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Designing Shiraz Urban Laboratory with a Social Sustainability Approach

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Abstract*:* Today, urban laboratories introduce a wide range of methodological and conceptual methods to solve urban complexities as an emerging model of urban innovations and a new method in urban management. This project aims to design a Shiraz urban laboratory inspired by object-oriented theory and sectional object diagrams to achieve flexible spaces for experimentation, co-thinking, and co-creation of experts and designers in the design field. According to the nature of the subject and the goals considered, this study is classified in the class of applied and qualitative research. Also, the methodology is considered a descriptive and analytical study simultaneously. At first, through library and internet studies, using the comments of specialists related to urban design and evaluating successful samples in Iran and the world, information on urban laboratories, their objectives, and activities, as well as laboratories' functionality on an absolute scale, were collected. Then the collected studies were categorized based on their value and importance.

Keywords: urban laboratories, co-creation, social sustainability, Shiraz urban laboratory

Introduction

In the next few decades, most of the world's population will live in urban environments. Many new megacities are either under development or not yet developed [1, 2]. How these cities are realized, and the lifestyle developed in them determines the stability or instability of the future society [3, 4]. Although the progress seems alarming, if we cannot potentially imagine a different and more attractive lifestyle compared to now, we cannot hope to change the future. A strong belief in the realization of sustainability worldwide leads to the multiplicity of ideal cities for residents. It is the key to responding to the challenges in the current world [5].

On the other hand, realistic optimism with a hopeful look to the future in solving problems is the characteristic feature of designers. Due to having such features, designers are known as the saviors of the future world. The hope of solving difficulties through design-oriented solutions makes the desire to have a sustainable and responsible life in the present and the future more believable and probable. It emphasizes the use of design thinking in solving the challenges of the present world and the need for the cooperation of designers [6].

The incredible speed of changes, complex and multidimensional issues, and the necessity of a forward-looking view make the role of interdisciplinary interactions more significant day by day. Contrary to this vital need, the division of knowledge into distinct specialized fields and the tendency of the new generation of specialists and designers towards autonomy and individual work have challenged collective cohesion and integration more than before. This autonomy and insular functions have made cooperation and participation devoid of holistic meaning, aesthetics, and perfection. Overcoming the feeling of confusion and chaos over the formative experience and multifaceted influence has led to the victimization of the whole under the influence of the competition between the parts. The future becomes the sacrifice of the present moment, and the whole is reduced to something less than a collection of parts [7].

As a result, the need to address the upcoming challenges and issues with a sustainable approach, the necessity of the participation of designers and experts in the formation of a more sustainable future and providing a platform for nurturing and growing a more integrated society in this direction is considered a vital need. One of the emerging and effective answers to this challenge is the development of urban laboratories, whose role has recently been evaluated in the real world.

Urban laboratories, as a new method in urban management and an emerging model of urban innovations, introduce a wide range of methodological and conceptual methods to solve urban complexities. Urban laboratories based on a platform approach at the scale of the city invite all citizens, tourists, professionals, entrepreneurs, and all actors to experiment, experience, create, and innovate [8]. In the path of realizing the future, urban labs provide many alternatives without prejudging and considering fixed and predetermined solutions and provide the opportunity to participate in and influence urban processes and activities for all people. In addition, urban laboratories are intermediaries between the community and the local government and have transparent management and systematic structure according to the goals and environmental conditions. To create long-term relationships, urban laboratories create new experiences in limited time frames and gain maximum benefit and learning from the experiences of their diverse members. Finally, through interaction with transparent and fair social values, they publish all their learning through a public structure to be available to the public [9]. According to the proposed definitions, the urban laboratory is an umbrella term including all systematic experimental methods in the context of the city, which supports several thematic laboratories [10].

On the other hand, social sustainability is defined as the realization of a healthy and fertile life in harmony with nature, which considers the survival and life of the society to be dependent on the preservation of environmental quality and related to economic systems in order to achieve the highest level of satisfaction. In the definition of social sustainability, researchers pointed to four main elements: social justice, social cohesion, participation, and security. In this view, social sustainability means improving the quality of life and developing human resources, and ultimately the ability of local communities to overcome internal challenges and issues, react to external changes, and maintain values. In this regard, the social goals of sustainable development are emphasized in the form of issues such as equal opportunities, empowerment, improving the quality of life, human dignity and equality, poverty alleviation, cultural diversity, social cohesion, institutional capacity building, social security, responsibility, social welfare, and emotional adherence to the location of life.

Therefore, in an urban laboratory based on the social sustainability approach, new ideas are proposed to correct urban challenges and problems according to basic human needs. What is more, social sustainability is realized when active systems, structures, and communications, formally and informally, strengthen the capacity of current and future generations to create healthy and livable societies. This goal corresponds to communication and coexistence in an urban laboratory. Considering the position of Shiraz city in the path of urban development and the use of designers' expertise in urban design, a platform for the formation of good events related to the city in the field of design has been provided. However, these events are scattered and isolated and usually do not lead to an effective event. Due to having organization and integration and providing study support to urban designers, urban laboratories in Shiraz are considered progress. In light of the above, designing an urban laboratory in Shiraz city seems vital.

Urban Laboratory

The innovative idea of urban labs is attributed to William J. Mitchell of the MIT Media Lab [11]. This concept was first proposed in the 1990s to complement human-centered, collaborative, and user-centered approaches to design challenges. The need for new methods to strengthen the influence of leading people in all fields necessitated the emergence of urban laboratories [12]. In essence, urban labs are designed to expand innovation by including diverse participants in interactive processes.

Recently, research in urban laboratories has been extended from research and development of the private sector or start-ups to complex social contexts [13]. Due to participation and collaboration, testing, and results from natural environments and participants' daily life, this concept has been more and more considered. From this point of view, urban laboratories are considered potential innovation triggers in the urban environment, as they significantly generate local knowledge related to the development of dependent capital, which is crucial for testing new relations, arrangements, and governmental practices. As a result, they can stimulate the intellectual and follow-up activities that begin with experiments. It can also stimulate individual and collective changes and turn the results and feedback of the laboratory into a source of learning so that the path is provided for applying systemic and behavioral changes [11]. Urban laboratories are future-oriented platforms and provide practical

solutions in diverse fields for future development. These initiatives can turn visions and discourses about future urban well-being into reality [9].

Urban labs provide diverse pathways to ensure ambitious change through evidence-based interventions and integrating innovation and research processes. The ultimate goal of urban laboratories is education, learning, and innovation in order to strengthen urban sustainability. The role of learning and innovation processes resulting from experimentation is critical to realizing the performance of urban laboratories. Observations recorded in urban laboratory experiments enable the implementation of a repeatable process by applying continuous adjustments to the local context and maintaining them in continuous evolution. Evaluating the effects achieved and the actions taken strengthens the capacity of the urban laboratory to facilitate formal learning. Analyzing actions, data, impacts, and participant feedback are critical to improving visions and goals over time. The results and feedback from these activities can enhance understanding of sustainability issues in the public realm, as they are a source of learning toward systematic change. Learning from information can lead to the formation of direct behavioral changes towards sustainable actions, provided that they are institutionalized in the institutions, practices, and thoughts of the participants. Therefore, such activities can be valuable for putting pressure on existing regimes. Urban labs can challenge urban governance and improve the process of achieving sustainability [14].

Urban labs connect actors from different disciplines and sectors with various competencies, skills, knowledge, political influence, and financial resources to complement each other [14]. For example, the private sector has a significant advantage in providing expertise to manage and maintain complex projects. It can also become valuable by providing adequate and timely funding and maintaining services [15]. At the same time, government involvement in policy change encourages investments and supports cooperation between stakeholders who want change.

Urban Sustainability

Cities can become places to engage in multifaceted and ambitious work. They constantly face instability issues, centralize future (and current) production and consumption processes, and, as an operational unit, facilitate the design and effective implementation of specific actions [16]. In the past, urban sustainability was given to urban planners through public consultation processes and environmental assessments. However, today, urban laboratories are involved in an increasingly interventionist and learning approach, especially where the realization of sustainability seems urgent [17]. These learning processes contribute to developing emerging experimental processes in response to sustainability issues. They can be realized through the participation and consultation of participants or control and data management systems and intelligent applications [9]. Information technology can help strengthen evidence-based policymaking through quantitative performance measures. Therefore, urban labs can communicate investment decisions, refine selected strategies, and measure implementation success. The development of specific criteria to solve urban sustainability challenges can encourage transparent urban governance, promote urban participation and positively impact decision-making at different levels to strengthen democracy, local information, and empowerment.

Sustainability challenges and climate change concerns, as the most urgent issues of the 21st century, require an urgent solution to equip environmentally and socially sensitive approaches to urban management and development, which requires high levels of innovation and more profound economic, behavioral, and political changes [18]. Social justice, democracy, sustainability, and improving quality of life are the new drivers for realizing social innovation and replacing economic growth, increasing efficiency, dispersion of resources, etc. This process requires a re-evaluation of the fundamental values and standards of societies.

Concepts related to social sustainability at the architectural level are defined by focusing on maintaining and improving the quality of human life and aligning with nature. In this regard, the development of a platform for the emergence of creativity and the provision of social goals of sustainable development to guarantee a better life for all members of society is considered. The role of two vital elements of social development, including participation and empowerment of people to achieve greater prosperity, is vital. Social sustainability, along with social and human capital themes, can synchronize concepts such as health and hygiene, skill level, wisdom, and social homogenization with mutual benefits and preservation of values by emphasizing balance, justice, and freedom.

In this view, social sustainability causes more interaction, provides the basis for people's empowerment, and increases their sense of belonging to the place of life. The instability in environmental and economic dimensions is caused by the lack of attention to social dimensions and the lack of stable institutions, which has manifested in economic imbalances, inequality, poverty, unemployment, and resource destruction. As a result of emphasizing the social dimensions of sustainable development, their role and place in the strategic planning process have been given more attention than in the past.

[Insert Figure 1 near here]

[Insert Table 1 near here]

According to the data extracted from the research studies, their analysis, and their matching with the selected case samples, five main factors were determined in the selection of the site and the design of the urban laboratory, shown in Table 2.

[Insert Table 2 near here]

Research Methodology

According to the nature of the subject and the goals considered, this study is classified in the class of applied and qualitative research. Also, the methodology is considered a descriptive and analytical study simultaneously. The selected descriptive strategy is to conduct a systematic literature review. A descriptive-analytical method is considered to collect qualitative data. Most of the data required to identify the characteristics of urban laboratories have a defining aspect. For this reason, the goal of analyzing existing research (collected, produced, and published by other authors) is to reach a saturation point, That is, when it is possible to answer all the questions using the collected data, and more collection leads to the collection of duplicate data. According to the selected approach and the functioning of the Shiraz Urban Laboratory at the macro level, all the people of Shiraz can be affected by the activities and decisions of the urban laboratory.

Site Analysis

Meshkin Pham ST. is located in District 1 of Shiraz Municipality, on the south side of Azadi Park, i.e., between Somayeh ST. and Enghelab BLV. District 1 with an area of 4070 hectares is located from the north to the service area of the detailed plan, from the east to Har ST., Saadi ST. and Zand ST. and Moshir Fatemi to Baskol Nader, from the south to Esteghlal ST. and Pasdaran BLV, Moallem SQ. and Jonoubi Hammet to the beltway intersection, and from the west to the area of Jabal Drak to Ehsan SQ. and Dr. Shariati ST (Maali Abad). This area is located in the commercial/administrative, health, medical, educational, and cultural heart of the city. It is also considered a vital infrastructure in the set of subsystems of Shiraz city. The main characteristics of this area include the following:

1. Having an essential service and commercial economy
2. High-level socio-economic development
3. Establishment of vast gardens and natural landscapes
4. Centers of vital activities
5. The transit role of the region in the entire city
6. The passage of the first metro line with eleven stations in the region, the passage of the second metro line from the eastern border, and the deployment of the first station of the third line in Shariati ST (Detailed Plan of Shiraz, 2013)

The approach of the Shiraz urban laboratory in Meshkin Pham ST is in line with the vision of Shiraz city, District 1, and the goals of the detailed plan. The specifications of the development perspective in the strategic plan of Shiraz are as follows:

- Shiraz, the cultural capital of Iran

- Shiraz, the city of superior services and production support on the coast of the Persian Gulf
- Shiraz is the best tourism city at the national and international level
- Shiraz, electronic city, center for technology, information and communication systems
- Shiraz is a green, clean and stable city (Detailed Plan of Shiraz, 2013)

The vision of District 1 is described in the detailed plan as follows:

District 1 represents the contemporary urban identity of Shiraz and attracts governmental, modern business, tourism, and cultural activities with the sustainability of local settlement and natural environment (Detailed Plan of Shiraz, 2013).

[Insert Figures 2, 3 near here]

Physical Design and Design Criteria

Based on the concept and architectural approach stated in Chapter 5, the urban laboratory of Shiraz can be divided into two fields regarding its activities and processes, its function and role in the architectural approach of the studied subject, including:

1. Social and shared field
2. The field of co-creation and experimentation

Sharing all the achievements, lessons, and experiences gained from every challenge and project in the Shiraz urban laboratory with the community and training them for better use through socializing and collective activities will bring the people of the community closer and strengthen the social spirit. Also, service activities such as parking, sanitary service, etc., are defined in this field. Regarding usage and functionality, the space components of this field can be introduced, as shown in Table 3.

[Insert Table 3 near here]

Users and visitors to the Shiraz urban laboratory are audiences of this field who are invited to the laboratory daily through intra-organizational plans. The space components of this field are defined based on the research objectives and activities of urban laboratories which are shown in Table 4.

[Insert Table 4 near here]

Based on the user's nature and each project's requirements, the Shiraz urban laboratory is a self-governing, multi-functional process with variable users. Therefore, it is impossible to realize a reliable capacity for every space. Also, the knowledge of the capacities and the number of referrers and users is the starting point or controller of the project. From this point of view, the number of primary users (designers, specialists, etc.) and general users (citizens of Shiraz) who enter simultaneously are 50 and 100, respectively. The spaces are considered more significant for the possible expansion of the plan in the future. Estimates are presented in Table 5.

[Insert Table 5 near here]

Conclusion

In light of the above, due to having the necessary elements to meet the spiritual and physical needs of the people, Meshkin Pham Street is considered an essential element in the urban space of Shiraz. As a result, developing a space such as an urban laboratory with a new perspective can enrich this social presence. The urban laboratory is a unique space covered by the neighborhood context and a space for people. The integration of dense residential context and park space has led to the development of a homogeneous social context. Also, due to traffic issues affecting the process of social transitions, developing a platform for the passage of people is very important in creating spatial qualities. The establishment of Azadi Park has helped to solve this crisis, energize the pedestrians and attract the audience and, subsequently, has justified the choice of this site even more. At the same time, the green space of the park also plays a vital role in improving the spatial qualities and is a positive factor for the active participation of citizens. Shiraz urban laboratory acts as a platform for the development of co-thinking, co-

creation, and learning in all fields related to the city, design, and solving mental and practical dead ends in urban micro and macro decision-making.

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Tables

Table 1. Comparing and matching with case studies.

Comparing and matching with case studies			
Parsons DESIS Lab	UFRJ/Coppe DESIS	Urban laboratory of the future city	TUIC Urban laboratory
Creating correspondence between design and social change	Efforts in the field of design to create social innovation and service design	Creating a platform for human-centered designers, design strategists, and those interested in solving problems through design	Creating innovative, feasible, and scalable solutions
Enhancing the practice and discourse of design-based social innovation to foster more equitable and sustainable practices	Fostering initiatives through design at the intersection between service design and social innovation	Participation and experimentation to create innovation	Knowledge production based on research-oriented design and design-oriented research
Providing fine-grained approaches derived from design practices	Supporting and promoting social innovation initiatives through designing solutions	Activity-based on design thinking and architecture	Providing services and products related to physical space at the object, building, and city scale
Filling structural gaps, valuing tacit knowledge, fostering dualities	Organizing learning initiatives Promoting cultural and communication initiatives	Problem-finding, problem-solving, planning, facilitation, acceleration	T-Lab, T-Studio, T-Pro, T-Residency, and T-Event

Table 2. Critical components for site selection and design of Shiraz urban laboratory (Source: author).

For participation, collective activity, promotion of knowledge, collective spirit, a place for face-to-face meetings	**Sociability**	**Shiraz urban laboratory with a social sustainability approach**
The ability to achieve the three principles of sustainability, especially social sustainability	Alignment with sustainability issues	
A sense of experimentation, curiosity about finding the truth, uncertainty about the outcome, wonder	Integration with a sense of experimentation	
Emerging and innovative, just like the urban laboratory	New and emerging	
Respond to the functional needs of the urban laboratory	Spatial responsiveness	

Table 3. Social and shared field (Source: author).

Sub-spaces	Activity	Theme (objects)	Fields
Amphitheater, meeting hall	Sharing	TREE no.3	Social and shared field
Co-working space, take-away cafe, shop, curator	Shared work, rest, and intra-organizational services	ROOD	
Parking, restroom	Services	SETTING	
-	Gaming Face to Face meeting Collective participation	PARK	

Table 4. Co-creation and experimentation field (Source: author).

Sub-spaces	Activity	Theme (objects)	Fields
Entrance, reception area, bookshelves, study and search space, vertical accesses	Search and Research	TREE no.1	Co-creation and experimentation
Entrance, reception area, construction workshop, workspace, atelier, studio, co-thinking space, meetings, vertical accesses	Co-creation and experimentation	TREE no.2	

Table 5. Total square footage required for each space (Source: author).

Area	Number	Components of space	Theme (objects)	Fields
250 square meters	15 to 20 people	Search and Research Library and computer	TREE no.1	Social and shared field
400 square meters	25 to 30 people	Construction workshops Atelier Studio Workspace	TREE no.2	
100 square meters	50 people 50 people	Amphitheater Meeting hall	TREE no.3	Co-creation and experimentation
1000 square meters	50 people 100 people 100 people	Shared workspace Take-away café Collective participation	ROOD	
3000 square meters	200 cars	Parking	SETTING	

40 square meters	10 restroom	Restroom		
210000 square meters	Unlimited	Gaming Face to Face meeting Collective participation	PARK	

Figure 1. Data analysis and matching with case samples (Source: author).

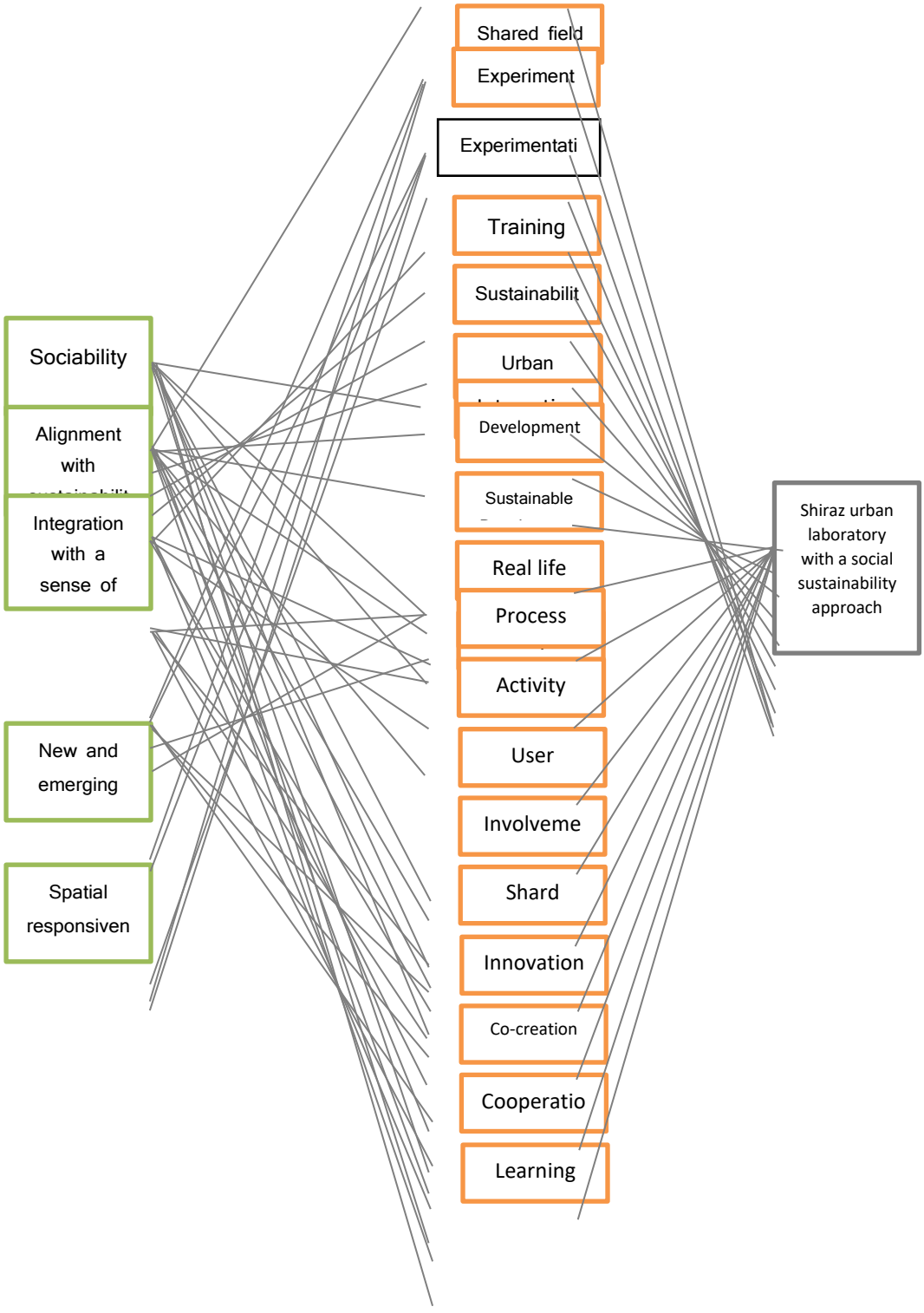

Figure 2. The location of the site concerning the city (1) (source: Google Maps).

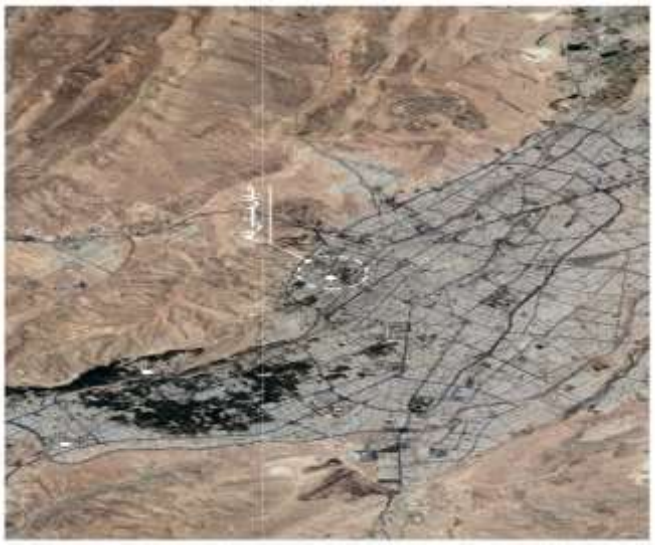

Figure 3. Pedestrian and rider access to the selected site (Source: author).

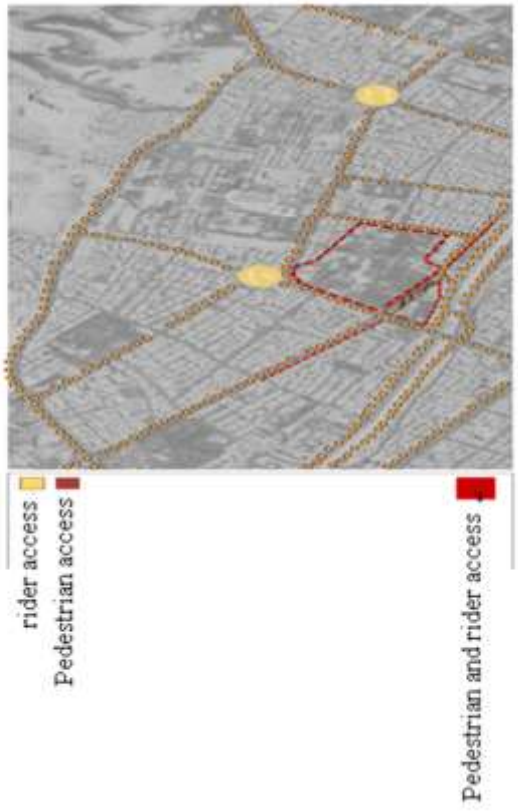

Figure captions

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