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Assessing Walkability and Urban Vitality Indicators in the City of Najaf.

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Abstract

Assessing walkability and urban vitality indicators is of significant importance in enhancing the quality of life for both residents and pilgrims. Given the key role of pedestrian-oriented spaces in fostering social interactions, improving urban experience, and increasing presence in public areas, a precise analysis of these indicators is fundamental for planning sustainable and vibrant urban environments. This study aims to evaluate the indices of walkability and vitality in the city of Najaf. The research methodology is descriptive–analytical and, in terms of purpose, falls within theoretical-applied studies. Data collection was conducted through both library (books, articles, theses, official documents, and online sources) and field methods (questionnaires, observation, and interviews). The statistical population comprised residents and pilgrims present in the proximity of the Holy Shrine of Imam Ali (AS), with a sample size of 384 determined by Cochran's formula at a 95% confidence level. Data analysis was performed using SPSS software and statistical tests including Kolmogorov–Smirnov, correlation coefficients, and the SWARA multicriteria decision-making technique. The findings indicate that urban vitality in Najaf's religious core results from the interaction between the physical and policy–social dimensions, with the physical dimension (≈41%) acting as the primary and determinant factor, while the policy–social dimension (≈24%) plays a supporting role. Safe and attractive pedestrian path design, enhanced architectural quality of religious spaces, traffic reduction, and appropriate street furniture and lighting were identified as the most influential indicators. Therefore, an effective strategy for boosting Najaf's urban vitality involves an immediate focus on visible improvements (lighting, furniture, cleanliness), medium-term investments in redesigning pedestrian spaces, and long-term policy planning for traffic management and preservation of architectural identity. It is recommended that before large-scale

implementation, field pilots with pre/post-assessments be conducted to validate the impact of interventions.

Keywords: (walkability, vitality, religious cities, Najaf city).

تقييم مؤشرات قابلية المشي والحيوية الحضرية في مدينة النجف

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الملخص

يُعد تقييم مؤشرات قابلية المشي والحيوية الحضرية ذا أهمية كبيرة في تحسين جودة الحياة لكل من السكان والزائرين (الزائرين والحجاج). ونظرًا للدور المحوري الذي تؤديه الفضاءات الموجهة للمشاة في تعزيز التفاعلات الاجتماعية، وتحسين التجربة الحضرية، وزيادة التواجد في الفضاءات العامة، فإن التحليل الدقيق لهذه المؤشرات يُعد أساسًا مهمًا لتخطيط بيئات حضرية مستدامة ونابضة بالحياة.

تهدف هذه الدراسة إلى تقييم مؤشرات قابلية المشي والحيوية الحضرية في مدينة النجف. اعتمدت الدراسة المنهج الوصفي–التحليلي، وتندرج من حيث الهدف ضمن الدراسات النظرية–التطبيقية. تم جمع البيانات من خلال الأساليب المكتبية (الكتب، المقالات العلمية، الرسائل الجامعية، الوثائق الرسمية، والمصادر الإلكترونية)، إضافة إلى الأساليب الميدانية (الاستبيانات، الملاحظة، والمقابلات).

تكوّن المجتمع الإحصائي من السكان والزائرين المتواجدين في محيط مرقد الإمام علي (عليه السلام)، وتم تحديد حجم العينة بـ ٣٨٤ مفردة اعتمادًا على معادلة كوكران وبمستوى ثقة ٩٥%. جرى تحليل البيانات باستخدام برنامج **SPSS**، وبالاعتماد على عدد من الاختبارات الإحصائية، من بينها اختبار كولموغوروف–سميرنوف، معاملات الارتباط، وتقنية **SWARA** لاتخاذ القرار متعدد المعايير.

وأظهرت النتائج أن الحيوية الحضرية في النواة الدينية لمدينة النجف ناتجة عن التفاعل بين البعدين المادي والسياساتي–الاجتماعي، حيث يُعد البعد المادي العامل الأساسي والحاسم بنسبة تقارب (٤١%)، في حين يؤدي البعد السياساتي–الاجتماعي دورًا داعمًا بنسبة تقارب (٢٤%). كما تم تحديد تصميم مسارات مشاة آمنة

وجاذبة، وتعزيز الجودة المعمارية للفضاءات الدينية، وتقليل حركة المرور، وتوفير الأثاث الحضري المناسب والإضاءة الملائمة، بوصفها أكثر المؤشرات تأثيرًا في تعزيز الحيوية الحضرية.

وبناءً على ذلك، فإن الاستراتيجية الفاعلة لتعزيز الحيوية الحضرية في مدينة النجف تتطلب التركيز الفوري على التحسينات المرئية (مثل الإضاءة، والأثاث الحضري، والنظافة)، إلى جانب استثمارات متوسطة الأمد في إعادة تصميم فضاءات المشاة، وتخطيط سياساتي طويل الأمد لإدارة الحركة المرورية والحفاظ على الهوية المعمارية. كما توصي الدراسة بضرورة تنفيذ تجارب ميدانية تجريبية، تتضمن تقييمات قبلية وبعدية، للتحقق من فاعلية التدخلات المقترحة قبل تطبيقها على نطاق واسع.

الكلمات المفتاحية: (قابلية المشي، الحيوية الحضرية، المدن الدينية، مدينة النجف).

Introduction

Walking is the most basic and fundamental way of human commuting. In a urban space, walkability is one of the most important indicators of a livable space and an effective tool in a achieving sustainability of urban spaces for citizens(Rahnama and Bazargan, 2020: 182). In the past, cities had a high pedestrian capacity but following the industrial revolution and the domination of cars in cities this issue was forgotten.(Abdullahi and Halakui,2018: 173)

Around the world many cities have made efforts to improve the conditions of their central fabric. One of these measures is the conversion of some street into pedestrian walkways, which has tried to improve the quality of the environment by eliminating or reducing the traffic of cars on busy streets.(Shia etal. 2013:43). Finally, vitality is injected into the central fabric of cities. The old texture of the city is one of the main factors and manifestations of historical and cultural values and the embodiment of symbols, signs and memories that give identity to all of its inhabitants.
(Mostofi Al-Mamalaki and Norouzian, 2013:146)

The city center is one of the main factors and manifestations of historical and cultural values and the embodiment of symbols, signs and memories that give identity to the whole city and its residents. One of the important

features of historical urban centers is the integration and interaction of a set of economic, social and cultural activities which were formed based on pedestrian-oriented public spaces within it.(Esmaeilpour and colleagues 2021:60)

Therefore, the central fabric of cities has always been in the center of attention of experts, planners and city managers due to having a clear map in the economic, physical, social and political structure of the city. Although walking has a historical circuit as high as human life, during the last few years the importance of walking and pedestrian road construction has been widely discussed in the cities, and taking into account the urban spaces measures have been taken in this field.(Saket Hassanlui and et al. 2022: 634)

Cities often include a complex network of roads, streets, parks and sidewalks. Experience shows that if people face a problem on pedestrian paths, they will be disappointed to spend time on these paths in the city and the possibility of their presence in these spaces will decrease. Like many aspects of urban life, sidewalks have their own social and physical structure. In different countries many efforts are made at different levels of urban planning to encourage and facilitate movement on sidewalks and municipalities have a significant contribution in this field.

So much so that many cities tried to develop plans and visions for the development of pedestrian networks in different time scales and especially with the vision of the 21st century.(Seyed Bigi and et al. 2023: 18). Today, urban vitality has attracted a lot of attention as a comprehensive concept with a wide range of concepts. Urban vitality is not a purley environmental concept but rather a social concept and is the result of people's satisfaction with urban spaces in the long term.vitality is achieved by the interaction of evil and citizens in different functional layers.(Khasto 2023: 74)

The pilgrimage city of Najaf as one of the most important religious centers of the Ilamic world, has faced numerous challenes and opportunities in recent years in terms of improving the quality of urban spaces and increasing vitality. The link between the practical and functional dimensions of the city with the feasibility indicators is considered one of the most important factors shaping the social life and dynamics of the public spaces of this city. In such context, identification and analysis of indicators affecting walkability and urban vitality is considered a basic necessity for policy makers and city managers of Najaf. Accordingly, the present study is based on the assumption that the pilgrimage city of Najaf plays the greatest role in achieving a vibrant city in terms of physical and functional dimensions and there is a meaningful and reciprocal relationship between the implementation of pedestrian construction projects improving the level of citizen presence and the realization of successful urban policies and strategies.

Theoretical foundations

Pedestrian street[1]

It is a street that prohibits its entry in order to improve the pedestrian environment and the entry of other motor vehicles is regulated. In general, footpaths refer to the areas or passages that are provided to the barracks and motor vehicles have the right to enter it only for the purpose of access and essential services.(Moeini and Ebrahimpour2020:103)

Walk[2]

It is an urban space where pedestrian movement is prioritized and horse movement is eliminated in part or all hours of the day and night. In addition to providing and safe space for different social groups and their interaction this space creates.(Azizi et al.2022:113). Sidewalk is a passage with the

[1] Pedestrian street
[2] Walk

most social role in which vehicles are used to serve the current life and in which the pedestrian is dominated. The sidewalk is a tool for collective activity, especially in the city's economic connection, social health and environmental quality.(Kzeroni and Mahdavi 2017:3)

Pedestrian street is a concept that was proposed since 1950 to compete with the suburbs, reducing the traffic load from the old streets of the city center.(Seyed Begi et al. 2023:20)

Pilgrimage city[3]

A pilgrimage city is a part of the city that comes to life with the presence of pilgrims and the social action of the form leads to the production of the spatial text of the pilgrimage. The supply of accommodation services, shopping and market tourism the supply of catering services, health and other field are included in the scope of this action and ofcourse, it is clear that this area is compressed and expanded at different times according to(the pilgrimage song and the pilgrimage calendar). The social and physical closure of the pilgrimage city also injects life from pilgrimage into other urban areas and is a necessary condition for urban empowerment in order to provide adequate services to pilgrims(Saghaei et al.2012: 98)

Vitality

Vitality is a factor that results from the attractiveness of spaces and the satisfaction of citizens, which ultimately leads to the creation of a livable space. If we consider the city as a living organism this organism needs vitality and vitality to continue living. Today, in developed countries, paying attention to the presence of people in urban spaces plays a key role in urban design and planning and the important key to achieving successful, vibrant, safe, stable and healthy cities is to pay attention to the role of people and their needs.(Hamzaei et al.2024: 121)

[3] Pilgrimage city

William White defined vitality as the sum total of two elements: people and the space used for their activities which is a very general definition. On the other hand, Ryan and Frederick[4] defiend vitality as the physical and mental energy whose presence makes people feel enthusiastic and energetic when experiencing the city(Ryan & Frederick, 1997:536)

Yangel and Jacob have provided a more balanced definition and considered urban vitality to be the result of the vitality of people in the urban space as well as the activities of those people(Lu et al,2019)

Liveliness can be attributed to the number of people who are present on the street and around whether during the day or at night. This concept also refers to the number of cultural events and celebrations that are held throughout the year, the ongoing activities in street life and in general the amount of feeling that a place evokes of being alive. Certainly, it is possible to creat vitality at certain times of the day by planning events and activities that take place on the street, although in the long term, urban vitality can only be formed in places where there is a complex diversity of primary land uses and extensive economic activities(Yazdanpanah Shahabadi and Zahiri 2024: 58)

Amiri and Shams (2024), in an article entitled “Investigation and Analysis of the Components Shaping Urban Vitality: The case study of Bouali pedestrian route in Hamedan,” concluded that the status of urban vitality indicators in the studied pedestrian route is favorable. Moreover, the results of the Friedman test and the prioritization of indicators showed that climatic comfort has the highest priority in assessing spatial urban vitality in the Bouali pedestrian route of Hamedan city.Naderikia and Khaliji (2020), in an article entitled “assessing the quality of vitality in urban pedestrian routes: The case of Salman Farsi street in Ahvaz,” In addition, the creation of pedestrian routes is regarded as one of the main concerns of

[4] Ryan and Frederick

residents, and the components of security, culture, creativity, and diversity have the greatest impact.Siyami and colleagues (2022), in an article entitled "Measuring the walkability of urban streets with an emphasis on social Interactions: Case study of Kouhsangi axis in Mashhad,"

Vahidi and colleagues (2022), in an article entitled "walkability Index: An approach to urban sustainable development, case study: District 16 of Tehran municipality," found that the criteria affecting walkability in district 16 of Tehran were classified hierarchically into 9 main categories and 30 sub-criteria, and their spatial and locational information was collected. The diversity and wide range of evaluated indicators led to a comprehensive analysis of the existing situation, which can be considered one of the strengths of this study.Each of these indicators was analyzed for the case area, and the walkability status in district 16 of Tehran municipality was evaluated based on each criterion.

Nastaran and colleagues (2023), in an article entitled "feasibility study of achieving walkability with emphasis on the TND Approach: The case of Modarres street in Kermanshah," showed that all components of the TND approach influence walkability, although the degree of correlation between each TND indicator and walkability differs.According to their findings, eight factors—presence of attractive land uses, land-use mix, route legibility, diversity in buildings, safety from crime, quality of social life, attractiveness and vitality, and finally sensory richness—have the greatest impact on promoting walkability along Modarres Street.

Dozduzani et al. In their article titled " identifiction of vitality factors in sidewalks, urban spaces the research case of Ferdowsi sidewalk in Sanandaj" . in the studies conducted the factors affecting the vitality of the Ferdowsi pedestrian path are , in order the " accessibility-spatial " factor with a correlation coefficient of 94% " functional-environmental" with a correlation coefficient of 92% and" social-cultural" with a correlation coefficient of 88% which have the greatest impact on pedestrian life. In the

survey of citizens' satisfaction with pedestrian vitality factors the highest level of satisfaction is with the spatial accessibility factor with an average of 3/85 and the lowest level of satisfaction is with the socio-cultural factor withan average of 3/61 which is in the average satisfaction with the life of the Ferdowsi pedestrian path is 3/70 which is average.

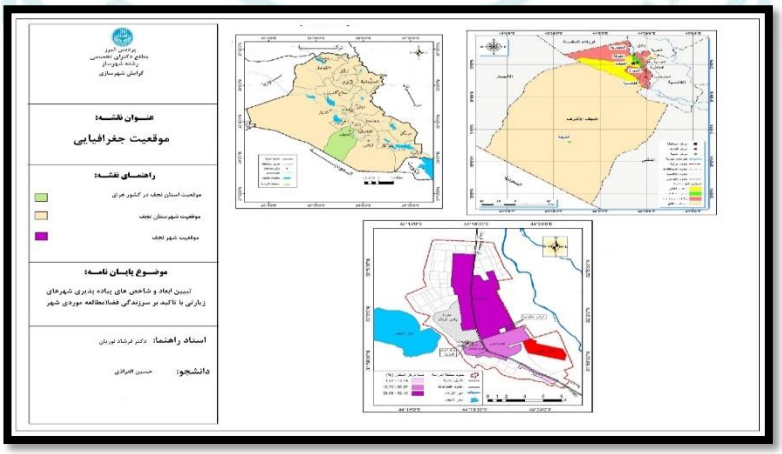
Research method

The statistical population includes citizens and pilgrims of Najaf who were present in the area around the holy shrine of Imam Ali (as) at the time of the research. This group was selected because they have the most experience with urban and pedestrian spaces. Using the Cochran formula and a 95% confidence level, the final sample size was determined to be 384 people.

Study area

Iraq is located in the northeast of the Arab world to the southwest of the Asian.(maqdad Majidet al.2016)

The city of Najaf is located in the center of Iraq and borders Al-Anbar province from the west, Babol and Karbala provinces from the north, Diwaniyah province from the east and Al-Muthani province from the south.(Wissam Neeme Rajab Al-Khafaji 2018; 55)



Map 1-3: Location of the city o Najaf the writer

Analytical findings

Among the respondents 56% were man and 44% were women. In terms of marital status, 62%were married and 38% were single.

The examination of age groups showed that the majority of respondents were in the age group of 31 to 40 years , 39% while the age group of less than 30 years was about 26% and over 50 years was only 12% of the sample.

In terms of education level, 10% had an associate's degree 42% had a bachelor's degree, 34% had a master's degree and 14% had a doctorate. In term of residence about 52% of the respondents lived in the city of Najaf and 48% were foreign or domestic pilgrims.

First hypothesis: the pilgrimage city of Najaf has the highest level of importance and priority in achieving a vibrant city in terms of physical and functional dimensions. In order to examine this hypothesis, 20 indicators related to physical components (aesthetics, lighting, architecture and urban furniture) and functional components (transportation, services, social interactions and cultural spaces) were weighted using the SWARA method. After collecting the experts' questionnaires the data was merged with the average scores of each indicator and then SWARA calculations were performed.

The results showed that the physical dimension has more weight in the vitality of Najaf than the functional dimension with a difference of about 12%. However, both dimensions have complementary and synergistic roles, meaning that improved physical design has its impact through increased performance of spaces and social interactions.

In the qualitative analysis, experts believed that the architectural quality of religious places, night lighting and the design of public spaces such as squares and parks have the greatest effect on the vitality of Najaf.

In contrast, functional factors such as health services, welfare facilities and traffic planning are also of great importance but they play a more secondary role than physical quality.

Table 1: The results of fitting the indicators of the first hypothesis based on the SWARA method

Row	indicator	relative comparison value	coefficient	weight amount	normalized final weight	rank
1	Architectural quality of religious places	----	1.00	1.000	0.094	1
2	Night lighting and beautifying the environment	0.10	1.10	0.909	0.085	2
3	Designing public squares and spaces	0.11	1.11	0.818	0.077	3
4	Quality of urban green spaces	0.10	1.10	0.744	0.070	4
5	Urban cleanliness and order	0.09	1.09	0.682	0.064	5
6	Quality of public transport	0.08	1.08	0.632	0.060	6
7	Reducing traffic in the city center	0.07	1.07	0.590	0.056	7
8	Amenities of (restaurants and cafes)	0.06	1.06	0.557	0.052	8
9	Cultural and artistic spaces	0.06	1.06	0.5526	0.049	9
10	The quality of urban furniture	0.05	1.05	0.501	0.047	10
11	Service and health facilities	0.05	1.05	0.477	0.045	11

12	Social interactions in markets and routes	0.04	1.04	0.459	0.043	12
13	Easy access to places of pilgrimage	0.04	1.04	0.441	0.041	13
14	Resting areas for pilgrims	0.04	1.04	0.424	0.040	14
15	Various cultural and religious programs	0.03	1.03	0.412	0.039	15
16	Safety of urban routes	0.03	1.03	0.400	0.037	16
17	Quick access to emergency services	0.02	1.02	0.392	0.037	17
18	A place for families to play and have fun	0.02	1.02	0.384	0.036	18
19	Organizing advertisements and city views	0.02	1.02	0.376	0.035	19
20	The beauty of visual coordination of buildings	0.01	1.01	0.372	0.035	20

The analysis of the results shows that the first 5 indicators of(religious architecture, lighting, design of squares, green spaces and cleanliness) include more than 40% of the total weight of importance.

This means that the perceived quality of Najaf depends above all on the visual effects and the physical arrangement of the space.

On the other hand, lower indicators such as recreational spaces and visual coordination of facades although they are important but according to experts they were less realized in the current conditions of Najaf and have a more indirect effect on creating vitality.

A comparative study showed the weights related to two main dimensions:

- Physical dimension = of total weights =0. 54
- Functional dimension: of sum of weights = 0.46

Therefore, the importance ratio of the two dimensions is about 1,17 to 1 which confirms the superiority of the physical dimension.

Supplementary statistical analysis with independent T test between two groups of physical and funvtional indicators showed that the difference in average weights is significant at the 95% confidence level. (t=2.47, p=0.021) this result also confirms the research hypothesis from a statistical point of view.

From an interpretive point of view, these findings indicate that in pilgrimage cities like Najaf well-constructed physical spaces, favorable lighting and original religious architecture can be directiy effective in the spiritual perception and peace of pilgrims.

Results and ranking of indicators of the first hypothesis

Table2 : of the final ranking of the indicators of the first hypothesis of the method (SWARA)

Row	Indicator	Final weight	Importance percentage (%)	Rank
1	Architectural quality of religious places	0.094	9.4	1
2	Night lighting and beautifying the environment	0.085	8.5	2
3	Designing public squares and spaces	0.077	7.7	3
4	Quality of urban green spaces	0.070	7.0	4
5	Urban cleanliness and	0.064	6.4	5

	order			
6	Quality of public transport	0.060	6.0	6
7	Reducing traffic in the city center	0.056	5.6	7
8	Amenities of (restaurants and cafes)	0.052	5.2	8
9	Cultural and artistic spaces	0.049	4.9	9
10	The quality of urban furniture	0.047	4.7	10
11	Service and health facilities	0.045	4.5	11
12	Social interactions in markets and routes	0.043	4.3	12
13	Easy access to places of pilgrimage	0.041	4.1	13
14	Resting areas for pilgrims	0.040	4.0	14
15	Various cultural and religious programs	0.039	3.9	15
16	Safety of urban routes	0.037	3.7	16
17	Urban emergency services	0.037	3.7	17
18	A place for families to play and have fun	0.036	3.6	18
19	Organizing advertisements and city views	0.035	3.5	19
20	The beauty of visual coordination of buildings	0.035	3.5	20

Weighting the indicators of the second hypothesis with the SWARA method

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Table3 : the results of the the indicators of the second hypothesis with the SWARA method

Row	Indicator	Relative comparison	coefficient	Weight amount	Normalized final weight	Rank
1	Safe and beautiful design for sidewalks	----	1.00	1.000	0.101	1
2	Reducing traffic and noise pollution	0.08	1.08	0.926	0.094	2
3	Suitable and standard urban furniture	0.09	1.09	0.850	0.085	3
4	Cultural and artistic programs on the sidewalks	0.08	1.08	0.787	0.079	4
5	Incentive policies for car restrictions	0.07	1.07	0.736	0.070	5
6	Increasing the sense of safety for pedestrians	0.07	1.07	0.688	0.066	6
7	Facilitating access to city services	0.06	1.06	0.650	0.062	7
8	Green space and suitable canopy	0.06	1.06	0.613	0.058	8
9	Implementation of continous maintenance and cleaning policies	0.05	1.05	0.584	0.055	9
10	Strategies for reducing speed	0.05	1.05	0.556	0.052	10

	around sidewalks					
11	Easy school access to public spaces	0.04	1.04	0.534	0.050	11
12	Creative design and identification of sidewalks	0.04	1.04	0.513	0.048	12
13	Increase opportunities for social interaction	0.03	1.03	0.498	0.046	13
14	Creating multi-purpose spaces on the pedestrian path	0.03	1.03	0.483	0.044	14
15	Air pollution reduction policies	0.03	1.03	0.469	0.042	15
16	Lighting and night security	0.02	1.02	0.460	0.041	16
17	Furniture maintenance and general cleaning	0.02	1.02	0.451	0.040	17
18	Seasonal social events	0.02	1.02	0.442	0.039	18
19	Community participation in urban decision-making	0.01	1,01	0.438	0.038	19
20	Improving communication infrastructure	0.01	1.01	0.434	0.037	20

Table4: the final ranking of the indicators SWARA method:

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row	indicator	Final weight	Importance %percentage	rank
1	Safe and beautiful design for the sidewalk	0.101	10.1	1
2	Reducing traffic and noise pollution	0.094	9.4	2
3	Standard and suitable urban furniture	0.085	8.5	3
4	Cultural and artistic programs on footpath	0.079	7.9	4
5	Incentive policies for car restrictions	0.070	7.0	5
6	Increasing the sense of safety of passers-by	0.066	6.6	6
7	Facilitating access to city services	0.062	6.2	7
8	Green space and suitable canopy	0.058	5.8	8
9	Continuous maintenance and cleaning footpaths	0.055	5.5	9
10	Speed reduction strategies	0.052	5.2	10
11	Easy access to public spaces	0.050	5.0	11
12	Creative design and identification of routes	0.048	4.8	12
13	Increasing social and cultural interactions	0.046	4.6	13
14	Creating a multi-purpose space on the footpath	0.044	4.4	14
15	Air pollution reduction policies	0.042	4.2	15
16	Lighting and night security	0.041	4.1	16
17	Furniture maintenance and general cleaning	0.040	4.0	17
18	Holding seasonal social	0.039	3.9	18

	events			
19	Comprehensive participation in urban decision-making	0.038	3.8	19
20	Improving communication infrastructure	0.037	3.7	20

Selected final indicators and total weght of combinations

row	The final index	Main dimension	Final combined weight	Imotrance percentage %	Rank
1	Safe and beautiful design for sidewalk	Physical-functional	0.096	9.6	1
2	Architectural quality and design of religious places	Physical	0.091	9.1	2
3	Reducing traffic and noise pollution	Physical-politics	0.087	8.7	3
4	Suitable and functional urban furniture	physical	0.081	8.1	4
5	Nighttime urban lighting and beautification	physical	0.077	7.7	5
6	Green spaces and natural shades	Physical-environmental	0.071	7.1	6
7	Cultural and artistic programs on the sidewalks	Social-policy	0.066	6.6	7
8	Incentive policies for car restrictions	policy	0.058	5.8	8

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Table 6: Relative Impact of Each Dimension in the Overall Model, Average Weight of Indicators Assigned to Each Dimension

Dimension	Average combined weight	The percentage of the final share of the construction model
physical	0.082	41%
Social-policy	0.048	24%

Table7: complete SWARA model analysis results based on expert opinion

rank	indicator	Average importance	Sj Sj Relative importance	Kj=Sj+1K j=Sj+1	Initial weight Qj Qj	Normalized final weight
1	Q20 the feeling of belonging to the place of emotional connection with the space	3.467	0.000	1.000	1.000	0.0566
2	Q9 presence of pedestrian guidance signs,(signs, maps, location information)	3.367	0.030	1.030	0.971	0.0549
3	Q6 Accessiblity for all(ramps, tactile signs, ease of passage for people with disabilities)	3.300	0.020	1.020	0.952	0.0539
4	Q17 easy access to welfare servoces and catering(near restaurants, cafes, shopping)	3.300	0.000	1.000	0.952	0.0539

5	Q10 comfort facilities on the way to (the bench, trash can, toilet)	3.167	0.042	1.042	0.913	0.0517
6	Q15 the cultural and historical identity of the space reflects (the identity of the city of Najaf in design and use)	3.167	0.000	1.000	0.913	0.0517
7	Q4 continuity and connection of non-stop walking paths	3.167	0.000	1.000	0.913	0.0517
8	Q1 safety of footpaths against vehicles and environmental hazards	3.133	0.011	1.011	0.904	0.0511
9	Q12 the presence and activities of people(the presence of different classes of various activities)	3.133	0.000	1.000	0.904	0.0511
10	Q11 the diversity and attractiveness of the uses of the edge of the space (of the service cultural restaurant shop)	3.100	0.011	1.011	0.894	0.0506
11	Q13 the presence of spaces for gathering and interaction(meeting places, resting, talking)	3.000	0.033	1.033	0.865	0.0490
12	Q2 the quality and condition of the flooring of(the	3.000	0.000	1.000	0.865	0.0490

	sidewalks is smooth without resistance)					
13	Q7 the visual appeal and landscape of (the walkway , the easthetics of urban elements)	2.900	0.034	1.034	0.837	0.0473
14	Q18 the quality and attractiveness of design of public spaces, architecture, artistic element of lighting	2.900	0.000	1.000	0.837	0.0473
15	Q19 dynamics and changes during the day and night of activity at different hours	2.900	0.000	1.000	0.837	0.0473
16	Q3 adequate width of the sidewalks for easy movement of wheelchairs	2.867	0.012	1.012	0.827	0.0468
17	Q14 a sense of security and peace in space a sense of psychological and physical security	2.867	0.000	1.000	0.827	0.0468
18	Q5 the presence of canopy and temperature-reducing elements of artificial canopy trees	2.867	0.000	1.000	0.827	0.0468
19	Q8 air quality and lack of noise pollution , clear air, sound peace	2.833	0.012	1.012	0.817	0.0462

20	Q16 the existence of religious cultural events and activities, celebrations, exhibition	2.833	0.000	1.000	0.817	0.0462

This ranking shows the most important indicators from the experts' point of view, which should be given special attention in urban planning decisions the development of pilgrimage spaces and the management of pilgrimage sidewalks. Especially indicators such as the quality of welfare facilities and pedestrian guidence signs, air quality and accessibility for everyone are of great importance.

Table8: the final integration of the dimensions and indicators of the vitality model of the pilgrimage city of Najaf

Main dimension	Selected key indicators	Combined weight (W_{gvn})	Relative share %	Importance rating
physical	Safe and beautiful, lighting, design of urban furniture, green spaces, religious architecture	0.082	41	1
Social policy	Incentive policies , cultural programs, social interactions, public participation	0.048	24	3

Ultimately, the research's final SWARA-based model, integrating weights and inter-indicator relationships, proposes the following structure for realizing a vibrant pilgrimage city.

Table 9: Final integrated vitality model for Najaf's pilgrimage city

level	Key elements	Role in the vitality model
Level1: physical	Space design, lighting, urban furniture, religious architecture	The basis of the spatial experience and the beauty of the environment
Level2: social policy	Cultural programs, car traffic	Ensuring dynamism and

	restriction , social participation	human interaction

This model rests on interactive relationships among space, function, and people, fully confirming the research hypotheses. Thus, a vibrant pilgrimage city is one where spatial beauty, efficient services, and coordinated cultural policies operate synergistically, creating a lasting experience of presence and tranquility for pilgrims and residents.

Conclusion

The study concludes that urban vitality in the pilgrimage environment of Najaf is the result of the synergy of three main dimensions: physical, functional, and socio-political. The physical dimension plays the leading role in spatial perception and initial attraction of people, but without adequate functional services such as transport, cleanliness, welfare facilities, and managerial policies like vehicle restriction and cultural programs, this vitality will not be sustained.

The findings show that vitality in Najaf's pilgrimage fabric emerges from the interaction of two core dimensions: physical and socio-political. Weighting results using SWARA indicate that the physical dimension, with an approximate share of more than half of the total, plays an initiating and determining role in shaping the perception of vitality, while the socio-political dimension accounts for around one-quarter of the total weight. Statistical tests reveal significant differences between these roles [($t = 2.47$, $p = 0.021$; $F = 6.42$, $p < 0.05$)] and strong correlations between physical and socio-political dimensions [($r = 0.79–0.87$)], underscoring their mutual dependence and the need for alignment between spatial design, urban services, and policymaking. From a theoretical perspective, the results highlight three key points: (a) the initiating role of the physical dimension,

where changes such as façade improvement, paving, furniture, and lighting act as first triggers of positive spatial perception and quickly enhance attractiveness and willingness to stay; this aligns with environmental behavior and environmental psychology theories that stress perceptual quality as a prerequisite for collective behaviors in public spaces; (b) the sustaining role of functional services, as accessible transport, hygiene, cleanliness, and maintenance stabilize and prolong the experience of presence—physical form "invites" while functional services "retain" presence; and (c) the interactive, synergistic role of policy, where measures such as vehicle restriction, cultural programming, and support for local businesses not only function as direct interventions but also can amplify or weaken physical effects, making institutional coordination essential for lasting outcomes. In practical and policy terms, the study proposes a set of short-term actions (up to 12 months) with rapid and low-cost impact. These include: improving and standardizing lighting along routes leading to the shrine and main squares (responsibility of the municipality and regional lighting authority); installing standard urban furniture such as benches, temporary shading, waste bins, and pedestrian signage (municipality); increasing the frequency of cleaning and waste management during peak pedestrian hours (waste management organization); and piloting time-limited vehicle restrictions on one key axis to immediately assess impacts on safety, environmental quality, and pedestrian vitality (traffic management and municipality).

For medium-term actions (1–3 years), the study recommends structural changes to strengthen walkability and urban vitality in Najaf. These include redesigning pedestrian routes with priority for accessibility for people with limited mobility, creating continuous paths and removing obstacles (under the responsibility of the urban development organization and the technical department of the municipality), expanding linear green spaces and planting shade trees along pedestrian routes (green space organization),

developing peripheral parking lots and a clean shuttle-bus system to transfer pilgrims to the pilgrimage core (traffic and urban transport management), and standardizing façades and commercial fronts around the shrine area. From an operational perspective, the findings point to several key strategies for managing the city of Najaf: (1) development of a safe and attractive pedestrian network focused on access to religious sites; (2) increasing per capita green space and standard urban furniture, especially around the Holy Shrine; (3) establishing a robust system of continuous urban maintenance to preserve cleanliness and order; (4) holding regular cultural and religious events in public spaces; and (5) formulating traffic and incentive policies to reduce vehicle flow in the central area. These five strategies, acting synergistically, can sustain and enhance dynamism and vitality in the urban spaces of Najaf.

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