

# Slovak Republic: Catching-up Regions Initiative 4

## Gemer Trail – Taking It Forward

December 2023



**WORLD BANK GROUP**



**KOŠICKÝ  
SAMOSPRÁVNY  
KRAJ**



**European  
Commission**



**MINISTRY  
OF INVESTMENTS, REGIONAL DEVELOPMENT  
AND INFORMATIZATION  
OF THE SLOVAK REPUBLIC**

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## Acknowledgments

This report was prepared by a World Bank Group team in close coordination and collaboration with a Košice Self-Governing Region (KSK) team and a group of international and local experts.

The team extends its appreciation to the executive, technical, and administrative staff of KSK, including Ľubomír Gerda, Jana Jačišinová, Viera Štupáková, Barbora Kováčová, and Martin Pukančík for their commitment, dedication, and contributions to the preparation process.

Special thanks go to all the international experts who directly contributed their expertise to shaping this report, including Tengiz Gogotishvili (World Bank Senior Urban Development Specialist), Václav Hochmuth (Architect), Lukáš Szöllös (Cycling Expert), Vladimír Benč (Consultant), and Veronika Zimanová (Consultant). The team extends its appreciation to Ellen Hamilton (World Bank Lead Urban Specialist) for her overarching guidance in the process.

The team is grateful to the members European Commission CURI team, including Pascal Boijmans, Eva Wenigová, Katarína Prokopič, Andrej Mikyška, as well as to the members of the Ministry of Investment, Regional Development and Informatization of the Slovak Republic team, namely Peter Balík, Dominika Forgáčová, Ján Stano, and Karol Schmuck, for their contributions in the process, and their comments and feedback pertaining to the report and the conclusions provided therein.

The team is grateful to the mayors and council members of local governments in the Rožňava District and all other stakeholders for the support they provided during consultative meetings and their contributions to the development process.

## Disclaimer

This report has been developed through collaboration between the Košice Self-Governing Region, the Government of Slovakia and the World Bank.

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The report was prepared in December 2023.

## Introduction

This report, ***Gemer Trail: Taking it Forward***, is a follow-up study after the analytical work that was conducted by the World Bank and Slovak experts for the Rožňava District in the Upper Gemer area of the Košice Self-Governing Region (KSK) of Slovakia. The tourism sector situational analysis report for the Upper Gemer area has identified several factors that hindered sector development. Out of the six identified factors, addressing the needs of mobility, including cycling, appeared to be a priority. As a result, a team of experts from KSK, the World Bank, the local municipalities, with the participation of the private sector, have identified the Gemer Trail with its length of 60 kilometers as a pilot investment that can start addressing connectivity issues to attract a higher number of tourists from the domestic market and Hungary, leverage the district's tourism potential, and become the key driver for local tourism development. The Gemer Trail will allow cyclists to explore the beautiful landscapes of the Upper Gemer area and serve as an ideal destination for cyclists of all levels. With its charming villages and challenging mountainous terrain, Rožňava District has the potential to offer a wide range of cycling trails to suit every preference. With its stunning scenery and diverse nature, it's no wonder that cycling enthusiasts will flock to this region to explore its natural beauty on two wheels. The trail can take riders through picturesque villages such as Betliar and Krásnohorské Podhradie. This trail can offer a leisurely ride, allowing cyclists to immerse themselves in the charming architecture of Krásna Hôrka Castle and the villages around and in the local culture. For more adventurous cyclists, mountain trails can provide a thrilling experience with steep climbs and breathtaking views of the surrounding mountains. Diverse range of cycling trails can cater to all types of cyclists, ensuring an exciting and enjoyable experience for everyone. Whether a beginner looking for a relaxing ride or an experienced cyclist seeking an adrenaline rush, the Rožňava District can have something to offer everyone. The well-maintained trails merged as a comprehensive cycling network with small infrastructure along the route, with its stunning natural beauty and outstanding architecture, can make it a perfect destination for cycling enthusiasts to grab their bikes and get ready to explore the wonders of Rožňava District on two wheels!

This report has been designed as a pilot for the implementation of the Gemer Trail, which is fully aligned with all of Kosice's strategic documents for tourism and cycling development at the local and regional levels. The list of the strategic documents and their brief overview are offered in the situational analysis report.

For the preparation of this report, a team of experts from KSK, the World Bank, and the local public and private sectors have explored various alternatives for the cycling trail alignment. A series of consultative meetings have been held to solicit feedback on the proposed alignment from the local communities. Factors like the anticipated environmental impact, land ownership and other social elements, the value for the money, and others were all considered during the preparatory work. In addition, several technical visits and validation trips have been conducted to inspect the proposed alignment and select the best possible option.

This report is of a technical nature, offering a detailed overview of the trail alignment broken into three sections, the types of interventions anticipated for each, consideration and design standards for the project preparation stage to promote adequate services and safety for the riders, the anticipated land resettlement, and others.

This report has been designed as a feasibility study document to allow the KSK authorities through their project team to take it forward into the project documentation preparation and implementation.

# GEMER TRAIL – Route Description

Figure 1: The Gemer Trail and tourist sites



## Section 1: Krásnohorské Podhradie – Rožňava – Betliar



The first section of the proposed Gemer Trail with the estimated length of 14.3 km will connect the district town of Rožňava with the locations attractive to tourists in the neighboring municipalities of Betliar and Krásnohorské Podhradie. The town and both municipalities can serve as an ideal starting or ending point for cycling trips along the Gemer Trail. The easternmost point of the proposed cycle route is located in Krásnohorské Podhradie near the Andrásy Mausoleum (the site also includes a car parking, but with limited capacity). It continues gently downhill to the municipality itself with the possibility of turning off to go to Krásna Hôrka Castle through the local roads. The route continues over a terrain ridge to the town of Rožňava. The passage through the town starts on its eastern side at the monument to Pope John Paul II (the starting point for the Mine Trails mountain bike single-trails), crosses a field (with the planned construction of family houses, where the cycle route will form part of the transport network of the area) and passes through the outskirts of the Juh ('South') neighborhood and through local roads - Rumunská and Joviská streets) continues to the town center. From this point it continues south-west along the Rožňavský potok stream to the crossroads of cycle routes on Šafárikova street with the possibility to continue south along the river Slaná (towards Plešivec, Gemerská Panica, Domic) or to the north. The northern route continues in the direction of Betliar, first along Štefánikova street and later comes out on the dike of the river Slaná which leads to the turn-off to the Nádabula district of Rožňava. After crossing the railway track, the route continues along the local roads to the new cycle path leading through Nižná Maša (historical objects of industrial architecture from the 19th century) to the bridge over the Betliarsky potok stream. Following the existing road, the Gemer trail comes to Železničná street in the municipality of Betliar, where the route is proposed to end. Going forward, the route can continue along the railway and the river Slaná towards Dobšiná.

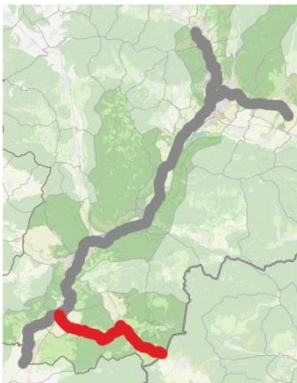
## Section 2: Rožňava – Gemerská Panica



The longest proposed section of the Gemer Trail with the length of 30.5 kilometers runs south from the district town of Rožňava along the river Slaná up to the border with the Banská Bystrica Self-Governing Region. The whole section is on a flat terrain, which makes it ideal for easy cycling trips. The route starts at the crossroads of the routes leading to the municipalities of Betliar and Krásnohorské Podhradie on Šafárikova street in Rožňava. After crossing the first class road and the railway (the route will also include a safe passage through these arterial thoroughfares), it continues southwest along the Rožňava stream to the dike of the Slaná river. The route follows the crest of the dike up to the border of the Brzotín municipality's built-up area where it crosses the local road leading through the municipality up to the junction with I/16 road. After crossing the road, it continues along the existing roads used to a limited extent by motor vehicles as well to access recreational and technical facilities located here. The road surface will be changed in its entirety to the paved cover allowing the riders and drivers to share the space. Through the Hámor locality it passes into the cadastral territory of the Slavec municipality, where the route reaches the river dike again from the turn leading to the center of the municipality. On the northern side of the river, the route continues to the municipality of Plešivec (with a turn-off to the area of the Gombasecká Cave – a natural monument listed on the UNESCO World Heritage List and the reconstructed ruins of the Pavlínov Monastery). In Plešivec, the cycle trail runs parallel to the I/16 road and then returns to the Slaná embankment at the traffic junction to Štítnik (the Gothic Route and the Ochtinská Aragonite Cave). From this point, the Gemer Trail continues along the dike to the southern boundary of the

municipality of Gemerská Panica and also the boundary of the BBSK. Due the complex land ownership situation in the area, the trail alternates between the northern and southern banks of the river (cadastral area of Bohúňovo). In the municipality of Čoltovo, the route also enters the northern edge of the municipality, where another cycling crossroad is located. It continues east to the municipality of Dlhá Ves, the Domica Cave up to the border with Hungary (Gemer trail – Section 03). In Čoltov, the route crosses the railway (there is no railway crossing at this point and it would therefore be suitable to build the route under the railway bridge) and the I/16 road and then continues along the southern embankment of the Slaná River through the cadastral territory of the municipalities of Bretka and Gemerská Panica to the planned connection of the cycling trail on the territory of the Banská Bystrica region (the municipality of Gemer and then the town of Tornaľa).

### Section 3: Čoltovo – Domica/Aggtelek



This proposed section, with the length of 11.3 km, connects the municipality of Čoltovo, situated in the valley of the Slaná river, with the state border with Hungary. It is the shortest section of the planned route, but it has the highest elevation difference (the elevation difference on the Čoltovo – Dlhá Ves section is 152 m). It starts in the municipality of Čoltovo by turning off from the section between Gemerská Panica and Plešivec. The route continues south-east through the municipality of Čoltovo. Next to a farm, it starts to climb up the ridge and then descends lightly into the valley of the Sograd' stream. Alongside the stream, it comes to a climb along the northern boundary of the forest with views of the north-west. At the top of the climb (350 meters above sea level), at the crossing point with the green hiking trail, there is a lookout point with long-distance views of the Slovak Karst, the Slovak Ore Mountains, and, at times of good visibility, also the High Tatras. The Gemer Trail then continues through the forest together with the green hiking trail, and after a flat section on the ridge, it descends to the municipality of Dlhá Ves. Through the municipality, the trail follows the local road and then connects to a separate cycle path along the II/587 road. The cycle path ends at the entrance area of the Domica Cave, the natural monument listed on the UNESCO World Heritage List. The route continues along the road down to the state border. After the border, travellers can find the entrance to the Baradla Cave and the Hungarian Aggtelek National Park.

## GEMER TRAIL – Technical solution

Due to the diverse terrain, land ownership situation (see below), and degree of urbanization in the areas where the Gemer Trail is proposed to be built, the construction of a continuous network of cycle paths requires the use of several types of roads suitable for the movement of cyclists. The range of possible solutions for specific solutions is wide, from building new routes designed exclusively for cyclist movement to the use of existing local roads in sections with low traffic intensity.

The design and technical parameters of the proposed cycling trail shall follow the guidelines set by the technical parameters presented in tables 1 and 2. The designer must ensure they are fully met with respect to the different sections of the trail—whether for mountain cyclists requiring a soil cover or for the increased connectivity and mobility provided by a hard cover (road type). Depending on the purpose of the trail, its topographical conditions, and the terrain, the design parameters may vary and be further adjusted.

Table 1: Trail Design Technical Parameters for Mountain Biking

Criteria for designing and assessing the route for cyclists		Category of cycling paths		
		Grade 1 Recreational	Grade 2 Sport	Grade 3 Expert
Planned route width in cm	One-way path	90–150	60–120	45–80
	Two-way path	180–240	150–220	Only in case of setting up detours
Surface treatment	Type	Constant, hard road surface	Imported material and overall stabilized route. Soft road sections are very rare or spilled with fine gravel of 0–22 mm.	Original material, occasionally weighed with other soils or gravel. There may be soft or gravel sections of fraction 16–32 mm.
	Barriers	-	Smooth road with minimal barriers, max. 10 cm high	Smooth road with barriers that do not exceed 20 cm
Longitudinal slope*	Planned range of more than 90% of the route	<5%	<8%	<10%
	Short max. climbing up to a length of 60 m	8%	10%	15%
	Maximum climb total **	<3% of trail	<3% of trail	<5% of trail
Transverse slope	Planned range in direct	2–3%	2–5%	2–5%
Transit clearance	Width (cm)	45–60 cleared from the edges of the route	30–45 cleared from the edges of the route	30–45 cleared from the edges of the route
	Min. high (cm)	270	250	200
Turns	Min. radius of directional curve	14	5	0

\* Slope variations depend on soil type, hydrological conditions, degree of exploitation, and other factors contributing to surface stability and potential erosion. Given these impacts, careful consideration should be given to how larger slope ratios can damage the route and cause further erosion.

\*\* Maximum slopes on the route shows how many sections of the entire length of the route are within 5% (+/-) of the maximum slope on the route.

Table 2: Trail Design Technical Parameters for Road Biking

Criteria for designing and assessing the route for cyclists		Category of cycling paths		
		Grade 1 Recreational	Grade 2 Sport	Grade 3 Expert
Maximum longitudinal slope	%	6	8	11
Transverse slope	%	2	3.5	5
Minimum road width	m	3	2.5 (2.00)**	2
Surface treatment	-	Hardened*	Hardened*	Hardened*
Min. radius of directional curves	m	30	14	5
Maximum longitudinal unevenness	cm	0,3***	0,5***	0,5***

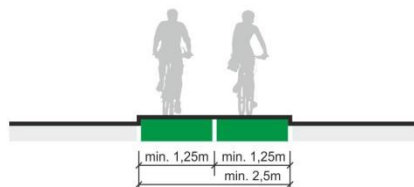
\* According to 2.3.3 Guiding cycle paths in protected areas and sections designated in the skeleton network—maintained surface of gravel or fine gravel 0–22 also suitable for gravel bicycles.

\*\* In justified cases, within the meaning of TP 085. See: [https://www.ssc.sk/files/documents/technicke-predpisy/tp/tp\\_085.pdf](https://www.ssc.sk/files/documents/technicke-predpisy/tp/tp_085.pdf)

\*\*\* For paved cycling roads, measured below 1.00 m in accordance with TP 085.

## Cycle roads designed primarily for cyclists' movement:

### New cycling road – path for cyclists

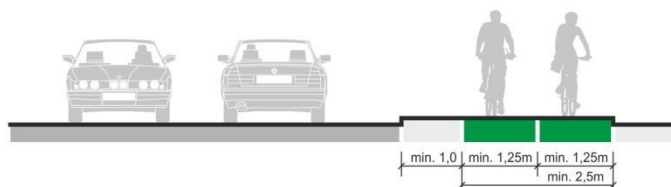


Schematic section of the cycle path – minimum width of the road is 2.5 m (2 m in confined conditions)

Example of implementation – cycle route Trenčín – Nemšová

A cycle path is a surface road reserved by a traffic sign for cycling. It is intended for bicycle traffic only. Car and motorcycle traffic is excluded from it. The minimum width of one lane is 1.25 m, in confined conditions it can be reduced to 1.0 m (the actual width of the road is therefore 2.5 m or 2 m). The surface of the proposed road is paved with asphalt or concrete.

### Cycle path in parallel with a road

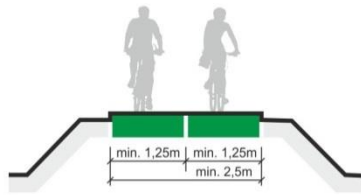


Schematic section of the cycle path – the distance from the road is created by a green belt

Example of implementation - Aquavelo – Bardejov cycle route

This is a cycle path that must meet the parameters outlined above. Its directional alignment shall be parallel to the road along which it is built. It may also be created directly on the road in the form of marked lanes with a separation of at least 0.5 m from the car lane. Due to the intensity of traffic or the nature of the proposed route (intended for use by families with children and also beginner cyclists), it is preferable to separate the path from the road with a physical barrier, for example, a green belt.

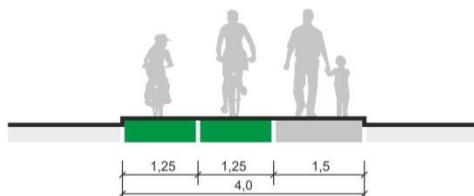
## Paved surface on the crest of the Slaná river embankment



Schematic section of the cycle path on the embankment – Example of implementation – Vlára  
the axis of the path is identical to the crest of the embankment

The path for cyclists will be built on the crest of the Slaná river embankment. The width of the path will be adapted to the width of the crest of the embankment – there should be no construction interventions that would reduce its height or cause disruption of the embankment. In case of the necessity to overcome a greater height difference, the access to the path on the embankment will be solved by means of a ramp (which must meet the requirements for maximum slope). In areas of increased risk (steep gradient of the embankment body, culverts, etc.), a guardrail will be installed at the edges of the cycle path.

## Path for cyclists and pedestrians



Schematic section of the cycle path and pedestrians – the width of the footpath is at least 1.5 m  
Example of implementation – cycle route Trenčín – Nové Mesto nad Váhom

In the town of Rožňava, the proposed path for cyclists also includes a pedestrian walkway. This solution may take the form of:

- a separate cycle path and pedestrian footpath which are adjacent to each other, or with a gap between the cycle path and the pedestrian footpath of not more than 0.75 m;
- a shared path for cyclists and pedestrians. In the case of a shared path for cyclists and pedestrians, it is assumed that the speeds of the users will be the same or similar (speed difference of no more than 10 km/h).

The specific solution will be determined in more detailed technical documentation after verification of the spatial conditions as well as after incorporation of the comments from the town of Rožňava.

## Cycle routes in shared traffic space with motor vehicles.

### Paved surface on an existing unpaved road



Schematic section – the width of the road depends on the actual situation in the area



Example of implementation – Vážska cycle route

A road proposed along an existing ‘special purpose’ road with an unpaved surface (or paved surface eroded to more than 75 percent). The proposed road will be based on the width of the existing road, but should meet the minimum width parameters for two lanes for cyclists (2 – 2.5 m). Traffic on such a road will be restricted to motor vehicles for vehicular access.

### Repair of an existing paved road



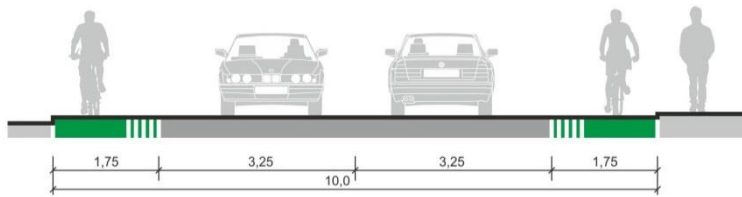
Schematic section – the width of the road depends on the actual situation in the area



Example of implementation – cycle route Trenčín – Nové Mesto nad Váhom

This is the repair of the surface of an existing ‘special purpose’ road. There will be no widening of the road or change in its routing, only the reconstruction of its surface. Warnings of cyclist movement will be signalled by traffic signs, motorised traffic will be restricted to vehicular access where justified.

## Route along an existing road



Schematic section in the case of the creation of cycle lanes at the edges of the road

Example of implementation – Bardejov cycle route

If the width parameters allow it, the cyclists' movement will be guided in separate lanes on the edges of the road, otherwise the cyclists' movement will be indicated by traffic signs. These roads are proposed on the Gemer trail only in places with low traffic intensity (these are mainly local roads in the built-up areas of municipalities with limited maximum speed, or at the end positions of lower-class roads).

On the route of the Gemer Trail it is also necessary to overcome several linear barriers – these are watercourses (the Slaná river, its tributaries, or irrigation canals), roads for motor vehicles (from class I roads to local roads) and the railway line. Local point measures are used to overcome them.

### Bridges

All sections of the proposed route include watercourses – from the Slaná river to smaller streams and irrigation canals that feed into it. Existing bridges can be used in some cases, and their widening is also possible. In some cases, new bridges will have to be built. Their width and load capacity will be adapted to cycling and pedestrian traffic; their use by motor vehicles is not envisaged. The specific design solution can only be determined at a later stage during the preparation of the project documentation.

The preliminary assessment has shown that 10 bridges will be required to be built or upgraded. They will range from small crossings of local streams and irrigation canals (7 smaller bridges in total) to bigger cycling bridges crossing the river Slaná (3 bridges – 1 reconstruction of the existing bridge and 2 new constructions). There is an existing bridge in Rožňava over River Slana, which can be adapted for the needs of the cyclists by the walkway section reconstruction. New cycling bridges are required in the villages of Bohúňovo and Čoltovo, as the existing road bridges of the road I/16 cannot be used.

### Crossing the road

The route of the Gemer Trail crosses several roads, from the busiest road I/16, on which the long-distance traffic runs on the Tornaľa – Rožňava route, to local roads in built-up areas of municipalities and towns. In total, 16 crossings shall be arranged. Out of this, 6 crossings on the first class road I/16, 2 crossings of the third class road (III/3009 near Brzotín and III/2822 near Bretka), and 9 crossings of the local roads including 6 road crossing located in the town of Rožňava.

The primary criterion for the design of the crossing of these roads is safety. The construction of out-of-level crossings (underpasses, overpasses) is not foreseen. Existing road crossings will be partly used, but they must be adapted for cyclists. In some cases, crossing the road on a bicycle may only be possible by walking the bicycle after dismounting. Otherwise, the crossing of the road and the cycle path can be dealt with in three ways:

- a separate crossing for cyclists;
- a cyclist crossing adjacent to a pedestrian crossing;
- a cyclist crossing next to a pedestrian crossing.

The traffic at the crossing points needs to be slowed down by technical solutions. Optical (vertical and horizontal road signs, reflective signs, flashing spot lights and others) and physical (road narrowing, gradients, profile barriers and others) features can be used to slow cyclists down on the cycle paths. However, individual deceleration features must be marked and visible to the cyclist from a sufficient distance (even at night).

The specific technical solution of the road crossing will be determined only after the road administrator's statement and approval of the concepts by the relevant authorities - for first class roads the administrator is the Slovak Road Administration; for the second- and third-class category roads the administrator is the Košice Self-Governing Region; for roads of lower categories the respective municipalities or the owners of the road itself bear the responsibility. In the case of service roads near watercourses, Slovak Water Management Enterprise hold the responsibility over the road.

### Crossing the railway

Crossing train tracks can be very dangerous for cyclist due various safety reasons. If a cyclist is travelling at a high speed and does not anticipate an obstacle (in this case the rail track), this can lead to fatal consequences. In the case of a cycling path crossing a rail track, it is necessary to maintain a minimum 60° crossing between them. There are four railroad crossings along the Gemer Trail.

In the Nádabule town district of Rožňava, the proposed route crosses the railway line No. 167 Rožňava – Dobšiná. Regular passenger transport on this line was terminated in 2003, and currently it is only used sporadically during the summer months, or for freight transport needs. It is proposed to use the existing crossing over the railway line, with its adaptation for the needs of cyclists and improved safety.

In Rožňava, west of Štefánikova street, the route continues in the direction of Brzotín over the existing railway crossing (line No. 167) with an unpaved surface. The existing crossing over the railway line can be used with adequate adaptation for the needs of cyclists as well as surface modification and improved security.

The railway line No. 160 Zvolen – Košice (still used for regular passenger and freight transport in the south of Slovakia) runs along the entire section along the Slaná river up to Rožňava. The proposed cycle route crosses it in two places:

- A crossing of the railway line on the 'special purpose' road south of the municipality of Brzotín. It is an existing crossing point on a road with an unpaved surface, so its reconstruction and improved safety will be necessary;
- Proposed crossing with the railway line in the municipality of Čoltovo. There is currently no existing crossing here – it would be advisable to consider another type of crossing of the railway line, for example an underpass under the railway bridge over the river Slaná.

## GEMER TRAIL – Land Ownership Status

Considering the length of the trail as well as its routing (through the built-up areas of several municipalities and towns, routing outside the built-up areas through different types of plots), one of the biggest problems in the preparation of the construction is the fragmentation of plots of land and complex land ownership situation.

Individual plots are registered in two registers of the Slovak cadaster. The older one (marked 'E') is based on old land registers (often dating back to the 19th and early 20th centuries) and the original map of the designated area. The new 'C' register came into use in the 1950s with the nationalization of private property. Efforts to return land to its original owners after 1989 have meant that both the E and C registers are now in use. A large part of the plots, especially in cadastral areas where the renewed land registration procedure has already taken place, is now only registered in the new C register, but it is often possible to find a plot of land with an entry in both registers (moreover, in many cases, the numbers of the plots in the E and C registers are different).

Another major problem is the number of owners of individual plots (by inheritance and sale of individual shares, the number of owners is in many cases in the hundreds), including a large number of unknown or deceased owners. The administrator of the shares of unknown owners is the Slovak Land Fund.

For simplicity, the Gemer Trail map considers the following categories of ownership:

- plots owned by 1-5 owners – in this case it is easier to obtain a permit, as only a small number of owners need to be consulted;
- plots with more than 5 owners – problematic plots where a more complex construction permit procedure is required.

Another group is publicly owned plots of land. They can also be divided into several subgroups:

- plots of land owned by towns and municipalities.
- plots owned by the self-governing region (mostly plots under second and third class roads – often, however, the actual location of the road does not correspond to the location of the plot).
- plots owned by the state or state companies (e. g., plots of land under the embankment of the Slaná river owned by the Slovak Water Management Enterprise).
- plots administered by the Slovak Land Fund – these plots of land can be transferred to municipalities on the basis of an application and the intention of a planned construction of a public utility building, but the whole process is time-consuming.

The table below summarizes the ownership status and the lengths of the Gemer trail that they apply to:

Table: Gemer trail land ownership

Ownership type	Length
Privately owned plots (1-5 owners)	12 167 m
Privately owned plots (more than 5 owners)	3 992 m
Publicly owned plots	39 888 m

## GEMER TRAIL – Infrastructure and services

The route of the Gemer Trail runs mainly through urbanized areas. The valley of the Slaná River is the main arterial thoroughfare in this part of the Gemer region. The first-class road Košice–Rožňava–Tornaľa as well as the regional railway line run here. The slopes of Slovak Karst National Park are in close proximity. While the proposed route does not directly interfere with the protected area, all the environmental standards and considerations including in the design for small infrastructure shall be adhered to.

The area offers many natural and historical attractions for tourists. There are destinations of national as well as international importance (caves listed in the UNESCO World Heritage List, Krásna Hôrka Castle, and the manor house in Betliar), which attract many tourists, but mostly only for short-day trips.

The Gemer Trail is a link that connects several parts of the region; the main axis is the embankment of the Slaná river, which passes through or is directly adjacent to a number of municipalities as well as the town of Rožňava. Along the route, it is possible to find a number of services for residents and visitors, from accommodation to catering and shopping.

However, what is missing in the area are the services for cyclists (except in the district town of Rožňava, where there is already a cycling community and a network of cycling single trails—the 'Rožňava Mine Trails'—is built above the town) including rest areas or repair services. In light of the expected development of cycling tourism, it will be important to adapt the existing services (overnight accommodation with the possibility of safe bicycle storage, bicycle racks at restaurants and shops, etc.) to the needs of cyclists.

### Rest areas for cyclists

Rest areas are the simplest feature to be located along the entire Gemer Trail. They are proposed to be located at each of the starting points of the route (Gemerská Panica, Domic, Krásnohorské Podhradie and Betliar, as well as at their crossings – Čoltovo and Rožňava) and then at regular intervals along the route. The distance between the rest stops should be no more than 5 kilometers – a length that can be easily covered by a beginner cyclist or a child.

For the location of rest areas, the following shall apply:

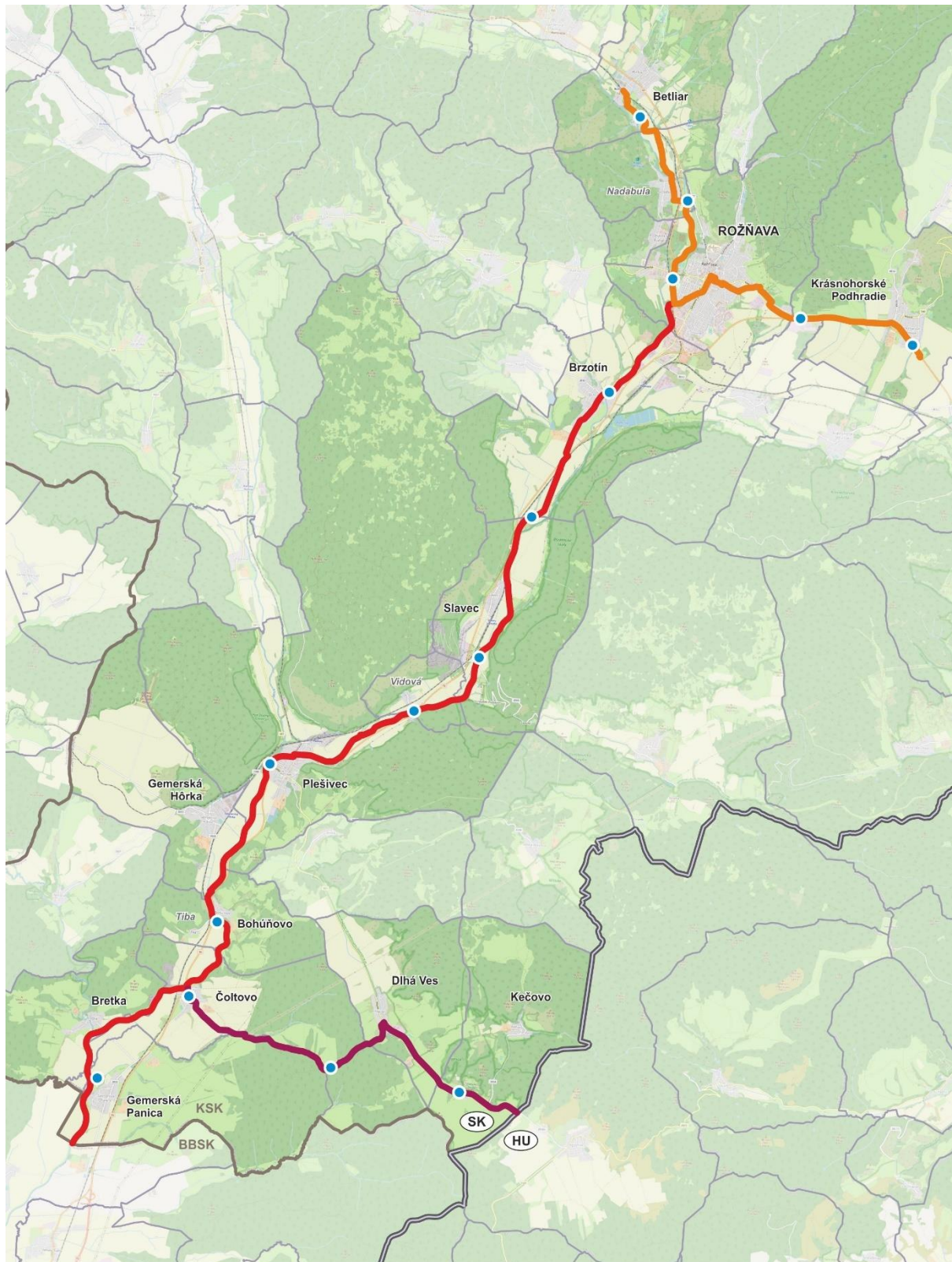
- to ensure regular maintenance and access to utility networks, rest areas should be located in the built-up areas and close to the municipalities;
- in the case of a larger structure, it is necessary to check its placement with the valid land use plan of the municipality;
- the rest areas can be divided into several types, according to their size and facilities (simple rest area, rest area with a service stand, etc.)
- the design of individual rest area should have a common element based on the traditions of the region (nature, 19th century industrial construction, history, etc.), which will help visitors identify their affiliation with the Gemer Trail
- charging stations for e-bikes should also be placed along the route, ideally in locations with the highest visitor traffic and with sufficient distances between each station (it is not necessary to have a very dense network of charging stations due to the distance the e-bike can cover, but their location should be clearly identifiable, including times and distances to reach them if charging is needed)
- the possibility of emergency overnight shelter should be provided in structures located outside municipalities – with the possibility of food preparation (fireplace) and the close

proximity of drinking water. In such a case, it is also necessary to provide maintenance access for regular waste removal;

- consider the layout and location of visitor lavatories, including the use of existing facilities (e.g., cave entrances)
- consider security measures such as surveillance cameras, especially at the locations with enhanced service provision (charging stations, etc.)

15 locations have been identified along the trail that are suitable for the placement of rest areas for cyclists. The detailed maps with the proposed locations of the rest areas are available at KSK. In addition to covering the entire trail at relatively regular distances, the locations of rest stops were also determined by the property relations in the area (land owned by the municipality, by the state or by organizations established by it, are preferred) and the location at key points along the trail.

Figure 2: The Gemer Trail and proposed rest areas



- Gemer Trail - Section 1 - Krásnohorské Podhradie - Rožňava - Betliar
- Gemer Trail - Section 2 - Rožňava - Gemerská Panica
- Gemer Trail - Section 3 - Čoltovo - Domica / Aggtelek
- Gemer Trail - Rest area

0 1 2 3 4 5km

**Segment 01 Krásnohorské Podhradie – Rožňava – Betliar**

#### *Rest area 01 – Krásnohorské Podhradie*

The location for the rest area is on the southeastern edge of the municipality. It is also the first rest area on the Gemer Trail in the direction of Rožňava – it should provide key information, including a complete map and a list of attractions and cycle routes in the area. The location of this rest stop at the outskirts of the municipality allows for easy connection to the electricity supply, so the rest area should also include a charger for electric bikes (a charging station should be part of all Gemer Trail end stops).

The rest area serves as a crossroads of several cycling routes – in addition to the access to the Krásna Hôrka Castle, which lies on the northern edge of the municipality, it is possible to continue the ascent to the Úhorná saddle (with a subsequent continuation to Smolník or southwards to Krásnohorská Dlhá Lúka (the Krásnohorská Cave is a UNESCO natural monument).

#### *Rest area 02 – Breziny*

The rest area is located at the eastern access point of the town of Rožňava. It is a stop situated on the trail, therefore it is only sufficient for placing a simple shelter with seating.

This location can be used as a starting point for the Mine trail – MTB singletracks – the ascent route to the Rákoš hill is located north of the rest area.

#### *Rest area 03 – Rožňava*

The proposed rest area is situated in the western part of the town, near the bridge over the Slaná River on Štítnická street. Here, the route of the Gemer Trail passes alongside the town sports complex (football field, swimming pool, winter stadium) with good parking possibilities. This is one of the key places – Rožňava will serve as a starting point for many visitors. In addition to the shelter, a charging station for electric bicycles should be installed in the rest area.

In addition to information about the Gemer Trail and a map, information about points of interest in the town should be included, together with information about important facilities for cyclists (bike shops, services, accommodation and catering facilities).

#### *Rest area 04 – Nadabula*

The rest area is situated on the embankment of the Slaná River, at the entrance to the Nadabula town district. This is a peripheral part of the town, so the shelter can also serve as a destination for small suburban trips with a stay on the river bank (if the contamination problem can be solved). In addition to a shelter with seating, the rest area should include outdoor seating as well as a fire pit that can be used for barbecuing.

In addition to the proposed Gemer Trail, access to the site is also possible via a bridge over the river with a continuation to Betliarska street on the northern edge of the town (the town observatory and Calvary).

#### *Rest area 05 – Nižná Maša*

This is one of the end stops of the Gemer Trail. The proposed route temporarily ends a little further west at the entrance to the municipality of Betliar. It is planned to continue along the river and railway in the direction of Dobšiná. Due to its location outside the built-up area, it is advisable to locate the charging station for e-bikes directly in the municipality of Betliar, rather than directly on the route. The Betliar Manor House is an important tourist attraction and draws many visitors every year. In the centre of the municipality there are parking areas as well as accommodation and catering facilities – information at the rest area should provide the cyclists with an up-to-date overview.

Nižná Maša – part of the Betliar municipality – with preserved monuments of industrial architecture from the 19th century is located on the other bank of the Slaná River.

## Segment 02 Rožňava – Gemerská Panica

### *Rest area 06 – Brzotín*

A rest area on the northern edge of the municipality. The Gemer Trail route here runs along the existing road, so the rest area must be built at a safe distance from the road to avoid collisions with resting cyclists. It is also advisable to connect the rest area to the local network of footpaths.

*Figure 3: Proposed Rest Area in Brzotín*



The information panel at the rest area should also provide information about the history of the municipality and the preserved cultural monuments in Brzotín – mansions and manor houses. Other interesting sights in the area include the Brzotín Ponds and the Brzotín Rock with a viewpoint to the east of the ponds and the cycle path leading from Brzotín to the Plešivec plateau. Another potential starting point for the Gemer Trail is located near the rest area – the Rožňava railway station (located on the southwestern outskirts of the town).

### *Rest area 07 – Slavec – Hámor*

The rest area is located near a technical and cultural monument – a manor house and a former hammer mill in the local part of the municipality of Slavec – Hámor. It is a rest area with no other route branches (from the west side, it is impossible to cross the railway line and in the east, there is the river Slaná).

In addition to a shelter and covered seating, the rest area should also provide outdoor seating and a fire pit that can be used for barbecuing.

### *Rest area 08 – Gombasek*

Figure 4: Proposed Rest Area in Gombasek



The rest area is located at an important crossroads of the Gemer Trail and the access road to the Gombasek complex (with the possibility of access from the first class road as well as the railway station) and the continuation of the cycle route to the municipality of Silica and the Silica plateau. The most important attraction within the Gombasek complex is the entrance area of the Gombasek Cave – an accessible cave, which is on the UNESCO World Heritage List. There are also the ruins (gradually being repaired) of a medieval Pauline monastery and reconstructed industrial buildings from the 19th century.

The shelter and the paved area will be located on the widened embankment of the Slaná River near the crossing of the Gemer Trail with the III/3009 road. A charging station for e-bikes would preferably be located in the Gombasek complex, where there is better access to a source of electricity and more opportunities to spend time while charging the bike.

#### *Rest area 09 – Vidová*

A small rest area next to the route along the Slaná river between Gombasek and Plešivec. It is located near the Vidová railway station. It is situated on the route, which means that it is only suitable for placing a simple shelter with a seating possibility.

The rest area is located in the narrowest point of the Slaná valley between the slopes of the Plešivecká and Silická plateaus.

#### *Rest area 10 – Plešivec*

The selected site is an area near the football stadium on the northwestern edge of the municipality. It is a junction of roads – it is possible to turn from the Gemer Trail to the roads heading to the valleys of the Slovak Ore Mountains – through the valley of the Muráň River in the direction of Jelšava and Revúca as well as northwards to Štítnik (the Gothic Route) and Ochtiná (Ochtinská Aragonite Cave). There is a cycle route going south towards the Domic Cave (the route leads along the road). In the municipality of Plešivec, there are a number of monuments – the remains of Plešivec Castle, a gothic church, an industrial area from the 19th century and others.

Due to its location, the rest area will be one of the nodal points of the route with many connections. The information panel needs to be expanded to include information on possible cycle trips in the area. The shelter should also include a charging station for e-bikes.

#### *Rest area 11 – Bohúňovo*

A small rest area on the southern outskirts of Bohúňovo (an interesting gothic church with a bell tower is located in the centre of the municipality) on the bank of the Slaná River. A smaller type of rest area – a shelter with seating is sufficient.

#### *Rest area 13 – Gemerská Panica*

An end point of the Gemer Trail near the border with the Banská Bystrica region. The rest area is located on the northwestern edge of the municipality. From the site it is possible to get to the center of the municipality via an unpaved road, where there is a catering facility and a shop (as well as a couple of manor houses). Due to its terminal location, the rest area should include an information panel with a full range of information about the Gemer Trail. A charging station for e-bikes is not located here – it will be available in the neighboring municipality of Čoltovo – see Rest area 12.

North of the rest area is the municipality of Bretka with several natural (the Prielom Muráňa gorge) and historical attractions (museum of local traditions, preserved fortifications from World War II)

### **Segment 03 Čoltovo – Dmica**

#### *Rest area 12 – Čoltovo municipality*

The rest area is located in the center of the Čoltovo municipality in the existing central zone with a park. It is located near the crossing of two Gemer Trail routes (connection to the main route of Gemerská Panica – Rožňava in the direction of the Dmica Cave).

*Figure 5: Proposed rest area in Čoltovo*



The shelter is sufficient – there are already adequate facilities rest. A charging station should be part of the shelter – the first one from the entrance to the territory of the Košice Region in the direction

from Tornaľa. It will also serve for possible recharging of batteries before the ascent in the direction of Dmica.

#### *Rest area 14 – Čoltovo viewpoint*

*Figure 6: The view from the Coltovo Viewpoint*



The only rest area that is located completely outside the urbanized area. It is located on the ridge of the slope between Čoltoo and Dlhá Ves. This is the highest point of the entire route, and it is also the best vantage point directly on the route of the Gemer Trail. When visibility is good, it is possible to see the mountain massifs of the Slovak Karst and the Slovak Ore Mountains to the north, with the peaks of the High Tatras in the background.

The rest area should provide sufficient capacity for resting (it is accessible from both sides of the route only after significant ascent) and possibly also space or shelter with the possibility of overnight accommodation – at least in the summer period.

#### *Rest area 15 – Dmica*

The end rest area should be part of the recreation area (unfortunately rundown) at the entrance to the Dmica Cave (UNESCO Natural Monument). It is the first (or last) rest area near the border with Hungary. Close to the proposed rest area, there is a car park and the entrance area of the cave.

Due to the terminal location, the rest area should also include an information panel with a full range of information about the Gemer Trail – since the location is on the border, the information should also be provided in a foreign language. A charging station for e-bikes will be part of the rest area. Larger outdoor rest spaces are not needed.

Just over the border there is a recreational area of the Hungarian part of the Dmica – Baradla Cave with other accommodation and catering options (it would be suitable to address advertising and signage pointing to the Gemer Trail cycle route in this area as well).

#### *The design proposal for rest areas*

The rest stops shall be located along the cycle path. The bicycle shelter is located on a surfaced area (tiled to allow storm water to drain back into the soil) that is used to safely stop and park bicycles as well as for resting and obtaining information. In addition to the shelter, it is appropriate to place additional outdoor seating, information displays (information panel and, in the case of the town of Rožňava and larger municipalities possibly also a pole for posters) and bicycle racks. If the space allows it, the unsurfaced area around the rest area can also be used as a place to rest – e.g., for a fire pit or a camping site.

The main function of the shelter itself is to protect cyclists from the sun and adverse weather conditions (rain). The partially open construction also allows for entry with a bicycle. The standard internal amenities of the shelter should include a central seating area with a table and an information board with information about the Gemer Trail and the attractions and cycle routes in the area (the information displays should also be linked to online resources – e.g., via a QR code with a link to an app or the Gemer Trail website). Consideration should be given to the installation of a bike service stand with the necessary tools, or a charging station for electric bikes (if a power source is available). The electricity needed for lighting can be generated by solar panels placed on the roof of the shelter.

Figure 7: Technical Parameters for the rest area

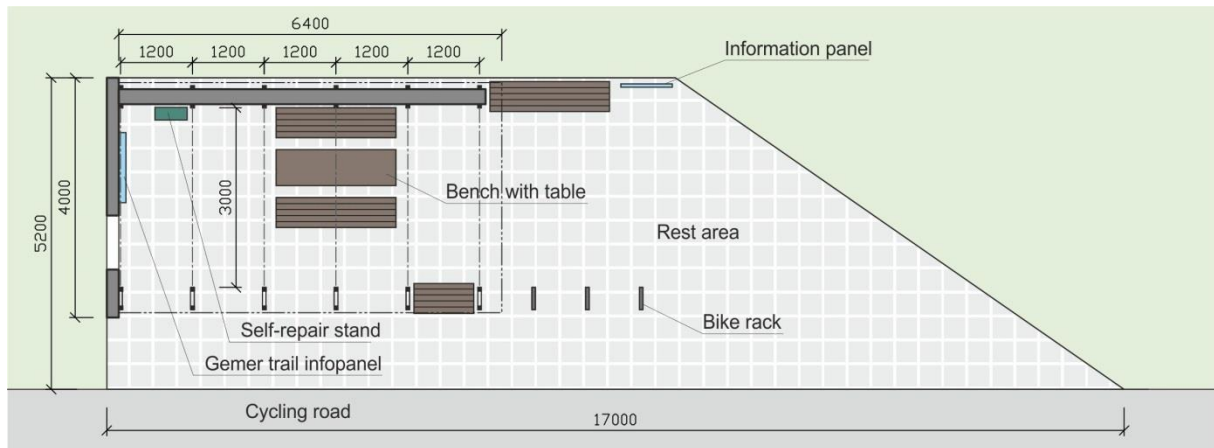


Figure: Location and equipment of a standard shelter with a surface area of 4x6m

The design and material of the shelter draw inspiration from the architecture of industrial and technical buildings that have been preserved in the area to this day. In the past, Gemer was one of the first industrialized regions of the Kingdom of Hungary and many interesting buildings from this period are located along the proposed cycle route (Betliar, Rožňava, Plešivec, Gombasek).

The simple gable roof is supported by a steel structure consisting of standardized truss frames with a pair of columns and a roof truss. The axial spacing of the trusses is 1.2m – the standard size of the shelter is 5 modules (6m) but it can be reduced to a minimum of 4 models (4.8m) or extended if necessary. The width of the free area between the columns is 3m. The roof itself is also steel with a metal support frame anchored to the trusses.

The space between the columns is partially filled (with baked brick or stone). The dominant front facade of the structure is also made of the same material, thus forming a characteristic feature recognizable from a distance. The facade surface is punctuated by a distinctive circular window – at the same time a graphic symbol with the name of the entire project.

The material used for the masonry parts varies depending on the location of the shelter – in the valley of the Slaná River in or near built-up areas, solid baked brick is used as the main material, either left in its natural appearance or plastered with local brick accents. In shelters situated in the natural environment (the turn off towards Domica), the brick is replaced by stone – the front wall is a massive wall made of gabion baskets filled with rocks. The steel frame of the gabion baskets will be used for the growth of creeping plants – the outer walls will thus partly blend in with the surrounding nature.

The minor furnishings that will be part of the rest area can also be designed in a similar material style – steel supporting structure combined partly with brick / stone elements. The horizontal

surfaces of the benches and tables will be made of durable materials (e.g., HPL boards), anchored into the steel structure.

## Information and orientation



In addition to their main purpose, tourist markings and other types of visitor navigation signs serve to guide visitors' behavior and improve the overall experience during their visit. All markings should be uniform in design, in multiple languages and based on the conventions used for marking hiking and cycling routes in Slovakia. It is also necessary to avoid overly dense marking, which is more likely to distract visitors without actually receiving the relevant information.

The information board should offer basic information to the visitors. This can be a map with the entire route displayed on it, main attractions, distances, contact details, local attractions in the immediate area, and relevant QR codes to secure additional information. In addition to the distances, it is also appropriate to give indicative journey times.

More detailed information should be provided at the entry points of the Gemer Trail or urban centers such as the town of Rožňava.

Visitor and information centers can provide an important management function of the trail, including overseeing the maintenance and management of the entire route. They also serve to collect feedback from visitors—information that can be used to improve the service as well as to oversee the services provided.

### Services for cyclists

As the number of cyclists increases, the pressure on services specifically targeted at this group of tourists will also increase. At present, there are two bicycle shops and two service shops located in the town of Rožňava. There are no bicycle rental shops located in the town, however, two electric bicycle rental shops are located in Krásnohorská Dlhá Lúka and Drnava. They are not located along the proposed Gemer Trail and they focus on the visitors of the Slovak Karst National Park.

Rožňava, as the largest town on the planned route, has sufficient potential to accommodate additional services for cyclists – in particular, there is a lack of rental facilities for visitors who cannot or do not want to travel with their own bicycles. In addition to the Gemer Trail, there are several interesting destinations in the area accessible by bicycle. Along with rental and repair services, other services for cyclists can be developed, such as a cycling guide service.

### GEMER TRAIL – Preliminary Costing

The table below offers preliminary construction costs of the trail. The unit prices presented in the table are based on the average market data in Slovakia. The estimated construction cost does not include the amount needed for the purchase or lease of the land plots needed for the implementation of this project. The final costs to construct the Gemer Trail is subjected to the preparation of the detailed designs that will inform the technical parameters and detail all nuances described in this report.

*Table 3: Preliminary cost calculation*

Type of cycling path	Length	Price per m of path	Price
Construction of a new cycling road – path for cyclists	12 605 m	250 €	3 151 250 €
Construction of a new cycle path in parallel with a road	3 010 m	210 €	632 100 €
Construction of the paved cycle path on	24 762 m	210 €	5 200 020 €

the crest of the Slaná river embankment			
Construction of a new path for cyclists and footpath	2 317 m	340 €	787 780 €
Construction of a new paved surface on an existing unpaved road	3 629 m	350 €	1 270 150 €
Repair of an existing paved road	1 220 m	200 €	244 000 €
Construction of a new route along an existing road	7 900 m	150 €	1 185 000 €
Construction of a new bridge	233 m	6000 €	1 398 000 €
Construction of a new road crossing or the adaptation of the existing one for the cyclists	303 m	300 €	90 900 €
Construction of a new railway crossing or the adaptation of the existing one for the cyclists	68 m	300 €	20 400 €
<b>Total</b>	<b>56 047 m</b>		<b>13 979 600 €</b>

## GEMER TRAIL – Next Steps

To make the findings and the proposals offered in this report a reality, KSK management shall empower their project team to proceed with the preparation of the technical documentation. As noted in this report, in certain cases, the process will require amendments to the zoning decisions, dealing with resettlement issues, working on the public procurement aspects, and many more to allow the Gemer Trail to come true. It is also strongly recommended for the project team at KSK to be in close contact with their colleagues at PSK, as the delivery of the Poloniny Trail has substantially advanced and there are some great lessons learned that the KSK team can benefit from.

