

D.T 1.5.11 - ACTION PLAN ON MULTIMODAL NODES EFFICIENCY AND CONNECTIONS - ÚSTI REGION

Nodes management optimization

Final version
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Executive summary

The actions, presented in details in this document are the answers to the problems, needs and challenges identified within the first step of the project activities, that is to say the analysis phase of the TalkNET nodes' regions, both for Multimodality and Eco-innovation as the two main fields of action of the whole project.

1	LAST MILE CONNECTIONS OF MULTIMODAL NODES	MULTIMODALITY
2	NODE MANAGEMENT OPTIMIZATION	
3	ASSESSMENT OF MULTIMODAL SERVICES	
4	ALTERNATIVE FUELS DEPLOYMENT	ECO-INNOVATION
5	ENERGY EFFICIENCY SOLUTIONS	

Table 1 Five sub - topics of the TalkNET project

Source: TalkNET project

The base for the presentation of the planned actions is the “Analysis on multimodal nodes efficiency and connections - Ústí Region” carried out within the TalkNET project, which provided information on the main challenges of multimodal terminals in the Ústí Region and its immediate vicinity and the terminals must respond to increase their efficiency and capacity.

The alternative to the still prevalent road freight transport is combined transport, where a significant part of the transport is provided by rail or by inland waterway transport. In recent years, in the Czech Republic, the trend in the development of combined transport has been clear: the number of semi-trailers and containers transported has steadily increased and it is clear that combined transport is the future. But some of the problems mentioned below hinder the further development of a combined transport.

- limited availability of the Elbe waterway for water transport of cargoes form part of a year
- insufficient throughput of the railway network



- very high load on the main railway corridors and insufficient throughput of diversion lines during construction measures on the track
- practically no alternative route to the main railway corridor and any lockout or emergency will result in network collapse
- lack of investment in new lines and modernization of lines
- missing public terminals and transshipment terminals (the vast majority of terminals are owned by private companies and the prices for transshipment at Czech private terminals are 2 to 2.5 times higher than for example in neighbouring Germany)

The situation in long-distance freight transport in the Ústí Region follows the situation in the whole Czech Republic. In practice, by 2030, the basic objectives set by the European Commission and set out in the White Paper of 30% of long-distance transport over distances of more than 300 km by rail will require a number of railway and also water infrastructure measures to meet them. Their implementation will increase the capacity of the main railway routes and the Elbe waterway. Important projects linked to the Ústí Region will include several projects, described below.

Water transport

The Elbe River, as the only inland waterway suitable for large-scale cargo transport to seaports, is being continuously improved. Some obsolete or unsatisfactory locks are being reconstructed, and the clearance height at bridges over the Elbe to Pardubice is being gradually increased. The main limiting obstacle to smooth shipping, ie. the insufficiently high water level in the Elbe River in the section between Ústí nad Labem - Střekov and the state border with Germany in part of the calendar year has not yet been resolved. The elaborated project of the Děčín lock, which would eliminate this problem, was not approved in the EIA. Next figure shows the strategic projects to develop the Ředitelství vodních cest ČR (Czech Waterways).

Railway transport

Combined transport units in relation to maritime transport:

Unified shipping units in maritime transport are ISO containers of various lengths of 20 ', 40', 45 ', which are very well compatible with a wide range of container wagons. The high degree of uniformity and technical consistency between containers and container wagons are a clear advantage of ISO containers. ISO containers are stackable in several layers. Their disadvantage is incompatibility with the dimensions of European pallets, which limits the



optimal use of the loading area of ISO containers. Another disadvantage is the container doors at their front, which prevent their loading from the side.

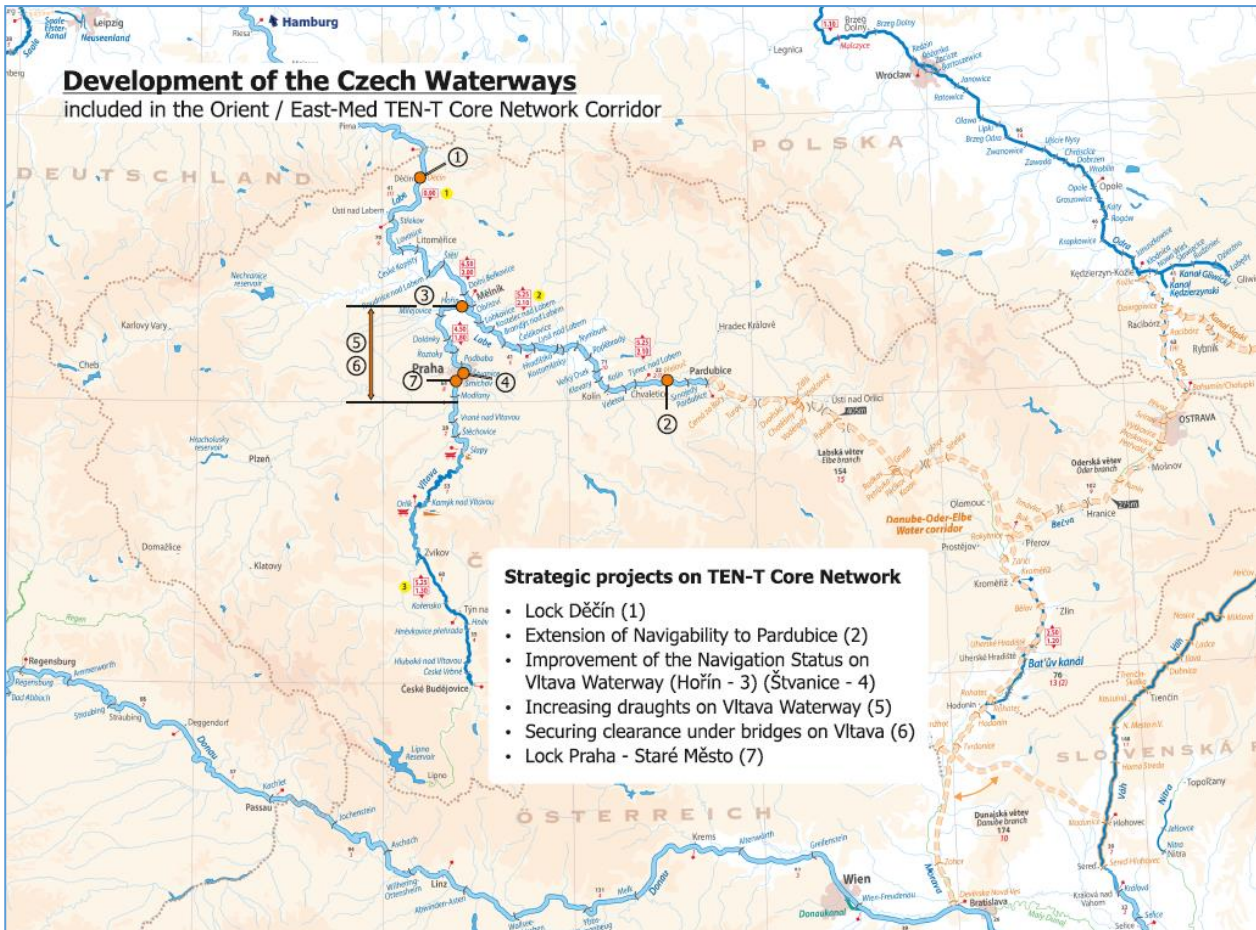


Fig.1 Development of the Czech Waterways

Source: Ředitelství vodních cest ČR

Transport units for continental transport:

The discrepancy between the internal dimensions of the ISO containers and the dimensions of the European pallet and their high tare have resulted in inland containers having a larger internal width, thus allowing two Euro pallets to be stacked side by side, facilitating pallet handling while allowing better utilization of cargo space. The same advantage is provided by swap bodies and intermodal (semi-trailers), which are technically equipped with gripping edges, which enable vertical reloading to / from railway wagons by mobile translators or cranes equipped with collets. The advantage is the possibility of loading goods from the side of the trailer or swap body. The disadvantage of intermodal semi-trailers and swap bodies, especially from the point of view of terminals, is the high demands on the size of paved surfaces, as these units cannot be stacked.



While swap bodies can be transported by rail on container wagons, so-called pocket wagons are used for the transport of intermodal semi-trailers by rail, which have a reduced loading area in the space between the railway bogies used for storing the rear axles of semi-trailers. An indisputable advantage of pocket cars is their versatility, in addition to intermodal semi-trailers, they can also be transported swap bodies and containers of all types, the disadvantage is their higher purchase price. Initially, the development of unaccompanied continental combined transport was hampered by the need for investment by road hauliers and forwarders in swap bodies, intermodal semi-trailers and various types of special tank and lump containers. Trends in goods transport by rail loaded in intermodal trailers:



Fig.2 Road semi-trailers transported from and to the Czech Republic by rail

Source: CZSO

Problems preventing the combined transportation development:

Although statistics on the transport of intermodal semi-trailers by rail have shown very positive figures over the past decade, satisfaction with the quality of this type of transport is definitely not appropriate. There are a number of Czech road hauliers who were willing to invest their money in intermodal transport units after 2010 in the hope of benefiting from continental combined transport and rail transport at a high level of quality. However, many of them, after gaining practical experience in real operation of intermodal trains, had to return to the road based on their customers' requirements - mainly because of repeated failures in service reliability. According to the Bohemiakombi, the combined transport operator, the main causes of unsatisfactory operational reliability are the relatively frequent abnormalities in the rail infrastructure with high impacts on train delays, staff problems in



the train driver profession, very high load on the main railway corridors and insufficient diversion tracks. Significant operational problems arise in connection between the railway infrastructures of individual EU countries and in the necessary transfer of trains between railway carriers.

The vast majority of exports and imports from the Czech Republic are carried out westward to the EU and beyond, through Saxony and Bavaria. However, there is only one single electrified double-track capacity railway line across the Czech-German border, which is approaching its parameters the conditions necessary for the operation of efficient rail freight transport, which is therefore very intensively used. With its high utilization at levels between 85 - 105%, significant operational problems with very adverse impacts on the quality and reliability of rail freight transport arise due to any extraordinary operation in the Děčín - Dresden section or during necessary construction measures on the track. Given the current impossibility of diverting trains on another line, this is a fundamental problem that logically discourages all potential customers from switching from road to rail.

However, the points of contact between the road and railway transport infrastructure - terminals and transshipment points of the combined transport are also an obstacle to the faster development of combined transport on the Czech railway network. The infrastructure of transshipment facilities belonging to the Czechoslovak State Railways was privatized in the early 1990s. National railway carriers from neighbouring countries of Germany, Austria and Poland gradually became the main owners of the transshipment infrastructure. In the Czech Republic, unlike, for example, Germany, Austria or Italy, there is a lack of public combined transport terminals with guaranteed non-discriminatory access for all rail carriers, train operators and road carriers. The only exception in this respect was the ČD DUSS terminal in Lovosice, which was established in 2008 and is operated on a public railway transport infrastructure. The negative result of this situation is inadequately high prices for transshipments in Czech private terminals, which are 2 to 2.5 times higher than the prices for transshipments e.g. in neighbouring Germany. This is, of course, an obstacle that significantly hinders the more dynamic development of combined transport on the Czech rail network, which is demanded by politicians and the public.

If, in practice, the fundamental objectives set by the European Commission are to be achieved by 2030, a number of measures will have to be implemented on the railway infrastructure to increase the capacity of the main railway routes. Important projects linked to the Ústí Region will include several important projects, such as:



- Modernization of the right-bank railway line No. 503 from Lysá nad Labem to Děčín, which serves as the northern bypass of the Prague hub for freight trains in the east-west direction. This line will be the first in the Czech Republic to be designed for regular operation of long freight trains of 740 m, which will significantly improve the conditions of economic competitiveness of intermodal trains over road transport.
- project of cross-border high-speed line newly led from Dresden to Prague through tunnels under the Ore Mountains. In addition to establishing a fast connection between Berlin and Prague in passenger transport, the project intends to release the necessary freight capacities along the existing main railway line through the Elbe Valley
- the forthcoming German project for the modernization and electrification of the Hof - Nürnberg railway lines (see the information at https://saechsisch-bayerisches-staedtenetz.de/dokument/Brosch%C3%BCre_Elektrifizierung_SFM_0_2842.pdf) or Hof - Schwandorf - Regensburg in the near future will finally remove the track side restrictions on the Bavarian side, which in the future will significantly improve the prerequisites for establishing continental routes from the Czech Republic not only to Bavaria but also transit through Bavaria to Austria, Switzerland, but mainly to Italy, where none of the continental combined transport lines has been heading from the Czech Republic until now
- in parallel with the planned changes to the Bavarian railway infrastructure, it will be important to prepare construction projects on the Czech side with a view to improving the parameters of the main corridor line No. 504 Ústí nad Labem - Chomutov and line No. 533 Chomutov - Cheb for more cost-effective and with an increase in the length norm for freight trains, but also an increase in axle pressure to 22.5 t over the entire section between Ústí nad Labem and Cheb, which is noticeably missing.

It follows from the above that the main obstacles to the further development of combined transport in the Czech Republic are in the area of infrastructure, railway and waterway. The development of this infrastructure is handled by the Czech Government. Also, multimodal freight transport terminals in order to increase the efficiency of their services and performance are ready to implement the investment measures. This document presents the “Action Plan to improve multimodal nodes efficiency and connections - Ústí Region” that will focus on the development of multimodal terminal optimization, one of the sub-topics dealt with the TalkNET project in the field of Multimodality.

There are important inland ports Mělník, Lovosice, Ústí nad Labem and Děčín and multimodal terminals ČD-DUSS terminal Lovosice, Metrans terminal Ústí nad Labem, M.I.T. Mělník,



operators MAERSK and RCO ČSKD, UPLINE terminal Obrnice at the Ústí Region and its close proximity.

The aim of these multimodal terminals is to support their performance and further development. To this end, some future actions have been developed to improve access to the terminals by road, rail or water, and to increase their capacity and speed of transshipment. The document also describes other necessary actions in the future that will have a significant impact on the amount of freight transported off the road network, rail and water.

The above mentioned analysis has foreseen the assessment of the multimodal chain in which ports and logistics nodes operate, to understand how is the state of art (AS-IS analysis) and what are the methods to improve the situation (TO-BE) that will be performed in the following stages of TalkNET implementation. The tool chosen to achieve these aims is the S.W.O.T. analysis.

At the same time, the actions presented will support and will be the ground for the implementation of the pilot actions that will be carried out within the project in some of regions. This is not the case of the Ústí Region. The TalkNET project has no pilot action planned at the Ústí Region.

Therefore, the core intervention logic of the project is the following:

- 1) to detect the problems affecting the nodes (analysis phase)
- 2) to find solutions through specific actions planned (planning phase)
- 3) to test and implement the solutions presented (testing phase - Not in the case of the Ústí Region)

Moreover, the document will offer also a brief overview of the best practices that can offer good solutions to better plan actions and the pilot actions foreseen in the project (the complete collection of best practices is available in the knowledge management activity of the project: Outputs Knowledge tools).

In the following paragraphs, a summary of each action included in this document will be presented, clearly linking problems/needs/challenges and actions/solutions that will be illustrated through the support of the results of the SWOT analysis.

As part of its port development framework, the České přístavy a.s. is modernising the container terminal, which is the part of the Mělník port. Now there are two tenants in the Mělník port, the companies MAERSK LINE and Rail Cargo Operator CSKD s.r.o., which operate



container transport by rail. The port is operated by the owner of the infrastructure, the České přístavy a.s.

Action 1: Extension of handling area, tracks length and environmental measures in the Mělník container terminal

SWOT ANALYSIS - RESULTS:

STRENGTHS	WEAKNESSES
<p>Competitive position of the terminal at the Czech Republic and Central Europe area.</p> <p>Trimodality of the terminal on the Elbe River</p> <p>Excellent road and railway accessibility to main railway and road network.</p> <p>Richness and industrial character of the port and terminal hinterland</p> <p>Port equipped with heavy static crane with a lifting capacity of 300 tons</p>	<p>Proximity to populated areas - complaints about noise at night</p> <p>Frequent unreliability of the Elbe level on the waterway to the BRD and seaports prevents container shipping</p> <p>Insufficient track length</p>
OPPORTUNITIES	THREATS
<p>Additional traffic</p> <p>New investments in terminal's facilities: construction of new noise barriers, using less noisy locomotives</p> <p>New planned investment in order to increase the intermodal terminal capacity: expanding the handling area and increasing the length of the track in the terminal to 740 m</p>	<p>Additional pressure on port and terminal operations and impacts on their efficiency</p> <p>Growth of railway traffic flow and need to upgrade the external railway network</p> <p>Increase competition by other terminals in close proximity (Prague, Central Bohemia Region, Ústí Region)</p>



The objective of this action is to extend the handling and storing area of the terminal and build a new 740 m track, which simplifies the handling of container trains. At the same time, additional anti-noise measures will be implemented. The multimodal container terminal will have the following area requirements:

- berth, handling and storage areas
- rail tracks and ancillary facilities

Particular focus should be given on the work and cargo flows inside the areas, on the relations between the operators activities and their link with the outside, in order to achieve the best transport performance in line with the market requirements (e.g. delivering and forwarding time) and to optimize the available space.

This action will not be followed by a pilot action within TalkNET project, but it will have the following funds leverage foreseen after the project end:

- Extension of the handling area and new track: € 7 400 000

Action 2: Extension of the ČD DUSS terminal Lovosice

SWOT ANALYSIS - RESULTS:

STRENGTHS	WEAKNESSES
<p>Excellent road and railway accessibility (close proximity of the D8 highway and position at a main railway network).</p> <p>Richness and industrial character of the terminal hinterland</p> <p>Established international connection by block trains to 9 destinations in Europe (seaports, inland terminals)</p> <p>Open access to all terminal services.</p> <p>Strategic focus of the terminal on multimodal transports and services within the continent (semi-trailers, swap bodies, tank-containers).</p>	<p>Limited handling capacity of the terminal and insufficient track length.</p> <p>Low number of multimodal transports to southern Europe's terminals and destinations.</p>



OPPORTUNITIES	THREATS
<p>Additional traffic</p> <p>Increase the railway track length inside the terminal to 600 m eliminates the need to divide trains when handling at the terminal.</p> <p>New planned investment in order to increase the intermodal terminal capacity - expansion of the terminal handling area by 9 hectares.</p> <p>New investments in port's facilities.</p>	<p>Additional pressure on terminal operations and impacts on its efficiency.</p> <p>Growth of railway traffic flow and need to upgrade the external railway network.</p>

The ČD-DUSS terminal Lovosice makes plans for investment with the scope of increase its performance and efficiency. The investment is focused on:

- expansion of the terminal handling area by 9 hectares
- increase the railway track length inside the terminal to 600 m which will result in eliminating the need to divide trains when handling at the terminal.

2. Cluster 2 - Multimodal nodes optimization: overview of needs and best practices in cooperation with stakeholders to develop the action plan

Main problems of combined transport development in the Czech Republic and in the Ústí Region were described in the “Executive summary” section as problems of the water and rail transport network, which are gradually solved by the Czech State. On the Elbe waterway it is mainly insufficient water level in the critical section between Ústí nad Labem - Střekov and the state border with BRD and insufficient height of bridges over the Elbe. The main routes of the railway network are their high traffic load and insufficient substitute routes in the case of construction work on the route or in removing accidents. In such cases, customers lose confidence in the reliability of combined transport and prefer road transport.

Multimodal terminals in the Czech Republic and in the Ústí nad Labem Region respond to changes in world trade in recent years, when volumes of transported goods have been increasing, especially from the Far East. Terminals in the Ústí nad Labem Region, in



cooperation with railway operators, provide freight transport services in sea containers (unified transport units in maritime transport are ISO containers of various lengths of 20 ', 40', 45 '), according to the requirements and needs of customers from / to European ports North and Baltic Sea and the Adriatic Sea. Some terminals and operators are also involved in the so-called continental transport of goods between terminals in Europe, where transport in containers of other dimensions or directly in interchangeable or intermodal trailers is often more advantageous. (The mismatch between the internal dimensions of the ISO containers and the dimensions of the European pallet and their high tare resulted in inland containers with a larger internal width, allowing two Euro pallets to be stacked side by side, facilitating pallet handling while allowing better use of cargo space). Swap bodies and intermodal (semi-trailers) have the same advantage.

While the use of rail transport to ports is commonly used for the transport of goods between continents in ISO containers, the so-called continental transport still has a tendency to use road transport over relatively long distances. That is why this kind of combined transport is supported by both the Czech state and the European Union.

2.1 Action 1: Extension of handling area, tracks length and environmental measures in the Mělník container terminal

In order to respond new logistic needs in accordance with ecology standards, the České přístavy a.s. is planning for a new part of the container terminal in Mělník.

Mělník Public Port is the largest port in the Czech Republic, occupying approximately 50 hectares. There are two container terminals that are rented by private companies. Several hundred containers are reloaded in the port every day and several freight trains and dozens of trucks arrive here. In 2020, the last phase of the modernization of the port is to be carried out, with the extension of the handling area and the construction of new tracks to which part of the train handling will be moved. The project also includes the construction of a noise barrier and fixed rail for electric gantry cranes.

The following actions to increase the intermodal terminal capacity will be carried out:

- expanding the handling and storage area
- increasing the length of the track in the terminal to 740 m
- building a new noise barrier of the length 120 m and a fixed rail for electric gantry cranes.



By the end of 2020, the modernization of the port should be completed, including the final stage of the construction of the handling area and the new track, where part of the train handling will be moved. Completing the modifications will allow trains to go deeper into the terminal and further away from the city. In addition, it will not be necessary to close the level crossing several times for handling.

2.2 Main challenges tackled

The Mělník container terminal should increase its capacity in response to increasing demand by increasing the container handling and storage area and the length of three tracks in order to reduce the amount of train handling. At the same time, it is necessary to ensure safe compliance with environmental limits, especially noise levels in the surrounding buildings. The container terminal will be able to improve the logistic chain performance thanks to reduction of turn-around time.

2.3 Results to be achieved

The Mělník container terminal has made a number of investments in recent years to increase the capacity and efficiency of the terminal. The planned investment in 2020 will achieve the following results:

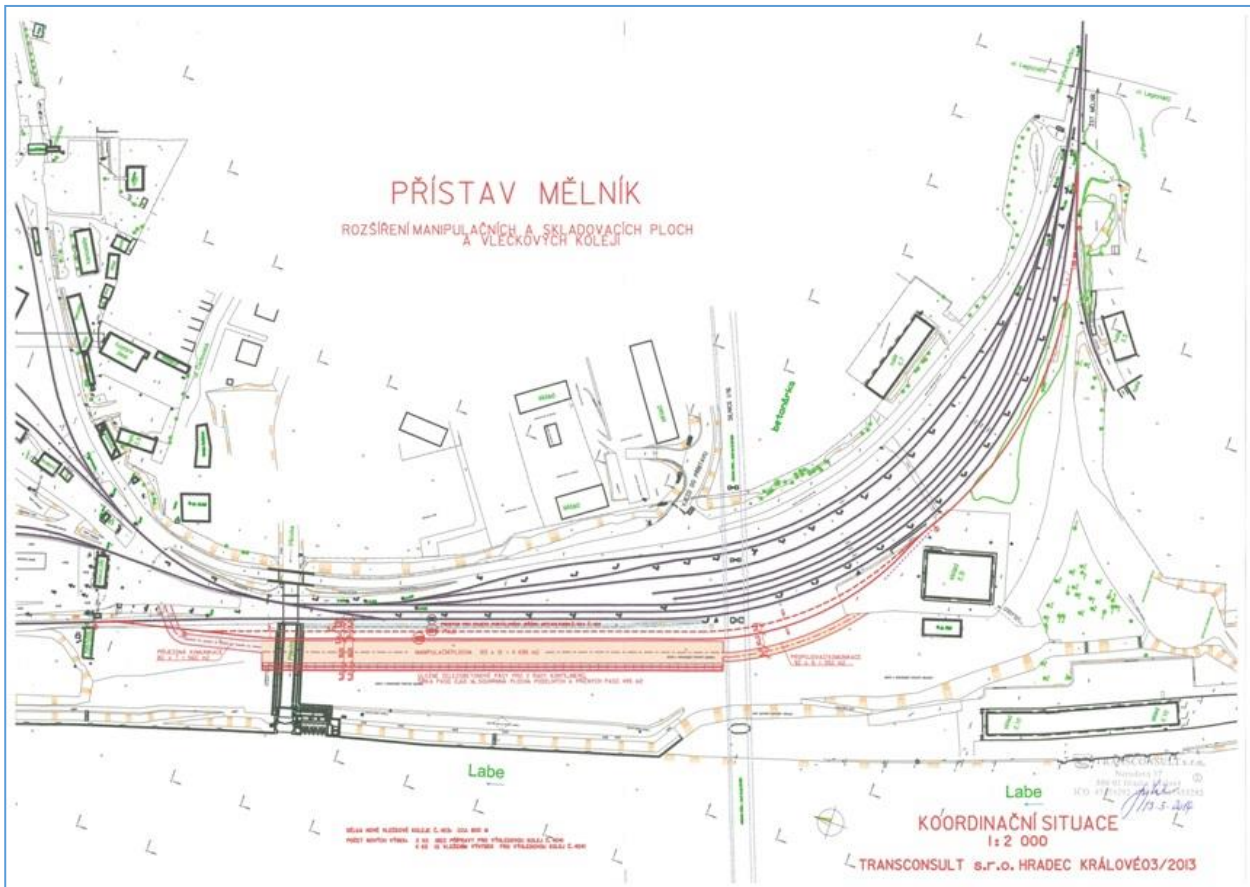
- increasing its multimodal efficiency
- increasing its logistic efficiency
- ensuring the protection of the environment against noise from terminal operations

2.4 Tasks to be performed

Main tasks to be performed to extend the handling area, tracks length and made environmental measures in the Mělník container terminal are the following:

- extension of three siding tracks
- completion of storage and handling areas
- drainage, lighting and construction of fixed crane tracks for gantry cranes with electric drive

The layout A shows the construction situation inside the terminal:



Layout A

2.5 Key actors

Stakeholder	Level of involvement	Relevance of participation
Terminal operators	High	High
Railway operators	High	High
Local public authorities	Medium	Medium



2.6 Timeline and financial sources

Action	2019	2020	2021	2022	2023	2024	2025
Extension of handling area, tracks length and environmental measures							

Financial forecast:

Completion of the container terminal: € 7 600 000

2.7 Expected results

The completed terminal, which would have extended area for handling and storage of containers, new rails with sufficiently long pull-out track, a noise barrier and fixed crane tracks for gantry cranes with electric drive, would be able to handle more containers.

The port of Mělník is the largest in the Czech Republic. It is spread over more than 50 hectares on the right bank of the Elbe River, it is open all year round and is designed mainly for transshipment of goods between water, road and rail transport. In particular, agricultural products, building materials, substrates, iron, chemical products, individual packages or investment units flow through the port. It also serves as a stand for vessels and serves as a flood protection function in two port pools. It includes two container terminals. Hundreds of containers are reloaded every day in the port, where several freight trains and dozens of trucks arrive. The facility will serve the Central and Eastern Europe market which implies that intermodal rail freight services will be a key element of the overall offer.

The purpose of the Mělník container terminal completion is:

- increasing the capacity of shipment of import and export containers via river, road and rail
- simplified handling of trains / siding operation optimization
- ensure environmental standards when operating the terminal



- simplified shipment of import/export container loads to/from local destinations



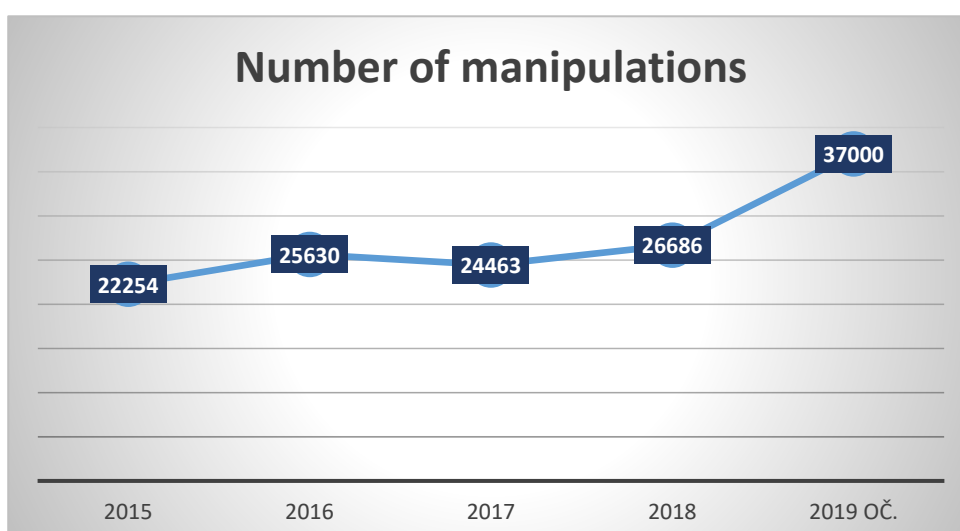
Sight to the Mělník port and container terminal



2.1 Action 2: Extension of the ČD DUSS terminal Lovosice

Keeping world trade at current levels, the ČD-DUSS terminal Lovosice potential for increasing transport and transshipment volumes in the next 5 years is tens of percent. The current terminal capacity can only be increased by extending the terminal's storage capacity.

That is why the ČD-DUSS terminal Lovosice has planned investment with the scope of extending its storage capacity, allowing the next railway traffic flows increase.



ČD-DUSS terminal Lovosice - numbers of manipulations in last years

2.2 Main challenges tackled

Currently the ČD-DUSS terminal Lovosice operates at the upper limit of capacity. The bottleneck is the storage capacity for intermodal semi-trailers, swap bodies and containers inside the terminal. The lack of storage space is a major obstacle to further enhancing terminal performance. Another obstacle to development is the insufficient length of the track at the terminal, which requires the separation of trains put up for loading or unloading. Both mentioned problems are solved by the prepared project "Extension of the container terminal in Lovosice - the so-called SOUTH stage".

The project of the infrastructure growth would create the potential:

- another 9 ha and 600 m handling rails (red module), land use is owned by ČD Cargo (one of two company ČD-DUSS terminal a.s. shareholders).
- Total possible warehouse capacity up to 2 thousand TEU, possible usable track length for handling 600 m

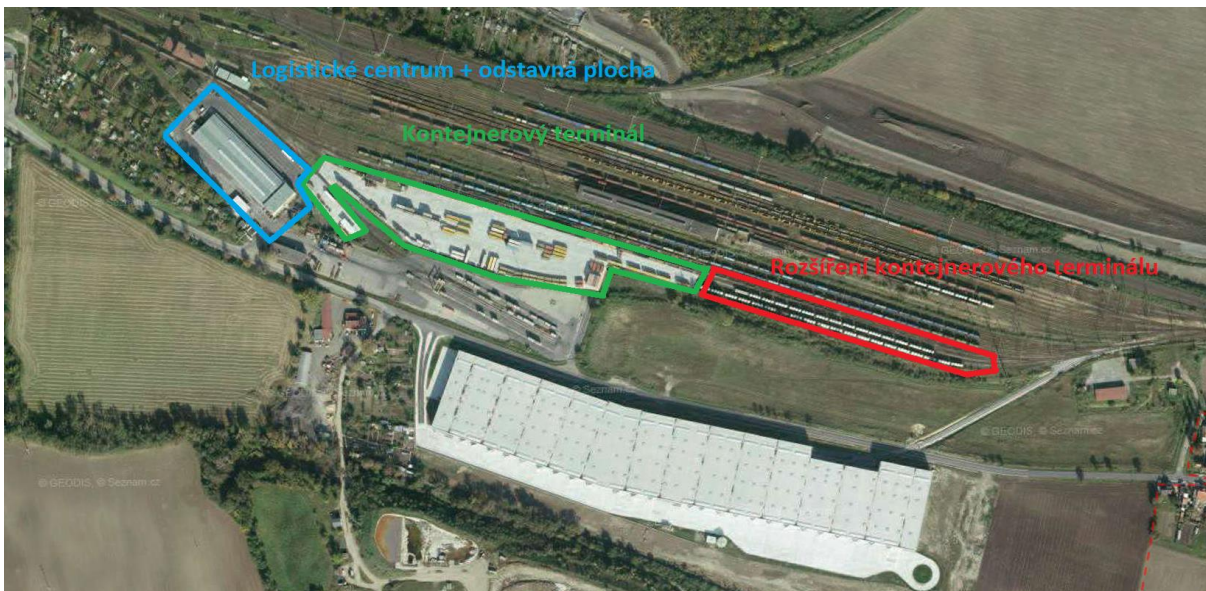


- take advantage of train departures directly from the unloading tracks
- clearance of transit trains without locomotive replacement

2.3 Results to be achieved

The following main results are foreseen:

- 1) increasing terminal capacity (warehouse + number of reloading)
- 2) 600m track available for handling trains (no need to divide trains)



Planned extension of the terminal - marked in red

2.4 Tasks to be performed

- Get funds (the ability to support 49% of the Czech Operational Program Transport)
- Ensure building permit
- Carry out a tender for the contractor
- Implement the construction under full terminal operation



2.5 Key actors

Stakeholder	Level of involvement	Relevance of participation
Terminal operators	High	High
Railway operators	High	High
SZDC - national railway infrastructure manager	High	High
Local public authorities	Medium	Medium



2.6 Timeline and financial resources

The preparation of the investment is supposed in 2022.

Financial forecast: The cost foreseen for the investment is € 4 500 000.

Action	2019	2020	2021	2022	2023	2024	2025
Funding, building permit, tender							
Construction							

2.7 Expected results

The extension of the terminal's storage capacity and improvement of the efficiency of railway operations in the terminal will significantly increase the capacity of the ČD-DUSS terminal Lovosice:

- another 9 ha of handling and storage area - increased the terminal storage capacity up to 2 thousand TEU
- new handling rail increased possible usable track length for handling to 600 m
- take advantage of train departures directly from the unloading tracks
- clearance of transit trains without locomotive replacement