

EVOLUTION OF RAILWAY STATIONS: NAVIGATING CHALLENGES IN TRANSPORT NETWORKS

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Abstract

This article delves into the historical evolution of railway stations, tracing their emergence from ancient times to their modern-day significance in shaping transport networks. It explores the developmental stages of road infrastructure networks, highlighting the pivotal role of railway stations in facilitating connectivity and mobility. The article addresses the challenges encountered in the establishment and operation of railway stations, both historically and in contemporary times. By examining past and present issues, this article offers insights into the complexities of transport networks and the strategies needed to overcome emerging challenges.

Key words: railway, metallurgical plant, wooden tracks, iron tapes, steam engine building plant, special commission, road construction.

Introduction

Railway stations have played a crucial role in the development of transportation systems throughout history. From their humble beginnings as simple stops along ancient trade routes to the bustling hubs of activity they are today, railway stations have been instrumental in facilitating the movement of people and goods across vast distances. This article aims to explore the evolution of railway stations and the challenges faced in creating and maintaining efficient transport networks [1].

Historical Context: The emergence of road infrastructure networks dates back to ancient civilizations, where early societies developed rudimentary systems to facilitate trade and communication. Over time, these networks evolved, incorporating innovations such as paved roads, bridges, and waystations. Railway stations emerged as key nodes within these networks, providing vital links between distant destinations and facilitating the efficient movement of goods and passengers.



Development Stages: The development of railway stations can be traced through various stages, each marked by significant advancements in technology, infrastructure, and organizational structures. From the early steam-powered locomotives of the Industrial Revolution to the high-speed trains of the modern era, railway stations have continually adapted to meet the changing demands of transportation.

Issues in Transport Networks: Despite their importance, railway stations and transport networks face a myriad of challenges. These include issues such as inadequate infrastructure, congestion, safety concerns, and environmental impacts. Additionally, the rapid pace of urbanization and population growth has placed strain on existing transport networks, exacerbating these challenges and necessitating innovative solutions [2].

The main part

For the first time, tracks were used for internal technological transport in metallurgical plant shops and mines as a railway. Carts loaded with ore were moved through the wooden tracks with the help of a rope and a water pump. Later, the top of the wooden tracks was covered with iron tapes to ease the movement.

The creation of the steam engine by the Russian inventor P.P. Polzunov and the English inventor D. Watt made it possible to make cakes with mechanical power. In 1803, the English inventor R. Trevitik created the first transport vehicle, the 1st steam locomotive, which was moved along the track using a steam engine (Fig. 1).



Figure 1. The first steamtrain

In 1814, Englishman D. Stephenson built his first steam locomotive, the Blucher, and in 1823 he opened the first steam locomotive factory in Darlington.



Under the leadership of D. Stephenson, the first railway, 21 km long, was built between Stockton and Darlington (Fig. 2) and was inaugurated on September 27, 1825. The first train was driven by D. Stephenson.



Figure 2. Stockton-Darlington Railway (1825)



Figure 3. Paris Railway Station (1895) Berlin Railway Station (1838)

After England, railways began to be built in other countries. In 1830 in the USA, in 1832 in France (Figure 3), in 1835 in Germany and Belgium, and finally in 1837 in Russia, railways were built.

History of the development of railway transport in Russia. The father and son E.A. Cherepanov and M.E. Cherepanov, mechanics of the Nizhny Tagil factory, who worked in Lake Demidovlar, Ural manufacturers, built the first steam locomotive



and the first railway in Russia and put it into operation in August 1834. However, in 1834, at the suggestion of F.A. Gerstner, professor of the University of Vienna, who founded the construction of a railway in Russia, the first railway in Russia was built from St. Petersburg to Sarskoe Selo with a length of 27 km. It had 42 minor wooden bridges, and five stations, and was officially opened for use on November 11, 1837. The Sarskoye Selo railway proved how important railways are for Russia. After that, a 651 km long two-track main railway with complex engineering solutions was built between the cities of Petersburg and Moscow and was officially put into operation on November 1, 1851 (Figure 4).



Figure 4. Harbin railway station (1898) Russia

— 34 stations and 184 bridges were built on this road. The width of the railway is 1524 mm. The first train was a passenger train that arrived in Moscow in 27 hours. The construction of further railways continued with periodic changes. Between the 60s and 80s of the XIX century, a period of rapid development was observed in railways. In 1891, the Great Siberian Railway began to be rapidly built and caused great changes in the economic development of Russia.

Introduction of railway transport to Central Asia. The history of Uzbekistan's railways began in 1874, during which a special commission built the Orenburg-



Tashkent railway. The history of railway construction in Central Asia begins with the construction of the Caspian railway in 1880.

The construction of a railway in the territory of Central Asia is aimed at solving the biggest problem. It was supposed to serve to strengthen the military superiority and political dominance of Tsarist Russia in these countries. That is why the construction of the railway started from Kaspiyort [3]. After the Akhal-Teke expedition of 1880, a railway was built from the Caspian Sea to the Red Arvat. According to the situation, it was necessary to continue it to Chorjoi and Samarkand. The first railway in Central Asia with a length of 217 kilometers was completed in 10 months. On September 20, 1881, trains began to run over the steel tracks from Mikhaylov Coltig to Kizil Arvat. Later, the railway was continued from Kizil Arvat to Samarkand, and the second Caspian railway battalion was formed. In May 1895, under the leadership of engineer A.I. Urusat'ev, the continuation of railways from Samarkand to Tashkent and Andijan was started. This work was completed after 4 years, and the length of the railway reached 2368 kilometres. 1748 calls of the road Krasnovodsk - Toshkent route, 294 calls to Murgob, 306 calls to the Andijan network, 12 calls to Kogon - Bukhara and 8 calls to Gorchakovo (Margilan) - Skobelev (Fergana) sections. Also, 99 railway stations, 96 bridges, oil and water supply facilities, many residences, workshops, and educational institutions were built. In 1900, the railway had 311 locomotives and 4552 cars. The capacity of the road in 1903 was 17 pairs of trains in one day and night.

Tashkent railway station was built in 1899 by architect G.M. Svarichevskiy. designed by After major earthquakes in 1902, the building was put out of repair. (Figure 5)

In the autumn of 1900, Russia began the construction of the Orenburg-Tashkent railway. the construction is two-way - starting from Orenburg and Tashkent, and in 1906, the Orenburg-Tashkent railway with a total length of 1736 kilometres was commissioned. The Kinel - Orenburg network consisting of 354 links was also built in those years. There is information that the entire railway network consisted of 2,090 trains in 1906. On January 1, 1906, the Tashkent - Orenburg railway line was opened. In 1935-1947, the next reconstruction of the station was carried out under the leadership of architect E. Limar. The old building of station was built in 1957 by architects L. Travianko and V.Y. Rusanov, V. It was

rebuilt according to the Biryukov project. In 2005, the station building underwent another complete reconstruction (Figure 6).

The Tashkent-Orenburg route is the second-largest railway network connecting Central Asia with the central industrial regions of Russia. Later, the construction of internal routes was started. Fergana railway, Kogon-Termiz, and Karshi-Kitob sections are among them. By 1908, private entrepreneurs and various joint-stock companies began to actively participate in the construction of the railway. Development, current status and prospects of railways in Uzbekistan During the Tsarist Russia and the Soviet era, the wealth of our country was continuously transported for almost 130 years. Railway transport is now working for the economy of our country. In turn, our state and government are paying great attention to this industry. In just a few years, several kilometres of new roads were built and powerful enterprises were built [4-7].



Figure 5. The first view of the Tashkent railway station.





Figure 6. The current view of the Tashkent railway station.

Conclusion

In conclusion, the creation of railway stations and the development of transport networks have been integral to the progress of civilizations throughout history. However, challenges persist, requiring ongoing efforts to address issues such as infrastructure development, congestion management, and environmental sustainability. By understanding the evolution of railway stations and the complexities of transport networks, we can work towards building more efficient and sustainable transportation systems for the future.

After gaining independence, great changes are taking place in our Republic, including in the railway sector. One of them is the construction of the Uchkuduq-Misken-Sultonuzak railway. The new railway project was created in 1993, and the most suitable one was selected from many projects. And a new road was built in 1996^{shi} started. After the full operation of this railway, freight and passenger trains to the Republic of Karakalpakstan and Khorezm went directly from the territory of our country. In addition, the construction of new enterprises, the development of new land in the desert, and providing service to railway stations made it possible to open thousands of jobs.

Another news is the launch of a wagon repair plant. In the past, this factory would have been a facility that would repair wagons at the depot level. In 1996, a



loan agreement was signed between the Government of Uzbekistan and Japan's Foreign Economic Cooperation Fund.

The number of workers at the plant is 1,280, which is capable of overhauling up to 450 wagons per year. Another important thing that should be noted separately is that our wagons used to be repaired in Russia for 50-70 thousand US dollars. And now a large amount of currency is saved.

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