

The feasibility study of launching local trains in the development of Qom villages

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Abstract—Transportation segment plays an important role in the mobility and dynamism of society in order to achieve economic, social and cultural development plans goals of country as one of the most important infrastructural segments.

Transportation is the medium loop in different social fields. In other words, formation of added value in all economic activities is affected by transportation segment activities directly or indirectly so that even one economic activity can't be found which has not used offered services in transportation segment. In fact the development of important economic, industrial and... segments are not possible without the development of transportation infrastructures.

It has been tried to study the relationship between launching local trains and stable development of region in this investigation. For this purpose, t test has been done in spss environment by compilation of questionnaire and field studies within the limits of study and data analysis by Pearson's correlation coefficients and stepwise multiple regression. Offering operational results and necessary solutions in order to improve the strength level and desirable usage of existent abilities and also actualizing rail transportation system potentials is among applied goals of the investigation. Because it's time for governments to pass instrumental view of local trains, it is expected to see the development of town communications by improvement of scientific level and remarkable effort of experts and locals.

Key words: *suburban transportation, Qom town, stable development, railway*

I. Introduction

Rail transportation is among usual land transportation methods that has high economic advantages in terms of energy usage and security. Although because of low speed of trains in the past using railway's capacity was mostly used for displacement of goods, because of , on one hand high price and insecurity of air transportation and deficiency of road transportation , and on the other hand, speed increase and improvement of train welfare facilities , rail transportation has benefitted

increasing interest in recent years. Mainly with implementing targeted subsidy law this transportation method for displacement of goods will be welcomed by customers. Having an area of around one million and six hundreds and fifty thousands square meters, Iran's area is more than six European countries of England, France , Germany, Italy, Holland and Belgium and because of being located in important communication corridors, it is the connection place of the three continents of Europe , Asia and Africa. Superior strategic location of Iran, existence of entrance starts in the beaches of the Persian Gulf and Oman and Caspian seas, connection of cargo, recreational and pilgrim centers to transportation rail network and high engineering power are among advantages that make development of rail industries vital. (Davudzade , 1997)

II. Investigation goals

In order to achieve ultimate goals of management of rail transportation affairs, distinguishing special position of each of the persons in charge in the field of transportation, kind of their duties and functions, and also setting up appropriate connection and necessary coordination between them , goals below are desired

- 1- reviewing the role of local trains in the organization of villages and cities
- 2- Offering appropriate applied solutions in order to increase rail investments
- 3- Deleting economic, social, physical distance between city and village societies by developing rail transportation system
- 4- Specifying rail paths for optimal usage
- 5- Identifying the potentials of considered region in order to develop rail lines

Investigation hypotheses

- 1- It seems that the development of local trains causes the development of villages of Qom city
- 2- Local trains of Qom - Jamkaran are followed by a kind of pilgrim tourism

III. Transportation system

It is a part of communication system that includes physical relations between spaces with different applications and it is posed as a human commuting or complete transportation and relocation and it is carried out via transportation networks naturally. (Rezayian, 2000, page 48)

IV. Urban development

Urbanism is a universal flowing. It is predicted that more than half of world population would live in urban environments in the new century. The process of urbanism has more rush in third world countries in comparison with industrial countries. For instance according to a prediction by "world supervision institute" the stabilization of country's population in Iran will be in the level of 169 million people which the majority of this increasing population will inhabit in the level of small and big cities on the strength of world bank calculations. (Ziari, 2007)

Since the 1970's, new strategies have been appeared in urban trends, policies and plannings which most of them have been in the direction of obtaining power in the local levels and municipalities and debates like improvement of social welfare, Providing optimal house, efficient urban transportation, appropriate education and health services are brought in urban studies and cause development of local governments' activities in urban levels. (Garrett, 2004)

Despite all these developments, basic work has not still been done in the course of real explanation of urban issues and solving them. Urban societies have always been longing for obtaining Utopias and the reason of this might be their real and routine life circuit, meaning that they explain utopias as an option against modern cities. (Maddanipour; 2002)..

Urban planning requires correct receiving and understanding of urban people, goals and events create that and it generates a concept of stable urban development which emphasizes on reforming and improving citizens' lives; A task that is not considered so much in urban planning today.

V. City suburbs

A suburb is a physical location geographically. From sociological viewpoint, the suburb is a position of labor and especially immigrants, however, we see more or less workers, average technician staff and youth who are in a special social class over there. According to urbanism dictionary, the suburb is an urbanized castle around a city.

VI. Stable transportation

It is one of concepts that always suggests mentally a change of fuel kind and a decrease of fuel consumption or using public transportation. Meanwhile, paying attention to subjects relating to stable development, especially Stanbul statement, can be considered by explaining instability causes and effective factors on transportation by stability approach. Beside that, necessities and obligations of achieving stable transportation can be offered in urban designing and planning.

Table 1: key subjects of basic concepts of stable development from the viewpoint of urban public transportation

environment	society	economy
Air pollution	Inequality in wealth distribution	Urban traffic
Water pollution	Problems of movement and transportation	Difficulties of burden and passenger transportation
Noise pollution	Healthcare and citizens' health	Accidents' damages
Climate changes	People organizations	Cost of maintaining vehicles
Extinction of natural residences		Excessive use of natural resources

VII. Suburban trains

These trains are active having a length more than or equal to 150 meters and a weight less than 400 tons. Suburban trains have a low running board height and move on a surface.

These are trains that are used in a 100-kilometer radius of a metropolis and they are utilized for accessibility of inhabitants of satellite cities to this metropolis .Most passengers of suburban trains use these trains intending to go to work and to return home. On-time departure in trip towards a metropolis, high speed, the minimum number of stops in the middle-way station are among the features of this train in an ideal situation.

Fig (1) country's rail lines



Geographic position of studied range

Holy city of Qom lies in the 135-kilometer road distance and 120-kilometer air distance from the city of Tehran having an area of around 11 thousands hectares and its coordinates are 50 degrees and 53

minutes and 15 seconds longitude towards the Greenwich meridian and 38 minutes and 30 seconds latitude towards the equator (mathematical location) and its elevation above the sea is 135 kilometers.

Fig (2): the position of Qom town in province



Source: The Qom governor's general office

Table (2) political divisions of Qom town

Number of villages with population between 500 and 999 people	Number of villages with population over 1000 people	Number of villages	Number of rural districts	Number of cities	Number of counties
17	11	224	9	5	5

Table (3) villages of Tehran – Qom path

Place of work or education – other village	Place of work or education – other city	Population	families	Marine way	Railway	Land way	Normal situation of village	village	Rural district	county	town
6	33	305	76	0	0	2	1	Dowlatabad	Jafarabad	Jafarabad	Qom
0	0	0	0	0	0	3	1	Sharifabad	Jafarabad	Jafarabad	Qom
0	0	1282	279	0	0	1	1	Baqerabad	Jafarabad	Jafarabad	Qom
13	9	155	33	0	0	1	1	Aliabad nazaralikhan	Jafarabad	Jafarabad	Qom
	0	19	4	0	0	2	1	Aliabad roodkhane	Jafarabad	Jafarabad	Qom
0	6	66	22	0	0	1	5	Hasanabad	Datjerd	Khalajestan	Qom
0	0	0	0	0	0	1	1	Rahmatabad	Qahan	Khalajestan	Qom
0	8	317	65	0	0	1	1	Qalesadri	Qamrud	Markazi	Qom
1	0	53	14	0	0	3	1	Kushk bahram	Qamrud	Markazi	Qom
0	5	28	9	0	0	2	2	Allahyar farm	Qamrud	Markazi	Qom
*	*	*	*	*	*	*	*	Aminabad	Qamrud	Markazi	Qom
*	*	*	*	*	*	*	*	Amadgah manzariye Qom	Qamrud	Markazi	Qom
0	12	177	42	0	0	1	1	Cheshme shur	Qamrud	Markazi	Qom
0	0	0	0	0	0	1	1	Hoseinabad(Yusefi chicken farm)	Qamrud	Markazi	Qom
2	1	33	11	0	0	1	2	Aliabad	Qamrud	Markazi	Qom
0	0	0	0	0	0	1	1	Eynabad	Qamrud	Markazi	Qom
0	0	15	4	*	*	*	*	Kushk nosrat	Qamrud	Markazi	Qom
*	*	0	0	0	0	3	1	Mohamadabad	Qamrud	Markazi	Qom

0	0	0	0	0	0	1	2	Nalbandan	Qamrud	Markazi	Qom
0	0	1500	2	443	0	1	1	Qamrud	Qamrud	Markazi	Qom
2	17	0	0	0	0	1	1	Mozafarabad masile	Qamrud	Markazi	Qom
0	0	136	30	0	0	1	1	Alborz	Qamrud	Markazi	Qom
2	17	100	25	0	0	1	1	Kaj	Qamrud	Markazi	Qom
39	817	1369	76	0	5	1	1	Jamkaran	Qanavat	Markazi	Qom
0	5	625	137	0	0	3	1	Shamsabad	Qanavat	Markazi	Qom
11	15	291	72	0	0	1	1	Navaran	Qanavat	Markazi	Qom

Fig (3) city of Qom divisions



VIII. Tehran – Qom railway line

Railways are the best and the most secure kind of transit path and participation and investment by private sector are the best way for extending the railways and pathways of country in order to decrease the traffic volume of Tehran, easy and fast connection of satellite cities with Tehran. Railways are arteries of country's economy and investing on railway causes creating added value.

New railway path of Qom beltway is the Saqe – Mohamadiyeh axis. Executive operations of this project has been started since 1999 and in 2000 the process of project operation stopped due to 250-meter trenching. However, organization and execution of this project was given priority during the president's provincial visit. This project has been launched by a total credit of 93 billion rials in a 34-kilometer length trenching. 20 kilometers of the project is built two-sided and the rest of the path is one-sided.

Taking a look at the Tehran – Qom railway path, there are 27 active villages that each of them is located in a different distance from the railway. The more we approach to Qom town, the more active villages with more population density there are. Villages of Dowlatabad, Baqerabad, Kaj, Qale-sadri, Qamrud, Jamkaran are of considerable population in this path. Meanwhile, having the highest percentage of activists and employed persons who refer to Tehran due to work and having strong religious and tourism

potentials, Jamkaran has the highest percentage of train users and is on the first rank and despite more population, Qamrud Village is in the next rank because its people don't travel back and forth to Tehran metropolis so much. Baqerabad that has a population of 1282 people is in the third rank. Among the Tehran – Qom path regions, it is the only region that has direct railway station. Mohamadiyeh station is also one of the very important stations in the Tehran – Qom path.

A. Characteristics of Tehran – Qom railway

The path of Tehran – Qom express railway has been divided into two paths and some sections and sections are in different stages of project development. For the first path, two express HSR 350 trains and for the second path, two express burden trains and two express HSR 350 trains have been designed.(report of railway's development plans, 2013)

Tehran – Qom path has been considered as the second path for HSR 350 passenger train and express burden train. Initial plan of this path is in the process of geotechnique study and contractors of project execution have been chosen. Length of this path is 142 kilometers which has been divided into five sections. "Artin kavak" company, which is one of subsets of Artin Pooyan company, is the consultant of this path. Now 3 points within the limits of Tehran city have been chosen as the main passenger stations which consist of: The first station of Imam Khomani airport, the second station of Aftab city and studying for choosing the third station in Tehran city is under way.

By inaugurating the new beltway line of Qom, Saqe – Mohamadiyeh axis, in addition to saving in passengers' time, passing traffic of passenger trains in Qom city will be decreased. So far around 100 billion rials have been expended for building this beltway axis. Transportation and road minister, chief executive of railway, representatives of Qom province in Islamic consultative assembly and some of local and railway officials participated in the inauguration ceremony of this path which was held on third of Khordad.

Railway lines are the best and the most secure kind of transit path and we need participation and

investment of private sector for extension of country's freeways and pathways. Because fast and comfortable connection of satellite cities to Tehran is the prerequisite of decreasing traffic volume of Tehran city. By launching new path of Qom's beltway railway, distance between Tehran and Qom will decrease to one hour. By completing beltway line in Saqe – Mohamadiyeh path, passing trains will not stop in Qom. (Statistical yearbook of pathway transportation, 2006)

Because of being located in the country's geometric center of gravity, Qom province has the biggest center of railways, asphalted ways and roadways communication network after Tehran in different levels which connect this province to adjacent cities, province capitals and commercial ports of the Persian gulf and Caspian sea.

IX. Economic and social effects of building Tehran – Qom railway

As noted earlier, building Tehran – Qom railway has economic and social effects in the region and finally in the country. So we express these effects and explain them:

A. Social development of Region's villages:

Regarding that villages are life centers for a lot of people in our country, this issue must be noted that they are among important economic centers of the country. Since between two cities of Tehran and Qom there are different villages too; building this railway should certainly affect improving social situation of villagers and be successful in eliminating their deprivation. Besides, because of passing different trains, villagers can benefit different cultures and gain abundant scientific and industrial developments. (Iran' economy monthly, 2006)

B. Economic effects of the development of railway on regions' villages

Building Tehran – Qom railway has economic effects on the region in addition to social effects, which consist of:

Burden transportation via railway benefits more ease. By building Tehran – Qom railway, burden volume will increase to several times over that is effective and beneficial in improving economic situation of the region, because in case of exploiting this project, in addition to transportation of products via sea, pathway and air plane, burden transportation will be carried out via railway. So it can be said that the more burden volume increases, the more transferring different materials to other regions and outside of country will increase.

X. The first hypothesis

A. It seems that the development of local trains causes the development of Qom's villages.

Table (4): average and standard deviation of rail factors of development of Qom's villages

Standard deviation	average	Rail factors
0.81	3.98	creating stable manufactured and service job opportunities in Qom's railway segment causes development of villages and national development in the country
0.71	4.03	Development of rail infrastructures in Qom town will cause development of villages
0.65	3.77	.Development of organizations and people-oriented organizations in the direction of optimal exploitation of Qom's rail transportation capabilities causes development of villages
0.83	3.75	Standardization and development of optimal techniques of using Qom's local trains causes development of villages
25.63, p<0.01		Amount of Friedman's test

As it is seen in the table above, Friedman's variance analysis test showed that from the viewpoint of responders the factors that cause stable development of Qom villages; have significant priority (p<0.01). The development of rail infrastructures in Qom town had the highest rank and standardization and development of optimal techniques of using Qom's local trains had the lowest rank in the stable development of country's villages. To answer if factors above lead to significant development of the country's villages, One-sample t-test was used. The factors above all had averages above 3. (Because questionnaire's questions were on the basis of Likert's 5-optional scale "I totally agree=5 to I totally disagree=1"; middle number is 3). Results of t test showed average difference with 3 significantly (p<0.01) that is a sign of significant effect of the factors above in the significant development of the country's villages.

B. The second hypothesis

It seems that Qom – Jamkaran local trains are followed by a kind of pilgrim tourism

Table (5): average and standard deviation of pilgrim tourism questions

Standard deviation	average	questions
0.68	4.15	Increase of suburban lines of Tehran to Jamkaran causes development of pilgrim tourism
0.75	3.98	.Increase of transportation lines of Tehran – Qom has caused development of trip to Qom and Jamkaran
0.67	4.07	Development of rail transportation of Tehran – Qom has caused more attention to pilgrim places including Jamkaran
3.28 p 0.05		Amount of Friedman's test

As it is seen in the table above and the chart shows too, from the viewpoint of responders, increase of suburban lines of Tehran to Jamkaran has caused development of pilgrim tourism, increase of trips to Qom and Jamkaran and more attention to pilgrim places. Friedman's variance analysis test showed that among these three, there is not a significant priority ($p > 0.5$). To respond if the factors above lead to pilgrim tourism, one sample t test was used. The factors above all had average greater than 3 (because questionnaire's questions were on the basis of Likert's 5-optional scale "I totally agree=5 to I totally disagree=1" 3 is the middle number). T test results showed average difference with 3 significantly ($P < 0.01$) that is a sign of significant effect of local trains in pilgrim tourism. (Results are in table 5)

Conclusion

Inspections and accomplished studied in the remotest corners of the world show that the development of public transportation systems have the most common economic, social and environmental benefits and advantages and they are totally in the course of the goals of stable urban development.

Public transportation systems, especially urban rail systems, cause decrease in transferring burden and passenger, damages due to accidents, usage of fossil fuel, wasting non-renovation resources and increase in purchasing power of citizens by decreasing traffic problems and provide countless economic benefits. Besides, by fair distribution of public transportation facilities and improvement of health and society healthcare, and also increase of public welfare, the development of social justice will be helped.

Decrease of air pollution affected by optimal usage of natural resources, prevention of severe climate changes, prevention of water pollution and also decrease of noise pollution are among the most important environmental benefits and advantages of public transportation systems.

Suggestions and solutions

- More participation of private sector in the development of passenger railway transportation
- Strengthening the sense of customer orientation in trains' employees and staff and necessary education to encounter tourists in order to respectful and attractive meeting with them and offering services together with observing healthcare and high quality.

- Appropriate planning and offering facilitations since the beginning of tourist's entrance to the country and correct informing for optimum usage of facilities and facilitations of railway's passenger segment
- Reinforcing diplomatic solutions with neighbor countries in order to encourage and persuade more investment in this field and taking serious the mutual technical relationships.

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