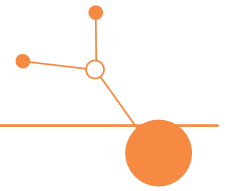


Case studies of rail freight transportation bottlenecks in Central Europe

Deliverable 1.1.2



Version 4

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CASE STUDIES OF RAIL FREIGHT TRANSPORTATION BOTTLENECKS IN CENTRAL EUROPE

Deliverable 1.1.2

GENERAL PROJECT INFORMATION

Rail4Regions addresses the need to improve the freight transport grid. While there were already certain investments on the main corridors, the freight transport on the regional rail lines have just received little attention. Despite their potential importance for the local economy, the carriers mostly transport via road. A reduction of access points and a decrease of knowledge about the special requirements for rail transport makes it even worse. As there are multiple overall problems, it is still needed to know about the specific problems of the shift to rail in each region.

OBJECTIVE OF THE DELIVERABLE

To improve the knowledge about the specific obstacles hindering rail transport in each region, single examples of micro cases need to be identified and detected. For this a common methodology is developed and discussed with all project partners. The thereof resulting case studies should give an overview about actual issues and difficulties of regional rail freight transport.

After the elaboration of a common methodology in the D.1.1.1, several examples were presented at the first project meeting in Varaždin. After some clarifications, these case studies were finalized from the FH Erfurt on the base and research of all partners. The results were edited in form of fact sheets in a common template, that make the difficulties comparable and cluster the case studies into different categories, as listed below.

OVERVIEW OF THE CASE STUDIES

In the following there are the categories listed, based on the different characters of the case studies. The listed categories can distinguish between extent, character or intention, what may result from the perspective the ideas come from: In some cases, an overall demand of transporting a specific type of good in a region was detected, but no exact place for a terminal was already located. In other cases the idea of revitalization a railway existed first and in the second step it was looked for potentials in the catchment area of this line. The methodology drafted in the beginning of this work package allowed both procedures, as it is always an iterative process of detecting the demand and base of the existing infrastructure.

1) Multiple loading points or sidings at a line

- Möllbrücke (Carinthia)
- Hermagor (Carinthia)
- Tauern (Carinthia)
- Ludbreg Industrial Zone (Varaždin County)
- Ivanec Lepoglava Industrial Zone (Varaždin County)

2) New terminal

- Koprivnica (Koprivnica-Križevci County)
- Križevci (Koprivnica-Križevci County)
- Brezje (Varaždin County)
- Artern (Thuringia)
- Railport Nordhausen (Thuringia)
- Terminal for consumer goods (Novara)
- Terminal for waste (Novara)
- Access point for stone (Novara)
- Tarnow District Logistics Center (Małopolska)

3) Extension of sidings

- Đurđevac (Koprivnica-Križevci County)

4) Revitalization of a line

- Ohratalbahn (Thuringia)
- Limestone transport on the Žilina - Rajec railway line (Žilinský kraj)
- Stone transport on the Žilina - Rajec railway line (Žilinský kraj)
- Timber transport on the Žilina - Rajec railway line (Žilinský kraj)
- Tarnow Sub region railway line (Małopolska)
- Rail Border Crossing Muszyna-Plavec (Małopolska)
- Regional railway line Ljubljana Metlika (Slovenia)
- Access to rail for “Adria Mobil” via the line Ljubljana - Metlika
- Access to rail for “Revoz” via the line Ljubljana - Metlika

5) Revitalization of sidings or feeder lines

- Baja (Dél-Alföld Region)
- Kecskemét (Dél-Alföld Region)
- Kiskunfélegyháza (Dél-Alföld Region)
- Transportation of waste to incineration plant (South Moravian Region)
- Powerplant Dukovany (South Moravian Region)
- Teplárny Brno (South Moravian Region)
- Siding to Mokrý (South Moravian Region)

ALL CASE STUDIES

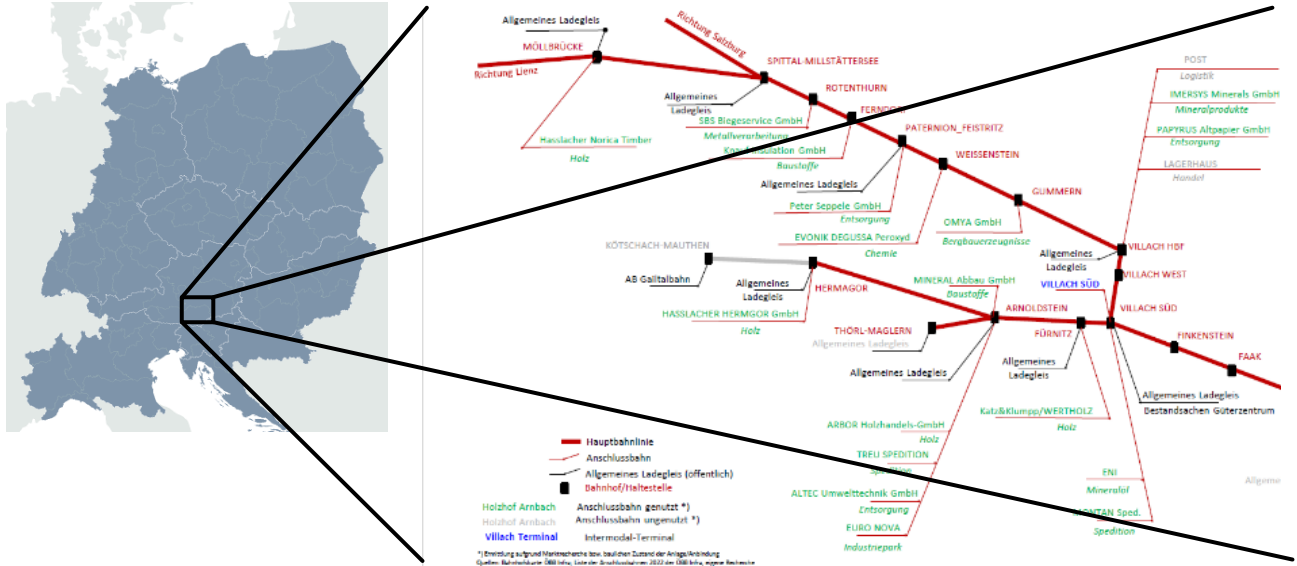
A. Multiple loading points or sidings at a line

These case studies look at a railway line with multiple loading points or sidings, where a railway connection could collect several wagons and establish a regular rail cargo service on this line. In some cases, an existing or potential terminal in the region is planned to sort the wagons for different directions, in others there are direct trains to remoter targets.

All these case studies have in common that they are a collection of not directly depended projects on several places but to collect a sufficient amount of cargo for a regular rail service, it is necessary to link multiple access points.

Sachsenburg Carinthia (Austria)

Quick Facts



Location:	Oberes Drautal Villach-Spittal
Kind of goods:	Timber, waste, building material
Volume:	1-2 trains per week
Distance by train:	Möllbrücke via Spittal to Fürnitz (LCA), app. 76 km

Description

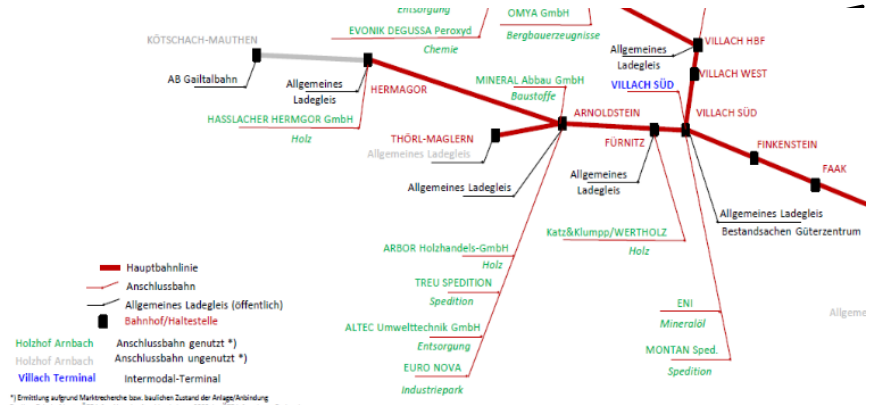
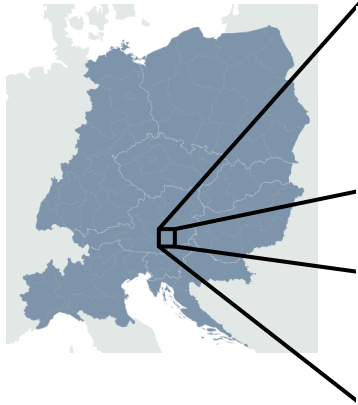
An extended timber loading point brings a rail connection to a 50 ha industrial side near Möllbrücke in the upper part of the Drau valley. Several companies with especially the treatment of timber and waste would profit from it. Depending on the overall freight volume there is expected to drive one to two trains per week that could substitute 50 to 80 trucks each. The loading point will give access to the TEN-Corridor and NAPA Ports via the Railhub in Fürnitz.

The loading point near Möllbrücke stands vicarious for several other options at the railway line along the valley of the Drau that can be reactivated or extended. A total investigation of all options comparing the costs for the rail infrastructure and the transferred cargo volume could assess which of them are beneficial to use.

Hermagor-Arnoldstein

Carinthia (Austria)

Quick Facts



Location:	Several places along the line between Hermagor-Arnoldstein and Fürnitz
Kind of goods:	Timber, waste, building material
Volume:	1,5 train per week
Distance by train:	Disperse, 70 km

Description

Several companies with especially the treatment of timber and waste would profit from it. Depending on the overall freight volume there is expected to drive 1,5 trains per week that could substitute 50 to 80 trucks each. The loading point will give access to the TEN-Corridor and NAPA Ports via the Railhub in Fürnitz.

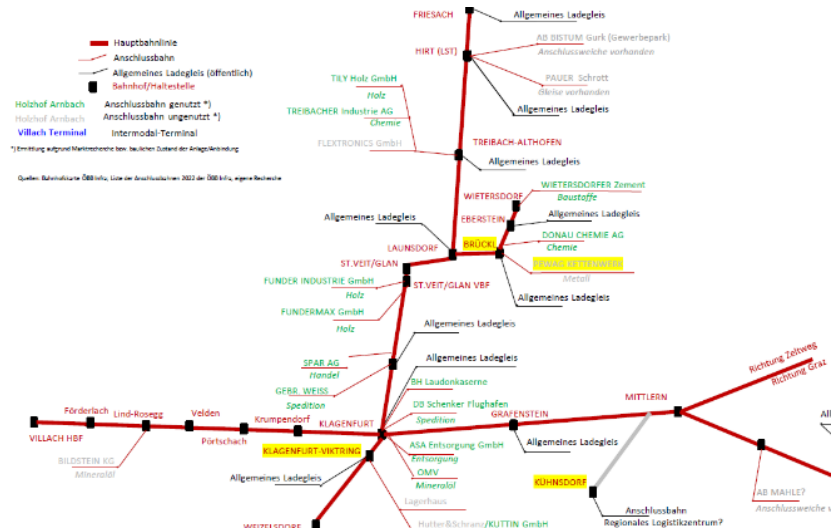
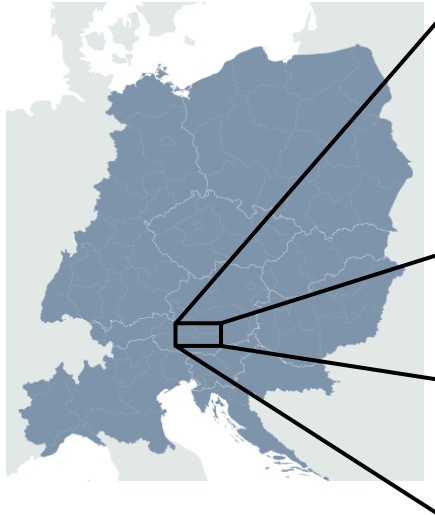
There are several options for loading points along the branch railway line that can be reactivated or extended. Especially a cooperation between the industrial area Arnoldstein and Fürnitz could be positive for railway transport activities.

At the moment, the branch line to Hermagor is only used for passenger transport. The necessary permits for freight transport are only available for a pilot operation.

Südbahn

Carinthia (Austria)

Quick Facts



Location:	Several places along the Südbahn
Kind of goods:	Timber, waste, building material
Volume:	1-2 Trains per Week
Distance by train:	100-350 km

Description

The Kühnsdorf industrial park and the loading point at the Klagenfurt Railwaystation are ideal to form a network together with the logistic hub Fürnitz to collect goods for rail transport and ensure regular railwayservices from and to Fürnitz.

Several companies with especially the treatment of timber and waste would profit from it. Actually most of goods are transported by trucks. Depending on the overall freight volume there is expected to drive one or two trains per week that could substitute 50 to 80 trucks each. The loading point will give access to the TEN-Corridor and NAPA Ports via the Railhub in Fürnitz.

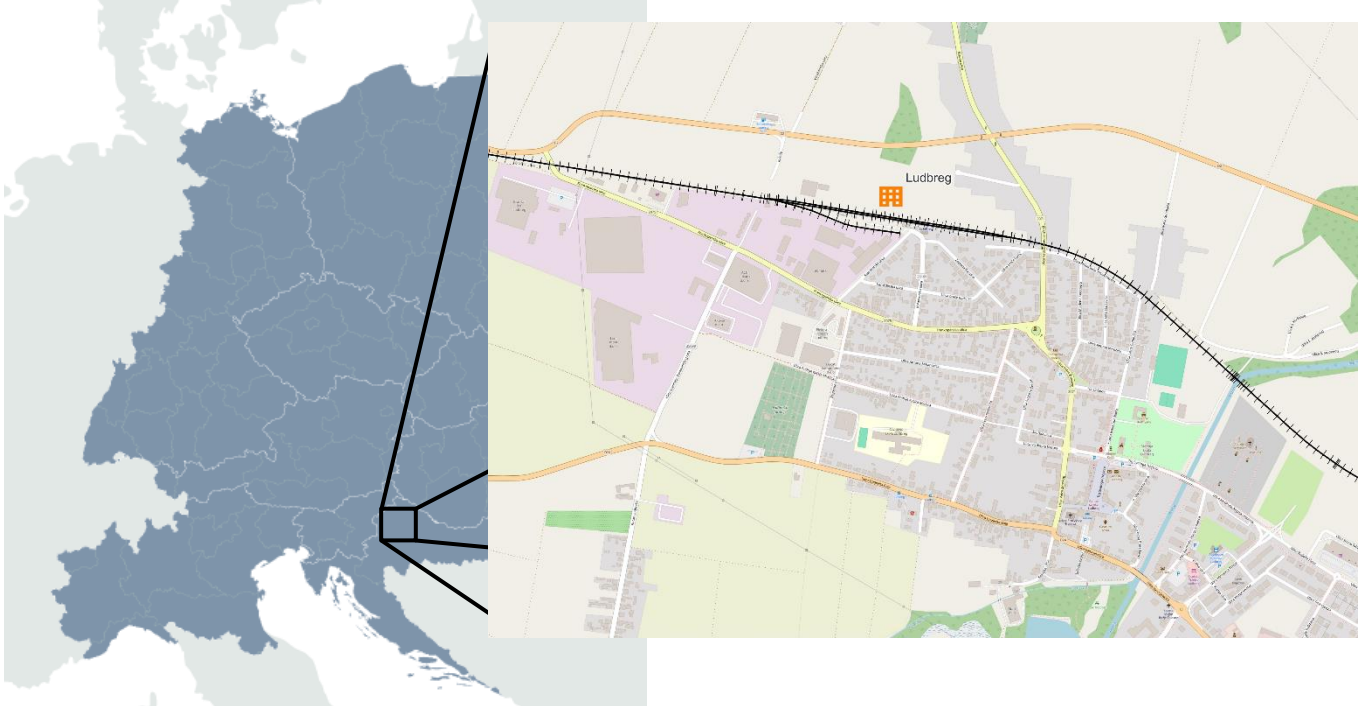
There are several options for loading points along the Südbahn railway line that can be reactivated or extended.

Challenges are that branch lines are not in use and the loading point at Kühnsdorf is under construction due the constructions of the Koralmbahn Project. Railwaytransport is more expensive than truck transport.

„North Ludbreg” Business Zone

Varaždin County (Croatia)

Quick Facts



Location:	Ludbreg
Kind of goods:	Grain and goods related to the wood industry
Volume:	700 tons per week
Distance by train:	335 km to port of Rijeka or 530 km to Split

Description

In the north of Ludbreg is a business zone with existing railway cargo supply for some industrial zone companies. The cargo transportation flows from and to port of Rijeka and port of Split. It comprises mainly grain and good that are related to the wood industry. These goods are “rail suitable” and are already transported by rail. For the execution of these transportation the business zone has an existing railway station and marshalling yard, including 3 functional sidings.

The main goals for the future are:

- new siding on the north side
- improvement of the existing sidings on the south side
- installation of specialized cranes for efficient transshipment and cargo potential realization
- improvement of the road infrastructure in „North Ludbreg” zone

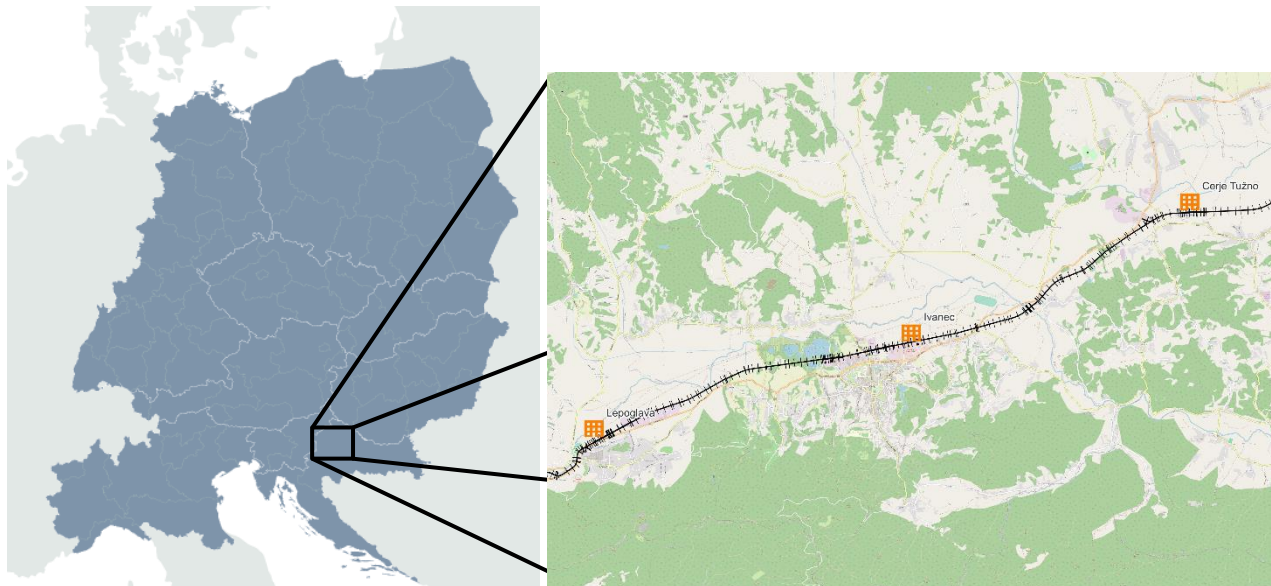
With these extensions the existing rail transportation could proceed more efficient and further transport relation like the transport of plastic mass or gelatin with targets in Graz, Zagreb, Koper or the river port of Vukovar could be initiated. Therefor is a high local support for intermodal transport. Along these lines there are five additional hectares provided by the existing spatial plan.

The main challenge is the outdated infrastructure that does not meet the primary needs. Large investments are needed in the existing infrastructure with the aim of building new or improvement of the existing sidings and transshipment points. There are several more problems that needs to be considered: terminal, inefficient transfer technology, longer handling time due to poor equipment, load/unload capacity limitation, access roads, inflexible shunting, terminal handling costs and the most important is the lack of sufficient number of qualified personnel.

Ivanec - Lepoglava industrial region

Varaždin County Croatia

Quick Facts



Location:	Ivanec, Lepoglava
Kind of goods:	metal products, wood products
Volume:	300 tons per week
Distance by train:	385 km to port of Rijeka or 180 km to station of Graz

Description

Due to a high cargo potential of wood and metal industry in the region and in Lepoglava additionally furniture and insulating materials there is a need for a development of the railway network. Beside the local transportation to Varaždin and Koprivnica, the main amount of cargo potential goes to the port of Rijeka and to Graz (Austria).

Currently there are two industrial zones with existing railway stations and sidings (Ivanec, Cerje Tužno) which need to be extended and supplemented with additional sidings. The lack of proper transloading infrastructure, equipment and technology results in a high amount of truck transportation.

There is a high local support in Ivanec and Lepoglava for intermodality by the spatial plan due to the negative impact of 5000 trucks using the national road through the populated areas.

The main challenge is the lack of proper transloading infrastructure, equipment and technology. Large investments are needed in the existing infrastructure with the aim of improvement of the existing sidings and transshipment points. There are several more problems that need to be considered: inefficient transfer technology, longer handling time due to poor equipment, load/unload capacity limitation, access roads, inflexible shunting, terminal handling costs and the most important is the lack of sufficient number of qualified personnel.

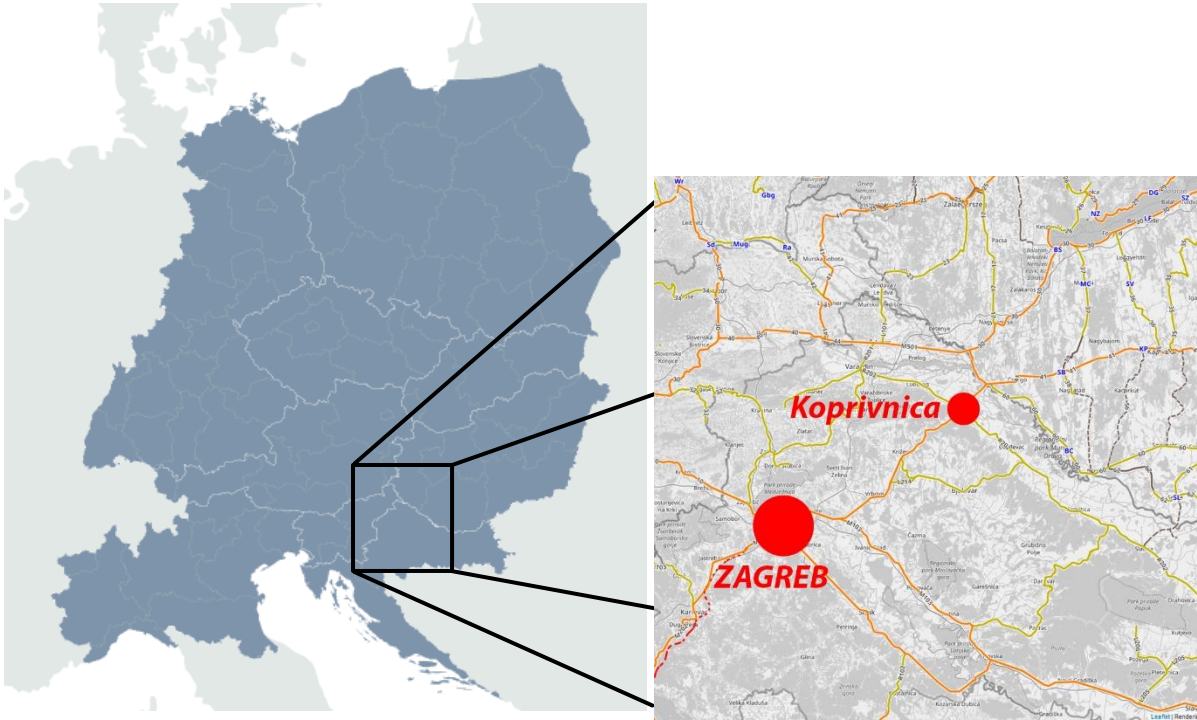
B. New terminal

A new terminal means a new loading point (not only but) especially for the intermodal cargo traffic. The terminal affords the collection, storage and (un-)loading of goods on road and rail. Thus, it enables the transportation of goods on rail that do not reach a sufficient amount on cargo by itself. It is based on a detected cargo volume in the area around that currently transported on road or not (fully) developed yet.

Koprivnica

Koprivnica-Križevci County (Croatia)

Quick Facts



Location:	Koprivnica
Kind of goods:	Food products, raw materials, pharmaceutical products
Volume:	About 500 tons per day each
Distance by train:	260 km to port of Rijeka

Description

There are multiple industrial and business zones in the county Koprivnica-Križevci. A potential hub is the construction of a terminal in Koprivnica, related to the industrial zone Danica. The advantage is the connection to the TEN-T corridor which is just about 300 m from the industrial zone.

The minimum potential is one train per day to the port of Rijeka. The potential will likely increase, as there is a further development of the industrial zone as well as an industrial development of the city and country around.

current bottlenecks hindering rail transport

In the infrastructural part, the main emphasis was on the great lack of will in the realization of multimodal solutions on the part of various responsible stakeholders. The solution to the above is gathering and encouraging responsible stakeholders, for example through a series of workshops.

The main problem is the outdated infrastructure that does not meet the necessary needs. Large investments are needed in the existing infrastructure with the aim of building terminals, tracks and new transshipment points.

Other railway stations in the region are also problematic due to the lack of proper transloading infrastructure and equipment, thus making them unsuitable for access points to railway transport.

Current obstacles hindering rail transport

In the infrastructural part, the main emphasis was on the great lack of will in the realization of multimodal solutions on the part of various responsible stakeholders. The solution to the above is gathering and encouraging responsible stakeholders, for example through a series of workshops.

The main problem is the outdated infrastructure that does not meet the necessary needs. Large investments are needed in the existing infrastructure with the aim of building terminals, tracks and new transshipment points.

The construction of a logistics center is planned in the zone, but without the railway connection, the restoration of the existing industrial siding nearby is uncertain, the national strategies do not support the sufficient development of such terminals. The shunting crew exists in Koprivnica station but their availability for other operations is limited, there's the lack of organising capacities to compose complete freight trains, which is not interesting for carriers.

There are several more problems that need to be considered: inefficient transfer technology, longer handling time due to poor equipment, load/unload capacity limitation, inflexible shunting, terminal handling costs and the most important is the lack of sufficient number of qualified personnel.

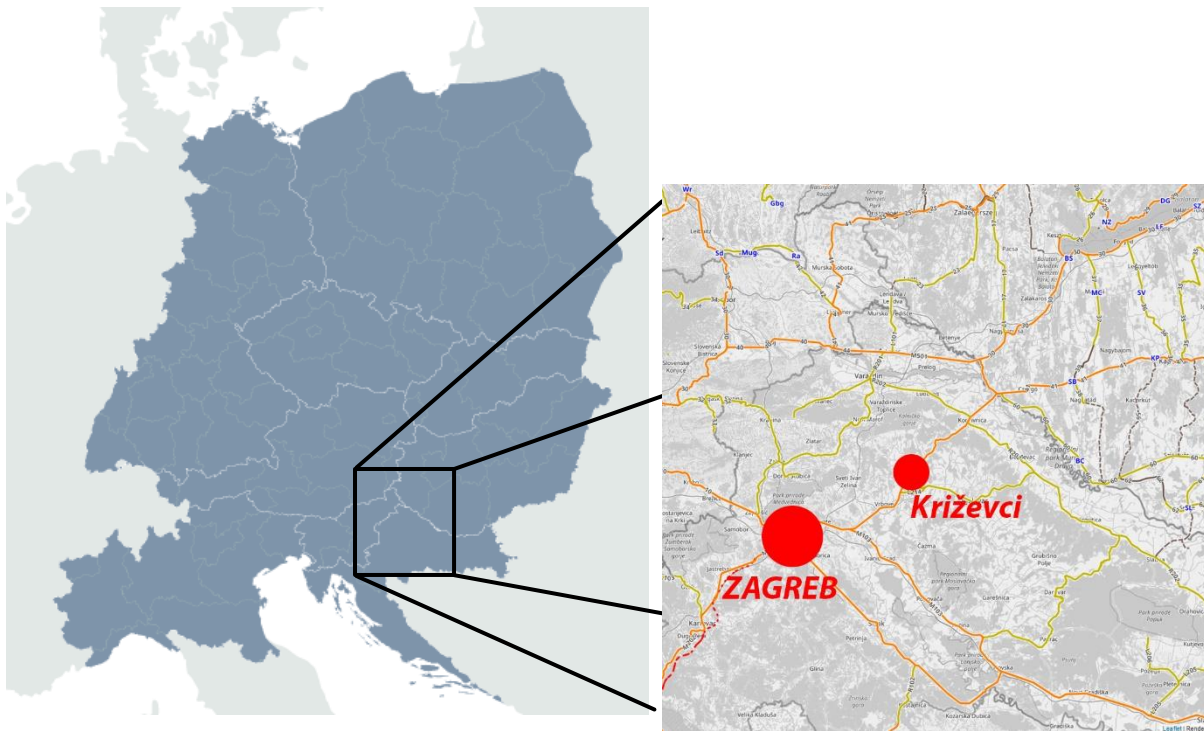
Estimated costs to remedy these bottlenecks

Total amount of costs in Euros for reconstruction of existing rail infrastructure amounts to approx. 10 000 000 Euros, for new loading points 7 000 000 Euros, for extension of tracks 3 000 000 Euros and for signalling 1 000 000 Euros.

Križevci

Koprivnica-Križevci County (Croatia)

Quick Facts



Location:	Križevci
Kind of goods:	goods related to the wood and metal industry
Volume:	About 300 tons per day each
Distance by train:	300 km to port of Koper

Description

There are multiple industrial and business zones in the county Koprivnica-Križevci. A potential hub is the construction of a terminal in Koprivnica, related to the industrial zone Gornji Čret, which has a total area with approx. 32.309,97 m². The advantage is the connection to the TEN-T corridor that runs through the industrial zone.

The minimum potential is two trains a week to the port Koper with the possibility of a return connection. The potential will likely increase, as there is a further development of the industrial zone itself as well as an industrial development of the city and country around.

Current obstacles hindering rail transport

In the infrastructural part, the main emphasis was on the great lack of will in the realization of multimodal solutions on the part of various responsible stakeholders. The solution to the above is gathering and encouraging responsible stakeholders, for example through a series of workshops.

The main problem is the outdated infrastructure that does not meet the necessary needs. Large investments are needed in the existing infrastructure with the aim of building terminals, tracks and new transshipment points.

A zone for the construction of the center has been planned, other multimodal facilities do not exist in that region, there is strong support from the main administration, but there is not a single strategic document at that level.

The main obstacles to establishing permanent freight railway transport: the absence of shunting crews and locomotives for stacking trains and serving terminals, as well as the impossibility of stacking whole trains.

There are several more problems that needs to be considered: inefficient transfer techniques, longer handling time due to poor equipment, load/unload capacity limitation, inflexible shunting, terminal handling costs and the most important the lack of sufficient number of qualified personnel.

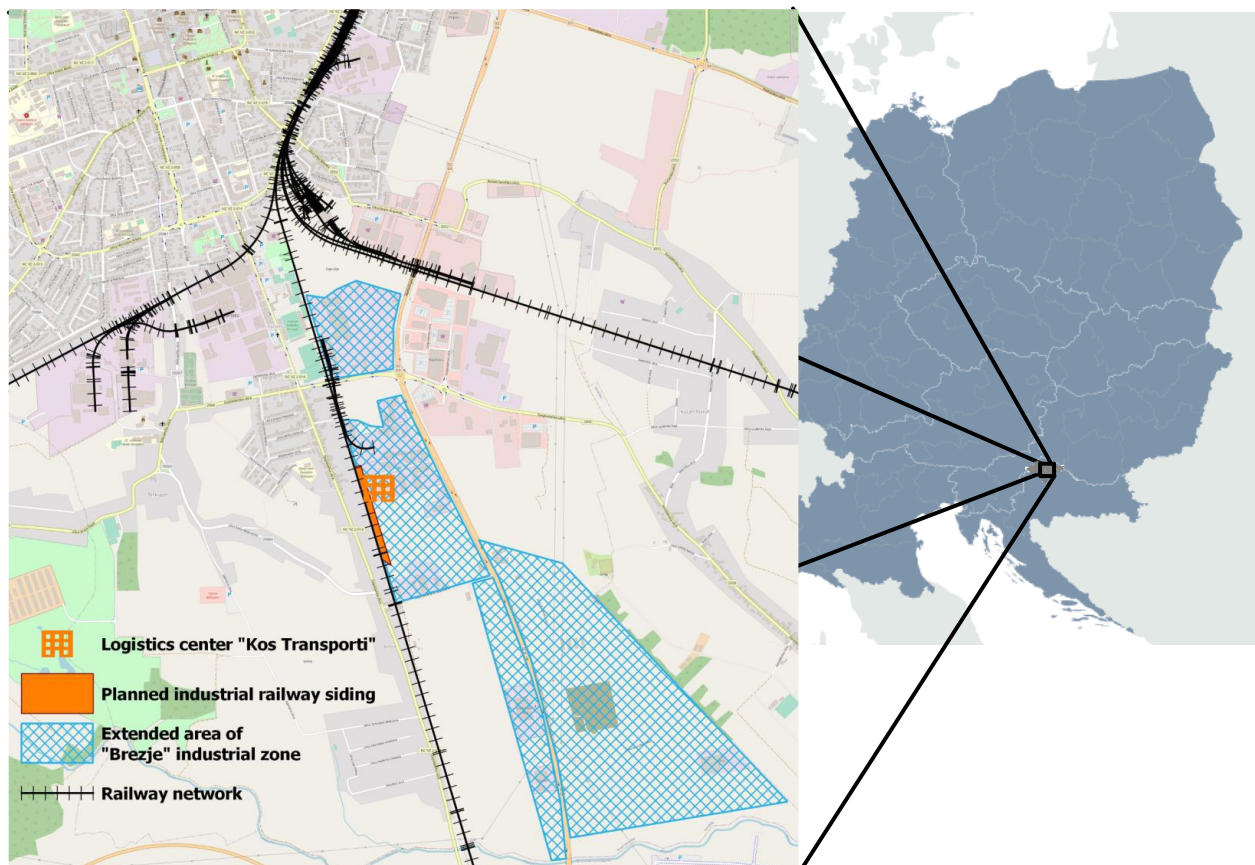
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Intermodal terminal Brezje

Varaždin County Croatia Varaždin County Croatia

Quick Facts



Location:	Varaždin
Kind of goods:	Containers
Volume:	500 tons per day
Distance by train:	295 km to port of Koper

Description

The extension of the „Brezje” industrial zone is a strategic project of Varaždin City. The primary project objective is to establish a connection between the existing logistics center and the „Brezje” industrial zone with the existing railways R201 Zaprešić - Zabok - Varaždin - Čakovec and R202 Varaždin - Koprivnica - Virovitica - Osijek - Dalj. With the mentioned railway routes, at Zaprešić and Koprivnica railway stations, the logistics center would have a connection to the Mediterranean Corridor.

For Univerzal and Vindija companies sidings already exist. There is a strong interest in adding industrial sidings on a private company plot of Kos Invest/Kos Transporti. Kos is looking for a possibility of extending their business on rail transport. Therefore it would support a multimodality development with substantial private investments.

An existing project documentation outlines the implementation of two container loading points with two industrial sidings measuring 385 m in useful length. These sidings would also be accessible to other potential users of the „Brezje” industrial zone. To that effect the companies SOLVIS d.o.o., BERNARDA d.o.o., BOXMARK Leather d.o.o., Velmart d.o.o., PRESS GLASS d.o.o., KOSTWEIN Proizvodnja Strojeva d.o.o. are looking forward for an intermodal access terminal.

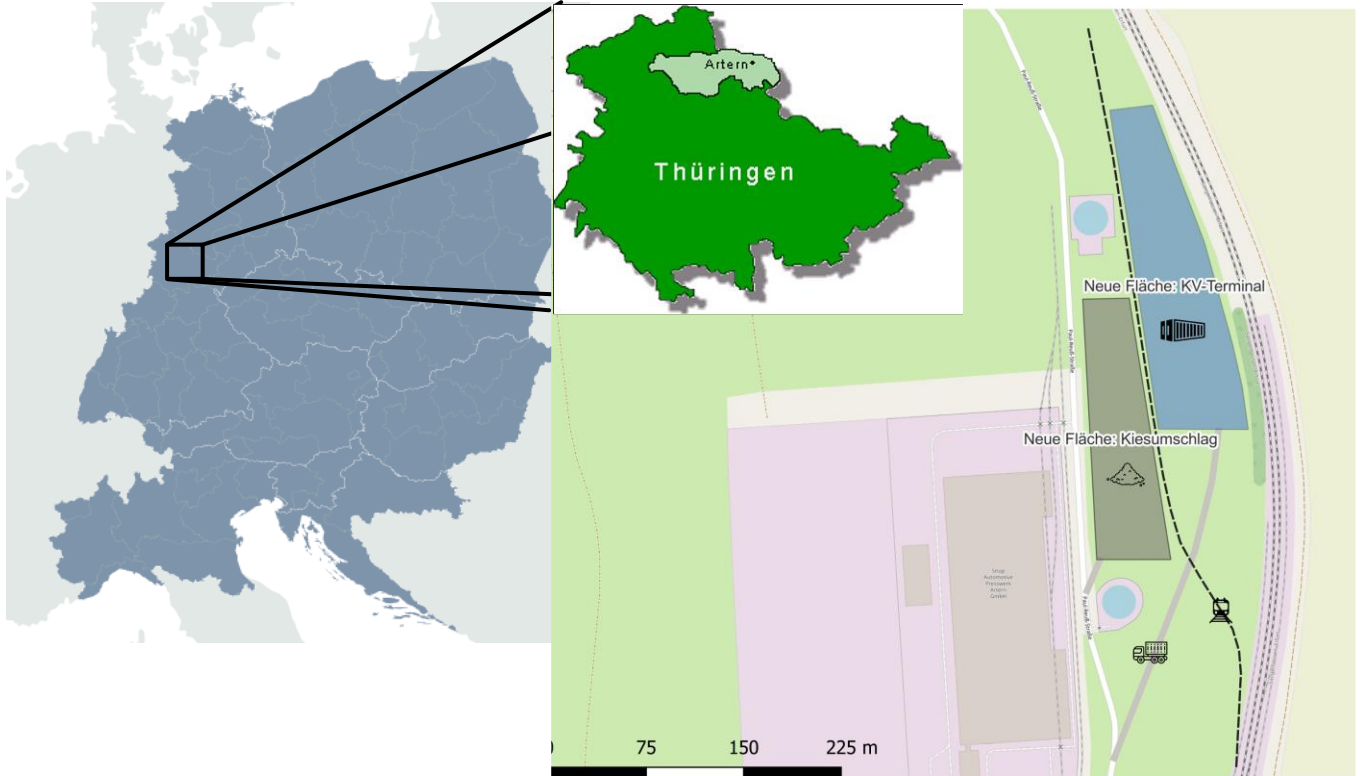
Current obstacles hindering rail transport

The current main project challenges are the ineffective railway development, limited performance of the key stakeholders, alignment with spatial plans, varied levels of the land ownership. In the infrastructural part, the main emphasis was on the great lack of will in the realization of multimodal solutions on the part of public responsible stakeholders. Although there is a strong will for investment by the private investor, the decision-making process of the public administration is too slow. The project development is currently dependent on the status of the spatial plans and the challenge of merging the land ownership.

Artern

Thuringia (Germany)

Quick Facts



Location:	Artern
Kind of goods:	Gravel, timber, products of the automotive industry
Volume:	3 trains per week
Distance by train:	300-350 km

Description

There is no intermodal terminal in the north of Thuringia yet. In the surroundings of Artern are multiple relevant business locations and some of them already signaled their will of a shift to rail freight transport. One large gravel quarry in particular is only a few kilometers away and could transport a large proportion of its products by rail.

Additionally there are detections ongoing for a revitalization of the railway lines to Bad Frankenhausen and Nebra that can bring a potential terminal in Artern the role of a local hub.

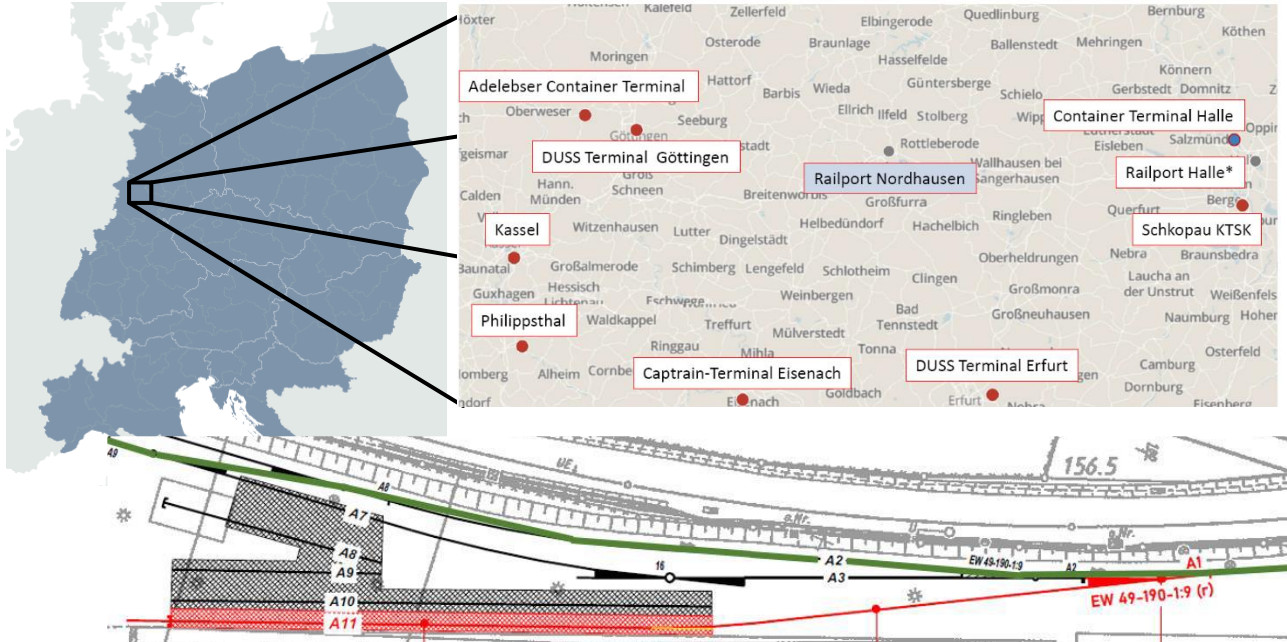
Current studies counted a potential of an amount of 87 LU per week, which means 4350 per year and an additional, unverified potential for timber transport. For that purpose there needs to be one loading track constructed and multiple areas for loading, handling and seating goods aside. A reach stacker with different grippers could handle various kind of goods.

In the moment it seems to be difficult to reach a sufficient and reliable amount of cargo that meet the logistic requirements like just-in-time deliveries and the cost structures. Therefor it is prospected for a suitable investor that could bear the costs and/or a regular, long-term volume of cargo.

Railport Nordhausen

Thuringia (Germany)

Quick Facts



Location:	Nordhausen
Kind of goods:	Glass bottles, Gypsum, Cardboard packaging
Volume:	3 trains per week
Distance by train:	200-350 km

Description

An intermodal terminal in Nordhausen in terms of a so-called “Railport” could give the north of Thuringia a comprehensive access to the railway system.

The idea of a Railport is, to break the circle of a non-sufficient and regular demand and a rare supply of rail transport routes. For this purpose it is required to have a weather-protected loading zone or house available to deposit goods and accumulate them for a sufficient amount to carry it by train. Intermodal transshipment options like cranes or reach stackers and a stable connection by rail and road permit a reliable logistics chain. Therefore for the Railport should be equipped with transloading options for Bulk goods, bulky goods, heavy cargo, palletized goods and container goods.

A Railport enable also small cargo enterprises an access to the rail network, since the entire transport relation including rail and road transport is offered by the haulage companies.

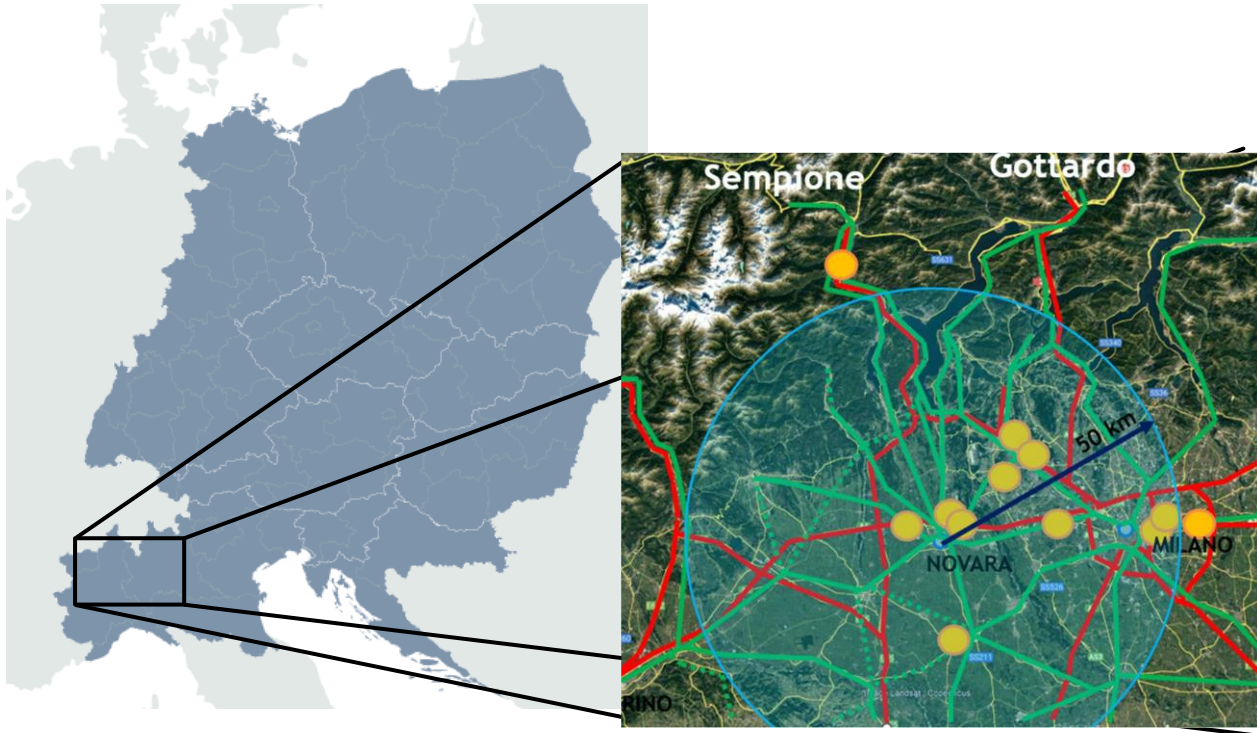
The location of Nordhausen is predestined as there is a lack of intermodal terminals in North-Thuringia (min. 90 km distance to next existing one) and there are multiple cargo potentials around.

Production for large-scale retail trade

Bringing on train Consumer Goods

Novara (Italy)

Quick Facts



Location:	Multiple locations in the province of Novara
Kind of goods:	Consumer goods, especially body care
Volume:	239.000 tons; 78 ILUs; 2 trains per week
Distance by train:	300-1.600 km

Description

Consumer goods production in the area

Consumer goods production has important settlements in the study area. A representative of this industry segment is a major provider of body care and personal hygiene products, made in Italy and exported all over Europe. These products belong to the so-called Consumer Goods and are distributed through large-scale retail trade.

It has a main production site in Province of Novara, and some warehouses nearby, operated by a logistic partner. The management is very interested in the use of rail transport as a part of a sustainability policy, and intermodal transport has already been tested and has been confirmed for some destinations, but most of the products travel by road. Similar situations were found in other companies linked to large-scale retail trade, with production plants located within the study area.

Type of shipments and transport volumes

As the destinations are different and many, transport volumes are not suitable for dedicated company trains, but can in several cases be convenient for relying on open-access intermodal services if they are operating on the requested routes.

Transit time requirements

Large-scale retail trade requires tight and strict times for the order-to-delivery logistical process including transport, especially in domestic business where there are not buffer warehouses near the customer. These situations are difficult to manage with rail and intermodal transport, as they reduce the field of performance competitiveness of the railway compared to the road.

Access by road and rail

The area around Novara (say within a radius of about 25 km) is easily connected to the main roads network: more motorway entrances are available, and they give access both to an East-West route (A4) and a North-South route (A26); from these, the whole Italian and European network is attainable.

Bottlenecks

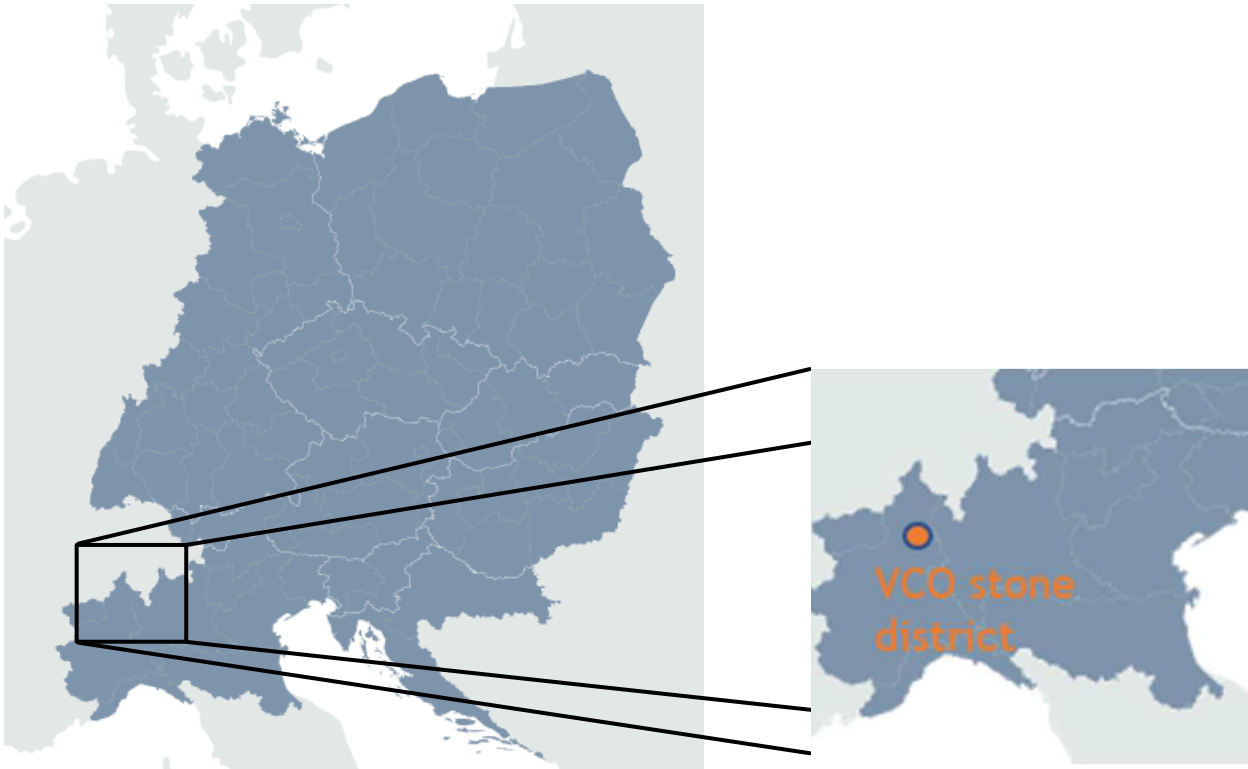
Challenging features in the transport mode choice of Consumer Goods producers in the study area are more related to the organization, performance level and availability of rail transport services, than to the inadequacy of the available infrastructures.

The stone district of VCO

Shifting stone transports on the rails

Novara (Italy)

Quick Facts



Location:	Verbano Cusio Ossola (VCO), Crevoladossola
Kind of goods:	Marble blocks and slabsfeldspar sand
Volume:	95,000 tons/year; 3 trains per week
Distance by train:	210 km (to port) - 300 km

Description

About the stone district and the companies interested in the project

The area of Verbano Cusio Ossola is a well-known district of quarries and production of stone materials for ornamental or architectural use.

Two companies expressed their interest in the project:

- one produces felspathic sand that after travelling 300 km by truck from Baveno to the Sassuolo area the is used for making ceramics. 8 to 10 trucks per day travel the whole distance carrying the sand in controlled humidity condition.

- the other company is dedicated to a special type of marble that is mostly sold in blocks and slabs. It is carried by trucks in 20' containers loaded up to 28 tonnes from Crevoladossola to Genova where about 2000 containers/year are embarked on ships to their destinations.

Transit time requirements vary but the only strong constraint for marble containers is the need to meet the loading schedule of the vessels on which they are exported.

Access by road and rail to the origin area is excellent. The Verbano Cusio Ossola is served by the A26 motorway that links the area with the national motorway system and with the port of Genova. Both the destinations of the marble and of the feldspathic sand can be reached on routes that are mostly on motorways.

The area is also served by railway lines belonging to the Rhine-Alpine Corridor with major freight flows. Domodossola, located within the stone district, is home to a rail-road terminal with departures to the north of the Alps. Novara, located between 40 km and 100 km of the district, hosts the rail-road terminals of CIM/Boschetto and Agognate linked to the national network and offering further services across the Alps, to the west of the Alps and to the south of Italy. Also the rail-road terminals in Gallarate are within a short distance and can be reached by motorway.

The company selling feldspathic sand did not mention current bottlenecks in relation to road transport, but it is interested to explore the rail option. In fact, they tried it in the past but were disappointed due to:

- Commercial offers for rail transports that had too short a duration;
- Issues with weight measurements at different locations along the rail network;
- Issues with available space to receive the swap bodies at the destination terminal.

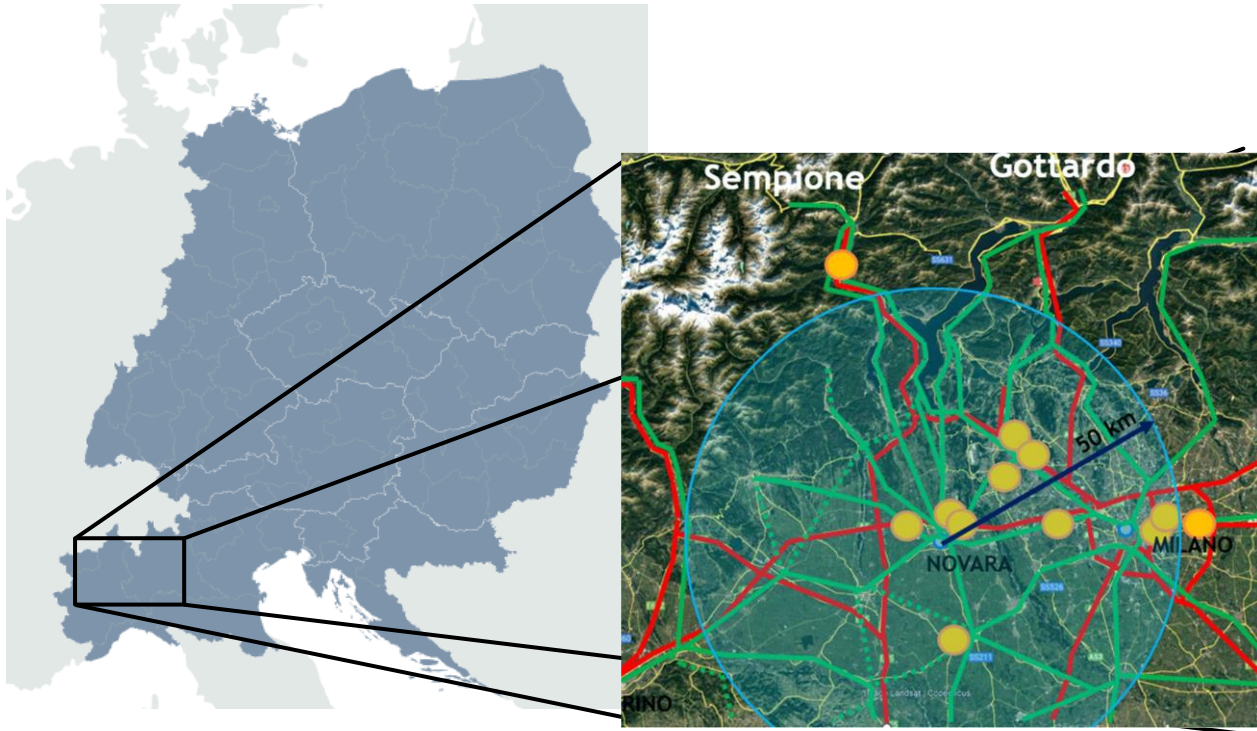
The only bottleneck concerning rail mentioned by the company selling marble is the reliability of transports that need to meet ships loading times

Environmental services company

Sustainable waste transport

Novara (Italy)

Quick Facts



Location:	Multiple locations with terminals in the province of Novara
Kind of goods:	Waste
Volume:	1000.000 tons per year; 3,5 trains per week
Distance by train:	1.500 - 3.000 km

Description

About waste transport: type of shipments and transport volumes

Waste products, such as like amiantiferous/asbestos sands for example, are shipped from North Western Italy to Germany/Poland/Sweden in boxes grouped in big bags. At present, shipments to most destinations are managed as Full Truck Loads. A single waste producer could transport 2,000 full trucks per year, about 8 every day.

Transit time requirements

The transit times usually required for export waste transport from Italy to Germany and other countries are not strict. Most of the times, these are goods that are dangerous to human health, so there must be special precautions, but timing doesn't seem to be a problem, the important thing is that transport is regular.

Access by road and rail

The material transported abroad originates on construction sites (for new railway lines, for example). From construction sites, today, the material is transported to storage and consolidation centers and from there it is transported by road to its final destination. Destinations are, for example, former salt mines in Germany. The construction sites, origins of the flows, are in various parts of northern Italy. The proximity of a railway terminal cannot be determined. On the other hand, the position of the collection and consolidation centers can be determined, which are not next to intermodal centres. The idea is to build a collection and consolidation centre inside of the freight village close to Novara. In this way the material destined abroad can be loaded directly onto the train carriages without further transport by road from the collection centre to a terminal.

Bottlenecks

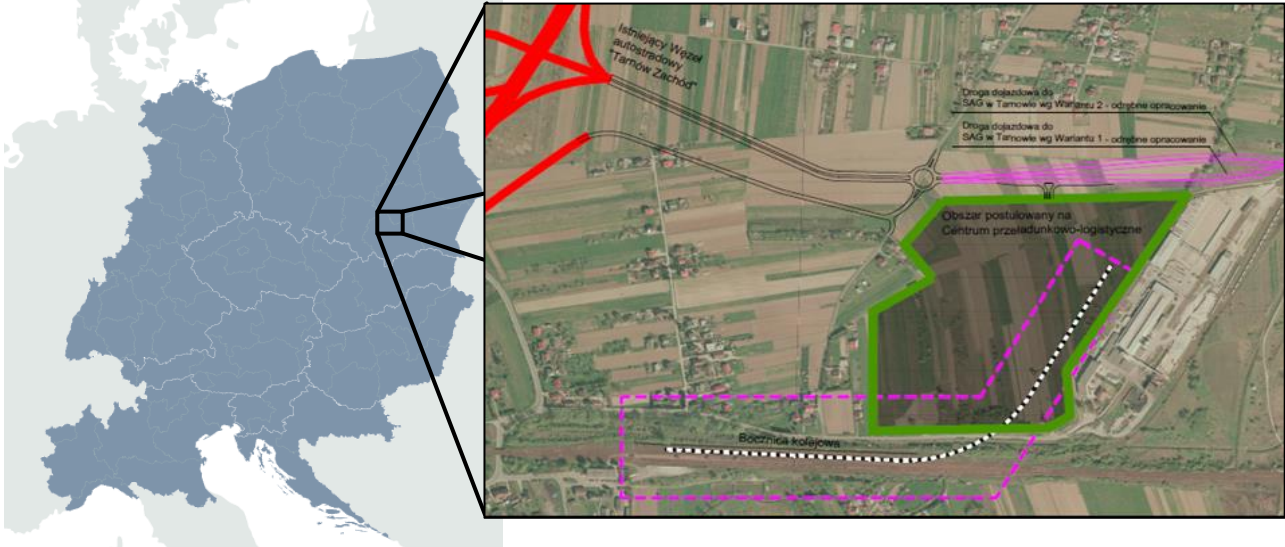
The difficulties of setting up a collection and consolidation centre for inorganic waste at a freight terminal/village and the following loading onto the wagons towards the destination countries are as follows:

- Combining the flows of multiple waste management companies to create enough critical mass to justify full trains
- Create a special purpose company involving a railway operator to manage waste within a freight village/terminal

Tarnów District Logistics Center

Małopolska (PL)

Quick Facts



Location:	Tarnów Sub-region
Kind of goods:	industrial production, food industry, construction material
Volume:	3 trains per week
Distance by train:	30 km

Description

The project of Logistic and multimodal Center (LMC) in the district (powiat) of Tarnów was proposed as one of initiative in frame of Małopolska Operational Program 2014-2020 (Priority Axe 3 “Entrepreneurial Małopolska”, Activity 3.1.”Economic Activity Areas / EAA”). In total it was creating 54 EAA in the region. The project of LMC was prepared included technical documentation, works planning and railway construction.

The local LMC in Tarnów District was dedicated for SMSE’s investing in the EAA and representing different sectors of industry: chemical products, automotive components, metal treatment, machinery, logistic services, food industry, plastic products. The companies practically do not use the rail transport, using the good connection with highway A-4.

Prospective rail infrastructure.

The rail infrastructure located on the Logistic and Multimodal Center (LMC) predicts the creation of the new multimodal area dedicated to the connection between enterprises investing in local Economic Activity Areas and existing railroads in the immediate vicinity. The project contains:

- Development and management of the LMC area with road (local and regional level, access to A4 Highway) connections by the LMC operator (public/private investment)
- Development of the LMC area with parking places, warehouses, customs offices, logistic management center.
- Multimodal transshipment points road - rail transport.

- Direct access to railway siding, attendant all new investment (industrial, production) located on Tarnów District EAA (3-4 location, 10-25 new investment in 2020- 2030),
- Direct access to sub-regional railway network (City of Tarnów as central railway connection with regional and national railway network), average distance 20 km,
- Introduction of new technologies and service variants: Single Wagon Loading, rail and road vehicles, dedicated special shipments, automated shipment control.
- Prospective to use the new rail infrastructure to combine passenger / freight transport

The project is suspended, we can suggest that the local authorities were forced to made the selection between different EAA project located in sub-region. Finally, it was created 3-4 new EAA and the documentation of LMC still waiting the best moment to be taken into account.

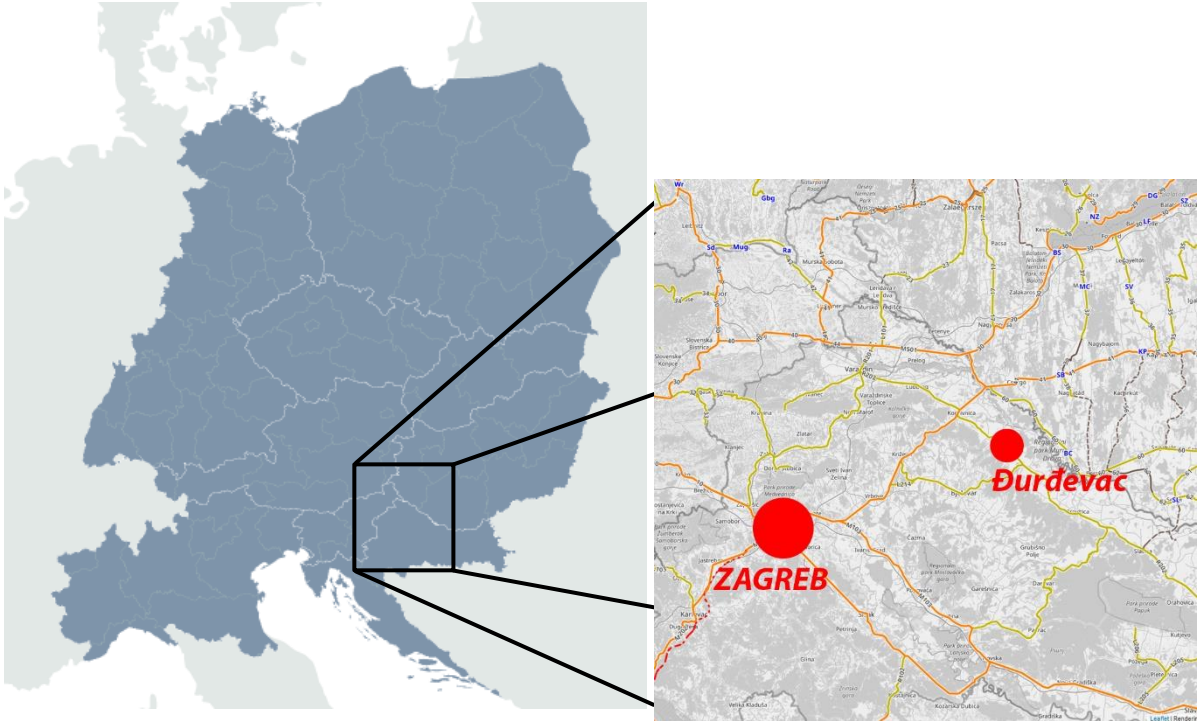
C. Extension of sidings

An extension of one or more sidings is necessary if the current situation does not meet the requirements of the transported goods (anymore) or if further potential is requested to be transported on rail. It could contain more tracks or turnouts and an extension of the loading facilities.

Đurđevac

Koprivnica-Križevci County (Croatia)

Quick Facts



Location:	Business zone Sjever A - Đurđevac With business zones in Novigrad Podravski and Koprivnički Bregi
Kind of goods:	Grain and goods related to the wood industry
Volume:	200 tons per day each
Distance by train:	30 (to Koprivnica)

Description

There are several industrial and business zones in the Region Đurđevac. It includes business zone A-SJEVER, Novigrad Podravski and Virje. They are all located at the railway line R202 Varaždin - Koprivnica - Osijek - Dalj. Đurđevac and Virje are 7 km apart, while Novigrad Podravski and Virje are only 5 km apart. From Novigrad Podravski railway station Koprivnica is 15 kilometres away. Therefore Đurđevac, Virje and Novigrad Podravski form a one logistics area and the potential locations of loading points (partly with industrial sidings) at these railway stations are approached in one case study.

The potential is predicted as listed below:

- Đurđevac - one train per week with the possibility of single wagon load shipments to Koprivnica several times per week
- Novigrad Podravski - possibility of single wagon load shipments to Koprivnica several times per week
- Virje - possibility of single wagon load shipments to Koprivnica several times per week

The potential will likely increase, as there is a further development of the industrial zone itself as well as an industrial development of the city and country around.

The business zone A-SJEVER has a distance of about 28km to the TEN-T corridor in Koprivnica.

Current obstacles hindering rail transport

In the infrastructural part, the main emphasis was on the great lack of will in the realization of multimodal solutions on the part of various responsible stakeholders. The solution to the above is gathering and encouraging responsible stakeholders, for example through a series of workshops.

The main problem is the outdated infrastructure that does not meet the necessary needs. Large investments are needed in the existing infrastructure with the aim of building terminals, tracks and new transshipment points.

There is a regional railway line Đurđevac-Koprivnica which is in extremely bad condition, the station has limited track capacity, no maneuvering capacity, no transshipment equipment, no strategically supported development. There is a complete lack of organizational capacities to compose the entire freight trains and the lack of shunting locomotive (one or more) to serve the terminal.

There are several more problems that needs to be considered: inefficient transfer technology, longer handling time due to poor equipment, load/unload capacity limitation, inflexible shunting, terminal handling costs and the most important is the lack of sufficient number of qualified personnel.

Estimated costs to remedy these bottlenecks

Total amount of costs in Euros for reconstruction of the existing railway infrastructure amounts to approx. 10 000 000 Euros, for new loading points 7 000 000 Euros, for extension of tracks 3 000 000 Euros and for signalling 1 000 000 Euros.

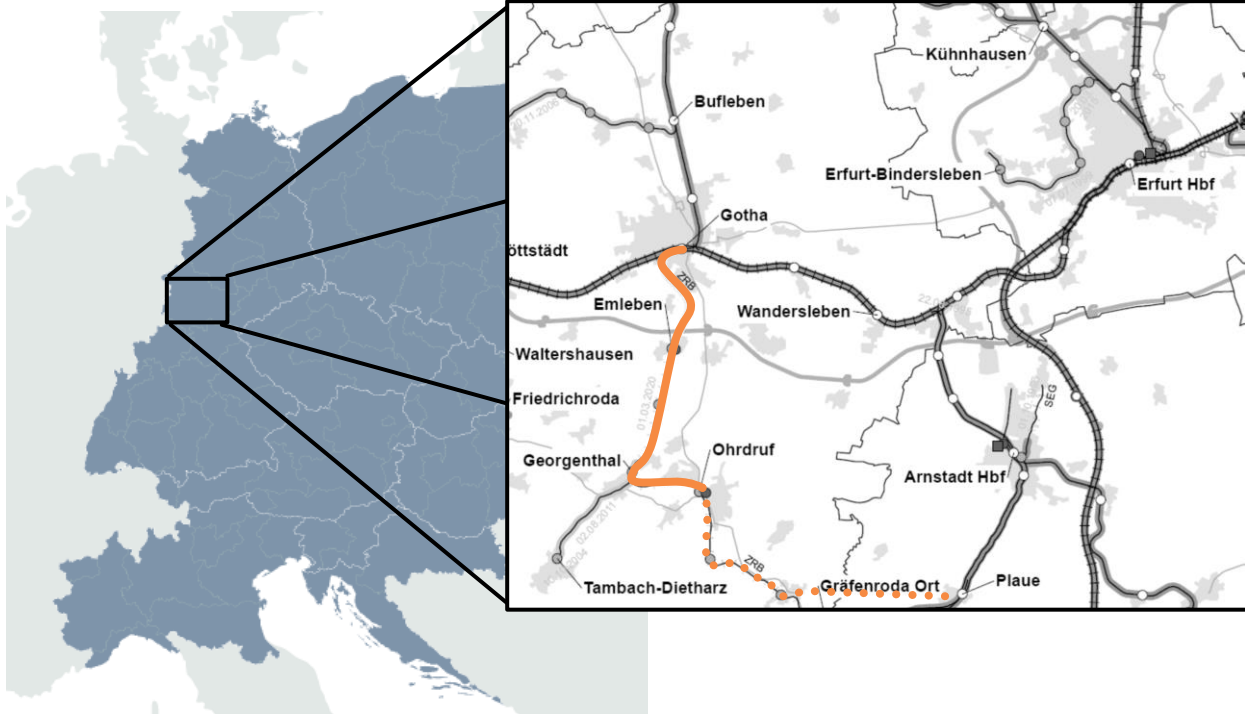
D. Revitalization of a line

A line could be revitalized, if it was temporarily closed for rail transport or is in such a bad condition that the rail transport is not competitive to the one on road. It offers a railway connection to regions beside the existing railway main corridors. Depending on the current state of the rail infrastructure there are several technical and formal requirements to overcome before the traffic may restart. Therefor a basic condition for the revitalization is a persistent cargo volume of one or multiple sources at the line.

Ohratalbahn

Thuringia (DE)

Quick Facts



Location:	Ohrdruf
Kind of goods:	Food industry, timber, mixed goods
Volume:	2,5 trains per week
Distance by train:	500 km, changing

Description

In the former station of Ohrdruf is a timber loading point which is currently just used by truck transport. The existing plan is the revitalization of the loading point for train transport. For this aim, a modernization of the railway line from Ohrdruf to Gotha (there: connection to main railway corridor) is in work.

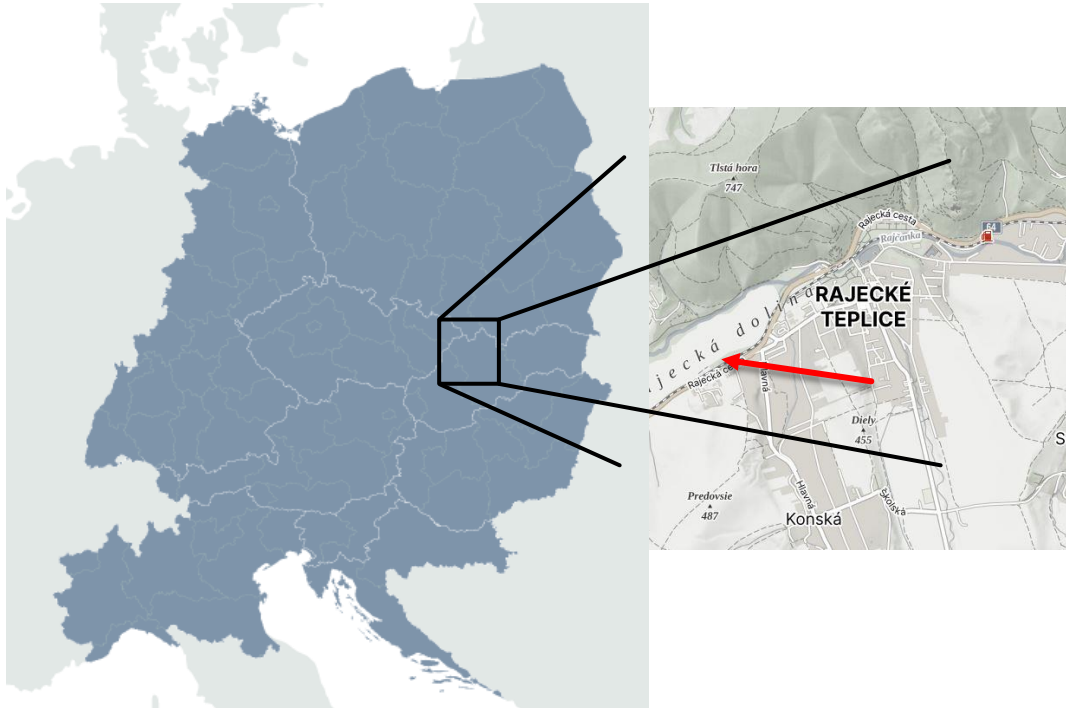
But with planned, minimal reconditioning the railway line does not enable a suitable transport connection to the 190 ha industrial zone that is located near Ohrdruf. For a regular freight the condition of the tracks require an upgrade to enable higher speeds and a technical signal system to allow multiple trains in the same time on the railway line.

Additionally there is a strong political will for re-establishing public passenger transport on rail.

Timber transport on the Žilina - Rajec railway line

Žilinský kraj (SK)

Quick Facts



Location:	Kónská loading point
Kind of goods:	Timber
Volume:	5 trains per week
Distance by train:	72km (Slovak section, section to the border crossing station)

Description

Railway line Žilina - Rajec

The railway line Žilina - Rajec is a regional railway line connecting the regional capital city of Žilina with the municipalities that lie south of Žilina, along the Rajčianka river. It is a non-electrified single-track line with a local importance. ZSSK Cargo provide of pperation the local freight train (Mn train) and transit freight train (Pn). Based on the timetable some freight trains runs regulary (Pn) or "ad hoc" (Mn).

Existing companies with wood processing:

- Lesy SR - Kónská pri Rajci and Porúbka
- PS Wood - Zbyňov
- Drevomax - Kónská pri Rajci

Loading station (hub) Kónská pri Rajci

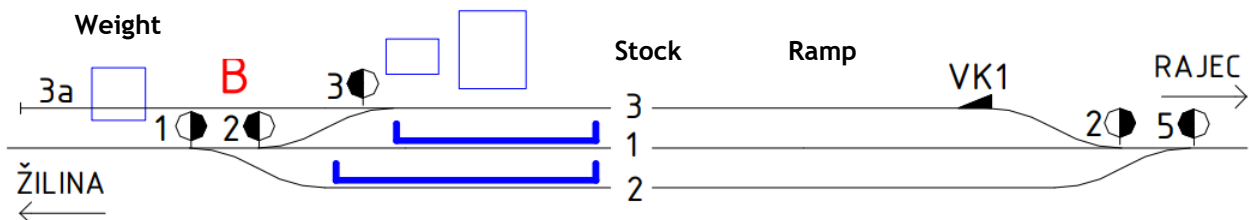
The Kónská pri Rajec loading station is located at km 16.643 of the single-track non-electrified railway line Žilina - Rajec. The neighbouring stations are Lietavská Lúčka and Rajec. The goods are connected to the track via points K1, K2, K4 and K5. The warehouse is also a stop. It is assigned to the Žilina station.

Access to loading station

Access to the loading station is from the public road - 1st class road no. 64 towards the station reception building. Emergency and escape routes are identical to the access routes.

From an operational point of view, it is an intermediate station - D3. Tracks no. 1 and 2 are always in service. Track 2 is used as a siding. Track no. 3 is for loading and on track no. 3a is the rail weight.

Scheme of Kónska pri Rajci:



Technical equipment:

- wagon weigh-bridge
- open warehouse
- side ramp

Transport indicators for the station/transport point/tariff point Rajec

There is a long-term downward trend in the dynamics of the development of the indicators for the loading station Kónska pri Rajci. This fact is also caused by the increasing competition from road transport on the one hand. On the other hand, there are the threats listed below.

- **Volume of goods:** 198 750 t/year

Indicators for one train:

- Σ wagon km: 1080
- Σ train km: 72
- Σ gross train km (consignments)= 1125
- Σ gross train km (locomotive)= 6000
- Σ locomotive km (including shunting) = 75

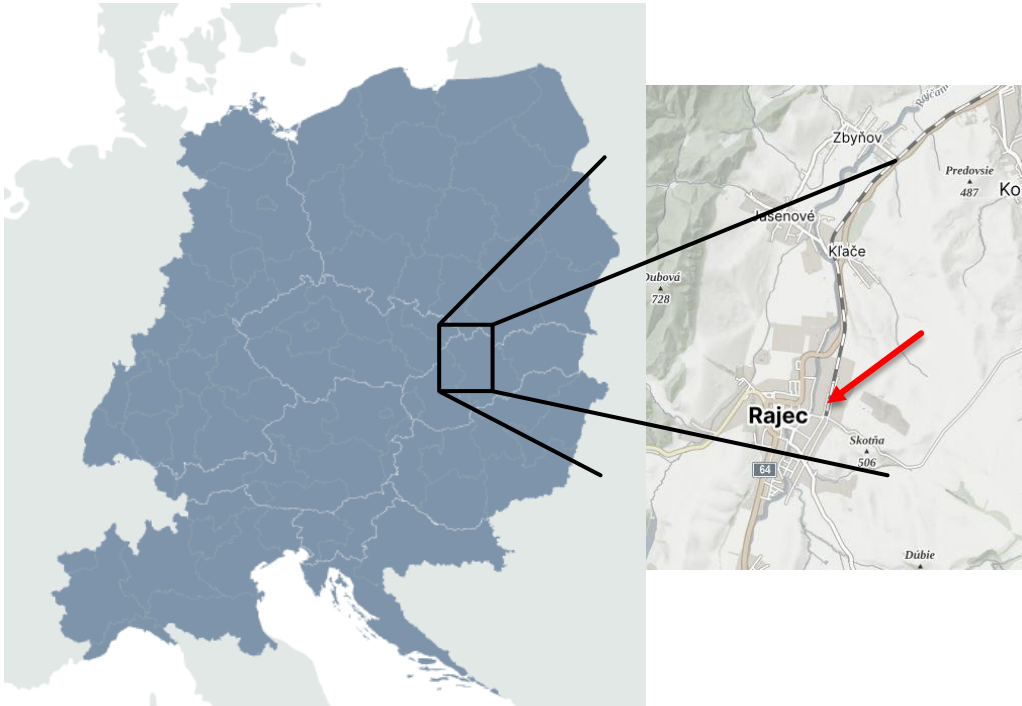
Threats:

- Location of loading station
- Capacity of infrastructure
- Road transport
- Connection to the rail corridor (PAN V, VI, RFC 9) - closure/reconstruction of Žilina station (next 2-3 years)
- High charges for local freight (Mn) trains
- Outdated infrastructure
- Lack of staff

Stone transport on the Žilina - Rajec railway line

Žilinský kraj (SK)

Quick Facts



Location:	Rajec station
Kind of goods:	Stone
Volume:	2 train per week
Distance by train:	86 km (Slovak section, section to the border crossing station)

Description

Railway line Žilina - Rajec

The railway line Žilina - Rajec is a regional railway line connecting the regional capital city of Žilina with the municipalities that lie south of Žilina, along the Rajčianka river. It is a non-electrified single-track line with a local importance. ZSSK Cargo provide of pperation the local freight train (Mn train) and transit freight train (Pn). Based on the timetable some freight trains runs regulary (Pn) or "ad hoc" (Mn).

Existing companies on the site and production profile:

- Ferona - metallurgical company (Bytčica)
- Ekocell - industrial company (Lietavská Lúčka)
- KFTS - industrial company (Rajec)
- Lesy SR - Wood processing (Konská pri Rajci and Porúbka)
- PS Wood - Wood processing (Zbyňov)
- Drevomax - Wood processing (Konská pri Rajci)

- Other agricultural and industrial companies (cement, gravel, stone, wood, waste...)

Railway station Rajec

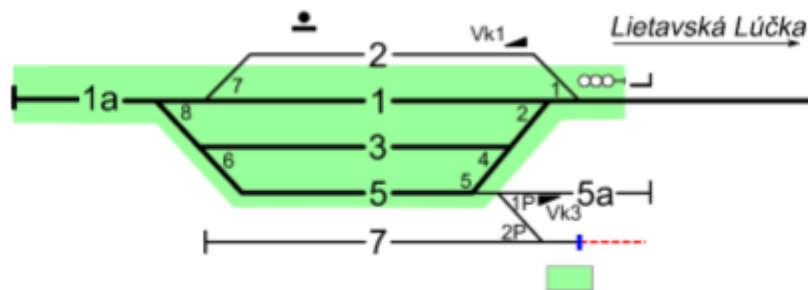
Rajec railway station is accessible from Nádražná Street and is used for passenger and freight transport.

The Rajec railway station is located at km 21.285 of the single-track non-electrified Žilina - Rajec railway line. According to the nature of the work, the station is a mixed starting, finishing and dispatching station for the Rajec - Žilina line. It is not an independent station. It is located in the Žilina station. At the Rajec station, the siding, which is currently out of service, branches off from track no. 7 via switch no. P2.

- **Location on the railway line:** ŽSR no. 126: Žilina - Rajec [Km 21,285]
- **Track in the station:** Transport: 3 Loading: 3
- **Rail gauge** 1 435 mm

At Rajec station there is a category 1 safety device. The entrance sign is illuminated, independently of the points, in a position that allows the train to pass with a warning sign. At the Lietavská Lúčka - Rajec intermediate station there is a category 1 safety device in both directions - a telephone communication method.

Scheme of railway station Rajec:



Equipment in the station

Ramps: There is one side ramp in the station - uncovered with an unpaved surface. The length of the ramp is 20m and the width is 8m. The ramp is located next to track number 2. Access to the ramp is from the local road.

Handling areas: General loading and unloading track no. 7 is located on the east side of the station with a length of 86 m and is lit by electric poles. The handling area is reinforced with concrete slabs.

Warehouse: the station has a rented warehouse in the second part of track no. 7, rented by the tenant FABŠO Pavol. The length of the warehouse track is 80 metres. Access to the warehouse is from the eastern side. The warehouse at track no. 2 is rented by DOLKAM Šuja. The area of the warehouse is 294 m². The tenant has installed mechanisation equipment for loading railway wagons on this area.

Transport indicators for the station/transport point/tariff point Rajec

There is a long-term downward trend in the dynamics of the development of the indicators for the Railway station Rajec. This fact is also caused by the increasing competition from road transport on the one hand. On the other hand, there are the threats listed below.

- **Volume of goods:** 93 280 t per year

Indicators for one train:

- Σ wagon km: 1548
- Σ train km: 86
- Σ gross train km (consignments)= 1330
- Σ gross train km (locomotive)= 7120
- Σ locomotive km (including shunting) = 89

Threats:

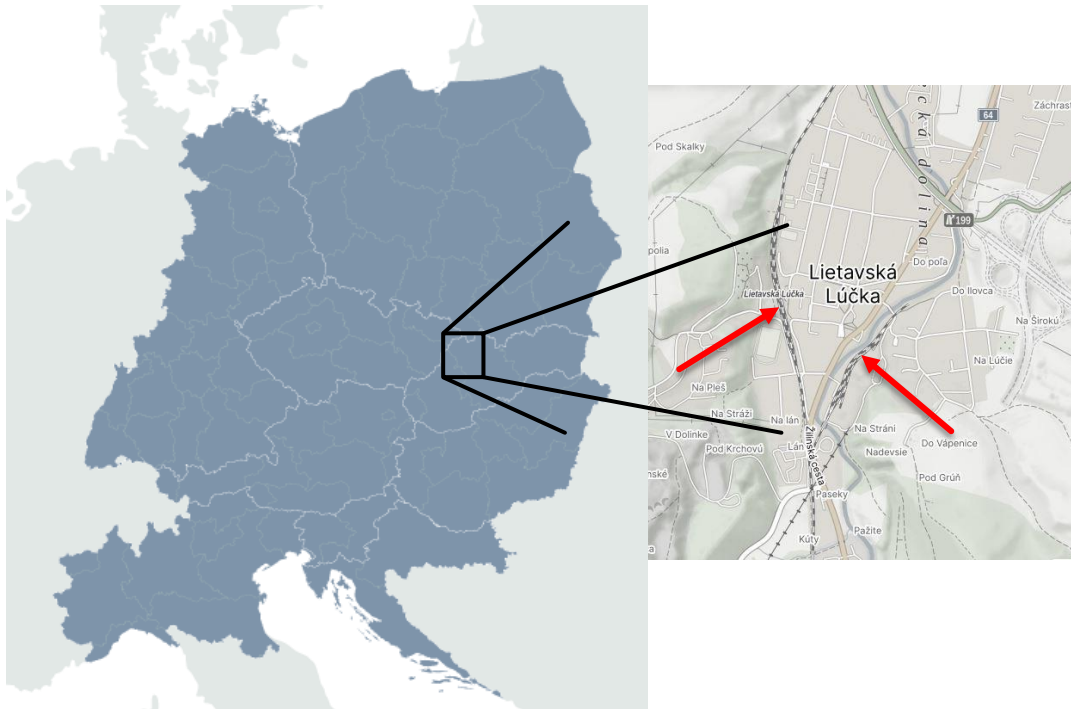
- Connection to the rail corridor (PAN V, VI, RFC 9) - closure/ reconstruction of Zilina station (next 2-3 years)
- Capacity of infrastructure is very low
- High charges for local freight (Mn) trains
- Outdated infrastructure
- Lack of staff

Low axleload limit

Limestone transport on the Žilina - Rajec railway line

Žilinský kraj (SK)

Quick Facts



Location:	Lietavská Lúčka station
Kind of goods:	Limestone
Volume:	2 trains per week
Distance by train:	117 km

Description

Railway line Žilina - Rajec

The railway line Žilina - Rajec is a regional railway line connecting the regional capital city of Žilina with the municipalities that lie south of Žilina, along the Rajčianka river. It is a non-electrified single-track line with a local importance. ZSSK Cargo provide of pperation the local freight train (Mn train) and transit freight train (Pn). Based on the timetable some freight trains runs regulary (Pn) or "ad hoc" (Mn).

Existing companies on the site and production profile:

- Ferona - metallurgical company (Bytčica)
- Ekocell - industrial company (Lietavská Lúčka)
- KFTS - industrial company (Rajec)
- Lesy SR - Wood processing (Konská pri Rajci and Porúbka)
- PS Wood - Wood processing (Zbyňov)

- Drevomax - Wood processing (Konská pri Rajci)
- Other agricultural and industrial companies (cement, gravel, stone, wood, waste...)

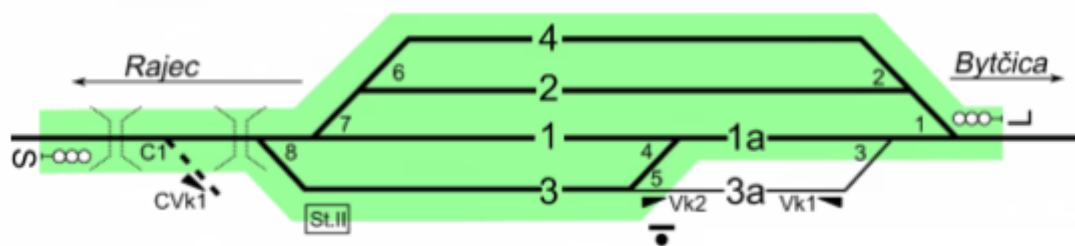
Railway station: LIETAVSKÁ LÚČKA

The railway station Lietavská Lúčka is situated at km 7.697 of the single track non-electrified railway line Žilina - Rajec. According to the type of work, it is a mixed and intermediate station. It is not an independent station. It is located in the Žilina railway station. The Lietavská Lúčka station has category 1 safety equipment with independent illuminated entrance signs and manually operated points secured by interchangeable locks. In the intermediate section Lietavská Lúčka - Bytčica and Lietavská Lúčka - Rajec there is a category 1 safety device in both directions - a telephone communication method.

Access to the station

Access to the traffic office is from the village along the public road (Staničná Street). Access to St. I. is from the reception building along the pavement next to the 3a track. The access road to St. II. is a footpath next to track 3a, then a footpath next to track no. 3 to the building of St. II. The access to St. III is from the building of St. II along the public road up to the building of St. III.

Scheme of railway station Lietavská Lúčka:



Railway station equipment

The weighbridge is located on track 3a with a length of 10 metres and a capacity of 45 tonnes without track interruption. It can be operated electrically or manually. There is an open side ramp at the station. The length of the ramp is 25 m. The ramp is located next to track 3a. Access to the ramp is from the local road. At the station, next to track 3a, there are handling areas for loading and unloading wagon consignments. The area is paved and can be accessed from the local roads.

Private siding “Cementáreň Lietavská Lúčka”

The owner of the private siding is Cementáreň Lietavská Lúčka a.s. At the railway station, it joins track no. 1, point no. C1. The boundary between the track and the siding is defined by the final connection of switch no. C1 at km 8.408. The operation of the siding is ensured on the basis of the Permission for the Operation of the Siding no. 0174/1997/P issued by the State Railway Office on 12 November 1997 in accordance with the Railway Act for an indefinite period.

Transport indicators for the station/transport point/tariff point Lietavská Lúčka

There is a long-term downward trend in the dynamics of the development of the indicators for the Lietavská Lúčka hub. This fact is also caused by the increasing competition from road transport on the one hand. On the other hand, there are the threats listed below.

- **Volume of goods:** 50 880 t per year

Indicators for one train:

- Σ wagon km: 1170
- Σ train km: 117
- Σ gross train km (consignments) = 730
- Σ gross train km (locomotive) = 9360
- Σ locomotive km (including shunting) = 120

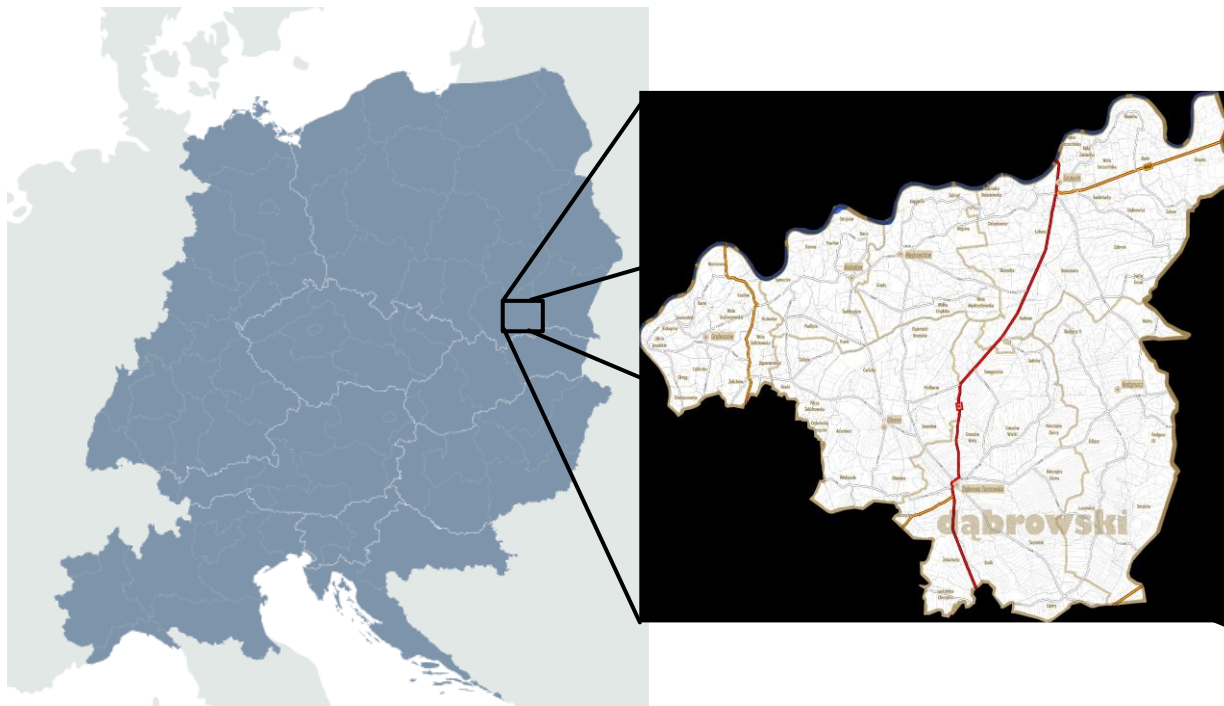
Threats:

- Ending of the transport of limestone block trains to the Nováky power plant (largest transport volume)
- Connection to the rail corridor (PAN V, VI, RFC 9) - closure/reconstruction of Zilina station (next 2-3 years)
- High charges for local freight (Mn) trains
- Outdated infrastructure
- Lack of staff

Revitalization of Line 115

Małopolska (PL)

Quick Facts



Location:	Tarnów Sub-region
Kind of goods:	Chemical products, Construction materials, Machinery
Volume:	3 trains per week
Distance by train:	250 km

Description

The idea is the revitalization of 25 km railway line on the section Tarnów - Żabno - Dąbrowa Tarnowska which is currently denoted as railway line nr 115.

The new conception has to include the increase of railway from single to double track on the section Tarnów - Żabno, electrification of the track on the section Tarnów - Dąbrowa Tarnowska and the construction of at least two new logistic (multimodal) points all long to the railway. The points have to be equipped in the freight loading ramp, ensuring the fast and easy goods transport. In the city of Dąbrowa Tarnowska the project has to include the building of logistic center and development of the train station - ready to operate the communication with the logistic center and occasional passengers traffic service.

In August 2018 was born the plan of re-activation of the railway 115 and to extend the rail to the City of Busko-Zdrój. The plan was the reaction to the national project of the Central Communication Port (CCP) and to the need to create the railway (passengers) connection between CCP and habitants of the City of Tarnów.

In 2020 modernization of the line Tarnów - Szczucin was included in the program of investment for years 2021-2030 with perspective 2040.

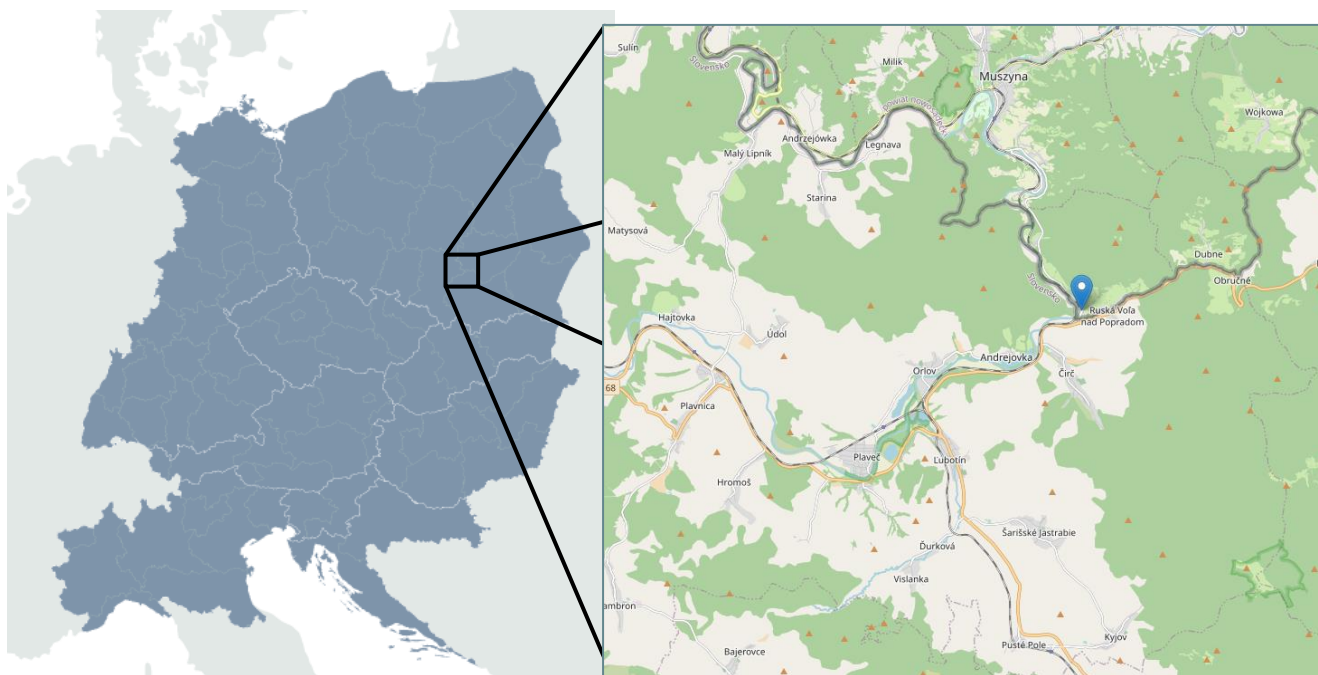
The owners or administrator of the railway siding are committed to obtain the formal security certificate

In addition to it, the railway nr 115 could be a part of a prospective railway connection between Warsaw and Budapest through cities of Tarnów and Nowy Sącz. Therefore a gap closure between the railway nr 115 and the railway nr 73 with a new railway section between Busko-Zdrój and Tarnów need to be build.

Rail Border Crossing Muszyna - Plavec

Małopolska (PL)

Quick Facts



Location:	Tarnów Sub-region
Kind of goods:	chemical products, construction materials, metal industry
Volume:	4 trains per week
Distance by train:	100 km

Description

Rail border crossing Muszyna-Plaveč, dedicated to freight and passenger rail transport was very active and used until to years 2007/2008. It was one of the most important railway connecting Nord and South part of Central Europe. The regular line handled the traffic between Poland (sea board) and Slovakia (Koszyce, Poprad), Hungary (Budapest), Romania (Bucharest) and Bulgaria (Sophia, Varna) with the EuroCity connections.

Rail border crossing Muszyna-Plaveč, from Polish side, is located at the end of railway nr 96 (145 km) from City of Tarnów, through the stations in the City of Nowy Sącz to the Muszyna-Leluchów border point. On the Slovakian side the railway runs to the Plaveč town, and next to the junction station Kysak connecting with the nord main railway Žilina - Košice. It's one of two electrified rail border crossing between Poland and Slovakia.

As result of the Schengen Agreement at 21.12.2007 the formal customs point and border guard was closed. Starting from the year 2010 and the results of catastrophic flood the importance of PL - SK border crossing Muszyna - Plavec began to decline. The damage of the flood caused the elimination of rail transport, both

if it concerns freight and passengers traffic. On the Slovakian side the transport between City of Poprad and nord side of the region they ran only in a shortened relation to Lubovnia 16 km before Plaveč.

Progressive degradation of technical and infrastructural aspects of the Rail border crossing Muszyna - Plaveč caused a threat for any rail traffic.

The main polish railways operator PKP PLK decide in 2022 to undertake repair work on several section Kłokowa - Stróże, Tarnów Filia - Kłokowa, Nowy Sącz , Biegonice - Muszyna. The renovation includes the replacement of rails and sleepers as well as the repair of engineering structures of bridges, culverts and a rail-road crossing.

Potentials:

- Strong tourist, sport and event center. Hugh offer of medical treatment. One of the most attractive tourist area in South of Poland.
- Food industry
- Wood construction
- Micro and Small Business structure
- Agriculture and regional products

Conclusion and re-action plan:

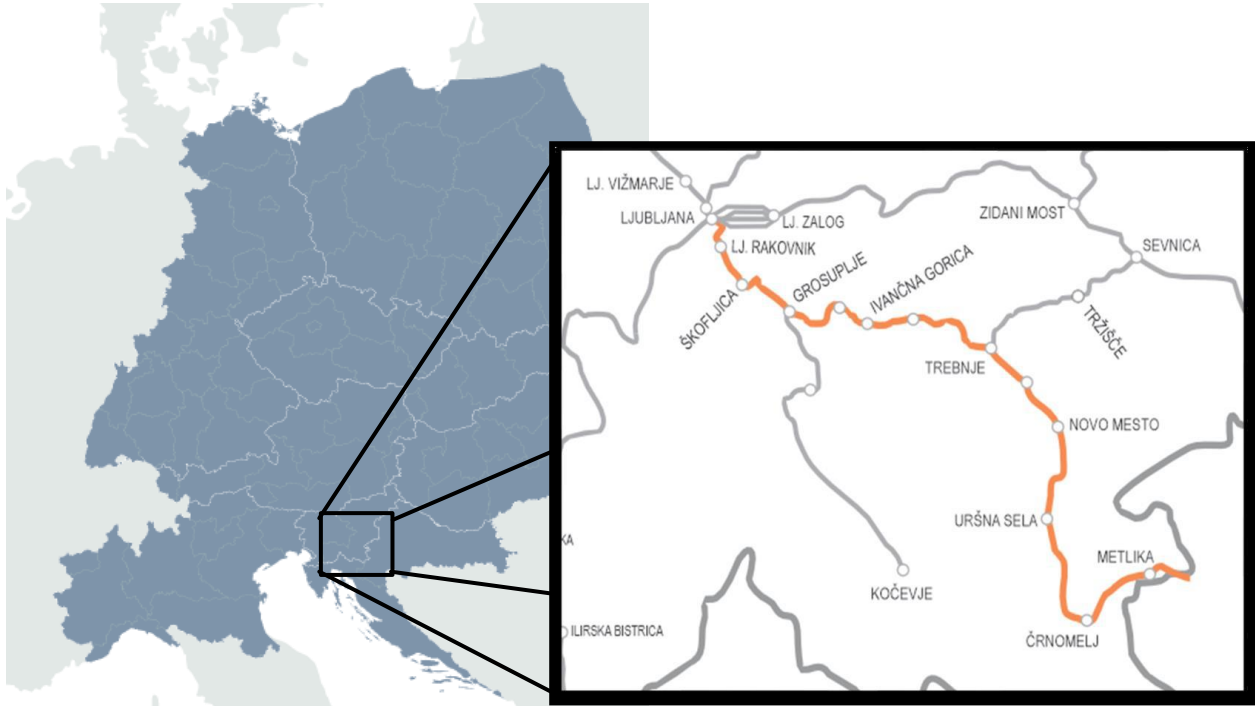
1. The re-opening of the rail traffic using the Polish-Slovakian border crossing Muszyna-Plaveč needs the common activity in both side of the border. First step could be made by Polish and Slovakian rail operators and, on the national level, by the ministry of transport infrastructure.
2. The local importance of the small transborder traffic have to be included in the strategic and long term investment program of the Małopolska Region, border districts (Tarnów, Nowy Sącz, Krynica, Muszyna, Rytro etc) and the similar partners from Slovakia.
3. Analyze of the economic potential and stakeholders interested in improvement and enlargement of transport opportunity in the cross border area ("little border traffic")
4. Re-opening of the freight railway connection in the Pilot Plan for Rail border crossing Muszyna-Plaveč and with a participation of local enterprises.
5. Elaboration of development plan for re-opening passenger traffic in the cross border area.
6. Initiative (public support) for a new regional railway operator dedicated to the short line connection.

Marketing of the project - regional promotion and research about the impact of the railway connection on local / sub-regional economic development.

Access to rail for “Adria Mobil” via the line Ljubljana - Metlika

Slovenia

Quick Facts



Location:	South-East Slovenia (Dolenjska region)
Kind of goods:	Mobile homes, Motorhomes
Volume:	1 train per week
Distance by train:	228 km Novo mesto-Koper (to Port of Koper) 139 km Novo mesto-Jesenice (to Central Europe) 172 km Novo mesto-Šentilj (to Central and East Europe)

Description

In Novo mesto (city in south-east Slovenia) there is a company “Adria Mobil” which is one of Europe’s leading companies in the recreational vehicle and mobile home markets. These products are distributed across Europe and beyond. All products are transported by road (highway A2 via Ljubljana, Zagreb) to customers and dealers (Central Europe, East Europe, South Europe, Port of Koper).

All products are transported by road (highway A2 via Ljubljana, Zagreb) to customers (Central Europe, East Europe, South Europe, Port of Koper).

City Novo mesto is located next to the regional railway line Ljubljana-Metlika R80. The regional railway line is single track railway line with diesel traction, old safety devices, low line speeds and short station’s sidings. This is also the reason why the freight traffic does not take place on the track, but on the road.

Railway line	Passenger trains in 2022	Freight trains in 2022	Net tonnes in 2022	Gross tonnes in 2022
Novo mesto-Trebnje	9.920	409	44.847	108.364

Challenges:

- Upgrading and modernization of the existing regional railway infrastructure

Opportunities:

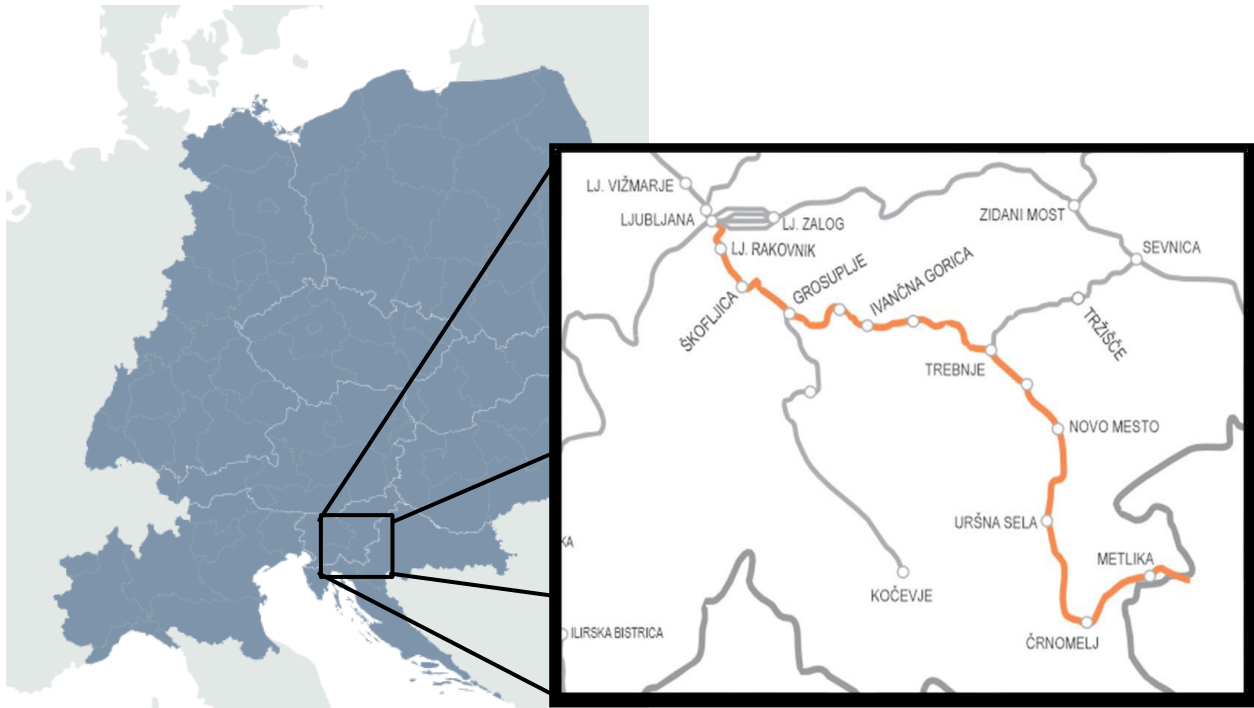
- Goods suitable for train
- Strong political (national and EU) will to re-establish rail transport

The regional line R80 connects to the main TEN-T network in Ljubljana.

Access to rail for “Revoz” via the line Ljubljana - Metlika

Slovenia

Quick Facts



Location:	South-East Slovenia (Dolenjska region)
Kind of goods:	Cars
Volume:	5 trains per week
Distance by train:	228 km Novo mesto-Koper (to Port of Koper) 139 km Novo mesto-Jesenice (to Central Europe) 172 km Novo mesto-Šentilj (to Central and East Europe)

Description

In Novo mesto (city in south-east Slovenia) there is a company “Revoz”, which is one of the biggest Slovenian companies, the only car manufacturer in the country and has been its No 1 exporter for several years. Revoz carries out its mission within global automobile alliance joining Renault, Nissan and Mitsubishi. In addition to Renault models Twingo and Clio, Revoz plant produces also the electric vehicle - Twingo Electric. In 2022 they produced 95.000 cars in company.

All produced cars are transported by road (highway A2 via Ljubljana, Zagreb) to customers (Central Europe, East Europe, South Europe, Port of Koper).

City Novo mesto is located next to the regional railway line Ljubljana-Metlika R80. The regional railway line is single track railway line with diesel traction, old safety devices, low line speeds and short station`s sidings. This is also the reason why the freight traffic does not take place on the track, but on the road.

Railway line	Passenger trains in 2022	Feight trains in 2022	Net tonnes in 2022	Gross tonnes in 2022
Novo mesto-Trebnje	9.920	409	44.847	108.364

Challenges:

- Upgrading and modernization of the existing regional railway infrastructure

Opportunities:

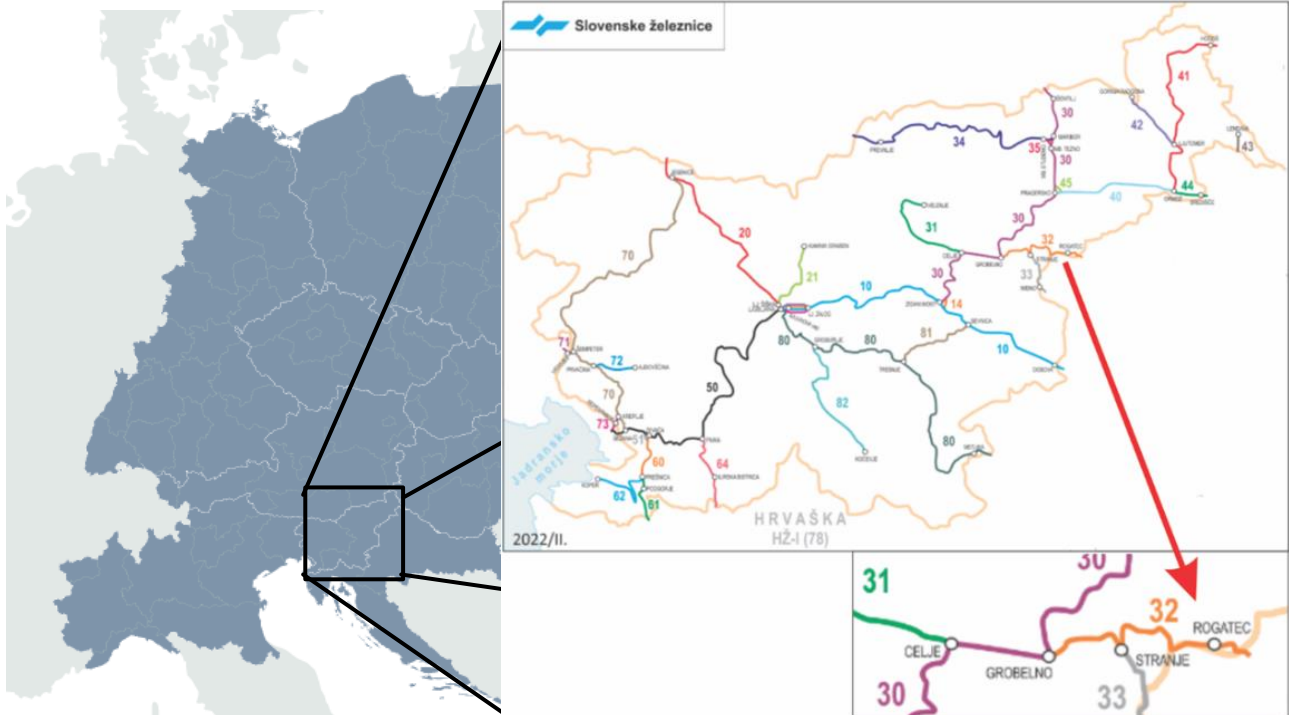
- Goods suitable for train
- Strong political (national and EU) will to re-establish rail transport

The regional line R80 connects to the main TEN-T network in Ljubljana.

Sand transport on the line Rogatec - Grobelno

Slovenia

Quick Facts



Location:	East Slovenia
Kind of goods:	Sand
Volume:	4 trains per week
Distance by train:	95 km Rogatec-Šentilj

Description

Regional line R32 state Rogatec-Grobelno is one of the regional, single-track and non-electrified lines in Slovenia, which has a length of 36.5 km. The line crosses the national border and connects the towns of Grobelno in Slovenia and Krapina in Croatia. The industrial track of the glass factory is connected to the Rogatec railway station, which is one of the four stations on this line. The length of the industrial track from the Rogatec station to glass factory is about 500 m. The factory is located next to the Slovenian-Croatian border, which runs along the middle of the Sotla river.

The glass factory produces, sells and distributes glass packaging in Croatia, Slovenia, Bosnia and Herzegovina and Serbia, as well as in other countries of South-Eastern Europe.

In 1996 the glass factory was modernised by reconstructing buildings, building new premises and improving the operation of production, the company achieved higher efficiency and lower energy consumption. The glass factory is today one of the leading European manufacturers of packaging glass, with many other owned glass factories in Europe. The glass factory produce approximately 960 tons of glass daily. The annual

production volume of the glass factory amounts to approximately 220,000 tons of glass packaging, which means almost one billion bottles and glasses intended for domestic and foreign markets.

Sand, as an input raw material for the production of glass, is obtained by the glass factory from the sand pits of Šajdíková (between Senica and Kúty, near the Slovak-Moravian border) and Provodín (near Lake Mách), which are located in Slovakia and the Czech Republic. In 2022 for the needs of the glass factory, 2,310 freight wagons of sand or 124,860 net tons were transported. The cargo was carried by 220 trains.

Freight trains with sand from the Czech Republic and Slovakia via international freight corridors arrive with electric locomotives to Celje station. The train consists of closed freight wagons of the Tads type. The length of the train is 320 m, it consists of 21 wagons and has a total weight of 1,600 gross tons. Due to its large mass, the train splits into two parts in Celje and is pulled by diesel locomotives on the Celje-Rogatec route due to the non-electrified line.

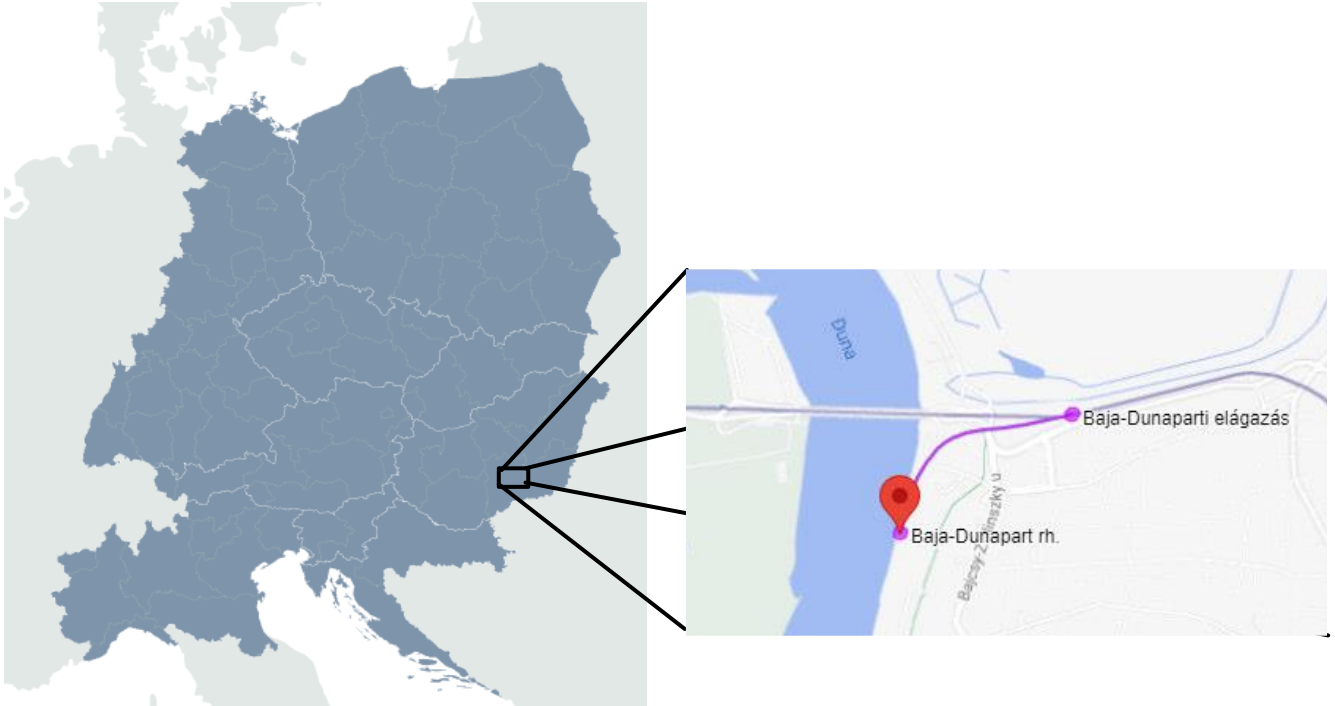
E. Revitalization of sidings or feeder lines

If sidings or feeder lines do not give a convenient connection to the main rail network anymore, a revitalization is needed to give access for the demanded transportation. In case of sidings, it is usually a private track belonging to a single or multiple companies. In case of feeder lines there are usually multiple access points which connect an industrial zone or commercial area to a station of the rail network.

Railway connection to port of Baja

Dél-Alföld

Quick Facts



Location:	Baja
Kind of goods:	Grain, other bulk goods (fertiliser, timber, etc.)
Volume:	550000 tons, 7 trains per week
Distance by train:	200-1.200 km

Description

This case study represents the railway connection of the port of Baja. The port is one of the most important river ports on the southern border of the European Union. Over the past decades, infrastructural developments in the current port have been only partly completed. Without further investments the port cannot sustain its current traffic. Ten years ago, the Hungarian government declared the development of the port - including the development of the railway connection - a priority project but renovation and extension of the siding in the port has just started recently. The port's siding network is currently single-track, with sidings, enabling loading and unloading. At present the network is 2 km long. The renovation will include the renewal of the track connecting the siding to the railway line, the extension of the siding and the construction of 3 400 m long tracks, which will enable to provide services for block trains in the port. The wagons will be moved and sorted within the port area by a tractor.

Due to the ongoing development port will become trimodal in reality. Development of the port, including development of the rail connection, is in line with Hungarian and EU transport and climate policy strategies. Potentials of inland waterway-rail and road-rail transport could attract more goods to the port. At the same time, in order to increase rail freight traffic, it would be advisable to upgrade the railway line 154 including the Danube bridge (two tracks, electrification). However, there is no real chance that it

will be accomplished in the near future, because in the medium term, section of the railway line 154 between Baja and Bácsalmás would be renewed when the railway line Baja - Subitca is rebuilt. It is still unclear, how to operate the siding, purchase the necessary traction vehicle, provide and train the necessary staff.

Baja is located along the railway line 154 that connects Bátaszék with Kiskunhalas. To increase the amount of transported good on rail, it also needs to be upgraded. Then it could also play a key role in the Hungarian railway transport, because here is the only railway bridge over the Danube south of Budapest. But currently this railway line is only a single-track line, not electrified, carrying a relative small volume of the rail freight traffic. The current maximum speed limit on this railway line is 100 km/h and permitted axle load is 210 kN. Considering that the superstructure was last renovated between 1967 and 1970, and at the same time the railway line is exposed to both passenger and freight traffic, it is significantly worn and in need of renovation.

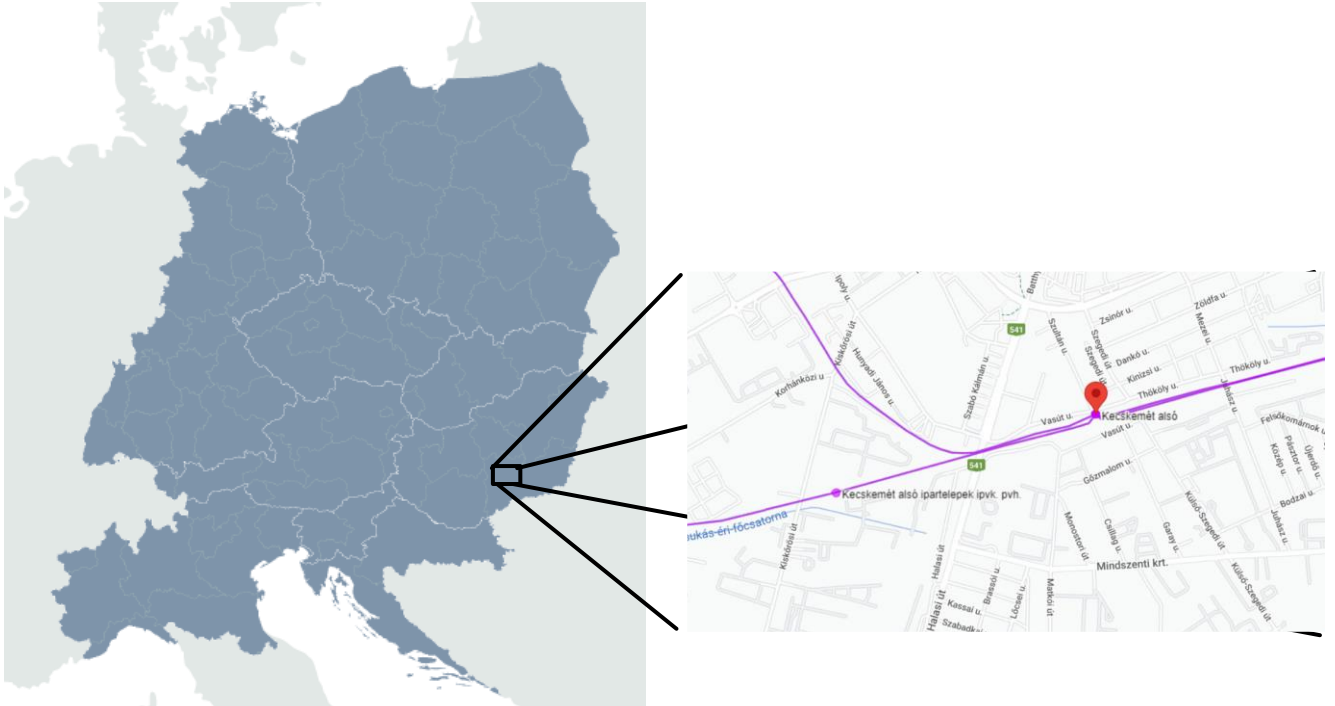
The development of the railway line between Baja and Subotica (Serbia) would have a significant impact both on rail passenger and rail freight traffic in the region. The former railway line was cut by the Trianon border between Chikéria and Subotica. In the remaining part of the line in Hungary, the Baja - Bácsalmás section is now part of the railway line 154. The majority of the tracks up to Chikéria has been preserved, but the superstructure is incomplete, a lush vegetation has almost completely overgrown the rails. The Hungarian state is counting on the financial aid of the European Union to restart traffic on the railway line. The construction works are not scheduled, they are only included in the medium-term development plans (valid until 2030).

Railway line 154 M, connecting Baja station with the riverbank of Danube (Baja Dunapart station, the siding of Baja Port is connected here) branches off between the stations Baja and Pörböly. It is a single-track, diesel-powered line. Currently the trains can run on the open line at a maximum speed of 25 km/h, on the tracks of the station Baja-Dunapart just at a speed of 5 km/h. Baja-Dunapart station is a service station without train service personnel. For trains, the switch must be set and controlled by the authorised traffic officer on duty at the railway station in Baja. There is a station-to-station service between Baja-Pörböly stations. Only one train is allowed to run or stay in the service area at the same time.

Industrial sidings in Kecskemét

Dél-Alföld

Quick Facts



Location:	Kecskemét
Kind of goods:	Scrap, grain, other goods/container
Volume:	500000 tons, 8 trains per week
Distance by train:	200 - 1.300 km

Description

Kecskemét is a railway hub, has two railway stations (Kecskemét and Kecskemét-alsó) and several railway main and branch lines in different conditions.

In Kecskemét are several industrial sidings located, belonging to different owners:

1. **Alcufer Zrt.**
one of the most important companies in the Hungarian waste industry
2. **ÁTI Depó Zrt.**
Logistics service provider with one of the largest warehousing capacities in Hungary, one of its main profiles is the operation of grain silos
3. **Kiskőrösi úti Kft.**
was established specifically for the operation and development of the Kiskőrösi Road depot in Kecskemét, with the task of leasing warehouses and loading areas
4. **Profi Trans Hungary Kft.**
Road carrier and freight forwarder not involved in rail transport
5. **Appennin Holding Nyrt.**
Dynamic, growing real estate investment and asset management company focused on the quality of office and retail property market

If considering only the potential traffic of the first three siding tracks, which are in good technical condition and have a licence for use, the storage and loading capacities available on them would currently allow 500-600 thousand tonnes of goods to be transported by rail. If the potential traffic of the other two currently disused sidings is added to this, this volume would not double, but would increase significantly.

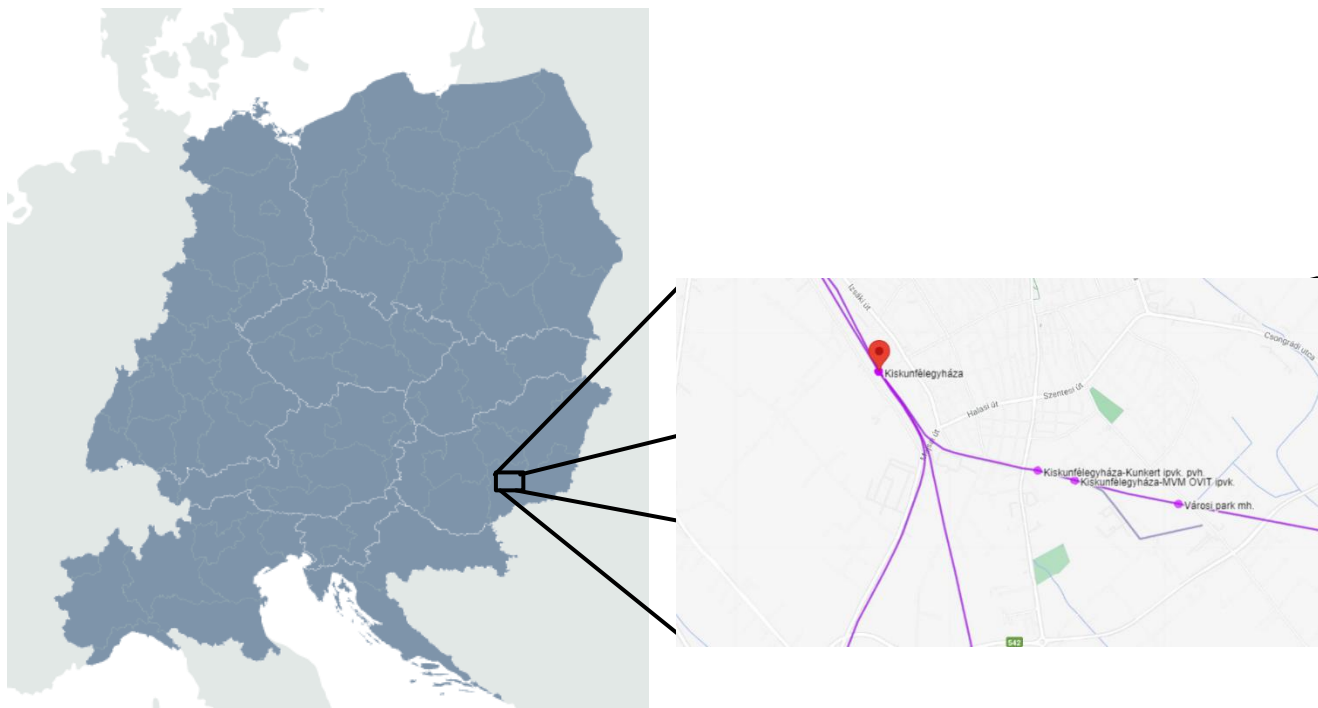
But for this to happen, several conditions must be met. The first of these challenges is the renewal of the common track, which is currently a physical barrier to the traffic on the siding. As it is jointly owned, the costs of renovation should be shared, but currently only 2 of the 5 companies would be willing to pay for this. Up to the siding of Alcufer Zrt., which is the first in line, the condition of the connecting line is still sufficient for a train traffic, but then follows a section of track in a bad state that cannot be used for traffic. For the time being the two companies at the end of the line do not want to renovate their sidings, henceforward they are not willing to invest in the connecting track either.

Once the infrastructural obstacles are removed and the sidings can be actually used, the next challenge is to find customers who are willing to take advantage of this opportunity to receive and dispatch their goods by rail.

Industrial siding of NT Kft., Kiskunfélegyháza

Dél-Alföld

Quick Facts



Location:	Kiskunfélegyháza
Kind of goods:	sunflower seeds, sunflower cooking oil, oilcake
Volume:	500000 tons, 8 trains per week
Distance by train:	200 - 1.300 km

Description

NT Élelmiszertermelő és Kereskedelmi Kft. (NT Food Production and Trade Ltd.) is a Hungarian subsidiary of the Czech AGROFERT Group, which produces refined sunflower oil in Kiskunfélegyháza. Based on the current production capacities of the factory, 400 thousand tonnes of sunflower seeds, 160 thousand tonnes of cooking oil and 160 thousand tonnes of sunflower meal could be transported by rail, even the total volume produced. Considering the company's plans for further growth, this volume could be increased significantly. However, first supply market and the distribution area have to be considered. According to the experience of the factory, rail freight transport is a good option for freight charges above a distance of about 400 km, but for shorter distances the price advantage of road transport is indisputable. However, even if rail freight charges are lower over 400 km, the additional costs of the road transport cannot be neglected. Moreover, delivery time is much longer and more unpredictable. The factory has a storage capacity for a volume of only 10,000 tonnes, and in order to ensure continuous production, the sunflower seeds to be processed must arrive and be available in time.

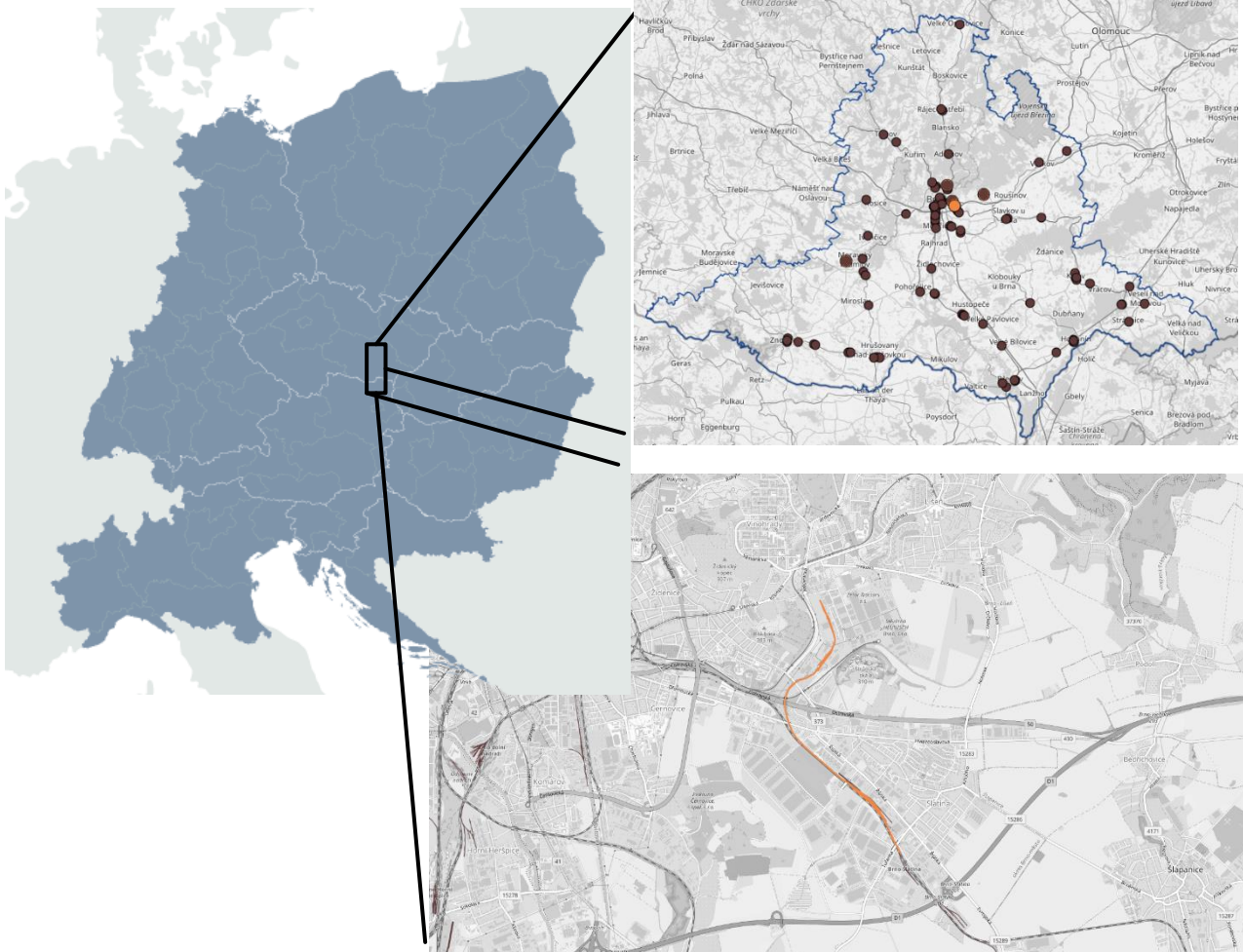
Renovation and extension of the currently abandoned and unusable siding to the manufacturing plant, and construction of rail loading and receiving facilities would be an extremely costly investment. In Hungary, there is currently no state aid provided for financing these costs, therefore neither the installation of new industrial tracks, nor the renovation or reutilisation of the existing siding can be at least partly financed by state subsidy. Currently, the full cost of the investment shall be borne by the owner of the industrial tracks. It represents a significant competitive disadvantage compared to transport on public roads, where the entire road infrastructure is built and maintained by the state. Freight charges do not reflect these costs, in fact, there is no toll for these last kilometres. In addition to raising the necessary funding, recruiting and training in-house staff to service the siding, and examining them, can be a challenge. Physical work that requires lot of skills to learn and then to pass a rigorous exam is becoming less and less attractive for today's workforce. This is a major challenge not only for siding owners, but also for infrastructure managers and rail freight companies.

The problems to be solved include finding a railway company willing to service the siding. They have to use diesel shunting locomotive to service the siding and such a locomotive must be available and dispatched by a crew. This is an important cost element, and it is the customer who will ultimately pay the costs; therefore, this could make rail freight transport even more expensive. In the best case, goods arrive by a block train, in the worst case by a group of wagons or individual consignments, but very few railway undertakings offer single wagonload transport (out of more than 50 companies with a national transit license in Hungary, only 4 were offering single wagonload transport in 2022). Finally, an important factor to highlight is that if the customer, and not the factory organises the rail transport, chooses a railway undertaking with which the factory has a contract to serve the siding, or the two railway companies should agree between themselves. In principle, for business policy reasons, the company contracting siding service will only accept consignments for which it has also provided rail freight transport.

Transportation of waste to incineration plant

South Moravian region

Quick Facts



Location:	Brno
Kind of goods:	Waste
Volume:	240 t (= 4 wagons) twice a week
Distance by train:	80-120 km approximately

Description

SAKO Brno is the operator of waste collection and an incineration plant in the South Moravian Region.

The plant is located in the south-easterly part of Brno and is connected with a siding the national railway. The siding length is about 2,5 km (with other rails 5,7 km). The tracks are adjacent to the railway station Brno-Slatina, which is located on railway line Brno-Uherské Hradiště. The siding is maintained, but not in regular use and no specific plans for usage are currently discussed.

In 2022, more than 242 000 tons of waste were processed in the incinerator. 103 thousand tons (43 %) came from the city of Brno, 85 thousand tons (35 %) were carried from other municipalities in the South Moravian Region and 53 thousand tons (22 %) came from surrounding regions. The vast majority of the waste were transported by trucks. Only very small part of this volume (10 000 to 15 000 tons / yearly) has been transported to the incineration plant on rail but not on the siding itself.

Currently, waste is transported in intermodal containers by train to the Brno-Slatina railway station. This happens approximately twice a week. The waste is loaded to ACTS container (Abroll-Container Transport System), that makes the driver possible to tranship the containers from trains to a lorry alone. The waste is then trucked 3,5 km to the incinerator. After several rounds between the railway station and the plant, the train is empty again at the end of the day.

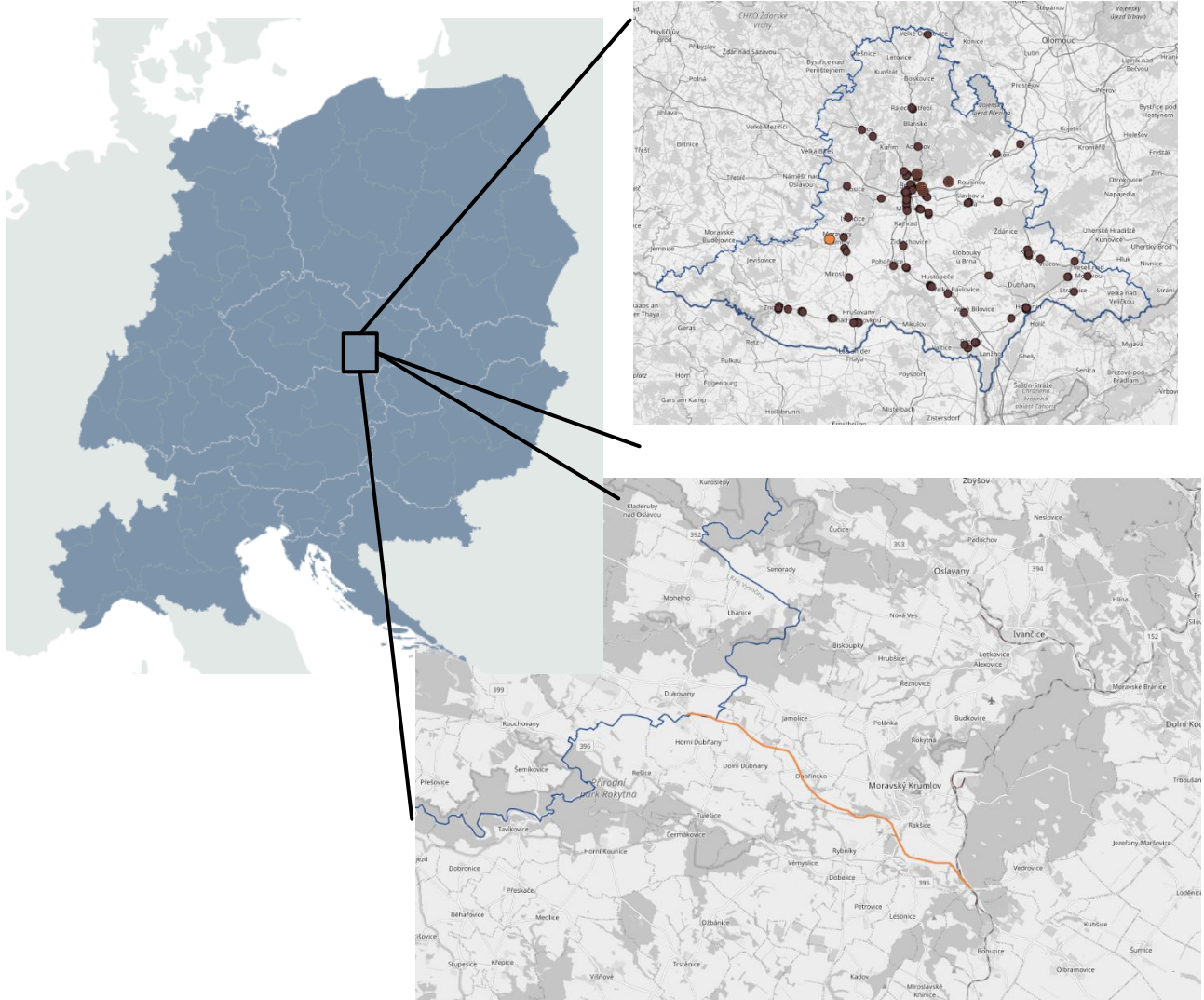
From 2030 environmentally recoverable waste cannot be landfilled anymore, therefore a plan for construction of a third boiler in the incineration plant has been considered. By this step the capacity for processing of waste would be increased from existing 240 thousand tons to roughly 370 thousand tons and waste from furthers municipalities would be shipped to Brno's incinerator. In that case, it could be hypothetically considered to use the train up to the incinerator. However, investigation of necessary investments is needed. In May 2023 the meantime the political representatives stopped preparation of the 3rd boiler, thus transport of waste directly to the plant without reloading to lorries for the last mile is again less presumable.

At present, the possibility of using the sidings for this aforementioned purpose does not seem to be promising due to economic reasons. The road transport is economically more viable. For the use of the siding to be profitable, the rental of railway wagons would have to be cheaper and the guarantee, that the wagons are available in desired time window would have to be more reliable despite construction works on the railway network. Besides that, a new technology for weighing the waste loaded in containers would have to be installed. Nowadays is the facility equipped only for taking the waste from lorries. Further investments ensuring unloading of the containers with a wheel loader in the facility would have to be solved.

Powerplant Dukovany

South Moravian region

Quick Facts



Location	Dukovany
Kind of goods:	Cement, Lime, Steel, Sands, Gravel
Volume:	Potentially 5 trains a week (the decision of transport mode has not been taken, yet); 1.670.400 tons in total (app. in 7 years) ¹
Distance by train:	Distance varying from 30 to 250 kilometres.

¹ Assumption from the document Environmental impact assessment (EIA)

Description

The Dukovany Power Plant is located near the village of Dukovany on the border of the Vysočina and South Moravian Regions. It is located about 25 kilometres southeast of Třebíč in a triangle bounded by the villages of Dukovany, Slavětice and Rouchovany.

The Dukovany Power Plant is the first nuclear power plant built in the territory of the Czech Republic. The plant has 4 generating units. The first reactor unit was put into operation in May 1985 and since July 1987 all four production units have been in operation.

The power plant is connected on the national railway with a siding, that leads roughly 17 km from the train station Rakšice on the railway line Brno - Moravský Krumlov - Hrušovany nad Jeviškovkou. This railway line is interlinked in Hrušovany with the railway line Znojmo - Břeclav. Thus, the Dukovany Power Plant is easily accessible from TEN-T railway node Břeclav.

The intention is to use of a railway siding for freight transport during the construction of a new nuclear unit. A big amount of construction materials like cement, lime, steel, sands, gravel could be potentially transported by rail. Nevertheless, the final decision on transport mode used will be taken by a contractor who will be chosen in a public tender. The owner of the power plant is the company ČEZ, which is the largest electricity producer in the Czech Republic.

The aim is to transport as much raw material as possible by rail so that the amounts of lorries and trucks on the roads would be minimised, the roads wouldn't be damaged due to heavy traffic and especially citizens would not be bothered by noise, emissions etc to any significant extent.

The project of a new nuclear unit is still in the preparation phase. It is important that the transport scenarios match the plans of construction processes. However, these are not yet known and will be elaborated by the contractor after finalisation of the public tender. Currently, construction companies are submitting their final offers to build a new nuclear unit at the Dukovany power plant, a project that is expected to become the Czech Republic's largest investment in its modern history. The completion of Dukovany is part of the State Energy Concept, which aims to make nuclear power the main source of electricity. The deadline for final bids from construction companies to complete the new unit is currently being closed. The construction itself is expected to start in 2029, with work on the new unit expected to be completed by 2036. The project will have a significant impact on the entire region, with infrastructure to be completed, such as wide access roads outside the villages or accommodation for large numbers of workers.

The siding was built in 1975 and is used for transporting chemicals needed for the operation of the Dukovany nuclear units, diesel fuel for diesel generators and large technological units such as packaging sets for used fuel. It has a length of approx. 17 km (with other rails 25 km) and is one of the longest sidings in the Czech Republic. After reconstruction in 1999-2000, the siding is still in good technical condition and light operation in 2014 and with a line speed of 60 km/h it is one of the best Czech sidings.

Regarding obstacles, a potential problem may occur at Rakšice station, from which the railway siding leads to the power plant. The capacity of the railway station may be insufficient. The contractor for the construction is unknown and will depend on the results of the selection procedure. That brings uncertainty in general at the moment.

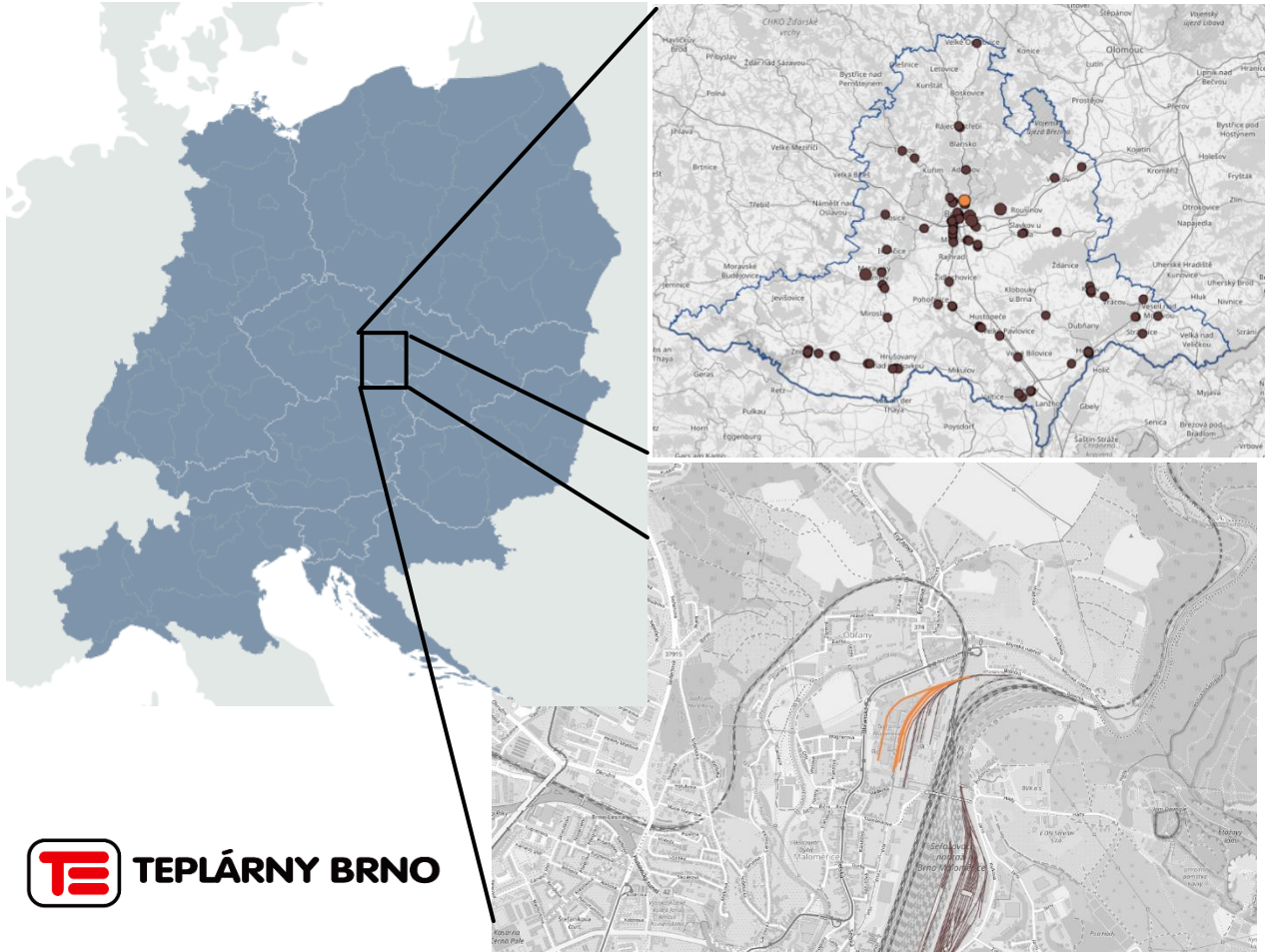
Overall, the siding has great potential, it is in good technical condition, the construction of the nuclear unit will take several years and it can be used for transporting construction materials during this time. Only for some materials the siding cannot be used, such as gravel and sand, because the nearest mining locations are not connected to the railway.

Cement:	Lime:	Steel:	Sands:	Gravel:
Čertovy schody near Praha (240 km) Cementárna Hranice na Moravě (180 km) Cementárna Mokrá (60 km)	Mokrá (60 km), Štramberk (210 km)	Moravian-Silesian Region (250 km)	Dolní Kounice (30 km), Luleč (100 km) a Opatovice	Dolní Kounice (30 km), Luleč (100 km) a Opatovice

Teplárny Brno

South Moravian region

Quick Facts



Location:	Brno-Maloměřice (city district)
Kind of goods:	wood chips
Volume:	80 000 tons per year
Distance by train:	approximately up to 150 km

Description

The siding is located in north-easterly outskirts of Brno and connects one of the Brno's heating plants to the national railway. The siding neighbours upon the railway line Praha - Brno - Břeclav which is part of the transnational Orient / East - Med Corridor.

The heating plant in Brno-Maloměřice produces heat in combination with electricity which is produced with a steam back-pressure turbine. The heat produced is supplied in the form of steam and hot water, and the electricity is supplied to the distributor's grid. In 2016, a significant modernisation of the plant took place, when one of the original boilers was replaced by two modern hot-water gas boilers. In 2023, after several years of preparations, the construction of a combined heat and power biomass unit (CHP) started. The

combustion of woodchips will replace approximately 15% of natural gas consumption since 2025. The fuel base will be diversified in this way and dependence on natural gas will be reduced. The project is co-funded from the Modernization Fund and a loan for its implementation was granted by the European Investments Bank.

The project of the CHP includes plans for intensive freight railway transport to the plant ensuring supply of wood chips. This fuel for the plant can be imagined as small pieces of wood that are produced from remains after logging and forestry. Wood chips will be transported to the plant solely in containers on trains.

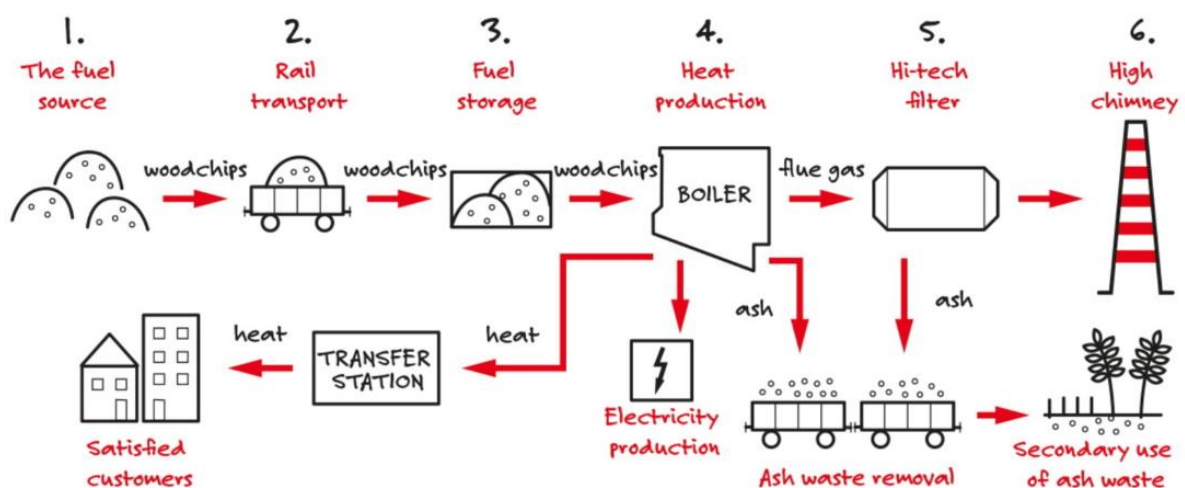
The planned shipment in regular operation is one train every working day during the heating season, i.e. October - April. This is therefore five complete trains per week. The trains will be composed of 16 to 20 wagons with a total capacity of approximately 550-750 tonnes, depending on the dampness of the wood. In total 80 000 tons of wood chips will be carried to the plant during the heating season.

The wood chips are produced in forest during logging or in a sawmill. External supplier of the biomass will deliver the woodchips from various loading points according to their current needs and harvesting locations. Teplárny Brno expected utilizing biomass from local sources within the Czech Republic. Theoretically, it is also possible to use biomass from nearby border areas in Slovakia or Austria. The planned distance from sources of the wood chips is approximately 150 km.

External supplier of the biomass will use trucks only for “first mile” from the location of harvesting or processing of the wood chips to a loading point nearby the railway. Loading points that should enable storage the mounds of wood chips and loading them into rail container are the crucial points in the supply. Finding suitable locations nearby the railway where the interim storage facilities can be established is the most limiting activity for replication or expansion of the planned supply by train.

In connection with the modernisation of the heating plant, significant part of the existing siding is being completely reconstructed. A stationary propulsion station specially designed for shunting waggons without a locomotive on along the siding will be acquired. The cost of modernising the siding itself, including new equipment for rail transport, is almost negligible compared to the whole project

The project is unique in the Czech Republic, in terms of fuel supply and train transport. The vast majority of heating plants are supplied mainly or even exclusively by road trucking. The company Teplárny Brno opted for supply of wood chips exclusively by rail to eliminate trucks in surrounding of the plant and to minimise carbon footprint in the distribution of the renewable fuel for the plant. After implementation of the project, green and efficient heat generation with lower emissions will be ensured whereas renewable resources from local woods will be utilized as fuel in the heat plant.

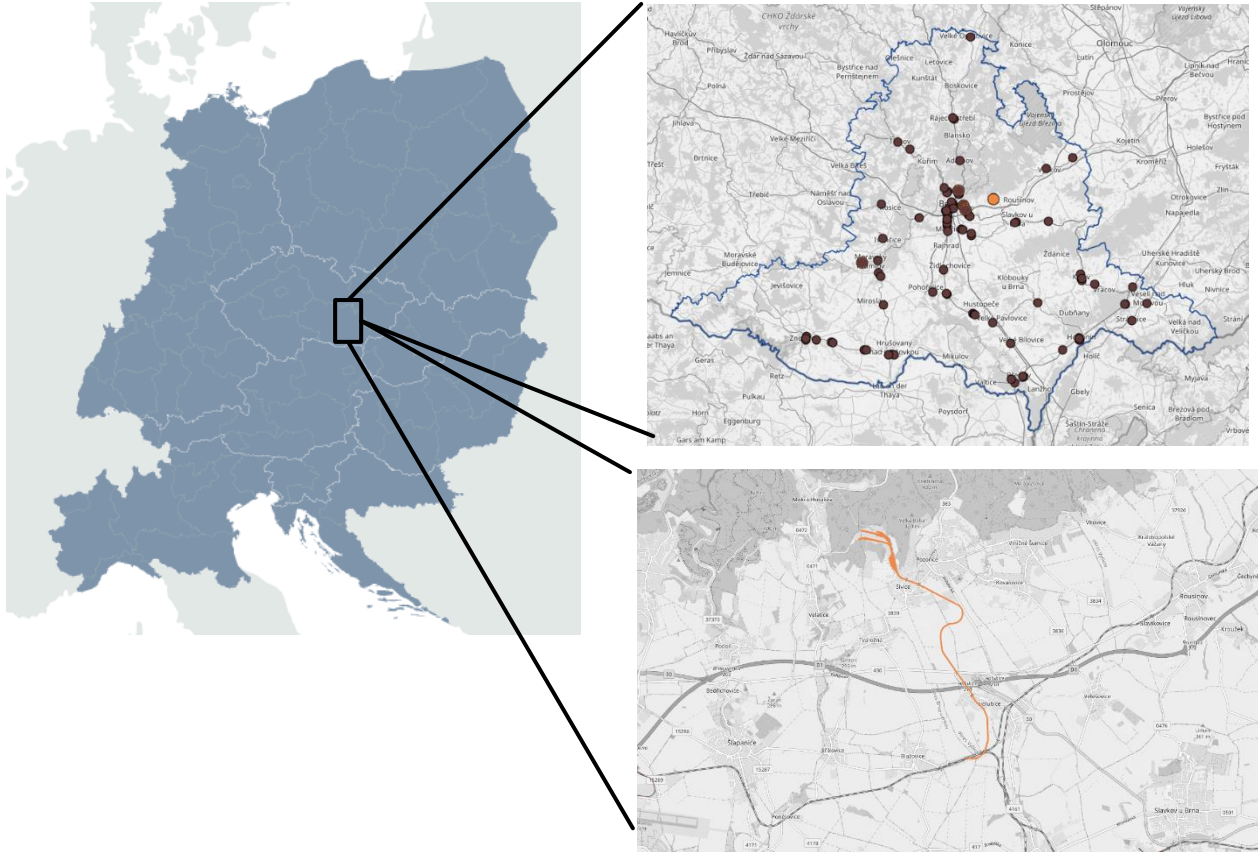


Heat generation process © Teplárny Brno

Siding to Mokrá

South Moravian Region

Quick Facts



Location: Mokrá (South Moravian Region)

Transport of passengers on a siding, that is currently used for freight transport only.

Distance by train: 25 kilometres

Description

The siding is located about 10 kilometres east of Brno, siding is connected to the railway line Brno - Přerov at Blažovice station. There is a cement factory on the siding. It is owned by Českomoravský cement a.s. The siding is currently used for transporting cement. There is also a large marshalling yard with repair workshops in the cement plant.

The study deals with the possibility of using the railway siding Blažovice - cement factory Mokrá for suburban passenger transport with the aim of providing a direct train connection between Brno and the densely populated area of Pozořice east of Brno. This is still an analysis, but freight transport will also benefit from

higher line parameters and higher line speed. However, it must not be restricted by passenger transport. This is an example of how to support freight transport, it could be financed by the state.

Passenger rail transport should provide competitive, reliable and high-capacity transport between Brno, Šlapanice and the municipalities of the eastern part of the Brno metropolitan area: Holubice and especially Pozořice and Sívce, which have a total population of 5 200. The operational concept should also consider a connecting bus service to neighbouring Kovalovice and Viničné Šumice, which have a total of another 2 100 inhabitants.

The aim is to create a conceptual proposal for the operation of a new suburban train line, to examine the possibilities of running this line in the context of the siding and the line Brno - Blažovice and to verify the competitiveness of the new connection compared to existing bus lines. The regular interval of the new suburban railway line should be 30 minutes in peak periods on working days and 60 minutes in other periods of operation, i.e. the same as on other IDS JMK lines of similar importance.

The basic assumption of the project is the reconstruction of the existing siding to a higher line speed (80 km/h), its electrification to the AC traction system 25 kV 50 Hz and the construction of station in Holubice-Kruh and a final stop or station between Pozořice and Sívce.

The operational concept of the new train line should be compatible with the development of the railway infrastructure of the Brno railway junction and line.

Brno - Veselí nad Moravou and this consistency should be documented. In terms of transport technology, the necessity of track modifications in the branch railway line will be assessed. Blažovice station, and the operational concept will show further requirements for the extent of track modifications, especially for the possible crossing point of trains on the siding.

The project should bring the transfer of regular commuter passengers from bus and individual car transport to rail, increasing the share of passenger transport capacity in the suburban area of Brno. This would in turn help the congested road network in the area.

CONCLUSION

As seen above there are several topics where case studies may approach to improve the access of the rail transport in the region. While some focus on a line and its requirements for a revitalization, others detected an overall demand in the region and were looking openly for a suitable place of a terminal. And others again look on one single siding or access that is not suitable for the current transport processes. But they all have in common that there are obstacles hindering or restrict the regional rail freight transport and thereby the rail freight transport in total - as it is considerably fed by the potentials in the rural areas apart from the main corridors.