

Capitalising TEN-T Corridors for Regional Development and Logistics

TRANSNATIONAL CORRIDOR CAPITALISATION STRATEGY

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Saxon State Ministry for Regional Development
New railway line Dresden-Prague EGTC

LEAD PARTNER

Saxon State Ministry for Regional Development

PROJECT PARTNERS

SBO Saxon Inland Ports Upper Elbe

Rostock Port

Ústí Region

KORDIS JMK

IPP Institute of Spatial Planning

KTI Institute for Transport Sciences Non-profit Ltd.

FBL Freeport of Budapest Logistics

GYSEV Győr-Sopron-Ebenfurth Railway

New railway line Dresden-Prague EGTC

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1. Introduction

The TEN-T corridor Orient/East-Med connects Northern, Central and South-Eastern Europe. A crucial bottleneck is the Dresden-Prague section, which needs to be extended by a new railway line to improve the connectivity between Germany, the Czech Republic, Slovakia, Austria, and Hungary.

To capitalise the opportunities of the infrastructure investment for multimodal environmentally friendly freight transport, the Free State of Saxony joined forces with partners from Germany, the Czech Republic, Slovakia, and Hungary. Improving coordination among stakeholders in the field of transport and spatial planning, CORCAP contributed to the creation of an environment for more efficient rail freight transport in Central Europe.

APPROACH AND AIMS OF THE PROJECT

TEN-T corridors are the backbone of the sustainable multimodal transport network across the European Union. Amongst others, they determine the competitive position of nodes and agglomerations such as Rostock, Dresden, Ústí nad Labem, Brno, Bratislava, and Budapest. However, based on social and economic market priorities, the upgrade and utilisation of the railway network (including related planning procedures) is often focused on national sections, while cross-border sections are the weak element and bottlenecks for transnational freight transport.

Having this in mind, the CORCAP project aimed at the facilitation of efficient and environmentally friendly freight transport along the Rostock-Budapest section of the Orient/East-Med corridor through better coordination of policies and stakeholders in the field of transport and spatial planning.

SUPPORTING MULTI-LEVEL GOVERNANCE

To facilitate the interaction of regional development and transport infrastructure development, the partners have developed Corridor Capitalisation Plans. These plans have a planning horizon corresponding to the perspective of realisation of the new railway line Dresden-Prague. They demonstrate how an intensively used corridor affects regional development and logistics, and which contributions made on regional level will strengthen the corridor and its functionality.

As informal instrument, Corridor Capitalisation Plans address existing planning levels and instruments in the field of transport and logistics, regional development and spatial planning on local, regional, national and transnational level, thus contributing to multi-level governance.

PRACTICAL STEPS TOWARDS MORE SUSTAINABLE FREIGHT TRANSPORT

To demonstrate the short-term benefits of better accessibility and connectivity and to underline the added value of the strategic infrastructure investment, the partners have implemented multimodal freight transport pilot actions. These were aimed at the improvement of the accessibility and connectivity of intermodal hubs and inland ports, the investigation of the feasibility of new intermodal services considering innovative technical and organisational solutions and the investigation of attractive multimodal logistics locations.

Facilitated through the pilot activities, potentials for joint application of the partnership for funding from the Connecting Europe Facility (CEF) have been investigated. Finally, findings and lessons learnt from project implementation have been summarised in the Transnational corridor capitalisation strategy at hand.

PROCESS OF WORK AND EXCHANGE WITH STAKEHOLDERS

Within three years, from the kick-off meeting in June 2019 in Budapest until the digital final conference in March 2022, a comprehensive plan of work was conducted. During ten digital and physical partner meetings the partners agreed on methodical approaches, discussed the progress of activities and evaluated joint results. Site visits and thematic workshops supported the process of cooperation.



All content-related activities were accompanied by an intensive exchange with stakeholders during bilateral meetings, stakeholder workshops, meetings of the Advisory Board and transnational roundtable meetings. More than 20 regional events and more than 10 transnational events took place, involving approx. 50 stakeholders and experts from more than 20 institutions.

Besides the final conference and the exchange with the European Coordinator Mathieu Grosch during several events, a special highlight was the International Rail Freight Workshop in Sopron in October 2021, which was followed by the 740 m TEN-T Demo-Train from Sopron to Budapest. In addition, the CORCAP partners supported the realisation of the Connecting Europe Express on its journey through Central Europe in September 2021.



2. Challenges for the development of the Orient/East-Med corridor

The Orient/East-Med corridor reflects the variety and diversity of Europe. It is characterised by a North-South divide in terms of infrastructure supply and quality: In its Northern part, capacity bottlenecks on roads and railways need to be removed for more efficient freight and passenger transport. In its Southern part, comprehensive infrastructure improvements are required, to enable the provision of competitive transport offers.

Low commercial speed and capacity constraints remain the main challenges for long-distance rail freight along the corridor. To avoid that operational and legal issues and time lost at border stations counteract the achievements in infrastructure upgrading, operational procedures and infrastructure coordination need to be improved.

GREENING FREIGHT TRANSPORT - FOSTERING TRANSNATIONAL APPROACHES

The European Green Deal calls for a substantial part of the 75 % of inland freight carried today by road to shift to rail and inland waterways. According to the Sustainable and Smart Mobility Strategy of the European Union (EU), rail freight shall increase by 50 % by 2030 (compared to 2015) and double by 2050. To achieve these aims, rail freight needs serious boosting through increased capacity, strengthened cross-border coordination and management of the rail network, and the deployment of innovative technologies such as digital coupling and automation.

If all planned TEN-T projects will be implemented, rail freight along the Orient/East-Med corridor is expected to increase by 64 % by 2030.¹ However, uneven achievement of operational parameters (e.g., electrification, train length, axle load, ETCS deployment) reduces the operational efficiency of the corridor. As infrastructure planning and construction remains within national frameworks, there is need for intensive cooperation to achieve coordinated development of corridor infrastructure and mobility services.

THE NEW RAILWAY LINE DRESDEN-PRAGUE

The existing railway line between Dresden and Ústí nad Labem is a heavily used cross-border link. Due to its exposition to natural hazards (e.g., floodings), limited track speed and dense settlements in the Elbe valley it is not possible to extend its capacity, and suitable alternative routes are missing.

To remove the bottleneck, a new railway line is planned. Between Ústí nad Labem and Heidenau the Ore Mountains base tunnel will be built, doubling the capacity for freight and passenger transport. The new railway line will be a high-speed line, allowing passenger trains to operate at 200 km/h and freight trains to operate at 120 km/h. In total, the tunnel shall be used by 150 freight trains, thirty-two long-distance passenger trains and sixteen regional trains per day.

For the German part of the project, the regional planning procedure has been finalised in 2020. Two corridors have been identified, which are further investigated in the pre-planning phase. If the planning process and construction works will be finalised on time, the tunnel shall become operational until 2038/2040.

HIGH-SPEED DEVELOPMENT ALONG THE ORIENT/EAST-MED CORRIDOR

In the Czech Republic, the new railway line Dresden-Prague is part of the future cross-country network of high-speed railway lines. The investment will be realised in several stages, starting with the high-speed line between Prague, Lovosice and Litomeřice. This section will be followed by the branch line to Most and the

¹ 4th Work Plan of the European Coordinator



Ore Mountains base tunnel. In the final stage (i.e., after 2040), the Central Bohemian Uplands tunnel will be realised.

The continuation until Brno shall be operational until 2034, including the complex redevelopment of the Brno railway node (which will take at least until 2045). These investments will create a high-speed link between Berlin, Prague, and Vienna, significantly increase the capacity for rail freight on the existing network and fundamentally improve connectivity within the Czech Republic.

In Slovakia and Hungary, currently feasibility studies for the V4 high-speed railway are being prepared, which follows the Orient/East-Med corridor between Bratislava and Budapest. Another strategic project is the “V0” rail freight bypass, allowing long-distance rail freight to avoid the Budapest agglomeration.

MULTIMODALITY AND INLAND WATERWAY TRANSPORT

To increase the efficiency of the corridor, last mile connections and intermodal infrastructure need to be improved, and intermodal facilities (rail-road terminals, inland ports) need to be integrated into logistic chains. Unfortunately, poor reliability of free-flowing inland waterways limits the potential shift to this mode of transport. Therefore, German-Czech initiatives for the joint management of the Elbe waterway currently aim for achieving a reliable draught level of 1.4 m, following the approach proposed by the Overall strategy for the Elbe (“Gesamtkonzept Elbe”).



3. Challenges for spatial development of the Orient/East-Med corridor

Starting in 2015, the International Working Group “Spatial and Transport Development in European Corridors - Example Corridor: Orient/East-Med” has dealt intensively with questions of cross-border transport and transnational governance in Central and Eastern Europe. During a series of bi-annual meetings in “hot spots” along the corridor, various aspects of corridor development have been discussed with experts of the respective countries, regions, and cities.

In the result of their research efforts, the group members from public administration, academia and practice compiled a comprehensive overview of challenges for transport and spatial development. Additionally, based on their valuable insights, they developed recommendations and suggestions for further strategy development.

STRENGTHENING THE RAILWAY SYSTEM

Projects of common European interest such as the Orient/East-Med corridor demonstrate the added value of transnational cooperation to the citizens of Europe. The enhancement of cross-border links, better accessibility and the removal of administrative and technical bottlenecks create visible benefits beyond national borders.

The working group calls for the development of an integrated railway system, which is based on competitive travel times and sufficient capacity for freight and passenger transport. With this regard, the corridor should be realised as double-track corridor with a capacity of 250-280 trains per day, including 130-150 freight trains, 30-40 long-distance trains and 40-80 local trains.

Passenger services should be developed based on a conceptual timetable, which defines desired travel times and necessary capacities between important nodes for a long-time horizon. With this regard, average line speeds of 160-180 km/h - except for sections being part of the European high-speed network - are considered adequate, allowing for the efficient operation of mixed transport routes, and enabling sufficient travel times between important metropolitan centres. For safety and capacity reasons, in densely settled agglomerations passenger and freight traffic should be separated.

CAPITALISING SPATIAL BENEFITS FOR URBAN DEVELOPMENT

On local level, corridor development leads to spatial benefits through improved railway accessibility - in addition to travel time savings, increased safety, reduced environmental impacts and reduced congestion costs. Around railway stations and hubs of public transport, railway development can trigger and facilitate the development of sustainable spaces and settlements.

In Berlin and Vienna impressive projects are already tapping into this potential. In Brno and Budapest, such projects are under preparation - and for places such as e.g., Ústí nad Labem appropriate solutions still need to be developed. In all cases, there is a need for intensified collaboration between different administrative levels, efficient coordination of multi-level policies and good cooperation among relevant stakeholders - to achieve the best results and to reap the benefits of integrated approaches.

FACILITATING PROCESSES OF INFORMAL COOPERATION

Along many European transport corridors, local and regional players support integrated corridor development by means of informal cooperation and bottom-up initiatives. Integrated spatial and transport development requires civil society participation and an intensive exchange of knowledge and experience in a multi-level environment, with overlapping and co-existing approaches - focusing on urban nodes, on cross-border areas, on larger corridor sections as well as on the entire corridor.



This is true for the implementation of cross-border railway projects, with the need to apply formal planning instruments based on the specific legislation of member states. With this regard, the new railway line Dresden-Prague is being managed in an exemplary way through regular exchange with relevant actors of spatial and transport development on both sides of the border. The experience gained from this cooperation can be applied along the entire corridor.

The working group considers the application of informal cooperation processes as complements to formal procedures to be essential to solve complex planning problems. With this regard, the following measures are being proposed:

- Holding regular events on important topics, facilitating the exchange of experiences, and complementing formal cooperation procedures,
- increasing funds for transport development, with particular focus on processes of informal cooperation,
- creating and maintaining a pool of suitable experts available for consultation.

With the CORCAP project, these processes of informal cooperation have been applied along the Rostock-Budapest section of the Orient/East-Med corridor. The results and outcomes of the project provide a suitable basis for further investigations - along the Orient/East-Med corridor, and along further European corridors, contributing to the aims of a green and just Europe.



4. Results and findings from Multimodal freight transport pilot actions

The multimodal freight transport pilot actions implemented by the CORCAP partners address the regional challenges and needs for corridor development. These include the capitalisation and the enhancement of the potentials of multimodal transport in cross-border and transnational perspective, the capitalisation and enhancement of the potentials of inland waterway transport, the reduction of the emissions of noise, pollutants, greenhouse gases and CO₂, the capitalisation of the potentials of digitalisation and the supply of skilled workforce. In particular, the following challenges have been addressed:

- Provision of more capacity for freight transport through more efficient operation of multimodal terminals and capitalisation of potentials of digitalisation (FBL Freeport of Budapest Logistics)
- Development and support of dependable business models for inland waterway transport (SBO Saxon Inland Ports Upper Elbe)
- Facilitation of modal shift and more efficient use of existing capacities in the freight transport system, complementing the cooperation along European Rail Freight Corridors (RFCs) by regional and cross-border networking (Rostock Port, SBO Saxon Inland Ports Upper Elbe)
- Provision of more capacity for freight transport in regional railway networks with capacity restraints (GYSEV)
- Creation of knowledge on the territorial prerequisites for a more efficient system of freight transport (IPP Institute of Spatial Planning, KORDIS JMK)

The approach, the results and the findings of the pilot actions are presented in the subsequent chapter, providing an overview about practical interventions realised within the CORCAP project.

4.1. Smart traffic management for logistics centres

The Freeport of Budapest Logistics Ltd. (FBL) is managing the site of the Budapest DOCK Logistics and Industrial Park, which is located in the area of the Budapest inland port. The site has a total area of 153 ha, more than 160,000 m² of warehouses and complex port facilities, such as railroads, quays, bays, and container depots.

At peak season, daily over 5,000 vehicles enter the port area. Over seventy tenants on the site depend on the efficient management of road traffic arriving at the port, including smart guidance and orientation for foreign drivers. Therefore, FBL decided to develop a state-of-the-art, innovative traffic management IT system with dependable, high-precision vehicle identification, access control, routing and a port information system.

DESCRIPTION OF THE PILOT ACTION

The European Federation of Inland Ports (EFIP) has identified the challenges faced by inland ports. There is need to understand the relevance of digitalisation, with the level of digitalisation differing from one port to another. An important challenge is to find the right balance between the creation of tailor-made solutions for digitalisation and securing harmonised and standardised IT systems in inland ports.

FBL required an access control and traffic management system based on automated license plate recognition and a navigation application, supporting the efficient management of the movement of road vehicles within the site. The pilot action required the digitalisation of the locations of tenants and the entire site, the development of a navigation application for the FBL's site (DOCK App) and a management system using artificial intelligence. The navigation is supported by smart LED screens and an InfoPoint (kiosk). Wi-Fi technology has been set up for accessing the application.

PROCESS AND ORGANISATION

To specify the exact business needs, on-site consultations, field visits, infrastructure surveys and interviews with tenants were realised. Technical specifications were developed, the map data to be digitised was collected, and visualisations were made for the tasks to be conducted. The DOCK App navigation application for the FBL site as well as the database and management system were developed. Subsequently, the DOCK App was evaluated, assessed, and published by FBL. For those who have not downloaded the App, on-site navigation is available with the smart LED screens and the InfoPoint.

Key tenants were actively involved in the implementation of the pilot action, to better understand their needs. The platform for system administration was assessed both by FBL and key tenants. During the 6-month assessment phase, interaction options between the traffic management system and tenants were evaluated, and impacts of the system were recorded and evaluated. Lessons learnt and success factors for deliverability were identified to ensure transferability. This allows interested multimodal logistics centres to adopt and to apply a well-developed solution.

RESULTS AND LESSONS LEARNT

The developed and implemented IT system delivers a smart solution for the management of road traffic at the site of the Budapest DOCK Logistics and Industrial Park. Based on experiences made during the pilot phase, the system is planned to be expanded at later stage. The investment will remain the property of FBL, who will operate and maintain software and hardware during the upcoming years.

At the beginning of pilot implementation, there was no ready-made solution available on the market for logistics sites of such type and size. Thus, this solution can serve as an important pioneer approach for the digitalisation of multimodal logistics centres and terminals.

In general, all logistics centres connected to road transportation, which are identifying similar challenges as FBL, may be interested to learn about the outcomes and solutions that the pilot action delivered. For future applications, as well linkages to the management of transshipment processes might be of interest.

Photographs / figures



Elements of the smart traffic management system: Access control at the gates, smart info panel with license plate recognition camera, InfoPoint (kiosk) and smart signpost (source: FBL)

4.2. accessibility harmonisation of inland ports

The Saxon-Czech inland ports in Saxony and Ústí Region have succeeded in establishing themselves as competitive locations for the transshipment of goods. Due to the general nature of these ports, their geographical location, their ability to manage all types of goods and their multimodality, there is an essential interest in linking the ports efficiently with transport flows along the Orient/East-Med corridor.

During the upcoming years, the focus will be increasingly on improving the accessibility of the inland ports for pre-carriage and on-carriage for rail and ship transport. This will contribute significantly to the development of an environmentally friendly transport system in Saxony and Ústí Region.

DESCRIPTION OF THE PILOT ACTION

Currently, the number of access routes for heavy and oversized goods to the Saxon-Czech inland ports is limited, and the improvement of road infrastructure is urgently needed. Therefore, it is necessary to consider the inland ports in road infrastructure planning, to find cross-border solutions for efficient access to the railway system and to consider the inland ports in spatial planning and regional development.

Within the pilot action, the currently available access routes for heavy and oversized goods as well as planned road infrastructure improvements in the catchment area of the Saxon-Czech inland ports have been identified. The maps visualise current shortcomings in accessibility of the ports, and they initiate and support the identification of priorities in the field of road infrastructure planning. The implementation of improvements will strengthen the position of the inland ports as multimodal consolidation points along the Orient/East-Med corridor.

With this regard, as well the handling capacities for intermodal transport in Saxony and Ústí Region have been analysed, enabling the access for regional production and trade companies to intermodal services. A key finding was that handling capacities for road trailers are limited in the border region. Therefore, a concept for a new intermodal terminal (TrailerPort) at the Dresden inland port has been developed, as a contribution to easing the bottleneck on the Elbe valley route between Dresden and Ústí nad Labem.

PROCESS AND ORGANISATION

The pilot action has been realised in close cooperation of German and Czech partners, consisting of the following key activities:

- Preparation of maps on planned road infrastructure improvements with effects on the transport of heavy and oversized goods in the catchment area of the inland ports
- Mapping of accessibility restrictions of inland ports in the German-Czech section of the Orient/East-Med corridor (30/60/90 min), including the identification of needs and demands for infrastructure improvements
- Development of recommendations for priority measures to improve the accessibility of inland ports, supported by an analysis of handling capacities for intermodal transport
- Development of the concept and launch of the planning process for a new intermodal terminal (TrailerPort) at the Dresden inland port

Already during project implementation, the test phase of the TrailerPort at the Dresden inland port could be successfully launched. The estimated value of the investment amounts to approx. four mln EUR.

RESULTS AND LESSONS LEARNT

To increase the awareness for the efficient integration of inland ports in road infrastructure planning and regional development, regional planning authorities and road infrastructure managers have been provided with the results of the pilot action. With this regard, particular attention is drawn to infrastructure links

from and to the Czech-Saxon inland ports as multimodal consolidation points along the Orient/East-Med corridor and handling points for heavy and oversized goods.

The findings of the accessibility analysis will be used for the implementation of pre-defined transport routes for heavy and oversized goods to inland ports in the German-Czech border region, in line with the recommendations of the German Masterplans for inland waterway transport and rail freight transport.

Similar pre-defined routes are currently being prepared for further inland ports in Germany, so findings of the pilot action (e.g., transport parameters) can be used there as well. Potential transfer might be facilitated through the German ShortSeaShipping Inland Waterway Promotion Center (SPC), which coordinates and promotes activities in this field.

Photographs / figures



4.3. development of new intermodal services from and to Scandinavia

Intermodal transport chains, which are much more environmentally friendly compared to road transport, are significantly underdeveloped along the Orient/East-Med corridor. Moreover, freight flows between Central and South-East Europe are dominated by road transport.

Rostock Port is a gateway for intermodal services from and to Scandinavia. A key challenge for more intermodality is the availability of intermodal transport equipment, which needs to be increased to enable the establishment of new intermodal transport chains.

The investigation of new intermodal services along the Orient/East-Med corridor raises the awareness for this issue, contributing to the promotion of more multimodality in Central and South-East European member states.

DESCRIPTION OF THE PILOT ACTION

Within the pilot action, Rostock Port prepared three market studies for train concepts between Scandinavia and Turkey, Hungary, and Romania to identify potentials for new intermodal services between Northern and South-East Europe. Each study comprises for each source region:

- the mapping of goods flows for different cargo commodities along the Orient/East-Med corridor,
- in-depth analyses for selected cargo commodities, destinations, and intermodal hubs,
- the development of logistics concepts for new intermodal services.



Based on identified transport potentials, different implementation variants for intermodal and conventional wagonload transport have been developed. These train concepts, which have been designed as hub concepts, are a first step towards the establishment of direct trains at later stage.

PROCESS AND ORGANISATION

Each market study is based on comprehensive desk research, identifying potential source regions for successful new intermodal transport chains. Afterwards, results and findings were discussed with potential users and relevant market players from the operational and organisational sector. Finally, the basic structure of the logistics product was refined step by step with information on prices and lead times together with all stakeholders involved.

The analysis of various sources and market surveys as well as many interviews with key players along the Orient/East-Med corridor allowed the elaboration of:

- the market potential (e.g., import and export volumes) for Turkey, Hungary, and Romania,
- the design of competitive intermodal products (train concepts) for each market,
- the assessment of opportunities and risks of such intermodal products, as well as
- the selection of partners for follow-up market penetration and product implementation.

An online platform serves as communication tool, promoting the project results (market studies and train concepts in the format of product sheets) and thus the capabilities of the corridor. Rostock Port will maintain this website as promotion and marketing tool for intermodal services.

RESULTS AND LESSONS LEARNT

According to routes investigated, the market studies lead to the following conclusions:

- Turkey-Scandinavia: To achieve the requested frequencies it is necessary to bundle transport volumes and to lower the utilization risk for operators. A hub concept via terminals such as Railport Arad or Budapest (Bilk) is considered a feasible option to connect Rostock Port with Istanbul (Halkali).
- Hungary-Scandinavia: The current Rostock-Vienna services, which now comprise conventional wagonload only, could be opened also for intermodal volumes. The frequency of two departures per week could be increased if Budapest (Bilk) would be linked with Vienna by an additional rail service.
- Romania-Scandinavia: In the start-up phase, the trains from Curtici (Romania) and Verona (Italy) to Rostock will meet at Fürth station near Nuremberg. The offer represents an entry-level solution that enables interested parties to test intermodal solutions between Romania and Scandinavia.

The market studies and the derived train concepts are being shared with further target groups and international partners, e.g., intermodal train operators, companies and customers interested in such transport services and further terminal operators along the corridor. The train concepts are open for all operators, providing equal opportunities to book and use the rail transport solutions.

Photographs / figures



Rostock Port - gateway to Scandinavia and the Baltic Sea Region (source: ROSTOCK PORT/nordlicht)

4.4. Logistics concept for the OEM freight liner train Rostock-Saxony/Czech Republic

The concept of the freight liner train allows to combine a wide variety of customers, goods, and transport concepts to achieve a competitive offer for shipping by rail, which on the one hand supports the shift of freight from road to rail, and on the other hand avoids weak points in the rail freight transport offer.

The approach pursued within the pilot action consists of the combination of existing services of wagonload and intermodal transport, creating new potentials for rail freight transport along the Orient/East-Med corridor between Rostock Port, Saxony, and the Czech Republic.

Additionally, new opportunities have been investigated to interlink the Czech-Saxon inland ports and further logistics centres in the region with transnational transport flows operated along the corridor.

DESCRIPTION OF THE PILOT ACTION

The main goal of the pilot action was to create a corridor train concept that is competitive with continuous road freight transport. This means that not only transport costs are decisive, but that - depending on the type of rail service - additional advantages and incentives for modal shift should be created. These could be shorter or at least the same transit times, additional payload compared to road freight transport as well as reduced need for truck drivers.

In terms of transit time, costs and frequency, the cheapest concept will be the block train as shuttle service between defined terminals with daily departures in each direction. However, this requires considerable volume flows. Particularly in combined transport for semi-trailers, swap bodies and containers, the consolidation can be achieved at conveniently located intermodal terminals. A comparable concept applies to conventional wagonload trains with loading facilities in railports or inland ports as consolidation points.

PROCESS AND ORGANISATION

After launch of the pilot action, a working group of railway operators and logistics centres was established to support the elaboration and the testing of the logistics concept. During regular meetings, the members of the working group jointly observed and evaluated the market, analysed potential quantities, inquired potential customers, and established contacts with further transport service providers.

Besides the Czech-Saxon inland ports and Rostock Port, cooperation took place with associated partners such as LINEAS, Stena Lines and VTG Rail Logistics. In parallel, the flow of goods and the market potential



for selected goods and types of goods, destinations and intermodal hubs were analysed, leading to the following outputs:

- a comprehensive analysis of goods flows, customers, locations, and transport offers of rail freight transport for the catchment area of the OEM freight liner train,
- a logistics concept for the OEM freight liner train between the Czech Republic, Saxony, and Rostock Port,
- testing of new transport services between the Czech Republic/Saxony and Rostock Port.

RESULTS AND LESSONS LEARNT

In the result of the pilot action, a new intermodal service for craneable semi-trailers between Dresden and Rostock Port was established in cooperation with the intermodal transport operator LKW WALTER. Test operation started in January 2021 with five round trips per week. A second phase of testing was launched in September 2021 with an intermodal service between Dresden and Curtici (Romania) with two weekly round trips. Both new intermodal train services, i.e., Dresden-Rostock and Dresden-Curtici, have left the testing phase and have been transferred into regular operation.

Due to the new transport offers, shippers and logistics services in the Dresden region benefit from the access to direct block train services to Rostock Port and to Romania. This has led to increased awareness and support for intermodal transport in Saxony, and it generated demand for additional handling capacity at the future TrailerPort at the Dresden inland port.

The members of the corridor train working group have agreed to continue cooperation and to use this platform to establish further intermodal services in combined and wagonload transport. Experiences and lessons learnt can be used e.g., for connecting services between North-South and East-West freight flows.

The developed and tested train concept is open for all operators, providing equal opportunities to book and use the rail transport solutions.

4.5. Best-practice guideline for small-scale low-cost improvements for rail freight

Small-scale low-cost investments have an often underestimated and therefore so far not fully exploited potential to make an important contribution to the development of the rail freight system, to the TEN-T network and to the functioning of TEN-T and EU Rail Freight Corridors.

Large-scale and small-scale projects and improvements must be seen as highly complementary. This clearly calls for a more integrated planning and development approach in the context of the TEN-T and EU Rail Freight Corridors, with better alignment of the timing of large-scale projects and small-scale improvements. Ideally, small-scale improvements should already be implemented before large-scale projects are finalised, to reap the benefits of the latter from the very first day of operation.

DESCRIPTION OF THE PILOT ACTION

Small-scale low-cost improvements for rail freight deliver quick benefits and tangible improvements at low cost, and they play an important role in strengthening the added value of large-scale investments. With targeted and (relatively) small-scale and low-cost investments on other sections of a corridor, the value of large-scale projects might substantially increase.

Regarding the implementation of small-scale low-cost improvements, the best-practice guideline identifies three key challenges:

- 1) The “prestige-factor” of small-scale low-cost improvements is often low, making them less attractive for (political) decision-makers. This is true for projects targeted primarily at rail freight.



- 2) The administrative effort in relation to the project size is rather high, both on the side of the project owner as well as on the side of funding entities (national Ministries and/or EU institutions). At the same time, funding instruments, especially on European level, are often adapted to large-scale projects.
- 3) Planning law is not facilitating small-scale projects, since planning procedures are often equally complex and “heavy” as for large-scale projects, e.g., regarding the requirements for the elaboration of studies and the need for approvals and permits.

Additionally, environmental protection provisions are focusing primarily on local impacts of infrastructure projects, while global effects - e.g., due to increased efficiency of the transport system - are usually underestimated.

PROCESS AND ORGANISATION

The best-practice guideline defines the understanding of the subject and puts it in a broader policy context and EU and national level. It also explains, how small-scale low-cost improvements contribute to addressing overall challenges for rail freight.

Subsequently, a system approach is being developed and applied on the Brno-Budapest section of the Orient/East-Med corridor and related railway networks, taking stock on experiences and “best practices” in global scale. In this context, also the TEN-T Demo-Train operated between Sopron and Budapest on 20 October 2021 is presented.

The guideline concludes with recommendations for how to better include small-scale low-cost improvements for rail freight in national and European infrastructure and spatial planning, serving as source of inspiration for planners and stakeholders in all European corridors and regions.

RESULTS AND LESSONS LEARNT

The guideline identifies exemplary measures for improvements, taking the example of the Brno-Budapest section of the Orient/East-Med corridor:

- Construction of triangle tracks to avoid the change of travelling direction,
- upgrade of terminals through the extension of handling tracks, connections at both ends of the terminal, electrification of head-ends of handling tracks and measures for digitalisation and automation,
- extension of sidings to at least 740 m and electrification of railway lines,
- construction of freight bypasses,
- identification of time windows and pre-defined train paths for 740 m freight trains,
- investigation of possibilities for directional running of trains through coordinated development of parallel single-track routes.

In addition, the guideline also presents suggestions how to improve the conditions for small-scale low-cost improvements in the context of planning processes, planning law and policy making, with particular focus on strengthening of the European corridor approach. With this regard, the guideline can also be seen as an input to the process of definition of the future role of TEN-T corridors.



Photographs / figures



The 740 m TEN-T Demo-Train on 20 October 2021 from Sopron to Budapest and the GYSEV team (source: GYSEV)

4.6. Investigating attractive multimodal logistics locations in SW Slovakia and South Moravia

To achieve carbon neutrality in Europe by 2050, it is necessary to prepare territorial pre-conditions for the efficient transshipment of goods between road and rail through the establishment of networks of intermodal/multimodal logistics centres and hubs (IHUBs) as well in the regions along the Orient/East-Med corridor.

Based on the mapping of cross-border accessibility in the Centrope region until 2050, potentially most suitable locations of attractive intermodal/multimodal logistics centres and hubs have been identified for the South Moravian Region and South-West Slovakia with the Bratislava, Trnava and Nitra Self-Governing Regions. Based on the results of the pilot action, in the next step adequate territorial reserves might be created within spatial planning procedures.

DESCRIPTION OF THE PILOT ACTION

Based on quantitative and qualitative surveys of freight transport flows crossing the South Moravian Region and scenarios of development of freight transport and TEN-T transport networks in the South Moravian Region and in South-West Slovakia, two partial studies were elaborated:

- Mapping of cross-border accessibility in the Centrope area until 2050
- Identification of attractive multimodal logistics locations and elaboration of profiles for development in the South Moravian Region and in South-West Slovakia

As a separate result, a web map application (WMA) documenting the identified multimodal logistics locations was launched, based on the setting up of the technical framework for the mapping of cross-border accessibility.

PROCESS AND ORGANISATION

Initially, road freight transport flows crossing the South Moravian Region were analysed. Then, scenarios of development of freight transport crossing and targeting the South Moravian Region and SW Slovakia until 2050 were developed. After setting-up the technical framework, cross-border accessibility in the Centrope area until 2050 was calculated, considering the modelling of the development of TEN-T transport networks. Based on the results, attractive multimodal logistics locations in the South Moravian Region and in South-West Slovakia were identified, and profiles for development of these locations elaborated.

The identification of attractive logistics locations was based on GIS network analysis and expert analyses, considering the above-mentioned models and surveys of goods flows. Experts from transport, logistics,



spatial planning, and GIS supported works during all stages of implementation, and stakeholders from national, regional, and local level were involved in the process by means of local meetings and bilateral consultations.

RESULTS AND LESSONS LEARNT

Besides comprehensive maps of accessibility and attractivity analyses, main outcomes of the pilot action are development scenarios for infrastructure development until 2050/2070. In case of South-West Slovakia, three crucial variants have been elaborated:

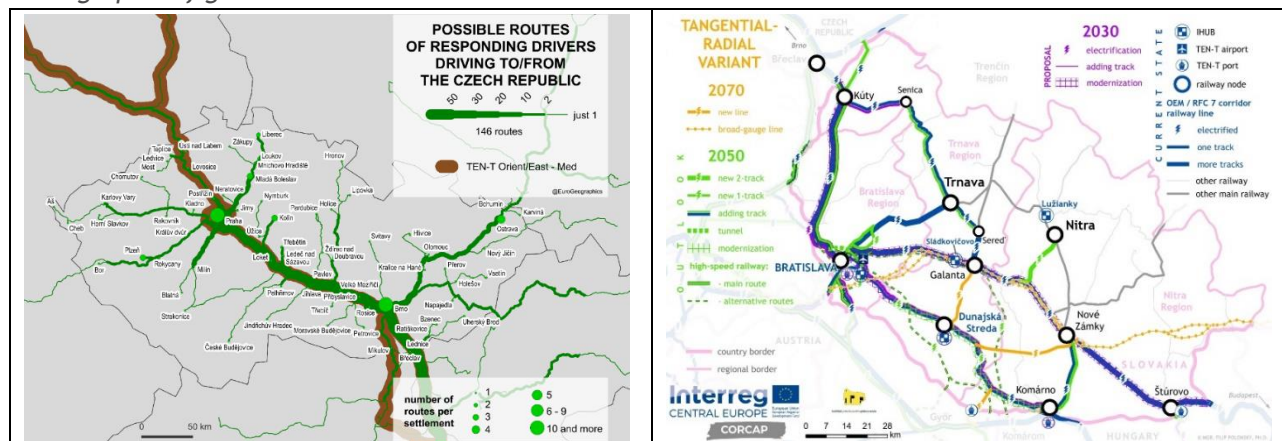
- Tangential variant with a freight bypass, enabling the substantial segregation of long-distance transit freight transport from transport starting/ending in Bratislava
- Radial variant with a focus on the Bratislava railway node, strengthening the radial railway system and providing a local bypass at the Bratislava main station
- Tangential-Radial variant as a combination of the tangential and radial variants, including the perspective of a broad-gauge railway line

Additionally, based on potential macro- and micro localities for intermodal/multimodal logistics centres and hubs (IHUBs), a proposal for a network of local, regional, and supra regional IHUBs has been developed.

The outputs of the pilot action in form of analyses, conclusions and drawings/shapefiles serve as input for the improvement of regional strategic documents, e.g., for the Economic and Social Development Programme of the Bratislava Region (2021-2027) and regional spatial plans of the Bratislava and Nitra Self-Governing Regions. They have already been accepted by decision-makers as background material for the improvement of planning documents and support the discussion on the revision of the TEN-T network in South-West Slovakia.

The methodology of the assessment of accessibility and attractivity of locations can serve as inspiration for other fields of investigation in various geographical areas. All results and findings are available via the web mapping application (WMA), including the profiles for IHUB development.

Photographs / figures



Visualisation of road freight transport flows along the Orient/ East-Med corridor targeting the Czech Republic (left) and Tangential-Radial variant of scenarios of infrastructure development in SW Slovakia (right, sources: KORDIS JMK, IPP)



5. Results and findings from corridor capitalisation plans

Corridor Capitalisation Plans are an innovative instrument with potential relevance for all TEN-T corridors. Currently, the existing practice of corridor development is mainly focused on infrastructure standards, following the principles of sectoral planning. The approach followed by the CORCAP partners goes beyond this practice, as it aims at the elaboration of strategies supporting the interaction of regional development and transport infrastructure development, considering as well operational requirements of multimodal logistics locations and transport services. With this regard, the following challenges have been addressed by the partnership:

- Strengthening the Orient/East-Med corridor as gateway to Scandinavia and South-East Europe (Rostock Region, Budapest Region)
- Facilitating high-speed development and efficient freight transport along the Orient/East-Med corridor (Free State of Saxony, Ústí Region, South Moravian Region, South-Western Slovakia, Győr-Moson-Sopron and Burgenland Region, Budapest Region)
- Increasing the capacity for railway transport in urban nodes (South Moravian Region, South-Western Slovakia, Budapest Region)
- Facilitating green logistics on regional and metropolitan level (Free State of Saxony, Ústí Region, South Moravian Region, South-Western Slovakia)

The development of Corridor Capitalisation Plans has been supported through a strategy-building tool and regional analyses of challenges and needs. The results and recommendations of the Corridor Capitalisation Plans are presented in the subsequent chapter, explaining the challenges as well addressed and the approach towards stakeholder involvement.

5.1. Free State of Saxony - Managing the last mile in the regions

A key element to increase the share of rail freight in the transport market is better access to the railway network for industry and commerce. With this regard, sidings for industrial and commercial areas and public access points to the railway network, such as intermodal terminals and railports, are important prerequisites for transporting goods by rail in a time- and cost-efficient manner.

In the context of the Free State of Saxony, it is important to develop the transport infrastructure in such a way that it provides incentives to shift freight flows from roads to alternative modes of transport. Additionally, besides their transit function, the corridors of the Trans-European Transport Network (TEN-T) offer favourable framework conditions for participation in international trade flows for the regionally based, import- and export-intensive economy.

CHALLENGES ADDRESSED

Investors are increasingly asking about the availability of renewable energies and environmentally friendly modes of transport, driven by requirements and demands of customers (CO₂-neutral supply chains). Accordingly, a shift of paradigm in transport policy is necessary, after decades of road-oriented planning and efficiency-oriented “optimising” of railway infrastructure, leading to the reduction of capacity and flexibility in the railway network.

While public passenger transport - as part of services of general interest - enjoys high priority, freight transport and logistics are seen as the subject of private-sector action. In the effect, most industrial and commercial locations are lacking access to the railway network. To change this situation, the Corridor Capitalisation Plan for the Free State of Saxony has examined how spatial planning, as an essential instrument for strategic development on state and regional level, can address this issue.



PROCESS AND ORGANISATION

The elaboration of the Corridor Capitalisation Plan was based on a comprehensive process of stakeholder involvement with four stakeholder workshops from March 2021 until February 2022. During these workshops, all regional planning associations, the Metropolitan Region of Central Germany, the Saxony Economic Development Agency and the Saxon Chambers of Industry and Commerce were involved.

To facilitate the discussion, the rail access of 113 existing and 52 designated locations > 25 ha for industry and commerce in the Free State of Saxony has been analysed in a GIS-based survey. As part of an additional in-depth analysis, for forty-three designated locations the realisation chances of rail access have been investigated. The results of the analysis have been shared and discussed with all regional planning associations.

RESULTS AND RECOMMENDATIONS

In the result of discussion and stakeholder involvement, the following set of measures and actions for better rail access of locations for industry and commerce has been developed:

- Systematic provision of information on rail access in commercial property databases
- Consideration of rail access as essential element of accessibility quality during the determination of locations for industry and commerce
- Documentation of disused railway lines in regional plans and identification of pilot projects for the reactivation for rail freight transport
- Extension of suitable locations for industry and commerce by spatial corridors for possible (future) access tracks and/or areas for transshipment facilities
- Improvement of access to locations for industry and commerce through additional stops for commuter trains

Additionally, access to the railway network should be strengthened e.g., through the extension of existing intermodal terminals, the creation of additional access points with efficient road connection and the upgrade of existing loading points to multifunctional transshipment facilities. In addition to public funding, these activities could be supported through a coordination function (“rail coach”), providing technical support and attracting new providers of intermodal logistics solutions - as practised in the pilot actions carried out by the Saxon Inland Ports Upper Elbe (SBO).

Needs for cross-border cooperation in the field of corridor capitalisation have been compiled to the “Elbe Valley 2040” paper, focusing on the development of the Elbe waterway, the strengthening of inland ports as logistics locations, the development of sustainable tourism and regular information of the public on the progress of the joint project of the Ore Mountains base tunnel.

5.2. Ústí Region - Capitalising the new railway line Dresden-Prague

The new railway line Dresden-Prague with the branch line to Most is the most important planned investment on the Orient/East-Med corridor in the Ústí Region. It will significantly reduce travelling times in the direction of Prague and Dresden, creating outstanding opportunities for regional and urban development. Through significantly improved accessibility, the city of Ústí nad Labem and the Ústí Region will become more attractive places for living and work.

To capitalise these opportunities and to create an environment for sustainable transport, a multitude of challenges must be addressed - both in the field of passenger and freight transport. With this regard, the future development of the railway node in Ústí nad Labem and its seamless integration with local, regional, and cross-border transport systems will be of crucial relevance.



CHALLENGES ADDRESSED

The Corridor Capitalisation Plan for the Ústí Region shall support the preparation of the construction of the planned new railway lines, increasing at the same time the added value of these investments. In particular, the Plan addresses the following challenges:

- Capitalising the effects of the new railway line Dresden-Prague for regional development, supporting structural change in the Ústí Region
- Increasing the competitiveness of rail passenger transport and enhancing the accessibility of cities and micro-regions not directly connected to the planned new railway lines
- Providing sufficient capacity for cross-border rail freight transport and improving the conditions for the development of intermodal transport

In the effect of implementation of the Plan, the transport and logistics system in the Ústí Region should be more in favour of railway transport.

PROCESS AND ORGANISATION

The Plan was developed based on the regional analysis of challenges and needs, discussions with project partners located along the Orient/East-Med corridor and discussions with stakeholders. The transnational process of elaboration enabled the Ústí Region to reflect its situation in the corridor and to receive inspiration and feedback from transnational exchange and discussion.

Already during project implementation, cooperation, and negotiations with the infrastructure operator Správa železnic, local authorities and e.g., potential investors of intermodal terminals were launched and intensified to facilitate the realisation of priorities outlined in the Plan.

RESULTS AND RECOMMENDATIONS

The Corridor Capitalisation Plan for the Ústí Region is composed of a comprehensive set of targeted actions, which are aimed at the improvement of coordination between transport and spatial planning and the strengthening of logistics locations through better accessibility:

- 1) Incorporating the spatial corridors from the feasibility study for the new railway line Dresden-Prague into the regional spatial plan (“Development Principles”) of the Ústí Region
- 2) Dealing with conflicts of interest arisen during the planning process of the high-speed railway line, along the route between Roudnice nad Labem and the Czech-German state border
- 3) Securing conditions for transit-oriented development in regional centres benefiting from faster train connections through spatial planning and reservation and acquisition of land around railway stations
- 4) Enabling faster train connections from Prague and Dresden to as many regional centres as possible
- 5) Assessing changes of the transport system in the Elbe/Labe valley after completion of the Ore Mountains base tunnel and the Central Bohemian Uplands base tunnel (“Elbe Valley 2040”)
- 6) Incorporating the needs of freight transport into strategic planning documents of the Ústí Region
- 7) Securing conditions for future development of intermodal terminals and rail freight facilities
- 8) Increasing resilience of cross-border rail freight transport until completion of the new railway line Dresden-Prague
- 9) Navigability of the Elbe/Labe waterway
- 10) Preserving and developing rail sidings through management of land use changes

It is planned to incorporate the principles and recommendations of the Corridor Capitalisation Plan into the Development Strategy of the Ústí Region. Throughout further implementation, it will be crucial to keep concerned stakeholders and the public continuously informed about investment plans and plans for the development of transport infrastructure - to prevent misunderstandings, to receive useful feedback and to increase support for planned improvements.

5.3. South Moravian Region - Promoting long-planned infrastructure improvements

The South Moravian Region is heavily affected by transit traffic. Therefore, there is an urgent need to make road and rail transport along the Orient/East-Med corridor significantly faster, smoother, with less delays caused by works on tracks, offering more attractive connections and using regional transport as feeder for national and international high-speed connections.

The South Moravian Region has been working for many years on measures that can significantly improve the traffic situation both in the region and throughout the Czech Republic. The support and construction of the high-speed line Prague-Brno, the new Brno railway node, the completion of the motorway to Austria and capacity increase of the motorway along the Orient/East Med corridor are the most important challenges in long-term perspective.

CHALLENGES ADDRESSED

The TEN-T railway line between Brno and Prague faces problems of capacity, inefficient routing, and speed. The planned construction of the high-speed line Prague-Brno and the new Brno railway node will increase the capacity both for passenger and freight trains. It speeds up connections not only between Brno and Prague, but also with the neighbouring countries. For improving the transport situation in the South Moravian Region, it is necessary to support the development of the high-speed line and the new railway node.

Motorway sections around Brno are heavily congested. The Brno-Vienna motorway is as well part of the Baltic-Adriatic corridor and the most important connection between Poland, Moravia, and Austria. It is necessary to complete the last, still missing section of this motorway and to extend the Prague-Brno motorway, to manage the heavy transit traffic passing the South Moravian Region.

PROCESS AND ORGANISATION

The Corridor Capitalisation Plan has been prepared by KORDIS JMK, applying its expert knowledge of the transport sector in the South Moravian Region. Initially, four studies and analyses on rail freight transport, quantitative and qualitative aspects of road freight transport, and scenarios of development of freight transport crossing and targeting the South Moravian Region have been realised.

The research confirmed the strong demand for the TEN-T corridor route from the Balkans to Northern Germany and Western Europe, the enhancement of the traffic intensity in the vicinity of Brno through the routing of several major transit routes and the intense competition of freight and passenger transport, due to insufficient capacity of tracks in the section Břeclav-Brno-Prague and in the Brno railway node.

The draft Plan was consulted in July and September 2021 with representatives of the South Moravian Region, the Railway Infrastructure Administration, the Road and Motorway Directorate of the Czech Republic and further transport experts, with particular focus on priorities and timeframes.

RESULTS AND RECOMMENDATIONS

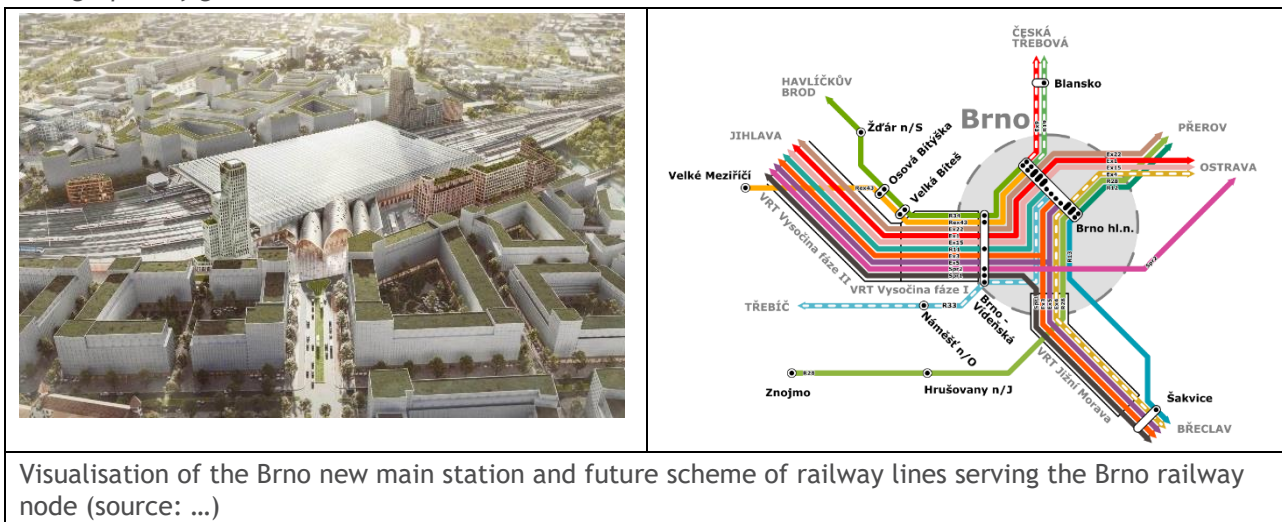
The Corridor Capitalisation Plan for the South Moravian Region is an important supportive material for making regional decisions about future passenger and cargo transport. It also supports the increase of the capacity of railway infrastructure along the Orient/East-Med corridor between Vienna/Bratislava, Dresden, and Berlin. Content-wise, the Plan addresses the following priorities, which are translated into specific measures to be implemented by 2030 and 2050:

- Higher capacity, reliability and speed of passenger and freight transport along the multimodal link Vienna/Bratislava-Prague,
- support of planning and construction of high-speed railway lines,

- support and promotion of the increase of capacity of the Brno railway hub,
- monitoring and support of activities of multimodal cargo terminals (Brno railway terminal, Brno airport terminal, Břeclav terminal),
- integration of priorities into regional development and spatial plans, interaction with the interested public.

Due to its effects on public transport, the development of the new Brno railway node will as well reinforce the need for thorough planning and coordination of public transport services, both in relation to the mobility needs of the population and in relation to complementary modes of transport (shared ownership of emission-free vehicles, walking, cycling, etc.). Therefore, public authorities at all levels and public transport coordinators such as KORDIS JMK are expected to be involved in regular preparation and continuous updating of sustainable mobility plans.

Photographs / figures



Visualisation of the Brno new main station and future scheme of railway lines serving the Brno railway node (source: ...)

5.4. South-West slovakia - Preparing the infrastructure for the future

Considering the results of the pilot action aimed at the investigation of attractive multimodal logistics locations, the Corridor Capitalisation Plan for South-West Slovakia outlines an action-oriented framework for the preparation and implementation of identified investments and improvements in the Bratislava, Trnava and Nitra Self-Governing Regions.

For this purpose, a comprehensive intervention logic with a hierarchy of objectives, priority axes and measures has been developed, supporting the enhancement of the functionality of the freight corridor and an efficient corridor development process. Additionally, related outputs and activities, financial needs, relevant stakeholders, possible sources of funding and relevant key projects have been identified.

CHALLENGES ADDRESSED

Following the Slovak Spatial Development Perspective, the settlement system in the Slovak Republic shall be developed according to the principle of “concentrated decentralisation”, with efficient suburban and regional rail passenger transport. At the same time, it is necessary to provide sufficient capacity for transit rail freight, leading to better utilisation of the transport system and ensuring a sufficient quality of the settlement environment.



To comply with these aims, the strategic objective to increase the share of rail freight to at least 50 % by 2050 has been laid down in the Corridor Capitalisation Plan. This change shall be achieved through the modernisation and completion of the regional railway network and the development of a network of intermodal/multimodal logistics centres and hubs (IHUBs). In the effect, the burden on the settlement environment created by road freight transport would be significantly reduced.

PROCESS AND ORGANISATION

The Corridor Capitalisation Plan for South-West Slovakia is based on the regional analysis of challenges and needs, and the results and findings of the pilot action aimed at the investigation of attractive multimodal logistics locations. Representatives from regional offices of the Bratislava, Trnava and Nitra Self-Governing Regions, the Ministry of Transport and Construction of the Slovak Republic, the Capital City of Bratislava and transport and logistics experts have been involved in the processing of the Plan during stakeholder meetings and bilateral consultations. Works and agreements were supported through the web mapping application (WMA) created in the result of the pilot action.

RESULTS AND RECOMMENDATIONS

Based on the intervention logic with strategic, specific, and operational objectives, the following key measures have been included in the Corridor Capitalisation Plan:

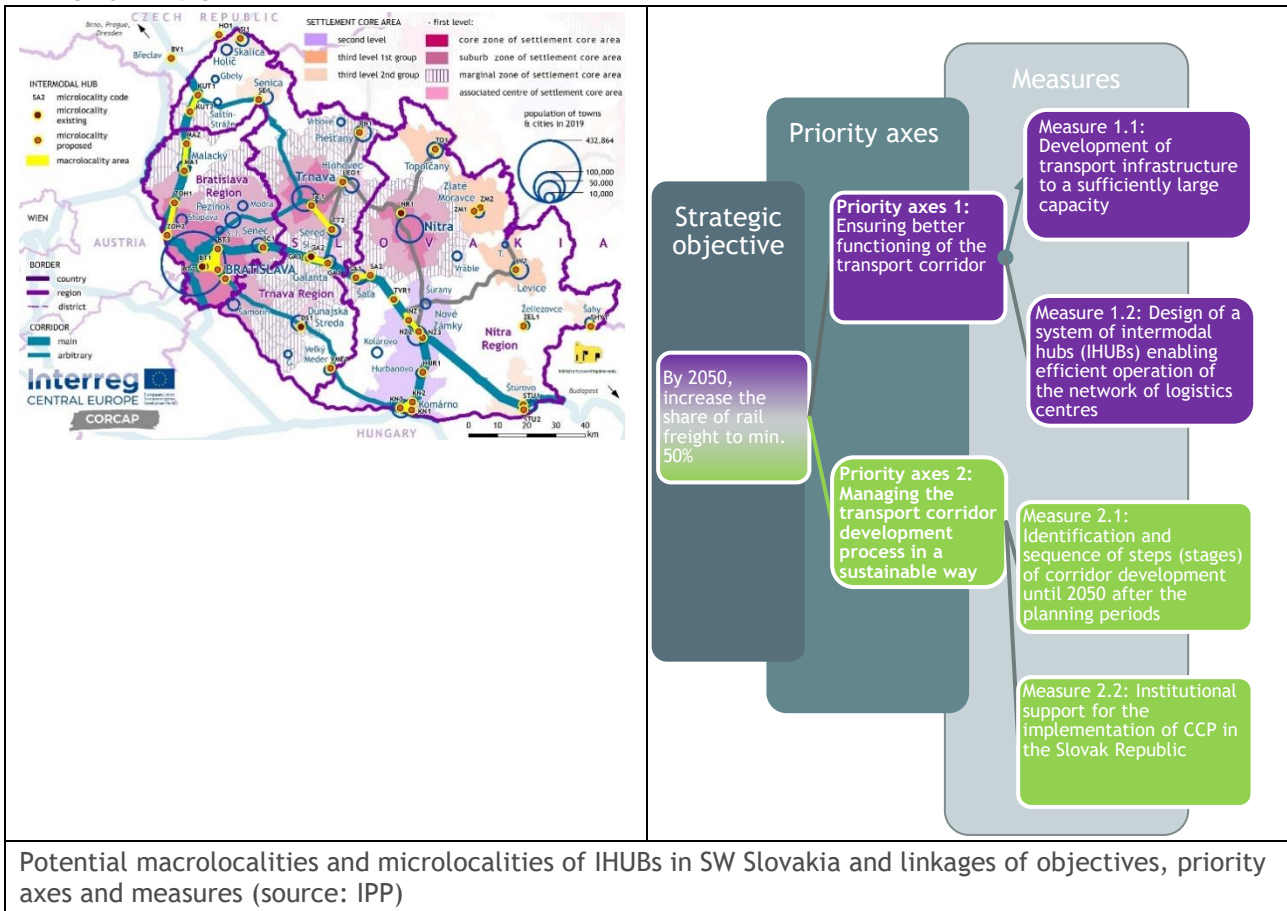
- Development of transport infrastructure to a sufficiently large capacity, based on the analysis and assessment of different development scenarios and variants (Tangential, Radial, Tangential-Radial)
- Design and development of a system of IHUBs according to different development scenarios, enabling efficient operation of a network of logistics centres
- Identification and sequence of steps (stages) of corridor development until 2050, considering the interlinking of different planning cycles of EU regional policy and spatial planning
- Institutional support for implementation of the Corridor Capitalisation Plan, consisting of a coordination and cooperation platform and a territorial monitoring and information system

Regarding the development of the railway system, it is proposed to establish a rail freight bypass for the Bratislava railway node via Kúty, Senica, Trnava, Nové Zámky and Komárno/Štúrovo. Railway lines and facilities should be adjusted and upgraded to make cross-border freight transport more efficient, with high-quality railway infrastructure providing effective connections to Brno, Budapest, Győr and Vienna. Regarding the possible extension of the broad-gauge line from Košice to Vienna, particular attention should be paid to the impact on the economic and social development of regions located along the line.

Finally, several recommendations on transnational, national and regional level have been identified, supporting the implementation of the Plan. These include the adoption of EU and national legislation favouring rail freight transport, the incorporation of project results into national and regional documents in the field of regional policy, transport, economic development and spatial planning and the elaboration of territorial and technical documents mapping related quality factors of the settlement environment, as a useful database for subsequent works.



Photographs / figures



5.5. Győr-Moson-Sopron and Burgenland Region - Promoting small-scale low-cost improvements

The Győr-Moson-Sopron and Burgenland Region is characterised by a dense network of TEN-T corridors and Rail Freight Corridors, which are interconnecting in the region. Considering the continuously growing demand for transport services, it is necessary to further develop the transport infrastructure for future transport needs. With this regard, faster and efficiently operated transit and freight and passenger rail services should be well coordinated with road and inland waterway transport.

During future development, the operational requirements of multimodal logistics locations (e.g., in Sopron) and related transport services need to be thoroughly considered. Through the improvement of the connectivity of intermodal hubs, including e.g., the Danube inland port of Győr-Gönyű, tangible benefits will be delivered for more efficient freight transport solutions.

CHALLENGES ADDRESSED

The key objective of the Corridor Capitalisation Plan for the Győr-Moson-Sopron and Burgenland Region is to support a dynamic economic development, keeping the environmental burden and the impact on natural resources as low as possible. In the mobility and transport planning sector this can be achieved by shifting the growing passenger and freight traffic - both locally generated and macro-regional transit traffic - to rail. With this regard, there is a need to resolve existing capacity constraints found at junctions along important traffic flow directions. Also, track doubling along several single-track sections is crucial to



increase capacity, reduce transit times, decrease delays and to improve the resilience of the transport system.

Due to recently opened new motorway sections (M85-M86) and the M83 soon to be opened, it is essential that the competitiveness of rail services will be improved. TEN-T standards, in particular train lengths of at least 740 m and 22,5 tons axle-load must be available on the TEN-T rail network. Based on an integrative and interactive approach, the Corridor Capitalisation Plan addresses organisational and coordination barriers for these issues.

PROCESS AND ORGANISATION

The preparation of the Corridor Capitalisation Plan was closely interlinked with the elaboration of the best-practice guideline for low-cost improvements for rail freight transport. Regional and national stakeholders were involved through bilateral consultations, with the International Rail Freight Workshop in Sopron and the 740 m TEN-T Demo-Train between Sopron and Budapest on 19-20 October 2021 being the highlight.

The feedback received on the Plan from key experts from various authorities, planning institutions and railway operators are considered as well for further plans and strategies, including the V4 High-Speed Rail Concept and the National Rail Freight Concept.

RESULTS AND RECOMMENDATIONS

Based on the analysis of plans and studies, the Corridor Capitalisation Plan identified infrastructural bottlenecks related to all transport modes, which should be removed through

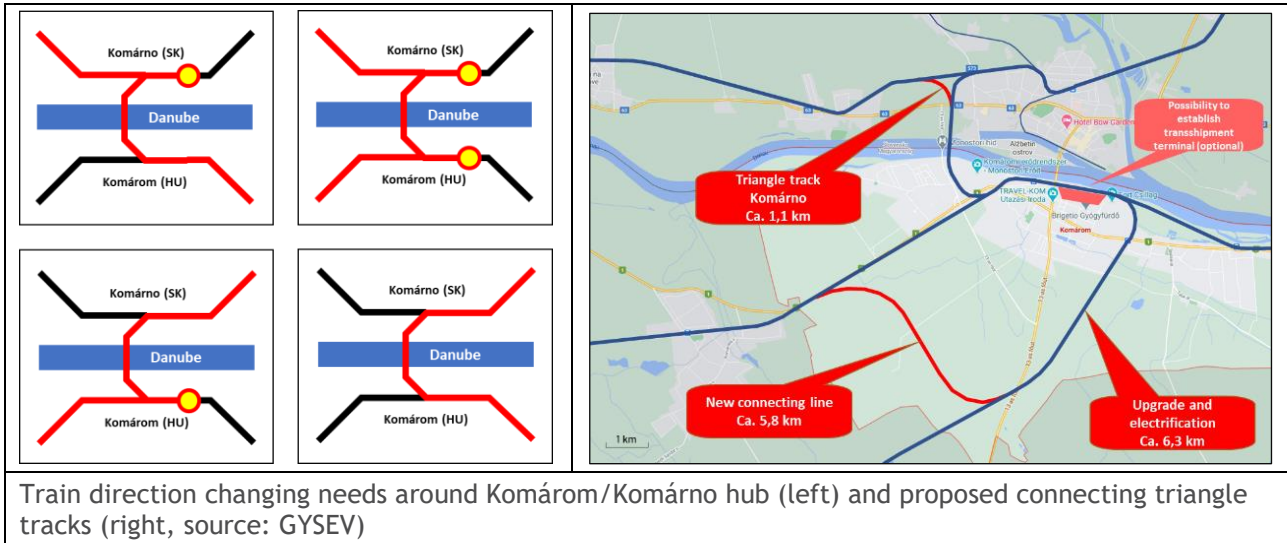
- improvement of the railway network,
- development of the Danube waterway for safe and economical navigability of the Hungarian river section, including the Győr-Gönyű Port and the Komárom/Komárno ports,
- development of the road network, the M85/A3 cross-border section between Sopron and Eisenstadt.

For the improvement of the railway network, a set of key measures has been identified:

- Construction of triangle tracks in Zalaszentiván and Ebenfurth to avoid the change of travelling direction,
- upgrading of the Sopron node and the Sopron intermodal terminal,
- improvement of the Komárom/Komárno node through triangle and connecting tracks, improving fluidity of traffic, and creating the opportunity to strengthen the Komárom/Komárno node as intermodal node,
- reconstruction and upgrading of the Zalaszentiván-Szombathely-Csorna-Hegyeshalom-Rajka-Bratislava line, double-tracking of the Győr-Csorna-Sopron line and electrification of the Sopron-Wiener Neustadt line,
- implementation of full TEN-T standards (740 m train length, 22,5 t axle load) along North-South and East-West transit lines.

All projects should be considered in regional and local spatial planning to ensure that e.g., possible land requirements - in particular in case of new alignments of railway lines - are properly met. Since the Győr-Moson-Sopron and Burgenland Region serves as hub for macro-regional connections in the EU, improved alternative routes are beneficial for a much wider area than the directly impacted regional population. With this regard, relations to Austria and to Slovakia are of similar relevance.

Photographs / figures



5.6. Budapest Region - Strengthening the gateway to South-East Europe

In the Budapest region, as in the case of all urban nodes along the Orient/East-Med corridor, there is the need to provide an attractive mobility system that is both economically and environmentally sustainable and able to cope with the ever-growing transport demand, both in terms of passenger and freight traffic. Also, supporting economic growth and transport-oriented regional planning is a crucial task.

Through the elaboration of the Corridor Capitalisation Plan a professional platform for coordination between transport infrastructure and spatial planning has been facilitated, supporting the connectivity of intermodal hubs and inland ports through better railway access and increased capacity for rail freight. The main lesson learnt is that coordination between different stakeholders is necessary to reach efficient optimal solutions.

CHALLENGES ADDRESSED

To create an attractive mobility system in the Budapest region that is both economically and environmentally sustainable and able to cope with the ever-growing transport demand, there is a need to

- facilitate cross-sectoral cooperation between stakeholders in the field of regional development and transport, leading to mutual involvement in the elaboration of plans and concepts,
- shift significant transport volumes from road passenger and freight transport to more environmentally friendly modes of transport and remove bottlenecks,
- strengthening the hub function of Hungary for Central and South-East Europe,
- facilitate multi-governance level cooperation within the transport sector, enabling stakeholders at various levels to share their thoughts and to identify synergies,
- integrate local, regional, and national development concepts.

To create commitment on lower levels, experts responsible for smaller administrative territories should be involved in higher level development plans as well. This approach should result in jointly elaborated, aligned development plans, making the best use of development opportunities.



PROCESS AND ORGANISATION

Stakeholders engaged in the process of elaboration of the Corridor Capitalisation Plan through a series of four online workshops from March until June 2021. Due to the wide stakeholder consultation process, decision-makers from different administrative levels and different sectors could take part and cooperate on the issues discussed. The first and the final workshops were organised on a larger scale, to include more participants and to provide broader publicity for the developed Plan.

To elaborate on the contents of the Plan, interactive methods for discussion and for the ranking of problems have been applied, enabling all participants to actively share their insights and opinions.

Results and recommendations

Based on the discussion of development challenges and considering findings from regional development plans such as the Budapest Transport Development Strategy 2014-2030, the Budapest Rail Node Study (BRNS) and the Budapest 2030 Long-Term Urban Development, existing project ideas have been identified. After in-depth discussion, they have been grouped into three sequential action plans:

- Action plan 1 - Business-as-usual scenario (BAU), based on the patching of the current transport system according to official and valid decisions.
- Action plan 2 - New Plans (NP), including planned and proposed measures from the Budapest Rail Node Strategy.
- Action plan 3 - Rail Freight Development, including measures necessary for the service of local and corridor-based freight operations.

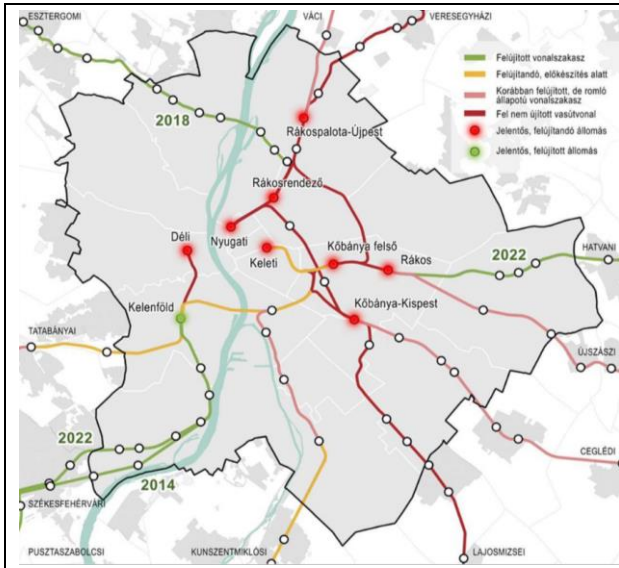
The Corridor Capitalisation Plan for the Budapest Region supports the planning process for the removal of crucial bottlenecks through additional tracks on Danube bridges and a new Danube tunnel, the improvement of the feeder network and the upgrade of important junctions. Additionally, it supports faster rail freight flow across the Budapest urban area, considering plans for the “V0” rail freight bypass as well as small-scale investments for better rail access to important logistics sites and a better served urban logistic system.

Several elements and objectives of the Plan were adopted and agreed upon by the Budapest Municipality and the Hungarian Central Government, which has approved the Budapest Agglomeration Railway Strategy by the Governmental Decree 1994/2021 (28/12/2021).

Since the Corridor Capitalisation Plan includes all planned developments foreseen for the Budapest Region within a holistic concept, it may serve as justification for the support of project developments. If policy makers need to rank project ideas by necessity and importance, it may also serve as a decision-support tool.



Photographs / figures



Rail infrastructure conditions in Budapest (left) and capacity upgrade of the Southern railway bridge

6. Outlook - Action Programme 2022+

The topics and issues tackled within the CORCAP project will remain on the agenda. Draft decisions and action frameworks aimed at the implementation of Corridor Capitalisation Plans and further capitalisation of results and outcomes of multimodal freight transport pilot actions have been prepared for all participating regions and partners, outlining the possible framework for follow-up activities. Each draft decision and action framework has been tailored to the local situation, considering the experience of stakeholders, current challenges for cooperative and integrated approaches and expected developments.

In the very end, each pilot action and each Corridor Capitalisation Plan shall contribute to the durable strengthening of the Orient/East-Med corridor and its functionality. With the CORCAP approach, certain steps towards the transnational capitalisation of the corridor have been undertaken - and there are many further steps to follow, contributing to European cohesion and solidarity.

Rostock Region and intermodal services along the Orient/East-Med corridor - Rostock Port & SBO Saxon Inland Ports Upper Elbe:

- Strengthening of hub concepts to support the bundling of cargo volumes and the establishment of direct services:
 - Further operation of the Rostock-Dresden and Dresden-Curtici intermodal services
 - Launch of regular intermodal services Rostock-Budapest, with bundling of cargo volumes from Hungary, Turkey, and Romania in Budapest
 - Investigation of Fürth (near Nuremberg) as strategic rail node/hub for Rostock Port, to connect/switch rail units between North-South and East-West relations
- Continued exchange with train operators, shipping companies and freight forwarders to foster their commitment for the implementation of (corridor) train concepts
- Continued operation of the online platform <https://intermodal-rostock.de> as promotion and marketing tool for intermodal services

Free State of Saxony - Saxon State Ministry for Regional Development, New railway line Dresden-Prague EGTC & SBO Saxon Inland Ports Upper Elbe:

- Support of the review of criteria for the designation of locations for industry and commerce and of the extension of existing locations by spatial corridors and areas for possible (future) access tracks and/or transshipment facilities
- Support of informal approaches (e.g., GIS databases, regional development concepts) to promote better rail access of locations for industry and commerce
- Intensification of dialogue between spatial planning and sectoral planning in the field of economic development and transport
- Update of information on access points (terminals, railports) and their capacities, support of preparatory studies for the extension of existing and the creation of new terminals

Ústí Region - Regional Authority of the Ústí Region:

- Incorporation of spatial corridors from the feasibility study for the new railway line Dresden-Prague into the regional spatial plan (“Development Principles”) of the Ústí Region
- Dealing with conflicts of interest arisen during the planning process of the high-speed railway line (“Not in my backyard” - NIMBY)
- Use of the results and outcomes of the Corridor Capitalisation Plan as input for the actualisation of the development strategy of the Ústí Region



Free State of Saxony & Ústí Region: Elbe Valley 2040

- Support of the further development of inland ports as multimodal logistics interfaces for inland waterway, rail, and road
- Promotion of sustainable tourism in the Elbe valley - support of sustainable mobility and management of visitor flows
- Continuous promotion of the new railway line Dresden-Prague - regular exchange with stakeholders and Saxon-Czech working groups, active participation in dialogue fora of infrastructure operators and support of information activities

South Moravian Region - Regional Authority of the South Moravian Region & KORDIS JMK:

- Support of the railway infrastructure administration (SŽ) and the motorway operator (ŘSD) in development and upgrading of transport infrastructure according to priority needs confirmed within the Corridor Capitalisation Plan
- Emphasising the importance of planned developments in future communication towards the public and decision-making bodies
- Support of the implementation of planned investments in the regional development strategy and in the regional spatial plan

South-Western Slovakia - Bratislava Self-Governing Region, Trnava Self-Governing Region, Nitra Self-Governing Region & IPP Institute of Spatial Planning:

- Monitoring of follow-up studies on the analysis and assessment of different development scenarios for the upgrade of transport infrastructure
- Elaboration of proposals for follow-up projects on logistics networks and monitoring of the implementation of IHUBs
- Update of national, regional, and local planning documents and realisation of task-related urban studies (e.g., on the Komárno-Komárom node)
- Follow-up discussions on working structures and governance arrangements

Győr-Moson-Sopron and Burgenland Region - KTI Institute for Transport Sciences & GYSEV:

- Incorporation of results and outcomes of the Corridor Capitalisation Plan into ongoing and future works and studies (e.g., National Rail Freight Concept, “V0” rail freight bypass feasibility study)
- Adjustment of spatial plans, based on the results of feasibility studies
- Promotion of more attention for processes of prioritisation of train paths, check of regular operation of 740 m trains
- Promotion of more attention for different requirements of passenger and freight transport - need to reduce travel times vs. need to optimise freight handling

Budapest Region - FBL Freeport of Budapest Logistics & KTI Institute for Transport Sciences

- Facilitation of exchange and collaboration among stakeholders, regarding the application for CEF funding
- Dissemination and transfer of the results of the Smart traffic management system
- Use of the results and outcomes of the Corridor Capitalisation Plan as input for follow-up studies
- Emphasising the importance of planned developments and digitalisation issues in future communication and promotion of the improvement of inland navigation



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