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Comparison of Renovation of Damaged Fabrics with Smart Growth Approach (Case Study: Renovation of Qarani Neighborhood in Mashhad)

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Abstract

A special position is dedicated to preservation and reconstruction of old city centers in the world with the aim of cultural, economic, social and historical revival. Economic revival is considered as an important strategy which means boosting suitable and harmonious economic activities to both strengthening the existing activities and attracting new economic activities. Over time, the centers of cities gradually wear out and their importance and application decrease. This will lead to migration of city center residents to suburbs and consequently horizontal growth of cities. Smart growth and form-oriented regulations formulation known as transport regulations is as one of the introduced approaches in developed cities to deal with horizontal growth and urban sprawl. In the recent study, the processes of old areas reconstruction are compared to the transport criteria and indices of smart growth to deal with horizontal growth. We have attempted to make it possible to evaluate local projects and reconstruct damaged urban textures. In addition, hypotheses were examined using mean comparison test to determine the conformity of these methods with the smart growth. Results showed that the local project of reconstruction of Qarani neighborhood in Mashhad is inconsistent with the smart growth regulations.

Keywords: combined land use, neighborhood, new urbanism, smart growth, transport design

1. Introduction

Scientific, technical and economic developments in the human life affect the life style and activity in local communities. Development of knowledge and technology have growing trend, while urban textures are designed and constructed in a long time. So that, as time passes social and economic developments are accelerated with rapid scientific and technical developments which cause new needs in human lives. Response to the needs is beyond what that can be realized in the available urban living and activity spaces. Therefore, measures have already been taken are not able to meet the needs of new generations who are born in the old urban neighborhoods and new measures should be adopted based on modern ideas as approaches different from past and not in the sense of denying the context (Andalib, 2008). City center is considered as historic turning point, ever living heart of urban civil society, the heart of financial and economic credits, and a place that includes most attractive public buildings of services and management and education, a place in which various networks of technical-welfare services cut each other in different levels and come together with the highest density. These are among points that can be mentioned in a quick visual interpretation. Clearly, it is a center or a hearth for a city that based on what we mentioned; its life is as long as all human beings' lifetime and brings together different experiences, shows the identity and originality of urbanities, who set the scene for shaping the cultural, civil and literary nature of the city over their generations (Falamaki, 2005). The movement of city centers revival has more than 150 years of history. It initiated with the activity of Baron Haussmann, mayor of Paris to renovate the center of city in 1850s and entered a new stage with the Le Corbusier designs as shining city in 1920s. After the World War II, the Le Corbusier' principles were approved by world governments which knew that as an easy and quick response to renovation needs and select him as a real propagandist of modern urban development. Consequently, a revision of city centers renovation patterns and transformation of renovation to retrofitting and preserving patterns became important since 1960s. In fact, social-economic planning and relying on the people

instead of body and primacy of culture and heritage over economy were introduced. Preference of external expansion (horizontal growth) or internal expansion (smart growth) was considered by specialists of the urban planning (Rahnema, 2009). Since 1980s, increasing number of American urban developers presented some theories on aging of city centers and horizontal expansion of suburbs which were dispersed, based on automobile traffic and with long distance and from city centers. Evolution of these theories led to the emergence of new urbanism movement based on humanistic urban planning. In the urbanism culture, new urbanism is supported by an attitude toward planning and urban design with emphasis on physical characteristics of neighborhood units and smart growth (Rahnema, 2012). Ideas related to the new urbanism design principles and conventional neighborhood units have been derived from conventional design principles consistent with the human's position in the city. Every neighborhood has a certain center and edge, its optimal size is a quarter of a mile from center to the edge and it includes a balanced combination of different activities such as living space, shopping, work, school, leisure time and worship. It forms the constructed spaces and internal riding network and is prior to the public spaces and location of urban public places (Einifar, 2007). Mashhad city has special national and regional importance due to the presence of the Shrine of the eighth Imam of the Shiites and renovation and reconstruction projects of central parts of city requires precise evaluation. On this basis, designing process of one of the old central neighborhoods of the city is compared with principles of smart growth.

2. Literature Review

Form-based codes were first implemented in the California as one of the urban smart growth concepts. Displacement of development principles by form-based codes began 15 years ago. Since then, it was emphasized to apply form-based codes to some urban neighborhoods. As a result, a combination of both text regulations that buildings represent the space and non-textual principles in which buildings easily are present, is applied (Talen, 2013). Hence, urban smart growth today's is able to present almost complete indices and criteria for urban planning and designing. The indices are gathered from reliable sources and are categorized and summarized in a table. We use the multi criteria analysis method to evaluate the consistency of urban areas with the smart growth principles and transit design. Combination of spatial data and their features are assessed using this method and consistency score is calculated finally for every index used in analyses. The analytic hierarchy process (AHP) is a flexible, powerful and simple method which is applied when different decision making criteria make difficult the selection between options. AHP method was first proposed by Tomas Thomas L. hour in 1980 and has already been used in different sciences. It significantly decreases the conceptual complexity of decision making since two components (paired comparison) are evaluated at the same time. It has 3 main steps: a) Production of paired comparison matrix. b) Standard weights calculation citizenship right. c) Estimation of consistency ratio (Ziari, 2010). Designing the Qarani and Horameli neighborhoods in Mashhad which was performed by Mehrazan consultant engineers was selected as one of the newest reconstruction projects of central worn out neighborhoods. All required indices and criteria for urban smart growth adaptation in the local project of the Qarani neighborhood in Mashhad were deduced based on documentations presented in the consultant report and a score from 0 to 100 was considered for every criterion. Finally, results of this table are judged based on mean comparison statistical model to test the hypothesis acceptance and consistency of planning process with smart growth approach was evaluated.

3. Theoretical Foundations

Once, the urban centers were regarded as desirable places for living. some issues such as traffic congestion, environmental degradation, stagnant houses, low quality of public schools, crime, lack of access to open space and destruction of infrastructures occurred in the city core With economic and population growth which led to destruction of city center. In recent years, many communities have decided to establish the development pattern of their societies based on smart growth principles and strategies. These principles will increase the land uses access, decreases the share of use and travel with means of transportations and creates a society with combined uses (Rahnema, 2008). New homes are preferred to be located near the workplace to decrease the problems related to transportation, traffic and air pollution. Access to local stores and public transportation and services is also emphasized (Edwards et al., 2007). Horizontal expansion is a term entered to the research literature in the recent half century as "sprawl" word and today's is the topic of most urban seminars in developed countries. Some researchers believe that sprawl is resulted from low density, dispersed and discontinuous urban development and expansion toward out of range areas and low density suburb areas along with dominance of private cars in transportation (Rahnema, 2008). Opposite views on the horizontal growth are defined as the compact urban form which encourages the walking and minimizes the environment degradation, encourages the social, economic and land use diversity to contrast homogeneity and uniformity, connects land uses, has high quality public spaces which create opportunities for interaction and interchange, provide fair access to goods,

services and facilities and protect human and environment health (Talen, 2013). In designing the rural to urban transects, a wide environmental range from rural to urban is the basis of habitat features structure which includes land, building, land use, street and all other physical elements of human habitat, finding a suitable space allocation from elements which form the human habitat. Rural elements should look for their position in the rural places, while urban elements are found in urban areas. Transect is designed to strengthen the integrity of each inclusive environment and can be used as an alternative for conventional zoning systems (Talen et al., 2007). Seven basic principles of neighborhood units' traditional development on their consistency with smart urban growth are as follows:

Connected streets pattern: a transport network is far more efficient than a case that consists of stalemate passages and few connector streets. More connection allows traffic to be distributed instead of concentration in one place and there are more options of routes and increases the time of response for emergency services and empowers the transportation.

(1) Inclusion of parks and open spaces in neighborhood units design to evaluate the environmental problems effectively.

(2) Compact design of a site results in the preservation of land surfaces and investment and maintenance costs of infrastructures.

(3) Integration of consistent land use: Such as a business in smaller scale and administrative levels with neighborhood habitats help the creation of job opportunities and services in the local level and finally decreasing the number of trips which requires cars in a conventional suburb level.

(4) Designing low traffic streets: Narrow streets are combined with marginal parking and it showed that it decreases the cars speed. Narrow streets promote the walkability through decreasing the effort of pedestrians and required time to cross the street. Marginal parking as a safe barrier protects travelers from parked cars against the current traffic. stop signs in regular intersections and other traffic reducing measures such as speed controllers and speed tables can also be combined and decline the traffic to the favorable speeds by pedestrians.

(5) Cost saving: Traditional development of neighborhood units creates privileges for those who pay taxes as well as local government that should balance tax revenues and service costs. Many research show that compact forms with development of mixed uses not only decrease the land consumption, but also decline the creation and maintenance costs of conventional separations.

(6) Popular traffic design: Connected patterns of streets, a combination of uses, a wide variety of home and congestion of habitats with general concept of creation of a walkable neighborhood is inherently supporter of public transport, subway or bus. Since efficiency of a public transport is a key factor in the smart growth, conventional development of neighborhood units is considered as a main concept of smart growth (Atlanta, 2005).

Neighborhood unit is the fundamental progress of human habitat throughout the history which is separated just by 60 years deviation that is now called horizontal growth of the suburb. Smart growth of a region can be measured using neighborhood unit structure strength (neighborhood unit principles) (Duani et al., 2012). Local communities of smart growth first include neighborhood units that meet the daily needs of residents in a suitable walking distance. The most complete neighborhood units provide walking paths to school, recreation centers, open spaces and stores. While neighborhood units include wide range of houses, creation of higher density is encouraged (Ibid).

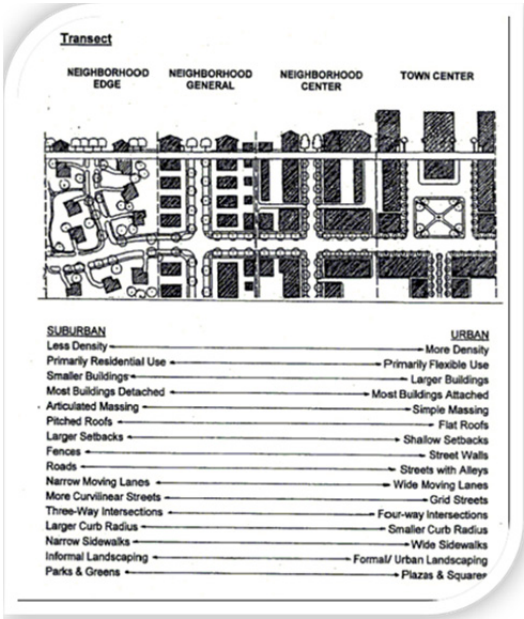

Figure 1. Traditional neighborhoods indices in transect design

A neighborhood unit design should try to create a balanced mix of different uses such as living, work, shopping, recreation and public uses. Such neighborhood units decline the undesired effect of traffic along with services and infrastructures costs. For various reasons, a healthy neighborhood unit has a wide range of habitation: because valid social networks depend on wide range of income and age and affordable habitation provide environmental health concentration and it helps builders to have access and attract all parts of market faster. All neighborhood units need to have retail space, the size of this space is depends on the neighborhood unit size and its density in relation to transport. Moreover, the units should have urban school sites, supportive services of local outdoors and residential density. According to definition, Neighborhood units are created in the pedestrian scale. A neighborhood unit is zoning not based on land use and on the basis of adaptable structural in which form-based regulations are implemented (Ibid). Neighborhood unit size matches a five minute walking or walkable range. This structure place most families in a short walking to a center with various uses (neighborhood unit size). Every neighborhood unit is defined first by its center and then by its edge. The center of neighborhood unit should contain a public space such as plaza, square or greenbelt depending on local culture. Edge is usually boulevards or parkways where there is traffic (organizing the neighborhood unit). Smart growth regulations which are based on buildings configuration, should replace the conventional zoning which is based on land use. Tall buildings are located among tall buildings; medium buildings are among medium buildings. Streets except rare cases must be symmetric with similar buildings on their sides and zoning changes should be made In the middle of blocks along the back plots where. So that homogenous street landscape can be obtained from non-uniform blocks. (Form-based zoning) a permeable street network is the result of small blocks presence. Kane Jacobs observed that the most walkable parts of small and large cities are located in places with smallest blocks. Surrounding area of available blocks in new neighborhood units must typically have 300-400 meters length (blocks size). Created passages typically have narrow path, facilities for bicycle movement, marginal parking, adequate sidewalks, continuous trees, street furniture, street lights and supportive frontages. When streets became pleasant sites, probably more people will leave their cars in their homes. Sidewalks and passages can be used to strengthen a pedestrian network with 3-6 m width. Sidewalks create some cross-cuts between long blocks in residential neighborhood units to create an efficient network for pedestrians. Public domain (passages and sidewalks) are shaped by private surrounding buildings. Place and configuration of a public domain helps its safety, spatial definition, performance and visual attraction to create a public domain, establishment of private buildings should be in a way that can surround the street space easily and view of buildings can array relatively close together (Ibid). People can less feel the need for private cars through creating a better balance in car use and availability of more walkable streets. Areas equipped with complete transit system should compel builders to provide maximum parking instead of minimum parking (Ibid). Ground level parking lots should be located in the block centers to be hidden from view by residential buildings. Most of the zoning standards control buildings through retreats, arrangement of buildings on the plot and occupied area by a building (Ibid). Regions with

public transit system are the most appropriate areas to locate tall buildings. Mixed –use buildings are so flexible and include a ground level commercial floor on which one or several residential or work spaces are built. Apartment houses are generally built toward the center of neighborhood unit, but are compatible with single-family homes. A residential-commercial building which is also called flexible house is a single-family home which is considered as workplace too. Such buildings are built near the neighborhood unit center and establish a perfect transition from commercial buildings to homes. Villas well known as single-story homes are independent buildings which are built on narrow lands with 75 to 135 m residential space. Such houses can located as small clusters throughout a neighborhood unit (Duany, 2012).

4. Results

All mentioned indices in the smart growth guide and transect design of smart growth code are categorized as follows and are gathered in a table to facilitate adapting the urban smart growth indices code. Given the importance of criteria weights and their effectiveness level, the diagram of categorizing the smart growth indices are arranged in the following hierarchical diagram:

Figure 2. Neighborhood unit indices in urban smart growth

The first levels of 5 main indices are weighted using paired comparisons of AHP model. Weighting is performed based on the index importance in planning and designing process of urban areas:

Table 1. Main index matrix (level 1)

Main indices	Physical index	Land use index	Density index	Passages index	Transport index	Geometric mean	Normal weight
Physical index	1	4	6	2	3	2.702	0.427
Physical index	1.4	1	2	1.3	1.2	0.608	0.096
Physical index	1.6	1.2	1	1.4	1.3	0.37	0.059
Physical index	1.6	3	4	1	2	1.644	0.26
Physical index	1.3	2	3	1.2	1	1	0.158

Note. Incompatibility rate = 0.011.

Then, subsidiary indices in every set are weighed and regulated in separate matrixes, respectively.

Table 2. Sub-criteria index (physical index)

Physical indices	Neighborhood size	Blocks size	Primary center	Plot area	Plot width	Geometric mean	Normal weight
Neighborhood size	1	1.2	2	3	4	1.644	0.263
Neighborhood size	2	11	3	4	5	2.605	0.417
Neighborhood size	1.2	1.3	1	2	3	1	0.16
Neighborhood size	1.3	1.4	1.2	1	2	0.608	0.097
Neighborhood size	1.4	1.5	1.3	1.2	1	0.384	0.061

Note. Incompatibility index= 0.015.

Table 3. Sub-criteria matrix (density index)

Density index	density	Number of floors	Occupied area	Geometric mean	Normal weight
Density	1	1.2	2	1	0.286
Number of floors	2	1	4	2	0.571
Occupied area	1.2	1.4	1	0.5	0.143

Note. Incompatibility rate = 0.012.

Table 4. Sub-criteria matrix (transport index)

Transport index	Urban train	BRT	Urban bus	Public parking	Geometric mean	Normal weight
Urban train	1	4	2	3	2.213	0.447
Urban train	1.4	1	1.3	1.2	0.452	0.095
Urban train	1.2	3	1	2	1.316	0.277
Urban train	1.3	2	1.2	1	0.76	0.16

Note. Incompatibility rate= 0.017.

Table 5. Sub- criteria matrix (passages index)

Passages index	Passages pattern	Passages area per hectare	Bicycle crossing facilities	Marginal parking	Continuous tree covers	Urban furniture	Street lights	Supportive frontages	Walking path	Geometric mean	Normal weight
Passages pattern	1	2	4	4	6	6	6	5	3	3.608	0.301
Passages area per hectare	1.2	1	3	3	5	5	5	4	2	2.546	0.212
Bicycle crossing facilities	1.4	1.3	1	1	3	3	3	2	1.2	1.084	0.09
Marginal parking	1.4	1.3	1	1	3	3	3	2	1.2	1.084	0.09
Continuous tree covers	1.6	1.5	1.3	1.3	1	1	1	1.2	1.4	0.426	0.036
Urban furniture	1.6	1.5	1.3	1.3	1	1	1	1.2	1.4	0.426	0.036
Street lights	1.6	1.5	1.3	1.3	1	1	1	1.2	1.4	0.426	0.036
Supportive frontages	1.5	1.4	1.2	1.2	2	2	2	1	1.3	0.685	0.057
Walking path	1.3	1.2	2	2	4	4	4	3	1	1.714	0.143

Criteria and indices of urban smart growth are determined and measured based on mentioned described standards and documentations. These quantitative values which are used as research final criteria for decision making are first ranked and then are derived from consultant's report documentations for local project of Qarani neighborhood of Mashhad.

Table 6. Primary stage of ranking the indices

Neighborhood units criteria in urban smart growth design approach (Physical index)		Low rank	High rank	Qarani neighborhood
Neighborhood unit size	80-160 acre	80-160	120-130	equivalent to 101 acre, 412250 m^2
Blocks size	150-400 m perimeter	500-600	< 100 m	Max: 280 min:120
Center and edge center: public area or green belt Edge: boulevard or parkway		Tall building Residential Singles-home	Public space boulevard	Green belt, religious, training space wide street and path
Minimum area of plot single- at least 130 m^2 Complex – at least 450 m^2				At least 100 m^2, single home, encouraging policy, at least 540 m^2 complex
Minimum and maximum width of plot min: 5.5 m max: 210 m				No regulations
Land use diversity: residential, commercial, greenbelt, leisure time, work space (Land use index)		Single use	6 Land uses	Residential, mixed residential-commercial, greenbelt, training, religious space
Residential dens (Density index) 24 unit per acre equivalent to 6 units per 1000 m^2 Building floors: min: 3 and max: 8 floors in T6 zone		< 2 1 floor	> 6 8 floors	23 units per acre equivalent to 2715 units throughout neighborhood min density: 200% equivalent to 4 floors and max 300%: 6 floors
Occupied area		40%	90%	60%
Passages network connected streets pattern (Passages index)		Deadlock 50 %	no deadlock	Plaid connected streets pattern
Passages design passages area per hectare		60 m	300 m	Above 300 m per hectare (13000 m throughout the neighborhood)
Bicycle crossing facilities		< 15%	> 85%	More than 30 km just in main passages
Marginal parking		< 15%	> 85%	In 20 % of passages
Continuous tree covers		< 15%	> 85%	In all passages, no detail
Urban furniture		< 15%	> 85%	No detail
Street lights		< 15%	> 85%	No detail
Supportive frontages		< 15%	> 85%	No detail
Walking path		3-6 m width (T5-T6)		Minimum width of 1.75 in 12 m paths and Maximum width of 4.5 m in 45 m paths
Urban train number of stations BRT number of stations Urban bus number of stations Public parking establishment site (Transport index)		No station No station No station In edges	> 4 > 4 > 4 near Residential areas	Qarani-Karimi line, with 2 stations Qarani-Karimi line, with 3 stations 4 bus lines and 12 stations 6 public parking- one hectare

All required criteria and indices for compliance of urban smart growth in the local project of Qarani neighborhood in Mashhad are derived based on documentations presented in the consultant report and a score from 0 to 100 are considered for every criteria:

Table 7. Scoring the smart growth indices

regulations of neighborhood units in urban smart growth design approach		Incompatibility 0	very poor 20	poor 40	moderate 60	relatively well 80	completely compatible 100
Neighborhood unit size (Physical index)	80-160 acre	< 80 > 160	80-90 150-160	140-150 90-100	130-140 100-110	130-135 110-120	120-130
Blocks size (physical index)	150-400 m perimeter	> 400	350-400	300-350	250-300	200-250	150-200
Center and edge (Physical index)	Center: public space or greenbelt Edge: boulevard or parkway	residential (tall buildings) single-home residential	single-home residential public space	sanitary- training parking	institutional-urban use institutional-urban use	greenbelt linear greenbelt	public space boulevard-parkway
Minimum plot area (Physical index)	Single: 130 m2 – complex: 540	no policy		without minimum and……encourage policy	encouraging and minimum policy		smart criteria
Min and max width of plot (Physical index)	m2 5.5- 210	no policy					smart criteria
Land use diversity (Land use index)	Residential-commercial, greenbelt, leisure time, work space	single use					diversity of 6 land use types
Residential density (Density index)	24 units per acre, equivalent to 6 units per 1000 m^2	< 2					> 6
	building floors : min:3 – max: 8 floors in T6 zone	one floor	2 & 3	3 &4	4 &5	6 &7	8
	Occupied area	40 %	50%	60%	70%	80%	90%
Passages network (Passages index)	Connected streets pattern	50% deadlock	40%deadlock	30% deadlock	20%deadlock	10%deadlock	no deadlock
Passages design (Passages index)	Passage area per hectare	< 100 m per hectare	100-150 m per ha	150-200 m per ha	200-250 m per ha	250-300 m per ha	> 300 m per ha
	Bicycle crossing facilities	no facilities	0-20%	20-40%	40-60%	60-80%	> 80%
	Marginal parking	no facilities	0-20%	20-40%	40-60%	60-80%	> 80%

	Continuous tree covers	no facilities	0-20%	20-40%	40-60%	60-80%	> 80%
	Urban furniture	no facilities	0-20%	20-40%	40-60%	60-80%	> 80%
	Street lights	no facilities	0-20%	20-40%	40-60%	60-80%	> 80%
	Supportive frontages	no facilities	0-20%	20-40%	40-60%	60-80%	> 80%
Walking paths (Passages index)	3-6 m width (T5-T6)	no walking path					smart criteria
(Transport index)	Number of stations	0	1	2	3	4	> 4
Urban train	number of stations	0	1	2	3	4	> 4
BRT	number of stations	no parking	1	2	3	4	> 4
Urban bus Public parking	establishment place		parking with unsuitable establishment				parking inside the blocks

A guide or criterion is regulated to evaluate and rank neighborhoods and urban areas compared with smart growth indices after gathering and scrutinizing indices based on documentations presented in the related reference. Local project of Qarani and Horeameli streets neighborhood was notified to consultant by Mashhad municipality. The aim was to study hidden potentials and capabilities of the neighborhood in relation to its position in the city and presenting economic and operational strategies through preparation of development and organizing the neighborhood with urban design approach. the local project of Qarani and Horeameli streets neighborhood was prepared in a place with almost 62 hectare area located in the west part of Imam Reza holy shrine in Mashhad in 2013 (Mehrazan, 2013).

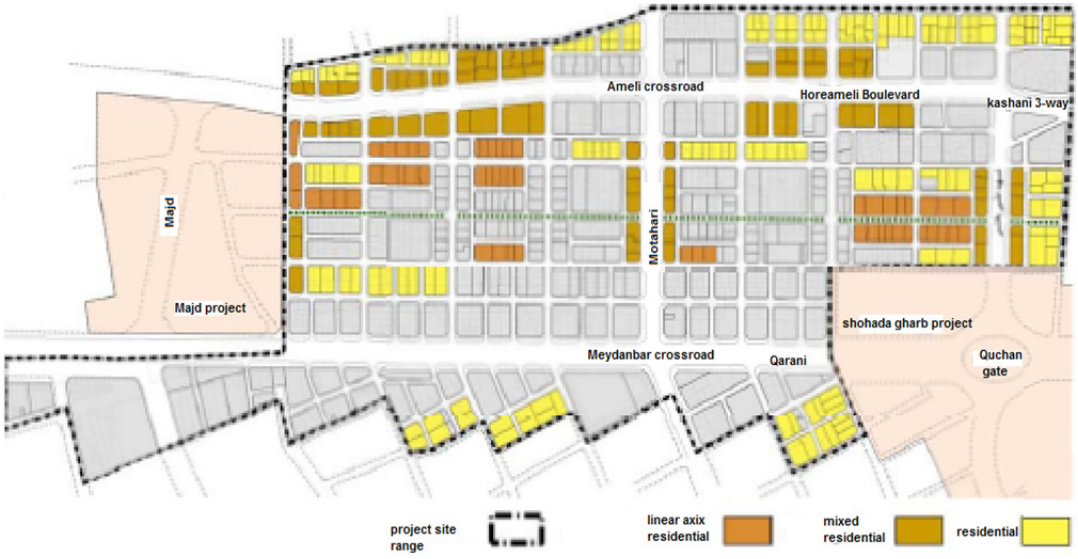

Figure 3. Recommended land use of the Qarani neighborhood local project in Mashhad (Mehrazan, 2013)

Final results of these studies are preparation of the smart growth evaluation table and determining the compatibility degree of Qarani neighborhood unit local project with urban smart growth as presented in the following matrix:

Table 8. Final table of scores and total compatibility degree

Indices	Data		Main index weight	Subsidiary index weight	Total weight	Score (from 100 total scores)	Score * weight
Physical index	Neighborhood unit size	80-16- acre	0.427	0.263	0.1123	60	6.74
	Blocks size	150-400 m perimeter		0.417	0.1781	100	17.81
	Center and edge	Center: public space or greenbelt Edge:		0.16	0.0683	80	5.46
		boulevard or parkway					2.48
	Minimum plot area	Single: 130 m2 – complex: 540		0.097	0.0414	60	0
	Min and max width of plot	m2 5.5- 210		0.061	0.026	0	9.6
Land use index	Land use diversity	Residential-commercial, greenbelt, leisure time, work space	0.096	1	0.096	100	1.69
Density index	Residential density	24 units per acre, equivalent to 6 units per 1000 m2	0.059	0.286	0.169	100	2.69
		building floors : min:3 – max: 8 floors in T6 zone		0.571	0.0337	80	0.34
		Occupied area		0.143	0.0084	40	0.34
Passages index	Passages network	Connected streets pattern	0.26	0.301	0.0783	100	7.83
	Passages design	Passage area per hectare		0.212	0.0551	100	5.51
		Bicycle crossing facilities		0.09	0.0234	20	0.47
		Marginal parking		0.09	0.0234	40	0.94
		Continuous tree covers		0.036	0.0094	80	0.75
		Urban furniture		0.036	0.0094	0	0
		Street lights		0.036	0.0094	0	0
		Supportive frontages 3-6 m width (T5-T6)		0.057 0.143	0.0148 0.372	0 80	0 2.98
Transport index	Urban train BRT Urban bus Public parking	Number of stations	0.158	0.447 0.095 0.277 0.16	0.0706 0.015 0.0438 0.0253	40 60 80 80	282 0.9 3.5 2.02
			Sum.		0.9962		74.53

In table (8), it can be seen that the Qarani neighborhood acquires 74.53 sores of total 100 scores after taking into

account the indices weight and scoring the urban smart growth. This score shows relatively good compatibility with the urban smart growth approach.

5. Hypothesis Testing

To ensure the statistical accuracy of the above mentioned process, scoring stages are followed one more time without using AHP method. Here, we use SPSS to conduct the One-Sample t-Test.

H0 is defined as: Mean $\geq$50 or mean scores of the smart growth is $\geq$50 in the study area.

Consequently, H1 means that the smart growth score is less than 50 that indicates that the urban smart growth approach is not considered in the given region project. In table (8), score column that represents the compatibility with the smart growth approach, was prepared before applying the weights of AHP method. These scores are processed in the SPSS software and the results are as follows:

Table 9. The results of One-Sample t-Test in SPSS software

	N	Mean	Std. Deviation	Std. Error Mean
Value	22	59.0909	36.24114	7.72664

The mean score is also higher than 50 (59.09) and represents that results of Qarani neighborhood unit reconstruction indices are close to the smart growth approach.

Table 10. The results of significance of One-Sample t-Test in SPSS software

	Test Value = 50					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference Lower	Upper
Value	1.177	21	.253	9.09091	-6.9775	25.1593

By entering the numerical test value (test value=50), confidence interval values includes negative quantities (-6.75) which shows the uncertainty of compatibility of smart growth indices that are higher than 50%.

Table 11. The results of significance of One-Sample t-Test in SPSS software

	Test Value = 0					
	t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference Lower	Upper
Value	7.648	21	.000	59.09091	43.0225	75.1593

By entering the numerical test value (test value=0) confidence interval values with 95% of probability are between 43-75 which is an acceptable range in which Qarani local project indices are close to the smart growth criteria.

6. Conclusion

This study aims to makes it possible to compare criteria and indices of urban smart growth with local projects and reconstruction of urban neighborhoods. In this study, AHP and hypothesis test for mean as a credible statistical process to compare qualitative indices of urban planning and design were used in this study. All scores and comparisons of designing criteria were derived from consultant documentations related to the Qarani neighborhood and the conventional scoring range was used after being in a quantitative form. Considering the similarity of more than50% of indices results showed relative compatibility of new approach of Qaran neighborhood designing with the urban smart growth. The compatibility increases as score of the indices table increases from 50% to 100%. Given the positive achievements of urban smart growth in horizontal growth decrease and social interactions increase and environment degradation prevention, orientation of urban planning, designing and reconstruction of worn-out urban texture of neighborhood units toward this approach can decrease many disorders of the urban communities. Tendency of urban design methods toward smart growth have had increasing effect on decreasing the difficulties in metropolises of developing countries. Findings indicate the relative compatibility of smart growth in new designs presented by urban management of Mashhad as a

Petropolis. However, more efforts and studies are required to obtain better compatibility score and desired results.

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