

# Infrastructure of railroad transportation term paper

[Business](#), [Company](#)



## **Introduction**

Efficient transport in terms of cost and transportation time is a vital element towards the realization of economic development; this implies that transport activities are bound increase steadily due to the need to achieve economic development. Railroad transport is a means of moving passengers and freight by use of wheeled vehicles on fixed rail tracks, whereby the locomotive is channeled by the infrastructure of the railroad tracks. Rail transport serves as one of the effective means of transport that can be used to meet the increasing transport demands such as freight and passenger transport (Organisation for Economic Co-operation and Development 58). An important aspect of the railroad is that its infrastructure is a bottleneck in itself, in the sense that the movements of the rail trucks are limited to the direction of the rails tracks and routes, implying that there is lack of flexibility compared to other means of transport such as water, air and road transport. Despite the lack of flexibility, railroad transport is an important aspect of the economy in terms of inter-regional freight carriage. This paper discusses the infrastructure of the railroad transportation, the rail road routes, firms and stations. In addition, the paper also highlights the operations of rail road transport in terms of energy and usage, the operations of the railroad transport in terms of ownership, financing and safety (Hylton 87).

## **Railroad Routes and Firms**

One of the most dominant railroad firms in the United States is Amtrak, which is owned by the government and operates under the National Railroad Passenger Corporation. The firms rolling stock are under the ownership of

the federal government, with the government being in charge of overseeing the firms operations. Due to the fact that Amtrak is a national corporation, it can operate on the national rail track system. As a result, its operation is extended to almost all of the states in the United States. Some of the specific rail tracks and routes under the ownership of Amtrak are discussed below.

The Northeast Corridor, which stretches from Washington D. C to Boston and passes through New York, Philadelphia and Providence. This track is also co-owned by other commuter agencies under the control of the state and the federal government, with Amtrak owning the larger part of the railway route. The route is served by Acela Express. Its economic significance is that it provides a connection to the major cities.

## **Rail road transport operations**

The electrification of the railway transport system was a revolution in the operations of the rail transport sector due to the fact the modern rail systems are computerized and electronic, compared to the traditional railway systems that were mechanical and mostly manual. The operations of the rail road transport can be broadly classified into passenger operations, freight operations, locomotives and maintenance of the rail tracks operations.

Passenger operations are one of the most various forms of public transport that is used in the facilitation of movement of people. Most of the operations that relate to passenger operations are carried on the train stations. People movements are an important aspect of economic development owing to the

fact that people are the key drivers of the economy. Inter urban movement is increasing, with the demand to have faster means of transport across the cities; this led to the development of train subways that are used to interconnect various cities, in which modern trains move at high speeds to move people within the various cities so that they can undertake their economic activities (Hylton 23).

Freight operations principally entail the movement of goods using train locomotives from intermodal terminals to customer locations such as factories and mines. Freight operations that are intermodal deploy the use of containers which are standardized in such a manner that they can be used in other transport means such as road, water and air in points whereby the movement of the container changes from the rail road transport to another means of transport such as road and water transport. Freight operations are an integral element of economic development because they facilitate the movement of goods from one region to another, which may be at the local level, intercontinental level or at the global level. Locomotive operations mainly involve the various procedures of getting the locomotive functioning properly. This also entails the operations and respective costs associated with the maintenance of the locomotives and the overall infrastructure of the railway transportation sector (Hylton 78).

Railway firms have the principal role of operating and managing the railroad track and the locomotives that use the tracks. A railroad firm can be private or public depending on the level of government involvement in rail transport. The structure of most railway systems usually comprise of a national railway

firm, which have the ownership of all the rail road tracks and the operations of the trains in that particular country. Such an example is the Russian Railways, which have the total ownership of the trains and it is in charge of all the operations of rail road transport. In other countries such as the United States and Canada, there are different railroad companies, with each being in charge of their own railway tracks and the trains. In Europe, the European Union proposes that its member state should split the operations and management of the railway transport industry for various railway companies; with the railway truck being owned publicly, while the private companies can have the ownership of the train cars. In such a case, operations of the rail track are determined by means of public service obligations, whereby private investors are given a limited a time to run the railway transport system of the country (European Conference of Ministers of Transport 25).

In terms of financing, the principal source for most of the railway companies is due to the revenue from the tickets due to the costs associated with the movement of the passengers. Another principal source of income is from the shipment fees that are as a result of the shipment of the various goods. Freight revenue is an integral element of the income source of the railway companies in the sense that they constitute most of the costs associated with the haulage, whereby the shipper can be charged basing on the container rented or whereby the shipper can own the trains. Most of the rail systems in the globe are operated under the supervision of the government, with a few private investors having a stake in the rail transport. In cases where privatization of the rail road system is evident, there are various

options that can be adopted in the railway industry for that particular country. For instance, the government can allow open access to the railway infrastructure for any railway transport company that can be able to meet the required operational standards of railways. In such scenarios, the government may have the choice of providing access to the rail track and other facilities for free or a minimal cost that can be used for the maintenance of the rail tracks (Organisation for Economic Co-operation and Development 56). This can be compared to a scenario where the government has the responsibility of offering free access to the roads, provided the users meet the operational and safety standards. For the case of passenger operations, the involvement of the government is minimal, in the sense that the government issues a subsidy to an operator that is public-owned, in other cases; the government may deploy the use of a public service obligation, whereby it issues a tender to the lowest bidder to provide the rail passenger services.

### **Impacts of the Railroad transportation infrastructure**

The economic impacts of the rail road transportation infrastructure can be perceived in terms of energy and usage of the infrastructure. With respect to energy, rail road transport is one of the most energy-efficient means of transport, although it is often capital intensive with high operational costs (European Conference of Ministers of Transport 100). Operational efficiency of the rail road transport is evidenced by the fact that the major locomotive can be used to haul several bogies, hence increasing the tonnage during transport. The design of the railway infrastructure makes facilitates the

minimal use of energy, while at the same time carrying heavy haulage on land, compared other means of land transport. An important aspect of the railway transportation infrastructure is its aspect of economies of scale. This is due to the fact very long trains are usually pulled by few engines and one operator. This makes the operations of the railway transportation infrastructure on economies of scale with respect to human labor and energy consumption, since it is only the leading that is powered and operated by a person. Compared to other means of transport such as road transport, a trailer of more than one locomotive increases the risks of using road transport and makes inefficient in terms of energy consumption (European Conference of Ministers of Transport 52). The following figure depicts the gains associated with the fuel efficiency of the railway transport system.

### **Source: Organisation for Economic Co-operation and Development**

The railroad transportation infrastructure has significant impacts on the economic system of the United States, this can be perceived from the economic viewpoint of railroads played a significant role in the development of the America's national market, for the larger part of the 19th and 20th century. Prior to the invention of the automobile, the railway contributed most of the development of the Gross National Product. Hylton (85) argues that with the advent of the Rail road, the GNP of the United States could not have risen by 7. 2 per cent during 1890. Hython (90) further infers that this has been largest contribution to the economy by a single invention, although its spread resulted to a GNP growth of about 2-3 years, implying that it was comparatively small. Therefore, it can be inferred that

the Railway transportation infrastructure was an important economic aspect to the United States, but was not vital to steer the economic growth of the late 19th century and early 20th century. The specific economic hypothesis concerning the principal effect of the railroad infrastructure system is that it resulted to greater social savings, that was as a result of the shift from an transport economic system that was dependent on water and wagon systems, to an cost efficient economic system of the railroad infrastructure. This implies that railroad were not only cost effective, but also played a dominant role in reducing the transpotation time. The outcome of this economic asociation is that the railroad created opportunity cost implications. The onset of the railroad transportation system resulted to an incline in the social savings of approximately 1. 2 per cent of the total GNP. An important characteristic of the railroad transportation system is its operability irrespective of the weather conditions, this means that its contribution to the economy is all round throught the year. Hylton (102) notes that the agricultural sector benefited the most from the railway transportation system. For instance, the costs assciated with interregional shipment of agricultural produce would have doubled if the railway transportation infrastructure could not have been invented.

### **Factors that determine the railway transportation infrastructure**

A transport system of a country forms an integral part of its infrastructure, and plays an important contribution in the realization of economic development. There are various factors that determine the orientation of railroad infrastructure of a given country (Hylton 89).



One of the principal determinants of the railway transportation infrastructure are extrinsic factors such as the physical geographical orientation, such as valleys, lakes and hills; and the orientation of human geography such as settlements. In most cases, the geographical orientation determines the direction and the design of the rail tracks such as the slope, tunnel construction and many more.

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