$CR = \frac{CI}{RI}$$

where  $\lambda_{\max}$  is the maximum eigenvalue of the matrix,  $n$  is the matrix rank, and the random index (RI) is a randomly generated consistency index of a matrix, which relates to the matrix rank.

Saaty (2014) noticed the comparison as randomly generated when CR reached 1 and the consistency as higher when CR reached 0. Basically,  $CR < 0.1$  was considered acceptable, whereas  $CR > 0.1$  demonstrated a level of inconsistency and needed to be re-compared.

Based on the residents' opinions in the questionnaire, the factors' weights were calculated. The results obtained from the factors' weights are provided in Tables 7–9. The hierarchical analysis of the questionnaire was used to determine the critical items for assessing user preferences for the leftover space, using the weights.

### 4.3 Results of questionnaires and personal interviews

The weights of assessment factors given in Tables 7–9 indicate that relaxing had the highest weight for social intervention, topography had the highest weight for design intervention, and colour had the highest weight for aesthetic intervention. In weighing the social category (Figure 4), the two groups had similar priorities (table play and gallery). The choices were relaxing as the first priority, followed by leisure in café, playground, and exercising.

Interviews with the respondents indicated that the playground had the lowest priority for residents in the neighbourhood near the site, and that relaxing and restorative spaces were more vital to them. Comparison of the two options for sitting and relaxing intervention indicated that the urban furniture types were also important for the respondents. They paid attention to the form of the furniture and its flexibility. Although sitting and relaxing was not a priority of respondents in using open spaces (Figure 3), relaxing was a priority in the AHP comparison analysis. This could be due to the current inadequacy of urban furniture in Tehran. Respondents indicated that because having a restaurant in the neighbourhood is also interrelated to other factors, such as benches, these facilities can be the best way to become familiar with people in the neighbourhood and

**Table 7:** Relative weights of evaluation items in the social category.

Social							
	Relaxing	Playground	Leisure in a café	Gallery	Table-top games	Sitting	Exercising
Relaxing	1	3.436	3.527	4.506	3.235	1.744	3.091
Playground	0.291	1	1.453	3.392	2.868	1.928	2.098
Leisure in a café	0.283	0.688	1	4.398	4.073	3.069	4.214
Gallery	0.221	0.294	0.227	1	1.126	1.601	2.254
Table-top games	0.309	0.348	0.246	0.888	1	1.826	2.091
Sitting	0.573	0.450	0.325	0.624	0.547	1	3.664
Exercising	0.323	0.476	0.237	0.443	0.478	0.272	1

Note: Maximum eigenvalue ( $\lambda_{\max}$ ) = 7.638; CI = 0.106; CR = 0.080.

**Table 8:** Relative importance of evaluation items in the design category.

Design					
	Topography	Regular	Diversity	Density	Irregular
Topography	1	3.346	1.677	2.651	1.388
Regular	0.298	1	1.519	1.265	1.712
Diversity	0.596	0.658	1	2.893	2.128
Density	0.377	0.790	0.345	1	2.134
Irregular	0.720	0.584	0.469	0.468	1

Note: Maximum eigenvalue ( $\lambda_{\max}$ ) = 5.415; consistency index (CI) = 0.104; consistency ratio (CR) = 0.093.

**Table 9:** Relative importance of evaluation items in the aesthetic category.

Aesthetic					
	Colour	Pattern	Sculpture	Installation	Mural
Colour	1	3.315	3.227	2.862	3.113
Pattern	0.301	1	2.604	2.097	3.228
Sculpture	0.309	0.383	1	1.322	3.245
Installation	0.349	0.476	0.756	1	4.420
Mural	0.321	0.309	0.308	0.226	1

Note: Maximum eigenvalue ( $\lambda_{\max}$ ) = 5.401; consistency index (CI) = 0.100; consistency ratio (CR) = 0.090.

attract new restaurants. Working out consistently received the highest rating in the questionnaires (63% of the residents use public open spaces to walk and 23% for sports activities), and active space for exercising was the least preferred intervention. As mentioned, respondents are more likely to walk, and they refuse to exercise in small spaces. Concerning the design category (Figure 5), topography was given the most weight, followed by diversity. In contrast, an irregular form for sites was chosen as the least important priority. Although variety in the level of space and type of vegetation was given priority in the design intervention subcategories, high vegetation density was the least preferred intervention. However, respondents did not favour designs below street level because they believed these would be turned into dumping grounds.

Unstructured interviews consistently indicated that high vegetation density creates a lack of visibility and social control, reducing safety and turning places into a crime location. A resident noted the existence of unsafe abandoned spaces with similar sizes in the neighbourhood. For this reason, she insisted on the importance of visibility and low vegetation density to ensure the safety of the space. According to four women, environmental factors, such as high vegetation density, also led to the disruption of norms. Therefore, the visibility of space was one of the most important variables for residents. Another woman said the following: "A few days ago, when I was passing through this area with my husband, we imagined this space as a small park with irregular geometry and a few benches". One of the respondents disagreed with all the options in the questionnaire. In his opinion, only design interventions with facilities,










Category	Scene	AHP weight	Category	Scene	AHP weight
Relaxing		0.317	Table-top games		0.0843
Leisure in a café		0.205	Gallery		0.0863
Playground		0.1778	Exercising		0.0493
Sitting		0.0797			

Figure 4: Relative importance of factors in the social category (illustration: authors).






Category	Scene	AHP weight	Category	Scene	AHP weight
Topography		0.340	Density		0.137
Diversity		0.221	Irregular		0.115
Regular		0.185			

Figure 5: Relative importance of factors in the design category (illustration: authors).






Category	Scene	AHP weight	Category	Scene	AHP weight
Colour		0.413	Sculpture		0.147
Pattern		0.232	Mural		0.061
Installation		0.145			

Figure 6: Relative importance of factors in the aesthetic category (illustration: authors).

such as a taxi station or a parking space, were suitable for this neighbourhood. Concerning the aesthetic category (Figure 6), colour had the most weight. In contrast, murals was chosen as the factor with the least priority. Although interviews showed that respondents liked the mural presented, they were not convinced that they would like one in their neighbourhood.

The difference in AHP weight in the two subcategories of colour and murals was raised in the respondents’ interviews. According to a woman, the impact of colour on how we feel has been explored by researchers, but murals invoke an image associated with concepts and themes that may not suit her taste. A man mentioned: “Murals would be my first choice if I did not live in Tehran. Based on the low quality of the current murals in Tehran, this option will be my last priority. This reason also applies to not choosing a sculpture.” Another man indicated that graffiti on a painted wall or floor can make it more attractive, but advertisements or writings on the wall cause a visual disturbance that is not easily removed.

Based on the questionnaire, because 81.21% of the respondents use miniparks in the evening and at night, darkness and lack of visibility may be another plausible reason for not selecting these types of interventions.

This study provides an excellent example of using AHP for evaluating user preferences. It employs AHP to discover residents’ priorities in the design process and decision-making. Urban design, as an interdisciplinary process, needs to be incorporated with different dimensions. Therefore, deci-

sion-makers and designers are required to have comprehensive knowledge of the related aspects. Both residents’ preferences and experts’ opinions show that deciding what to do and how much to do can only be effective if it is based on both descriptive and prescriptive analysis. When dealing with urban spaces, using minimal operations, considering safety and vandalism, may help them remain active. This would be an intervention approach following urban acupuncture. Although respondents expressed interest in aesthetic interventions, based on the current interventions going on in the city, they refused to select those categories as their priority. They seemed to be more interested in installations rather than sculptures because installations are temporary and changeable. In this regard, it is key to consider whether the intervention is permanent or temporary. Although the selected space is small, it is possible to effectively choose the type of intervention considering land uses around each pocket park. Despite their small size, these spaces can have different uses and play a vital role in changing the urban environment.

## 5 Conclusion

The results suggest that design interventions are the most preferred. However, the type of vegetation and its density should be considered in a way that does not compromise safety. In addition to respondents’ interests in using various types of vegetation, emphasis was placed on planting deciduous and non-deciduous trees together. This type of planting can be valuable in creating diversity in different seasons. Considering these details can lead to minimal spatial interventions with

high user preferences. In addition, respondents expressed interest in aesthetic interventions that are temporary and changeable. In this regard, it is key to consider whether an intervention is permanent or temporary. Moreover, the right type of urban furniture can improve the quality of space, which has a significant effect on residents' interaction with space. For new interventions to be effective as a catalyst of urban renovation, they must match the actual public preferences and priorities. This can be achieved by taking into account previous projects' experiences and selecting the best design interventions through categorizing and assessing their features.

In past decades, lost spaces were viewed negatively. However, findings have shown their potential to provide small-scale public space that can benefit residents and the entire city. Intervention on vacant land needs to be adapted to the characteristics of urban reality. In the future, it would make sense to carry out similar studies in other regions with different cultures and social contexts to see whether there is a significant difference between them. Furthermore, the views of experts and residents can be compared through further inquiries and surveys. Moreover, to evaluate residents' preferences regarding various interventions at the design phase, incorporating virtual reality into a questionnaire could prove useful.

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