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# Explaining the Spatial Structure of Urban Neighborhoods; Case Study: Kerman City*

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## ABSTRACT

The city texture is discussed and analyzed in different aspects and dimensions. One of these dimensions is its "spatial structure". In simple words, structure refers to the features and elements of anything, and its absence means the absence or non-existence of that thing. In the present study, first, the concepts of "space and place" are defined, and then, it is tried to introduce various types of public places, including "passages, squares and plazas, waterfront circles, traffic circles, stairways, sidewalks, public rooftops, city/neighborhood gates, parks, and public gardens, open spaces between residential complexes, Rasteh bazaars and passages, and yards of mosques. Next, the commonalities and differences between terms such as "spatial organization and spatial structure" are investigated and the constituent elements of the spatial structure are presented. Since old public places (in old neighborhoods) and new urban spaces (in new neighborhoods) are the most important components of the spatial structure of neighborhoods, it is attempted to explain their role in the formation of the spatial structure of each of the inner-city, mid-city, and suburban neighborhoods and investigate the connection/disconnection between new and old public spaces in new and old neighborhoods through a case study (Kerman City). Reviewing relevant studies and scholars' opinions on the research topic indicates that it is not adequate to introduce urban design indicators for addressing the "spatial structure of the city texture" and it is required to select some indices considering these indicators to compare the selected neighborhoods of Kerman city in the structure. The present study is descriptive-analytic research where required data are collected through library and internet sources as well as observations and field studies in Iranian cities, including Kerman.

**Keywords**: Spatial Structure, Texture of Neighborhoods in Kerman, Spatial Organization, Spatial Structure Indicators, Qualitative and Quantitative Methods.

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## 1. INTRODUCTION

Neighborhoods have been of interest as the most basic and coherent general complexes constituting Iranian cities for a long time. The constituent elements of neighborhoods include private buildings - the most important of which are residential buildings - and public buildings including bazaars, mosques, bathhouses, schools, and on a larger scale, caravanserais, Ab anbar (cistern, in English)/ Yakhchal (ice house), gardens, mausoleums, and cemeteries (sometimes, fire temple), dispensaries, and some industrial buildings. Moreover, in the past, public places such as squares, and passageways, along the Rasteh bazaars and mosque yards, provided a place for gatherings and social interactions of neighborhood residents in Iranian cities and formed the structure of neighborhoods.

Nowadays, new neighborhoods have included new urban spaces such as traffic circles, streets, passages, and parks in their structure. In these new neighborhoods, interactive features and social interactions have a lower quality compared to the past because, due to the mixture of pedestrians and vehicles, the characteristics of being pedestrian-centric and human—centeredness have faded out. In this way, the quality of space has decreased and many characteristics of public places have disappeared in placelessness. Therefore, the term "space" has replaced "place" in such new neighborhoods, and the sociocultural role of neighborhoods receives less attention in today's society, making the confrontation of new spatial elements with the old place become a problem instead of being compatible with each other.

In this regard, this research seeks to answer the following main research questions arising from the abovementioned issues by studying and reviewing old and new urban neighborhoods in cities such as Kerman:

1. What valuable old public places and new urban spaces are there in Kerman city? (introduction of public places and urban spaces);
2. What role have the mentioned urban places and spaces played in the formation of the structure of the neighborhoods and the urban texture of Kerman? (effective and influential issues);
3. How influential was the neighborhood texture in the construction of urban places and spaces? (The mutual effectiveness of neighborhoods in creating public places/spaces);
4. How can the indicators and components proposed in this research be used to explain the spatial structure pattern of the neighborhoods in Kerman city? (Analysis of findings);
5. How can the prevailing relationships between public places/spaces and city neighborhoods be used to organize and arrange the damaged neighborhoods as well as build new neighborhoods in Kerman? (application of solutions).

## 2. RESEARCH PURPOSE

In general, answering the abovementioned questions is considered the research goal, and they are answered to explain the research topic. Otherwise, raising research questions is unnecessary.

It is important to develop and present the research vision and goals because they direct the research and relevant activities. Obviously, in the process of conducting research, research goals are refined in the form of operational objectives, and solutions in a hierarchical form and as maps.

### 2.1. Goals

1. Introducing the physical-spatial structure of the selected neighborhoods of Kerman city and the relationships between their components.
2. Relating space, time, form, function, and people's objective and subjective perceptions of the neighborhoods in the mixed arrangement of old and new neighborhoods.
3. Paying attention to the connection/disconnection between the physical-spatial structure of urban spaces in new neighborhoods and public places in the old neighborhoods of Kerman.

### 2.2. Operational Objectives

1. Introducing the authentic old and new neighborhoods of Kerman and comparing them in spatial structure.
2. Trying to synchronize the physical-spatial development of public places/spaces with the context related to it (neighborhoods) (linking text and paratext- ground and background)
3. Providing conditions for improving the legibility and structural transparency of the old and new neighborhoods of Kerman city and strengthening a lasting picture of the city.
4. Strengthening the aesthetic arrays in the parts and elements of the physical space of the public areas in the neighborhoods of Kerman.
5. Providing appropriate solutions to control and direct the physical-spatial development of the new neighborhoods of Kerman city.
6. Making the proposed solutions maximally comply with the status quo of the neighborhoods in Kerman.

## 3. THE NECESSITY OF RESEARCH

Presenting the problem statement, research goals, objectives, and the prevailing approach, the necessity of the research is clarified. In this regard, it should be acknowledged that the neighborhoods in every city represent the physical, social, cultural, and economic identity of that city and are considered one of the most important components of the structure of any city.

What makes the present study necessary is finding why the spatial-functional quality of today's neighborhoods in our cities has substantially declined,

how this problem can be resolved, how valuable old neighborhoods can be conserved, and how one can take advantage of the experiences of the past.

## 4. RESEARCH PRESUPPOSITIONS

The presuppositions proposed in this research are as follows:
- Old public places and new urban spaces in Kerman play an undeniable role in the formation of an important part of the physical-spatial structure of its neighborhoods.
- The context of the neighborhoods of Kerman also influences the establishment of public places/spaces.

Accordingly, in this research, the "independent variable" is the context of the selected neighborhoods of Kerman city and the old public places/new urban spaces in them. The "dependent variable" is the connection/disconnection between the physical-spatial structures of new and old neighborhoods of Kerman city.
In this way, presenting the presuppositions directs the research toward its conduction process and the approval of the research hypothesis.

## 5. RESEARCH HYPOTHESIS

It seems that the dimensions, components, and indicators of urban design, which include the components of function (activity), access, perception, visual landscape, society (and culture), form, space, ecology, time, intuition, and management, play an effective and significant direct role in explaining the spatial structure of Kerman's neighborhoods, especially its "effectiveness and affectability" so that the physical, activity, and perceptual aspects have the "greatest", "moderate", and "least" impact on the spatial structure of the neighborhoods, respectively. In other words, the substantive part of urban design dimensions dominates its procedural part.

## 6. RESEARCH METHOD

One of the most important parts of research is determining the research method and structure by which the research is carried out. In adopting the research method, the most important issue is the research approach to the research topic because it dictates the research direction and if this direction is not accurate or its situation is not scrutinized, it cannot direct the research in a specific direction.
In this regard, three approaches and perspectives are used:
The first approach, which is quantitative and called planning, investigates the city texture, urban places, and people basically in terms of size, number, or dimensions.
The second approach, which is qualitative and called designing, investigates public places/urban spaces and their relationships in terms of quality and human-centeredness.
It should be noted that each of these two perspectives also considers the other approach, but the dominant approach to the research subject is planning or designing.
The third approach considers it necessary to address both quantitative and qualitative approaches. Therefore, each of the first and second approaches can be considered an exclusive approach, and the third approach can be considered an inclusive approach. The role of the urban texture is investigated in number, size, and dimensions using the first approach, and in terms of quality using the second approach.

**Table 1. Approaches to Urban Texture Studies**

| | | |
|---|---|---|
| Exclusive Approach | The Public Arena of Public Places and Human ⟶ | Quantity |
| Exclusive Approach | The Public Arena of Public Places and Human ⟶ | Quality |
| Inclusive Approach | The Public Arena of Public Places and Human ⟶ | Quantity and Quality |

The methodology of the present study I as follows. First, the research literature, including methods applied for qualitatively studying, and investigating the concept of design dimensions in the urban context of Kerman, is reviewed and presented in the form of comparative tables and matrices through the "thematic analysis method". Most of the quantitative results extracted are measured using an analytical-evaluative method. That is, the weights and ranks of the spatial structure components are estimated using the AHP technique. next, since there is a semantic relationship between the criteria of the spatial structure components, the ANP technique is used to weigh the spatial structure of the selected neighborhoods. Finally, the Factor Analysis technique is used to categorize correlated criteria (metrics) of the same value.
The present study is "field-exploratory" research where "the texture of Kerman's neighborhoods as case studies" was investigated and analyzed based on objective and concrete studies, achievements, and foundations from the sum of conceptual and practical conclusions and judgments. Therefore, the required data were collected through library and field studies. It should be noted that this research was developed by using relevant specialized texts and comparing

case studies considering their special conditions. The analytical methods used in the present study include observation, interview, and document analysis. The method of observation is applied through anthropology and participation in the research.

## 7. THE STATISTICAL POPULATION

Since the present research addressed the urban texture of Kerman and its neighborhoods, the statistical population included the following areas:
- The old fabric of Kerman (that part of the city formed in the Qajar era – inner-city texture), as the scope of direct intervention; with an area of 200 hectares.
- Two neighborhoods in the adjacent peripheral area (mid-city texture); the Zarisaf neighborhood with an area of 36 hectares, and the Koucheh Mahani neighborhood with an area of 44 hectares.
- Two neighborhoods in the influenced area (suburban texture); the Shahid Bahonar neighborhood with an area of 80 hectares, and the Houshang Moradi Kermani neighborhood with an area of 75 hectares.

The reason for choosing the Qajar area of Kerman city is its relatively limited and enclosed area as well as the unique characteristics of each neighborhood in it, which guide the researcher in achieving the research goals. Also, the new neighborhoods were selected based on their characteristics, which distinguish each one from the others and make it characteristic in the city.

## 8. RESEARCH BACKGROUND

Reviewing relevant studies indicates that the various methods and techniques applied to investigate and analyze the fabric of Iranian cities have been explained in different ways. Usually, more studies have addressed the "texture structure" or "spatial organization" of cities and their neighborhoods. Despite the similarities between them, there are also substantive differences between them.

The present research topic is one of the most up-to-date and important topics related to neighborhoods and the relationship between their structural constituents, and appropriate studies have been conducted on it in the world. In general, in Iran and the city of Kerman, this topic has not been studied from this perspective considering its climate, religions, history, diverse cultures, population, and policies, and it has remained abandoned and neglected in studies on various dimensions of urban neighborhoods.

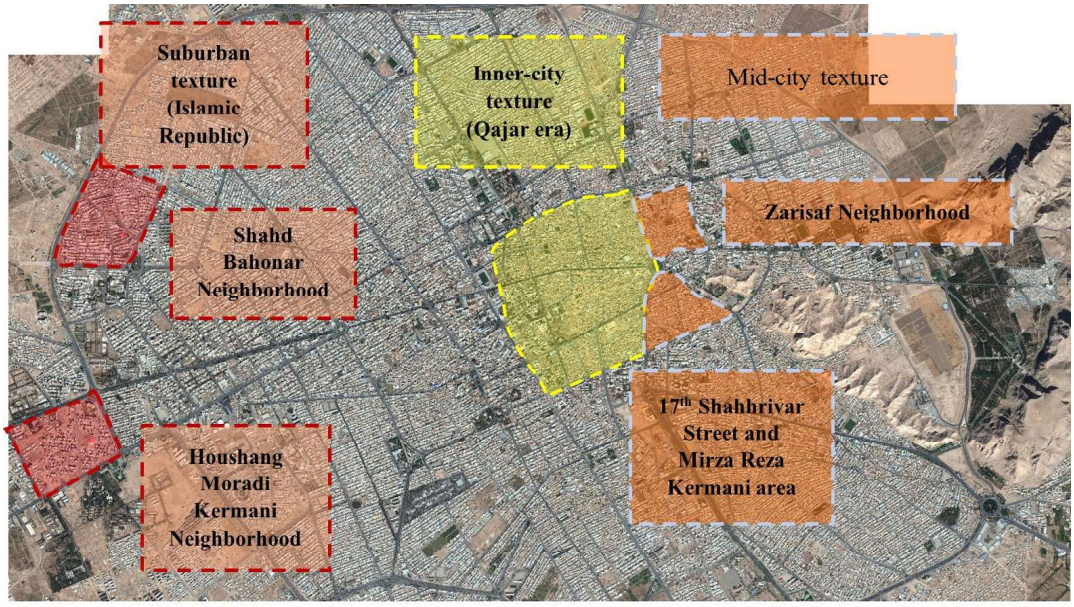


**Fig. 1. A View of the City of Kerman and the Location of the Research Population**

## 9. "SPACE" AND "PLACE"

Space is an empty area that is structured in the form of infinity with the nature of emptiness. When the emptiness is disrupted through the occupation of the mass, the infinity would be disrupted and a limitation and confinement are imposed on the space. These keep it away from being pure space. What remains in this way is "place", not space. However, in the literature of architecture and urbanism, the term space has been used instead of the term place for centuries. Accepting that space is the essence of place and the essence of design, there is no deep objection to this practical process. The texture does not become meaningful without considering the existence of the mass and any other dimension in the space. Therefore, in practice,

when it comes to the spatial structure of the texture, the "place" is referred to. Places can be a small cell, or the whole universe (Malek Abbasi 2019, 13).

### 9.1. Definition of the Term "Space"

[Bernard] Chomey reminds us that there are two approaches to the definition of space:
1. "Distinguishing space"; is a prescriptive dimension that is of interest to art and architecture.
2. "Expressing the exact nature of space"; is a descriptive dimension that is of interest to philosophy, mathematics, and physics (Madnipour 2000, 9).
Of course, here the inclusion of space is more intended than the space. "Bruno Zevi" considers space to be the essence of architecture: "It doesn't matter how beautiful the facades and walls of a house, church or palace are; they are only containers. The walls shape the box. The entity and content is the interior space." This concept is still widely accepted. For example, according to "Van der Laan", "the architectural space emerges by erecting two walls; they create a new space between themselves and it is separated from the natural space around them".
"Zevi" considers the same definition for urban space. According to him, streets, squares, parks, playgrounds, and gardens are all "empty spaces" that are limited or defined to create an enclosed space (ibid., 10).

(https://tabriz.airport.ir)
(available on 6 Jan 2018)

(https://upload.wikimedia.org/wikipedia)
(available on 6 Jan 2018)

**Fig. 2. Abstract Space Resulting from Modern Architecture and Urbanism**

In this way, "space" can be defined as follows: "Space is an infinite area that is free of any activities and social interactions".

### 9.2. Definition of the Term "Place"

Unlike "space" which appears with the dimensions, time, meaning, and activity, the emergence of "place" requires many human-related factors, including ownership, special function, or collective memory. Moreover, comparing the extent of these two indicate that the extent of place is usually more limited than the extent of space. "Razieh Rezazadeh" states that "unlike space, which is considered a global phenomenon, the place is a human concept that is directed to meaning". "Heidegger" believes that "place is interpreted as a deep and complex aspect of human experience". Sometimes, while emphasizing that "place" is an experienced space, the human-place relationship is considered two-sided, and in other words, humans and place are considered to influence each other mutually. Giddens "considers place as a structured space" and based on this opinion, geographers consider "place a space consisting of social relations and at the same time forming them". However, some disagree with these opinions and believe in "the subjectivity of the place and the objectivity of space" and say that If the mentioned space creates associations in the person's mind, recalls memories, or has a special meaning for him, it changes from an objective phenomenon to a mental entity, it is placed in his mentality and becomes a place" (Naghizadeh 2013, 42-44). "While we see space as an open and abstract area, the place is a part of space that is occupied by a person or something and has a meaning and value" (Madanipour 2000, 32). "Bahreini" believes: "The scene where public activities of urban life take place. The streets, squares, and parks of a city form human activities". "Habibi and Maqsoodi" acknowledge: "The place organizes the events, and incidents playing a creative role in linking today with tomorrow. This space includes four basic elements: residents or passers-by, man-made elements (physical or activity), relations (between people and elements or between elements), and time". "Jahanshah Pakzad" believes: "space is a place for social interaction and it is open and public". "Tavassoli and Bonyadi" say, "the place is valuable space". "Lynch and Carriers" say: "space is a scene in which a collective story unfolds", "a place of unplanned encounters", "clarity of geometric features and aesthetic qualities" (Naghizadeh 2013, 39).
All the researchers, who have provided definitions for the urban place, emphasize "the publicness of the space and its relationship with public life and public access". Generally, they use the terms "space" and

"place" together and do not make a special distinction between them. However, what is referred to as "place" in this article is an arena with the following characteristics:
1. "It is in the human settlements (city or village);
2. It has spatial confinement;
3. Various social activities take place in it (more than two activities);
4. Social attendancy in it should be in such a way that all classes of the society with any gender, age, and different tendencies and opinions can use it;
5. That space should be active 24 hours a day (24-hour activity)" (Malek Abbasi 2019, 11)
In fact, "urban space" is a wrong term commonly used in the architecture and urbanism community of Iran, and what is meant by the public arena in cities is called "urban place". Since the experts have different opinions on the examples of urban places, which are mostly referred to as "urban spaces" in written and non-written sources, it is necessary to separately conduct field studies to determine the examples of public places in Iranian cities. In old Iran, places such as highways, passways, roads, public roads, dead ends, squares, plazas, streets, alleys, Hussainiya, Takya, bazaars, etc. have been considered public arenas for a long time. In the present study, the adaptation of these places to today's needs is presented in the form of the following 12 locations:
1. Rasteh bazaars/passages, 2. Open spaces between residential complexes, 3. Passways and routes, 4. Squares and plazas, 5. traffic circles, 6. Waterfront circles or water's edges, 7. stairways, 8. Walkways, 9. Public top roofs, 10. Gates/entrances (city/neighborhood), 11. Public parks/gardens, 12. The courtyards of some mosques.
In their research in the cities of Iran, including the city of Kerman, the authors found that there were physical, functional, and semantic interactions between the old and new neighborhoods. By classifying neighborhoods based on their age, three stages can be considered in the formation of the city:
1. Inner-city area - the area of the old fabric (the limits of the city in the Qajar period)
2. Mid-city area (those areas in the city that have been formed in the Pahlavi I and II periods)
3. Suburban area (expansion of the city during the period of the Islamic Republic)

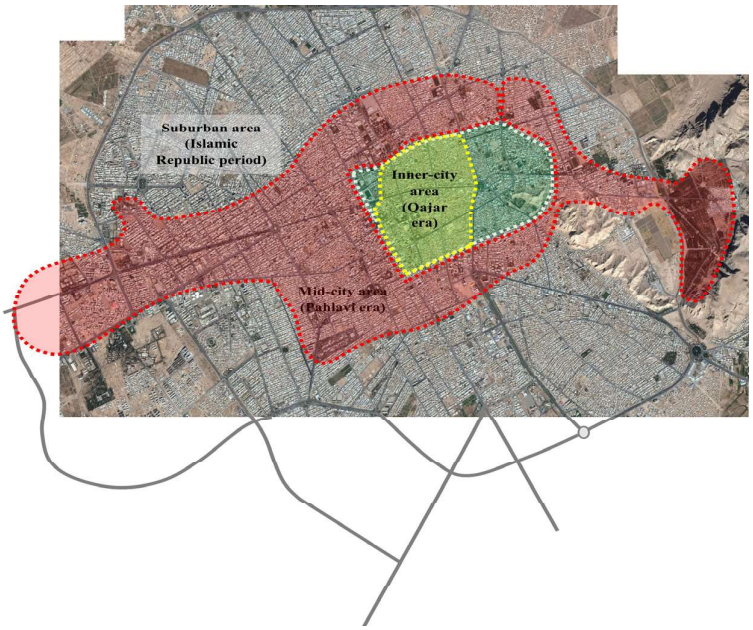


**Fig. 3. Constituent Areas of Kerman City**
(Malek Abbasi 2021, 40)

## 10. INTRODUCTION OF SPATIAL ORGANIZATION AND SPATIAL STRUCTURE - SIMILARITIES AND DIFFERENCES

Spatial organization and spatial structure are among the terms that have not been defined precisely. In other words, when it is presented (in the form of a map), each area and position has a unique organization or structure for itself. Even, these terms have sometimes been used interchangeably. That is, some experts have not considered any difference between organization and structure. Since the main research topic is the spatial structure of the neighborhoods of Kerman city,

it is necessary to present various definitions presented by the experts and to choose a clear definition and boundary.

"Organization" refers to a set of components and elements that gather together to achieve a goal (changing the status quo and achieving the desired situation), in a certain period and based on limited resources and facilities (Shie 2007).

"Spatial organization" is not defined as a fixed order, rather, it is defined as a permanent process of ordering within cultural, natural, temporal, and spatial processes. Therefore, the organization of space is a process full of uncertainty, contrast, and contradiction, and nothing is fixed in it forever. Based on this view, presenting an image of the spatial organization can be considered "an attempt to introduce the structural elements of the organization in a specific time frame". Structural elements experience lower speed, lower depth, less change, and less transformation, so they have higher stability, and greater strength to explain the spatial organization.

According to Matthew Carmona, in the design of residential complexes, the spatial scale of the street network and the shape of the residences should be considered considering the specific scale of the site. Moreover, one of the key points is How to combine public space and natural and built environments (Matthew, Nick, and Sarah 2001).

In the planning and spatial analysis of a specific factor in an environment, the geometric dimensions of that factor are taken into account and no special evaluation is done.

"Space organization" is a subjective concept. As we know, there is no such creature as a city in the outside world. What evokes the city are streets, buildings, and squares that gather together. To construct the concept of the city as a whole[1], the mind needs a system to establish logical relationships between its perceptions of the elements in the environment. In other words, one can say that to understand the spatial organization of a city, first, it is required to identify the city limits, the overall skeleton and backbone of the city, and its main and major connections, and then, examine how the city's street network interact with its buildings (Alexander and Chermayeff 1994, 57).

"The spatial organization of the city is the same system or organization according to which the mind perceives the city. In fact, the spatial organization is a system according to which the citizens' mental imagery of the city has been formed throughout history and under the influence of geographical, climatic, historical, social, and economic, cultural conditions, etc."

"Spatial organization is the same content, subject, meaning, and concept that is hidden in the city and has a dual nature, objective and subjective". The objective and subjective aspects of a phenomenon do not live together but are intertwined. The aesthetic element of a work is not only in its form but also in its content. To match the form and content with the architectural divisions of a phenomenon, the appearance of that phenomenon should be called "form" and its function and meaning "content". Form and function include objective aspects while meaning includes subjective dimensions.

"The skeleton of the city" is a set composed of a backbone and an interconnected network of various uses and elements of the city that makes the city, as a whole, coherent. It extends throughout the city to its most extreme parts, i.e. the residential neighborhoods. This set is the foundation of the physical spatial organization of the city and its internal components. It shows the general characteristics of the city, and the buildings in the city are placed between the main parts of this network" (Hamidi et al. 1997, 1).

"The backbone of the city is also called the "skeleton, structure, or organ of the city". Because these terms reveal the outline and framework of the constituent parts of the city."

The structure, skeleton, or organ of every city is composed of the following physical components:

- Hierarchy of access and road network
- Important urban spaces
- Important public buildings (Abbaszadegan 2007)

Whenever the urban structure is investigated in the third dimension or space, as well as when the texture is combined with the urban design components, the physical structure of the city changes to "spatial structure".

"In fact, the spatial structure is a subset of the spatial organization that is presented in a more concrete, physical, and specific way." However, in some references and reports, both concepts have been used to introduce the skeleton of cities.

Thus, the structure of the traditional (inner-city) neighborhoods of Kerman includes:

1. The city/neighborhood gate, 2. Square/plaza, 3. Bazaar, 4. School, 5. Passways and roads, 6. Mosque, Takya and Hussainiyah, 7. Traditional bathhouses, 8. Residential building/ Garden house, 9. Ab anbar/ice house, 10. Zoorkhaneh

The structure of the mid-city neighborhoods of Kerman includes:

1. City entrances, 2. traffic circle, 3. Passage, 4. Pre-primary/primary school, 5. streets and alleys, 6. Mosque, Takya and Hussainiyah, 7. National park/ garden, 8. Residential building, 9. Public bathhouse, 10. Garage.

Also, the structure of the new (suburban) neighborhoods of Kerman includes:

1. City entrances, 2. traffic circle, 3. mall, 4. Pre-primary/primary school, 5. Open spaces between residential complexes, 6. Mosque, Takya and Hussainiyah, 7. Local garden, 8. residential building, 9. Streets and alleys, 10. Terminal. It is actually a combination of roads, public urban places, and important public buildings.

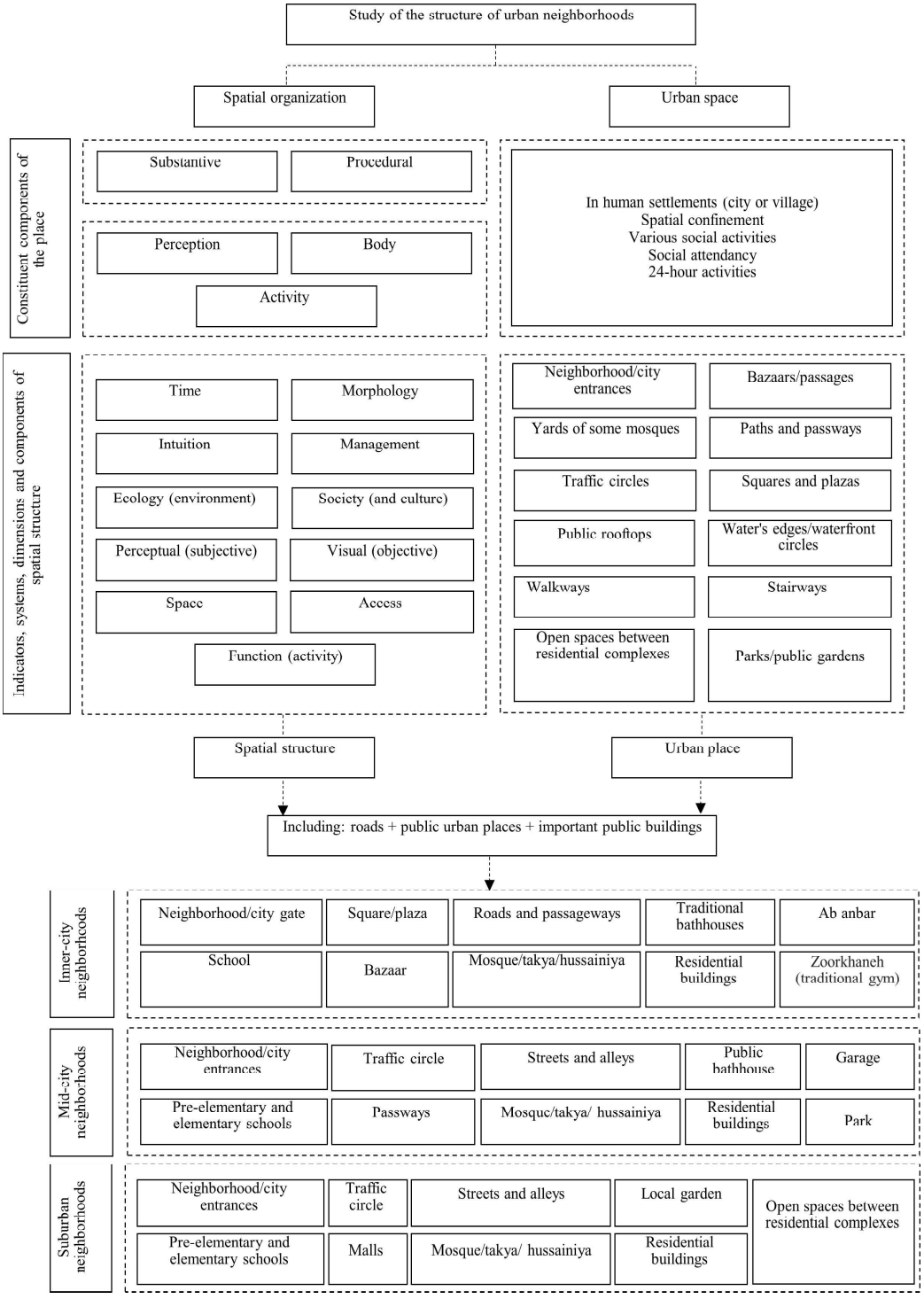


**Fig. 4. The Theoretical Framework**

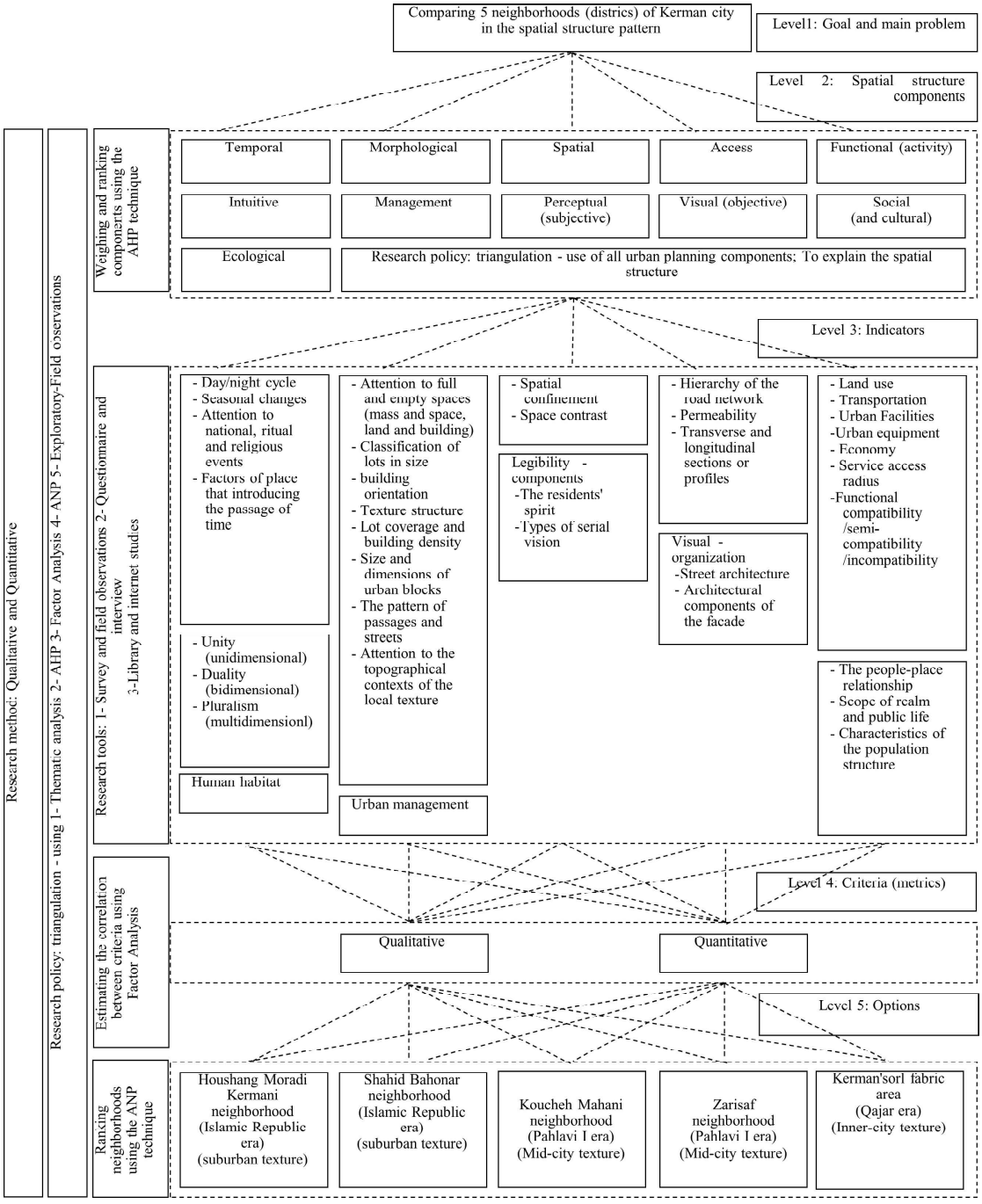


**Fig. 5. Research Methodology Process**

## 11. RESEARCH FINDINGS

Since the research policy is based on the "triangulation method", i.e. several ways are used to achieve the research objectives so that the solutions direct the researcher toward the destination, this section presents the achievements resulting from this method.

### 11.1. Results of Thematic Analysis

The "spatial structure of the city texture" requires the use of indicators directly or indirectly playing their role in the field of urban places.
This refers to those places where
- there are architectural and aesthetic values;
- The shape and dimensions of the space (place), the

continuity and heights of the body, their proportions, and pavings provide the ground for carrying out public activities;
- The facilities, furniture, and space layout help to perform public activities (more than two activities);
- Various public activities have been formed;
- The humans' perception of life and existence is improved and they become better men.
Over time, such places obtain "character" and then, "belongingness, sense of belonging, belonging to place or integration". In the perfected state, these places will obtain "territorialism" and will be considered places with exclusive uses by people. To better realize such a desirable condition, 11 urbanism indicators, systems, dimensions, and components have been studied through observations and questionnaires, which were filled out by people and city managers, and the obtained data were described in the form of thematic analysis. These dimensions are among the dimensions constituting the place:
- Access, visual (objective landscape), morphological and spatial indicators in the physical category
- Perceptual (subjective landscape), temporal, management, and intuitive indicators in the perceptual category (mind)
- Functional, social (and cultural), and ecological indicators in the activity (behavior) category.

### 11.1.1. Functional Component and Dimension

- In the ranking of the neighborhoods of Kerman city in the functional component, the Shahid Bahonar neighborhood was ranked first, followed by the Houshang Moradi Kermani neighborhood, the old fabric area, the Zarisaf neighborhood, and Koucheh Mahani neighborhood, respectively.
- It is concluded that the new neighborhoods in Kerman city are more efficient, applied, and up-to-date. However, there are inadequacies in the new neighborhoods of the city in areas such as the existence of pedestrian-centric paths, climate-compatible architectural and urban design of the environment, social solidarity, humaneness of the place/space, and the rate of receiving some public services.
- The following are common in the neighborhoods of Kerman (in this component):
1. The short distance between home and workplace: due to the small or medium size of the city
2. Energy savings: according to the scores obtained by the neighborhoods of the city, the use of technology has been effective in saving energy, and the typology of traditional buildings has also tried to preserve energy resources. However, in general, the optimal use of non-renewable energy is not culturalized in Kerman city.
3. Internet access: Internet services are almost the same throughout the city.
4. Coordination between activities in the neighborhood: since most of the activities in the neighborhoods are compatible with each other, most of the uses in the neighborhood are residential.
5. Receiving recreational green public services: In the neighborhoods of the city, there are few neighborhoods with no recreational green spaces. This defect exists in the traditional parts of the city.

### 11.1.2. Access Component and Dimension

- In the ranking of the neighborhoods of Kerman city in the access component, the Zarisaf neighborhood was ranked first, followed by the old fabric area, the Shahid Bahonar neighborhood, the Koucheh Mahani neighborhood, and the Houshang Moradi Kermani neighborhood, respectively.
- It is concluded that the city management in Kerman focuses on the construction of streets and pays less attention to the quality of sidewalks or the construction of bicycle lanes, or the creation of walkways in the city. Also, the standards for street furniture and equipment have not been observed.
- The following are common in the neighborhoods of Kerman (in this component):
1. The quality of the construction of sidewalks/ walkways: There are no walkways in Kerman except for the "traditional market axis and the Qadamgah axis". The quality of sidewalks in most places is low and sometimes moderate.
2. Continuity of sidewalks/walkways: There is no required continuity of sidewalks anywhere in the city.
3. Paying attention to the situation of the disabled, children, and the elderly: despite the studies and research on the facilitation of the presence and passage of the disabled, children, and the elderly in Kerman, it is still not feasible to apply and operate them.
4. The invitation of neighborhood entrance(s): one can firmly say that there is a potential to define the entrance for Kerman's neighborhoods.
5. Applying a hierarchical system in the spatial organization: the street network in Kerman has an almost regular access hierarchy. However, the incorrect loadings in some parts of the city, including the old fabric, in recent years will cause problems for the movement system in the future.

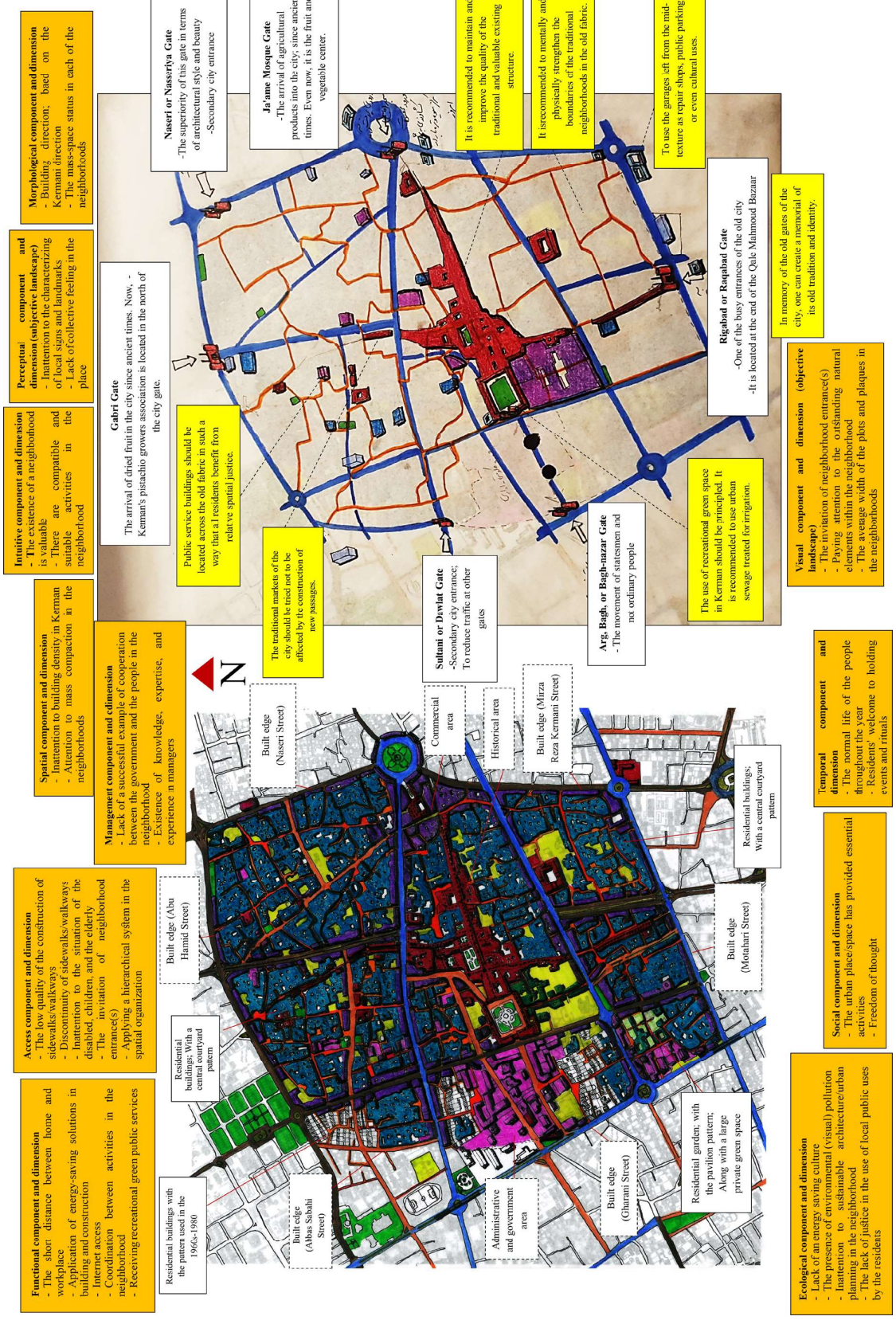


**Fig. 6. The Spatial Structure of the Old Fabric of Kerman in the Qajar Era– the Inner-city Texture**

### 11.1.3. Visual Component and Dimension (Objective Landscape)

- In the ranking of the neighborhoods of Kerman city in the visual component (objective landscape), the old fabric neighborhood was ranked first, followed by the Zarisaf neighborhood, the Koucheh Mahani neighborhood, the Shahid Bahonar neighborhood, and the Houshang Moradi Kermani neighborhood, respectively.
- It is concluded that in the contemporary period, despite the modern constructions in the city, the beauty of traditional neighborhoods still delights the residents. This indicates the advanced urban planning of the past because today's advanced architecture could not dissolve in urban planning.
- The following are common in the neighborhoods of Kerman (in this component):
1. The invitation of neighborhood entrance(s): As mentioned above, suitable gates can be defined at the entrance of Kerman neighborhoods considering their inviting features.
2. Paying attention to the outstanding natural elements within the neighborhood: Paying attention to the natural contexts in the construction of neighborhoods, such as topography, slope, direction, etc., has made them contextual.
3. The average width of the plots and plaques in the neighborhoods: since in the culture of the people of Kerman, living in houses with courtyards is common, most of the buildings have been constructed in the villa pattern until the second Pahlavi period and even the beginning of the period of Islamic Republic and the lots have been large- or mid-sized. As the population increased and lifestyle changed, urban densification has been common in the city for two decades and the width of plots has decreased in some areas. Like other Iranian cities, Kerman is not excluded from suburbanization and the creation of small plots.

### 11.1.4. Perceptual Component and Dimension (Subjective Landscape)

- In the ranking of the neighborhoods of Kerman city in the perceptual component (subjective landscape), the old fabric neighborhood was ranked first, followed by the Zarisaf neighborhood, the Shahid Bahonar neighborhood, the Koucheh Mahani neighborhood, and the Houshang Moradi Kermani neighborhood, respectively.
- It is concluded that in the contemporary period, despite the modern constructions in the city, the traditional neighborhoods are still more legible for their residents than the new neighborhoods. This indicates that the residents of the old neighborhoods walk more on foot in their residents than the people living in the new neighborhoods. The residents of old neighborhoods have more social relations, more attention to the surroundings, and a higher level of attendance in the place/space than those in new neighborhoods. Therefore, it is easier for them to understand the environment. There is a huge numerical difference between the legibility of old and new neighborhoods. Again, one can understand the lack of urban planning in new neighborhoods.
- The following are common in the neighborhoods of Kerman (in this component):
1. Paying attention to the characterizing of local signs and landmarks: in urban neighborhoods, the residents consider natural or built landmarks unimportant, if they exist, although characterizing them makes the neighborhood more legible.
2. Collective feeling in the place: In Kerman's neighborhoods, people's feelings about the surroundings are neutral! As in the past, no one is on anyone else's back. The feelings of sympathy, philanthropy, help, cooperation, greetings, socialization, etc. have disappeared from urban life today. However, the city of Kerman is in a better condition than some bigger cities. The reason is because of the following:
- There is no suitable urban place/space for the manifestation of common feelings in the neighborhoods.
- The current government is against the holding of some social or political events and meetings.
- Today, people do not have attention, knowledge, and conscience same as those of the past, and have reduced their social activities.

### 11.1.5. Morphological Component and Dimension

- In the ranking of the neighborhoods of Kerman city in the morphological component, the old fabric neighborhood was ranked first, followed by the Zarisaf neighborhood, the Koucheh Mahani neighborhood, the Shahid Bahonar neighborhood, and the Houshang Moradi Kermani neighborhood, respectively.
- It is concluded that the form of the old neighborhoods is more suited to its context. In other words, it matches the context well. The slow pace of building neighborhoods in the past provided the architects and urban planners of that period more opportunities to meditate. Today's technology is useless if it only imitates the West. We should take advantage of today's facilities and designs more deeply, and the ancient identity of the past should not be forgotten.
- The following are common in the neighborhoods of Kerman (in this component):
1. Building direction; According to the Kermani direction: one can definitely admit that the direction of the old and new buildings in the city follows the Kermani direction.
2. The mass-space status in each of the neighborhoods: by considering or disregarding some items, one can see an even mass/space rate in the texture of the neighborhoods. This means that in new neighborhoods, with dense construction, less open space is available to the residents, and on the other

hand, the old fabric also has dense construction.
However, some new neighborhoods, including the Shahid Bahonar and Houshang Moradi neighborhoods, have suitable public open spaces in their centers. In the old neighborhoods, with the destruction of traditional buildings, many unbuilt lands are seen, which provide the potential of their optimal use for the benefit of the public.

### 11.1.6. Temporal Component and Dimension

- In the ranking of the neighborhoods of Kerman city in the temporal component, again the old fabric neighborhood was ranked first, followed by the Zarisaf neighborhood, the Koucheh Mahani neighborhood, the Shahid Bahonar neighborhood, and the Houshang Moradi Kermani neighborhood, respectively.
- It is concluded that:
1. Old neighborhoods have more suitable space, or in more correct words, urban (local) places for holding ceremonies and events than new neighborhoods.
2. In the old neighborhoods, the lifespan of the structure is longer, the quality of construction is higher, and the durability of the structure is higher.
3. The flow of life in the old fabric is more natural, simpler, and more regular.
4. More religious activities are held in old neighborhoods.
5. Time and historical identity are more evident in traditional neighborhoods.
- The following are common in the neighborhoods of Kerman (in this component):
1. The normal life of the people always flows throughout the year: Generally, there is nothing in the city that disrupts the normal life of the people. Unlike Tehran, there are no matters such as air pollution, snowfall, fires in certain buildings, landslides, funerals of famous people, public demonstrations, government marches, etc. that disrupt the public's lives.
For this reason, when, for example, it rains a little in Kerman, the whole city closes down, and this adds to the vitality of the people.
2. Residents' welcome to holding events and rituals: The people of Kerman, like the people of other Iranian cities, are eager to hold religious, and national events and rituals.

### 11.1.7. Social (and Cultural) Component and Dimension

- In the ranking of the neighborhoods of Kerman city in the social component, the Shahid Bahonar neighborhood was ranked first, followed by the Houshang Moradi Kermani neighborhood, the Zarisaf neighborhood, the old fabric area, and the Koucheh Mahani neighborhood, respectively.
- Today, most of the residents of the traditional fabric of the city are non-Iranian and non-native people, and the negative effects of this have been evident in the activities and social fabric of the city. The number of households, household size, literacy status, gender ratio, age pyramid, etc. were decisive in this research.
- The following are common in the neighborhoods of Kerman (in this component):
1. The urban place/space has provided essential activities: generally, the public areas in the city manifest the essential activities of the people, including commuting, shopping, entertainment, etc.
2. Freedom of thought: In Kerman, people are less involved in social activities and pay more attention to their own lives. In their lives, they seek peace, silence, and tranquility. Sometimes, this silence has resulted in "inactivity", leading to the lack of growth and bustle that can be seen in other cities like Isfahan. This is why the body of the city did not change anything in the 1980s, 1990s, and 2000s. Recently, the new and educated Kermani generation is acting based on thinking and demanding new needs.

### 11.1.8. Ecological Component and Dimension

- In the ranking of the neighborhoods of Kerman city in the ecological component, the old fabric neighborhood was ranked first, followed by the Zarisaf neighborhood, the Koucheh Mahani neighborhood, the Shahid Bahonar neighborhood, and the Houshang Moradi Kermani neighborhood, respectively.
- Basically, our ancestors were more compassionate, more aware of the living environment, more considerate, and more convincing. But now people are following the opposite of the mentioned characteristics and thereby harming their environment.
- The following are common in the neighborhoods of Kerman (in this component):
1. Saving energy: In truth, we are not frugal people and we have not followed the ways and customs of our ancestors. Such waste also exists in other areas such as water, air, and soil.
2. Reduction of environmental (visual) pollution: such a case can be seen in traditional neighborhoods as well. Today, in the city, each person acts according to his personal tastes, and facades, shop signs, pavements, etc. are created according to personal tastes without considering the public interest.
3. Attention to sustainable architecture/urban planning in the neighborhood: in the past, sustainable architecture and urban planning have been implemented to meet the residents' needs. But today, no one pays much attention to sustainable architecture/urban planning. The construction of high-rise buildings with high costs in residential areas and the influence of urban commercial activities in the alleys of the city have deprived its residents of the comfort and peace of the past.
4. The existence of justice in the use of local public uses by the residents: since there are not many suitable spaces/places in all the neighborhoods of the city (of course, there are exceptions) for public use, and also, there is no sufficient ground for carrying out public activities, "justice" is a word faded out in the neighborhoods.

### 11.1.9. Management Component and Dimension

- In the ranking of the neighborhoods of Kerman city in the management component, the neighborhoods were ranked at very small distances from each other. The old fabric and Zarisaf neighborhoods were jointly ranked first, followed by the Koucheh Mahani neighborhood, the Shahid Bahonar neighborhood, and the Houshang Moradi Kermani neighborhood, respectively (Fig. 8).
- The decision-making and decision-taking management in Kerman emerges in all neighborhoods equally, because it has just one origin. In places where people have supported the managers, the decisions have been fulfilled. Otherwise, the decisions were fulfilled temporarily and for a short time.
- The following are common in the neighborhoods of Kerman (in this component):
1. Existence of a successful example of cooperation between the government and the people in the neighborhood: such cooperation has been poor at the city level.
2. Existence of knowledge, expertise, and experience in managers: recently and in the last generation, the city has experienced more desirable events. Managers have tried to have scientific and academic advancement and pay attention to urban experts' opinions. These things are happening in the city.

### 11.1.10. Spatial Component and Dimension

- In the ranking of the neighborhoods of Kerman city in the spatial component, the old fabric area was ranked first, followed by the Koucheh Mahani neighborhood, the Zarisaf neighborhood, the Shahid Bahonar neighborhood, and the Houshang Moradi Kermani neighborhood, respectively.
- In traditional neighborhoods, the third dimension and construction details have been paid more attention.
- In the study and analysis of the neighborhoods of Kerman, it is concluded that these neighborhoods have nothing in common in the spatial component! In terms of building density, if the texture compaction is intended, Kerman's neighborhoods are generally built compactly - except for apartment complexes. But if it refers to the uncontrolled and illegal increase of floors, it is apparently considered unimportant by the managers, and selling surplus building density is observed all over the city.

### 11.1.11. Intuitive Component and Dimension

- In the ranking of the neighborhoods of Kerman city in the intuitive component, the old fabric neighborhood was ranked first, followed by the Zarisaf neighborhood, the Koucheh Mahani neighborhood, the Shahid Bahonar neighborhood, and the Houshang Moradi Kermani neighborhood, respectively (Fig. 9).
- One can see complete unity in traditional neighborhoods. Beauty, preciousness, surprise, and excitement can be sought in the closed and open passways of the old neighborhoods. The sense of curiosity and the spirit of revelation still exist in these places. The multiple elements and components of the old fabric have merged in a magical way.
- The following are common in the neighborhoods of Kerman (in this component):
1. The existence of a neighborhood is valuable: Since every neighborhood is a place for its residents to rest and live, the existence of neighborhoods in Kerman is valuable in itself.
2. There are compatible and suitable activities in the neighborhood: as mentioned above, there are few incompatible activities in the neighborhoods of Kerman.

**Table 2. Ranking of the Neighborhoods of Kerman in the Spatial Structure using the "Thematic Analysis" Method**

| Component, Indicator, or Dimension / Neighborhood/Area | Old Fabric Area | Zarisaf | Koucheh Mahani | Shahid Bahonar | Houshang Moradi Kermani |
|---|---|---|---|---|---|
| Functional | 3 | 4 | 5 | 1 | 2 |
| Access | 2 | 1 | 4 | 3 | 5 |
| Visual (Objective Landscape) | 1 | 2 | 3 | 4 | 5 |
| Perceptual (Subjective Landscape) | 1 | 2 | 4 | 3 | 5 |
| Morphological | 1 | 2 | 3 | 4 | 5 |
| Temporal | 1 | 2 | 3 | 4 | 5 |
| Social | 4 | 3 | 5 | 1 | 2 |

| Component, Indicator, or Dimension / Neighborhood/Area | Old Fabric Area | Zarisaf | Koucheh Mahani | Shahid Bahonar | Houshang Moradi Kermani |
|---|---|---|---|---|---|
| Ecological | 1 | 2 | 3 | 4 | 5 |
| Management | 1 | 1 | 3 | 4 | 5 |
| Spatial | 1 | 3 | 2 | 4 | 5 |
| Intuitive | 1 | 2 | 3 | 4 | 5 |
| The Frequency of Obtaining the First Rank | 8 | 2 | 0 | 2 | 0 |
| Rank | 1 | 2 | 4 | 3 | 5 |

- The old fabric area of Kerman was recognized to have the most suitable spatial structure, due to getting the top rank 8 times.
- The Zarisaf and Shahid Bahonar neighborhoods were ranked first 2 times. However, since the Zarisaf neighborhood obtained the second rank 6 times in terms of the abovementioned components, it was ranked second in the spatial structure, and the Shahid Bahonar neighborhood was ranked third.
- The Koucheh Mahani and Houshang Moradi Kermani neighborhoods did not obtain the top rank in any of the spatial structure components. Since the Koucheh Mahani neighborhood more frequently obtained the middle rank than the Houshang Moradi Kermani neighborhood, it was ranked fourth and the Houshang Moradi Kermani neighborhood was ranked fifth (Fig. 10).

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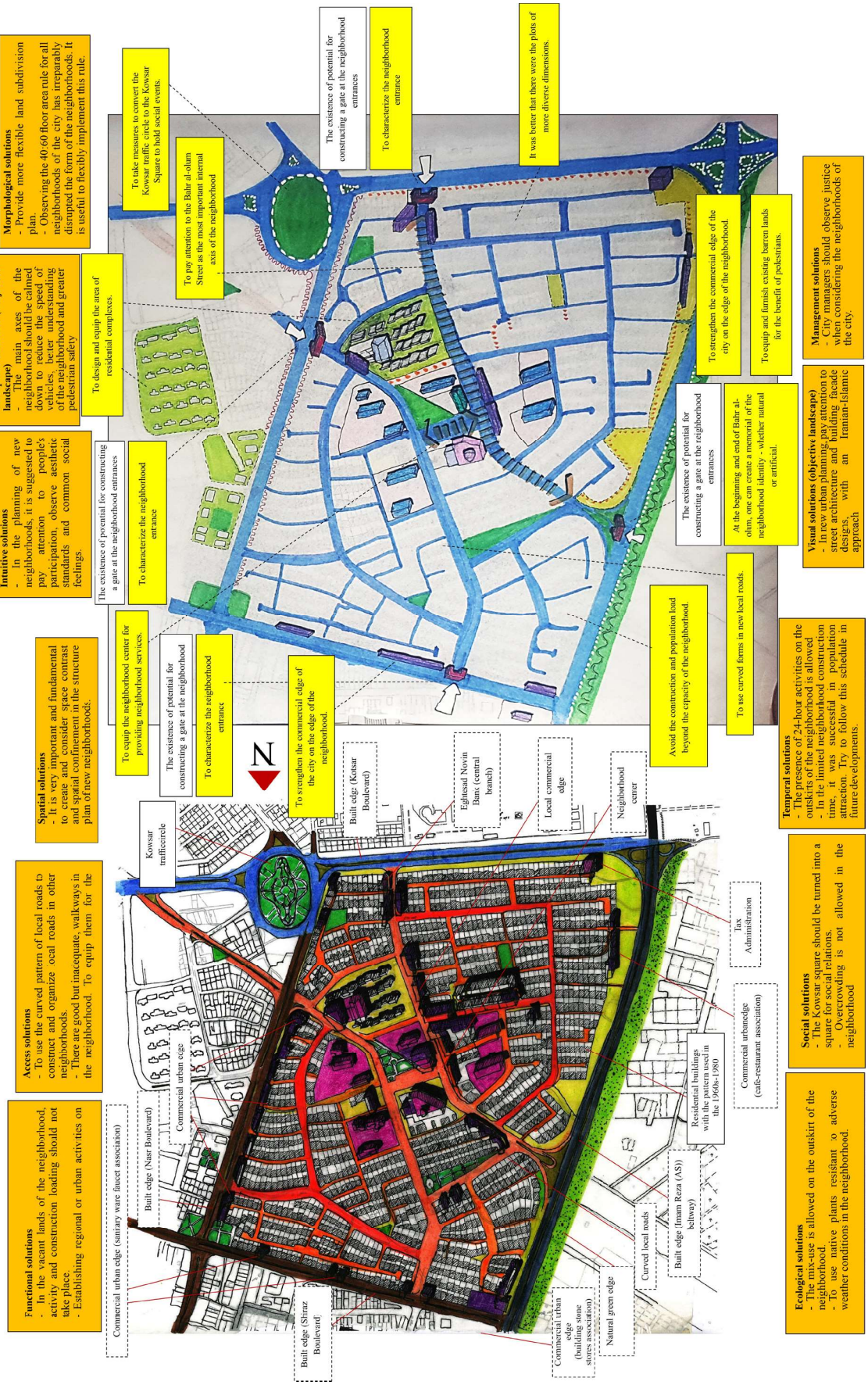


**Fig. 7. The Spatial Structure of the Shahid Bahonar Neighborhood of Kerman – the Suburban Texture**

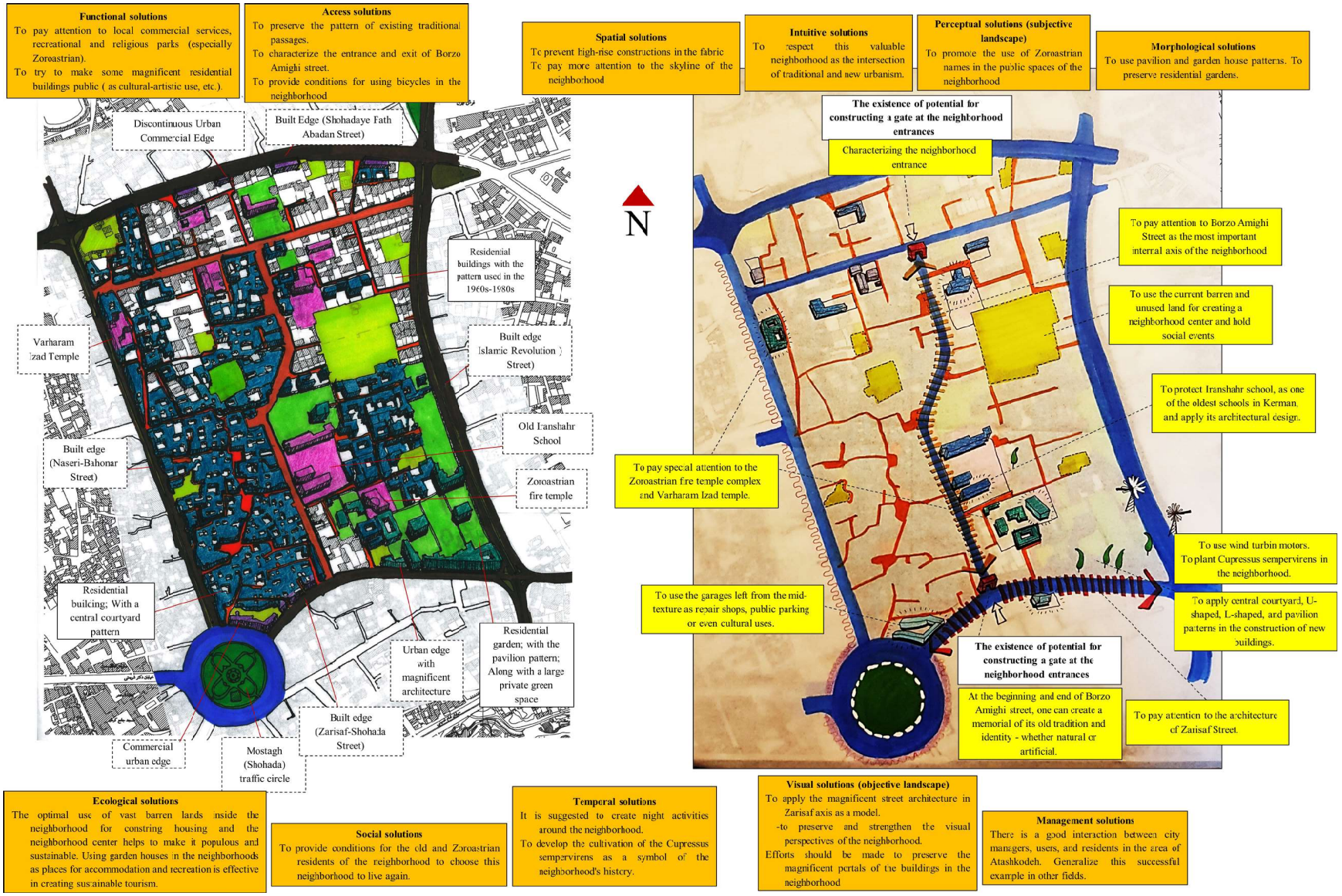


**Fig. 8. The Spatial Structure of the Zarisaf Neighborhood of Kerman – the Mid-city Texture**

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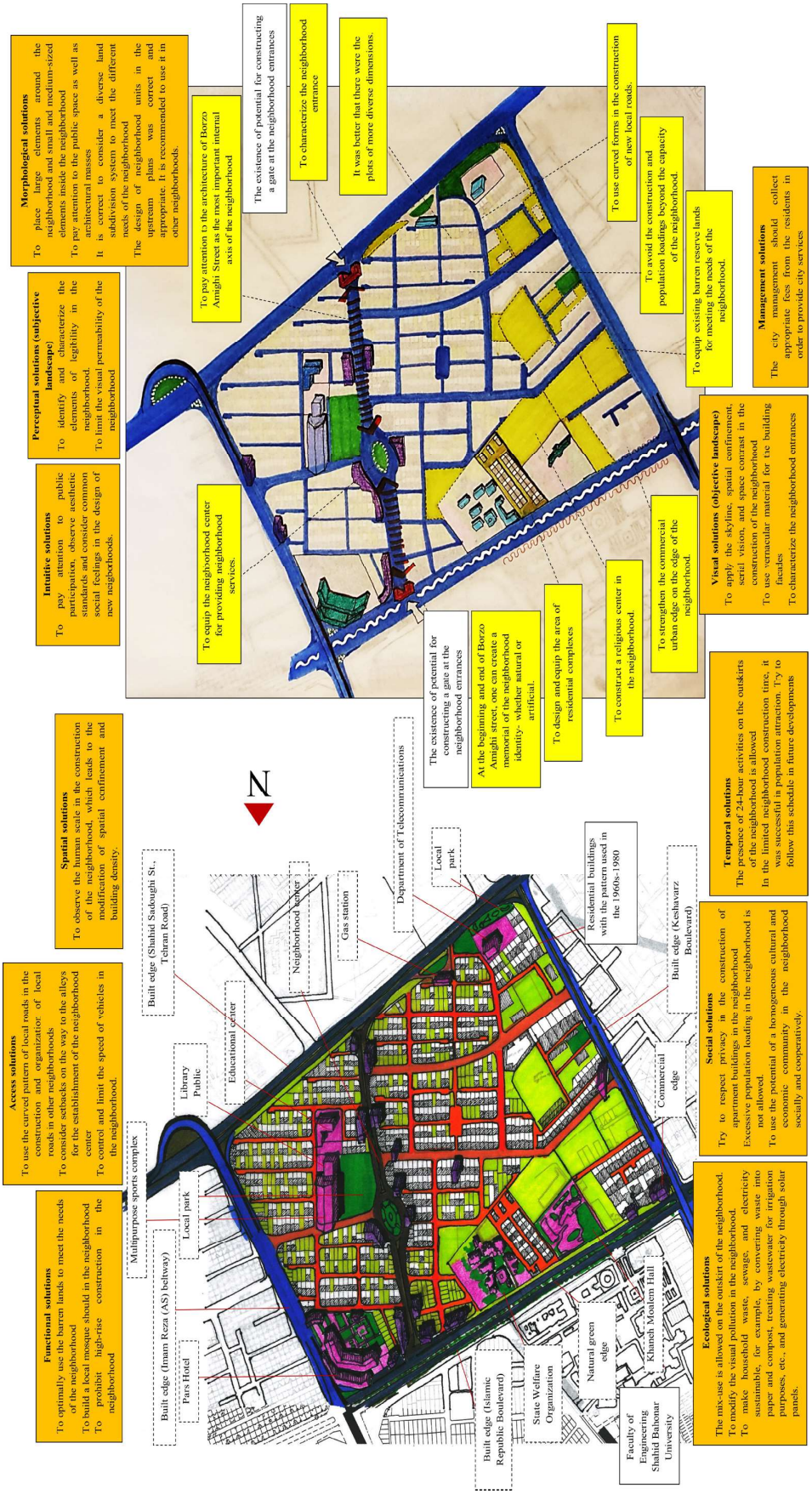



**Fig. 9. The Spatial Structure of the Houshang Moradi Kermani Neighborhood of Kerman – the Suburban Texture**

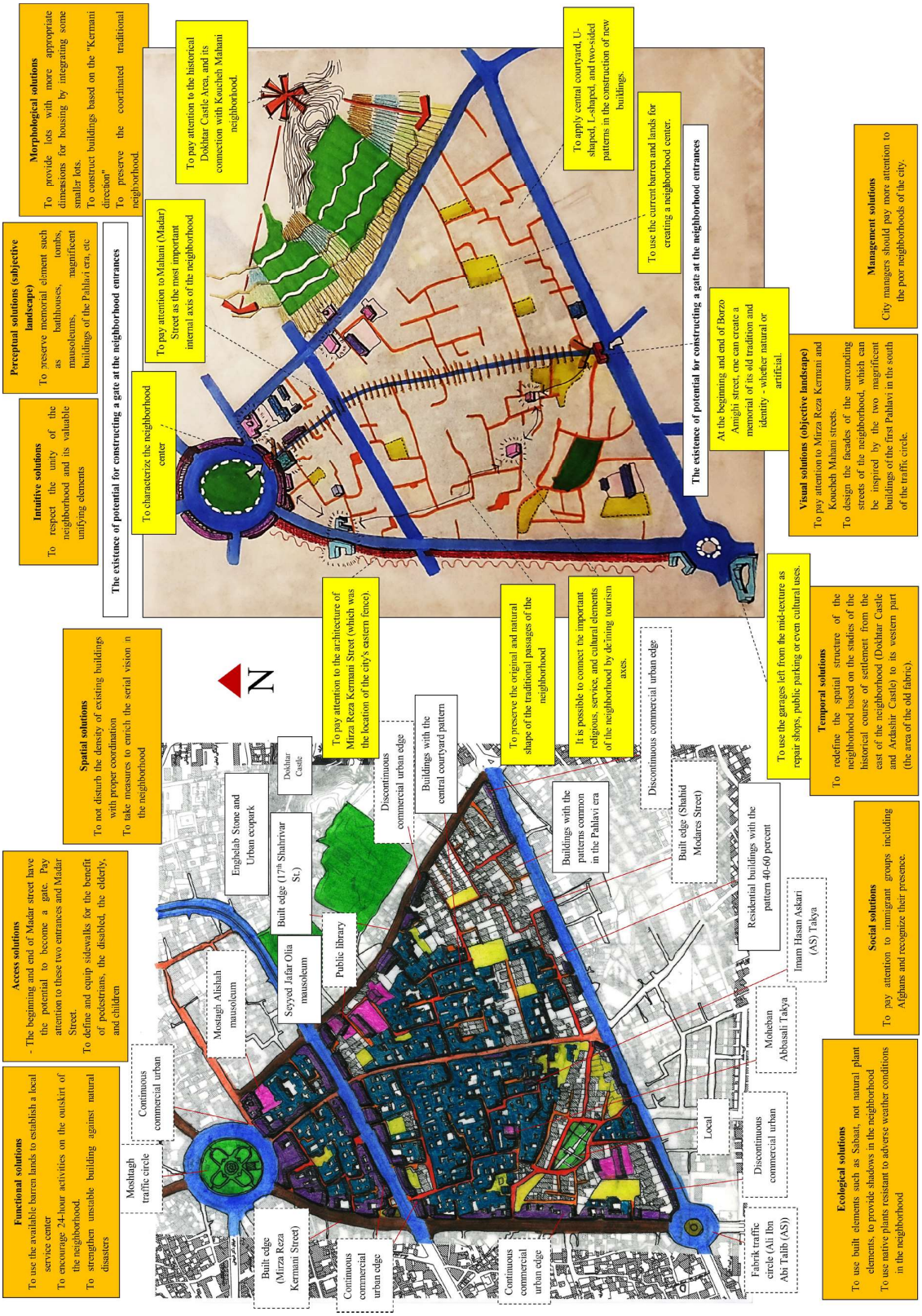



**Fig. 10. The Spatial Structure of the Koucheh Mahani Neighborhood of Kerman– the Mid-city Texture**

### 11.2. Results of the Analytical Hierarchy Process (AHP) Technique

The Analytical Hierarchy Process (AHP) technique was used in two parts:
1. To weigh and prioritize the components of the spatial structure which were obtained from the public questionnaire and city managers and presented in the previous section.
2. To rank the neighborhoods of Kerman in the spatial structure, the results of which are as follows.

**Table 3. Ranking of the Neighborhoods of Kerman in the Spatial Structure using the "AHP" Technique**

| Neighborhood/area | Score | Rank |
|---|---|---|
| Old fabric area | 203.7935 | 1 |
| Zarisaf | 199.4228 | 2 |
| Koucheh Mahani | 184.3509 | 4 |
| Shahid Bahonar | 185.959 | 3 |
| Houshang Moradi Kermani | 176.8972 | 5 |

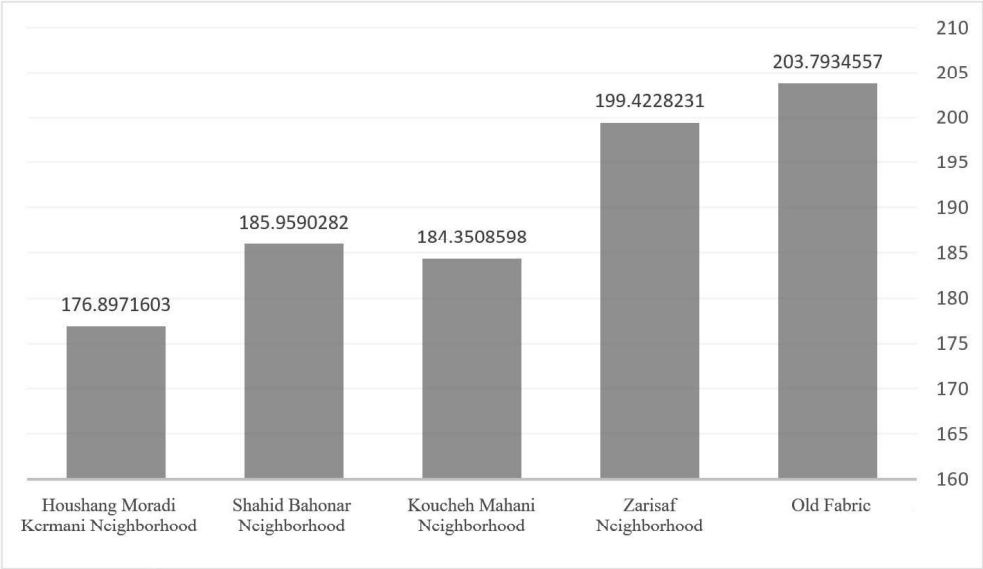



**Fig. 11. Ranking of the Neighborhoods of Kerman in the Spatial Structure using the "AHP" Technique**

- Ranking the neighborhoods of Kerman in terms of spatial structure using the AHP technique provided results similar to those of the "thematic analysis" method.
- In this way, the concepts of spatial structure in the old fabric have been more obvious.
- Also, it is observed that the newer neighborhoods have lower-quality spatial structures.

### 11.3. Results of the Factor Analysis Technique

- Utilizing the factor analysis technique showed that the qualitative and quantitative criteria presented are interdependent and are placed in 4 categories.
- Accordingly, the selected neighborhoods of Kerman city are also placed in these categories.

The intended urban design criteria were categorized and analyzed in two qualitative and quantitative categories.

**Table 4. Determination of Qualitative Eigenvalues**

| Qualitative Eigenvalues | F1 (Place-making) | F2 (Creating the Character of the Place) | F3 (Contextualism) | F4 (Attention to Public Transportation) |
|---|---|---|---|---|
| Eigenvalue | 88.032 | 11.579 | 10.147 | 3.241 |
| Variability (%) | 77.905 | 10.247 | 8.980 | 2.868 |
| Cumulative Variations (%) | 77.905 | 88.152 | 97.132 | 100.000 |

Among qualitative indicators and criteria of the urban design components, those with shared values were placed in the same group and compared with other groups.

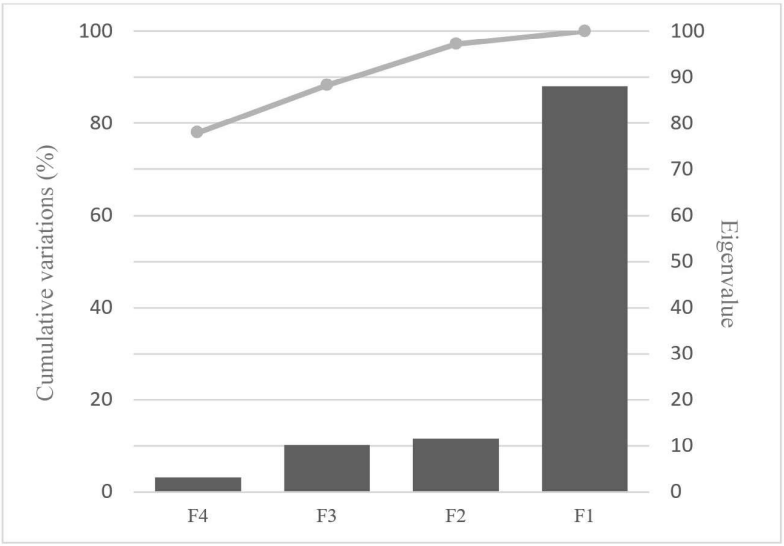



**Fig. 12. Determination of Qualitative Eigenvalues**

**Table 5. Determination of Quantitative Eigenvalues**

| Quantitative Eigenvalues | F1(Attention to Statistics) | F2 (Appropriate Occupation of Place and Space) | F3 (Attention to the Land Use) | F4 (Attention to the Context and Form) |
|---|---|---|---|---|
| Eigenvalue | 16.019 | 5.040 | 4.072 | 1.869 |
| Variability (%) | 59.331 | 18.668 | 15.081 | 6.921 |
| Cumulative Variations (%) | 59.331 | 77.998 | 93.079 | 100.000 |

Among quantitative indicators and criteria of the urban design components, those with shared values were placed in the same group and compared with other groups.

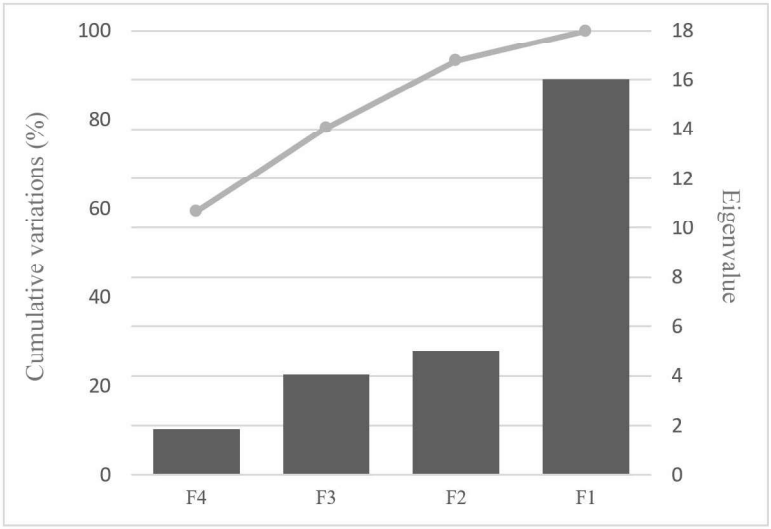


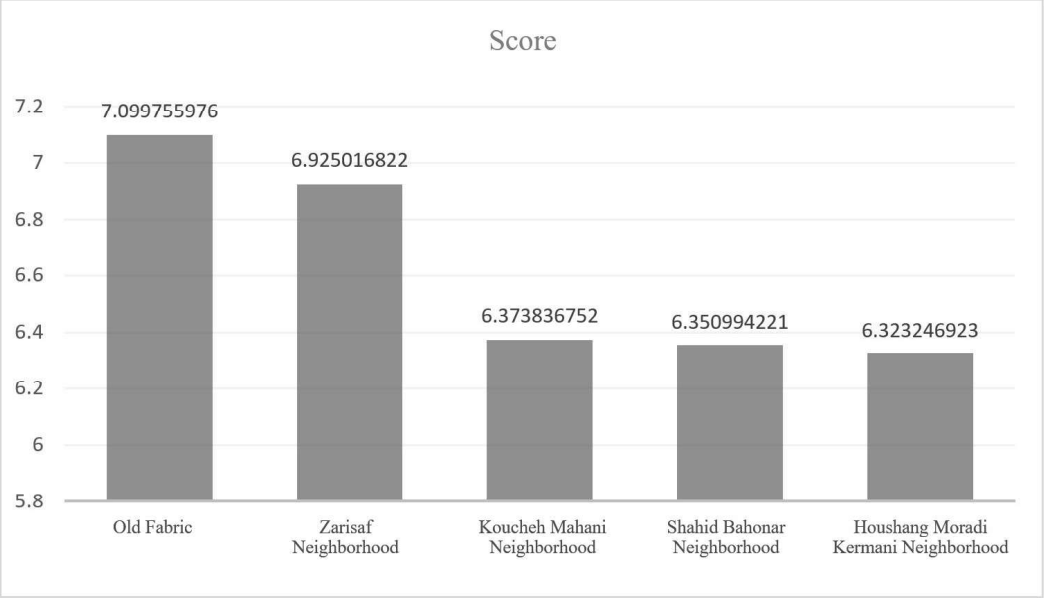

**Fig. 13. Determination of Quantitative Eigenvalues**

### 11.4. Results of the ANP Technique

Although the analyzes were done using the AHP technique, the results were again analyzed using the ANP technique because the criteria and metrics of the spatial structure components depended on each other. The results of the ANP analysis are as follows:

**Table 6. Ranking of the Neighborhoods of Kerman in the Spatial Structure Using the "ANP" Technique**

| Neighborhood/Area | Score | Rank |
|---|---|---|
| Old Fabric Area | 7.09975597617642 | 1 |
| Zarisaf | 6.92501682177781 | 2 |
| Koucheh Mahani | 6.37383675231495 | 4 |
| Shahid Bahonar | 6.3509942213147 | 3 |
| Houshang Moradi Kermani | 6.32324692328606 | 5 |




**Figu. 14. Ranking of the Neighborhoods of Kerman in the Spatial Structure using the "ANP" Technique**

- The results of the ANP analysis are similar to the results of the "AHP" and "thematic" analyses, with the difference that the Koucheh Mahani and Shahid Bahonar neighborhoods were ranked third, and fourth, with a slight difference, respectively, while they got the fourth and third places in the AHP and thematic analyses.

- This ranking shows that the spatial structure of the inner-city neighborhoods of Kerman is the most coherent, followed by the mid-city neighborhoods and then, the suburban and new neighborhoods, respectively.

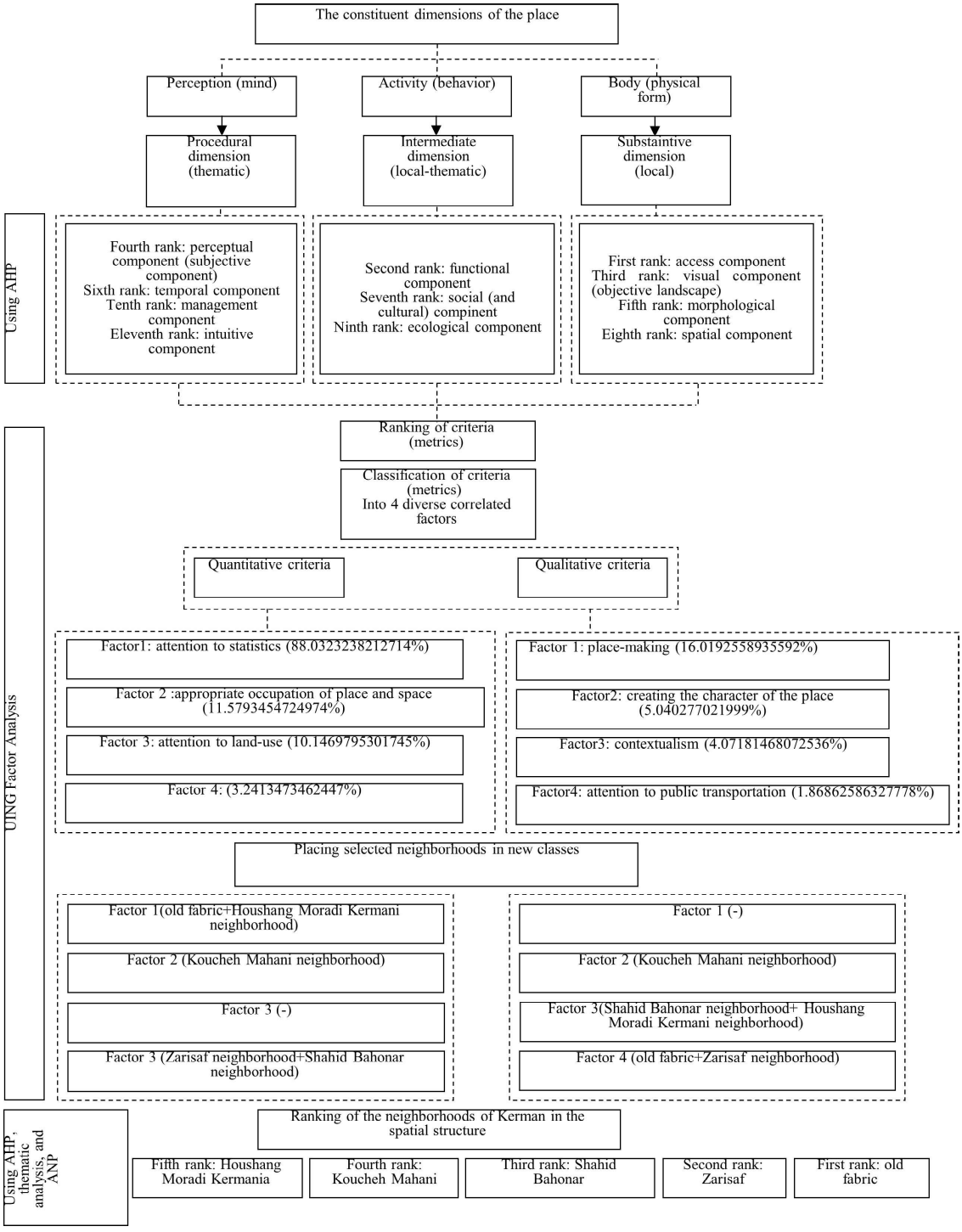



**Fig. 15. The Process of Research Findings**

## 12. CONCLUSION

1. The lessons obtained from the study of the spatial structure of Kerman's neighborhoods are including:

- In planning the spatial structure of urban neighborhoods, the mutual relations between reason and logic are needed in addition to mental perception and aesthetics.
- In the construction of the city and its neighborhoods,

it is not adequate to only operate based on expertise and knowledge and observe the principles of urban planning and architecture, and "the residents' intuition, the public's spirit, and participation, referring to the aesthetic sense, etc." can also show the same path that the past uneducated urban planners and architects have correctly followed.

- In some of the mid-city neighborhoods of Kerman, which were established even outside the historical city fence in the past, there are beautiful residential buildings (with the central courtyard pattern and magnificent portals), cultural buildings (public library), urban facilities (public baths), mausoleums (Seyyed Jafar Olia, the old Friday prayer leader of the city and Moshtagh Alishah), and religious buildings (beautiful takyas and traditional mosques) built in the Qajar era. Such buildings are considered treasures for a neighborhood and have caused "structural unity" in it. Therefore, it is recommended to emphasize the importance of these valuable constructions.
- Also, these neighborhoods are the place where traditional (old) urbanism and architecture meet modern (new) urbanism and architecture. This meeting currently exists in a compromise form. The architectural and urban planning achievements of these neighborhoods can be used in the construction of new neighborhoods.
- The neighborhoods in the old fabric of Kerman have procedural unity and are considered a "united whole". So, if a part of it is destroyed, the remaining parts would be ruined. Therefore, it is recommended to believe in the unity and uniqueness of the texture and not disturb it.
- The "structure" of the texture is its body, and the "activities" in the texture are its soul. So the old fabric has duality. The body and soul of the old fabric include its structure and the current activities in it, respectively. So, if any of them becomes defective, the defect would influence the texture. The solution is "renovation and rehabilitation", respectively.
- The components of the old fabric have diversity and plurality. The fabric is composed of various elements and factors, which mutually influence each other. The old fabric is a complex whole. Therefore, it has pluralism. To solve the fabric's problems, it is necessary to consider it in multiple dimensions and consider all aspects.

2. The horizontal ground bed, elevation codes, slope and topography of urban neighborhoods, defined or customary boundaries of neighborhoods, and the qanat courses in the city have provided conditions for creating old public places and new urban spaces.
3. Old public places and new urban spaces in Iranian cities play an undeniable role in the formation of an important part of the physical-spatial structure of neighborhoods.

The context of urban neighborhoods also influences the establishment of public places/spaces.

4. "Explaining the spatial structure of the neighborhoods of the Iranian cities requires paying attention to various urban design indicators (as a support for urban planning issues) and the constituent elements of the structure (position-oriented) comprehensively."

What is presented in this research is a brief document representing the most important things that happen in urban design. It is a tool for the purpose it pursues and its purpose is improving the quality of life of all people. This document facilitates research on the structure and space, social and behavioral structure, as well as the biological morphology of Iranian cities. Moreover, the results of analyses and solutions presented in it can be categorized and presented in this framework.

## ENDNOTE

1. The whole refers to a coordinated and purposeful set where the components are mutually and permanently related under specific rules and regulations.

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