

ROLE OF RAIL TRANSPORTATION IN DEVELOPING TOURISM INDUSTRY IN NORTHERN DISTRICT OF IRAN

by

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ABSTRACT

In this paper first the north railway district and also current stations in its route for geographical reason was investigated. Then current situations of tourism in this district was studied and using gathered data and information's and also based on proposed regression models, demands of tourism in Iran, especially in northern part, were anticipated and finally passenger growth concluded that during travel peak, this amount in next 15 years will increase significantly. This paper also considers the current infrastructure conditions for tracks and fleets in mentioned the area. Since the tourism development in rail industry in north part of Iran depends on 3 major factors including passenger demands growth, tracks development and fleet growth, therefore these major factors were carefully investigated. Parts of this paper were dedicated to solve the current problems issues and threats in way of rail industry tourism development with using the SWOT matrix and to offer solutions for current problems and threats in way of any developments in this industry and finally the implementable packages for any tourism progress with help of rail transportation system were offered

KEYWORDS

Rail, Tourism, Passenger

INTRODUCTION

Tourism nowadays considers being the third industry in world trade after oil and gas industry. This industry not only from revenue making but also from culture and communication development is highly important and thus the passenger transportation considers being major aspect of tourism. Between different modes of passenger transportation with respect to tourism, the railroad has special importance because of its cheap, high safety, and comfortable trip. The importance of tourism through railroad network because of its advantage has also its root from railroad attractions. Daily development of monorail tracks, and railroad tracks development in forestall and mountainous area and usage of internal attraction of train show the high demands and importance of railroad in tourism development.

Therefore as much as tourism industry had effects on railroad developments also the railroad had the same effects on tourism industry. Reference to tourist statistics especially in north area district shows in travel peak time. The passenger growth during next 15 years will be tremendous suitable climate of north district, Caspian Sea, different and highly coverage of important plantations, people rich culture, and historical attractions are the main reasons for north district trips popularity. Population growth and therefore increase of psychological and spiritual problems persuade people use the unique nature of this area to reach peace and comfort in this nature. The studies which had be done so fare show the daily growth of tourism in north district and this issue needs the serious determinations of those people who are involved in national transportation to reach suitable infrastructure for it.

The railroad tourism industry development in north district has dependency to three major factors. Which are passenger growth, track growth, and related railway fleet expansion. The statistical studies which had been done show that the passenger railway demands in north district will pass 307 million during next 15 years.

Thus the plans for railroad track development in north districts are tremendous, somehow that more than 3 railroad tracks are under study and 2 railroad tracks are under construction to answer the needs of transportation in this area. It is necessary to mention that issue of fleet development in north district depends on railroad passenger growth and increase in freight railroad in it. With high potential in fleet production area in country and also with Iran's experiences in railroad fleet renewal it seems the answer to future needs in area of fleet can be fulfilled easily from national resources.

North district railroad investigation

The area which covers north railroad starts from external switch of Garmsar station in Semnan state and it passes from tall Alborz Mountains and a part of Tehran state and enters into Mazandaran and beautiful forests and passes from different cities and plain area and enters into Golestan state and finally it ends at Gorgan station. The length of north railroad track is 382 km; beside this it has also Amir Abad branch track with length of about 21 km and secondary track with length of 91 km which about 43.5 km of it is business track and 47.5 km of it maneuver track. North railroad has 27 of big and small stations which currently the Rostam kola, Tirtash, Galogah and Sabzdzt stations are closed. The highest point of this track is Gadok Gardaneh with 2112 metre altitude from sea level. This track from Gorgan to Shirgah with length of 187 km passes near to green sea and then after 113 km from mountainous and forestall area it enters at Gardaneh Gadok and Firozkoh.

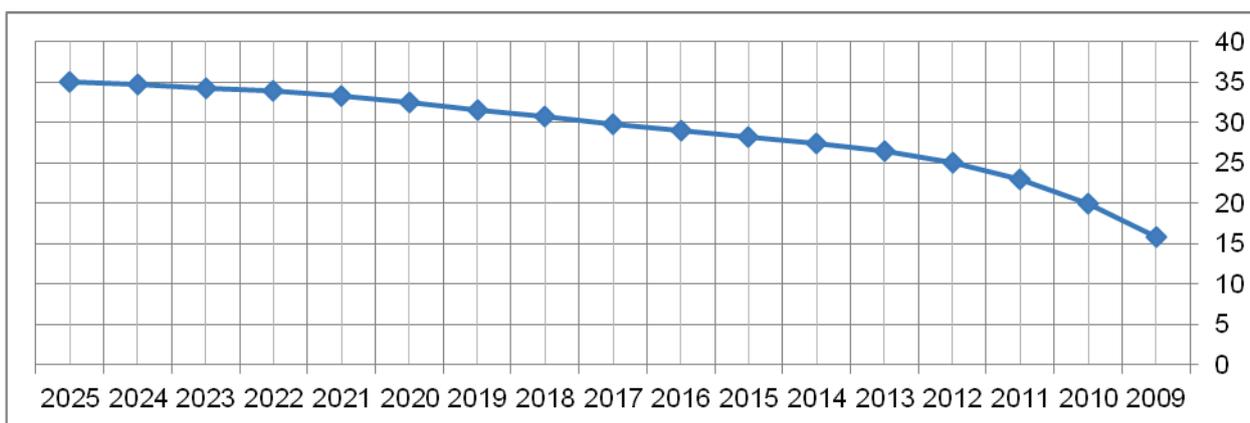
Investigation of future of tourism industry condition in north railroad district up to year 2025

Information about railroad trips usually has the number of tourist, naturally the railroad trips in country has been done for different purpose which one of them is for tourism. It is necessary to note that usually the calculation of the trend of growth of railroad travels in past And anticipation of the number of travelers in future (2025) also covers the number of tourist. Thus with creation of infrastructures for railroad routes and make the tourism areas accessible and near to railroad routes will double the number of tourists.

But having peak travel time duration in mind creates special conditions which need to pay special attention in this area. The number of New Year (norouz) visitors in three northern states in year 1400 was about 20 millions. In norouz 1401 this number reached to 23 million which shows the 15% growth. The portion of railroad transportation of passengers was very little which will be discussed later. But what is important is the growth of trips to the three northern states during the last year. If we consider this growth rate, then in year 2025 we should expect a boom in number in number of visitors during norouz and this passes 162 millions. But to consider this number of visitors for year 2025 will not be logical and there is a doubt in it. Chance of reaching to this number of visitors is not logical. But national travel growth rate during norouz from 2021 to 2022 is about 31% and paying attention to this travel growth rate during norouz makes a challenging anticipation. Question is: will this trend of growth rate continue in future?

In year 2020 the number of New Year travelers to three northern states was about 15.8 millions, then in year 2021 compare to year 2020 we have a 96% traveler's growth rate in those states and decrease of this growth rate for year 2022 (about 15%) shows that passenger growth rate is decreasing and during future years these numbers relatively will be stable.

FIGURE 1
ESTIMATIONS OF NUMBER OF VISITORS IN THREE NORTHERN STATES



As it can be seen from chart 1 is the gradual passenger growth rate in these three states up to year 2025 which reaches to 34 millions. if we able to attract only 18% of these passengers toward using railroad transportation (based on government's plan for year 2025 and table 1 if fuel consumption management law at least 18% of passengers transportation should be done by railroads) we will have about 6 millions norouz railroad travelers in year 2025.

Portion of railroad from norouz tourist transportation in northern states.

During norouz vacation period of year 2010 passengers traveled to Mazandaran state are 10,955,802 and between these only 17,315 passengers (or 0.16%) used railroad to travel to this state. Since the total number of passengers who used railroads in year 2010 is about 998 thousands, therefore the total of passengers to northern states is about 2% of total number in the country. Portion of public transportation on roads are only about 8% and indicates that travelers are interested to use their own cars for trip to north areas. Based on studies that had been done, 39% of travelers use buses for travel to Golestan state. Gilan has not been utilized the railroad transportation infrastructures so far, but the number of norouz trips with buses to this state is a sign hope. These numbers show in case of providing railroad infrastructures, tourists are eager to use train for trips to this state.

From other side in Golestan and Mazandaran states which have already some kind of railroad tracks, these track cover up to states centers, some tourists still prefer to use their own cars and previous phase investigated the weakens and threat points of such an act. It seems with some implementable work, it easily possible to increase the number of tourists to use trains for mean of transportation during norouz. In norouz 2010 about 12635769 persons use their own car to reach to those two states; in near future we hope that with changes in culture of society and encouragement for using public transportation which is a result of plan of aimful grant in aid, then we hope to encourage at least 20% of these travelers to use railroad transportation.

From other side attracting of 20% of travelers to Gilan who use their own cars and also attracting 50% of travelers who use buses in this state seems to be possible. Calculations show that in case of better service in sections of passenger train, it is possible to attract at least 3.6 millions of travelers to northern areas toward using train. Assuming that in future many tourist facilities in these will be created, and then the rate of tourists to these areas by train will be increased and reaches to 20 % of total amount of travelers.

Anticipation of passenger demand

For anticipation the passenger demand up to year 2025 the multivariable's regression has been used. In the following table the data from year 1999 to year 2025 which are about the number of railroad passengers in northern district used as a dependent variable and average ticket price and fuel price (gas) used as independent variables and are given.

TABLE 1
DEPENDENT AND INDEPENDENT VARIABLE FROM YEAR 1999 TO 2010

Fuel price (gas) Rial/Litre	Average price in railroad / person kilometer	Number of railroad passengers in north district (in thousands)	Year
350	24.8	434	1999
385	27.3	466	2000
450	32.2	494	2001
500	39.3	550	2002
650	48.4	576	2003
800	49.3	724	2004
800	50.5	797	2005
800	48.5	922	2006
1000	56.8	832	2007
1000	61.5	931	2008
1000	74.3	890	2009
4000	78.4	998	2010

With respect to all calculations in creation of a regression model, a best method which is (maximum R-Square) in WINSTATE software has been used and the following results have been achieved:

Multiple Regression					
		X-Variables	Average Price Person-Kilometer (Rial)		
		:	Fuel Price (gas) Person-Kilometer		
		Y-variable:	Passenger Rail North District		
		Method:	Maximum R- Square		
Steps	P	R-Square	corrected		
Average Price Person-Kilometer (Rial)	0.799244		0.779168		
Fuel Price (gas) Person-Kilometer	0.799618		0.755333		
Summery					
	n	R	R-Square	Std.Error	
normal	12	0.894326		0.799816	
			100.8168		
Corrected			0.869099		
			0.755333		
Equation			95%		
coefficient	Coef. (+/-)	Std.Error	T	P	
Constant					
Average Price Person-Kilometer (Rial)	179.8092	237.0682	104.7958	1.715805	0.120334
Fuel Price (gas) Person-Kilometer	11.062	5.849581	2.585803	4.277976	0.002056
	-0.00717	0.100932	0.044617	-0.16072	0.875863
Analysis Of Variance					
	Sum of Squares	Degrees Of Freedom	Mean Square	F	P
Regression	365489.5	2	1827447	1797957	0.000718
Residue	9147621	9	1016402		
Total	4569657	11	4154233		

R shows the correlation coefficient between real values of dependent variable and its anticipated values which can be 1 at maximum and R- Square also shows the percentage of dependent variable variance which can be derived from given formula.

For any statement a coefficient has been calculated and beside this a given level of confidence has been defined which in this case in 95% Std-Error are standard deviation error of Regression curve compare to observed real values which have scale and unit as dependent variable.

T is quotient of coefficient and standard deviation, P indicates that each statement in formula is meaningful.

Finally the analysis by variance has been done. The resulted calculation created the following regression model:

$$Y = 179.8092 + 11.062X_1 - 0.00717X_2$$

In this equation we have:

Y= number of railroad passenger in north district

X1= the average ticket price

To estimate demand or number of railroad passengers in north district with respect to during last 12 years the average ticket price has increased 11% per year, then the column for price have been calculated with 11% annual increase up to year 2025.

Also with respect to protection removal for fuel price, the increase in fuel price with average increase of world price for future years have been considered the average price increase during last 12 years was 19%, the following diagram shows the resulted calculation of obtained regression, in year 2025 the estimated number of railroad passengers in north district is about 3.75 millions. This number is calculated for a period of 15 years. In the previous calculations we obtained the 3.6 millions which are very close to 3.75 million and (4% difference) in an indication of the validity of our calculations:



Anticipation of passenger fleet

The most demanding month of year to travel is in March (farvardin) which is the first month of New Year in Iran and it is necessary to provide railroad transportation for at least 358560 passengers just in this month. If we divide this number by 31 we arrive at 11566 passengers per day and since every wagon can accommodate 60 people, therefore we need about 193 wagons. If each train Ram (can have 11 wagons) then we need 18 trains Rams or in the other word we need 9 couple of trains.

TABLE 2
ANTICIPATION OF PASSENGER FLEET FOR NORTH DISTRICT

Winter			Fall			Summer			Spring			Yearly passenger in year Minimum number of 2025
12	11	10	9	8	7	6	5	4	3	2	1	3,600,000
7.37	7.86	7.35	7.71	7.89	7.87	9.37	9.05	9.17	8.13	8.27	9.96	Monthly (%) Portion Of Northern District
265.000	282.960	264.600	277.560	284.040	283.320	337.320	325.800	330.120	292.680	297.720	358.560	Monthly (people) Portion Of northern District
8.844	9.432	8.820	9.252	9.468	9.444	10.881	10.510	10.649	9.441	9.604	11.665	Daily Passenger
147	157	147	154	158	157	181	175	177	157	160	193	number 60 Wagon of
246	262	245	257	263	262	302	292	296	262	267	321	number 36 Wagon of
Note:	36convert The Current Wagons To We Persons Wagons By Multiplication Of It By And Deduct It From Total Number 1.7								133	person 60Needs For :Wagon	193	Maximum Number Persons 60of :Wagon
									219	person 36Needs For :Wagon	321	Maximum Number Persons 36of :Wagon
											60	Number Of Wagon Variable

Investigation of situation of track line development in railway north district

Development of transportation network considers as a major factor to achieve improvements on economical and social issues especially in developing countries, and between these railroads with relative advantages like high security, low energy consumption has special place among other form of transportation. And with respect to area and position of country and dispersal of population centers and long distances between productions and consumptions hubs therefore development of railroad network seems to be vital. Based on this issue during past few years many plans by governments for completion of railroad network corridors have been approved which connection of Gorgan is going to Mashhad, Gorgan to Inchebroun and central Asia and Gorgan to Shahrod are some of those. The main point in mentioned plans is that Gorgan is going to be hub after implementation of above mentioned rail tracks and with respect to role, position and operation of Gorgan in administration on policy, tourist and issues in area and 50years history of accessibility of Gorgan to entire railroad network, then this selection seems to be scientific and logical.

TABLE 3
RAILROAD PLANS OF CURRENT, UNDER CONSTERNATION, UNDER STUDY IN NORTH DISTRICT

Rows	Railroad Plan	Condition	Track Length
1	Gorgan - Mashhad	Under Construction	650
2	Gorgan - Inchebroun	Under Study	86 (New Variant According To Query From Railroad Track Main Office)
3	Gorgan - Shahrod	Under Primary Study	150 To 200 Km
4	Sari- Mashhad	Under Primary Study	-
5	Qazvin- Rast-Bandar Anzali- Astara	Under Contraction	205
6	Rast- Sari	Under Primary Study	700

Methods' for improvement and development of railroad tourism in north district

With respect to analysis done by SWOT matrix for strength and weakness points and opportunity and threat of north railroad, the following methods for future improvement and development of railroad tourism are presented:

Suggested Packages For Tourism Industry	
New Fleet Purchase	Fleet Development
Renewal Of Used Fleet	
Provision Of Special Wagons For Tourisms	
Renewal And Equipment Of Current Facilities In Each Station	Stations Equipment And Renewal
Creation Of Parking Tracks For Tourist Train With Sleeping Accommodation	
Tourist Temporary Residence	
Convenient Scheduling For Train Movement	Management Plans
Mixed Traffic Or Passenger Traffic	
Private Section Management In Guidance And Planning	
Setting Up Tour For Rail Travel	Marketing And Increasing The Railroad Portion In Passenger Transportation
Setting Up Festivals, Celebrations Exhibitions In Low Demanding Seasons	
Offering Accommodations Of Trips For Student, Public Organization And ... For Trip Low Demanding Seasons	
Using Advertisement Tools To Show The Good Sides Of Trip With Train	
Identifying Areas Close To Track And Road And Provide Suitable Facilities In These Areas	Provision Of Suitable Infrastructures For Access To Rail And Road
Public Transportation Vehicles And Rental Cars	
Wagons For Car Transportation	
Providing Suitable Vehicles Between Sari Railroad Station And Residence Area of Railroad And Other Organizations In Khazarabad	

Provision of special tourist wagons for trains (case study)



Description:

It is possible with some changes to current wagons build special wagons for tourists. For example there are many kabus (tele check) wagons currently in Iranian railways which are not being used, it is possible with a suitable design, change these wagons for special tourist wagons for north district and use them for tours. Buying similar wagons and change them to have at least 140 wagons of 6- persons for tourist is purposes of this study. The summery of economical analysis for this offer are as follows:

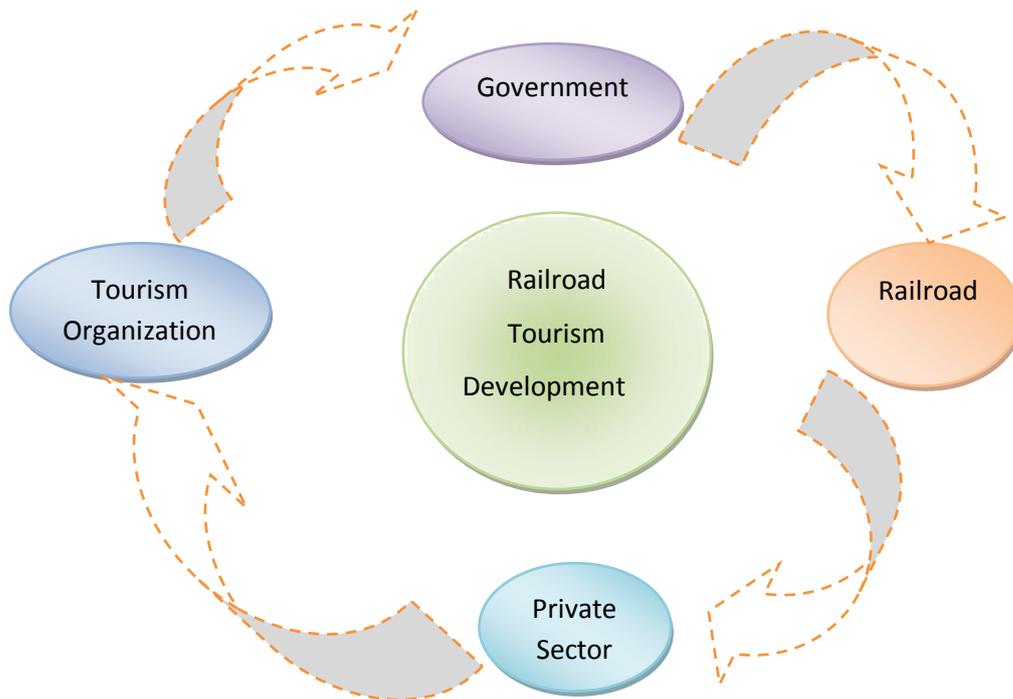
TABLE 4
PROJECT OF PROVISION FOR 140 PASSENGER WAGONS
SPECIAL FOR TOURIST TRAIN IN NORTH DISTRICT

Investment Amount	168 billion RAILS'	Average Yearly Income	70 billion RAILS'
Annual Expenditure	15billion RAILS'	Time Of Investment Return	3 years
Total Cost For 10 Years	318 billion RAILS'	Total Profit For 10 Year	340 billion RAILS'
Price Of Each Tour Ticket To Cover Cost	318000 RAILS'	Average Number Of Passenger In Year	100 000 persons

For tour of one day or two days price, including ticket price for each 6-persons wagon is about 420 thousands tomans or in the other word each person only pays about 70000 tomans(including transportation, foods and sleeping accomodations) and uses from variety of rail tour services and also can, use equeipment sleeping wagons. The investment return in this project is higher than banking interest rate.

Railroad tourist committee in north district

Different methods for expansion and development of railroad tourism in north district were offered and based on joint decisions of people in charge, these issue were categorized, but there is a missing link between these people in charge and main offer of these studies is creation of a tourism committee for north district.



CONCLUSION

With respect to estimation using multi variable regression method, the passenger demands for railroad in north district up to year 2025 are about 3750000.

Current railroad fleet cannot satisfy this number of demands and also there is no special train for tourism at this time but it is possible to change some variable trains to tourism train with repairs and modifications.

With respect to some past investigations the passenger demands anticipation for year 2025 at least 193 wagons of with capacity 60 persons are needed and if we assume that each train Ram has 11 wagons, therefore 18 Rams or 9 double Rams has to be provided.

According to studies which have been done so far about railroad tracks development in north district 855 Km of tracks are under construction and 1800 Km are under study.

Different methods for improvement of tracks in north district have been offered which the fleet expansions, stations, equipments and are some of them to point out. Considering that people in charge for each of these tracks and railroad tourism committee in north district for their implementations, including government, railway, tourism organization, and private sector should be selected.

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