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Examining Urban Transportation Quality Based on Intelligent Growth Criteria (Case Study: Kerman City Districts)

[1]Ali Asghar Abdolahi, [2]Asma Mahmudinia and [3]Fateme Mahmoudinia
[1]Department of Geography, Faculty of Literature, Shahid
Bahonar University of Kerman, Kerman, Iran
[2]Islamic Azad University, Kerman, Iran
[3]Department of Urban Planning, Islamic Azad University, Kerman, Iran

Abstract: Intelligent growth identified as the principles of development and planning operations has established the ground usage pattern and effective transportation. This method contains numerous strategies which their result is better accessibility, more effective patterns of land usage and multiple transportation systems. Intelligent growth is a proposed method for improving dispersal. This growth has been supported by various groups. In this study, districts 1, 3 and 4 in Kerman, Iran have been studied on the strategies of transportation intelligent growth. The objective of this study is to review the quality of urban transportation in Kerman districts. The method is research project and descriptive-analytical. Initially, the criteria (indices) to be studied were selected then several sub-criteria were identified for each one. After different calculations, the best district was identified among the three studied areas, considering the studied criteria using AHP method and GIS. The results of the research show that there is a meaningful difference among the districts of Kerman considering intelligent growth criteria. Among the studied districts, District 1 gained maximum score of criteria and the districts 3 and 4 were in the second and third place.

Key words: Intelligent growth, hierarchic analysis process, urban transportation, Kerman ground usage pattern, Iran

INTRODUCTION

Increasing growth of urban population and habitation of more than 60% of the world population in cities and continuation of this process faces the earth future more with urban landscapes. These selected spaces will have >5 milliard population to 2025 AD which will settle >75% of the world population. This great urbanism process with machine focus besides development of cities mould has caused spoiling of agriculture lands and imposition of irrecoverable costs on cities environment. In the late 20th century with inspiration of scientific foundations of sustainable development, a new approach called modern urbanism and intelligent growth has been considered for making cities spatial form sustainable. According to the main assumption of this viewpoint, usages proportionate distribution and city compact form, besides preserving the environment, causes less use of cars for transportation. In fact, the intelligent growth guideline tries to reshape the cities and direct them toward capable society with access to desirable environment (Pourahmad *et al*., 2009). In the past two decades, intelligent growth guideline has been grounded in the framework of urban sustainable development theory and supporting compact city pattern. In fact, attention to compact city and intelligent growth has been widely increased due to undesirable effects of scattered development patterns in political and environmental contexts (Hosseinzadehdalir, 2008). This viewpoint advocates, emphasize the city compact form because of urban environment efficiency promotion in regard of energy consumption and reduction of urban travels (Azizi, 2003).

Problem statement: According to the available documents, compact city can reduce using private cars to 70%. Kerman is among cities which has taken its first steps towards intelligent growth. In Kerman city, there are several main nodes that most corridors in which urban travels is performed by public transports (bus, taxi and private hire vehicles) are located between these nodes. Most of these spots such as Azadi Square, Shohada Square (Muztagh), Valieasr intersection, Motahari

Corresponding Author: Ali Asghar Abdolahi, Department of Geography, Faculty of Literature, Shahid Bahonar University of Kerman, Kerman, Iran

intersection (Ahmadi) have problems relating to public transportation systems terminals. Regarding the necessity of utilizing systematic management of traffic stream in Kerman city and overcoming this city transportation and traffic problems and implications, we could expect that using transportation intelligent systems in this city to be useful and necessary. The main issues of Kerman city districts (especially the intended districts) in line with intelligent growth include: immense costs of transportation and urban service, waste of energy and losing financial and social assets in the city, intensifying social separation and increasing inequality between ground usage and physical criteria. Population growth and as a result increasing the number of travels in the country great cities such as Kerman on one hand and inappropriateness of public transportation system on the other hand, have causes numerous problems. It is obvious that solving the problems relating to urban traffic or at least reducing them is not possible in short time due to requiring numerous financial resources and manpower. Management of such an issue requires existence of tools in respect of policies determination, policy making and planning and guideline programs which are established by experts.

Significance and necessity: The issue of transportation and traffic which today plays a very important and sensitive role in social-economic quality and structure of a society as a social political phenomenon shapes the base of modern urban life and human displacement. The debate of urban travels, throughout the world, deals with the issue of traffic and consequently the wasted time. In other words, what makes urban travels more problematic than before is almost specified time aggregations which cause formation of heavy traffics in crowded and central city spots. Identifying peak hours and districts with heavy traffic have a great significance for providing some approaches for their optimal management (Emami, 2013). Solving the transportation issues and problems like most social issues requires systematic and continuous study and planning (Gharib, 1979). Reducing negative effects of transportation and traffic on citizens life requires moving towards sustainable transportation systems and sustainable transportation systems requires a dynamic balance between three main pillars of sustainable development i.e., environmental conservation, social equality and economic efficiency for present and future generations. Then, in line with role playing of urban intelligent growth policies, we can point to a wide range of ground usage factors including constructional density, usages spatial distribution, usage combination, method of connecting various uses to transportation network and ground usage facilities designing. Then, the way of using land and usages spatial and local transmittance pattern which is specified in the ground usage planning process, influences the demand and distances of travel.

Objectives: General objective of the present study is examining transportation quality of Kerman city districts in various dimensions (public and private) based on intelligent growth policies.

Research background: Some studies have been conducted in respect of transportation, traffic and urban growth intelligent issue, some of which are mentioned below: Farzanmanesh *et al.* (2010) in an article have addressed parking locating in crowded districts of Isfahan city and have concluded that among various models of multi-criteria decision making models for locating, using AHP model and fuzzy logic in GIS is the best tool of locating public parking lot. Khammar *et al.* (2013) have studied urban intelligent growth in the framework of regional development policies in Iran marginal regions with focus on Saghez City. The studied indexes in this study can be mentioned in the framework of population centers separation from the city crucial economic and social spots, citizens common culture and urbanism features inducted based on religious and ethnical courses. The rate of Saghez city lands usage alterations during 1984-2011 has been related to agriculture and garden usages with 1.4% density and residential usage with 40% respectively.

Hosseinzadehdalir (2008) in their article consider notional foundation of urban intelligent growth in controlling fast and irregular growth of big cities, overcoming citizens housing problems, transmittance, distribution and relocating of economic activities from big cities to new ones and preventing from shaping informal settlements. Hanky and Marshal (2009) believe that city shape and quarters design have a great role in selecting type of vehicle and traversed distance and population density, ground usage and mass transportation are associated.

Alexander and Tomalty (2002) in an article under the title of intelligent growth and sustainable development, studied relation, density and urban development in 26 municipal districts of British Colombia Canada using 13 criteria. Their study, they pointed to the relation of

density with infrastructures efficiency and reduction of using cars along with economic and ecologic efficiency. Wang and Sun (2010) in an article pointed to traffic congestion as the major problem which has blocked urban transportation sustainable development and analyzed transportation network, travel cost and traffic demand. In this study, they concluded that MDT (management digital transport) is an effective solution in reducing urban regions traffic density and we can significantly reduce urban regions traffic density using combined optimization model.

Shi *et al*. (2012) have studied various forms of urban development as an answer to urban growth different patterns in marginal region of China Lian Youn Gang and analyzed 6 urban growth patterns during 2000-2008 using geographical information system capabilities. The study results showed that urban growth pattern tends to marginal development and city dispersion follows an increase and decrease of centralization growth discretely.

The research questions and hypotheses:

- Do Kerman city districts have required standards of intelligent growth in transportation dimension?
- How guideline designs of making transportation intelligent can be created in Kerman city?
- It seems that Kerman city have the required standards for making transportation network and traffic intelligent
- It seems that intelligent making guideline could be administered in Kerman city by identifying demands and suitable approaches in transportation domain.

MATERIALS AND METHODS

The considered research method is descriptive analytical and in respect of nature and method it is of survey research type. The required data collection in this study has been accomplished using experts views and descriptive questionnaire and in AHP method format that the best and most suitable district was selected in respect of urban transportation quality based on the considered criteria (economic, social and environmental) among studied districts, using AHP model and geographic information system GIS. Required guidelines and approaches have been acquired in SWOT technique format. Validity and reliability of the research variables have been determined using Cronbach alpha. It should be mentioned that all the above stages have been conducted through consulting with experts and professors of Kerman city traffic and transportation organization.

Introducing indexes and variables: Better and more accurate identification of geographical locations status in different contexts in various levels depends on access to complete and processed information of the considered locations. For achieving this goal, some criteria have been used which specify the process of collecting, classifying and analyzing information and logical conclusion and generally the activities direction and yield a suitable framework intentionally for goal setting, codification, planning and evaluating activities. In fact, criteria as indicators are translators of qualitative and massive goals which make directing towards goals more accurate. Precision in orientation, on one hand prevents from resources loss and on the hand makes the considered goals and policies realization possible. In selecting the present research criteria , two points are noticed: first , the criteria include various dimensions and universal development of the mentioned districts transportation as much as possible and second, since collecting required information and statistics for being studied and analyzed should have the feature of being formal and trustworthy , then it has been tried to use criteria which are accessible through formal and statistical centers so that the accuracy of the information utilized in the study to be verified . The criteria used in the present study are as follow:

Research range and domain: Kerman city with a population more than 722484 is the center of Kerman province. Population density in Kerman City is about 46 persons/ha which based on the present statistics of the country is almost 1.2 of average density of Iran cities (100 persons/ha). Today, Kerman city besides several infrastructural problems, encounters with traffic and transportation problems too. About 70% of Kerman City urban travels are performed by public transportation systems. Movement direction of bus system in most routes is in direction of passing traffic and just in Shariati St. and in reverse direction a special line is assigned. Of course, there is no other special line in the city (Fig. 1).

Implications, views and theoretical fundamentals: Before addressing intelligent city definition, it is better to know why people still want to live in cities and why it is predicted that to 2050, urban population reaches 6.3 billion people (United Nations, 2012). Today, cities are places with the most educational institutes, cultures, religions and cognitive systems, belief and generic diversity. Places where higher incomes are expected

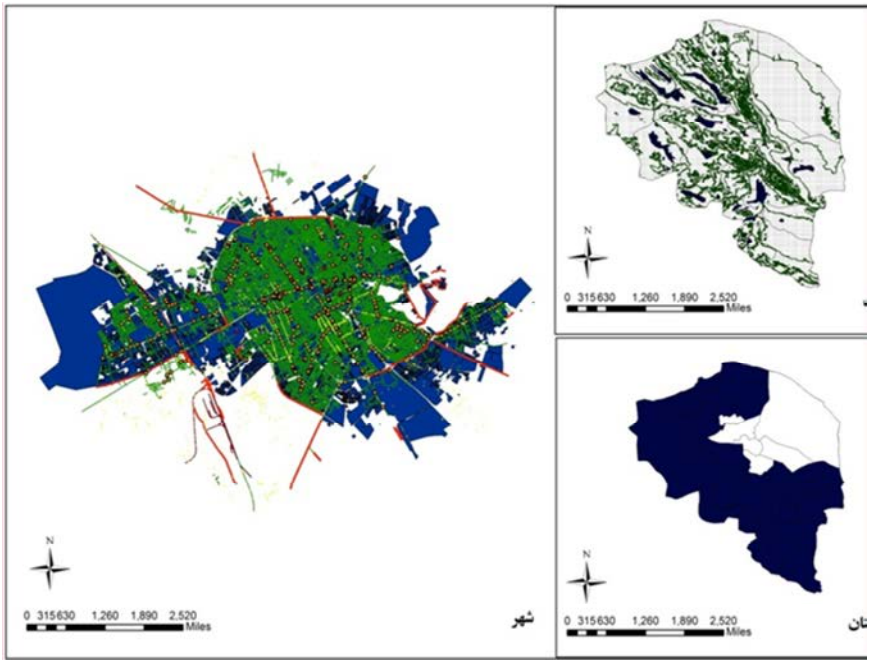

Fig. 1: Studied range

because most people who live there have higher educations and better occupations (Komninos, 2002). More than half of the world population lives in urban districts. Despite such great and complex societies of people, cities will turn to dirty and disordered locations. Necessity of confronting with these challenges has compelled many cities of the world to find more intelligent ways for managing them. These cities are described with the label of intelligent city. Human-centered intelligent city, based on its dependence rate, ICT advanced infrastructures and growing urban development always considers environmental and economic stability too (ITU, 2013). In fact, intelligent growth guideline tries to reshape cities and guide them towards a capable society with access to desirable environment (Pourahmad *et al*., 2009). Generally, an intelligent city is 24 h city in which urban affairs runs during all day and night. Through internet, citizens can at any time and any place access their required information and educational, recreational, commercial, departmental and health services (Kalantrari, 1974).

Intelligent transportation: Reaching intelligent development requires having intelligent transportation. The goals of extending transit and improving the capacity of transportation system is adaption with movement demands of economy and population development. Increasing people life level, issues and problems relating to transportation such as density, wasted times increase, accidents, environment pollution have caused safe transportation supply to be considered one of the most important issues before most countries (Mirbaha *et al*., 1966). One of the main ways of immunizing pathways or roads surfaces is pacifying which today wide efforts are being performed in many countries of the world in control and reducing speed and mass of vehicles. Intelligent transportation is one of the newest and most effective approaches of traffic management which originates from information technology. The idea of utilizing transportation intelligent systems is that it can create a new horizon for access to dynamic and cursive mobility in communication society of information and providing better services for citizens in line with implementing goals and traffic plans. Intelligent transportation systems cause improvement of safety level, efficiency and cheapness in transportation by using modern technologies. After long discussions about this system, most traffic experts have concluded that in case of correct use of this system, many growing problems of transportation could be solved (Panda *et al*., 1998).

The status of factors effective on traffic in Kerman City: A major part of Kerman urban travels is performed by public transportation systems like bus, taxi and private rent cars. Private rent cars haven't been under the control of any organization yet. Based on the information received from Taxi Organization, some measurements have

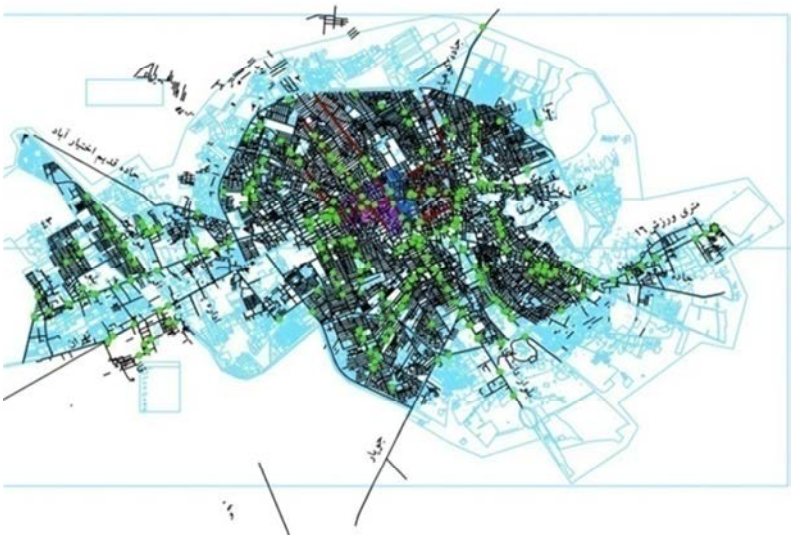

Fig. 2: Kerman City bus lines

been performed for organizing this type of public vehicles. The direction of moving bus system in most routes is in the direction of passing traffic. And just in Shariati St. a special line is specified in reverse direction. About other issues such as superficial status, navy life and the number of vehicles specified to lines, the evident point is that large passenger mass in most lines causes incapability of present system for responding passengers' demands which needs software management and buses increase seems inevitable in some lines (Fig. 2 and 3).

Transportation status of districts 1, 3 and 4 of Kerman City: Only Kerman eastern western street to east (located in district 1 of Kerman city) is one sided and no parallel street with this street exist in the city that this state causes heavy traffic formation in Shariati St. for passing from west to east. On the other hand, lack of big parallel pathways in the east to west axis, drags many drivers to Kerman subsidiary streets that low width of these pathways and their few number causes locking of the street in crowded hours (communication routes in Kerman city district 4) (Fig. 4 and 5).

Then, attention to intelligent growth criteria and achieving them for city development and growth is one of systematic measurements and solutions which should be considered. Car traffic in 40 years streets of Kerman City is traversing an ascending trend and everyday overcast pathways of Kerman while the infrastructures of this city with 722 thousand persons haven't changed yet. Kermanian have faced a phenomenon called heavy traffic in recent years, phenomenon they were unfamiliar with before, while Kerman urban structure has remained almost stable in previous years and the city face hasn't changed but every day the number of new vehicles entering the city is increased (Fig. 6 and Table 1).

Now, traffic is no more special to some city spots or special hours but most of Kerman city main pathways especially those which are located around Kerman Shariati St. bear the burden of heavy traffic. Also, limitation of parking space in the city various districts and non-supplying separate parking by some offices has also added the city traffic. Besides increase of traversing cars number and not adding to pathways length and capacity, considerable increase of Kerman population is enumerated one of main reasons of heavy traffic in these city pathways especially in central section streets. Despite continuing the present procedure i.e., increasing cars and population, still no clear and practical program has been declared by Kerman urban management for developing the city pathways. Lack of grades separation in Kerman crowded districts, existence of low-width pathways and shortage of multi-level bridges are considered among reasons of Kerman city traffic problems outbreak, also, intensive shortage of western- eastern pathways is patent in this city.

Then, regarding the discussed issues, we hope to reduce these factors mass using intelligent city principles and take fundamental steps for the city universal growth and development in line with intelligent city criteria.

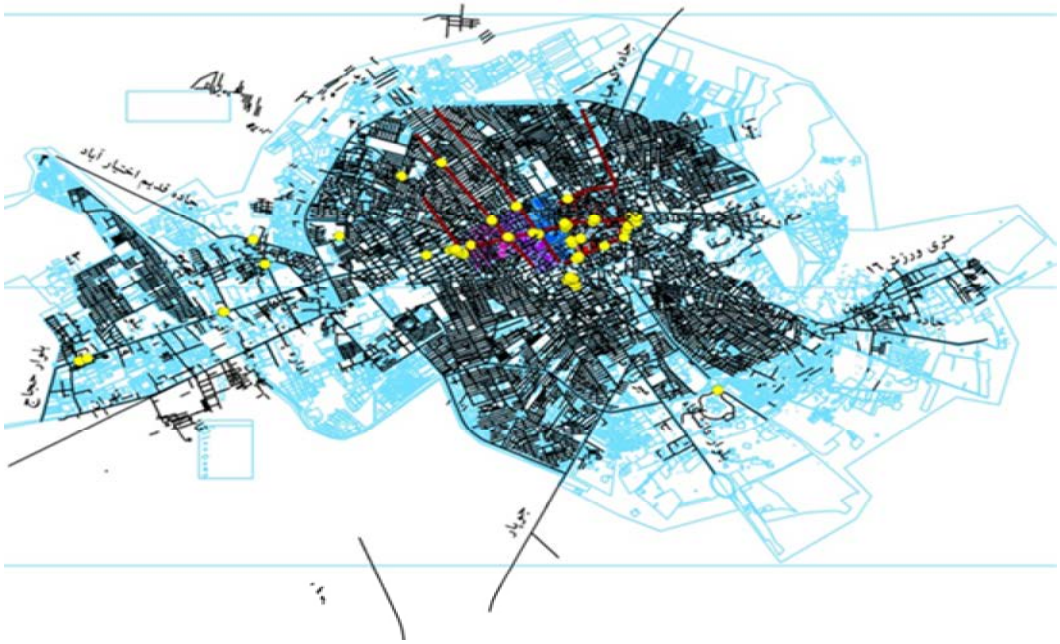

Fig. 3: Kerman City taxi lines

Fig. 4: Kerman City mass transportation corridors

Table 1: The study criteria and sub-criteria

Criterion	Environmental	Topography	Social	Economic
Sub-criteria	Pollution rate	Height-slope	Transportation demand	Economic growth
	Life diversity	Lands usage	Vehicles possession per capita	Car number
	Life possibility		Training	Services and facilities

As it is observed in the diagrams, among the occupational groups the greatest share of using vehicles is related to student's class and mainly public transportation system and after that household class stands that use public and usually private vehicles for performance of daily and out of house affairs. The occupants of the studied districts mostly use taxi and after that bus for performing their various works with

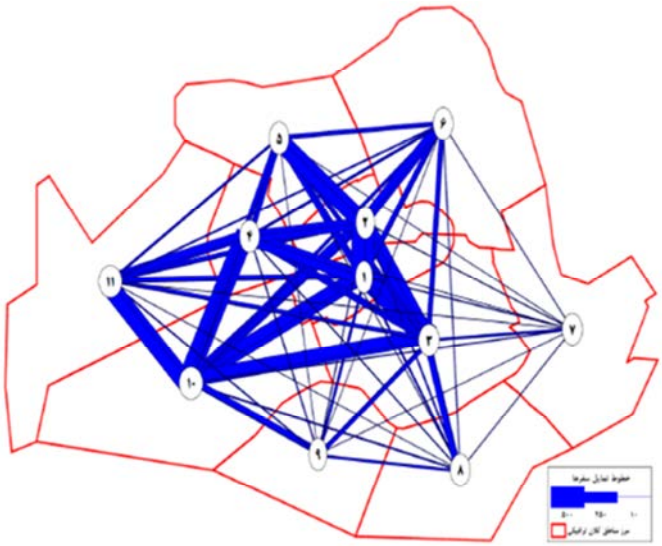

Fig. 5: Kerman lines of travel tendency

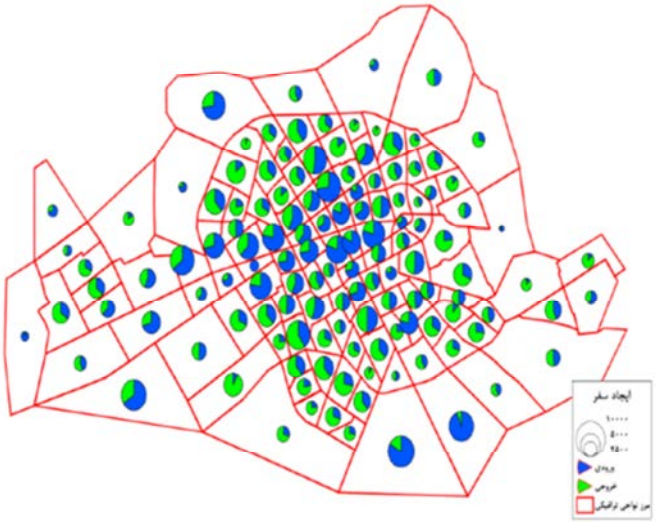

Fig. 6: Daily travels number of Kerman transportation system

different goals. Generally, the share of using public vehicles i.e., taxi and bus especially in the studied districts is more than private vehicles which in itself confirms attention to urban intelligent growth criteria.

RESULTS AND DISCUSSION

Hierarchical analysis process as one of the most famous multi-purpose decision making techniques for complicated status which has multiple and opposed measures, is considered a flexible and at the same time strong instrument which was first coined by Tomas L. Sati in 1970's. This pattern base is hidden in decision making on dual comparisons, i.e., analyzing value fundamentals are mixed with the information which exist about alternatives and creates a collection of priorities measuring rates for evaluating. In the first step, the hierarchical structure relating to this issue has been considered in which a four level hierarchy including goal, criteria, sub- criteria and options (communication axles) are introduced (Ma *et al*., 2005). Hierarchical display of the cases of goal determination, choosing important

Table 2: Kerman City districts specifications (2015)

Districts	Area (m^2)	Population	Family number
1	1511518	115105	28992
2	226081	114823	30155
3	2949963	135947	32943
4	202959	132750	29760

Table 3: Intelligent growth standards in the present study

Items	Standard
1	Life quality improvement
2	Public costs reduction
3	Increasing income through tourist attarction
4	Increasing satisfaction level/user acceptance
5	Reducing the time between accidents
6	Reduction of responding time
7	Increasing reliability of scheduling plan
8	Reducing gas pollutants
9	Reduction of fuel consumption
10	Reduction of delays

criteria, determining alternatives, determining criteria dual comparisons matrix from reference to extra priority (1-9), calculating relative weights of each criterion, alternatives rating and calculating adaptability rate for each of alternatives and criteria is performed separately. Moreover, it is based on dual comparison which makes judgment and calculation easy. Also, it shows the rate of consistency and inconsistency of decision which is considered among distinct profits of this technique in multivariate decision making. After analysis and calculating consistency factor this rate should be <0.1. Using this factor helps decision analysis before final selection of transportation axle (Dey and Ramcharan, 2008). In other words, hierarchical analysis process expresses complex issues through changing them to detailed issues which are relating to each other hierarchically and relating main goal with the lowest hierarchical level in a simpler form (Table 2).

The research findings: Th first level for attaining the research goal, i.e., studying urban transportation quality of Kerman City districts is finding the best and most suitable district in traffic and communication respect and in the second level, introducing main criteria that in this study are four criteria of environmental, topographical, social and economic. In the third level, some sub-criteria are introduced for each of the mentioned criteria and in the next step by dual comparison, relative weight of each criterion has been obtained. Finally, by consulting experts and in the format of questionnaire and scoring to each of criteria, sub-criteria and alternatives (1-9) according to Table 3, dual comparisons have been shown from scores 1-9.

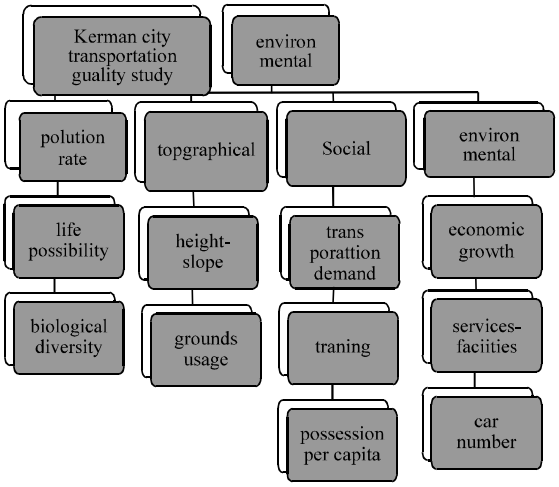

Fig. 7: Hierarchy tree of research process

Constructing a hierarchical tree: When E.H.P is used as decision making tool, the planner should at first provide a suitable hierarchical tree which is expressing the studied issue. Singularly, the first level of each tree expresses decision making goal. The second level includes decision making indexes or criteria. The third level expresses sub-criteria and the last level is expressive of alternatives which are compared with each other and are in competition with each other for selection. As it was pointed out, according to the preliminary studies in the city range, three traffic districts (1, 3, 4), suitable for this purpose were identified and revisited. After performing accurate evaluation, the mentioned unit wants to select among the three mentioned districts their best and most suitable in regard of transportation status. The essential stage, in this process is determining factors based on which the competitor alternatives (districts1, 3 and 4) are compared to each other. After structure stage, the decision hierarchy tree is drawn and written as shown in Fig. 7:

- Level 1(goal): selecting the best and most suitable district in traffic respect among three districts (1, 3 and 4)
- Level 2 (criteria): environmental, topographic, social and economic
- Level 3 (sub-criteria): rate of pollution in the site, biological diversity, urban viability possibility, ground height and slope, grounds usage, transportation demand, private car possession per capita, training and traffic culture building, transportation economic growth, the number of private cars and transportation services and facilities
- Level 4 (competitor alternatives): districts 1, 3 and 4

Table 4: Scale of pairwise comparing in A-H-P

Preferential value	State of comparing i to j	Explanation
1	Equal significance	Alternative or criterion I comparing j has equal significance and or don't have priority to each other
3	Relatively more significant	Alternative or criterion I is a bit more significant than j
5	More significant	Alternative or criterion I is more significant than j
7	Very more significant	Alternative or criterion I has very much more priority than j
9	Totally more significant	Alternative or criterion I is absolutely more significant and it is not comparable to j
2, 4, 6, 8	Intermediate	It shows middle values between preferential values. For example, 8 indicates higher significance than 7 and lower than 9 for j

Table 5: Weighing criteria, sub-criteria and alternatives

Criterion	Relative weight of criterion	Sub-criterion	Relative weight of sub-criterion	Alternative
Environmental	0.547	Pollution, biological diversity, life possibility	0.687, 0.150, 0.161	A, B, C
Topographic	0.157	Height-slope, grounds usage	0.833, 0.1666	A, B, C
Social	0.136	Transportation demand, possession per capita, citizens training	0.581, 0.185, 0.232	A, B, C
Economic	0.157	Economic growth, car number, services and facilities	0.245, 0.170, 0.584	A, B, C

From this stage, E.H.P operation is utilized for achieving goal which includes:

Weighing the criteria: In this stage, the objective is to determine weight of measures pairwise. In other words, competitor alternatives in level 4 should be pairwise compared by each of measures in level 2. Pairwise comparison is performed using a scale which has been designed from similar priority to screamingly preferable. It should be explained that comparative matrix in E.H.P is a reverse matrix, i.e., if the priority of measure 1-2 is 5, then the priority of 2-1 is 1.5 and in other words, the numbers of each comparison is determined as one of the following forms: first: as numbers 1-9, second as the reverse of the mentioned numbers. Regarding that the priorities are shown as in two forms (numbers 1-9 and reverse of 1-9), if the rate of (aij) is larger than 1 , its implication is that the criterion which is placed in level I th has more significance than the measure which is located in column j and vice versa. Amounts less than 1 indicates that the i th measure has less significance than measure j. after formation of dual comparisons judgment matrix, the criteria weight for each of decision making criteria should be calculated. These weights abstractly specify that which criterion is generally more significant. In a comparison made between 4 main criteria, the highest weight was assigned to environmental factors with weight 0.547 and its lowest to transportation social criteria with relative weight of 0.136.

Weighing sub-criteria: Comparing criteria in this stage like the previous stage is performed based on dual comparisons. After performance of comparisons, each criterion to the other, geometrical average is used one for acquiring their weights and by standardization of each of the obtained numbers, relative weight of each criterion is obtained.

Weighing alternatives: Weighing alternatives means explaining each site priority rate regarding each of fourfold criterion, for this purpose, judgment matrix of each district should be built regarding he first measure and then the weight judgment matrix of each district is built regarding the second measure and this continues till we have districts judgment matrixes in equal number of criteria. After completion of these stages, the third stage is started which is calculating the compound priority weight of each district. Alternatives weighing process is regarding the criteria, sub-criteria and general goal Table 4 and 5

Determining the alternatives final score (priority): As the prepared data and tables show, the significance of districts, in respect of criteria and sub-criteria, are different with each other. In this stage, a series of calculations is used which is known as the principle of time hierarchical combination. These calculations result yield a vector which includes all judgments of hierarchical levels. By holding criteria weight, the combined priority weight of each district is acquired Fig. 8.

Calculation of consistency rate: A.H.P significance, besides combining various levels of decision hierarchy and by considering various factors is in calculation of Consistency Rate (CR). Consistency rate is a mechanism which specifies comparisons consistency. This mechanism shows that how much we can trust the priorities result from group members or priorities of combined tables. According to experience, if consistency rate is < 0.1, we can consider judgments good and weights trustworthy. Otherwise, the analyzer should return the previous stage and re-revise the judgments. For calculating consistency rate, several studies have been conducted the best of which is special vectors (Table 6):

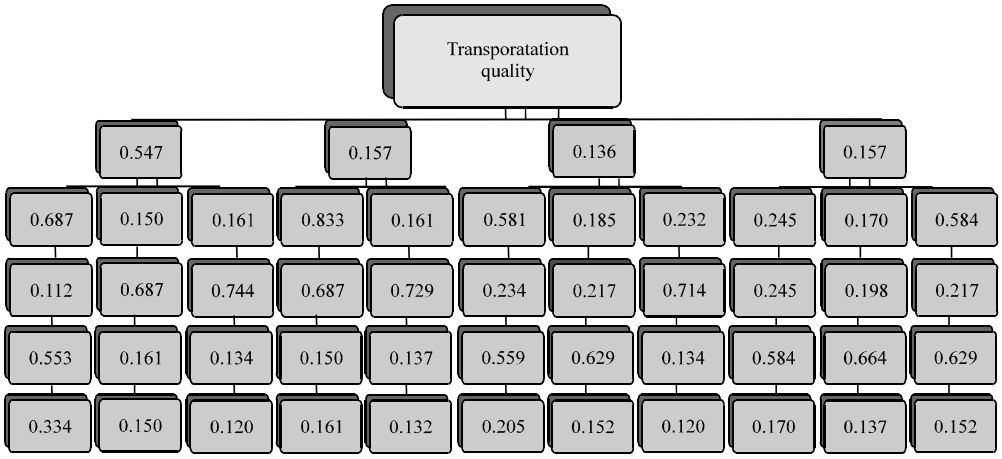

Fig. 8: Weights integration for selecting the best traffic district

Table 6: Weighting criteria

	Alternative			Relative weight		
Sub-criteria pollution	A	B	C	0.112	0.553	0.334
Biological diversity	A	B	C	0.687	0.161	0.150
Life possibility	A	B	C	0.744	0.134	0.120
Height-slope	A	B	C	0.687	0.150	0.161
Grounds usage	A	B	C	0.729	0.137	0.132
Transportation demand	A	B	C	0.234	0.559	0.205
Possession per capita	A	B	C	0.217	0.629	0.152
Citizens training	A	B	C	0.744	0.134	0.120
Economic growth	A	B	C	0.245	0.584	0.170
Car number	A	B	C	0.198	0.664	0.137
Services and facilities	A	B	C	0.217	0.629	0.152

Final priority, A = 20946; B = 21442; C = 8202

Table 7: Calculating matrix A assoil by measures weight vector W

Special weight	Relative weight	G	F	E	D	Matrix
2211	0.547	4.0	3.0	4.0	1.0	D
0.63	0.157	1.0	4.3	1.0	1.4	E
0.564	0.136	3.4	1.0	3.4	1.3	F
0.63	0.157	1.0	4.3	1.0	1.4	G

$$\frac{1}{n}\sum_{i=1}^{n}(AW_j)/(W_j)$$

$$L=\frac{1}{4}\left(\frac{2/211}{0/547}+\frac{0/63}{0/157}+\frac{0/564}{0/136}+\frac{0/63}{0/157}\right)=0/053$$

CI calculation: Consistency of E.H.P criteria is calculated from the following equation:

$$CI = (L-n)/(n-1)$$

$$= \frac{4/053}{4-1} = \frac{0/053}{3} = 0/0176$$

Calculating the ratio of CI to RI (random numbers criteria): It is calculated regarding to its respective n. Random number Index (RI) of each n has been shown in Table 8. The amounts mentioned in the table are produced by national laboratory of Ok Rich and Wharton School (Table 7-9):

$$CR = \frac{CI}{RI} = 0/019$$

$$= 0/019 < 0/1$$

The research main guidelines: Strategic planning is a coordinated, universal and continuous plan which binds the organization preferential liability with the environment and its purpose is the organization goals realization in the management correct implementation framework. Strategic planning and management process includes three main stages: guidelines codification, guidelines implementation and guidelines evaluation. Strategic planning and management is one of important management pillars in an

Table 8: Random consistency Index (RI)

N	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15
IR	0	0	0.58	0.9	1.12	1.24	1.32	1.41	1.45	1.49	1.51	1.48	1.56	1.57	1.59

Table 9: First hypothesis test

Model	R	R^2	Adjusted R^1	SE of the estimate	R^2 change
Regression	[a]1000	1000	0.921	0	1000

Table 10: Second hypothesis test

Model	R	R^2	Adjusted R^1	SE of the estimate	R^2 change
Regression	0.995	0.991	00.924	0.707	0.991

Table 11: Internal-External factors matrix (IE)

Marices	5	4	3	2	1
5	IFE				
4	offensive	2.95			
3	So				
2			Conservative (adaptive)	3.26	
1	EFE		Wo		
	Competitive				Defensive
	S_T				W_T

Table 12: General guideline

Items	Guideline
1	Reducing accidents in unfavorable climate conditions or surface destruction
2	Improving reporting about accident occurrence and reactive measurements
3	Improving traffic control and monitoring in urban regions
4	Development and exploitation from swift bus system
5	Providing a suitable system for exerting seasonal limitations of commercial vehicles weight
6	Providing more convenient public transportation services
7	Constructing and extending fast subway lines

organization and system. Examining internal and external factors is an important part of strategic planning and management since each organization management process is influenced by its interaction process with external environment. The matrix of Strengths, Weaknesses, Opportunities and Threats (SWOT) is one of famous patterns of strategic planning and management.

For building the matrix of strengths, weaknesses, opportunities and threats, we should measure as follows: Identifying the main strengths and weaknesses and creating Internal Factors Evaluation matrix (EFI) Identifying the main opportunities and threats and creating External Factors Evaluation matrix (EFE) Codifying guidelines and establishment of matrix of strengths, weaknesses, opportunities and threats (SWOT) (Table 10 and 11).

Drawing Internal-External matrix (EI): Based on the obtained results, we can say that the regression coefficient of first hypothesis in this sense that it seems that Kerman city has required standards for making transformation and traffic networks intelligent has been equal to 1000 and regression coefficient of the second hypothesis in the sense that it seems that by identifying suitable needs and approaches in transportation field , we can implement intelligent guideline in Kerman City, has been equal to 0.995 which shows that both research hypotheses are confirmed.

CONCLUSION

Urban intelligent growth is one of the principles which have always been under consideration of experts and planners following problems due to traffic and transportation and especially during recent years. Kerman is among cities which have taken new steps for achieving intelligent growth and regarding the problem of traffic and transportation which have today involved cities, attention to intelligent city principles in line with intelligent growth criteria can be a solution to this problem. Regarding various consequences that traffic and transportation issue can have, the cities? growth and development should be adjusted based on intelligent growth policies. Then, one of suitable models, in determining communication limitations and axles and measuring the traffic quality in them is A.H.P model whose utilization along with other models could have a valuable role in making decisions and future direction of intelligent growth. Using quantitative analyses in geographical studies provides trusty results. The aim of the present

study is to study transportation quality based on intelligent growth criteria in Kerman City districts. Based on the obtained results in this study in respect of pollution rate, district 1 with weight of 0.553 has assigned the highest rate of pollution and district 4 with weight 0.112 the lowest weight to itself. In respect of biological diversity, district 4 with weight of 0.687 has assigned the highest weight and district 3 with relative weight of 0.150 the lowest weight to itself and based on urban life feasibility factor, districts 3 and 4 with weights 0.687 and 0.150 have the highest and lowest weights respectively. Grounds usage status in district 4 with relative weight 0.729 includes highest rate and district 3 with relative weight of 0.205 the lowest rate. District 1 with weight of 0.559 has assigned the highest rate and district 3 with relative weight 0.205 the lowest rate in respect of transportation demand. Vehicles possession per capita rate in district 1 with relative weight of 0.62 has assigned the highest rate of per capita and district 3 with weight of 0.152 the lowest rate. The status of transportation training and culture building in studied axles is so that district 4 with weight of 0.744 includes the highest and district 3 with weight of 0.120 the lowest rate. Economic growth in district 1 with relative weight 0.584 has the highest rate and district 3 with weight 0.170 the lowest rate. The number of private cars in district 1 with weight 0.664 is the highest and in district 3 with weight 0.137 the lowest rate. Services and facilities relating to transportation in studied districts with relative weight 0.629 for district 1 and 0.152 for district 3 include the highest and the lowest rate. Regarding the performed calculations, we can conclude that among districts 1, 3 and 4, in respect of environmental and topographical criteria, district 4 has the highest score and district 3 the lowest score and in respect of social and economic criteria, district 1 has the highest score and district 3 has the lowest score.

SUGGESTION

Now, traffic is no more special to some city spots or special hours but most main pathways of Kerman City epically those around Kerman Shariati St. experience heavy traffic burden. Also, limitation of parking place in various city districts and not supplying private parking lot by some offices has added to city traffic. Besides increasing the number of cars traversing and not adding to pathways length and capacity, considerable increase of Kerman population is considered among the main reasons of heavy traffic in this city pathways especially central section of the city. Today, though citizens face many difficulties while trafficking in 4 main directions but the trouble of traffic is reduplicated for them in Western and eastern axels, since there not much alternatives for determining access route, so regarding the discussed issues, we hope that by using principles of intelligent city reduce the content of these factors and take fundamental steps for the city universal growth and development in line with intelligent city criteria. Then, attention to intelligent city principles should always be considered in advancement of making intelligent. For this purpose, some suggestions are provided about improving Kerman City transportation quality as follows:

- Widening pathways or constructing new streets especially in city dense texture (districts 1, 3 and 4)
- Fixity and reduction of high properties cost which increases the cost of traffic plans severely
- Creating underground pathways
- Constructing grades separation like overpass in some urban pathways

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