Monitoring the Current State of the Czech Section of Horse-Drawn Railway Ceske Budejovice – Linz and Design of Its Revitalization

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Abstract. The article deals with the mapping of the remains of the Czech part of the České Budějovice – Linz line. The horse-drawn railway is a national cultural heritage and one of the first major logistic activities of the Czech Republic. The work has confirmed little or no use of track relics and also confirms that the track is neglected and abandoned, although its remains are often in close proximity to current communications and are therefore easy to access. The relics are mostly surrounded by racing green, dilapidated and do not lead to any marked trails. An exception is made up of all four buildings on the territory of České Budějovice. For the last few buildings in front of the border with Austria, there is an educational trail. You cannot talk about the rest of the relics. During the research, relics lying close to each other were classified into four locations. These locations are: České Budějovice, Kamenný Újezd, Velešín and Suchdol up to the border. Locations are more interesting for visitors because they have several objects close together, which can be more easily visited. Some objects are far apart and have not been included in the locations. In the article, we focus on the section about Holkov up to the border with Austria. The aim of the thesis is to propose measures to increase tourism on these track debris. The main question of the work, to find out the possibility of revitalizing a part of the track to make tourist attractions more attractive, proved to be possible. The work proposes new educational trails on horse-drawn track on the remains of the track. These trails are located in the denser relic locations. Trails, positions, and stop counts are suggested for the nature trails, and they should be covered, but the panels themselves are not designed. It is also proposed to use modern technologies, usable in smart devices.

1. Introduction
The horse-drawn railway was the predecessor of today's railroad, cars and carriages trailed on railroad tracks with horse-drawn horses. These paths originated in the early nineteenth century, all over the world. České Budějovice - Linz railway line originated between 1825 and 1842 when we also count on the extension of the runway. This track was one of the first major logistics operations on the territory of the Czech Republic, along with the Schwarzenberg ditch. [1]

This track was mainly used for the transport of salt from today's Austria to Bohemia, later used for passenger transport or transport of various raw materials and products. In České Budějovice the salt was transported on ships sailing along the Vltava River to Prague, possibly along the Elbe. The track thus replaced a part of the prehistoric trade route, from the Mediterranean Sea, across Europe to the Baltic Sea. Earlier journeys have not changed since prehistory until this time, and have taken the form of a driveway for wagons. The horsepower track was a breakthrough in traffic on this route. Horse-drawn railway České Budějovice - Linz was the only materialization of the idea, centuries old, of building the
Dunaj-Vltava (Danube-Moldau) interconnection, which is still talked about and its viable solutions are being sought, [2]. The aim of the thesis is to propose measures to increase tourism on these track debris. The main problem associated with this national cultural monument is its neglect and practically zero use. Despite the earlier efforts of city councils, regional prosecution offices, or various organizations, they have not done much to save and raise their visibility.

2. Monitoring the current state of the track in Holkov to the border with Austria

The analysis of the problem is mainly based on the survey carried out in 2016. The following list (Table 1) contains relics of this part of horse-drawn railway in the territory of the Czech Republic.

| No. | Recipient/Object Name | Area | Region          |
|-----|-----------------------|------|-----------------|
| 1   | Change-over station Holkov | Holkov | Holkov          |
| 2   | Stables in Holkov     | Holkov | Holkov          |
| 3   | Incision in terrain   | Holkov | Holkov          |
| 4   | Building for storage of vehicles | Holkov | Holkov          |
| 5   | Raised construction in terrain with arched bridge and incision | Holkov | Holkov          |
| 6   | Raised construction in terrain with arched bridge and incision | Velešín | Velešín         |
| 7   | A section with a continuous occurrence of boundary stones | Chodeč - Zvíkov | Chodeč - Zvíkov |
| 8   | Guard house at Netětice | Chodeč - Zvíkov | Chodeč - Zvíkov |
| 9   | Raised construction in terrain with vaulted passage (Výheň) | Dlouhá | Dlouhá          |
| 10  | Raised construction in terrain with arched bridge (Kaplice station) | Střítež u Kaplice | Střítež u Kaplice |
| 11  | Raised construction in terrain with the passage and the rest of the bridge pillar | Žďár u Kaplice | Žďár u Kaplice |
| 12  | Raised construction in terrain with stone walls | Stradov u Kaplice | Stradov u Kaplice |
| 13  | Change-over station Bujanov | Suchdol u Bujanova | Suchdol u Bujanova |
| 14  | Raised construction in terrain | Suchdol u Bujanova | Suchdol u Bujanova |
| 15  | Raised c. in t., incisions, the remains of the bridge and the guard house | Hněvkov | Hněvkov         |
| 16  | Track section with raised constructions in terrain, incisions, bridges and passes | Dolní Dvořiště | Dolní Dvořiště |
| 17  | Raised construction in terrain with the remains of the two bridges and incision | Trojany | Trojany        |
| 18  | Incision and raised construction in terrain in the former border zone | Jenín | Jenín          |
| 19  | Monuments of horse-drawn railway in the former border zone | Jenín | Jenín          |
| 20  | Raised construction in terrain with vaulted passage | Jenín | Jenín          |
| 21  | Raised construction in terrain, incisions, bridges and remains of the guard house | Jenín | Jenín          |
| 22  | Incision, raised construction in terrain and border bridge | Jenín | Jenín          |

The description of the relics of the track is based on the aforementioned field survey and the written sources of both the earlier surveys and the other paths literature.

The first bigger building, on this part of the runway, from České Budějovice, is change-over station Holkov (1). It is a very interesting building, unfortunately in poor technical condition. This transfer station was the first one from České Budějovice and, unlike the others, it was placed in a previously built building. This building, built in the 17th century, served as a coaching inn before rebuilding. The building is divided into three parallel, ground-level tracts with triangular shields and new saddle roofs covered with double bobbins. The central tract has access to both sides. The object is not currently being used.

Right next to this building there are stables on Holkov (2), which are unfortunately in the same condition as the overfill station. No origin is known for this object, but it is estimated that it was built after the rebuilding station had been rebuilt. This is a ground-floor rectangular building with a saddle roof. The object is also not used. Further along the track there is incision in the terrain (3), which is overgrown with ravishing green. Interesting is the next building for storage of vehicles (4), but
unfortunately not from a historical point of view. According to PhDr. Ivo Hajn, an object named,, Kočárovna” (building for storage of vehicles), is originally only a guard house, which was modified and extended after the cancellation of the track. Today there is a restaurant and a guest house. After this construction, there is a raised construction in terrain with arched bridge and incision (5), which is very beautiful stretch of track. Most are in good condition and very interesting. Opposite this section, there is another one over today's railway a raised construction in terrain with arched bridge and incision (6), which is unfortunately no longer in such good condition.

A section with a continuous occurrence of boundary stones (7) continues several kms behind the previous relay. Border stones are located just around the current railway line. At the intersection crossing of the railway and E55 there is a guard house near Netřebice (8), which is in good condition. It is a ground-floor rectangular building with an annex. It has a half-roofed roof, covered with red eternity socks. Today the house is used for private recreation. Further along the runway in the village Vyheň, near the railway a raised construction in terrain with vaulted passage (9). This is a very bad relic. Just like the previous relic, it is a raised construction in terrain with arched bridge (10) at the chapel station, badly visible. Next is a raised construction in terrain with the passage and the rest of the bridge pillar (11) is located close to the current railway in the fields near Blažek. The relic of the pillar is poorly accessible and there is not much left. Raised construction in terrain with stone walls (12) around the road from Kaplice to Omlenička is even worse than the previous relic. The stone core is almost unimaginable.

The second and last change-over station on our territory, located in Bujanov (13) serves today as a primary school. The building was built directly for horse-drawn tracks, most probably in 1837, when an older wooden station burned out in 1826. It is a two-story building on a rectangular ground plan with a ground floor annex. The building has a folding roof with cement tiles.

Raised construction in terrain (14) is located near the village of Suchdol, and unfortunately it is almost unidentifiable. Raised constructions in terrain, incisions, the remains of the bridge and the guard house at Bujanov (15) forming a continuous section, located a few hundred meters behind the previous hill, forms a curve of the track, outside today's railroad. The arc of today's railroad is more direct. Buildings are overgrown, partially broken but well identifiable. Track section with raised constructions in terrain, incisions, bridges and passes (16), another hundreds of meters behind the previous section, also forms a curved curve of the track, beyond today's railroad. The arc was bypassing a ridge that was dug during the construction of today's railroads. Buildings are overgrown, partially broken but well identifiable.

The next section is near Rybník station and forms it a raised construction in terrain with the remains of the two bridges and incision (17). In front of the village of Pond, today's railroad departs from the original route, thus preserving whole sections of horse-drawn railway. The stretch of the track continues through objects in the former border zone. Create it incision and raised construction in terrain (18); a raised construction in terrain (19); a raised construction in terrain with vaulted passage (20); a raised constructions in terrain, incisions, bridges and remains of the guard house (21) and incision, a raised construction construction in terrain and border bridge (22). Again, these are well-identifiable constructions, except for a small stretch of track at Šibenický hill. This long stretch continues on to Austria. Remnants of horse-drawn tracks are spread in some places along the original route at great distances, making it uncomfortable or impossible to see a larger number of these relics at one time. In other places, sites with a higher density of relics can be identified. There is an educational trail in Jenín, so we do not continue to visit it. Therefore, the following two locations are considered for tourist use.

2.1. Location Holkov, Velešín

The location around Holkov and Velešín is very interesting with many relics on a small area. You can include these six relict list items in this site, with 5 and 6 containing several objects.

1 Change-over station Holkov
2 Stables in Holkov
3 Raised in construction in terrain
4 Building for storage of vehicles
5 Raised in construction in terrain with vaulted bridge and incisions
6 Raised in construction in terrain with vaulted bridge and incisions

Part of this locality is the educational trail of the village Velešín.

2.2. Location Trojany
This locality is the most interesting part of the remains of the track, mainly due to the fact that the railroad runs in a different route than the horse-drawn railway. The section includes the following structures:
15 Raised constructions in terrain, incisions, the remains of the bridge and the guard house at Bujanov
16 Track sections with raised constructions in terrain, incisions, bridges and passes

3. Solution suggestions
From the previous chapter there are two sites, where there are more relics on a relatively small area. These sites are suitable for designing measures to boost tourism.

3.1. Location Holkov, Velešín
The proposed horse-drawn railway near Velešín comes from the car park near the building for storage of vehicles. Part of the nature trail follows the embankment and notch of the original route. The trail is circular and returns to the park. There are six relics on the trail. On the proposed 3.2 km long trail, six stops are proposed, the first on the car park and the remaining five on the site of preserved relics of the monument. The first stop (labelled A) informs about the horse-drawn railway in general. Stop B to F then tell you about the specific relics they are in. The educational trail can be seen in Figure 1.

![Figure 1. Map of education path Holkov-Velešín](image)
The marking of the nature trail is designed in a classic way, with special marking placed according to the rules of the Czech Tourist Club (KČT). Parking is possible on the existing car park at the starting point of the trail. Several segments need to get rid of racing green. Culvert at stop C is about 1.8 m tall, pass by it, but it is necessary to draw the water in the middle so that it runs on the edge with a dry leg.

The map shows that the trail between stops D and E runs across the road. At this point, measures need to be taken to secure the movement of tourists from one side of the road to another. This can be done in two ways. The first way is to make a transition, with or without light signalling. This solution is cheaper but less secure. A more secure solution would be to build a wooden pedestrian footbridge designed to be able to carry strollers or bicycles. An example of a footbridge is shown in Figure 2.

![Visualization of an example of a wooden footbridge](image)

**Figure 2.** Visualization of an example of a wooden footbridge

Another problem on this educational path that needs to be addressed is the crossing of the nature trail and the railroad at stop C. In this place is a passage flowing through the creek. Culvert is tall enough and wide for the passage of a person, but it may be claustrophobic.

When used for the trail of a nature trail, it would have to be edited. At the bottom, place a footbridge beneath which a stream will run, or run water, for example, a rig, so that a tourist can walk through a dry leg. Culvert can be seen in Figure 3.

![Culvert in the current railway at the horse-drawn railway](image)

**Figure 3.** Culvert in the current railway at the horse-drawn railway
3.2. Location Trojany

The proposed horse-drawn railroad trail around the village of Trojany is largely guided along the original track of the horse-drawn track, thanks to two curves curved in a different way than the rail is curved today. On this 6 km long route, ten stops are proposed, one at the beginning, eight on the site of preserved monuments and one in the village Trojany. The map of the educational trail can be seen in Figure 4. The trail marking is designed with a special mark, green sloping stripe on a white field, according to the rules of the Czech Tourists Club. Parking is possible on the existing car park at the starting point of the trail.

![Figure 4. Map of education path Trojany](image)

Several segments need to get rid of racing green. The embankment behind the E stop is located behind the fence. The dam occupies the body of the embankment even though it belongs to the state, while the surrounding plots on which the enclosure continues is private. After the embankment the Excursion Route from Bujanov, which is also interrupted by this fence. Despite, bridge pillars could be built. See Figure 5.

![Figure 5. Example of a bridgeboard](image)

3.3. Visualizing proposed sites with modern technology

In addition to a nature trail or hiking trail, sites can also be seen through modern technologies in smart mobile phones. The so-called Geocaching and QR code are considered.
3.3.1. Geocaching. Geocaching is a game on the edge of sport and tourism, which consists of using the GPS navigation system to find a hidden object called a cache known only for its geographical coordinates. Searching for common GPS receivers. Geocaching man is often referred to as geocacher. [3] This is a game whose purpose is to place caches on interesting places, which are mostly not visited by tourists. On the internet, in the so-called list, cassette description, you can find information about a particular place.

Geocaching is therefore a good way to increase tourism on horse-drawn tracks. It is worth mentioning that the Czech Republic is one of the countries with the highest number of caches and this game is very popular here.

A smart visitor to find relics is a smart mobile phone or tablet with a GPS module. To do this, you need to install one of the Geocaching applications, or just copy the coordinate cache coordinates.

3.3.2. QR code. QR code (abbreviation for Quick Response Code) [ISO06] is a two-dimensional barcode that encodes information. It is now popular and widely used owing to its low cost of creation, large data storage capacity, and instant readability. Smartphone users can easily obtain decoded information using built-in cameras with QR code readers to read the QR codes in any broadcasting media, including magazines and monitors. The QR code has also become a popular tool for advertising by companies or marketing of brands, as it enables customers to access websites more easily. It therefore permits quick and effortless access to information. [4]

Like Geocaching, the QR Code is designed for modern technology and can be used to increase tourism on horseback tracks. Any track relics could be placed with a QR code tag that would include a link to the internet relay stories. This solution requires smart access to the Internet, which is not a problem today. Another possible solution is to place text in QR code, preferably brief information about a particular recipe. In this case, Internet access is not needed, but the length of the text is limited and cannot be changed.

4. Conclusions

When examining the condition and use of relics and objects of the Czech part of the České Budějovice - Linz line of horse-drawn railway, the assumption of very little use for tourism was confirmed. Relics are mostly surrounded by racing green and do not lead to any marked trails. The relics dilapidate and are neglected. An exception is only a few buildings on the territory of České Budějovice.

The main question of the work, finding the possibility of using a part of the track and the visibility of this monument for tourists, proved to be possible. In the course of the research, the relics in the Holkov section - the border with Austria, located close to each other, were classified into two localities. These locations are: Holkov, Velešín and Trojany. Locations are more interesting for visitors, because they offer several objects close together, which can be easier to visit. Some objects are far apart, so they were not included in the locations.

Work in these localities suggests educational trails on horse-drawn tracks, including measures necessary for the operation and movement of tourists such as bridgeboards or overpasses. In addition to the above, he proposes the use of modern technologies, usable in smart devices. This will be especially interesting for the younger generation who cannot get around without smartphones or tablets. Today, most of the population in the Czech Republic has these devices and therefore these technologies are not designed for young people. In this work is proposed the use of Geocaching and QR codes.

The work therefore suggests the possibility of using the remains of the track and should serve as a springboard for further efforts to protect, maintain and use the monument.

References
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