

Study and Follow-up of the Iraqi Railway System utilize GIS

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Abstract

In this project, the land transport system was monitored using the railways in Iraq, mapping the cities it passes through using geographic information systems, and clarifying the governorates that the railways do not pass through, and damaged or old railways that have not been updated from 2003-2024, the results were that there are five provinces that the railway has not passed through since it entered Iraq in the last century, which are (Najaf, Messan, Sulaymaniyah, Dohuk and Erbil), there are also seven important railway lines starting from Baghdad that have been stopped since 2003, the Mosul-Qamishli line has stopped and a line from Mosul, to neighboring countries is suspended and all of them need maintenance and rehabilitation.

Keyword: Iraqi Railway, ArcGIS, government railway, land transport.

The aim of the research:

to highlight the problem of neglect of railway transport lines in Iraq and the lack of attention to this important means of land transport, whether transporting passengers or transporting goods since the twentieth century, so far there are some of the railways neglected and disabled for many years, as in Erbil and Wasit governorates there are an old iron structure neglected since the seventies of the last century and the damaged railways in Diyala Governorate and did not connect with the railways

with Baghdad because of the security conditions of the country.

1-Introduction

Iraqi railways one of the formations belonging to the ministry of transport institutions, because of their importance and the role of the advanced role in the sustainability movement of passengers and cargo and various goods and materials in addition to transport and provide the basics and promotion my servants enjoy all the comfort, safety and industrial technology [1]. The importance of railway transport through the large capacity heavy cargo and for long distances and quickly clear superiority of a lot of other means, it also highlights the importance of the railroad through their direct impact on population distribution and creation of large urban agglomerations by passage of the railway networks, and we also note that in many industrial European cities that grew and prospered by the presence of the railway[2], the railway is at the forefront of transportation States depend heavily on (significant) in achieving economic, social and political goals And military and that many States establishing railway updated with modern units, more or, most of the countries in the world consider the railways among the national projects of national profitability in the sense that its returns are indirect and therefore are not subject to measures of commercial profitability, but rather are measured by the benefits and social and economic gains they achieve as railway transport represents one of the fundamental aspects of road transport that satisfy these conditions of carriage is safe and less expensive for passengers and goods and for long distances Is the actual beginning of the first train running between Baghdad and thick Dujail (Ishaki) 1914 and 1918, [3] Bucher creates a standard line between Baghdad and Hillah to transport crops, then were extended several lines including line of sharqat to Mosul and was linked to the Syrian and Turkish Airlines and European network and in 1940 was the first train running from Iraq to the Haydarpasa (Istanbul) and the geographical location of Iraq was laid the foundation stone for building major global station in the Karkh side of

Baghdad in 1948 and completed once and for all 1953 and named after the railway company Showing that railways in Iraq has entered since the beginning of the last century while the British presence in Iraq, the railways network extended from southern Iraq to the north. Iraq has begun to renew, develop and establishing many lines of the network, passenger trains and cargo trains. The length of the railway network in Iraq is 2893 km in 2020; Iraq has begun to expand the railway network recently to connect with some neighboring countries, Iran through Basra - Shalamjah. Within the five-year plan of the company, in addition to the Baghdad Metro project which is the first of its kind in Iraq [4]. The Iraqi Railways Company can be used to transport goods and other materials instead of road trucks belonging to the private companies, because there are efficient systems and guarantees for the transport and delivery of goods within a specified period of time [5]. To provide statistical data and indicators for the planning authorities about this activity has evolved a great deal of importance in the planning of railway transport and road transport in General and from the importance of statistical indicators in terms of comprehensiveness and accuracy of their organization and how its flow to reach the beneficiaries and their adoption plans and follow up the required software and make the right decisions in directing this activity for development [2].

Method objects Statistical data are collected through administrative records in tables and annual public railway company containing statistical data reflect the qualitative, financial, and economic activity of the company. Check data in transport and communication Statistics Directorate in terms of accuracy and coverage indicators in addition to extract statistical indicators using Meta and methods include the most important data of the most important indicators [3]. Central Statistical Organization has in coordination with the Ministry of transport statistical bulletin for railway activity in Iraq to provide indicators on the number and types of locomotives, number of passengers, the amount of goods transported and the income from the transfer of passengers and cargo, rail lengths [5]. Railways entered Iraq since the beginning of

the last century in Iraq, and the railway network lines extend from southern Iraq to its north. Iraq may need to renew, develop and introduce many network lines and passenger and cargo locomotives [1].

The length of the railway network in Iraq is 2893 km. The current transmission lines are [3]:

a- Basra railway, 1271 km long, 34 stations, including 416 km double line.

b- The Baghdad-Fallujah railway, 60 km long

c- The Karbala- Musayyib railway line, 25 km long, the number of stations 3, and there are ten railway lines that have stopped working due to the political conditions of the country, without there being an alternative or development for them, despite the increase in the number of population and progress in all fields in the world Transmission lines stopped, Baghdad-Mosul-Rabiah line, Baghdad-Tikrit line, Baghdad-Tikrit line, Baghdad line – Haqlaniya, Baghdad line - Qaim Husaybah, Baghdad-Baigy-Kirkuk-Baigy-Haditha line, Al-Qaim Akashat line, Mosul-Qamishli line, Also, transportation lines for neighboring countries, such as a railway line from Mosul to Gaziantep and a railway line from Mosul to Aleppo, which have been suspended since 2003 [2].

Transport efficiency in general is an essential component of economic development at the global and local levels, and linking more sites leads to an increase in the value of transportation, and it would reduce the cost and time of movement of passengers and goods, and improving the increase in the contribution of this sector leads to economic growth. Availability of rail transport provides fuel and economic growth in every country [1], where transport increases productivity achieved through various inputs and requirements, such as larger and more diversified raw materials, spare parts, energy resources and labor, in addition to broader markets to achieve more diversified outputs and outputs. Transport has had an impact on economic development since the beginning of human civilization [3]. And the need arose to

transport large quantities of coal, iron and other materials, which led to the establishment of railways and trains that were used in land transportation. The development of railways was early [4]. Transport using modern railways has many advantages:

- 1- Low fuel consumption compared to road transport with increased speed [2],
- 2- In addition to the environmental benefits and the benefits of land use and capital investment, modern railways are considered one of the environmentally friendly transportation options and have significantly less environmental impacts on water, air, energy and other means of transportation [4], and many railways in the world are operated by electricity Which reduces the emission of pollutants according to the energy source used to generate electricity.[5]
- 3- The land requirements of railways are much less than transport on highways, although freight lines by rail require fewer gradations and curves than land transport, which increases the length of the road in mountainous terrain.

In this work, we will show how to improve railway efficiency and market response to railway management by mapping the railway path for each governorate, while addressing the private sector government railway entities [4].

Rail transport markets can be divided into two main segments: passenger and freight transport. The infrastructure of both is similar or identical, but the types of transport, equipment and infrastructure details are often different [6]. Passenger services, including metro, tram and urban systems Passenger market segments are characterized by character which includes intercity transportation [7].

2-Data and Working Methods

After obtaining the Iraq railway map as shown in Figure (1):

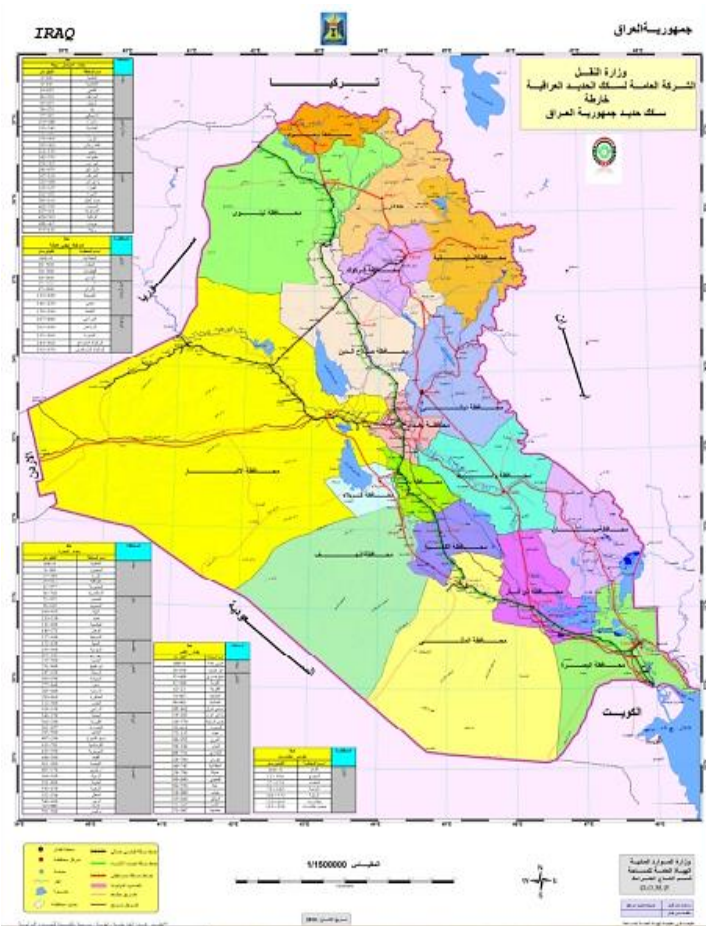


Figure (1), It represents the current railway tracks and projects under Implementation and future in Iraq [7].

- The map of Iraq and the Iraqi provinces was drawn using the ArcGis 10.8 program, as in Figure No. (2), showing registration and iron, and its branches in Baghdad province.
- A shapfile was provided for the governorates, as well as research topics from the Ministry of Planning and the Central Statistical Organization for the year

2020.

- c. The governorates that actually use railways as a means of transportation for transporting people and various goods from the north to the south have been drawn, as in Figure (4), and these railways have not undergone any development or modifications, whether to increase speed or modern technologies for trains, so no economic development has occurred for imports from Use of locomotives by trains or trailers.

The Map of Railway Tracking Passing through Governorates of Iraq

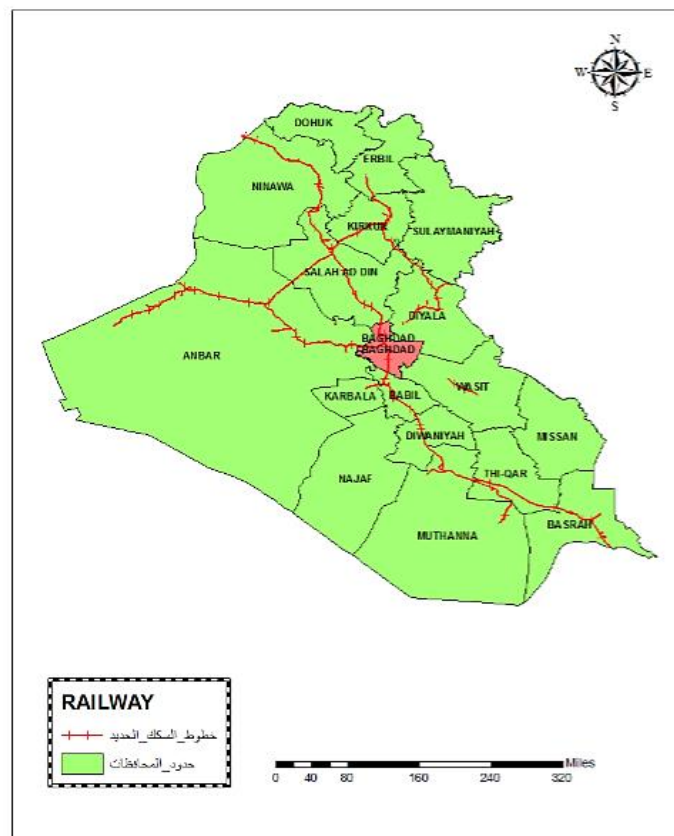


Figure (2), a map of Iraq and the capital, Baghdad, Showing the railway branches

We note that there are four provinces that the railways have not entered since entering Iraq. They are two southern cities (Najaf and Messan) and two northern provinces (Sulaymaniyah and Dohuk), which are shown in the map (Fig. 3). As for the governorates such as (Erbil - Diyala - Wasit), there are remnants of railways that have been cut off, neglected, and unfit for work since 2003. A map was drawn showing the Iraqi governorates through which railways pass and the governorates through which no railways pass, as shown in Figure (3).



Figure (3), a map of Iraq showing the provinces that use the railways in green and the governorates that do not use railways as a means of transporting travelers and various goods are in yellow

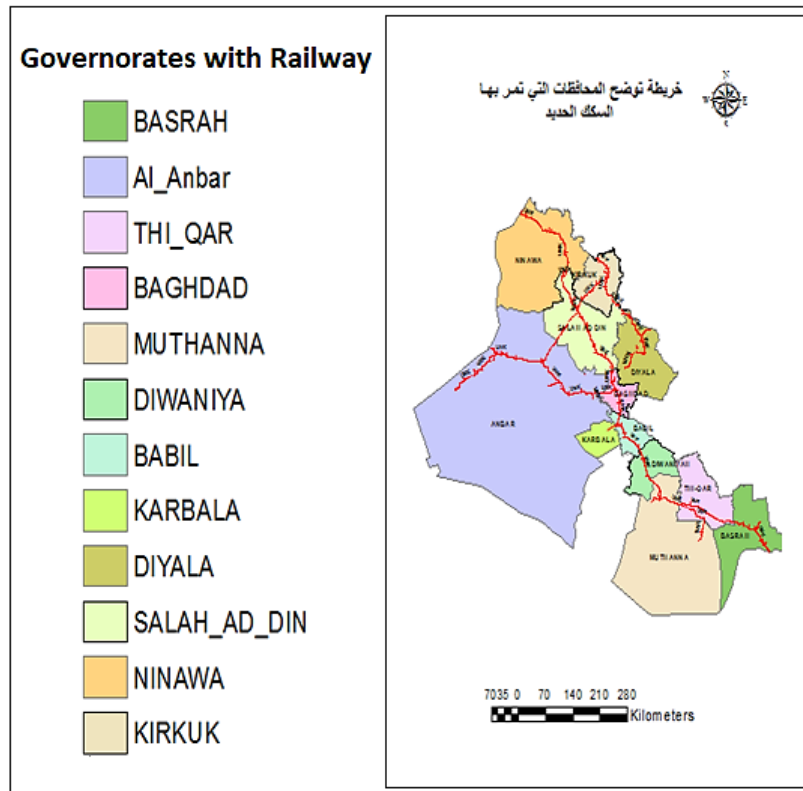


Figure (4), Railway map of the governorates that use trains as a means of transportation for passengers and goods

d. A map of Iraq was drawn showing the railways for each of the southern and northern governorates through which railways pass, with the exception of the governorates that do not use railways as a means of land transportation for people and goods, as in Figure (5, 6).

From figure number (5), we notice that three railway lines branch out from Baghdad, south - north and west, as shown in figure number (7), in more detail. The first branch goes to the south, where the province of Babel - Diwaniyah - Muthanna - Dhi Qar and finally to Basra. The railway line branches from Karbala Governorate to the Holy Karbala Governorate.

The Map of Railway Tracking Passing
through Governorates of Iraq

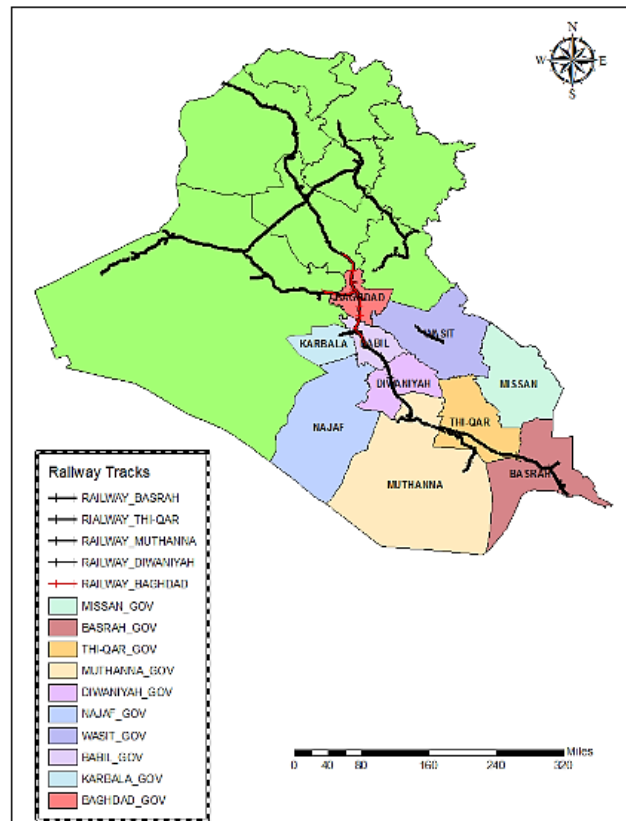


Figure (5) Railway map from Baghdad to the southern governorates
(Babylon - Karbala - Diwaniya - Muthanna - DhiQar - Basra)

The second branch, the northern railway lines, goes to Salah al-Din Governorate, from there to Mosul, while the third branch goes from Baghdad to the western region, which is the Anbar Governorate. we note from Figure (6) that the railways in Erbil are not fully utilized in the mountainous governorate due to the difficulty of extending railways in the mountainous areas Also, the economic cost is great, and the only line that connects Iraq with the neighboring countries, Syria and Turkey, is

from Mosul Governorate, and it has also been subjected to sabotage in recent years due to the conditions of the country.

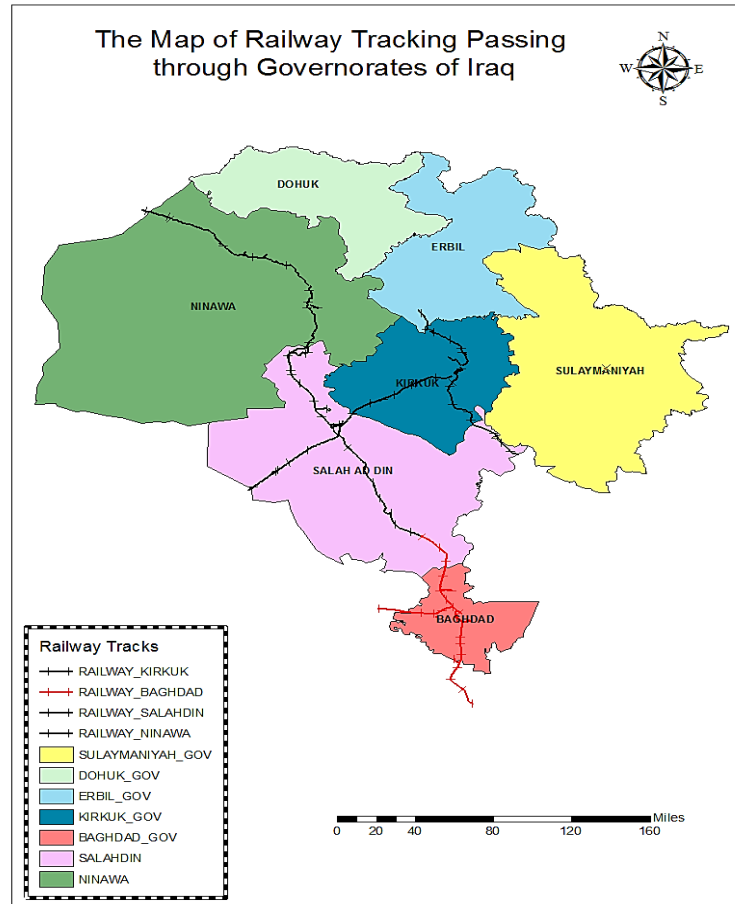


Figure (6), Railway map of the northern governorates Baghdad-Saladin-Ninawa railway line

We note from map in figure. 7 that it is possible to extend railways to western Iraq, that is, outside Iraq, to a neighboring country, which is Syria, and to invest this line for the economic benefit that will accrue to the Iraqi economy.

The Map of Railway Tracking Passing
through Governorates of Iraq

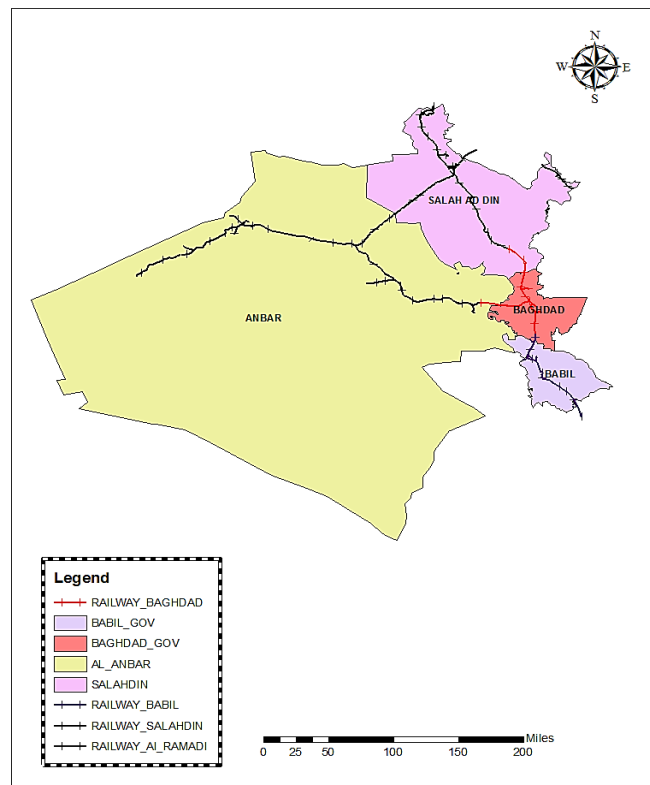


Figure (7) Railway map of the western region Baghdad-Anbar Railway

There are provinces such as Erbil - Diyala and Kut that have railways, but they are internal, that is, they are used within the province and were not linked with the railways with the capital, Baghdad, or perhaps they were cut off due to negligence by the Ministry of Transport and not investing them in the interest of the provinces and providing an important means of land transportation for them, as in the figure (8).

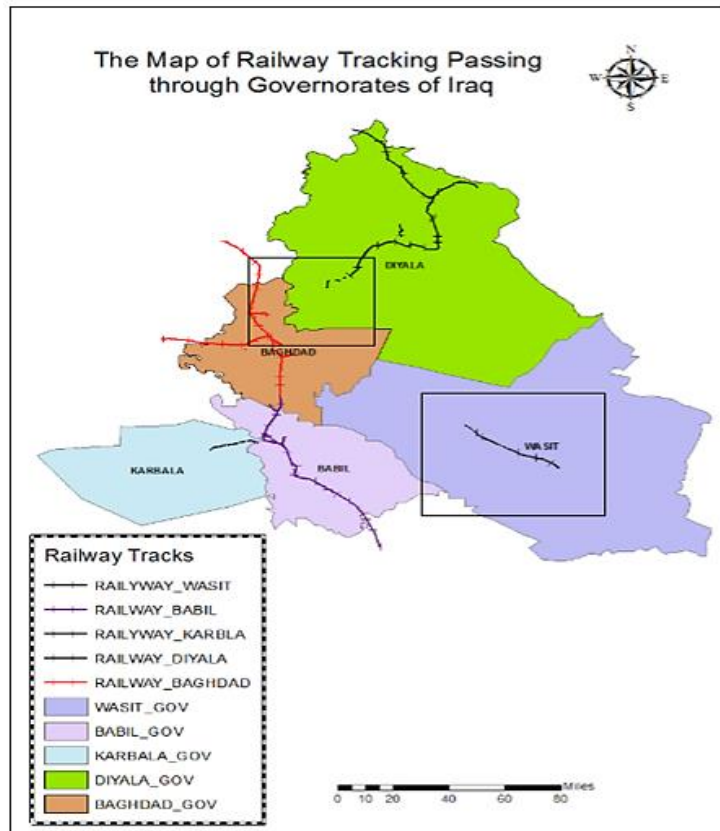


Figure (8) Railways map of the provinces that have old, undeveloped railways

3. Conclusions

- 1- The railway is an efficient and low-wage means of transportation as well as a safe means of transportation, and it works to transport goods and passengers over long distances, but it has not worked extensively in Iraq.
- 2- Modernizing the railways and keeping pace with the development in this area works to increase the growth of the economy in Iraq. Not all railways were modernized, some modernization was carried out on the railways in Baghdad.
- 3- The design and implementation of the railway line for Iraq with neighboring countries makes Iraq an important role because of its strategic location.

- 4- Non-implementation or suspension of projects negatively affects the movement of transport, citizens and cargo transportation.
- 5- Security has an important and influential role in the development and development of Railways.
- 6- Not covering the regions of Iraq with a railway network that facilitates and ensures the transportation of citizens and goods between parts of Iraq easily.

4- Recommendations

By studying the reality of the railways in Iraq, a number of the recommendations aim to advance the role of railways in transport movement in Iraq at the level domestic and regional:

- 1- Developing and encouraging railway transportation by allowing the sector regarding the opening of railway transport agencies to attract requests for transportation by rail iron and track its delivery.
- 2- Encouraging citizens passengers using railways and merchandise by means of advertising the features and facilities that this sector can provide (such as the possibility of providing specialized transport vehicles to transport passengers and goods within cities, to and from the train station, as a kind of encouraging the existence of privacy or privilege for the movement of these vehicles to walk inside city).
- 3- The need to reopen passenger transport lines to other country such as (Mosul- Aleppo) or (Mosul - Gaziantep) and make the facilities possible in order to attract investors.

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