

ORIGINAL ARTICLE

Evaluation of roadside service centers. Case study: Zahedan to Khash Road

Fateme Hashemzahi, Maryam Karimiyan Bostani*, Mahmood Reza Anvari

Department of Geography, Faculty of Humanities, Zahedan Branch, Islamic Azad University, Zahedan, Iran

**Corresponding Author Email: ordibehesht.m7@gmail.com*

Submitted: 25.10.2017. Accepted: 11.12.2017

In the recent century, the excessive and unplanned growth of urbanism and inattention to the proper and correct selection of locations for roadside uses, especially roadside services, have led to the appearance of problems such as lack of spaces for service centers, inappropriate access, and other problems. The strategic location of the city of Zahedan among other cities of Sistan and Baluchistan Province and its connection to the national corridors requires development and growth of transportation industry and improvement of its performance. Some of the utmost important centers that have to be established for this purpose on the roadsides in the required quantities are roadside service and welfare centers. Therefore, in order to maintain and promote the security of the roads in the country, the establishment of such centers requires studies, evaluations and eventually, determination of appropriate and secure locations. In this study, considering the necessity of establishing service and welfare centers on the Zahedan to Khash Road, first, the existing centers were evaluated from the perspectives of passengers, then, by the use of site selection systems, some locations were determined in the high traffic parts of this road. The research methodology in this study is descriptive-analytical which is used in order to analyze the collected data. The research findings show that according to the passengers, the conditions of roadside services on the Zahedan to Khash Road and the existing infrastructures are weak. However, they are satisfied with social and security-related factors. The passengers also stated that these roadside service centers have created job opportunities in the region. They also have been effective in providing security of the roads.

Key words: evaluation; roadside services; Zahedan to Khash Road

Statement of the problem

Establishment of order in the environment has been one of the most popular, and at the same time, most complicated activities of human beings. One of the highly important issues in urban planning is using space in order to maintain appropriateness, balance, and interaction in the city. Therefore, it is common that if in some urban areas, provision of urban services is better, compared to other areas, the population will flood to those areas, and consequently, there will be side effects such as traffic jams, air pollution and stress in those areas (Abbasi, 2009). Identification and determination of appropriate locations for establishment of service centers depend on recognition of the type of activity, performance, requirements, actions, and reactions that service centers create alongside each other. Respecting the principle of honesty in access to service centers, especially educational areas, requires that in site selection and balanced distribution of these spaces, the existing conditions and regulations be taken into account (Taqvaei et al., 2010). Optimized distribution of service centers is a challenging issue to most planners (Bahreini, 1998) in order for the principle of justice to be considered in access to service centers. This is because the utmost important factors in urban planning are making the best use of spaces and proper distribution or, in other words, spatial justice. In this regard, urban uses and services are some of the effective and useful factors which alongside accountability to population requirements, increase of public benefits, qualification and competency of individuals, can establish aspects of spatial justice, social justice as well as economic justice in a more balanced way (Varesi, 2007).

One of the highly important infrastructures required for development is the establishment of roadside service-welfare centers; not establishing these centers in the required spots, or establishing them dispersedly on the road networks, in addition to wasting of capitals, leads to decrease of security ratio and an increase in road accidents. Because these centers were considered as places for providing different services, they were very important in the past and included some of the important urban and roadside functions. Unfortunately, in the recent century, because of the fast, unplanned and excessive growth of cities and also because of inattention to correct and rational site selection of roadside uses, especially service centers, some problems such as lack of service spaces, inappropriate access, etc. have appeared. These problems are also observed on the Zahedan to Khash Road. In fact, the most important reason that made doing this study essential was the shortcomings and incorrect site selection

of service centers on the Zahedan to Khash Road. Therefore, correct and optimized site selection for different land functions such as the establishment of roadside service centers by the use of scientific techniques, tools and models according to the basic principles of planning can be effective in blooming and development of a country's economy. Hence, in this survey, the objective is to evaluate site selection of roadside service centers and according to the basics and standards of site selection, optimized site selection can be suggested for the Zahedan to Khash Road for the establishment of these centers. This study tries to answer the following questions:

- Are the passengers satisfied with the socio-economic conditions and security of roadside service centers on the Zahedan to Khash Road?
- Can correct site selection of roadside service centers be effective on increasing security of roads?
- Are the roadside service centers appropriate sources of entrepreneurship in the region?

It can be said about the research literature that in relation to site selection of roadside service centers in the recent years, due to the need for evaluation of problems of service spaces, some studies have been carried out either theoretically or within the framework of site selection at universities and scientific associations. The following cases are some of these studies:

In addition to the fact that every one of the roadside facilities could have been considered as an element of creating a central urban core, nowadays, every one of them has appeared in a new form. Roadside service complexes work as places for refreshment, creation of security, as campsites for staying and relaxing, provision of travel supplies, exchange of goods, doing social as well as cultural interactions, and as inns for passengers to stay at nights or places for entertainment or passing leisure time. In the meantime, as horses and camels have been replaced by cars, nowadays, barns, stables, and warehouses gave their places to parking lots for vehicles, petrol stations, oil exchange centers, mechanic garages and carwashes. On the other hand, requirements of passengers are provided in a modern way in the stores of service complexes. These services include communication facilities, children's parks, aid and hygiene facilities, etc.

Soleimani Farsiani (2009) has studied the present situation of urban services in the city of Shahre Kord in his MA thesis. He has concluded that spatial distribution of urban services in this city is not optimized at the moment, and by the use of GIS software, he has presented a proper pattern for site selection of urban service centers for future.

Concentration of service centers on the roads in the form of roadside service complexes is considered as an accepted method in the world. In this regard, the governments do not pay attention only to economic justifications of these complexes, but they also consider ecological, social, cultural and political benefits of these complexes, so much so that they grant specific facilities for the establishment of roadside service centers. For example, in Turkey, when a highway is built, along with that, roadside service complexes, too, are simultaneously built (Davoodi, 2001).

Parhizkar (1997) has carried out studies on urban models and urban GIS and has tried to present an appropriate pattern for site selection of urban services. He has concluded that making simultaneous use of mathematical models and GIS capabilities is an appropriate pattern for site selection of urban service centers.

Adeli, Mohsen et al in Tehran Shahid Beheshti University have identified the best locations for establishment of service centers in the city of Gorgan by the use of priorities and criteria. They also have insisted on the role of GIS in modeling complicated time and place phenomena; they have suggested that Cellular Automata model can be used to evaluate and study the direction of future urban development more precisely. It can direct GIS capabilities in finding the location of service centers in order to be used for longer time periods.

Moshavash Farid (2001) has studied presenting of an appropriate model and has concluded that by the use of Matrix rating model, locations can be rated according to their specific scores and eventually by calculating the criteria coefficients and weight values of each location, the optimized location can be achieved.

Some other countries, apart from the welfare requirements of passengers, have paid special attention to their other requirements such as entertainment and tourist requirements. For example, in the existing samples in Britain and Canada, specific attention has been paid to entertainment and tourism issues. They have more focused on the provision of facilities that let the travelers make the best use of the countryside in addition to fulfilling their requirements (Farid, 2001).

In this regard, there is not a single pattern for the establishment of service-welfare complexes in the countries because every country's specific features require it to practice the policy of creating its complexes in a different way from other countries. For example, in Saudi Arabia, huge complexes are designed for pilgrims and foreign passengers who have limited requirements. So, they enjoy services in large scales (Shia, 2003).

Research methodology

The type of this survey is applied because it is a step for expansion of welfare and for solving some problems of the society. It uses the descriptive-analytical method. For data collection, two methods of document studies and field studies were used.

1. Library studies: this method was used for studying the literature of the survey and also for data collection about population, economy, society, history, etc. of the Zahedan to Khash Road.
2. Field studies: these studies were complementary to library studies. In this method, by attending the field, the current situation was evaluated and the required data was collected through field observations and distribution of questionnaires.

The statistical population in this study is all cars that transited the Zahedan to Khash Road from 22nd Sep 2016 to 20th Nov 2016 for two months. According to the statistics of the Zahedan to Khash Road traffic police, 162845 cars have transited this road in this period. These cars were buses, minibusses, sedans, and trucks. It was evaluated that the average number of cars that daily transit this route was 3000 cars which travel from Zahedan to Khash, and vice versa. Therefore, the number of passengers on this road, 233000 passengers, was estimated as the statistical population, and the prepared questionnaires were filled by these drivers and passengers.

In this level, according to the Cochran formula, the number of required samples for this survey was calculated as 380 questionnaires.

$$n = \frac{\frac{(1.96)^2 * .8 * .2}{(.05)^2}}{1 + \frac{1}{23300} \left(\frac{(1.96)^2 * .8 * .2}{(.05)^2} - 1 \right)} = 380$$

Geographical location of the studied region

The city of Khash is located in the south of Zahedan. The Zahedan to Khash Road is 178 km long and it takes 2 hours by car to travel this road. The below map shows the situation of the Zahedan to Khash roadside centers where there are two traffic police stations, two police stations, 2 petrol stations and 4 roadside emergency centers spotted on the map.

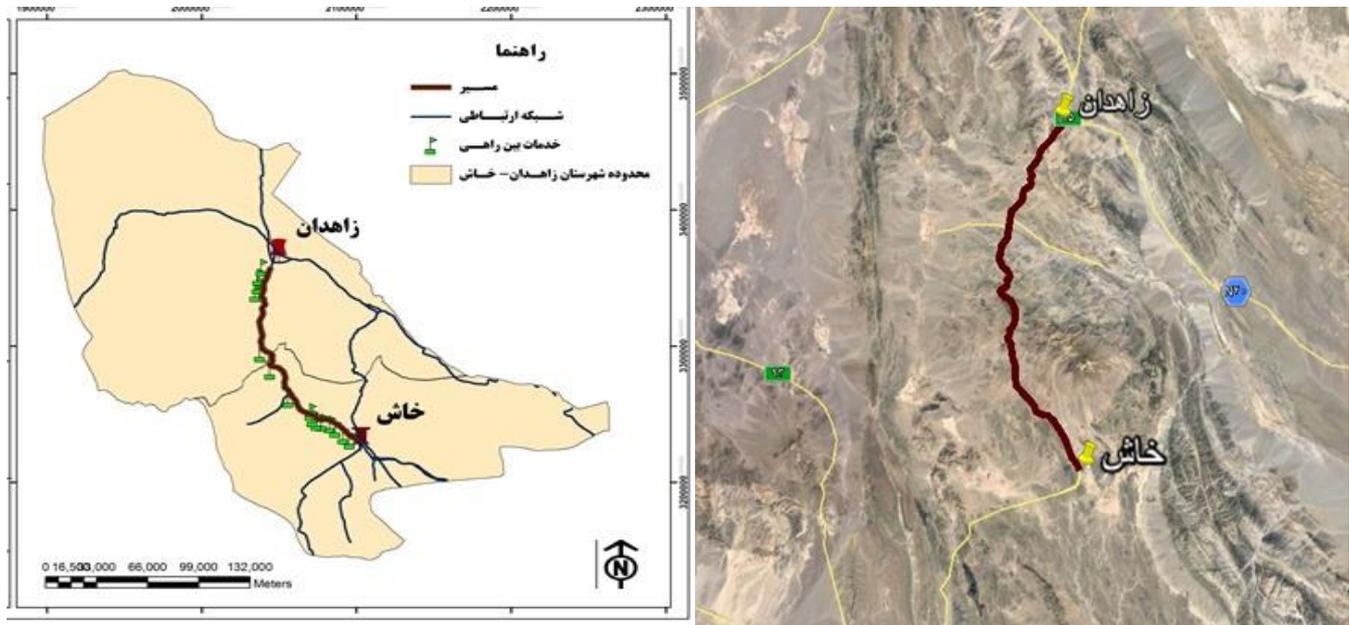


Fig. 1. The current situation of roadside service centers on the Zahedan to Khash Road

Theoretical principles

Land is considered as one of the most important elements that contribute to shaping the physical environment of mankind. It has always been considered as a principle in urban development and is a base on which mankind does activities and gets affected by (Charter, 1976).

Different definitions have been presented for land use. Dickinson and Shaw presented a simple definition of land use in 1998. They believed that land use was an activity that was specified to one place. Malinger defined land use in 1988 as the advent of mankind's dynamic utilization of natural resources in order to fulfill his own requirements. Wangles presented two definitions of land use in 1991. First, human activities on earth which are directly related to earth; and second, the appearance of mankind's management of ecosystems in order to fulfill some of his requirements. All of these definitions are common in two concepts of land and human activities (Noroozi, 1997).

According to the presented definitions, land use is considered as one of the key issues in urban planning so much so that on the one hand, some believe that it is the main and practical essence of urban planning (Seif-ud-Dinni, 2002). In other words, the concept of land use means applying land by human beings for specific purposes (Turner & Meyer, 1994).

In fact, the ultimate goal of land use planning is creating a type of ecological balance and social justice in the process of development and construction of cities; and it must be accountable for the qualitative objectives such as aesthetic concepts, spatial identity sensibility and the sense of belonging to the region.

This is because, eventually, it is these factors that lay the foundations for providing welfare and satisfaction of citizens. Considering the shortages and limitations of quantitative standards in the recent decades, the indicators related to life quality, social welfare, public well-being, environment conservation and conservation of historical resources have to be taken care of (Mehdizadeh, 2000); therefore, sustainable urban development is achievable by following correct policies about land use.

Sustainable development is not achievable without taking into account different strategies at the national, regional and local level; and in the meantime, the role of land, as an important tool in the identification of objectives of national and regional policies is very sensitive (Maleki, 2011).

From the sustainable development perspective, the term 'land use' includes all economic, social and cultural activities that man does on land. In fact, development and construction on land can be sustainable when it can fulfill material as well as social, cultural and mental needs of people in the present and in the future (Razavian, 2002).

By formation and development of modern urbanization, the subject of land use and planning it was largely influenced by capitalist economic development, expansion of car industry, road networks, building technology, etc. However, in the recent decade, in response to failure of the pattern of traditional comprehensive plans and appearance of new perspectives and

objectives about environment, social justice, quality of urban life and subjects alike, as well as principles and objectives of land use planning have qualitatively improved and have become in line with sustainable development (Chapian, 1965).

The following three conditions have been mentioned as the initial features of the sustainable development of the function of land use:

Variety of use: sustainable development of land in large scales has to create some balance in the relation to the different uses of urban land. The studies have shown that identifying different functions in urban land use for development (residential, productive, service, etc.) leads to improvement of environment quality, and because of facilitation in the required physical as well as social relationship, it practically creates an important role in improvement of environmental conditions and in decreasing of pollution in the environment (Moshiri and Maleki Nizam Abad, 2011).

Flexibility: lands that are predicted as developable in the urban planning have to be defined in the form of projects such as water and sewage plans, residential area development, land preparation, etc. These projects have to include specific coordination, and in the form of the whole development plan, they should have the capability of influencing one another and being influenced by each other.

Sufficient support: development can be a successful condition only when it is backed up by the strong social support. Experiences of new cities and land preparation plans have shown that how much public support can be effective on the success of the plan in the process of land development. Although, public participation in different fields (such as site selection, design, planning, and construction, etc.) increases through comprehensive and all-inclusive leadership, the work results can win the public support as well (Amin Zadeh, 2000).

There are two perspectives about land use:

Strong durability perspective: followers of this perspective believe that the mechanism of land use planning should be in a way that the target land is used for different aspects of environmental purposes.

They also believe that land use planning must identify ecological aspects because there are no substitutions for them and they are considered as natural resources (Davoodi, 2001). In defining ecological limitations, many of the supporters of this perspective try to expand this attitude in order to make it include cultural aspects as well. According to this perspective, too much emphasis on merely ecological limitations might lead to loss of the sense of public responsibility towards cultural heritage (Owens, Cowell, 2001).

Weak durability perspective: according to this perspective, land use planning system, as a strategic system, has to be planned in a way that ecological effects resulted from economic development can be modified (Pennington, 2006).

It can be said that sustainable development includes deep concepts in three fields of environment, economy, and society. Because of this, land use planning is one of the most important and most effective axes of sustainable development. This is because it is closely related to and influenced by three fields of sustainable development namely environmental, economic and social aspects, so much so that along with changes in attitudes and axes of development plans, land use admits a lot of content changes (Masoozi, Peiravi, 2008). The process of planning urban land use, like other forms of planning, starts with understanding the phenomenon of planning (statement of the problem) and after compiling objectives and determining priorities, it leads to the production of strategies, evaluation, and accomplishment.

Results

Evaluation of the situation of indexes on the Zahedan to Khash Road from the perspectives of passengers

In this part of the study, the replies of the passengers to 21 items of the questionnaire have been evaluated. According to the types and forms of items, they have been divided into four indexes namely quality of roadside services, security, infrastructures and socio-economic index. In the index of services, 8 items have been placed. Index of security includes three items, index of infrastructures includes four items and the socio-economic index also includes six items. The passengers' replying method was spectral varying from very little to very much. In this spectrum, the level of passengers' satisfaction with every item on the Zahedan to Khash Road has been evaluated.

Quality of urban service provision on the Zahedan to Khash Road

According to the data of the below table and the single-sample t-test with a confidence rate of 95% and mean value measured according to replies of passengers, the achieved level of passengers' satisfaction with the Zahedan to Khash Road services in all indexes is lower than the average mean value.

Therefore, the passengers are only satisfied with the presence of traffic police on the road. The achieved mean values show that the index of sufficient services was 0.442, quality of service provision was 0.421, the ratio of the number and quality levels of services was 1, the level of emphasis on hygiene was 0.6052, the hygiene situation was 0.4526, existence of WCs was 0.671, advertisements and existence of appropriate billboards was 0.3078; they were all lower than the average mean value i.e. 3, and this shows that the passengers evaluated the level of services at the roadside service centers as weak.

Evaluation of the situation of infrastructures on the Zahedan to Khash Road

The achieved results from the data of table 2 and the one-sample t-test with confidence rate of 95% and sig 0.000, and also the mean value measured according to passengers' replies show that just the index of road quality is higher than the mean value

and other indexes are all lower than the mean value so much so that the index of satisfaction with proper and sufficient electricity (0.8315) is lower than the average mean value, water system (0.721), heating and cooling systems (1.289) are all lower than the average mean value (3) and this shows that infrastructures at the roadside centers are inappropriate.

Table 1. T-test of satisfaction with quality of services provided on the Zahedan to Khash Road

	Test Value = 3				95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
	Existence of sufficient and appropriate services for passengers	-9.354	379	.000	-.44211	-.5350
Quality of service provision at the centers	-9.749	379	.000	-.42105	-.5060	-.3361
Ratio of number and quality level	-19.028	379	.000	-1.00526	-1.1091	-.9014
Level of emphasis on maintaining hygiene	-12.264	379	.000	-.60526	-.7023	-.5082
Hygiene situation	-9.482	379	.000	-.45263	-.5465	-.3588
Situation of WCs	-12.369	379	.000	-.67105	-.7777	-.5644
Advertisements and existence of appropriate billboards	-5.042	379	.000	-.30789	-.4280	-.1878
Presence of traffic wardens	13.996	379	.000	.60263	.5180	.6873

Table 2. T-test of satisfaction with quality of provided services on the Zahedan to Khash Road

	Test Value = 3				95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
	Sufficient and appropriate electricity	-14.538	379	.000	-.83158	-.9440
Pipeline water	-15.192	379	.000	-.72105	-.8144	-.6277
Heating and cooling	-24.967	379	.000	-1.28947	-1.3910	-1.1879
Road quality	12.329	379	.000	.58158	.4888	.6743

Evaluation of the situation of social and economic factors on the Zahedan to Khash Road

According to table 3, the level of satisfaction with social indexes in the one-sample t-test with confidence rate 95% and sig $p > 0.000$ shows that from the statistical perspective, the mean value of variables of hospitality and entertainment 0.0421, level of familiarity with the centers 0.273, behavior with drivers 0.8, and further attendances 0.015 are higher than the average mean value and passengers are satisfied with these indexes but the value of the index of investment by private section and government 0.905, and the index of prices and costs of goods and services 0.323 are lower than their average mean values.

Table 3. T-test of satisfaction with socio-economic indexes on the Zahedan to Khash Road

	Test Value = 3				95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
	Investment of private and governmental sections	-16.404	379	.000	-.90526	-1.0138
Hospitality and entertainment	.730	379	.000	.04211	-.0713	.1555
Price and costs of goods, services and foods	-5.796	379	.000	-.32368	-.4335	-.2139
Level of familiarity with the number and location of centers	4.044	379	.000	.27368	.1406	.4067
Behavior of drivers	17.004	379	.000	.80000	.7075	.8925
Further attendances	.298	379	.000	.01579	-.0883	.1199

Discussion

Evaluation of the situation of security on the Zahedan to Khash Road

According to table 4, the level of satisfaction with index of security in the one-sample t-test with confidence rate 95% and sig $p > 0.000$ shows that in all indexes the achieved value is higher than the average mean value, so much so that the mean value in the social-judicial index 0.2, financial security 0.123 and life security 0.205, are higher than the average mean value

Table 4. T-test on satisfaction with the index of security on Zahedan-Khash Road

	Test Value = 3			Mean Difference	95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)		Lower	Upper
	Existence of social and judicial security	4.041	379		.000	.20000
Sense of financial security at the centers	2.131	379	.034	.12368	.0096	.2378
Sense of life security	3.757	379	.000	.20526	.0978	.3127

First hypothesis

It seems that passengers are satisfied with the socio-economic situation and security of roadside service centers on the Zahedan to Khash Road

In order to study this hypothesis, one-sample independent t-test has been used. The achieved results show that in the error rate 0.05, because the significance rate sig is 0.000 and lower than 0.05, the mean value is achieved 0.05 (higher than the average mean value). On this basis, H₀ is rejected and H₁ is approved. Therefore, it can be stated that passengers are satisfied with the socioeconomic situation and security of roadside service centers on the Zahedan to Khash Road. Hence, this hypothesis is approved.

Table 5. T-test of satisfaction of passengers with socioeconomic situation and security of roadside service centers

Satisfaction of passengers with socioeconomic conditions of service centers and with road security					
t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
				Lower	Upper
42.123	379	.000	3.25730	2.9169	3.4531

Second hypothesis

It seems that optimized site selection of roadside service centers can be effective on the increase of road security

In order to study this hypothesis, one sample independent t-test was used. The achieved results show that in the error rate 0.05, because the significance rate sig is 0.000 i.e. lower than 0.05 and the mean value is 3.357, H₀ is rejected and H₁ is approved. Therefore, it can be stated that roadside service centers are highly effective on security of the roads; hence, this hypothesis is approved.

Table 6. T-test of the effect of roadside services on the security of the road

Effect of roadside service centers on road security					
t	df	Sig. (2-tailed)	Mean Difference	95% Confidence Interval of the Difference	
				Lower	Upper
64.584	379	.000	3.35789	3.2557	3.4601

The third hypothesis

It seems that roadside service centers have provided appropriate foundations for entrepreneurship in the region

This hypothesis is formed in the following way for the test:

In order to evaluate this hypothesis, one sample independent t-test has been used. The achieved results show that in the error rate 0.05, because the significance rate sig is 0.000 i.e. lower than 0.05, the mean value has been achieved 0.05 which is higher than the average mean value. On this basis, H₀ is rejected and H₁ is approved, therefore it can be said that roadside service centers have played their entrepreneurship role for the region very well. Therefore, this hypothesis is approved.

Table 7. T-test for measuring the effect of roadside service centers on entrepreneurship

Effect of roadside service centers on entrepreneurship				95% Confidence Interval of the Difference	
t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
45.053	379	.000	3.05000	2.9169	3.1831

Conclusion

The strategic location of the city of Zahedan among other cities of Sistan and Baluchistan province and its connection to the national corridors requires that this city gets developed and plays a better role in the transportation industry of the region. Some of the most important plants that have to be established for this purpose are roadside service centers. Therefore, in order to maintain and elevate the security rate of country roads, the establishment of such centers requires studies, evaluations and eventually, determination of appropriate and secure sites for this purpose.

In this study, considering the necessity of establishing service-welfare centers alongside the Zahedan to Khash Road, the existing service centers were studied and evaluated from the perspectives of passengers. The achieved results in different stages of the study are briefly listed as follows:

- In the indexes of satisfaction with services of roadside centers on the Zahedan to Khash Road all of the mean values were lower than the average mean value except in the index of the presence of traffic police on the road; therefore, passengers are only satisfied with the presence of traffic police on the road. This shows that passengers have evaluated the services of roadside centers as weak.
- The results achieved from the data related to satisfaction with the existing infrastructures show that out of the mean values measured according to replies of passengers, only the index of road quality is higher than the average mean value; and all other indexes are lower than their average mean values. This shows that infrastructures in the roadside centers are inappropriate.
- The level of satisfaction with social indexes shows that, statistically, the mean values of the variables of hospitality and entertainment, the level of familiarity with the centers, the level of behavior with the drivers, and further attendances in the centers were higher than the average mean values. This means that passengers were satisfied with these factors but in the variables of investment by the private and governmental sections, prices and costs of goods and services were lower than their average mean values.
- The results of level of satisfaction with the index of security show that in all factors, the mean value was higher than the average mean value
- Roadside service centers have been able to create job opportunities in the region
- Roadside service centers have been very effective on the security of the roads

Strategic suggestions

- Improvement of the level of quality and hygiene of the provided services through active presence of supervising institutions
- Providing administrative facilities for the injured people in the natural and unexpected disasters
- Creation of expansive and national networks for providing roadside services as well as tourist and pilgrimage services on the roads
- Investment by the private and governmental sections for establishment of hotels, restaurants and service centers
- Installing advertisement boards in order to emphasize on hygiene
- Providing appropriate plants such as water, electricity as well as heating and cooling infrastructures

References

- Abbasi Mohammad Reza (2009). Study of the spatial distribution of urban service centers in the regions of the city of Shiraz, case study: educational centers of Shiraz. *Journal of Geography and Environmental Studies*, 1(2), 45-54.
- Amin Zadeh, Behnaz (2000). The role of land on sustainable urban development. The Conference of Land and Urban Development, published by the Iranian Center for Research and Studies on Urbanization and Architecture.
- Athens Charter (1976). Fourth International Congress of Modern Architecture, University of Tehran.
- Bahreini, Seyed Hussein (1998). The Process of Urban Planning, University of Tehran, Tehran.
- Chapian, F. Stuart (1965). *Urban Land Use Planning*, Chicago: University of Illinois Press.
- Davoudi, S. (2001). Planning and the twin discourses of sustainability (pp. 81-99). In *Planning for a sustainable future*. A. Layard, S. Davoud, and S. Batty (Eds.). London: Spon.
- Mahdizadeh, Javad (2000). Planning of land use changes in the perspectives and methods. *Seasonal of Urban Management*, 4.
- Maleki Hadi (2011). Analysis of urban land use by focusing on urban sustainable development, Shian region, Tehran. MA thesis. Islamic Azad University Science and Research Branch, Tehran.

-
- Marsoosi Nafiseh; Peiravi Ali (2008). Analysis of urban land use by focusing on sustainable development. *Seasonal of Geography*, 17. Tehran.
- Moshavash Farid, Afsoon (2001). Appropriate spatial structure for service units, MA thesis on urbanism, Subfield of Urban and Regional Planning. Islamic Azad University Tehran Central Branch.
- Moshiri Syed Rahim and Rasul Maleki Nizamabad (2011). Analysis of land use planning by focusing on urban sustainable development, case study: the city of Mianduab. *Journal of Geography*, 82, 73-87.
- Noroozi, Aliakbar (1977). Land evaluation and the effect of land use system on soil erosion using RS and GIS techniques supported by a case study of the Damavand catchment, NE of Tehran, Iran.
- Owens, S., Cowell, R. (2001). *Land Use Planning: Sustainability and the Environment*, London: Rutledge.
- Parhizgar, Akbar (1997). Presenting an appropriate pattern of site selection for urban service centers by studying models and urban GIS. Ph.D. thesis. University of Tarbiat Mudarris.
- Pennington, Mark (2006). Sustainable development and British land use planning: a Hayekian perspective, *Town Planning Review*, 77, 1.
- Razavian Muhammad Taqi (2002), *Planning of Urban Land Use*. Tehran, Monshi press.
- Seif-ud-Dini, Faranak (2002). *Principles of Urban Planning*. Aijev Press. Tehran.
- Shia, Ismail (2003). *The workshop of urban planning* Payam Nour University Press.
- Suleimani Farsiani, Zahra (2009). Analysis of the situation of the special distribution of urban service centers in the city of Shahre Kord. University of Isfahan, Faculty of Humanities, Department of Geography.
- Taqvae Masood and Hamid Reza Rakhshani Nasab (2010). Analysis of evaluating site selection of educational spaces in the city of Isfahan. *Seasonal of Planning Space Logistics (humanities professor) period*, 14(3), 53-57.
- Turner, B.L., Meyer, W.B. (1994). *Global land use and land-cover change: An Overview*, Cambridge University Press.
- Varesi, Hamid Reza, Zangi Abadi, Ali, Yaghfour, Hussein (2007), Comparative study of the distribution of public service centers from the perspective of social justice, case study: Zahedan. *Journal of Geography and Development*, 6(11), 37-78.
-

Citation:

Fateme Hashemzahi, Maryam Karimiyan Bostani, Mahmood Reza Anvari (2017). Evaluation of roadside service centers. Case study: Zahedan to Khash Road. *Ukrainian Journal of Ecology*, 7(4), 374-381.



This work is licensed under a Creative Commons Attribution 4.0. License
