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RAILWAY HERITAGE ON THE RAILWAY MALA KRSNA - MAJDANPEK

Abstract. In this paper we present some of the findings of our research “Research and documentation of railway heritage on the railway Mala Krsna - Majdanpek”. The Mala Krsna - Majdanpek railway established the shortest rail link between eastern Serbia, Belgrade and further north. It was built from 1920 to 1958. Since the opening to traffic, there has been no significant reconstruction or modernisation. The main improvement was the replacement of steam engines with diesel engines. The change in traffic trends has greatly reduced the share of this railway in public transport. That is why, in the last decades, some of the railway infrastructure and facilities have been abandoned and remained unprotected. As a result of the above circumstances and future modernisation, it is possible that the old railway facilities and technical infrastructure may disappear permanently. By following the railway, the objective of the project was to identify and document the existing railway heritage, which may be more than 100 years old. The results of the projects can launch and support further research. Finally, the authentic discoveries of today's issues are an urgent call to protect and permanently preserve the existing historical and cultural values of our railway artefacts.

Keywords. Serbian railways history, railway infrastructure, railway heritage

1. Introduction

The first railway on the territory of Serbia at the end of the 19th century was opened to traffic in 1884. In the following years the construction of the eastern railway continued to Bulgaria. The sections Niš - Pirot (1887) and Pirot - Caribrod, present-day Dimitrovgrad (1889) has been completed.

Following this, the development of the railway network in Eastern Serbia was slow and sporadic. Until the end of the World War I, the railways Prahovo - Zaječar and Zaječar - Knjaževac were opened to traffic. The last section, Knjaževac - Crveni Krst (Niš) was completed before the World War II (Figure 1). Thus, the eastern Serbian railways were integrated into the railway network of the Kingdom of Yugoslavia. However, they still remain of local importance.

The rest of the railway network in eastern Serbia was built after World War II, when the intensive development of the Bor mining basin began. The first phase of development included the reconstruction and construction of a mine and smelter in Bor (1957-1960), a factory for the production of sulphuric acid in Prahovo (1960) and building the railway Vražognac - Bor (1960-1963). The second phase involved, among others, the construction of a mine and flotation in Majdanpek (1957-1961). [1]



Figure 1. The railway station Crveni Krst, Niš (31 July 2020)

Finally, the railway infrastructure in the Bor mining basin was completed in 1969, when the Majdanpek - Bor railway was finished. This resulted in more efficient rail transportation of ore between Majdanpek (Figure 2) and the Bor smelter. At the same time, a direct cross-connection between Bor and the magisterial railway Belgrade - Niš was established.



Figure 2. 1: The mining town Majdanpek (12 September 2014)



Figure 2.2: The Majdanpek Mine - Environmentally controversial flotation (12 September 2014)

In recent years, the modernization of certain railway corridors in Serbia has been underway. At the same time, many railways in Serbia were closed to traffic, and railway infrastructure and objects were abandoned [2]. In these cases and circumstances, the historical and cultural importance of the Serbian railways has been ignored. So, most of the former railway facilities and technical infrastructure will be lost, without the prior protection and documentation [3].

This paper presents some of the results of the project "Research and documentation of railway heritage on the railway Mala Krsna - Majdanpek". The objective of the project was to record the railway route and to document the authentic railway technical features and facilities that date back to the period of railway construction.

2. Railway Mala Krsna - Majdanpek - Bor

The Mala Krsna - Majdanpek - Bor railway links the eastern and central part of the Serbian railway network south of the Danube. The construction of the railway included five sections that were completed at various periods. Sections are: Mala Krsna - Požarevac, Požarevac - Kučevo, Kučevo - Brodica, Brodica - Majdanpek and finally Majdanpek - Bor (Table 1).

	Section	Length / open for traffic	Railway stations and stops
I	Mala Krsna - Požarevac	17 km / 1 December 1920	Mala Krsna, Ljubičevski most, Požarevac
II	Požarevac - Kučevo	60.8 km / 3 December 1939	Požarevac, Stig - Sirakovo, Ljubinja, Češljeva Bara, Rabrovo - Klenje, Mustapić, Mišljenovac, Lješnica, Zvižd, Turija Kučevska, Kaona, Kučevo
III	Kučevo - Brodica	16 km / 29 November 1948	Kučevo, Neresnica, Voluja, Brodica
IV	Brodica - Majdanpek	30 km / 1958	Brodica, Bosiljkovac, Blagojev Kamen, Majdanpek (Debeli Lug)
V	Majdanpek - Bor *	42 km / 1969	Debeli Lug, Leskovo, Jasikovo, Vlaole, Gornjane, Šušulajka, Cerovo, Krivelj, Brezovik, Bor

* The section Majdanpek - Bor was not a subject of the project

Table 1. Railway sections, stations and stops of the Mala Krsna - Majdanpek railway

The Mala Krsna - Majdanpek railway is approximately 125 km in length. The complete railway has been under construction for over 40 years (Figure 3).

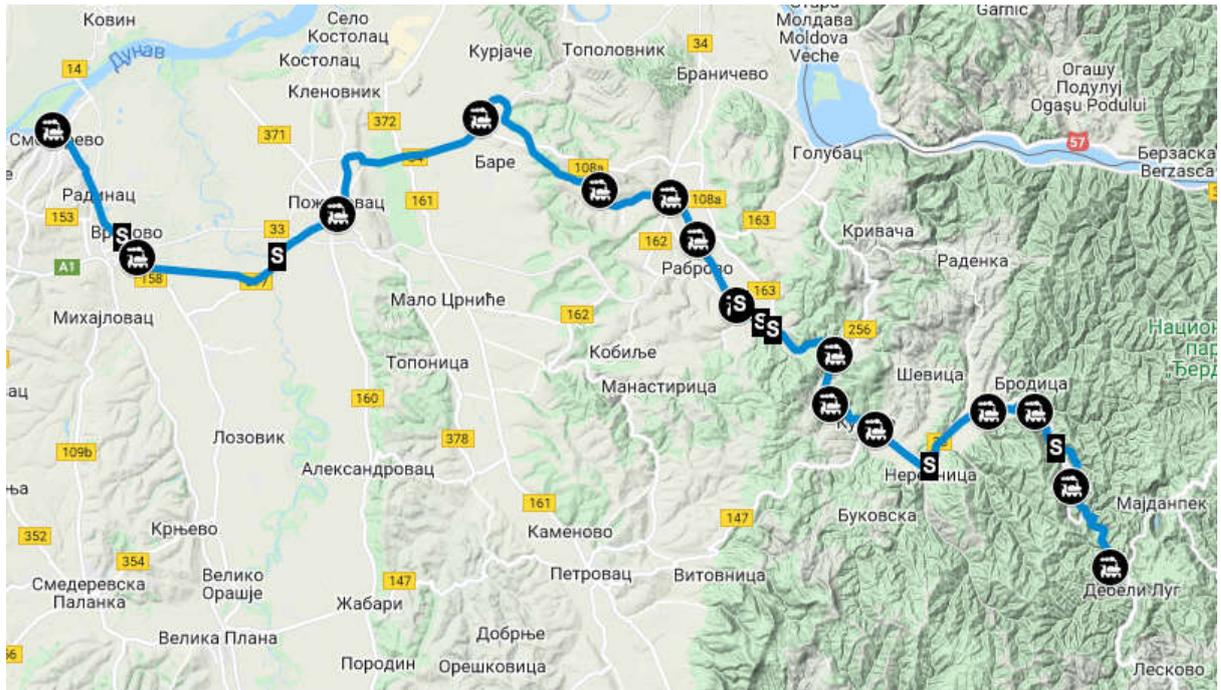


Figure 3. The railway Mala Krsna - Majdanpek

When it was completed, the shortest railway connection between eastern Serbia and the railway Belgrade - Niš, was established at Mala Krsna (Figure 4).



Figure 4. The railway station Mala Krsna (1 January 2022)

The railway crosses different geographical and economical areas, such as Pomoravlje, Bраничево, Stig, Zvižd and Pek. The first obstacle on the route was the Velika Morava River. The former railway bridge was destroyed during the World War II. Following the war, a new one was built and is still in use (Figure 5).



Figure 5. The Bridge over the Velika Morava River and the railway stop Ljubičevski Most (1 January 2022)

After crossing the river, the railway runs through the Stig (Figure 6) and Braničevo plains to Lješnica.



Figure 6. The railway station Češljeva Bara in the Stig Plain (23 December 2021)

The further route is faced with difficult, mountainous terrain. It follows the Pek River, around which are the ore areas of Neresnica, Brodica, Kaona, Blagojev Kamen (Figure 7), Majdanpek, and further Krivelj and Bor [1].



Figure 7. The railway station Blagojev Kamen (22 December 2021)

From Lješnica, the railway enters the canyon of Kaona (Figure 8). After 13 km it reaches Kučevo. The first train arrived in Kučevo on December 3, 1939.



Figure 8. .1: The mine of Kaona
(22 December 2021)



Figure 8.2: The railway at Turija Kučevska
(22 December 2021)

The railway construction towards Majdanpek continued after the World War II. The Kučevo - Brodica section crosses the Zviška valley. The section is 16 km in length and was opened for traffic on November 29, 1948. The stations are Neresnica and Voluja (Figure 9).



Figure 9. The section Kučevo - Brodica at Voluja (22 December 2021)

The last section of the railway, Brodica (Figure 10) - Blagojev Kamen - Majdanpek, passes through the gorge of Voluja. This section, approximately 30 km in length, was opened to traffic in 1958.

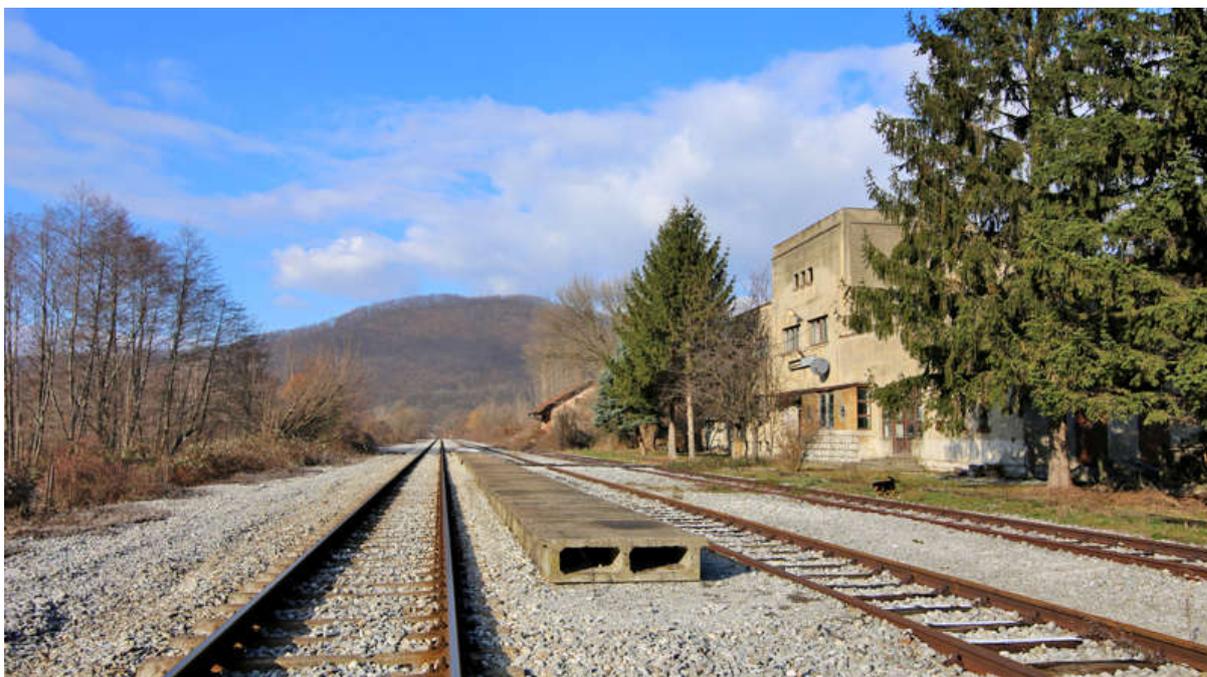


Figure 10. The railway station Brodica (22 December 2021)

Finally, the Majdanpek - Bor railway (42 km) was completed in 1969. With the construction of the Mala Krsna - Majdanpek - Bor railway, a transversal connection was established between the railways of eastern Serbia and the Niš railway. Due to the terrain configuration, the Majdanpek station has been relocated to the Debeli Lug location (Figure 11).

The railway is still single track and not electrified. Since its construction, it has not been substantially rebuilt.



Figure 11. The railway station of Majdanpek is located at Debeli Lug(22 December 2021)

3. Architecture of railway stations and stops

The complexity of the railways and traffic system required the use of exact construction and technical standards from the very beginning of the railway networks. Furthermore, the standards considered the stations' topology, objects and ancillary railway facilities, such as official buildings, railway warehouses, surrounding industrial plants, etc. The Mala Krsna - Majdanpek railway was building for over 40 years, under different historical circumstances and along different terrain.

Despite the long construction period, applying the same criteria above is evident in the case of the railway Mala Krsna - Majdanpek. There are 20 railway stations and stops. Following the railway, it is obvious that the station buildings were built using several typical projects.

The Mala Krsna station building is located on the Belgrade - Niš railway that was opened for traffic in 1884 (Figure 12). Consequently, it was built based on the standard projects of the time.



Figure 12. The rail station Mala Krsna (1 January 2022)

After the World War I, projects of major stations included elements of prevailing modernism. Similar projects have taken place in Kaona, 1939 (Figure 13), Kučevo, 1939 (Figure 14) and Brodica, 1948 (Figure 10, Figure 15).



Figure 13. The railway station Kaona(22 December 2021)



Figure 14. The railway station Kučevo (22 December 2021)



Figure 15. The railway station Brodica(22 December 2021)

Finally, the same project was used for the stations at Blagojev Kamen (Figure 7, Figure 16) and Majdanpek (Debeli Lug) that were completed in 1958 (Figure 11, Figure 17).



Figure 16. The railway station Blagojev Kamen (22 December 2021)



Figure 17. The railway station Majdanpek - Debeli Lug (22 December 2021)

Railway stop buildings typically have one or two rooms, intended for passenger waiting rooms, cash registers and railway service personnel. Examples include Ljubičevski Most (1920) (Figure 5), Ljubinja, Mustapić (Figure 18) and Mišljenovac (1939) (Figure 19).



Figure 18. The railway stop Mustapić (23 December 2021)



Figure 19. The railway stop Mišljenovac(22 December 2021)

When it was opened to traffic on the railway, stations and stops, there was an all-day duty of the railway staff. In recent years, railway staff have been present only at larger stations. Because, most railway facilities need the necessary physical protection and reconstruction.

4. Railway properties, technical devices and equipment

The research priorities at the Mala Krsna - Majdanpek railway was to identify and photograph objects, facilities, devices and technical equipment from the opening time. Some are not in use anymore and disappear permanently. Although they are part of the railway heritage, they are generally neither protected nor documented.

During the research, the remaining water towers and water supply systems of steam locomotives, mechanical signals, manual switches, winches for lowering and raising ramps at level crossings were documented. Water towers and feeders are symbols of the era of steam locomotives. They still exist at the railway stations Rabrovo - Klenje (Figure 20) and Kučevo (Figure 21).



Figure 20. The water tower at the station Rabrovo - Klenje (23 December 2021)



Figure 21. The water tower at the station Kučevo (22 December 2021)

Water feeders have not been used for more than half a century. They are occasionally found in the siding. We found them in Požarevac (Figure 22) and Majdanpek (Figure 23).



Figure 22. Water feeders at the railway station Požarevac (1 January 2022)



Figure 23. Water feeders at the railway station Majdanpek (22 December 2021)

Certainly the most important rail devices are traffic lights. The former traffic signs were mechanical, driven by winches and chains. Today, electrical traffic lights are used and mechanical signs along the railway are mostly removed. Two of them still remain on the railway near Kučevo (Figure 24) and Neresnica (Figure 25).

The initial expansion of the railway network made it possible to improve transport efficiency. Various industrial plants were built in the stations and alongside the railways. Meanwhile, industrial scales, cranes and cargo handling equipment were installed in the stations.



Figure 24. Mechanical signs near Kučevo
(22 December 2021)



Figure 25. Mechanical signs near Neresnica
(22 December 2021)

When truck transportation prevailed, scales and handling equipment are abandoned and generally removed. One of the last station scales is at Kučevo station (Figure 26).



Figure 26. The station scale in Kučevo (22 December 2021)

5. Conclusion

The railway Mala Krsna - Majdanpek was constructed in the period 1920-1958. When it was opened to traffic, it connected the eastern Serbian railways with the Belgrade - Niš railway. Departing from Lješnica, the railway passes through the mountainous area and ancient ore areas of eastern Serbia. The development and production intensity of surrounding mines has directly influenced railway use. Over time, several factors have affected the railway's importance. These are oscillations in mining production, the transition from railway to road transporting, and so on.

Perhaps because of these circumstances, the railway Mala Krsna - Majdanpek was not electrified and stayed single-track. Furthermore, the necessary maintenance, occasional reconstruction and modernisation of the railway and technical infrastructure were lacking. Recently, passenger traffic has been occasional and railway uses only a few freight trains per day.

Finally, the future of the railway depends on Serbian strategic plans for the development and use of mining areas. But the latest news are discouraging. At the beginning of 2022, an invitation to tender was issued for the dismantling and disposal of tracks and technical devices that Serbian railways do not use [4].

The fact is that the railway facilities, infrastructure and technical devices on the railway Mala Krsna - Majdanpek mostly do not meet the criteria to obtain the status of cultural property, according to the Law on Cultural Heritage RS [5]. But also, the fact is that genuine objects disappear permanently even if they are part of our history and our railway heritage.

The project presented was carried out from December 2021 until January 2022. Winter conditions influenced us to look over the complexity of the terrain, along the railway route. While travelling along the railway, we visited 20 stations and stops, created a GPS railway route and took more than 2500 images. The visual and identification data are permanently archived and the selected data are published on the Web [6].

We believe that every document, provided by the project, is an important and authentic source of historical information and useful for future research. In addition, the project results could initiate the displacement of artefacts from the time the railway was built. On the new dedicated location, a part of the history of the Serbian railways could be protected and presented permanently.

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