European Commission

Studies on the TEN-T Core Network Corridors and Support of the European Coordinators

BALTIC-ADRIATIC CORRIDOR

Final Study Report

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List of acronyms and abbreviations

AB	Allocation Bodies
AC	Alternating current
Alpine Crossings	Semmering base tunnel and Koralm railway line and tunnel in Austria
Art.	Article
Artt.	Articles
ASFINAG	Autobahnen- und Schnellstraßen-Finanzierungs-Aktiengesellschaft/Motorway and Highway Infrastructure Manager
AT	Austria
BAC	Baltic-Adriatic Corridor
CAPEX	Capital expenditures
CBA	Cost Benefit Analysis
CBS	Christophersen-Bodewig-Secchi Report
CCS	Command and Control System
CEF	Connecting Europe Facility
CEMT	Conférence Européenne des Ministres des Transports/ European Conference of Ministries of Transport
CF	Cohesion Fund
CIS	Charging Information System
CNC	Core Network Corridor
CNG	Compressed Natural Gas
CO^2	Carbon Dioxide
CZ	Czech Republic
DARS	Družba za avtoceste v Republiki Sloveniji/ Motorway Infrastructure Manager
DC	Direct current
DG MOVE	Directorate-General for Mobility and Transport
DG REGIO	Directorate-General for Regional and Urban Policy
EC	European Commission
EEIG	European Economic Interest Grouping
EIA	Environmental Impact Assessment
EIB	European Investment Bank
EFSI	European Fund for Strategic Investment
ENI	European Neighbourhood Instrument
ERDF	European Regional Development Fund
ERTMS	European Rail Traffic Management System
ERTMS EDP	European Rail Traffic Management System European Deployment Plan
ESIF	European Structural and Investments Fund
ETCS	European Train Control System
EU	European Union
EV	Electric Vehicle

GDDKiA	Generalna Dyrekcja Dróg Krajowych i Autostrad/ Motorway and Highway Infrastructure Manager
GHG	Greenhouse Gases
Hz	Hertz
ICT	Information Communication Technologies
IM	Infrastructure Manager
INEA	Innovation and Networks Executive Agency
IPA	Instrument for Pre-Accession
IT	Italy
IT (tools)	Information Technology (tools)
ITS	Intelligent Transport System
JASPERS	Joint Assistance in Supporting Projects in European Regions
KPI	Key Performance Indicator
LNG	Liquefied Natural Gas
MoS	Motorways of the Sea
MS	Member State
OPEX	Operating expenses
PAX	Passengers
PCS	Path Coordination System
PKP PLK SA	PKP Polskie Linie Kolejowe S.A./Railway Infrastructure Manager
PL	Poland
PRM	Persons with reduced mobility
REG.	Regulation
RFC	Rail Freight Corridor
RFC5	Baltic-Adriatic Rail Freight Corridor
RIS	River Information Services
RNE	RailNetEurope
Ro-La	Rolling Highway/Rolling Road
RP	Rail Policy
RRT	Rail-Road Terminal
RU	Railway Undertaking
SDM	Sesar Deployment Manager
SEA	Strategic Environmental Assessment
SESAR	Single European Sky ATM Research
SI	Slovenia
SK	Slovakia
SŽDC	Správa železniční dopravní cesty/Railway Infrastructure Manager
TAF-TSI	Telematics Applications for Freight Service – Technical Specifications for Interoperability
TCC	Traffic Control Centres
TCCCom	Traffic Control Centres Communication
TENs	Trans European Networks
TEN-T	Trans-European Transport Network

TIS	Train Information System
VTMIS	Vessel Traffic Management and Information System
WG PM&O	Performance Management and Operations Working Group
WP	Work Plan
ŽSR	Železnice Slovenskej republiky/Railway Infrastructure Manager

Abstract

This study represents the technical basis for the first and second update of the Baltic-Adriatic corridor work plan by the European Coordinator, Prof. Kurt Bodewig, together with Poland, Czech Republic, Slovakia, Austria, Italy and Slovenia, and in consultation with the Corridor Forum. The study provides an updated analysis of the characteristics of the 1,800 km long intermodal corridor between the Baltic and Adriatic basins, interconnecting 13 urban nodes and their airports, 10 maritime and inland waterway ports and 24 rail-road terminals. The general and specific objectives for the development of the corridor as already identified in the first Baltic-Adriatic corridor study of 2014 have been confirmed and further specified with reference to the requirements set in the Regulation (EU) 1315/2013, also considering the results of the corridor market study. The analysis emphasises the strategic relevance of investing in the following work plan priorities: development of the cross-border sections, completion of the railway Alpine crossings in Austria (Koralm railway line and tunnel and Semmering tunnel), improvement of the last mile connections of ports, modernisation of the rail corridor links in "Cohesion Member States", enhancement of interconnections and transfer operations in urban nodes and ERTMS deployment. The progresses and future challenges of the development of the corridor by 2030 have been monitored and assessed based on the analysis of the corridor project list. Nearly 640 projects have been identified. Also thanks to the support of the CEF Instrument over 80 projects have been already completed and over 550 are under development or implementation, which address the corridor specific objectives and work plan priorities. The development of a fully functional and interoperable corridor, compliant with the Regulation EU 1315/2013 by 2030, is challenged by the low maturity of the initiatives included in the project list, which calls for a more stable and mature pipeline of investments. In order to fully respond to the requirements set in Art. 47 of the Regulation EU 1315/2013, an analysis of the wider elements of the work plan has been performed. This shows that the corridor is contributing to transport decarbonisation thanks to the deployment of innovation. The analysis of the documentation of case studies demonstrates an increasing awareness among the stakeholders of the impact of climate change on the corridor infrastructure and identification of mitigation measures. The development of the corridor is finally significantly contributing to jobs and economic growth in the concerned Member States and Regions as well as in the wider European Union.

Executive summary

The Baltic-Adriatic Corridor (hereinafter BA Corridor) study has been prepared by the *BA Corridor study consortium* to provide the technical basis for the second update of the BA Corridor work plan, by the European Coordinator, Prof. Kurt Bodewig, together with the six Member States concerned, Poland, Czech Republic, Slovakia, Austria, Italy and Slovenia, and in consultation with the Corridor Forum.

The study comprises the following tasks: definition of the corridor KPIs and analysis of the corridor infrastructure parameters; update, integration and expansion of the corridor project list; confirmation of the results of the corridor multimodal market study; update of the elements of the work plan, including a description of the corridor characteristics, the definition of the objectives for its development and a plan for the implementation of the investments required to achieve the targets set in the TEN-T policy for the core network by 2030. The study also provides an analysis of the wider elements of the work plan, including the impact of the development of the corridor on innovation deployment, on transport decarbonisation and on jobs and economic growth, as well as the identification of the effects of climate change on the corridor infrastructure and the measures identified to mitigate this impact.

Support and follow up of the meetings of the Corridor Forum have been also performed as part of the study's activities. Seven Corridor Forum meetings and four working groups (two for Ports and Rail-Road Terminals and two for the Regions, Macro-regional Strategies and Urban Nodes) have been organised between September 2015 and November 2017. In the same period the *BA Corridor study consortium* has been also engaged in other meetings of the European Coordinator such as cross-border dialogues and visits to Infrastructure Managers and Baltic-Adriatic Rail Freight Corridor. Participation in the Corridor Forum and additional meetings have seen the involvement of the main corridor stakeholders, including: Member States, Railway and Port Infrastructure Managers and the Management and Executive Boards of the Baltic-Adriatic Rail Freight Corridor, Road and Airport Infrastructure Managers, Regions, Macro-regional Strategies and Urban Nodes, as well as representatives of the EU institutions (i.e. DG MOVE, DG REGIO, INEA).

Finally, the study activities comprise the definition of the basic elements and guidelines for the development of the innovative flagship projects Enhance passengers' transfer hubs in urban nodes along the corridor. This aims at supporting the development of integrated intermodal infrastructure and services between modes, smoothing or eliminating interruptions and barriers of operational, informative and commercial nature at transport nodes, towards a single multimodal market for EU passengers.

Characteristics of the BA Corridor

The BA Core Network Corridor is an 1,800 km long intermodal infrastructure between the Baltic and Adriatic basins. 4,300 kms of railway lines and 3,600 kms of roads interconnect 13 urban nodes and their airports, and a total of 10 maritime and inland waterway ports. 24 rail-road terminals have been also identified along its alignment.

Critical issues on the BA Corridor

Rail

With the only exception of the two Alpine crossings in Austria (Koralmbahn line section Wettmannstätten-Grafenstein within the wider section Graz – Klagenfurt and Semmering Base Tunnel Gloggnitz - Mürzzuschlag), the corridor railway infrastructure is already continuous and in operation. However, several challenges are to be faced in terms of compliance with the rail infrastructure requirements as laid down in the Regulation (EU) 1315/2013:

- Electrification – the railway infrastructure along the corridor is almost entirely electrified except for the diesel passengers' sections at the cross-border between Slovakia and Austria on the Bratislava-Wien railway line;
- Axle load – the corridor is mostly compliant with the Regulation (minimum of 22.5 t). There are however some corridor sections (7% of the total corridor railway infrastructure) that are not at standard yet, in Poland (some sections on the lines Katowice – Czechowice-Dziedzice – Zwardoń, Wrocław – Jelcz – Opole) and Slovenia (some sections between Zidani Most – Šentilj, where studies and works are currently ongoing);
- Line speed – 28% of the BA Corridor is also not at standard (minimum 100 km/h for freight trains), with relevant bottlenecks particularly affecting the Polish and Slovenian networks, which call for infrastructure modernisation. More specifically, over 840 km of the Polish railway lines (about 20% of the total corridor railway infrastructure) and 270 km of Slovenian railway lines would need to be upgraded to meet the requirement set in the Regulation;
- Maximum permitted length of trains – on most sections of the BA Corridor is shorter than the 740 meters required by Regulation (EU) 1315/2013. The prevailing maximum train length along the corridor is around 600 m, but more severe restrictions exist on specific sections.

Regarding the above parameters, critical issues are still present in 6 out of 9 rail cross-border sections, all of them requiring upgrading and modernisation works: Opole (PL) – Ostrava (CZ); Katowice (PL) - Ostrava (CZ); Bratislava (SK) – Wien (Stadlau) (AT); Katowice (PL) – Žilina (SK); Graz (AT) – Maribor (SI); and Trieste (IT) - Divača (SI).

Concerning train length, only the following national sections are fully at standard: Gdynia Port – Warszawa Zachodnia – Zawiercie and Gdynia Port – Tczew – Tarnowskie Góry in Poland; Púchov – Leopoldov in Slovakia; and Pivka – Koper in Slovenia. As of the other parameters, Poland has already started an extensive investment programme for the modernisation of their railway infrastructure during the period 2007-2013; however further improvements are required for the removal of line speed bottlenecks and increase axle load standards. In the Czech Republic, the passenger line Přerov – Brno is not compliant with respect to speed and axle load standards. Compliance to axle load and speed requirements is already achieved in Slovakia and Italy. In Austria, only the section Wien Meidling – Wien Inzersdorf is classified as non-compliant for speed; however, since it stretches for 6.2 km, and is located in an urban area this is considered not critical at the corridor scale. In Slovenia, gaps exist concerning axle load and particularly speed standards.

ERTMS deployment is progressing and by 2017 the ERTMS related technology was available on 17% of the corridor sections. In Poland ETCS level 1 is available on subsections between Grodzisk Mazowiecki and Zawiercie. In Austria ERTMS (ETCS Level 2) is available on the subsections connecting Bernhardsthal to Wien's main station. In Slovakia the system is in operation on the Púchov – Trenčianska Teplá and Zlatovce – Bratislava railway sections, which are equipped with ERTMS (ETCS Level 1), and ERTMS (ETCS Level 2) is installed on the Žilina – Čadca railway line. In Slovenia all sections except Pragersko – Maribor – Šentilj / Spielfeld-Strass (border AT / SI) are equipped with ERTMS (ETCS Level 1). Albeit not yet in use, the system is also under implementation in the Czech Republic and Italy.

Along the corridor, stations and junctions are generally technically adequate in the Czech Republic, Slovakia, Austria and Italy and are gradually undergoing modernisation and upgrading in Poland and Slovenia. Limitations are however identified, particularly regarding speed in Brno (Czech Republic), Žilina (Slovakia), Udine (Italy) and Zidani Most (Slovenia). Issues have been also identified in the rail network, stations and/or junctions on the main lines within core urban nodes: speed restrictions exist in Warszawa, Ostrava, Bratislava and Wien as well as in Gdańsk, Łódź, Katowice, Szczecin, Poznań, Wrocław, and Ljubljana. The network is also not at standard in terms of axle load in Łódź and Wrocław, and within the Ljubljana core urban node. 740 meters train operability is possible only in Gdańsk and Szczecin and partially within the Wien urban node. ERTMS is available in Ljubljana and only partially available in Wien; it is not available in the other nodes.

Road

The BA Corridor does not fully comply with the requirements of Regulation (EU) 1315/2013, especially with regard to the type of infrastructure (expressway/motorway standard). The situation is particularly relevant for the Polish road network, whereas the corridor infrastructure in Italy and Slovenia is fully compliant. Currently, 16% of the road corridor infrastructure is constituted by ordinary roads which do not comply with the requirements. The following two road cross-border sections (out of a total of 7 cross-border sections present along the BA Corridor) are neither motorways nor expressways and therefore do not comply with the Regulation: Katowice (PL) – Žilina (Brodno) (SK); and Brno (CZ) – Wien (Schwechat) (AT). Regarding the national networks, issues with the standards are present on segments of the S3, S7/S8 and A1 in Poland, and of the D1 in the Czech Republic. No compliance issues have been identified in core urban nodes where at least one urban motorway/expressway route exists interconnecting between the links outside the node.

Intelligent Transport Systems (ITS) activities are ongoing at the national level with respect to many of the measures foreseen by Directive 2010/40/EU, although European Electronic Toll Collection system – provisions of the Directive 2004/52/EC and subsequent Decision 2009/750/EC – are not yet implemented in the BA Corridor Member States. Alternative clean fuels are already available on the corridor road infrastructure, with many initiatives under development.

Ports

Regarding the analysis of the compliance of the port infrastructure, all ports have at least one terminal open to all operators in a non-discriminatory way and charges are applied transparently. Facilities for ship generated waste are available at all ports, except sewage treatment equipment at Trieste, Venezia and Ravenna. All classified inland waterway ports fulfil the CEMT IV requirement. All ports are furthermore connected to the road and railway links of the corridor. However, last mile railway and/or road port interconnections issues are present and limit the development in all Baltic-Adriatic corridor seaports. About rail, last mile connections' improvements are required to increase the standards of the existing dedicated rail links in terms of electrification, axle load, speed and train length at all maritime ports except Venezia. Improvements of the rail infrastructure within the port areas are also needed in Gdynia, Bratislava and at all Adriatic ports. Improvements to respond to capacity expansion needs in view of future traffic increase are foreseen or already ongoing in Gdynia, Gdańsk and at the Adriatic ports. Due to their location within or in the proximity of urban nodes, measures to reduce/mitigate the impact of rail traffic either at present or in the future are also required in Venezia and Ravenna. As of road, works to increase the standards of the last mile connections are envisaged at the ports on the Baltic sea and at Koper. The internal road infrastructure requires modernisation/upgrading at all Baltic ports as well as in Bratislava, Venezia, Ravenna and Koper. Improvements to respond to capacity expansion needs in view of future traffic increase are foreseen or already ongoing in the Baltic ports, Venezia and Koper. In Gdynia, Szczecin, Świnoujście, Venezia, Ravenna and Koper solutions to mitigate the impact of road transport on the respective urban areas are also needed.

As of 2017 alternative clean fuels were not available for maritime transport operations at any of the ten corridor ports. LNG fuel is available at the LNG terminal in Świnoujście, where it can be loaded onto road units. Finally, VTMIS and e-Maritime services are available or under development at the ports, although they are not integrated and fully interoperable at the European Union level (RIS deployment is also ongoing).

Airports

The two core airports of Wien and Warszawa (Chopin) are already interconnected to the BA Corridor railway network, which satisfies the requirements of the Regulation. In addition, a rail connection exists for the Szczecin, Gdańsk and Ostrava airports. The interoperable traffic management system for air traffic is currently under development as part of the ongoing Single European Sky Air Traffic Management Research and Development (SESAR) project. The analysis of the corridor KPIs shows that alternative clean fuels are not available at airports.

Rail-road terminals

The 24 rail-road terminals located at the Baltic-Adriatic corridor core nodes are all interconnected to their respective national road and rail networks. About rail interconnections, with respect to the technical compliance of the rail accessibility to terminals, 9 out of 24 rail-road terminals have 740 meters train length accessibility and 18 out of 24 have electrified train terminal accessibility. No specific critical issues have been identified so far that would affect the quality of last mile connections, except capacity constraints at the Poznań railway bypass and Bratislava railway node. Referring to the infrastructure inside the terminals, 5 out of 24 terminals have a maximum length of loading/unloading tracks of minimum 740 meters, 12 terminals do not have electrified rail tracks at terminal. As of road last mile connections, issues have been reported which relate to local urban road accessibility and traffic in Poznań, Warszawa and Wrocław. For the terminals located within seaports and inland waterway ports, similar considerations apply as the ones described for the ports in which they are situated in terms of conditions and issues associated to their accessibility by rail and road. All terminals are furthermore equipped to handle intermodal units. 10 rail-road terminals declare they have at least one freight terminal open to all operators in a non-discriminatory way and application of transparent charges.

Operational and administrative barriers

In addition to the gaps in the availability of an interoperable infrastructure different types of operational and administrative barriers affect the development of the BA Corridor. About freight transport by railways, barriers are under analysis and definition by the RFC5 in cooperation with RNE, which relate to communication between Infrastructure Managers (IMs) Traffic Control Centres (TCCs) or among Railway Undertakings (RUs) or between RUs and IMs at the borders; or to operational rules between RUs and IMs at the borders. International rail passenger market is also affected by issues related to inadequate implementation of previous railway packages or loopholes in previous EU legislation. Such barriers can be administrative (difficulties in obtaining a safety certificate or vehicle), operational (need for staff speaking all official languages along the route, volatility of infrastructure charges, access to operational facilities and services, difficulties to align train paths in domestic timetables to get suitable international paths, lack of the inter-availability of tickets) and also commercial (difficulties to use existing sales facilities on a fair and non-discriminatory basis or to rent space in stations).

Concerning multimodal transport operations of freights at the core ports and rail-road terminals no corridor specific issues are noticed. General aspects particularly relevant for the development of multimodal freight and combined transport fall however within the scope of the implementation of VTMIS and e-Maritime services and solutions aimed at promoting Single Window initiatives to access ports, track flows of vessels and transported intermodal vehicles, rolling stock and goods entering and exiting port areas; and/or simplifying administrative procedures associated to custom, safety and security processes (i.e. the Polish Port Community System under implementation). ICT initiatives at rail-road terminals and between nodes to monitor and increase the effectiveness and efficiency of the logistics chain and its basic operations are missing or associated to the network of operations of the Multimodal Transport Operators, rather than implemented at the European transport system scale. About these aspects the 2014 study "Analysis of the EU Combined Transport" by the European Commission notices how combined transport seems lacking an "open data" ICT platform for exchanging booking, operational and tracking/tracing data between relevant companies involved in the combined transport supply chain. In the same study it is noticed that further to the interoperability issues associated with the characteristics of the rail infrastructure and national systems (also including train weight, axle weight, loading gauge not allowing 4m high semi-trailers or transport of 9'6" high-cube containers) the development of rail combined traffic is currently hindered by total handling costs.

Finally, no corridor specific barriers have been identified which affect other transport modes infrastructure and services. However, in view of the growing trends in cross-border traffic operations and the target for the core network to support the development of long distance traffic across the European Union, due consideration shall be given to the promotion and development of digital links and initiatives for the exchange of traffic data and provision of information to the users. This objective is paramount for all transport modes and for both freight and passenger transport including at urban nodes, in support of the development of cross-modal and borderless commercial solutions of mobility services.

Progress of corridor development since 2014

Remarkable efforts have been made since the inception of the new TEN-T Policy in 2014 for the development of the BA Corridor. Activities for the development and implementation of more than 400 projects have already started for about 46 € billion investment costs. Out of these projects 87 projects have been already completed, for an overall budget of 6.6 € billion. These have positively impacted on the achievement of the corridor specific objectives and work plan priorities. Improvements have been made regarding the railway infrastructure with an increase of the KPIs for freight transport, namely speed (PL, CZ, SI), axle load (PL, SI) and train length (PL, SK, SI). ERTMS technology has been installed on several sections of the corridor in Poland, Czech Republic, Slovakia, Austria and particularly in Slovenia. Among the railway projects the completion of the Eastern Branch in Poland, namely the E65 national railway section between Gdynia and Warsaw is notable. Increase of the corridor KPIs for road transport are also noticeable due to completion of works in Poland and in Slovakia, including sections of the D3 along the cross-border itinerary between Katowice and Žilina. Preparatory works for the development of the rail cross-border sections between Poland, Czech Republic and Slovakia, as well as studies and works for the improvement of the last mile connections of the ports in Poland, Bratislava, Trieste, Venezia and Koper have been also finalised.

Results of the transport market study

The results of the market analysis undertaken in 2014 have been overall confirmed:

- Capacity of the railway infrastructure does not represent a general problem at present, with some railway sections in Austria and in the Czech Republic presenting however high levels of traffic and capacity constraints. Issues are also present on the Koper – Divača railway line due to poor technical parameters of the infrastructure, limiting the capacity below the theoretical level allowed by the number of tracks. Despite the implementation of the investments included in the corridor list congestion may still occur in the future at urban nodes (Warszawa and Katowice in Poland, Brno in the Czech Republic, Bratislava in Slovakia, Wien in Austria and Ljubljana in Slovenia) due to demand growth, increase in the operation of railway services and growth of freight operations at ports; as well as on specific sections (Ostrava-Přerov in the Czech Republic and between Werndorf and Wiener Neustadt in Austria, also as a result of traffic induced by the completion of the Alpine crossings (Semmering and Koralm);
- Capacity of the road infrastructure does also not represent a general problem at present; the only section currently above the identified critical level is on the D4 motorway, within the urban area of Bratislava. Considering the full implementation of all investments included in the project list, the corridor will generally be adequate to accommodate growth in road transport volumes for all the assessed future demand scenarios. Limited and specific exceptions to this situation may occur within or in the surroundings of major urban nodes;
- The transport demand is expected to grow significantly by 2030, both on the rail and road network, although at a reduced pace when compared to the historically observed trends. The investments in the rail and road infrastructure as currently planned to be implemented on the corridor are expected to have a positive, although limited, effect on modal shift. It is only assuming the implementation of rail policy oriented measures that the market share of railway transport may increase significantly.

Objectives of the BA Corridor

The analysis of the characteristics of the BA Corridor and the results of the transport market study, as extensively discussed with the Members of the Corridor Forum, led to the confirmation and further specification of the specific objectives identified in the 2014 corridor study for the development of the BA Corridor by 2030. These have been considered in the definition of the work plan (WP) priorities by the European Coordinator:

- Improving the most critical cross-border rail and road connections, also promoting the development of digital cross-border links for the exchange of traffic data and provision of information services (WP priority);

- Ensuring the timely completion of the ongoing projects at the Alpine crossings in Austria, in order to remove the two missing links along the corridor (WP priority);
- Increasing the infrastructure quality and standards with the target to comply with the technical requirements set in the Regulation (EU) 1315/2013, in particular concerning railways in Eastern Member States (WP priority);
- Enhancing multimodal transport by supporting the optimal infrastructure integration and interconnection of all transport modes at transport nodes – particularly the last mile connections of ports (WP priority) – and the deployment of ICT solutions to simplify administrative processes and improve the performance of the terminals in the wider logistics chain in terms of time savings, reliability and security;
- Improving interconnection in all urban nodes along the corridor between TEN-T and local transport infrastructure, for both passenger and freight traffic (WP priority);
- Supporting the development of interoperable transport networks, in particular through the promotion of transport digitalisation and the deployment of telematic applications and their further technological advancement, with a focus on ERTMS (WP priority).

Implementation of the BA Corridor work plan

More than 550 planned and ongoing investments have been identified for the development of the BA Corridor up to 2030, totalling 76.9 € billion (2015 prices). 50.5% of this total volume of investments is allocated to railways and ERTMS, 25.6% to road, around 14.1% to ports, including their interconnections (3.0%) and MoS projects (0.1%), and 9.8% to airports (7.6%), rail-road terminals (0.7%), innovation (0.8%) and transit and multimodal interchange facilities in core urban nodes (0.7%). 9.2% of the total budget is allocated to cross-border sections related initiatives. The cost of the two Alpine crossings is equivalent to 11.5% of the total investment value. 12.1% of the project list budget relates to the interconnection of the urban nodes.

These investments have been organised into specific actions for the development of the BA Corridor by 2030, in accordance with the corridor specific objectives and requirements set in the Regulation (EU) 1315/2013, and based on the corridor sections and nodes. These form a plan for the removal of technical and operational barriers, and for the development of the corridor as an intermodal and interoperable infrastructure for long distance traffic. The assessment of the impact of these projects on the corridor development shows that the project list is likely to contribute to the attainment of the requirements set in the TEN-T Regulation by 2030 for the core network. The specific objectives of the corridor and work plan priorities have been well addressed in the project list. 186 projects, corresponding to more than 45% of the project list's total investment costs are related to the work plan priorities. The remaining 365 projects are not less relevant if compared to the general objectives of the new TEN-T Policy. Despite this overall positive assessment, considerable financial resources are still required to implement these projects with a gap of over 40 € billion of required financial resources of which over 16 € billion relate to the work plan priorities. In addition to the lack of financial resources, the projects on the list show a low level of project maturity. Referring to the three main administrative steps of project implementation identified in the project list for the 356 investments concerning construction works, it is noticed that land acquisition has been concluded for only 59 projects; the Environmental Impact Assessment has been approved for only 74 initiatives and the project has received final approval by the relevant governmental and administrative authorities only for 63 projects. The lack of a stable and mature pipeline of projects represents a risk for the implementation of all the investment required to meet the corridor development targets by 2030.

Wider elements of the work plan

The analysis of the investments included in the BA Corridor projects list with reference to the wider elements of the work plan supports the consideration that the corridor will contribute to the *deployment of innovation*. Initiatives relate in particular to telematic applications and alternative clean fuels, whereas a gap seems to be present with respect to sustainable transport solutions, especially for freights. Regarding *transport decarbonisation*, the results of the market study show that the environmental impacts of the transport flows along the corridor are expected to increase. This will be mainly driven by the growth of the transport activity along the corridor thanks to its development, which will increase its attractiveness in comparison to the alternative routes. Among the scenarios considered in the study it is only by promoting modal shift to more sustainable modes (rail policy scenario) that the corridor development may mitigate the impacts of the growth of transport activity along the corridor. The negative impact of the corridor development on the environment can be also counterbalanced by investments in the field of innovation and the gradual market uptake of more efficient means of transport, in particular zero/low emission vehicles. Behavioural actions to rationalise the mobility of passengers and the delivery of freights to reduce the overall emissions generated by transport operations can also have a positive effect in this regard. About the *resilience to climate change*, the case study analysis of the project documentation is showing an increasing awareness among the stakeholders about the impact of climate change on the corridor infrastructure and the identification of corresponding mitigation measures. Finally, the development of the corridor will lead to *jobs and economic growth* with an increase of GDP over the period 2016 until 2030 of 489 € billion (year 2015) in total. The direct, indirect and induced job effects of these projects will amount to 1,403,661 additional job-years created over the period 2016 to 2030.

1. Introduction

1.1. Aim and content of this report

This document has been prepared by TPLAN Consulting S.r.l. and their sub-contractors, NDCON, Paradigma and the University of Maribor in fulfilment of the requirements of Contract No. MOVE/B1/2014-710, regarding *Studies on the TEN-T Core Network Corridors and Support of the European Coordinators* – 2015-2017 Corridors' Studies. More specifically this report relates to the delivery of the analysis for LoT 1 of this contract about the development of the Baltic-Adriatic (hereinafter BA) Core Network Corridor (CNC).

The overall aim of the study is to provide a technical basis for the monitoring and updating of the BA Corridor work plan. The work plan has been elaborated by the European Coordinator, Professor Kurt Bodewig, in consultation with the BA Corridor Forum, based on the 2014 BA Corridor study finalised in December 2014. The first version of the work plan has been approved in May 2015 by the concerned Member States, Poland, Czech Republic, Slovakia, Austria, Italy and Slovenia. A new version of the work plan has been elaborated during 2016 as part of the 2015-2017 corridor studies, and approved by the Member States by end of the same year. Another revision has been recently completed, reflecting the content of this final report, which is foreseen to be approved by the Member States in the first quarter of 2018.

The scope of this report is that of presenting the results of the 2015-2017 BA Corridor study in support of the third update of the BA Corridor work plan by 2018. Further to this introductory section, the report is structured into the following Chapters:

- Chapter 2 – summarising the main actions undertaken and identified for the development of the BA Corridor in the wider context of the EU policies for transport and mobility. It also includes a description of the actions accomplished since the inception of the new TEN-T policy
- Chapter 3 – describing the general objectives and Key Performance Indicators (KPIs) for the development of the BA Corridor, as well as its characteristics and compliance to the requirements set in the Regulation (EU) 1315/2013;
- Chapter 4 – recalling and integrating the results of the transport market study developed as part of the 2014 BA Corridor study;
- Chapter 5 – presenting the specific objectives and critical issues for the development of the BA Corridor by 2030, and the plan for the removal of the physical, technical, operational and administrative barriers between and within transport modes and for the enhancement of efficient multimodal transport and services;
- Chapter 6 – assessing the impact of the investments included in the updated project list for the development of the BA Corridor;
- Chapter 7 – assessing the contribution of the development of the BA Corridor to the wider elements of the work plan.

Two annexes complement the main body of the report:

- Annex A – Description of the links of the BA Corridor;
- Annex B – Summary sheets for the actions identified for the development of the BA Corridor.

1.2. Methodology for the analysis undertaken under the scope of the 2015-2017 study in support of the updating of the work plan

The following tasks have been performed as part of the 2015-2017 BA Corridor study:

- Definition of the corridor KPIs and analysis of the corridor infrastructure parameters;
- Update, integration and expansion of the corridor project list;
- Confirmation of the results of the corridor multimodal market study originally developed as part of the 2014 BA Corridor study;
- Update of the elements of the work plan originally developed as part of the 2014 BA Corridor study, including a description of the corridor characteristics, the definition of the general and specific objectives for its development, and an analysis and expert review of the impact of the implementation of the updated project list on the corridor infrastructure and performance by 2030, as a basis for the definition of a corridor plan to achieve the targets set in the TEN-T policy for the core network;
- An analysis of the wider elements of the work plan, including the impact of the development of the corridor on innovation deployment, on transport decarbonisation, and on jobs and economic growth, as well as the identification of the effects of climate change on the corridor infrastructure and the measures identified to mitigate this impact.

From a methodological standpoint, the content of this report has been prepared based on the following approach:

- The description of the BA Corridor alignment is based on Regulation (EU) 1315/2013, defining the TEN-T core and comprehensive networks; on Regulation (EU) 1316/2013, establishing the Connecting Europe Facility instrument (CEF regulation); and on the information encoded in the TENtec database at 2014, as also integrated, reviewed and commented with the stakeholders and the owners of the infrastructure;
- The description of the BA Corridor infrastructure and the identification of the critical issues are based on the analysis of the compliance of the corridor infrastructure with Regulation (EU) 1315/2013, the results of the market study with reference to the analysis of capacity issues, the review of publicly available sources including existing studies, as well as consultation with the infrastructure managers and professional knowledge of the corridor;
- The BA Corridor market study is based on data provided by the Infrastructure Managers either directly or from their Internet Web Sites, available studies, socio-economic data and statistics from Eurostat, OECD and IMF as well as national/regional statistical databases. The study also takes into consideration the results of the Transport Market Study by the Baltic-Adriatic Rail Freight Corridor;
- The general objectives of the BA Corridor work plan are derived from Regulation (EU) 1315/2013; the specific corridor objectives have been identified based on the general objectives and the characteristics of the BA Corridor infrastructure, its critical issues and problems;
- The plan for the removal of physical, technical, operational and administrative barriers between and within transport modes and for the enhancement of efficient multimodal transport and services is based on the project list for the development of the BA Corridor as lastly updated in November 2017. The study also takes into consideration the results of the ongoing analysis by the Baltic-Adriatic Rail Freight Corridor;
- The analysis of the wider elements of the work plan is based on the analysis of the updated project list for the development of the BA Corridor as lastly updated early

November 2017; the results of the BA Corridor Market study, relevant literature and other existing studies.

1.3. Presentation of the information by Member State

The information and data included in this report and related annexes, is generally ordered reflecting the alignment of the BA Corridor as listed in Annex 1 to the Regulation (EU) 1316/2013:

- Gdynia – Gdańsk – Katowice/Sławków;
- Gdańsk – Warszawa – Katowice;
- Katowice – Ostrava – Brno – Wien;
- Szczecin/Świnoujście – Poznań – Wrocław – Ostrava;
- Katowice – Žilina – Bratislava – Wien;
- Wien – Graz – Villach – Udine – Trieste;
- Udine – Venezia – Padova – Bologna – Ravenna;
- Graz – Maribor – Ljubljana – Koper/Trieste.

In line with the above sections, the sequence of the description of the information by Member Sate is as follows: Poland (PL), Czech Republic (CZ), Slovakia (SK), Austria (AT), Italy (IT) and Slovenia (SI).

1.4. Maps and tables included in this report and TENtec database

The maps and tables included in this report to describe the BA Corridor rail and road links, including the demand assessment, are the result of the Contractor's independent analysis of the BA Corridor infrastructure. These have been elaborated with reference to the sections encoded in the TENtec database at 2014, in line with the analysis performed as part of the 2014 BA Corridor study.

The maps do not represent the infrastructure at transport and urban nodes. Last mile" accessibility to core urban and transport nodes was not encoded in the TENtec database at 2014; only the corridor route within urban nodes was codified in the TENtec database. Given the intermodal nature of the Core Network Corridors and the multimodal definition of the nodes, for the purposes of the BA Corridor study it may be assumed that the alignment within urban nodes may either be represented by the possible existing continuation of the links in urban areas or by other existing city or urban crossing or bypassing infrastructure.

2. The development of the Baltic-Adriatic Corridor since the adoption of the new TEN-T policy in 2014

This chapter provides a comprehensive summary of the main actions undertaken and identified for the development of the BA Corridor in the wider context of the EU policies for transport and mobility. It also includes a description of the actions accomplished since the inception of the new TEN-T policy.

2.1. Origin and aim of the new TEN-T policy

As an EU policy, the trans-European networks (TENs) – in transport, energy and telecommunication – have existed since 1993. They are based on Title XVI, Articles 170 – 172, of the Treaty on the Functioning of the European Union. TENs allow the internal market to function, link European regions with each other and connect Europe with other parts of the world. In essence, creating and developing the TENs aims to interconnect national infrastructure networks and ensure their interoperability (i.e. setting standards which remove technical barriers).

The main EU-wide instruments of the TENs' policy are:

- Union Guidelines, which set out objectives, priorities and outlines of measures for establishing and developing networks, to create the framework for identifying projects of common interest;
- An EU infrastructure fund to support projects of common interest. These projects are prepared and implemented following the subsidiarity principle and in compliance with the relevant rules and procedures of the Member States on whose territories the projects are located.

In the transport sector, the first guidelines were adopted by the European Parliament and the Council in 1996; the first regulation for EU funding was adopted in 1995. A substantial policy review was launched in 2009 and led to a new legislative framework that came into force in 2014.

The current provisions set out the framework for policy development in transport up to 2030 and 2050 respectively for the core network and comprehensive network; these are set in the Regulation (EU) No 1315/2013 of the European Parliament and of the Council of 11 December 2013 on Union guidelines for the development of the trans-European transport network (TEN-T) and repealing Decision No 661/2010/EU; and in the Commission Delegated Regulation (EU) No 473/2014 of 17 January 2014, amending Regulation (EU) No 1315/2013 of the European Parliament and of the Council as regards supplementing Annex III thereto with new indicative maps.

Also relevant with respect to the implementation of the new TEN-T policy set in the above mentioned regulation is the Connecting Europe Facility - CEF Regulation (EU) No 1316/2013 of the European Parliament and of the Council of 11 December 2013, amending Regulation (EU) No 913/2010 and repealing Regulations (EC) No 680/2007 and (EC) No 67/2010. This is aimed at governing the EU funding in the transport, energy and telecommunications sectors during the period 2014 – 2020.

2.1.1. The new TEN-T Policy

The Trans-European Networks Policy has its basis in the Maastricht Treaty signed in 1992 and entered into force in 1993. Under the Terms of Articles 154, 155 and 156 of the Treaty, the European Union aims at promoting the development of a Trans-European Network as a key element for the creation of the Internal Market and the reinforcement of Economic and Social Cohesion in compliance with the objectives of the Lisbon Agenda on growth and jobs to be achieved. This development includes the interconnection and interoperability of national networks as well as its accessibility. It also supports free movement of persons within the territory (EU Law 341 – Directive 2004/38 and successive) of the Member States. It finally integrates environmental protection requirements with a view to promoting sustainable development.

The First Support Framework for the development of the Trans-European Network was set up in 1990, with the adoption of 14 (national) Priority Projects at the European Council meeting that was held in Essen on 9 and 10 December 1994.

The first Guidelines defining the TEN-T policy and infrastructure planning were adopted in 1996. These were drawn up with Decision No. 1692/96/EC of the European Parliament and of the Council of 23 July 1996 on Community guidelines for the development of the trans-European transport network, consisting of road and railway projects. Seaports, inland ports and intermodal terminals were included in May 2001, by means of the European Parliament and Council Decision No 1346/2001/EC.

In order to identify priority infrastructure, in 1997 and 1999 the Pan-European Corridors I – X ("Helsinki Corridors") and the TINA ("Transport Infrastructure Needs Assessment") network were introduced.

The first revision of the original 1996 guidelines occurred in 2004; Beside the TINA network of 1999, the list of priority projects was extended in the enlarged 27 Member States Union to 30 "Projects of Common Interest", in order to take into account the EU enlargement when the European Parliament and the Council adopted Decision N° 884/2004/EC.

Since its inception stage, the planning process of the network of "European Common Interest" was based on a dual layers approach: a comprehensive network layer (outlining plans for rail, road, inland waterway, combined transport, airport and port networks) and a second layer of 30 priority projects – including projects of common interest.

Over the course of the years questions arose as to the methodological soundness of the selection of the priority projects, the potential for interconnection and extension (both geographically and modally), the approach to coherent capacity and quality standards, and the means of better stimulating their completion within the planned timeframe.

In 2006 the European Commission created the Trans-European Transport Network Executive Agency (TEN-T EA) to manage the technical and financial implementation of its TEN-T programme. In 2007 general rules were set for the granting of Community financial aid in the field of TEN-T/TEN-E networks (Regulation N° 680/2007). EU financing of TEN-T projects was related to two different instruments: the TEN-T programme and more extensively the Cohesion and Structural Funds. Both instruments were assumed to contribute to fulfilling the objectives set out in the TEN-T guideline, however, each has its own rules and characteristics, including the fact that whilst funding under the Cohesion and Structural Funds could reach up to 85% in eligible Member States (cohesion countries), funding in the TEN-T programme was limited to

50% for studies and in case of infrastructure realisation it was limited up to 30% for initiatives involving cross-border sections or lower percentages in other cases.

Furthermore, while the TEN-T programme is under direct management of the EU Commission, which selects projects to be financed, the Cohesion and Structural Funds are affected by a shared management, in which the choice is made by Member States after the Commission agrees on the overall budget of each programme. This situation implied difficulties in setting common priorities and a strong national priority-setting and therefore, the lack of integrated funding strategy at EU level has been indicated as a critical issue for the completion of the TEN-T network, especially considering the outstanding investment needs.

In order to maximise the development of the TEN-T network, the European Union has made relevant efforts to concentrate its investments on the Priority Projects and in particular on cross-border sections and bottlenecks (including access routes to both) thus leveraging effect of the TEN-T budget. At the same time, in order to deal with lack of resources and impact of the financial crisis started in 2008, the European Union called for the exploitation of other financial means such as those provided by the European Investment Bank (EIB); Private Public Partnership (PPP) initiatives were also explored. Particularly regarding the EIB, its lending activity to TEN-T projects increased significantly since 2007. In addition to EIB loans and credit guarantees, the EIB supports the development of TEN-T projects through several joint initiatives with the Commission, encompassing not only mere funding, but also knowledge and best practice support.

The implementation and development of the TEN-T network also proved to be a challenge from a different view point, other than merely financial one. Technical realisations and the need for ever more enhanced project coordination that also includes a wide range of activities related to consensus building as well as evaluation and mitigation of the impacts of infrastructure realisation have also been identified by the stakeholders as relevant areas of attention, particularly for cross-border initiatives. In general, the experience of international cooperation processes on cross-border project coordination has revealed that Member States often lacked joint traffic forecasts, which leads to different investment plans. There have also been episodes of lack of investment planning coordination, thus leading to disconnected or even contradictory timelines, capacity planning, alignment, technical and interoperability characteristics, and environmental assessments. Therefore, joint management of both infrastructure development and operations (once built) is often insufficient and moreover, in the decision making process regional and local economies and other stakeholders have gained importance. Additionally, regions have more often been requested to contribute to the financing of infrastructure projects. In order to accompany these developments, local stakeholders should be able to find their relevant place in the national decision-making processes.

In order to cope with all the mentioned issues and to accelerate implementation, especially in cross-border projects and sections, European Coordinators were first appointed by the Commission in 2005, to cover the Priority Projects 1, 3, 6, 17, 18, 21 and 30, as well as ERTMS. The effectiveness of this choice has been proven in several cases, playing a major role in pushing forward realisation and in some cases also in helping with preparation and implementation of certain priority projects.

The above elements were considered in the review process of the TEN-T policy that was launched in 2009 and in the elaboration of the new one started in 2010, when the European Rail Freight Corridors were also introduced by Regulation EC 913/2010, also including the Baltic-Adriatic Rail Freight Corridor (RFC5) almost overlapping with the BA

Corridor. The regulation requests Member State to establish international market-oriented Rail Freight Corridors to meet three challenges:

- Strengthening co-operation between Infrastructure Managers on key aspects such as allocation of paths, deployment of interoperable systems and infrastructure development;
- Striking the right balance between freight and passenger traffic along the Rail Freight Corridors, giving adequate capacity and priority for freight in line with market needs and ensuring that common punctuality targets for freight trains are met;
- Promoting intermodality between rail and other transport modes by integrating terminals into the corridor management and development.

The main outcome from the above mentioned review of the TEN-T programme was that the European transport network is fragmented, geographically – particularly between countries, and modally – both between and within transport modes. The following additional elements were identified as critical ones regarding the previous policy and implemented Priority Projects which were deemed:

- Not reflecting a European planning perspective (rather investment than common market and cohesion needs);
- Forming rather a patchwork than a network;
- Not sufficiently connected with neighbouring countries and other continents;
- Not integrating transport policy objectives;
- Not taking into account environmental and climate needs;
- Lacking of multimodality, interoperability, technological innovation and overlap with other concepts (PETC's, De Palacio axes, ERTMS and Rail Freight Corridors);
- Showing deficits in implementation.

In line with consultations held on the future TEN-T policy in 2010, the new strategy should have focused on:

- Strengthening sustainable development (low carbon transport systems);
- Strengthening cohesion;
- Inclusion of ITS (e.g. ETRMS, telematics) and ICT (energy efficiency, sustainability);
- Connection with neighbouring countries;
- Better coordination of funding/financing instruments (cohesion fund, structural fund, TEN-T);
- Confirmation of the role of European Coordinators, possibly extending this concept (large border crossing projects, packages of smaller infrastructure measures and implementation in general).

The review and consultation process ended in 2013 with the publication of two new EU regulations, representing the basis of the new TEN-T policy:

- Regulation (EU) 1315 /2013 on Union guidelines for the development of the trans-European transport network and repealing Decision No 661/2010/EU;
- Regulation (EU) 1316/2013, establishing the Connecting Europe Facility instrument, amending Regulation (EU) No 913/2010 and repealing Regulations (EC) No 680/2007 and (EC) No 67/2010.

Similarly, to the previous policy, Regulation (EU) 1315/2013 sets out that the trans-European transport network is to be developed through a dual-layer structure consisting of a comprehensive network and a core network, those two layers being the highest level of infrastructure planning within the Union:

- The Comprehensive Network is the dense basic network aimed at/defined as:
  - Ensuring regional accessibility;
  - Comprising all modes of transport;
  - It is determined by Member States, according to a set of rules updating the TEN-T rules of 1996;
  - It is to be implemented by 2050.
- The Core Network is a subset of the Comprehensive Network:
  - Interconnecting the strategically most important nodes and links;
  - Comprising all modes of transport;
  - To be equipped with innovative technology applications;
  - Determined by a special methodology mixing a geographical and traffic demand driven approaches: it is composed of nodes and links between nodes, replacing TEN-T Priority Projects of 2004;
  - To be implemented by 2030.

2.2. The TEN-T core network corridors

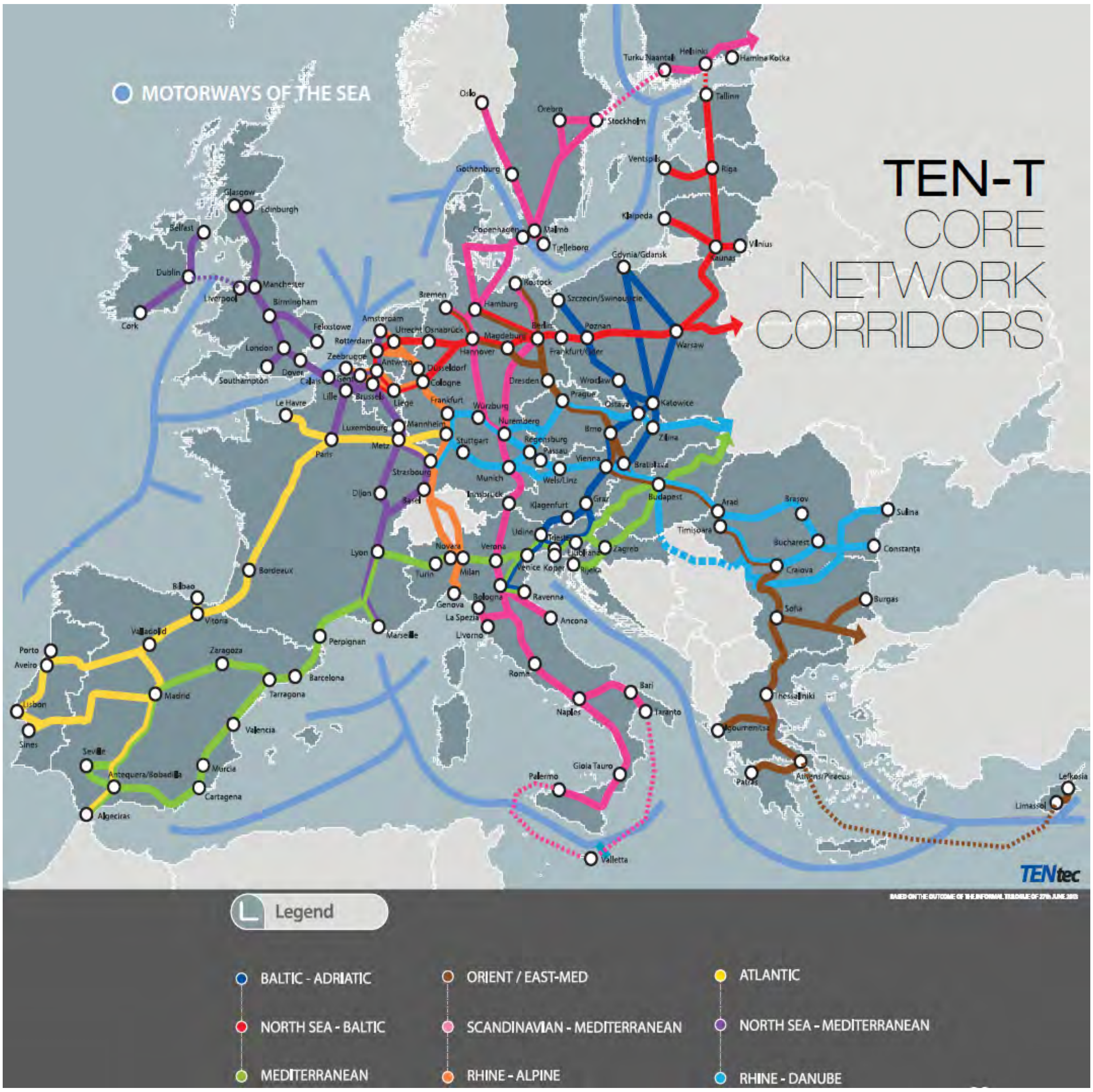
Whilst the above set of policy principles and targets are defined by Regulation (EU) 1315/2013, the geographical alignment of the nine Core Network Corridors as presented at Figure 1 below is defined in the Regulation (EU) 1316/2013 establishing the Connecting Europe Facility.

The main features of the nine core network corridors identified by the New TEN-T policy are as follow:

- The Baltic-Adriatic Corridor is one of the most important trans-European road and railway axes. It connects the Baltic with the Adriatic Sea, through industrialized areas between Southern Poland (Upper Silesia), Wien and Bratislava, the Eastern Alpine region and Northern Italy. It comprises important railway projects such as Semmering base tunnel and Koralm railway in Austria and cross-border sections between Poland, Czech Republic and Slovakia.
- The North Sea-Baltic Corridor connects the ports of the Eastern shore of the Baltic Sea with the ports of the North Sea. The corridor will connect Finland with Estonia by ferry, provide modern road and rail transport links between the three Baltic States on the one hand and Poland, Germany, the Netherlands and Belgium on the other. Between the Odra River and German, Dutch and Flemish ports, it also includes inland waterways, such as the "Mittelland-Kanal". The most important project is "Rail Baltic", a European standard gauge railway between Tallinn, Riga, Kaunas and North-Eastern Poland.
- The Mediterranean Corridor links the Iberian Peninsula with the Hungarian-Ukrainian border. It follows the Mediterranean coastlines of Spain and France, crosses the Alps towards the east through Northern Italy, leaving the Adriatic coast in Slovenia and Croatia towards Hungary. Apart from the Po River and some other canals in Northern Italy, it consists of road and rail. Key railway projects along this corridor are the links Lyon – Turin and the section Venezia – Ljubljana.

- The Orient/East-Med Corridor connects the maritime interfaces of the North, Baltic, Black and Mediterranean Seas, allowing optimising the use of the ports concerned and the related Motorways of the Sea. Including Elbe as inland waterway, it will improve the multimodal connections between Northern Germany, the Czech Republic, the Pannonian region and Southeast Europe. It extends, across the sea, from Greece to Cyprus.

Figure 1 Schematic map of the core network corridors



- The Scandinavian-Mediterranean Corridor is a crucial north-south axis for the European economy. Crossing the Baltic Sea from Finland to Sweden and passing through Germany, the Alps and Italy, it links the major urban centres and ports of Scandinavia and Northern Germany to continue to the industrialised high production centres of Southern Germany, Austria and Northern Italy further to the Italian ports and Valletta. The most important projects in this corridor are the fixed Fehmarnbelt crossing and Brenner base tunnel, including their access routes. It extends, across the sea, from Southern Italy and Sicily to Malta.

- The Rhine-Alpine Corridor constitutes one of the busiest freight routes of Europe, connecting the North Sea ports of Rotterdam and Antwerp to the Mediterranean basin in Genoa, via Switzerland and some of the major economic centres in the Rhein-Ruhr, the Rhein-Main-Neckar, regions and the agglomeration of Milan in Northern Italy. This multimodal corridor includes the Rhine as inland waterway. Key projects are the base tunnels, partly already completed, in Switzerland and their access routes in Germany and Italy.
- The Atlantic Corridor links the Western part of the Iberian Peninsula and the ports of Le Havre and Rouen to Paris and further to Mannheim/Strasbourg, with high-speed rail lines and parallel conventional ones, including also the Seine as inland waterway. The maritime dimension plays a crucial role in this corridor.
- The North Sea-Mediterranean Corridor stretches from Ireland and the north of UK through the Netherlands, Belgium and Luxembourg to the Mediterranean Sea in the south of France. This multimodal corridor, comprising inland waterways in Benelux and France, aims not only at offering better multimodal services between the North Sea ports, the Maas, Rhine, Scheldt, Seine, Saone and Rhone river basins and the ports of Fos-sur-Mer and Marseille, but also better interconnecting the British Isles with continental Europe.
- The Rhine-Danube Corridor with the Main and Danube waterway as its backbone, connects the central regions around Strasbourg and Frankfurt via Southern Germany to Wien, Bratislava, Budapest and finally the Black Sea, with an important branch from Munich to Prague, Žilina, Kosice and the Ukrainian border.

Each corridor crosses at least two borders and, could possibly involve at least three transport modes, including motorways of the sea. Core network corridors have been identified as a tool primarily aimed to removing bottlenecks, building missing cross-border connections and promoting modal integration and interoperability. Secondary, although key priorities for the corridors are integrating rail freight corridors, promoting clean fuel and other innovative transport solutions, advancing telematic applications for efficient infrastructure use, integrating urban areas into the TEN-T, and enhancing safety.

In addition to the definition of the alignment of the core network corridors, the Regulation (EU) 1316/2013 also establishes the Connecting Europe Facility. Directly managed by DG MOVE and by the Innovation and Networks Executive Agency (INEA) as the successor of the Trans-European Transport Network Executive Agency (TEN-T EA) the new fund is expected to increase the effectiveness in the development of an intermodal, interoperable network under a European perspective. The overall increase in the total available budget managed by DG MOVE and INEA passing from 8-9 € billion during the period 2007-2013 to over 24 in 2014-2020, is foreseen to concentrate funding on major corridors aimed at removing bottlenecks, upgrading infrastructure and streamlining cross-border passenger and freight movement to turn Europe's existing patchwork of roads, railways, airports and canals into a 'genuinely European' unified trans-European transport network.

Finally, Annex 1 to CEF Regulation (EU) 1316/2013 includes the following list of pre-identified sections and projects. In addition to the projects allocated to the BA Corridor, the list also includes those initiatives that the CEF Regulation assigns to the alignment of other core network corridors, but which are partially or totally corresponding to the links and nodes of the BA Corridor.

Table 1 List of pre-identified sections and projects from CEF Regulation (EU) 1316/2013

TEN-T Network Links/Nodes	Mode	Pre-identified Projects
Baltic-Adriatic Corridor		
Gdynia – Katowice	Rail	Works
Gdynia, Gdańsk	Ports	Port interconnections, (further) development of multimodal platforms
Warszawa – Katowice	Rail	Works
Wrocław – Poznań – Szczecin/Świnoujście	Rail	Works
Świnoujście, Szczecin	Port	Port interconnections
Bielsko Biała – Žilina	Road	Works
Katowice - Ostrava - Brno - Wien & Katowice - Žilina - Bratislava – Wien	Rail	Works, in particular cross-border sections PL-CZ, CZ-AT, PL-SK and SK-AT, Brno-Přerov line; (further) development of multimodal platforms and airport-rail interconnections
Wien - Graz - Klagenfurt - Udine - Venezia – Ravenna	Rail	Partial construction of new lines (Semmering Base Tunnel and Koralm Railway line), rail upgrading; works ongoing; (further) development of multimodal platforms; upgrading of existing two-track line between Udine - Cervignano and Trieste
Graz - Maribor – Pragersko		Studies and works for second track
Trieste, Venezia, Ravenna, Koper	Ports	Port interconnections; (further) development of multimodal platforms
Mediterranean Corridor		
Brescia - Venezia – Trieste	Rail	Works to start before 2014 on several sections in synergy with upgrading actions undertaken in overlapping stretches as in the BA Corridor
Cremona, Mantova, Venezia, Ravenna, Trieste	Inland Ports	Port interconnections, (further) development of multimodal platforms
Trieste – Divača	Rail	Studies and partial upgrading ongoing; cross-border section to be realised until after 2020
Koper - Divača - Ljubljana – Pragersko	Rail	Studies and upgrading/partially, new line
Ljubljana node	Rail	Rail node Ljubljana, including multi-modal platform; rail airport interconnection
Orient – East-Mediterranean Corridor		
Section Brno - Břeclav of the Praha - Brno – Břeclav	Rail	Upgrading, including rail node Brno and multi-modal platform
Rhine Danube Corridor		
Ostrava/Přerov – Žilina – Košice – UA border	Rail	Upgrading, multimodal platforms
Wien – Bratislava / Wien – Budapest / Bratislava – Budapest	Rail	Studies high-speed rail (including the alignment of the connections between the three cities)
Scandinavian – Mediterranean Corridor		
Bologna – Ancona	Rail	Upgrading
Other		
Brno – AT border	Cross-border	Road Upgrading
UA Border – Kraków – Katowice – Wrocław – Dresden	Other core network	Rail Works

Source: ANNEX I, Part 2, Reg. EU 1316/2013

The following horizontal priorities are also identified in Annex I, Part 1 of Regulation 1316/2016 which are applicable to all corridors and to more transport modes, except from SESAR, which is limited to airports. These are summarised in the table below.

Table 2 List of pre-identified sections and projects from CEF Regulation (EU) 1316/2013

TEN-T Network Links/Nodes	Mode	Pre-identified Projects
Innovative management & services	Airport	Single European Sky – SESAR system
Innovative management & services	Horizontal	Telematic applications systems for road, rail, inland waterways and vessels (ITS, ERTMS, RIS and VTMIS)
Innovative management & services	Horizontal	Core network ports, motorways of the sea (MoS) and airports, safe and secure infrastructure
New technologies and innovation	Horizontal	New technologies and innovation in accordance with points (a) to (d) of Article 33 of Regulation (EU) No 1315/2013

Source: ANNEX I, Part 1, Reg. EU 1316/2013

2.3. Governance of the core network corridors

2.3.1. European Coordinators

On the basis of Art. 45 of Regulation (EU) 1315/2013, European Coordinators have been designated by the European Commission to facilitate the coordinated implementation of the core network corridors and to make sure that the corridors are developed effectively and efficiently. In total 11 European Coordinators have been designated, one for each core network corridor and two for the TEN-T horizontal priorities identified in the Regulation, namely the European Rail Traffic Management System (ERTMS) and Motorways of the Sea (MoS).

These coordinators act in the name of the European Commission and on its behalf. The Commission provides them with the necessary secretarial assistance; an advisor has been also designated for each corridor, ERTMS and MoS in this respect.

The European Coordinator of the BA Corridor is Prof. Kurt Bodewig; the advisor is Mrs Silke Brocks.
The mandate of the European Coordinators includes:

- Drawing up the relevant corridor work plan (together with the Member States concerned) or the Detailed Implementation Plan for a horizontal priority;
- Supporting and monitoring the implementation of the work plan; as and when necessary, highlighting difficulties and looking for appropriate remedies;
- Regularly consulting the Corridor Forum (a consultative body bringing together Member States and various stakeholders);
- Making recommendations in areas such as transport development along corridors or access to financing/funding sources;
- Annual reporting to the European Parliament, Council, Commission and the Member States concerned on the progress achieved.

2.4. Activities of the European Coordinator Prof. Kurt Bodewig

2.4.1. Elaboration and updating of the BA Corridor work plan

On the basis of the 2014 BA Corridor study, the European Coordinator Professor Kurt Bodewig elaborated and submitted to the concerned Member States by end of December 2014 his first work plan for the BA Corridor. This was approved in Spring 2015 and published in May 2015. The same happened with the other 8 CNCs work plans as well as with the work plans of the two horizontal priorities: European Rail Traffic Management System – ERTMS, and Motorways of the Sea – MoS.

In line with the requirements set in the Regulation (EU) 1315/2013 which foresees the update of the work plan by 2016 and 2018, the second version of the BA Corridor work plan has been finalised and approved by end of 2016, based on the results of the 2015-2017 BA Corridor study. The third version of the work plan has been elaborated by end of November 2017, which is assumed to be approved in the first quarter of 2018.

In continuity with the first and second versions of the work plan, the third work plan reflects the main outcomes of the BA Corridor study. It confirms the five priorities already identified in the previous editions and adds a new priority relating to the improvement of the quality and standards of the corridor infrastructure in Cohesion Member States. This reflects the status and conditions of the network of the BA Corridor in these countries, and the importance to develop a homogeneous high quality infrastructure across all the Member States and Regions along its alignment:

- The cross-border links both for rail and road, including digital cross-border links for the exchange of traffic data and provision of information services for both modes;
- The timely implementation of the major projects of the Alpine crossings in Austria in order to remove the two missing links;
- The compliance of the corridor infrastructure with the quality and standards set in Regulation (EU) 1315/2013, with a particular focus on the completion of the modernisation of the railway infrastructure in Cohesion Member States;
- The 'last mile' connection of the ports building the start and end point of the corridor;
- The interconnection in all urban nodes along the corridor between TEN-T and local transport infrastructure;
- The interoperability of the transport network, in particular through the full deployment of ERTMS along the corridor.

Table 3 BA Corridor priorities – milestones and steps to be taken

Priorities	by 2018	by 2020	by 2023	by 2030
Developing cross-border links both for rail and road with highest European added-value	Monitor the timely development and implementation of cross-border projects Continuation of the cross-border dialogues and bilateral working groups to align national planning and timing of cross-border projects	Monitor timely development and implementation of cross-border projects Continuation of the cross-border dialogues and bilateral working groups to align national planning and timing of cross-border projects	Cross-border projects mature and ready to be implemented or under implementation	All cross-border sections fully compliant with the TEN-T requirements

Priorities	by 2018	by 2020	by 2023	by 2030
Ensuring the timely implementation of the missing links at the Alpine crossings	Monitor the timely implementation of projects	Monitor the timely implementation of projects	Monitor the timely implementation of the Semmering Tunnel and finalisation of the works for the construction of the Koralm railway line and tunnel, expected to be completed by 2024	2026: Both missing links completed
Improving the infrastructure quality and standards, especially in terms of modernisation of the national corridor railway links in the Cohesion Countries of the corridor	Monitor the timely development and implementation of projects impacting on KPIs for freight transport, including visits to Infrastructure Managers Consolidating synergies with RFC5 for the analysis of the operational and administrative bottlenecks, market study and priorities for infrastructure development	Projects for the development of the corridor at standard defined Monitor the timely development and implementation of projects impacting on KPIs for freight transport, including visits to Infrastructure Managers Consolidating synergies with RFC5 for the analysis of the operational and administrative bottlenecks, market study and priorities for infrastructure development	Projects impacting on KPIs for freight transport mature and ready to be implemented or under implementation	All sections fully compliant with TEN-T requirements
Enhancing multimodal transport, by improving the last mile connection of ports and promoting transport digitalisation	Continuation of the working group for ports (and RRTs), focussing on the role of the ports and corridor in the Baltic/North Sea and Adriatic/Mediterranean basins (possibly involving the Baltic Ports Organisation and North Adriatic Ports Association) Monitor the implementation of last mile/hinterland connection projects, and transport digitalisation solutions	Continuation of the working group for ports (and RRTs), strengthening mutual support between the MoS Detailed Implementation Plan and the Baltic-Adriatic corridor work plan Monitor the implementation of last mile/hinterland connection projects, and transport digitalisation solutions	Monitor the implementation of last mile/hinterland connection projects, and transport digitalisation solutions	All ports well integrated into a multimodal Baltic-Adriatic Corridor

Priorities	by 2018	by 2020	by 2023	by 2030
Improving the interconnection in all urban nodes	Continuation of the working group for regions, urban nodes and macro-regional strategies – understanding synergies between TEN-T and regional policy Monitor the implementation of innovative flagship projects and initiatives associated to this concept	Continuation of the working group for regions, urban nodes and macro-regional strategies – presenting progresses/results in the implementation of innovative flagship projects Monitor the implementation of the multimodal development and connection to the wider TEN-T network within urban nodes	Monitor the implementation of the multimodal development and connection to the wider TEN-T network within urban nodes	Core urban nodes along the corridor well connected to the corridor showing examples of integration of the TEN-T policy in the wider context of the EU policies for Mobility and Transport
Promoting interoperability, in particular through the full deployment of ERTMS	Support ERTMS deployment, focussing on cross-border sections (in line with the 2017 ERTMS European Deployment Plan)	Support ERTMS deployment, focussing on cross-border sections (in line with the 2017 ERTMS European Deployment Plan)	Support ERTMS deployment, focussing on cross-border sections (towards the update of the ERTMS European Deployment Plan)	ERTMS equipped and in operation on the whole core network corridor, including at cross-border sections

Source: 2018 BA Corridor work plan

The graphic above from the 2018 BA Corridor work plan presents the main milestones and steps for the development of the corridor by 2030 with respect to the above priorities.

The relevant documents associated to the development of the BA Corridor including the work plan are available at the Commission Web Site: https://ec.europa.eu/transport/themes/infrastructure/downloads_en.

2.4.2. Other activities

Further to the elaboration of the BA Corridor work plan, the European Coordinator undertakes a number of additional activities which are related to the implementation of the work plan and which include:

- Chairing the Corridor Forum meetings and working groups – The European Coordinator is the chairman of the meetings of the Corridor Forum of the BA Corridor as well as of the working groups organised as part of the activities related to the Forum.
- Other consultation activities – Further to the Corridor Forum and working groups, the European Coordinator also participates in the meetings between the Coordinators/Commission and the international transport organisations. Two meeting were already organised in this respect during 2014 and 2015.
- Visiting stakeholders and undertaking project missions – During 2014, 2015, 2016 and 2017 the European Coordinator engaged in many dialogues on the spot along the corridor with a high number of stakeholders. All Ministers of Transport and the Chief Executive Officers/Presidents of the infrastructure managers both for rail and road transport were visited already in 2014. Either as part of his visits to

the stakeholders or by means of dedicated missions, the European Coordinator also visited the most important projects under development along the BA Corridor. In 2014 missions were organised to visit the Alpine crossings development projects. In 2015, 2016 and 2017 the Coordinator visited all core seaports along the corridor to get a detailed insight into their port development and expansion projects. In these occasions he also met with all the Presidents of the concerned ports' authorities.

- Cross-border dialogues – In 2016, the Coordinator also launched to so-called "cross-border dialogues" in order to discuss about project alignment and harmonisation on each side of the respective border for all critical rail and road cross border sections. In May 2016, the Coordinator invited the concerned stakeholders to the first cross-border dialogue between Poland, Czech Republic and Slovakia where three critical rail and one critical road cross-border section are located, which deserve particular attention. In September and October 2016 two more cross-border dialogues have been held for the development of the rail cross-border sections between Austria, Slovakia / Slovenia. By end of 2016 another dialogue has been also organised in Brno for the development of an additional critical cross-border sections, the road link between Brno (CZ) and Wien (AT). The critical rail cross-border section between Trieste (IT) and Divača (SI) is followed conjointly with the European Coordinator of the Mediterranean corridor who already visited this section.

Table 4 Cross-border dialogues and their outcomes

Cross-border dialogues		*Results*
May 2016:	First cross-border dialogue on the three rail connections between Katowice (PL) and Ostrava (CZ), Opole (PL) and Ostrava (CZ) and Katowice (PL) and Žilina (SK) as well as on the road connection between Katowice (PL) and Žilina (SK)	Joint Declaration between the three Transport Ministers of the Czech Republic, Poland and Slovakia on the enhanced cooperation to eliminate bottlenecks and facilitate international traffic on critical rail and road cross-border sections between the three countries *Signed on 19 October 2016 in Warszawa*
September 2016:	Second cross-border dialogue on the rail connection between Bratislava (SK) and Wien (AT)	Memorandum of Understanding between the Transport Ministries of Austria and Slovakia concerning coordination and implementation of cross-border transport projects *Signed on 28 September 2016 in Wien*
October 2016:	Third cross-border dialogue on the rail connection between Graz (AT) and Maribor (SI)	Bilateral implementation agreement between the Transport Ministry of Austria and the Slovenian Infrastructure Agency *Signed on 20 October 2016 in Maribor*

December 2016:	Fourth cross-border dialogue on the road connection between Brno (CZ) and Wien (AT)	Dialogue based on the existing bilateral agreement between the Transport Ministries of Czech Republic and Austria on the importance of the R52/A5 motorway axis between Jihomoravský kraj and Niederösterreich, signed in December 2009

Source: 2018 BA Corridor work plan

The overall objective of the cross-border dialogues was to assist Member States and Infrastructure Managers in finding cross-border agreements for the smooth and coordinated implementation of those projects on both sides of the border and thereby to clear potentially diverging interests and uncoordinated implementation plans and timings. More precisely, the diverse meetings allowed getting a detailed insight into the state of project implementation on each side of the border, to discuss about possible steps for improvements (on infrastructural as well as operational side), to mediate – where and whenever needed – between different (national) interests and to harmonise planning and timing of the respective project implementations on both sides of the border. The ultimate goal was to come to joint and stable cross-border agreements for each critical cross-border section (e.g. in form of Memorandum of Understanding, Letter of Intent or any other appropriate form of agreement) for the smooth, coordinated and harmonised implementation of those projects on both sides of the border. The following table provides details on the successful outcomes of the cross-border dialogues proposed by the European Coordinator.

- Coordinating activities with EU institutions – As part of his mandate the European Coordinator also participates to coordinating and periodic reporting activities involving several European Union institutions, including the European Parliament, the European Investment Bank, other General Directorates of the European Commission.
- Special reporting activities – The European Coordinator is also involved in special reporting activities. In 2014 the Council of Transport Ministers under the Italian Presidency gave mandate to the former European Commission Vice-President Henning Christophersen (†), Prof. Kurt Bodewig (European coordinator for the BA Corridor) and Prof. Carlo Secchi (European Coordinator for the Atlantic Corridor) to prepare a report, in consultation with the European Investment Bank, on how to trigger project financing and project development in Europe and identify projects along corridors particularly suited for such new financial schemes in the context of the 'Jobs, Growth and Investment Package' proposed by President Juncker. A final report – Action Plan, Making the best use of new financial schemes for European transport infrastructure projects – was delivered in June 2015. A progress report has been issued in January 2018 that highlights the progress made with regard to the twelve CBS recommendations included in the original Action Plan of 2015 and most importantly outlines the steps and measures that are still needed to improve the framework for investments in Europe, including specific recommendations of how to leverage as much as possible additional financing from the private sector, including guarantees from the Juncker Plan.

Details on the activities by the European Coordinator are available at the Commission Web Site: https://ec.europa.eu/transport/themes/infrastructure/baltic-adriatic_en.

2.5. Composition and activities of the BA Corridor Forum

Further to the European Commission technical advisory the Regulation (EU) 1315/2013 foresees that for each core network corridor, the relevant European Coordinator shall be assisted in the performance of his/her tasks concerning the work plan and its implementation by a consultative forum (the Corridor Forum). This shall be established in agreement with the Member States concerned, and chaired by the European Coordinator. The Member States shall agree on the membership of the Corridor Forum for their part of the core network corridor. The Regulation also stipulates that with the agreement of the Member States concerned, the Coordinator may set up and chair corridor working groups which focus on specific targets of the TEN-T policy, including modal integration, interoperability, the coordinated development of infrastructure in cross-border sections.

The composition of the Corridor Forum for the Baltic-Adriatic axis at December 2015 is as follows: Ministries (also including National Development Agencies and Regulatory Authorities), Railway and Port Infrastructure Managers, BA Corridor Regions (including association of regions and the 4 Macro-regional Strategies), Highway, Airport and Rail-road Terminal Infrastructure Managers, as well as other entities, including the Baltic-AAdriatic Rail Freight Corridor Executive and Management Boards and Permanent Management Office, and EU institutions, i.e. DG MOVE, INEA, DG REGIO, and the European Investment Bank.

Table 5 Ministries of Transport Infrastructure and Agencies

Poland
Ministerstwo Infrastruktury i Budownictwa/Ministry of Infrastructure and Construction Department for Transport Strategy and International Cooperation
Ministerstwo Spraw Zagranicznych/Ministry of Foreign Affairs Permanent Representation of the Republic of Poland in the EU in Brussels
Czech Republic
Ministerstvo dopravy/Ministry of Transport
Slovakia
Ministerstvo dopravy, výstavby a regionálneho rozvoja/Ministry of Transport, Construction and Regional Development
Austria
Bundesministerium für Verkehr, Innovation und Technologie/Ministry of Transport, Innovation & Technology
Italy
Ministero delle Infrastrutture e dei Trasporti/Ministry of Transport and Infrastructure
Rete Autostrade Mediterrane/Motorways of the Sea Agency
Struttura Tecnica di Missione/Special Technical Unit
Slovenia
Ministrstvo za infrastrukturo/Ministry of Infrastructure
DRI upravljanje investicij, d.o.o./DRI Investment Management L.t.d. (Consultancy Body of the Ministry)

Table 6 Rail Infrastructure Managers

Poland
PKP Polskie Linie Kolejowe S.A./Railway Infrastructure Manager
Czech Republic
Správa železniční dopravní cesty, s.o./Railway Infrastructure Manager
Slovakia
Železnice Slovenskej republiky/Rail Infrastructure Manager
Austria
ÖBB – Österreichische Bundesbahn/Railway Infrastructure Manager
Italy
Rete Ferroviaria Italiana/Railway Infrastructure Manager
Slovenia
Slovenske železnice – Infrastruktura, d.o.o./Railway Infrastructure Manager
Javna agencija za železniški promet Republike Slovenije/Public Agency of the Republic of Slovenia for Railway Transport

Table 7 Port Infrastructure Managers

Poland
Zarząd Morskiego Portu Gdynia S.A./Port Authority of Gdynia
Zarząd Morskiego Portu Gdańsk S.A./Port Authority of Gdańsk
Zarząd Morskich Portów Szczecin i Świnoujście S.A./Szczecin and Świnoujście Ports Authority
Slovakia
Verejné prístavy, a. s./Public Ports, j.s.c.
Austria
Hafen Wien und Wiencont Container Terminal GesmbH/Port of Wien and WienCont Container Terminal
Italy
Sistema Portuale del Mare Adriatico Orientale – Porto di Trieste/Port authority of Triest
Sistema Portuale del Mare Adriatico Settentrionale – Porti di Venezia e Chioggia/Port Authority of Venezia
Sistema Portuale del Mare Adriatico Centro-Settentrionale – Porto di Ravenna/Port Authority of Ravenna
Slovenia
Luka Koper/Port of Koper

Table 8 Road Infrastructure Managers

Poland
GDDK&A - Generalna Dyrekcja Dróg Krajowych i Autostrad/Motorway and Highway Infrastructure Manager
Czech Republic
Ředitelství silnic a dálnic/ Highway Infrastructure Manager
Slovakia
Národná diaľničná spoločnosť/Motorway Infrastructure Manager
Slovenská Správa Ciest/Highway Infrastructure Manager
Austria
ASFINAG - Österreichische Autobahn- und Schnellstraßen Finanzierung Aktiengesellschaft/Motorway and Highway Infrastructure Manager
Italy
ANAS - Società per Azioni/Motorway and Highway Infrastructure Manager
Struttura di vigilanza sulle concessioni autostradali/Ministerial Toll Road Monitoring Office
AISCAT - Associazione Italiana Società Concessionarie Autostrade e Trafori/Italian Association of Toll Road Operators
Slovenia
Družba za avtoceste Republike Slovenije" – DARS/Motorway Infrastructure Manager

Table 9 Airport Infrastructure Managers

Poland
Port Lotniczy Gdańsk/Gdańsk Airport
Port Lotniczy Warszawa/Warszawa Airport
Port Lotniczy Łódź/Łódź Airport
Port Lotniczy Katowice/Katowice Airport
Port Lotniczy Szczecin/Szczecin Airport
Port Lotniczy Poznań/Poznań Airport
Port Lotniczy Wrocław/Wrocław Airport
Czech Republic
Letiště Ostrava/Ostrava Airport
Slovakia
Letisko Bratislava/Bratislava Airport
Austria
Flughafen Wien AG/Wien Airport
Italy
Aeroporto di Venezia/Venezia Airport
Aeroporto di Bologna/Bologna Airport
Ente Nazionale Aviazione Civile/National Civil Aviation Agency
Slovenia
Aerodrom Ljubljana/Ljubljana Airport

Table 10 Rail-road terminals Infrastructure Managers

PL	Warszawa	
	1	1. Terminal Kontenerowy Główna Towarowa/Terminal Container Główna Towarowa
	2	2. Terminal Kontenerowy Warszawa Praga/Terminal Container Warszawa Praga
	3	3. Terminal Kontenerowy Pruszków/Terminal Container Pruszków
PL	**Łódź**	
	4	1. Terminal Kontenerowy Łódź Olechów/Terminal Container Łódź Olechów
	5	2. Terminal Kontenerowy Stryków/Terminal Container Stryków
PL	Katowice	
	6	1. Terminal Przeładunkowy Sławków/Transhipment Terminal Sławków
PL	**Poznań**	
	7	1. Terminal Kontenerowy Clip Logistics/Terminal Container Clip Logistics
	8	2. Terminal Kontenerowy Polzug Poznań/Terminal Container Polzug Poznań
	9	3. Terminal Kontenerowy Poznań Franowo/Terminal Container Poznań Franowo
	10	4. Terminal Kontenerowy Loconi Poznań/Terminal Container Loconi Poznań
PL	**Wrocław**	
	11	1. Terminal Kontenerowy Polzug Wrocław/Terminal Container Wrocław
	12	2. Terminal Kontenerowy Brzeg Dolny/Terminal Container Brzeg Dolny
	13	3. Terminal Kontenerowy Kąty Wrocławskie/Terminal Container Kąty Wrocławskie
CZ	Ostrava	
	14	1. Kontejnerové překladiště Paskov/ Terminal Container Paskov
	15	2. Kontejnerové překladiště Šenov/Terminal Container Šenov
CZ	**Přerov**	
	16	Kontejnerové překladiště Přerov/Terminal Container Přerov
SK	Bratislava	
	17	Kontejnerový terminál Bratislava UNS/Terminal Container Bratislava UNS
SK	**Žilina**	
	18	Kontejnerový terminál Žilina/Terminal Container Žilina
		Terminál intermodálnej prepravy Žilina Teplička/Intermodal Terminal Žilina Teplička
AT	Wien	
	19	Combi Cargo Terminal Wien Nordwestbahnhof/Combined Cargo Terminal Wien Nordwestbahnhof

AT		Combi Cargo Terminal Wien Inzersdorf/Combined Cargo Terminal Wien Inzersdorf (under construction, replacing Nordwestbahnhof once completed)
	Graz	
	20	Terminal Graz Süd Graz-Süd-Werndorf/Rail-road Terminal Graz Sud-Werndorf
IT	Cervignano	
	21	Interporto di Cervignano/Cervignano Rail-road Terminal
IT	Padova	
	22	Interporto di Padova/Padova Rail-road Terminal
IT	Bologna	
	23	Interporto di Bologna/Bologna Rail-road Terminal
SI	Ljubljana	
	24	Kontejnerski terminali Ljubljana/ Ljubljana Rail-road Terminal

Table 11 BA Corridor Regions and Macro-Regional Strategies representing all BA Corridor Regions to the Forum

Poland
Związek Województw Rzeczypospolitej Polskiej/Union of the Voivodeships of the Republic of Poland
Stowarzyszenie Polskich Regionów Korytarza Transportowego Bałtyk – Adriatyk/Association of the Polish Regions of the Baltic-Adriatic Transport Corridor
Czech Republic
Asociace Krajů České Republiky/Association of Regions in the Czech Republic
Slovakia
Žilinský Samosprávny Kraj/Zilina Region
Bratislavský Samosprávny Kraj/Bratislava Region
Austria
Land Niederösterreich/Lower Austria Region
Land Steiermark/Styria Region
Land Kärnten/Carinthia Region
Italy
Regione Friuli Venezia Giulia/Friuli Venezia Giulia Region
Regione Veneto/Veneto Region
Regione Emilia-Romagna/Emilia-Romagna Region
Slovenia
Vzhodna Slovenija/Communities of Slovenian Eastern NUTS II Regions
Zahodna Slovenija/Communities of Slovenian Western NUTS II Regions

Table 12 Macro-Regional Strategies

European Union Strategy for the Baltic Sea Region (EUSBSR)
EU Strategy for the Danube Region (EUSDR)
EU-Strategy for the Alpine Region (EUSALP)
EU Strategy for the Adriatic and Ionian Region (EUSAIR)

Table 13 Other Entities

Baltic-Adriatic Rail Freight Corridor
Management Board
Executive Board
Permanent Management Office
EU Institutions
European Commission DG MOVE
European Commission DG REGIO
European Commission INEA
European Investment Bank

2.5.1. Forum meetings

The Corridor Forum meetings take place in Brussels at the premises of the European Commission. The Corridor Forum of the BA Corridor met 11 times since the inception of the new TEN/T policy. Four meetings were organised during 2014 towards the elaboration of the first BA Corridor work plan. Two meetings were organised in 2015, and 3 in 2016 in support of the first update of the work plan. Two meetings have been organised in June and October 2017 before the completion of the 2015-2017 BA Corridor study, in view of the second update of the work plan by 2018.

2.5.2. Working Groups

Regarding the working groups, two groups have been organised during 2014 one involving the port authorities along the corridor and one involving all the regions. The stakeholders invited to the working group of ports were the same port authorities participating in the Forum meetings as reported in Table 2 above. The list of stakeholders invited to the working group of regions also including the representatives participating in the Corridor Forum, is reported in the following table.

Table 14 BA Corridor regions representatives invited to the BA working group of regions

Poland
Pomorskie Voivodeship/Pomorskie Region
Warminsko-Mazurskie Voivodeship/Warmian-Masurian Region
Kujawsko-Pomorskie Voivodeship/Kuyavian-Pomeranian
Mazowieckie Voivodeship/Masovian Region
Łódzkie Voivodeship/Lodzkie Region
Wielkopolskie Voivodeship/Wielkopolska Region
Slaskie Voivodeship/Silesian Region
Swietokrzyskie Voivodeship/Swietokrzyskie (Holy Cross) Region
Opolskie Voivodeship/Opole Region
Dolnoslaskie Voivodeship/ Lower Silesian Region
Lubuskie Voivodeship/Lebus Region
Zachodniopomorskie Voivodeship/West Pomeranian Region
Czech Republic
Moravskoslezský kraj/Moravian-Silesian Region
Zlínský kraj/Zilina Region
Olomoucký kraj/Olomouc Region
Jihomoravský kraj/South-Moravian Region
Slovakia
Žilinský samosprávny kraj/Zilina Region
Trenčiansky samosprávny kraj/Trencin Region
Trnavský samosprávny kraj/Trnava Region
Bratislavský samosprávny kraj/Bratislava Region
Austria
Land Niederösterreich/Lower Austria Region
Land Steiermark /Styria Region
Land Kärnten/Carinthia Region
Italy
Regione Friuli Venezia-Giulia/Friuli Venezia-Giulia Region
Regione Veneto/Veneto Region
Regione Emilia Romagna/Emilia Romagna Region
Slovenia
Regionalna razvojna agencija - Ljubljanske urbane regije/Regional Development Agency of the Ljubljana Urban Region
Other representatives of associations of regions participating to the BA Corridor Forum
Stowarzyszenie Polskich Regionów Korytarza Transportowego Bałtyk – Adriatyk/Association of the Polish Regions of the Baltic-Adriatic Transport Corridor
Związek Województw Rzeczypospolitej Polskiej/Union of the Voivodeships of the Republic of Poland

Asociace Krajů České Republiky/Association of Regions in the Czech Republic
Vzhodna Slovenija/Communities of Slovenian Eastern NUTS II Regions
Zahodna Slovenija/Communities of Slovenian Western NUTS II Regions
Danube Macroregional Strategy

Two working group of ports and rail-road terminals, involving the stakeholders members of the Corridor Forum were held in March 2016 and October 2017. Two working groups of regions, macro-regional strategies and urban nodes have been also undertaken in September 2016 and November 2017, where the representatives of the 13 core urban nodes along the BA Corridor have been also invited. The latter event was jointly chaired by the European Cooordinators of the Baltic-Adriatic and North Sea-Baltic corridors (Prof. Kurt Bodewig and Mrs Catherine Trautmann), which was kindly hosted by the Wielkopolska region in Poznań, Poland, representing a common node to the two corridors.

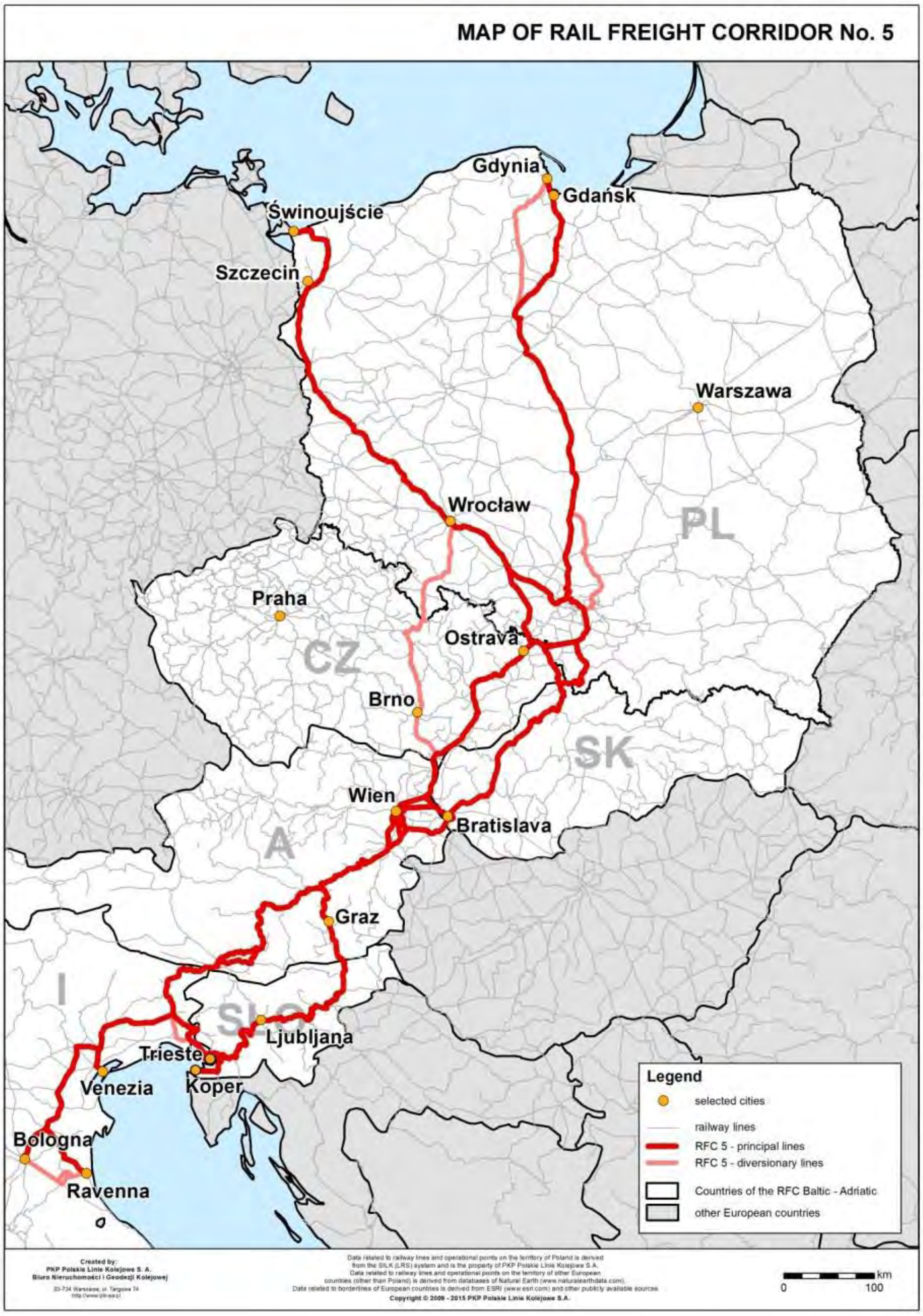
Table 15 BA Corridor urban nodes representatives invited to the BA working group of regions

Poland
Urząd Miasta Katowice / City Office of Katowice
Urząd Miasta Łódzi / City Office of Łódź
Urząd Miasta Poznania / City Office in Poznań
Urząd Miasta Stołecznego Warszawy / City Office of Warsaw
Urząd Miasta Szczecin / City Office of Szczecin
Urząd Miejski w Gdańsku / City Office of Gdańsk
Urząd Miejski Wrocław / City Office in Wrocław
Czech Republic
Statutární město Ostrava/Statutory city of Ostrava
Slovakia
Mesto Bratislava/Bratislava Municipality / Ministerstvo dopravy, výstavby a regionálneho rozvoja/Ministry of Transport, Construction and Regional Development
Austria
Stadt Wien/City Government of Vienna
Italy
Comune di Bologna/Bologna Municipality
Comune di Venezia/Venice Municipality
Slovenia
Mestna občina Ljubljana/Municipality of Ljubljana

2.5.3. Baltic-Adriatic Rail Freight Corridor

The need for a systemic and inclusive approach makes it also necessary to coordinate the preparation of the BA Corridor work plan and its implementation strategy in synergy with the parallel development of Baltic-Adriatic Rail Freight Corridor. In this respect it is noticed that as also stated by Regulation (EU) 913/2010, core network corridors (CNC), including the BA Corridor, overlap wherever possible the Railway Freight Corridors (RFC).

Figure 2 Scheme of the Rail Freight Corridor



Source: Baltic-Adriatic RFC5

According to Regulation (EU) 913/2010 a governance structure for each freight corridor shall exist consisting of Member States and Infrastructure Managers and the Allocation Body. The infrastructure managers together form the Management Board of the Rail Freight Corridor (RFC) 5, in charge of the studies to be undertaken for its implementation, whereas the Ministries represent the Executive Board. Advisory Groups to the Management Board are also worth mentioning in the RFC 5 governance structure – consisting of the Freight Terminal Operators and Railway Undertakings.

With respect to the Baltic-Adriatic Rail Freight Corridor, it is worth noticing that it became operational in 2015; during this same year several analysis and studies have been completed among which the RFC5 Implementation Plan. This plan includes a description of the corridor, including route and infrastructure parameters, the bottlenecks and the terminals, a market analysis and a list of investments with an indication of their impact on the development of the corridor. Corridor KPIs started also to be defined which refer to the operation of the corridor and which will be further refined in future analysis. Among the activities currently foreseen to be developmed and implemented in the short term, the following are worth mentioning which are of particular relevance for the development of both the Baltic-Adriatic CNC and rail freight corridor infrastructure: a) a train length study aimed at assessing the market needs and strategy for the development of the corridor in compliance with the 740 meters length interoperability requirement set in the Regulation (EU) 1315/2013; b) definition and analysis of the last mile connections to the ports' and rail-road terminals along the RFC5; c) updated analysis of the demand and market for freight transport along the RFC5.

Over the duration of the 2015-2017 BA Corridor study several exchanges of information occurred between the BA Corridor and RFC5 in terms of analysis and results of the respective activities. The European Coordinator has also participated to the RFC5 meeting held in Prague in October 2017 where both the BA Corridor and RFC5 expressed the interest and opportunity to consolidate the fruitful cooperation experienced since 2014. In this regard the BA Corridor study will reflect the relevant findings from the analysis developed by the RFC5, particularly on operational and administrative barriers affecting the development of long-distance traffic of freights across the corridor Member States.

2.6. Tools for the development and updating of the BA Corridor work plan

2.6.1. Studies for the development and updating of the BA Corridor work plan

The 2014 study towards the elaboration of the BA Corridor work plan

In order to provide the required technical support to the European Commission as technical advisor to the European Coordinator, the Commission launched in 2013 a call for tender for nine core network corridor studies, serving as technical basis for the elaboration by the European Coordinator of the work plan specific to each corridor. The studies include the results of the following tasks:

- Identification of relevant stakeholders;
- Collection and review of studies on sections and parts of the corridor;
- Definition of the BA Corridor alignment, analysis of available data on the corridor infrastructure parameters and encoding of the TENtec database (see Section below);
- Preparation of the elements of the work plan, including the description of the characteristics of the BA Corridor infrastructure and its compliance with the

Regulation (EU) 1315/2013; summary of the results of the multimodal market study; the analysis of critical issues; the identification of the objectives of the BA Corridor work plan; the tools for the implementation of the work plan including an analysis and review of the planned investments with reference to the critical issues; the ERTMS Deployment Plan and the Plan for the removal of barriers and enhancement of efficient multimodal transport and services.

As part of the study activities to support and follow up the meetings of the Corridor Forum have been also provided; four Corridor Forum meetings and two working groups (one for Ports and one for Regions) have been organised during 2014. Participation in the Corridor Forum saw the gradual and incremental involvement of the main stakeholders, including: Member States, Railway and Port Infrastructure Managers and the Management and Executive Boards of the Baltic-Adriatic Rail Freight Corridor, Road and Airport Infrastructure Managers as well as representatives from the Regional Authorities.

A copy of the 2014 BA Corridor study is available at the following Web Page of the Commission Web Site:https://ec.europa.eu/transport/sites/transport/files/baltic-adriatic_study_0.pdf.

The 2015-2017 study for the monitoring and implementation of the BA Corridor work plan, towards its update in 2016 and 2018

In order to monitor the implementation of the 2015 work plans and in view of their revision by mid-2016 and subsequently by 2018 as foreseen by the Regulation (EU) 1315/2013, a new call for tenders was issued by the European Commission early 2015 to further develop the nine corridor studies and get the technical support necessary for the refinement of the corridor work plans.

For each corridor it was envisaged that the new 2015-2017 studies would build upon the results of the 2014 analysis also aimed to complete and integrate the work initiated in 2014. Whilst important results have been achieved during 2014 the analysis completed in the first studies required further development as generally specified in the tender specifications issued for the new 2015-2017 analysis and pointed out in the work plans of the European Coordinators.

The new 2015-2017 studies were also expected to further promote among the stakeholders involved in the Forum and working groups, the importance of considering the core network corridors as the backbone of their EU and national transport policies, establishing synergies between regional, national and international funding programmes and transport development planning initiatives.

2.6.2. Other studies and tools for the implementation of the new TEN-T policy

The Study on the cost of non-completion of the TEN-T

In the framework of the activities launched for the implementation of the new TEN/T policy a study was launched in 2014 which was completed upon finalisation of the nine 2014 CNCs studies, to assess the impact on jobs and economic growth that could be achieved through the realisation of the TEN-T Core Network.

This study was also meant to provide useful information and data in response to a request by several stakeholders in the Corridor Fora to understand and measure the impact of the implementation of the nine CNCs on the EU economy and society.

The study has been based on a detailed analysis of the nine 2014 core network corridors studies which led to the identification of projects along the corridors and which back the first work plans of the European Coordinators for the TEN-T, finalized in 2015. The projects have the ultimate objective of completing the core network corridor by 2030.

The investment estimated to reach this objective is around 700 billion Euro, and the number of projects that have been identified so far exceeds 2,500. As further detailed below, "the cost of non-completion of the TEN-T" study shows that the steady implementation of this network until 2030 will bring 10 million man-years of jobs in total over the forthcoming 15-years period, and it will add 1,8% to Europe's Gross Domestic Product (GDP) until 2030.

Job-creating effects

The job-creating effects assessed in the study include:

- Direct effects, i.e. effects which are directly related to the construction of the projects (thus identified – in a unique way – from the perspective of a single European policy);
- Indirect effects, which are also incurring during the construction period and concern other sectors, such as services in relation to construction;
- Secondary effects, which result from a changed structure in trade and factor productivity.

Direct effects during construction represent a high share during the period until 2030, with a peak around the middle of the 15-year period at stake. They not only concern traditional construction works but also other sectors such as the electronic/equipment industry. Indirect effects concern sectors such as construction and electronic material provision, hotel and food industry etc.

The significant reduction of travel times and transport costs as well as the improved accessibility of all regions and economic centres, which will result from the completed trans-European transport network, leads to significant positive employment changes far beyond construction. They will benefit a wide range of other market services such as planning, transport industry, trade, communication, banking or tourism. These are the sectors that will see the most important job creation.

Since the completion of the trans-European transport network aims at creating an important permanent asset for Europe, the share of these secondary effects will not only increase over time until 2030 (compared to the share of direct and indirect construction effects); it is expected to continue growing beyond this target year. Furthermore, once the current objective of the TEN-T completion – 2030 – is achieved, the network will need to be maintained and further developed in order to keep abreast with future innovative developments of the transport system and with societal changes. This is expected to lead to the further generation of new/innovative jobs in the infrastructure development sector in the long run.

Gross Domestic Products (GDP) effects

In particular the secondary employment effects will have an impact on citizens' consumption and spending patterns. This has been calculated by the authors of the study as translating into a cumulative GDP surplus of 1,8% until 2030. It can be assumed that positive spatial effects, as well as this GDP impact remain at least unchanged after 2030 since productivity enhancements and structural changes (e.g. in the field of trade or new company creations) will continue to stimulate job creation. There are reasons to expect that the positive effects may even be accelerated after 2030.

The full study is available on the European Commission Web Site: http://ec.europa.eu/transport/themes/infrastructure/studies/doc/2015-06-fraunhofer-cost-of-non-completion-of-the-ten-t.pdf.

A new *Study on the impact of TEN-T completion on growth, jobs and the environment* is currently ongoing to update the results of the first assessment on the impact of the development of the TEN-T core network on jobs and economic growth, which considers as input data the updated project lists elaborated under the scope of the 2015-2017 core network corridor studies, namely over 3,000 projects for a total investment cost of about 750 € billion. Further to the assessment of the impact of TEN-T completion on the economy and on the employment (including direct and indirect jobs during construction as well as wider economic benefits of permanent nature) the study will also assess the impact of the development of the core corridors on the environment (notably carbon and other harmful emissions).

2.6.3. Coordination and consistency between the 2015-2017 BA Corridor study and other studies

In the execution of the activities of the 2015-2017 corridor studies the need to adopt a harmonised approach and coherent methodology among the nine core network corridor studies emerged, and was also emphasised by the Member States, many of them involved in the development of more than one corridor.

In line with this need for synchronisation among the contractors working groups have been set up among the nine contractors selected for the delivery of the new 2015-2017 CNC studies to define and adopt a common methodology for the delivery of the study tasks.

Furthermore, the new set of corridor studies to be developed in the period 2015-2017 for the monitoring of the implementation of the work plans and their revision has been accompanied by additional studies on the implementation of the new TEN-T policy, most of them started and/or completed over the same time-span. A brief overview of the scope of these studies is provided below:

- *Data collection on the trans-European transport network (TEN-T) using the TENtec system*; The objective of this study is to ensure availability of high quality data in the TENtec database, so that it can be relied on for monitoring the progress in terms of different transport policies, in particular regarding the availability of high quality transport networks, intermodal connections and the progress in terms of interoperability. Two lots have been identified: Lot 1, Railway infrastructure, rail connectivity of airports and selected parameters for road infrastructure, aimed to collecting data for the rail and road infrastructure; and Lot 2: Inland waterways infrastructure, aimed to collect data on inland waterways.
- *Study on the TEN-T Motorways of the Sea Horizontal Priority*; The main objective of this study will be to provide the technical support to the European Coordinator for the Motorways of the Sea in order to update his work plan of 2015 by means of development and subsequent update of a new Detailed Implementation Plan; the scope of the work includes a detailed analysis of the characteristics of the core and comprehensive ports, relevant experiences and developments relating to the implementation of the Union maritime transport policy, and development of traffic forecast.
- Services of technical support for the deployment of ERTMS along the core network corridors; with the overall objective to provide the technical support to the European Coordinator for the deployment of ERTMS in Europe.
- *Study on permitting and facilitating the preparation of TEN-T core network projects in particular waterborne projects and cross-border projects*; The scope of the study is to analyse the legal frameworks and practices in permitting procedures and provide recommendations of policy options for a positive EU framework for project development and investments focussing on waterborne and cross-border projects.

- *Study to develop tailor-made solutions for use of innovative financing to support deployment of ERTMS, in particular along nine core network corridors*; The study aims to provide support to the European Commission in developing market-based financial solutions for ERTMS deployment both on-board and trackside, with a view to encourage timely ERTMS deployment.
- *Article 49.3 Study: Review of Existing Sources of Information / Data and Support for the Preparation of the Progress Report on the Implementation of the TEN-T Network*; The study aims to support the European Commission Services in the preparation of the Progress Report to comply with EC obligations as defined in Article 49.3 of TEN-T Regulation (EU) 1315/2013 and Article 22 of the CEF Regulation (EU) 1316/2013.
- *Clean power for transport infrastructure deployment*; The study assesses the deployment of alternative clean fuels according with the requirements set in the Directive 2014/94/EU with a focus on the Core Network Corridors (see also Section 2.8.2 below for more details on this study).
- *Study on streamlining measures to accelerate the implementation of projects of common interest on the TEN-T network*; The study concerns the assessment of the benefits deriving from the swifter implementation of TEN-T projects. It is aimed at identifying and testing alternative policy options to achieve this overall target.

The studies already completed are available at the following link: https://ec.europa.eu/transport/facts-fundings/studies_en.

2.6.4. TENtec system

The Trans-European Networks technical (TENtec) database is in place and under development since autumn 2006, its first module put online in 2007. The system is managed and operated in-house at DG MOVE, by the Unit B (with development outsourcing to INEA for implementation modules).

The database is used to store and manage technical and financial data for the analysis, management and political decision making of the TEN-T programme. It acts as a bridge to Member States ministries and other key stakeholders either at DG MOVE (different units: IA, Ports+Inland Navigation, Clean Transport & Sustainable Urban Mobility, Road Safety, TEN-T, Land Transport etc.), as well as outside DG MOVE (DGs ENER/ELARG/ENV/CLIMA/REGIO/ECFIN/ESTAT; EP; EIB; INEA).

The database provides support for modelling of future policy and budgetary scenarios, briefings, interfacing with GIS (Geographical Information System), monitoring and reporting, the electronic submission of applications and online conduction of surveys. Since 2011 data input and validation is undertaken in close collaboration with MS and neighbouring states. With the approval of Regulations (EU) 1315/2013 and 1316/2013 the system increased its strategic relevance for the collection of data specifically on the core and comprehensive sections of the network, as well as on bordering countries.

It is actually in the framework of the new TEN-T policy that the use of the system is becoming of outmost relevance as also reflected in the mentioned regulation:

- Regulation (EU) 1315/2013 stipulates that in order to determine existing and planned transport infrastructures for the comprehensive and the core network, maps should be provided and adapted over time to take into account the evolution of traffic flows. The technical basis of those maps is provided by the interactive geographical and technical information system for the trans-European transport network (TENtec), which contains a high level of detail concerning the trans-European transport infrastructure.

- Again Art. 49 of the same regulation states that Member States shall inform the Commission on a regular, comprehensive and transparent basis about the progress made in implementing projects and the investments made for that purpose. This shall include the transmission of annual data as far as possible through the interactive geographical and technical information system for the trans-European transport network (TENtec). It shall include all relevant data concerning projects of common interest in receipt of Union funding.

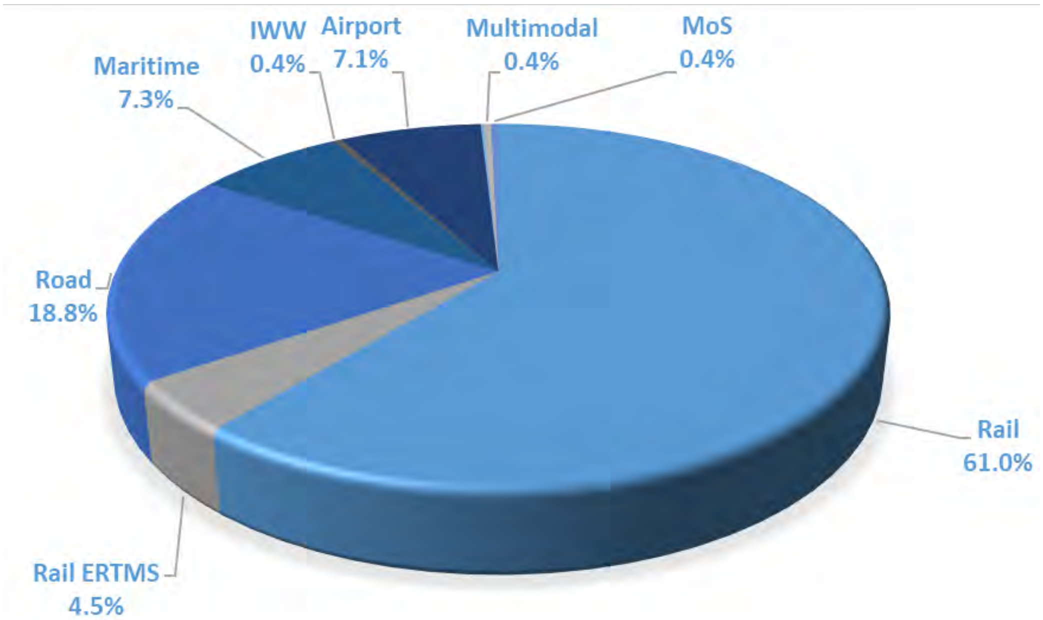
During 2014 the system has been already used by the consultants involved in the preparation of the CNCs studies for the elaboration of the work plans by the European Coordinators. As mentioned above, in parallel with the new 2015-2017 core network corridor studies, the Commission has launched a dedicated call for tender to ensure availability of high quality data in the TENtec database, so that it can be relied on for monitoring the progress in terms of different transport policies, in particular regarding the availability of high quality transport networks, intermodal connections and the progress in terms of interoperability. With respect to transport modes, the scope of the new TENtec study covers the railway, the road network and IWW modes; whereas in the same timeframe, a dedicated study on the TEN-T Motorways of the Sea horizontal priority will provide for data encoding at seaports. Another study on deployment of ERTMS in Europe is also ongoing which will provide data on ERTMS implementation on the TEN-T corridors. The results of these studies were not available for consideration as an input to the 2015-2017 BA Corridor study.

2.7. Progresses of corridor development

As part of the analysis undertaken within the scope of the 2014 BA Corridor study, a project list was developed aimed at identifying the investments required for the development of the BA Corridor by 2030. The list included over 350 investments for a total budget of 57.9 € billion. Over the course of the ongoing 2015-2017 BA Corridor study an updated list of projects has been also elaborated which includes 638 projects for a total value of 83.5 € billion, of which 551 are ongoing or planned to be implemented in the future and 87 have been completed since the inception of the new TEN-T policy.

The total value of the completed projects amounts to 6.6 € billion. The figure below shows the share of budget spent for the implementation of the completed investments by project category.

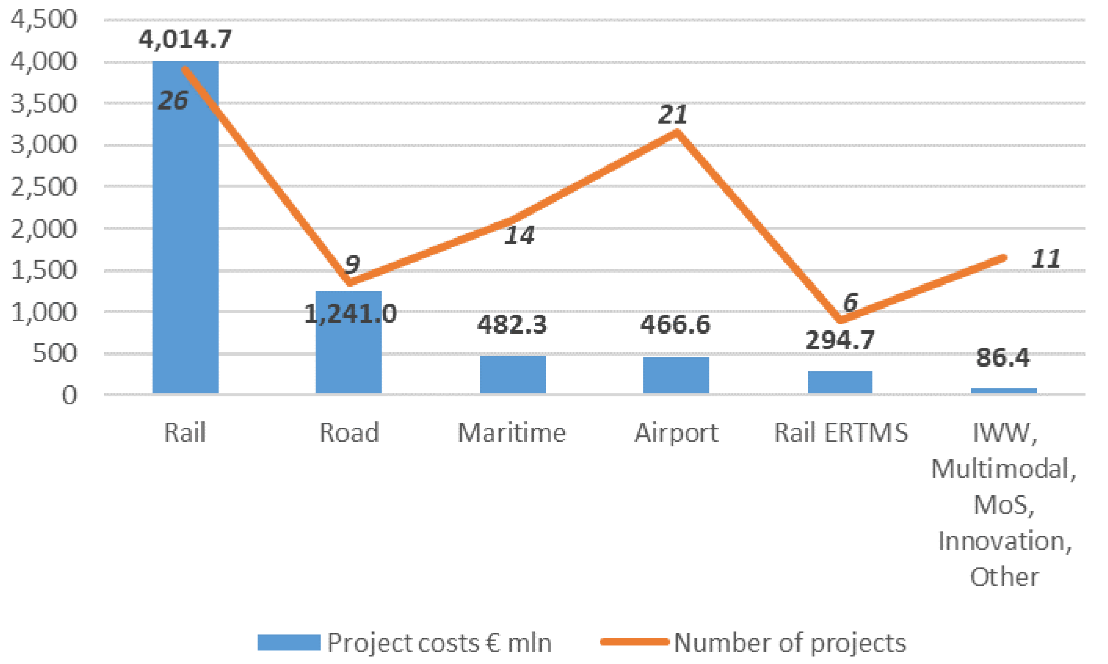
Figure 3: Share of budget by project category for completed projects



Source: BA Corridor study consortium

The overall statistics for the completed projects, reflecting split by mode and budget are presented in the figure below. Most of the investments already finalised as well as the largest amount of budget spent for the completed initiatives relates to rail infrastructure. Road investments shows the second highest amount of budget expenditure, followed by maritime and airport projects.

Figure 4: Total number and costs of completed projects by category



Source: BA Corridor study consortium

The specific objectives for the development of the BA Corridor are well addressed by the completed projects. These investments include the preparatory works for the rail cross-border sections between Poland, Czech Republic and Slovakia, and several modernisation works of the national railway lines in Poland, Czech Republic and Slovakia, among which the completion of the Eastern Branch in Poland, namely the E65 national railway section between Gdynia and Warsaw is notable. Furthermore, the list of finalised investments comprises works for the development of the road cross-border section between Katowice and Žilina; studies for the improvement of the last mile connections of the ports in Poland; road last mile connection works at the port of Gdańsk; completion of the reconstruction of the "Stary Most (Old Bridge)" in Bratislava; improvement of the existing road infrastructure interconnecting to the port of Trieste; road last mile connection works and rail last mile connection works to the new Ro-Ro terminal Fusina at the Venezia port; and reconstruction of the existing track between Koper and Divača, providing direct access by railway to the port of Koper.

Other relevant concluded projects relate to the completion of the new main railway station in Vienna; construction of the rail-road terminal in Žilina Teplička; expansion of container terminals at the ports of Gdańsk, Gdynia and Vienna; improvement of airport connections in Ostrava and Vienna; enlargement of the airports in Katowice, Łódź, Szczecin, Poznań, Wrocław, Venezia and Bologna; modernisation and upgrading of the corridor road network in Poland, Austria and Italy.

2.8. Issues Papers and Innovative Flagship Projects

2.8.1. Issues Papers

In 2016, in view of the TEN-T days in Rotterdam and in order to respond to the need to make the core network corridors forerunners of a sustainable and forward-looking European transport system, the European Coordinators identified five areas of particular attention in integrating transport policy issues into further core network corridor development:

- Multi-modality and efficient freight logistics;
- Intelligent Transport Systems;
- Innovation and alternative clean fuel infrastructure;
- Integrating urban nodes;
- Cooperation with third countries.

The above issues were chosen on the basis of their expected potential of sustainability enhancements, their transport policy relevance and future-orientation as well as the strong interrelatedness between infrastructure and transport policy.

The elaboration of the Issues Papers has seen the involvement of all units of the Directorate for Mobility and Transport; as part of the activities relating to the elaboration of the issues papers an extensive consultation process has been set up which has involved all the members of the 9 core network corridor fora. The issues papers are available at the following link: http://www.europarl.europa.eu/cmsdata/117302/tent-issues-papers_en.pdf

The following recommendations are worth reporting which were made by the European Coordinators specifically about the scope of the Issues Papers:

- *Enhance multi-modality and efficient freight logistics*. Terminal infrastructure, terminal accessibility and relevant ICT infrastructure need to be developed from a reinforced corridor-wide perspective, as well as with a better integration of users' needs and demand forecasts; selected corridors shall serve as test cases for the digitalisation of freight transport.
- *Boost Intelligent Transport Systems*. A coordinated ITS deployment beyond the so-called ITS corridors (also including at nodes) must be promoted; building on the C-ITS Platform and the Amsterdam Declaration, investment in digital infrastructure shall be stimulated to deploy cooperative intelligent transport services by 2019; new mobility services shall be enabled by enhancing data accessibility trough national access points and by linking travel information services along corridors.
- *Further boost new technologies and innovation in transport*. The governance and cooperation structure of the corridors shall be used to the best of its possibilities to deploy results of research and innovation activities in line with strategic transport policy objectives, to boost common commitment of actors (researches, industry, TEN-T stakeholders) and to create strong "flagship" cases.
- *Fully exploit the decarbonisation potential of the different options of alternative fuel propulsion systems - biofuels, electric, hydrogen and natural gas – and to ensure highest effectiveness of Directive 2014/94/EU on corresponding charging infrastructure*. Member States' National Policy Frameworks need to be highly ambitious and cooperation across national borders needs to be reinforced; market take-up shall be stimulated through pilot action along corridors.
- *Better integrate urban nodes into core network corridors*. It is not only important to remove bottlenecks and missing links on TEN-T infrastructure in such nodes; a stronger connection with Sustainable Urban Mobility Plans can vitally contribute to improving "last mile" connections for people and freight; urban nodes shall make

best use of their exemplary roles on multi-level governance and as forerunners of innovative and low-carbon solutions.

- *Cooperation between the EU and third countries* on transport infrastructure development is important in order to ensure continuity of the TEN-T and its corridors in different geographical areas and thereby to facilitate trade and international cooperation; this must also involve the common striving for coherent standards.

2.8.2. Innovative flagship projects

With the five "Issues Papers" European Coordinators started, in addition to their geographically-based corridor work, also an action aiming to advance newer components of TEN-T development and to strengthen corresponding cross-corridor synergies. This initiative not only constituted a necessary step towards the broad coverage of the full dimension of TEN-infrastructure; it also opened up a process to ensure that rapidly changing transport and mobility patterns go along with appropriate infrastructure development. The future of the European transport system requires close interaction between infrastructure and transport policy. Through its "soft dimension" (smart and intelligent components for all transport modes, clean fuel infrastructure etc.), the TEN-T decisively contributes to shaping the transport system of the future. Core network corridors present an excellent opportunity to lead this process and – as appropriate – serve as test cases for innovative approaches (be it technologically, legally, organisationally etc.).

To translate the basic work of the "Issues Papers" into concrete action, the Commission proposed to boost the generation of innovative flagship projects on the core network corridors. The aim is to generate at least one such project per corridor and to cover all Issues Papers' topics; these should build on the topics of the Issues Papers and take up bottom-up initiatives or projects that are driven (top-down) by transport policy objectives and will benefit from a strong involvement of colleagues from relevant sectors of DG MOVE. Corridor consultants have been instructed to identify such projects on their respective corridors, which should be characterized by:

- A set of connected actions which – as a whole – generate, in a period of no more than 3 to 4 years, clear benefits for users or/and society, and which should be expressed in KPI such as time gains, emissions' reduction, enhanced service quality etc.
- A listing of all actions belonging to this project, relevant promoters, cost and timing; total cost and implementation time;
- An agreement of all promoters, confirming their commitment to the project as a whole.

Flagship projects may aim at filling remaining gaps between already existing full-scale standard sections, at boosting new / innovative action or, where useful, also include stand-alone measures to deploy R&I results. The description of such flagship projects (including sound implementation plans) may become a complement to the third generation of corridor work plans. The work is not least of importance for a streamlined and focussed allocation of the last part of the CEF budget in 2018/2019, and it may furthermore help defining funding priorities for the next financial framework.

The initiative to generate flagship projects is conceived as the beginning of a process. The process will have to go on since strong interaction between infrastructure development and transport policy/services is the only way forward for transport to meet societal and technological challenges of the future, and to boost decarbonisation.

Such a continuing process is, for example, important to further specify the standards set out in the TEN-T Guidelines to ensure they remain aligned with the needs of a quickly changing transport system.

2.8.3. Enhance passengers' transfer hubs in urban nodes along the corridor

Within the above context an innovative flagship project has been allocated for development to the BA Corridor which relates to the *Issue Paper* dedicated to the integration of the urban nodes in the core network corridors, with a focus on passenger transport. The title of the flagship project is *Enhance passengers' transfer hubs in urban nodes along the corridor*. The table below provides the description of the main characteristics of this initiative.

Table 16 Enhance passengers' transfer hubs in urban nodes along the corridor

Scope of the flagship project (why)
Enhance passengers' transfer hubs in urban nodes along the corridor aims to translate into concrete action the policy targets set in the *Issues Papers* on Urban nodes. The actions foreseen for possible implementation as part of the project focus on Art. 30 of Regulation (EU) 1315/2013 and on the need to ensure and maximise the effectiveness of the integration of urban nodes into the core network. The implementation of these actions will facilitate the transfer of passengers between long-distance destinations and between long-distance and urban transport solutions along the corridor.
Market and Beneficiaries (whom)
The direct beneficiaries of the project and related actions are passengers transferring between two different nodes of the core network (Airport, Rail, Coach, Port) or accessing/egressing the core network from a core transport node (Airport or Port) or from a rail and coach station located along the corridor, where services are operated towards at least a core urban node. Passengers include here all type of possible users, namely individual or group of passengers from all nationalities, and of all ages, including people with reduced mobility. The target market of the project includes clients of long distance passengers' services of all transport modes, users of the local public transport services, taxi passengers and users of other forms of collective/shared transport solutions (motorised and non-motorised) as well as users of private means of transport (motorised and non-motorised), and pedestrians.
Places (where)
The flagship project foresees the implementation of a wide range of possible hard and soft measures, which may include development of infrastructure as well as information and communication technologies, R&I (Research and Innovation) solutions, including those aimed at solving administrative and legal barriers, particularly related to the provision of integrated and multimodal information, travel planning and mobility solutions along corridors and across country borders. The flagship project can have both a virtual and physical dimension thanks to the implementation of information and communication technologies accessible from internet and mobile devices; however the places subject of the actions shall affect transfer operations at least at one core transport node or rail and coach station along the corridor, where services are operated towards at least a core urban node. Solutions shall more specifically affect interchange places, and particularly those involving public transit systems (Heavy Metro, Light Metro, Tramway, Trolley Buses and Buses), park and ride and bike and ride solutions.
Actions (what, when, who, to what purpose)
A wide spectrum of actions focusing on transfer operations at hubs along the corridor can contribute to the objectives of the flagship project. These actions can be grouped to the scope of this flagship project into three different areas, including: *Land use and infrastructure solutions*, *Intermodal operations and information provision*, *Governance and management solutions*. The nature of the actions, as identified and described below allows their implementation as independent solutions. Depending on the existing and planned conditions of the infrastructure and operations at the core transport and urban nodes along the corridor(s), more actions may be possible to be implemented, thus generating more effects or improving the capacity of the existing nodes and services to generate wellbeing for society.

Actions	Time schedule for implementation	Relevant promoters	Expected effects
Land use and infrastructure solutions Development or improvement of direct interconnections between core transport nodes and the rail and coach stations along the corridor, by means of high capacity rapid transit systems (i.e. fixed links, dedicated bus lanes, etc.). Construction, upgrading or restructuring and reorganisation of interchange stations and facilities.	Actions whose construction is expected to be completed in a period of 12-18 months.	Infrastructure managers of the concerned infrastructure, owners of the infrastructure and concessionary companies.	Travel time savings. Travel time reliability. Reduction of operating and maintenance costs of transport. Reduction of external costs of transport (safety, GHG, noise…). Improvement of accessibility to the core network. Improvement of the quality of public transport services. Improvement of the image of the transport nodes and urban environment.
Intermodal operations and information provision Information strategies and technologies to improve the performance of transfer operations at interchange stations and centres, between different modes and urban transport solutions (motorised and non-motorised, public and/or private). Integrated and multimodal travel solutions towards Mobility as a Service.	Actions ready to be implemented or put in operation in a period of 18 months. Actions ready to be implemented or put in operation in a period of 24 months.	Infrastructure managers of the concerned infrastructure, public transport operators, MaaS providers, owners of the infrastructure and concessionary companies, users' and passengers' federations and associations, institutions or civil associations of PRM.	Travel time savings. Travel time reliability. Improvement of accessibility to the core network. Improvement of the quality of public transport and mobility services for all type of users and modes. Improvement of the image of the transport nodes and urban environment. Promote territorial cohesion.
Governance and management solutions Establishment of temporary or permanent consultative, concertation or management bodies for the planning, monitoring and provision of integrated and multimodal services, including MaaS solutions along the corridor(s).	Actions ready to be started and completed in a period of 12-18 months.	Local authorities, infrastructure managers, service providers, city users, passengers' federations and associations, institutions or civil associations of PRM.	Improvement of accessibility to the core network. Reduction of operating costs and of external impacts of transport on the environment. Improvement of the quality of public transport and mobility services for all type of users and modes, also supporting market opening and integration.

Funding and financing (how)

Similarly to other infrastructure and services, the actions part of this flagship project can be financed by means of public or equivalent funds as well as private resources from the operators and/or users. It is in any case worth noting how the actions to be developed or implemented as part of this flagship project seem to present a high potential for innovative funding and financing, particularly if located at large core transport nodes and stations. Transfer operations within the same transport mode or between different transport modes at nodes can indeed generate relevant flows of passengers. This generally represents a business opportunity for retail and shop activities to be located within these centres. The rental revenues from these activities may be partially used/allocated to the development or improvement of interchange nodes. Interchange stations and centres usually involve parking infrastructure. These may be constructed and/or managed by private developers under concession agreements. The concession fees related to the operation of these parking facilities may be also used for the development or improvement of interchange nodes. The modernisation/ improvement of interchange stations and centres in large urban areas may finally create spaces for real estate developments. The revenues from these operations may be also used to enhance transfer infrastructure and services at transport and urban nodes along the corridors. Apart from these possible revenues associated with infrastructure developments at interchanges, examples exist of revenue generating activities, which are linked to the possibility to share information technologies and displayers with providers of publicity/marketing services. These companies may offer the use of their technologies and devices to combine provision of information on transport services with publicity of other products and services. Furthermore transit systems and interconnections to airports usually operate with higher tariffs than standard urban services, usually allowing for their development and operation as PPP, Design Build Operate Finance projects. These considerations should encourage the stakeholders in identifying innovative financial solutions for the implementation of the flagship project.

Source: BA Corridor study consortium

The BA Corridor project list includes several initiatives relating to the development of public transport systems infrastructure in urban nodes. These also comprise the development of interchange stations as well as rail and transit infrastructure, allowing for the transfer of local and long distance traffic along the corridor. Such projects include rail and transit developments in the core urban nodes in Gdańsk, Łódź, Poznań, Bratislava and Bologna. The list furthermore comprises projects for the development of transfer infrastructure at core airports including last mile rail links in Katowice, Bratislava, Venice, Bologna and Ljubljana. Interconnections to the airports already exist or have been recently completed in Warszawa, Wien, Szczecin, Gdańsk and Ostrava. In most core urban nodes heavy/light metro and tramway systems are furthermore available and in Venice waterway services and a People Mover interconnecting the city to the Port are also in operation. A very large project concerning ITS implementation in Bratislava is also worth mentioning, covering the entire motorway network in this core urban node, up until the borders with the neighbouring countries.

Focussing on the initiatives included on the list which are already under implementation or which may be mature enough to be completed and/or generate tangible effects in a period of 3-4 years' time, the following projects are noticed:

- The development of the suburban regional railway network in Gdańsk, Gdynia, Sopot (Tricity), also interconnecting to the Airport. The project list includes an action of this wide initiative to be further implemented in the future, whose cost equals 11.7 € million. This is fully funded under the scope of the OPIE 2014-2020 through ESI funds and almost completed.
- The ongoing and planned works in Łódź, some of which relating to the Fabryczna interchange node development project which is fully funded under the scope of the OPIE 2007-2013 through ESI funds, and almost completed, for a total cost of about 100 € million.
- The modernisation of the railway station in Poznań, also including adjustments of the infrastructure to PRM needs, totalling 11.3 € million investment cost, funded by means of national funds and almost completed.

- The Automated People Mover in Bologna, under implementation as a PPP project for a total cost of about 120 € million. Expected to be completed by 2018, the project will interconnect the Airport with the Central Railway Station.
- The Linking Danube initiative, which is aimed at providing cross-border traveller information on public transport, particularly focussing on cross-border commuting and mobility in rural areas within the Danube Macro-Region. The project is currently under implementation and it is expected to be completed by mid-2019. It is fully funded as an INTERREG initiative totalling a cost of 2.9 € million.
- The projects for the electrification and upgrading of the cross-border section between the twin core nodes of Bratislava and Vienna. Albeit the projects are not expected to be completed before 2022, totalling over 550 € million costs, the works are already ongoing on the Austrian side, and the connection may present high potential for the development off cross-border multimodal passengers services along the corridor in the Danube area.

The BA Corridor project list seems thus already including examples of possible relevant actions which may be adjusted and expanded in their scope to reach the targets of the flagship project and *Issue Paper* on urban nodes and/or maximise the benefits generated by these initiatives with reference to these targets. Also considering the intermodal and interdisciplinary scope of the flagship project, according to the objectives of the *Issue Paper* on urban nodes, the flagship project *Enhance passengers' transfer hubs in urban nodes along the corridor* is proposed as a modular corridor wide initiative aimed at facilitating the identification of new initiatives or the adaptation of projects at their inception stage to the targets of the *Issue Paper*.

The expectation through this initiative is that the existing and planned infrastructure, facilities, tools and information or commercial solutions for travellers across the core network will be designed, implemented and managed towards the development of a *single multimodal market* for EU passengers. By focussing on the continuity of travelling activities across nodes and networks, *Enhance passengers' transfer hubs in urban nodes along the corridor* aims at supporting the development of integrated intermodal infrastructure and services between modes, smoothing or eliminating interruptions and barriers of operational, informative and commercial nature at transport nodes.

3. Characteristics of the BA Corridor infrastructure and its compliance with Regulation (EU) 1315/2013

3.1. Legal definition of the BA Corridor

The Baltic-Adriatic core network corridor alignment and infrastructure are defined by Regulations (EU) 1315/2013 and 1316/2013. Crossing six Member States (Poland, Czech Republic, Slovakia, Austria, Italy and Slovenia), the corridor connects the Baltic ports of Gdynia/Gdańsk and Szczecin/Świnoujście with the following ports in the Adriatic basin: Sistema Portuale del Mare Adriatico Orientale – Porto di Trieste (hereinafter Port of Trieste), Sistema Portuale del Mare Adriatico Settentrionale – Porti di Venezia e Chioggia (hereinafter Port of Venezia), Sistema Portuale del Mare Adriatico Centro-Settentrionale – Porto di Ravenna (hereinafter – Port of Ravenna), Port of Koper.

Figure 5 Alignment of the BA Core Network Corridor

Source: BA Corridor study consortium

Alignment of the BA Corridor

Annex 1 to Regulation (EU) 1316/2013 provides the following definition of the alignment of the BA Core Network Corridor:

- Gdynia – Gdańsk – Katowice/Sławków;
- Gdańsk – Warszawa – Katowice;
- Katowice – Ostrava – Brno – Wien;
- Szczecin/Świnoujście – Poznań – Wrocław – Ostrava;
- Katowice – Žilina – Bratislava – Wien;
- Wien – Graz – Villach – Udine – Trieste;
- Udine – Venezia – Padova – Bologna – Ravenna;
- Graz – Maribor – Ljubljana – Koper/Trieste.

The backbone of the BA Corridor is the existing TEN-T core rail and road infrastructure linking the urban and transport nodes. Motorways of the Sea are the Northern and Southern extension of the corridor, widening its dimension to the Baltic and Mediterranean basins. Inland waterways are not an internal component of the BA Corridor, although interconnections with this mode are provided at the inland ports.

The nodes of the BA Corridor

From a structural standpoint, the BA Corridor is defined by the two components of a transport or logistic infrastructure network: nodes and links. In line with the definitions of Regulation (EU) 1315/2013, the corridor nodes can be grouped into the following categories:

- Urban nodes, including their ports and airports;
- Passenger and freight airports;
- Maritime ports and inland waterways ports;
- Rail-road terminals.

The urban nodes are main nodes for passenger and freight traffic and include the capital city of each EU Member State and cities with EU capital function; in addition, other urban areas have been classified as TEN-T urban nodes based on socio-economic criteria (such as the "Metropolitan European Growth Area" in the ESPON Atlas 2006, all the conurbation or city clusters which exceed 1 million inhabitants and all the main cities of an island or a of group of islands forming a NUTS 1 region with at least 1 million inhabitants).

Table 17 Urban Nodes along the BA Corridor

Member State	Urban Nodes in the BA Corridor
Poland (PL)	Gdańsk, Warszawa, Łódź, Katowice, Szczecin, Poznań, Wrocław
Czech Republic (CZ)	Ostrava
Slovakia (SK)	Bratislava
Austria (AT)	Wien
Italy (IT)	Bologna, Venezia
Slovenia (SI)	Ljubljana

Source: Annex II of the Regulation (EU) 1315/2013

In the framework of the new TEN-T approach, urban nodes play an important role within the multimodal core network, with regard to their infrastructure both for passengers and for freight. Urban nodes are particularly relevant in the following respect:

- They connect network links – both of the core and the comprehensive networks;
- They interconnect transport modes, thus enhancing multimodality;
- They connect long distance and/or international traffic with regional and local transport (passengers and freight).

The list of nodes of the BA Corridor includes also the hubs of the transport and logistic infrastructure: airports, maritime ports, inland waterway ports and rail-road terminals of the TEN-T Core network. The following table lists the nodes along the BA Corridor where at least one core transport or logistic node is located.

Table 18 Transport Nodes in the BA Corridor: airports, ports and rail-road terminals

MS	Node Name	Airport	Maritime Port	Inland Port	Rail-road Terminal
PL	Gdynia, Gdańsk	Core (Gdańsk)	Core (Gdynia) Core (Gdańsk)		Core
PL	Warszawa	Core			Core
PL	Łódź	Core			Core (Łódź / Stryków)
PL	Katowice	Core (Pyrzowice)			Core (Sławków) Compr. (Gliwice / Pyrzowice)
PL	Szczecin, Świnoujście	Core (Szczecin)	Core (Szczecin) Core (Świnoujście)	Core (Szczecin) Core (Świnoujście)	Core (Szczecin) Core (Świnoujście)
PL	Poznań	Core			Core
PL	Wrocław	Core			Core
CZ	Ostrava	Core			Core
CZ	Přerov				Core
SK	Bratislava	Core		Core	Core
SK	Žilina				Core
AT	Wien	Core (Schwechat)		Core	Core
AT	Graz	Compr.			Core (Werndorf)
IT	Trieste	Compr.	Core	Core	
IT	Cervignano				Core
IT	Venezia	Core	Core	Core	
IT	Padova				Core
IT	Bologna	Core			Core
IT	Ravenna		Core	Core	
SI	Ljubljana	Core			Core
SI	Koper		Core		

Source: Annex II of the Regulation (EU) 1315/2013

The links of the BA Corridor

The second component of the BA Corridor is represented by the multi-modal transport infrastructure links providing interconnections between the corridor nodes primarily serving long distance traffic. The transport links of the TEN-T core network cover the following infrastructure: inland waterways, railway and road. The land-based core network links are complemented by the Motorways of the Sea, to give due access to insular Member States and to shortcut connections to or between peninsulas.

The definition of the corridor alignment for rail and road infrastructure is based on Regulations (EU) 1315/2013 and (EU) 1316/2013 and the information encoded in the TENtec system. A description of the corridor rail and road links with reference to the sections encoded in the TENtec database at 2014 is reported in Annex A to this report, also commenting on potential issues relating to the definition of the BA Corridor alignment and its encoding based on the contractors' independent analysis and/or as reported by the Members of the Corridor Forum. "Last mile" accessibility to core urban and transport nodes is not encoded in the TENtec database at present; only the corridor route within urban nodes is codified in the TENtec database. Given the intermodal nature of the Core Network Corridors and the multimodal definition of the nodes, for the purposes of this study it may be assumed that the alignment within urban nodes may either be represented by the possible existing continuation of the links in urban areas or by other existing city or urban crossing or bypassing infrastructure. A similar approach could be considered for the last mile connection to the other nodes, including ports, rail-road terminals and airports, particularly if located in urban nodes. It is worth noting that the TENtec system is currently under revision as part of other studies. The results of these analysis were not available for consideration as an input to the 2015-2017 BA Corridor study.

Cross-border sections

The table below summarizes the rail and road cross-border sections included in the BA Corridor. Two criteria have been considered in the identification of the cross-border sections:

- One referring to the two relevant economic centres (using as start and end point the TENtec names: this was always possible except for the road PL-CZ road section for which we do not have Ostrava, only Belotin);
- One referring to the shortest TENtec section (this was always possible for railways, for roads we have four sections PL-CZ, CZ-AT, SK-AT and AT-SI for which we actually refer to the nearest junctions).

Table 19 Cross-border sections of the BA Corridor

Border		Railway	Road
PL	CZ	Opole (PL) – Ostrava (CZ); [Chałupki (PL) – Bohumín (CZ)]	Gliwice (Sosnica J. E040/E075) (PL) – Ostrava (CZ); [(Gorzyczki (PL) – Bohumín (CZ)]
PL	CZ	Katowice (PL) - Ostrava (CZ); [Zebrzydowice (PL) – Petrovice u Karviné (CZ)]	
CZ	AT	Břeclav (CZ) – Wien (Stadlau); (AT) [Břeclav (CZ) – Hohenau / Bernhardsthal (AT)]	Brno (CZ) – Wien (Schwechat) (AT); [Mikulov (CZ) – Mistelbach (AT)]
PL	SK	Katowice (PL) – Žilina (SK); [Zwardoń (PL) – Skalité (SK)]	Katowice (PL) – Žilina (Brodno) (SK); [Zwardoń (PL) – Skalité (SK)]
SK	AT	Bratislava (SK) – Wien (Inzersdorf) (AT); [Petržalka (SK) - Kittsee (AT)]	Bratislava (Petržalka) (SK) – Wien (Schwechat) (AT); [Jarovce (SK) - Kittsee (AT)]
SK	AT	Bratislava (SK) – Wien (Stadlau) (AT); [Devínska Nová Ves (SK) – Marchegg (AT)]	
AT	IT	Villach (AT) – Udine (IT); [Thörl-Maglern (AT) - Tarvisio B. (IT)]	Villach (AT) – Udine (IT); [Arnoldstein (AT) – Tarvisio (IT)]
AT	SI	Graz (AT) – Maribor (SI); [Spielfeld-Straß (AT) - Sentilj (SI)]	Graz West (AT) – Maribor Pesnica (SI); [Spielfeld-Straß (AT) - Sentilj (SI)]
IT	SI	Trieste (IT) - Divača (SI); [Villa Opicina (IT) – Sežana (SI)]	Trieste (IT) - Divača (SI); [Fernetti (IT) - Divača (SI)]

Source: BA Corridor study consortium

The combination of the two principles together allows for a flexible interpretation of the extension of the cross-border sections with reference to critical issues of infrastructural and operational nature i.e. implementing works per operational phases reflecting the existence of junctions (for instance the section Werndorf-Maribor within the longer section Graz-Maribor) or longer missing link i.e. road cross-border section Pohorelice-Schrick).

This definition also takes into account the list of pre-identified projects in Annex 1 to the CEF Regulation (EU) 1316/2013 and is also aimed at facilitating the identification of functional units of analysis for demand and CBA studies to be provided in support of future applications.

Connections with other corridors

The alignment of the BA Corridor intersects directly with five other core network corridors and with other core links that compose the TEN-T core network:

- The *North Sea – Baltic Corridor* interconnects and overlaps with the BA Corridor in Poland. The Warszawa, Poznań and Łódź urban nodes and their airport and rail-road terminals are common to both corridors. The following sections are common to the two corridors: railway section Warszawa – Mszczonów / Szeligi, and road section Warszawa – Stryków.
- The *Rhine – Danube Corridor* interconnects and overlaps with the BA Corridor in the Czech Republic between Ostrava / Přerov and Žilina as well as in Austria and in Slovakia between Wien and Bratislava. The Ostrava, Bratislava and Wien urban nodes, their airports and rail-road terminals are common to the two corridors as well as the Přerov and Žilina rail-road terminals and the Bratislava and Wien Inland Ports.
- The *Orient – East-Mediterranean Corridor* interconnects and overlaps with the BA Corridor in the Czech Republic: section Brno – Břeclav; and between the Czech Republic and Austria as well as between Slovakia and Austria: overlapping railway sections Břeclav – Wien and Wien – Bratislava. The Bratislava and Wien urban nodes and their airports, inland ports and rail-road terminals are common to the two corridors.
- The *Mediterranean Corridor* interconnects and overlaps with the BA Corridor for most of its extension in Italy (from Ravenna to Trieste), and in Slovenia (from Koper to Ljubljana - Pragersko); as well as between Italy and Slovenia: overlapping cross-border section Trieste- Divača. The Venezia, Bologna and Ljubljana urban nodes and airports, as well as the Trieste, Venezia, Ravenna and Koper ports, and the Bologna, Ljubljana, Padova and Cervignano rail-road terminals, are common to the two corridors.
- The *Scandinavian – Mediterranean Corridor* interconnects and overlaps with the BA Corridor in Italy, sections Bologna – Faenza and Bologna urban node, airport and rail-road terminal.
- *Other interconnections* with the TEN-T core network not belonging to any of the 9 core network corridors are present in Poland (Szczecin, interconnected to Berlin by Inland Waterway along the Odra river: section Widuchowa – Oder River estuary); Wrocław and Katowice, located on the alignment Dresden – Wrocław – Kraków – Katowice – UA Border; as well as Łódź, Warszawa on the alignment Germany – Poznan – Łódź/Warszawa – BY Border) and Italy (interconnecting Bologna with Milan and from here to the Rhine Alpine Corridor).

3.2. General objectives and KPIs for the development of the BA Corridor

3.2.1. General objectives from TEN-T Regulation (EU) 1315/2013

The BA Corridor is not just legally defined in terms of alignment. The new TEN-T policy and particularly the Regulation (EU) 1315/2013 also sets general objectives and technical requirements for the TEN-T network, furthermore identifying priority targets and standards for the core network as a subset of the comprehensive network.

Core Network Corridors have been set up as an instrument to implement the EU TEN-T policy, with the general strategic goal to implement the Europe 2020 strategy. Article 4 of Regulation (EU) 1315/2013 defines the general objectives of the TEN-T network aimed at strengthening the social, economic and territorial cohesion of the Union, contributing to the creation of a single European transport area which is efficient and sustainable, and increasing the benefits for its users while supporting inclusive growth.

Table 20 Objectives of the trans-European transport network

Category	TEN-T objectives
Cohesion	Accessibility. Accessibility and connectivity of all regions of the Union, including remote, outermost, insular, peripheral and mountainous regions, as well as sparsely populated areas Infrastructure quality. Reduction of infrastructure quality gaps between Member States Interconnection of flows. For both passenger and freight traffic, interconnection between transport infrastructure for, on the one hand, long-distance traffic and, on the other, regional and local traffic Balanced infrastructure. A transport infrastructure that reflects the specific situations in different parts of the Union and provides for a balanced coverage of all European regions
Efficiency	Continuity of long distance flows. Removal of bottlenecks and the bridging of missing links, both within the transport infrastructures and at connecting points between these, within Member States' territories and between them Interoperability. The interconnection and interoperability of national transport networks Intermodality. Optimal integration and interconnection of all transport modes Economic efficiency. The promotion of economically efficient, high-quality transport contributing to further economic growth and competitiveness; the efficient use of new and existing infrastructure Innovation. Cost-efficient application of innovative technological and operational concepts
Sustainability	Long term sustainability. Development of all transport modes in a manner consistent with ensuring transport that is sustainable and economically efficient in the long term Clean transport. Contribution to the objectives of low greenhouse gas emissions, low-carbon and clean transport, fuel security, reduction of external costs and environmental protection Low-carbon transport. Promotion of low-carbon transport with the aim of achieving by 2050 a significant reduction in CO 2 emissions, in line with the relevant Union CO 2 reduction targets
Increasing the users' benefits	**Meeting users' needs**. meeting the mobility and transport needs of the users within the Union and in relations with third countries Safety and security. Ensuring safe, secure and high-quality standards, for both passenger and freight transport Risk resilience. Supporting mobility even in the event of natural or man-made disasters, and ensuring accessibility to emergency and rescue services Establishment of requirements. The establishment of infrastructure requirements, in particular in the field of interoperability, safety and security, which will ensure quality, efficiency and sustainability of transport services Accessibility PRM. Accessibility for elderly people, persons of reduced mobility and disabled passengers

Source: Regulation (EU) 1315/2013 Art. 4

The TEN-T guidelines in Regulation (EU) 1315/2013 also set general and thematic (mostly by transport mode) priorities that should be achieved implementing measures and projects of common interest. Priorities have also been set in order to enable the trans-European transport network to be developed within the timescales set in the regulation (2030 for the core network and 2050 for the comprehensive network).

The general priorities are defined in Art. 10 of the Regulation (EU) 1315/2013 and include ensuring enhanced accessibility and optimal integration of the transport modes and interoperability within transport modes; bridging missing links and removing bottlenecks, particularly in cross-border sections; promoting the efficient and sustainable use of the infrastructure and, where necessary, increasing capacity; improving or maintaining the quality of infrastructure in terms of safety, security, efficiency, climate change and, where appropriate, disaster resilience, environmental performance, social conditions, accessibility for all users (including persons with reduced mobility) and the quality of services and continuity of traffic flows; implementing and deploying telematic applications and promoting innovative technological development.

3.2.2. Key Performance Indicators of the BA Corridor

In line with the technical requirements of the TEN-T regulation for the TEN-T network and with a primary focus on the standards set for the core network by 2030, a set of Key Performance Indicators (KPIs) has been defined, which is common to all the 9 core network corridors. It should be however noted that, following strictly the definition of the alignment of the core network corridors, some indicators do not apply to all nine corridors or to the entire networks. Considering in particular the BA Corridor, KPIs related to IWW do not apply as the corridor do not include any network for inland water navigation. Also, specific indicators for rail freight (such as maximum train length and axle load and minimum speed) do not apply on dedicated passenger lines.

On the basis of this common approach, for each KPI included in the framework the following set of information is provided by the 2015-2017 CNC studies:

- A detailed definition of each indicator, inclusive of the relevant mode of transport, the type (passenger/freight), the general objective and corridor objective referred to, the unit of measure, the reference to the relevant provisions of the TEN-T Regulation (EU) 1315/2013 and finally the reference to the relevant fields included in the TENtec database;
- The target value for each KPI, to be attained at the time horizon set by the Regulation (EU) 1315/2013 for the completion of the corridor at standard by 2030. In line with the requirements of this regulation, target values are set only for the supply-side KPIs: the demand indicators are intended to be only used to monitor the performance of the corridor;
- The baseline value for each KPI, where available and/or possible to be calculated (for the BA Corridor 2013 has been considered).

With reference to the first point above, the KPIs' framework defined by the 9 core network corridor contractors in consultation with the Corridor Fora, also including a glossary, was distributed to the Members of the BA Corridor Forum on the 18th of February 2016. A technical memorandum on the definition and calculation of the modal share KPIs for the BA Corridor, integrating the above mentioned note on the common adopted KPIs structure, was also circulated to the Members of the Corridor Forum on the 22nd of March 2016.

Concerning the second point, the target values for each KPI have been defined on the basis of the standards set in the Regulation (EU) 1315/2013 about the infrastructure characteristics, with particular reference to Art. 39 and although in a minor extent, to the provisions included in Chapter II. Finally, the KPIs' framework includes the identification of the current values of all the parameters, so to create a baseline for a clear measurement of the progresses achieved towards the objectives in the implementation of the work plan.

In addition to the common KPIs' structure and the BA Corridor specific modal share indicators, the following additional elements of analysis have been elaborated for the description of the characteristics of the corridor and to monitor its evolution: information on the network and socio-economic parameters. The information about the corridor infrastructure includes specific indicators concerning the number and the extent of the missing links - that for the BA Corridor is of outermost relevance given that one of the work plan priorities is to finalise the project aimed at bridging the railway missing links trough the Alps: namely the Semmering tunnel and the Koralm railway line and tunnel. The information about the network in the corridor regions is deemed to provide a background to understand the relevance to the corridor and its interconnection with the rest of the TEN-T core and comprehensive infrastructure. Finally, socio-economic data (GDP, employment, and population figures) are monitored in time in order to complement the demand-side KPIs, providing additional elements for the assessment of the corridor performance over time.

Table 21 General and Specific Corridor Objectives and KPIs

COHESION	A high quality infrastructure corridor with interconnected long distance and regional/urban flows
General Objectives	• Accessibility of all regions of the Union • Reduction of infrastructure quality gaps between Member States • Interconnection of long-distance, regional and local traffic flows • Balanced transport infrastructure coverage of all European regions
Supply-Side KPIs	• Rail network: Electrification, Track gauge 1435mm, ERTMS implementation, Line speed (>=100km/h), Axle load (>=22.5t), Train length (740m); • Road network: Express road/motorway; • Airports: Connection to rail; • Seaports: Connection to rail, Waterway gauge IV connection; • Inland ports: Connection to rail, Waterway gauge IV connection; • Rail-Road Terminals (RRT): Capability for Intermodal (unitised) transhipment, 740 train terminal accessibility. •
EFFICIENCY	A continuous, interoperable and intermodal corridor
General Objectives	• Continuity of long distance flows • Interconnection and interoperability of transport networks • Intermodality • Economic efficiency contributing to further economic growth and competitiveness • Innovation

Supply-Side KPIs	• Rail network: ERTMS implementation; • Airports: Connection to rail, Availability of at least one terminal open to all operators in a non-discriminatory way and application of transparent, relevant and fair charges; • Seaports: Connection to rail, Waterway gauge IV connection, Availability of at least one terminal open to all operators in a non-discriminatory way and application of transparent, relevant and fair charges; • Inland ports: Connection to rail, Waterway gauge IV connection, Availability of at least one terminal open to all operators in a non-discriminatory way and application of transparent, relevant and fair charges; • Rail-Road Terminals (RRT): Capability for Intermodal (unitised) transhipment, 740 train terminal accessibility, Availability of at least one terminal open to all operators in a non-discriminatory way and application of transparent, relevant and fair charges.
Demand-Side KPIs	• Airports: Total passenger flows; • Seaports/Inland Waterway ports: Total passenger flows, Total freight flows
SUSTAINABILITY	A corridor targeted at reducing externalities, preserving sensitive areas and reducing emissions
General Objectives	• Long term sustainability • Clean transport • Low-carbon transport
Supply-Side KPIs	• Road network: Availability of alternative clean fuels; • Airports: Availability of alternative clean fuels; • Seaports: Availability of alternative clean fuels, Facilities for ship generated waste; • Inland ports: Availability of alternative clean fuels, Facilities for ship generated waste.
USERS' BENEFITS	**A safe corridor, accessible to all users', meeting the needs of** the demand
General Objectives	• Meeting users' needs • Safety and security • Risk resilience • Establishment of requirements • Accessibility PRM

Source: BA Corridor study consortium

Table 21 above presents the 4 general corridor objectives and their corresponding KPIs as identified for the nine core network corridors. Objectives related to Users' Benefits are not measured through correspondent KPIs. These may be rather included in project specific or corridor / network related demand and CBA studies.

Further to the KPIs and the additional network and socio-economic indicators, it is also foreseen that in the Corridor Studies and in the Corridor Fora Meetings the performance of the corridor can also be monitored by other specific sources. Harmonised KPIs have already been defined by the Rail Freight Corridors, addressing (RFC) corridor traffic and corridor capacity. A general rule has been adopted which foresees the possibility and opportunity to present in the CNCs study reports indicators from the RFCs in addition to the CNC KPIs.

3.2.3. Baseline values and targets for the BA Corridor KPIs

The BA Corridor spans for about 1,800 km from the core Polish ports on the Baltic, to the North Adriatic ones. It encompasses a total of 4,285 km of railway lines, 3,600 km of roads, 8 core maritime ports (of which 5 also classified as IWW) and 2 inland waterway ports, 13 airports and 24 rail-road terminals. The rail and road network is entirely complete, except for two sections in Austria (Koralmbahn line section Wettmannstätten – Grafenstein within the wider section Graz – Klagenfurt and Semmering Base Tunnel Gloggnitz – Mürzzuschlag). The two sections total together 133.6 km.

Table 22 BA Corridor background indicators

Indicator	Scope	Unit	Source	Baseline value (2013-2017)
Rail network	CNC	Number of km of tracks within CNC Rail network.	TENtec	4,285 km
Road network	CNC	Number of km within CNC road network	TENtec	3,611 km
Inland waterway network	CNC	Number of km of waterways within CNC network.	TENtec	0 km
Seaports	Seaports in CNC (Core/Comprehensive)	Number	TENtec	8 Core (5 classified also as IWW)
Inland waterways ports	Inland ports in CNC (Core/Comprehensive)	Number	TENtec	2 Core
Airports	Airports in CNC (Core/Comprehensive)	Number	TENtec	13 Core
RRTs	RRTs under analysis	Number	TENtec / CNC Studies	24
Number of missing links	Number of missing links defined within CNC (by mode)	Number	CNC Studies	2 (Rail)
Kms of Missing Infrastructure	Kms of missing infrastructure defined within CNC (by mode)	Kms	CNC Studies	134 km (Rail)

Source: BA Corridor study consortium

In addition to the 10 core ports, other 6 comprehensive ports are identified in the Regulation (EU) 1315/2013, of which 4 Italian ports classified as both maritime and inland waterway – Chioggia, Monfalcone, Porto Levante and Porto Nogaro – and 2 inland waterways Police in Poland and Rovigo in Italy.

Table 23 Transport Nodes of the Comprehensive Network along the BA Corridor

MS	Node Name	Airport	Maritime Port	Inland Port	Rail-road Terminal
PL	Bydgoszcz	Compr.			Compr.
PL	Police			Compr.	
CZ	Brno	Compr.			Compr.
SK	Leopoldov-Šulekovo				Compr.*
AT	Klagenfurt – Villach	Compr. (Klagenfurt)			Compr. (Villach-Fürnitz)
IT	Chioggia		Compr.	Compr.	
IT	Forlì	Compr.			
IT	Monfalcone		Compr.	Compr.	
IT	Porto Levante		Compr.	Compr.	
IT	Porto Nogaro		Compr.	Compr.	
IT	Rovigo			Compr.	Compr.
IT	Treviso	Compr.			
SI	Maribor	Compr.			Compr.
SI	Portorož	Compr.			

*Source: Annex II of the Regulation (EU) 1315/2013, Note: * not developed*

In addition to the 13 airports at the core urban nodes, other 2 comprehensive airports are also worth mentioning at Graz and Trieste. These nodes are included on the list of core nodes of the BA Corridor (See table 14 above), the first as a rail-road terminal and the latter as core port. Furthermore, other 7 airports are located at additional comprehensive transport and logistics nodes along the BA Corridor as reported in the following table. Finally, the second Warszawa airport (Modlin) should be also considered which has developing relatively quickly in recent years.

Regarding rail-road terminals other terminals than the 24 identified with reference to the nodes indicated in Annex II to Regulation (EU) 1315/2013 have been identified as relevant for the development of multimodal and combined transport either on the corridor or on the core network. Three rail-road terminals are under development at present in Warszawa (Brwinów), Poznań (Kórnik) and Přerov; other rail-road terminals are in operation, the recently opened Loconi terminals in Warszawa and Łódż (Łódż-Chojny) two terminals in Radomsko and one in Kutno in the Łódzkie Voivodship, where a new logistic, reloading base and industrial park is also foreseen to be developed to operate the connection Łódź – Chengdu. Additional terminals are present in the Mazowieckie Voivodship (Mława) as well as in the Katowice area (Sosnowiec Południowy, Dąbrowa Górnicza); and in the comprehensive nodes of Gliwice (Gliwice, Śląskie Centrum Logistyki), Bydgoszcz, Brno, Villach-Sud, Rovigo, Maribor. The dry port at Tczew in Poland, in the hinterland of Gdańsk and Gdynia seaports, designed as a fully functional load distributing centre aimed at the integration of the streams of container serviced by both ports, planned for construction by 2021, the Interporto Fernetti near the port of Trieste functioning as hinterland terminal for Ro-La traffic and the Interporto Pordenone on the comprehensive railway line between Udine, Treviso and Venezia, part of the Baltic-Adriatic Rail Freight Corridor, are also worth mentioning.

Further to the above mentioned rail-road terminals, the terminals located at the core ports and operating both maritime to rail and maritime to road transhipment services are also worth mentioning, which are relevant for the development of multimodal and combined transport along the BA Corridor. Based on the analysis by the RFC5 there are at least about 20 additional terminals at the core ports of the BA Corridor. To the scope of the BA Corridor study these are considered as part of the maritime infrastructure.

Table 24 Terminals at core ports for the development of multimodal and combined transport

Ports	Other terminals at ports (identified in Books 3 and 5 of RFC5*)
Gdańsk (PL)	3
Gdynia (PL)	3
Świnoujście (PL)	3
Szczecin (PL)	1
Bratislava (SK)	1
Wien (AT)	1
Trieste (IT)	1
Venezia (IT)	1 (4)
Ravenna (IT)	1
Koper (SI)	1

Source: Books 3 and 5 of RFC5

Although the corridor does not include any inland waterway section, it interconnects with the Rhine Danube/Orient East Mediterranean core inland waterways in Bratislava and Wien, and in Szczecin with the core network section on the Odra River, between Berlin and Szczecin: section Widuchowa – Odra River estuary (not belonging to any of the Core Network Corridors) where services are already in operation. Services are also in operation at Venezia on the inland waterway Padano-Veneta along the Mediterranean Corridor in Italy, which already fulfils the CEMT Va requirements. Trieste and Ravenna are also classified as inland ports, where no services are currently operated, although pilot projects have already been undertaken and could be considered to promote the use of inland waterway transport in Italy. In addition to the above mentioned Odra River route, the inland waterway section E40 from the Baltic up to Warszawa is worth reporting; this requires development and do not belong at present to the core network, however some initiatives aimed at revitalising the Vistula River and restoring the E40 waterway Warszawa – Gdańsk were recently undertaken.

The appropriateness of the inclusion of IWW sections in the alignment of the BA Corridor was commented at the meetings of the BA Corridor Forum. Questions were also made about the possibility to extend the rail and road links of the BA Corridor (e.g. the inclusion of the S3 express road in Poland in its entire extension till the border with the Czech Republic, the inclusion of the freight routes of the RFC5 in the Friuli Venezia-Giulia region in Italy, the prolongation of the corridor in the Adriatic basin to the ports of Bari and Rjeka. Whilst the alignment of the BA Corridor is not modifiable at presents, amendments may be considered in the future as part of the formal process that will be undertaken for the revision of CNC alignment currently expected not before than 2023.

The BA Corridor is already continuous and in operation, except from the above mentioned missing links at the Alpine crossings in Austria, totalling about 134 km of railway infrastructure.

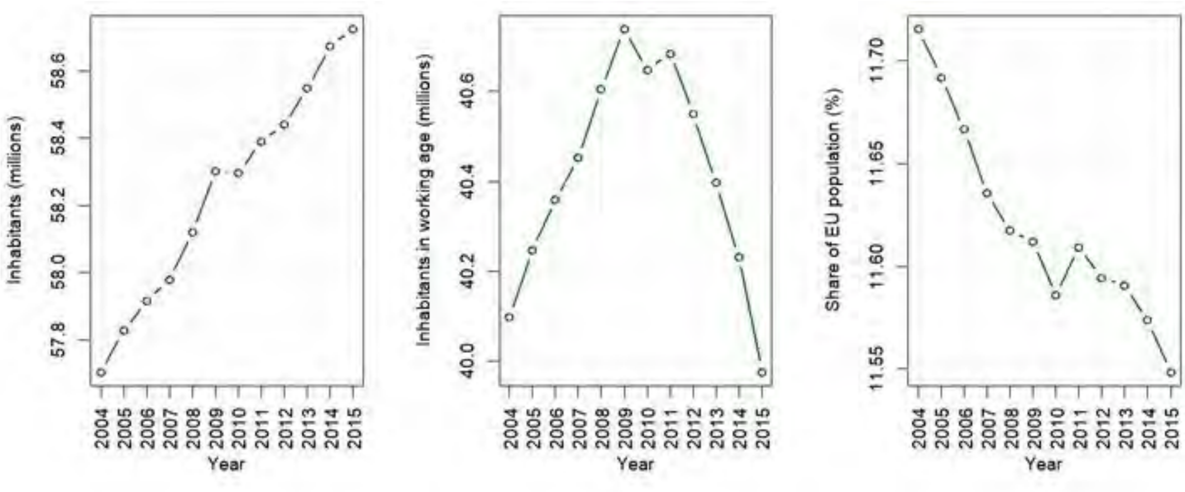
For the purpose of elaborating and presenting the indicators of the socioeconomic dimension of the BA Corridor, all the 29 NUTS2 regions have been considered, that are for at least 30% of their territory within a distance of 50 km from the road or rail corridor alignment (see figure below). This approach allows to include in the analysis not only the regions directly crossed, but also those regions that are not on the corridor geographically, but that will nevertheless benefit from its development.

Figure 6 Regions considered for the socioeconomic indicators of the BA Corridor

Source: BA Corridor study consortium

The population living along the corridor in 2015 was slightly below 60 million inhabitants. Since 2004, the population has grown by approximately 1 million, decreasing from 11.7% to 11.5% of the total EU28 population.

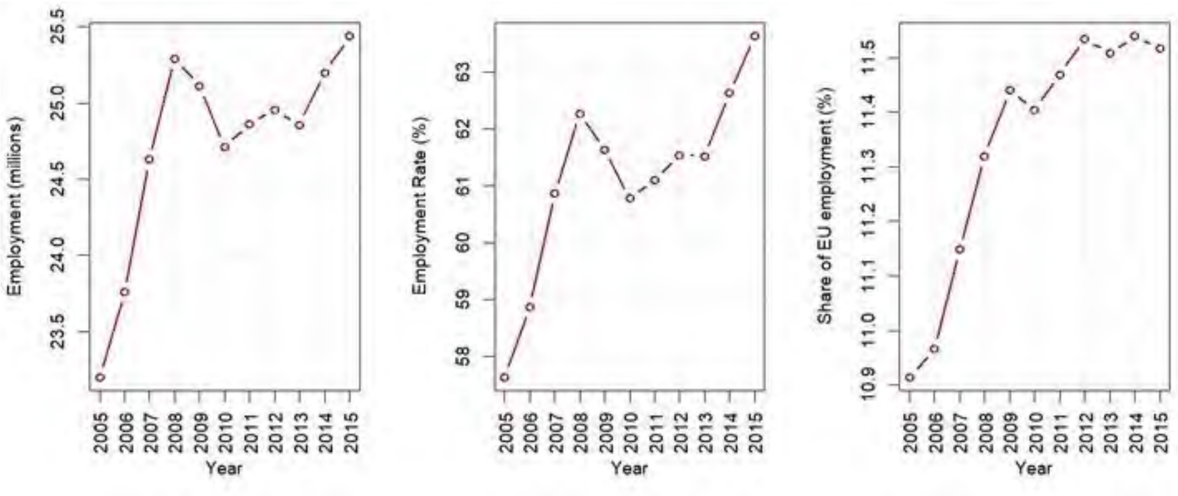
Figure 7 Population trends



Source: BA Corridor study consortium based on EUROSTAT

However, since 2009, a decline in the population in working age can be observed, in line with the ageing trend prevailing overall in Europe.

Figure 8 Employment trends



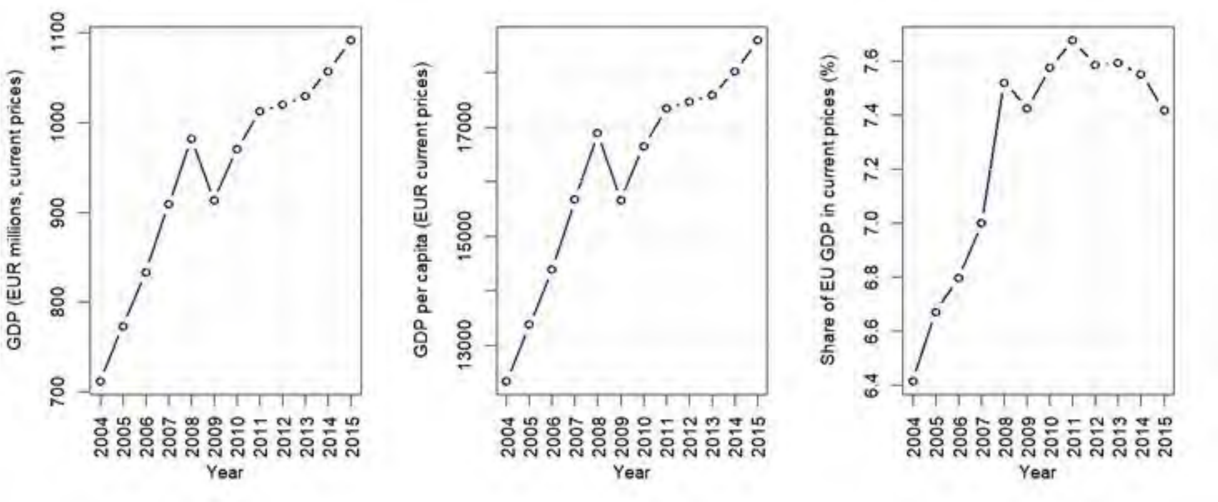
Source: BA Corridor study consortium based on EUROSTAT

In 2015 the corridor provides access to nearly 25.5 million jobs, over the maximum employment data registered in the pre-recession period. The employment rate has already exceeded the 2008 value, also due to the decreasing trend in population in working age

The corridor share has now reached 11.8% of EU28 employment, with a steady increase since 2011, meaning that job creation has significantly outpaced the average EU28.

In 2015 the total GDP of the corridor area was nearly 1.1 € billion, with a 50% growth in the last decade (in current prices). Growth has been driven by a combination of the demographic growth and the catch up of the former Easter European Member States: the average GDP per capita along the corridor is close to 19,000 €. The corridor regions account for 7.4% of the GDP of the whole EU28.

Figure 9 GDP trends



Source: BA Corridor study consortium based on EUROSTAT

Table 25 includes the demand side KPIs that have been calculated for the BA Corridor for the period 2013-2016, on the basis of the available data from Eurostat. In line with the economic growth in the regions and Member States along the BA Corridor, traffic flows have been gradually increasing since the inception of the New TEN-T policy. In line with the economic growth in the regions and Member States along the BA Corridor, traffic flows have been gradually increasing since the inception of the New TEN-T policy both along the corridor links and at its nodes, especially for freight transport. The negative trend registered at the Semmering pass for rail transport compared to the growth in road transport, seems confirming the low attractiveness of the current line and the need to complete the tunnel to improve transport by railway at this Alpine crossing.

Additional data and remarks on the modal share KPIs, particularly regarding future demand, also considering the impact of the development of the BA Corridor by 2030 and the potential market uptake of environmental friendly transport modes (i.e. railway) are described at Chapter 4 below.

Table 25 Demand-Side KPIs for the BA Corridor (2013-2016)

	2013	2014	2015	2016	Variation % '13-'16
Total international freight flows between the BA Corridor Member States	*97.5*	*97.7*	*100.1*	*111.3*	*14.2%*
Total international freight flows by rail between the BA Corridor Member States (million tons)	34.2	34.5	32.5	39.2	14.6%
Total international freight flows by road between the BA Corridor Member States (million tons)	63.2	63.2	67.5	72.2	14.2%
Rail modal share	35.1%	35.3%	32.5%	35.2%	0.2%
Total freight traffic flow at Semmering	*16.9*	*16.3*	*15.7*	*16.0*	*-5.3%*
Total freight traffic flow at Semmering by rail (million tons)	11.9	11.1	10.6	10.6	-10.9%
Total freight traffic flow at Semmering by road (million tons)	5.0	5.2	5.1	5.4	8.0%
Rail modal share of traffic flow at Semmering	70.4%	68.1%	67.5%	66.3%	-4.2%
Total freight traffic flow at Tarvisio	*22.2*	*25.7*	*n.a.*	*n.a.*	*n.a.*
Total freight traffic flow at Tarvisio by rail (million tons)	7.0	9.1	n.a.	n.a.	n.a.
Total freight traffic flow at Tarvisio by road (million tons)	15.2	16.6	n.a.	n.a.	n.a.
Rail modal share of traffic flow at Tarvisio	31.5%	35.4%	n.a.	n.a.	n.a.
Passengers flows at seaports (million)	*3.52*	*3.57*	*3.53*	*3.49*	*-0.9%*
Freight flows at seaports (million tons)	*171.1*	*176.0*	*186.6*	*194.0*	*13.4%*
Passengers flows at airports (million)	*59.3*	*60.9*	*64.0*	*68.8*	*16.0%*
Freight flows at airports (thousand tons)	*373.0*	*398.3*	*310.3*	*450.8*	*20.9%*

Source: BA Corridor study consortium based on EUROSTAT

The supply side KPIs values for the BA Corridor are presented in Table 26 for all transport modes, which include the baseline year at 2013, the updated indicator at 2015, 2016 and 2017 as well as the target for 2030.

Improvements have been made since 2013, in particular with regard to rail transport. ERTMS technology has been installed on several sections of the corridor in Poland, Czech Republic, Slovakia, Austria and particularly Slovenia. Works for the modernisation of the network in Poland, Czech Republic, Slovakia and Slovenia contributed to the increase of the parameters for freight transport, namely speed (PL, CZ, SI), axle load (PL, SI) and train length (PL, SK, SI). Increase of the corridor KPIs for road transport are also noticeable due to completion of works in Poland and in Slovakia.

Table 26 Supply-Side KPIs for the BA Corridor (2013 to 2017)

Mode	Objectives	Passenger / Freight	KPI	Unit	2013	2015	2016	2017#	2017 vs 2013	2030
Rail network	Cohesion	P/F	Electrification	%	99%	99%	99%	99%	(=)	100%
	Cohesion	P/F	Track gauge 1435mm	%	100%	100%	100%	100%	(=)	100%
	Cohesion/ Efficiency	P/F	ERTMS implementation	%	0%	7%	10%	17%	(+)	100%
	Cohesion	F	Line speed (>=100km/h)	%	69%	71%	72%	72%	(+)	100%
	Cohesion	F	Axle load (>=22.5t)	%	89%	92%	92%	93%	(+)	100%
	Cohesion	F	Train length (740m)	%	16%	29%	29%	29%	(+)	100%
Road network	Cohesion	P/F	Express road/ motorway	%	81%	82%	82%	84%	(+)	100%
	Sustainability	P/F	Availability of alternative clean fuels	No.	*n.a.*	*n.a.*	*n.a.*	*n.a.*		n.a.
Airports	Cohesion/ Efficiency	P/F	Connection to rail by 2050 (Warszawa, Wien)	%	100%	100%	100%	100%	(=)	100%
	Efficiency	P/F	Open accessibility to at least one terminal *	%	*n.a.*	100%	100%	100%		100%
		P/F	Availability of alternative clean fuels	%	*n.a.*	0%	0%	0%		100%
Seaports	Cohesion/ Efficiency	F	Connection to rail	%	100%	100%	100%	100%	(=)	100%
	Cohesion/ Efficiency	F	Connection to IWW CEMT IV (5 Seaports connected to IWW)	%	*n.a.*	100%	100%	100%		100%
	Sustainability	F	Availability of alternative clean fuels	%	0%	0%	0%	0%	(=)	100%
	Efficiency	F	Open accessibility to at least one terminal *	%	*n.a.*	100%	100%	100%		100%
	Sustainability	P/F	Facilities for ship generated waste	%	*n.a.*	63%	63%	63%		100%

Mode	Objectives	Passenger / Freight	KPI	Unit	2013	2015	2016	2017#	2017 vs 2013	2030
Inland ports	Cohesion/ Efficiency	F	Class IV waterway connection	%	100%	100%	100%	100%	(=)	100%
	Cohesion/ Efficiency	F	Connection to rail	%	100%	100%	100%	100%	(=)	100%
	Sustainability	F	Availability of alternative clean fuels	%	*n.a.*	0%	0%	0%		100%
	Efficiency	F	Open accessibility to at least one terminal *	%	*n.a.*	100%	100%	100%		100%
Rail-Road Terminals (RRT)	Cohesion/ Efficiency	F	Capability for Intermodal (unitised) transhipment	%	*n.a.*	100%	100%	100%		100%
	Cohesion/ Efficiency	F	740m train terminal accessibility	%	*n.a.*	38%	38%	38%		100%
	Cohesion	F	Electrified train terminal accessibility	%	*n.a.*	75%	75%	75%		100%
	Efficiency	F	Open accessibility to at least one terminal *	%	*n.a.*	42%	42%	42%		100%

*Source: BA Corridor study consortium; Notes: the elaboration of the KPIs of the rail and road networks is based on the sections encoded in the TENtec database as of 2014, corresponding to a total length of the corridor links of the rail network of 4,287 km, of which 3,740 km classified as freight or mixed passengers and freight railway lines; and 3,611 km of roads. # Status at November 2017. * Availability of one terminal open to all operators and application of transparent charges*

Finally, the following table provides the set of KPIs so far identified and calculated by the Baltic-Adriatic RFC5.

Table 27 Baltic-Adriatic RFC5 KPIs

Nr	KPI name	Methodology	Time of evaluation	Source of data	Target	Value for TT2017	Value for TT2018
Ca1	Volume of offered capacity (PaP)	Km*days offered (PaPs without F/O)	at X-11 (PaPs)	PCS	Compliance with FCA	7,589,572.00	8,926,364.00
Ca2	Volume of requested capacity	Km*days requested (PaPs without F/O)	at X-8	PCS	Compliance with FCA	861,273	1,306,077
Ca3	Volume of requests	Number of PCS dossiers	at X-8	PCS	Compliance with FCA	15	16
Ca4	Volume of pre-booked capacity	Km*days pre-booked (PaPs without F/O)	at X-7.5	PCS	Compliance with FCA	766,124	1,276,405
Ca5	Number of conflicts	Number of PCS dossiers that conflict with another dossier	at X-8	PCS	Compliance with FCA	-	-
Ca6	Number of conflicts/Volume of requests	Number of conflicts/Volume of requests		PCS	To assess whether the same PaPs were requested by many customers and workload of COSS to	-	-
Ca7	Volume of PaP requests/total requests per IM	Volume of PaP requests on RFC5 / total requests for international freight trains crossing RFC5 borders (data are per IM)		PCS	To evaluate development of corridor offer attractiveness	See Annual Report for detailed values	-
Ca8	Corridor share of capacity at borders	To evaluate share of capacity offered via COSS		PCS and IM	Volume of offered PaPs at border point / total planned international trains at border points (data are per IM for the same TT year)	See Annual Report for detailed values	
Mk1	Volume of transported freight (ton)	Cumulated gross ton of freight trains crossing borders of RFC5 (data per border and per year)			To assess if the rail freight market is growing along the corridor	Not yet published	

Nr	KPI name	Methodology	Time of evaluation	Source of data	Target	Value for TT2017	Value for TT2018
Op1	Punctuality at specific points (origin and borders)	As KPI2 in RNE Manual “cooperation in TPM”.		RNE OBI	Monitoring punctuality to identify where are born the delays	50% at origin (See Annual Report for detailed values)	
Op2	Punctuality at destination	As KPI1 in RNE Manual “cooperation in TPM”.		RNE OBI	Monitoring punctuality to assess if we are under the target	40%	
Op3	Data quality (% of undocumented delays)	Nr of RAs/number of CTTs at a station.		RNE OBI	To assess completeness of data of punctuality	See Annual Report for detailed values	
Op4	Total amount of minutes per delay reason	Minutes of delays sort by delay reason.		RNE OBI	To identify the main delays causes	See Annual Report for detailed values	
Op5	Number of train runs	Number of train runs with RA on selected borders.		RNE OBI	To assess if the rail freight market is growing along the corridor	Not yet published	

Source: Baltic-Adriatic RFC5; Notes: Annual Reports available at: http://rfc5.eu/documents/annual-report-2016/

The following sections and chapters of this report provide more details on the current status of the BA Corridor, the critical issues and action plan towards the achievement of the objectives and targets set by the Regulation (EU) 1315/2013. Whilst the main body of the text focusses on the description of the BA Corridor, providing aggregated information and results, details by corridor section and node are available in the action summary sheets included in Annex B to this report.

3.3. Compliance of the BA Corridor infrastructure with Regulation (EU) 1315/2013

Building on the results of the 2014 BA Corridor study this section updates the analysis of the characteristics of the BA Corridor railway infrastructure and its compliance with the requirements of the TEN-T Regulation (EU) 1315/2013.

3.3.1. Rail infrastructure

The following paragraphs provide an analysis of the compliance of the BA Corridor railway infrastructure with the TEN-T Regulation (EU) 1315/2013, focussing on the requirements set out in Art. 39.

Table 28 TEN-T Requirements set by REG EU 1315/2013 for railways

Requirement	Comprehensive Network	Core Network
Electrification: *Core network to be electrified by 2030 (including sidings where necessary)*	Art. 12 (2). Member States shall ensure that the railway infrastructure: [...]; (d) save in the case of isolated networks, is fully electrified as regards line tracks and, to the extent necessary for electric train operations, as regards sidings.	Art. 39 (2a). Full electrification of the line tracks and, as far as necessary for electric train operations, sidings.
Track gauge: *New lines to be built in UIC standard gauge (1435mm), except in certain circumstances*	Art. 13. In the promotion of projects of common interest related to railway infrastructure, and in addition to the general priorities set out in Article 10, priority shall be given to the following: [...]; (b) migrating to 1 435 mm nominal track gauge;	Art. 39 (2a). Nominal track gauge for new railway lines: 1 435 mm except in cases where the new line is an extension on a network the track gauge of which is different and detached from the main rail lines in the Union.
Line speed: *Core freight lines 100 km/h by 2030 (no speed requirement are set for passenger lines)*		Art. 39 (2a). Freight lines of the core network as indicated in Annex I: at least [...] 100 km/h line speed [...]
Axle load: *Core freight lines 22.5 t axle load by 2030*		Art. 39 (2a). Freight lines of the core network as indicated in Annex I: at least 22.5 t axle load [...]
Train length: *Core freight lines to allow for 740m trains by 2030*		Art. 39 (2a). Freight lines of the core network as indicated in Annex I: [...] possibility of running trains with a length of 740 m
ERTMS / signalling system: *Core network to be equipped with ERTMS by 2030*	Art. 12 (2a). Member States shall ensure that the railway infrastructure, save in the case of isolated networks, is equipped with ERTMS.	Art. 39 (2). Full deployment of ERTMS.

Source: Regulation (EU) 1315/2013

The BA Corridor includes 4,285 km of 1435 mm standard gauge railway infrastructure. With the only exception of the two sections in Austria (Koralmbahn line section Wettmannstätten – Grafenstein within the wider section Graz – Klagenfurt and Semmering Base Tunnel Gloggnitz – Mürzzuschlag), the corridor railway infrastructure is already continuous and in operation.

As regards *electrification* (Figure 10), with reference to passenger, freight and mixed use lines, the railway infrastructure along the corridor is also almost entirely electrified with the exception of diesel passenger sections at the cross-border railway line between Bratislava and Wien. In this regard it is however noticed that three different power systems are in use: AC 15 kV 16.7 Hz (Austria), AC 25 kV 50 Hz (Czech Republic and Slovakia) and DC 3 kV (Poland, Czech Republic, Slovakia, Italy, Slovenia). Those differences in traction (electrification and power systems) constitute an obstacle for interoperability on the corridor which can only be particularly mitigated by the use of multi-traction locomotives.

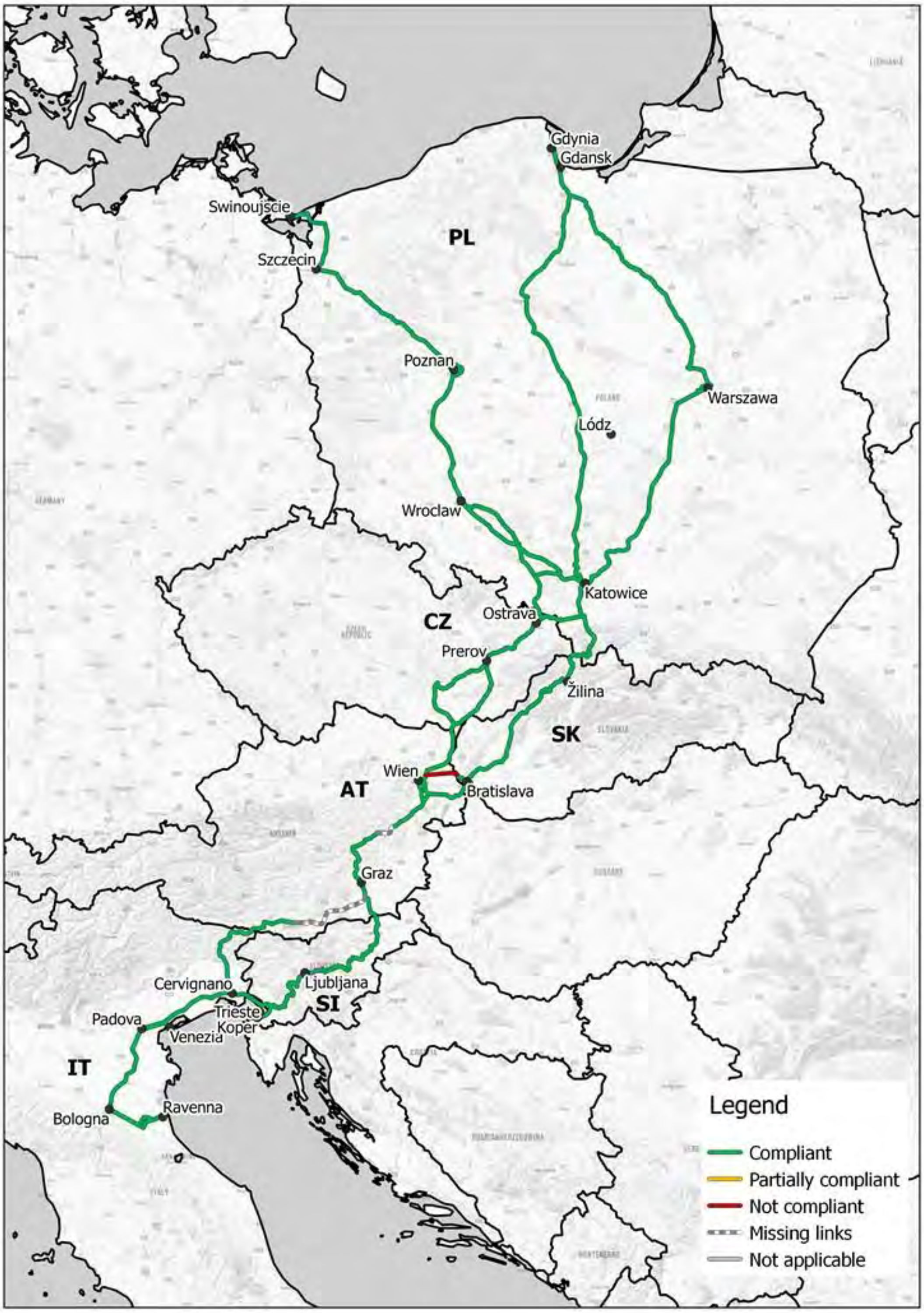
With respect to the *axle load* (Figure 11), the corridor is mostly compliant with the Regulation (22.5 t). There are however some corridor sections (7% of the total corridor railway infrastructure) that are not at standard yet, in Poland (some sections on the lines Katowice – Czechowice-Dziedzice – Zwardoń, Wrocław – Jelcz – Opole) and Slovenia (some sections between Zidani Most – Šentilj, where studies and works are currently ongoing).

In terms of maximum permitted *length of trains* (Figure 12), this is on most sections of the corridor shorter than the 740 meters required by the Regulation. The prevailing maximum train length along the corridor is around 600 m, but more severe restrictions exist on specific sections.

Regarding *Line speed* (Figure 13), 28% of the BA Corridor is also not at standard with relevant bottlenecks particularly affecting the Polish and Slovenian networks which call for infrastructure modernisation. In greater detail, over 840 km of the Polish railway lines (about 20% of the total corridor railway infrastructure) and 270 km of Slovenian railway lines would need to be upgraded to meet the requirement set in the Regulation with respect to the line speed for freight trains (100 km/h).

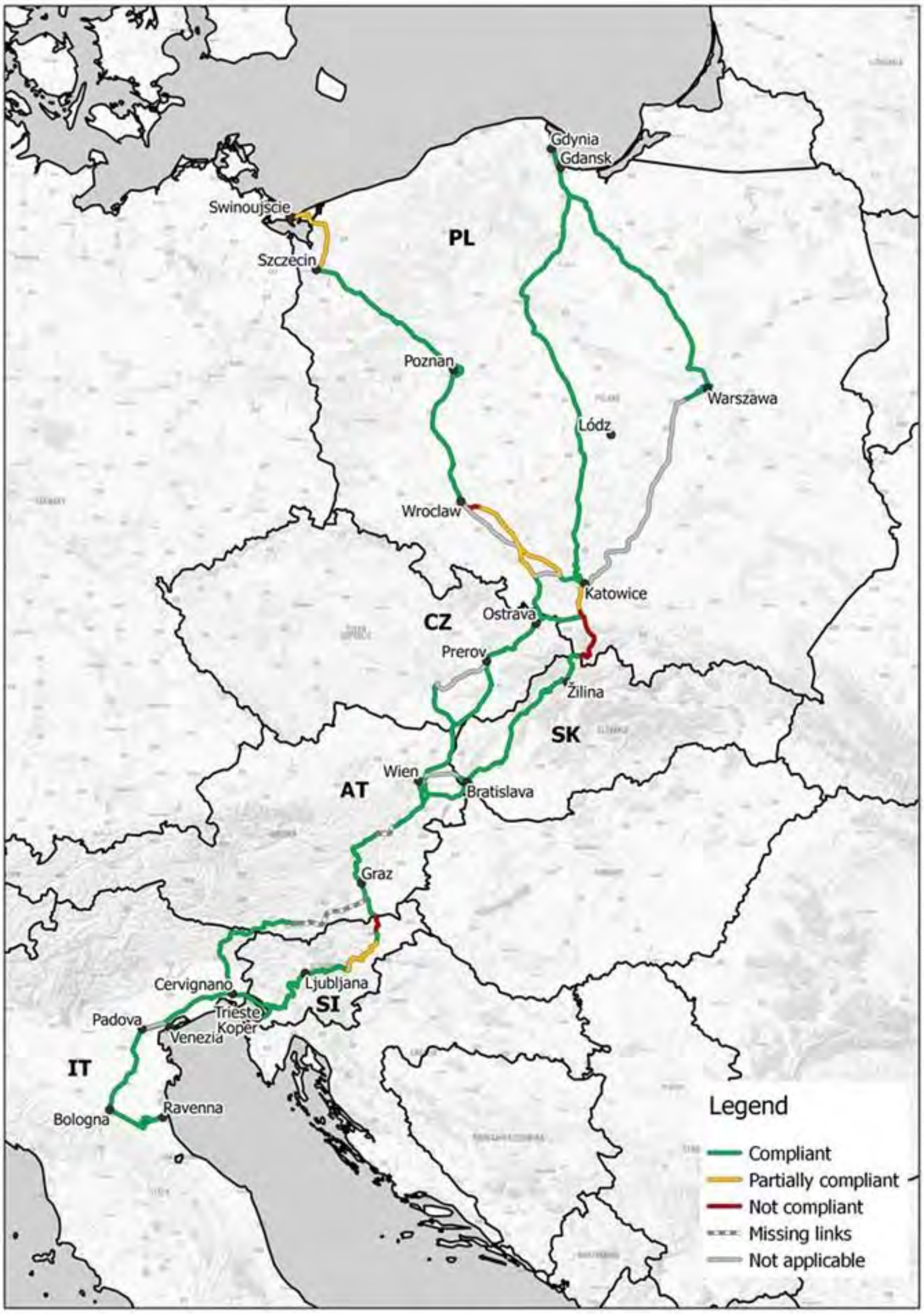
Issues with the technical required standards of the main sections of the railway infrastructure are therefore currently quite widespread along the corridor, and are specifically present at the cross-border sections between Poland and Czech Republic, Poland and Slovakia, Slovakia and Austria, Austria and Slovenia, Italy and Slovenia.

Figure 10 Rail traction compliance map



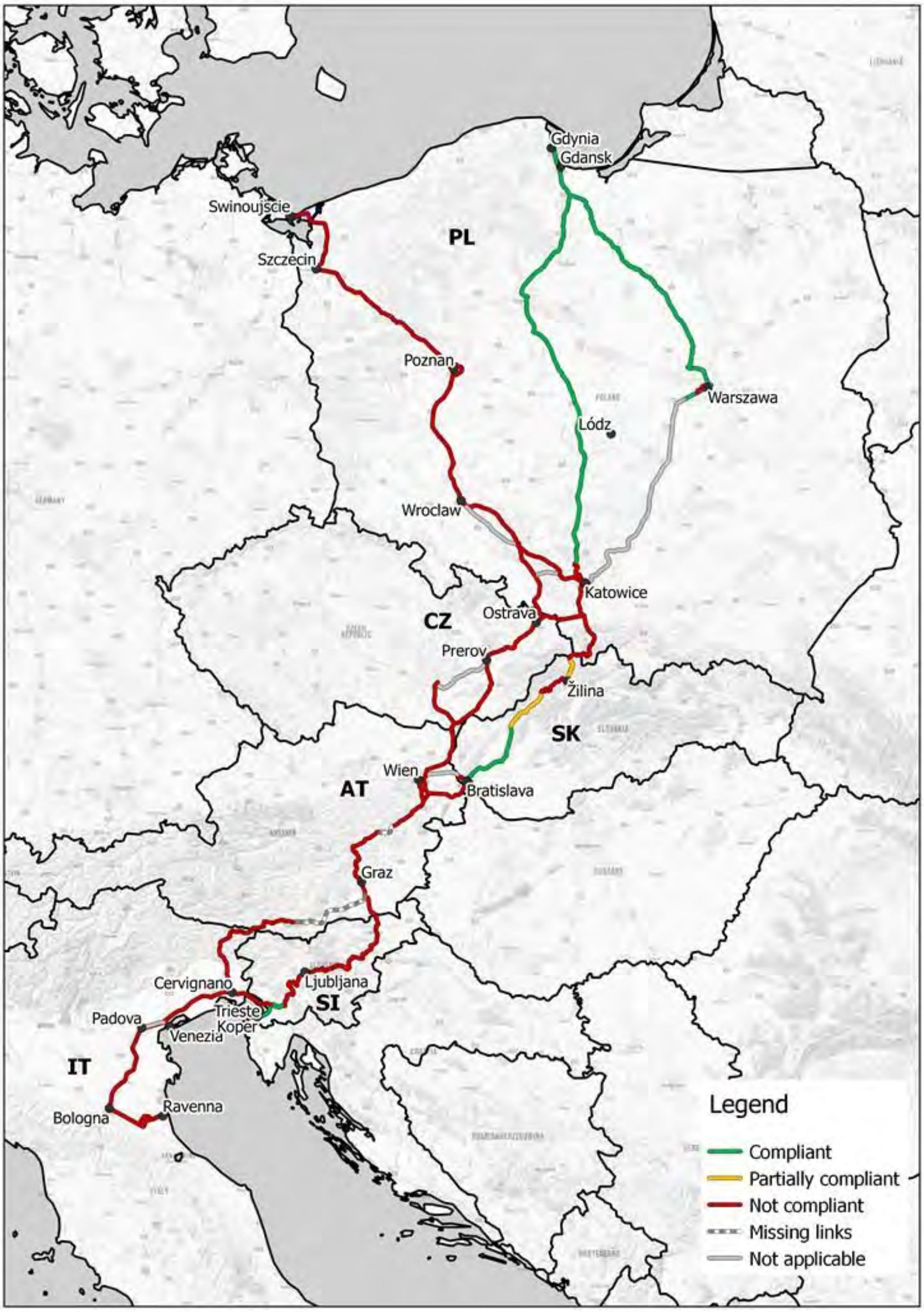
Source: BA Corridor study consortium elaboration based on TENtec data and sections as of 2014

Figure 11 Maximum axle load compliance map



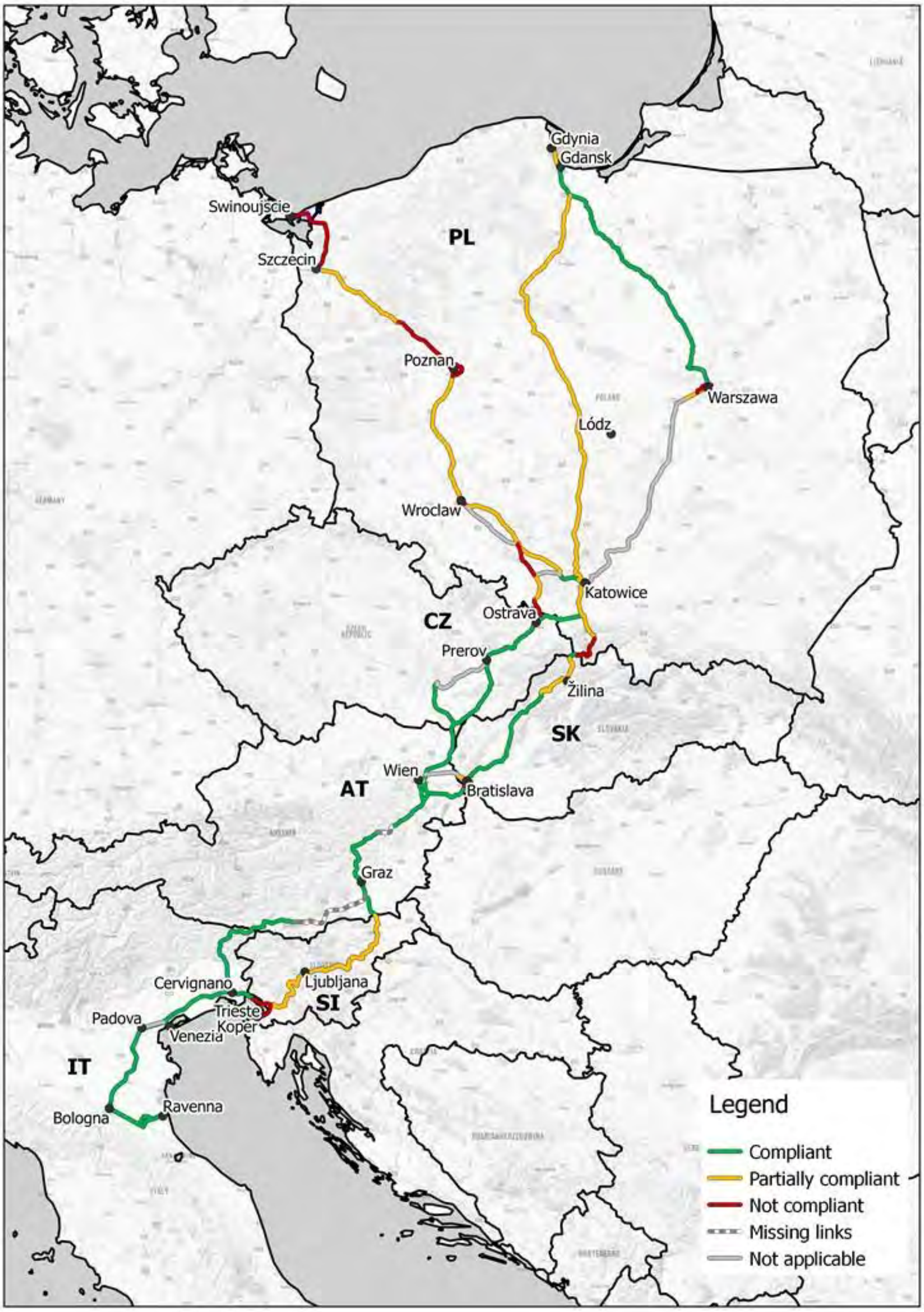
Source: BA Corridor study consortium elaboration based on TENtec data and sections as of 2014; Note: the map represents the maximum axle load on the encoded TENtec sections excluding urban nodes; sections presenting a mix of compliant and non-compliant subsections have been generally marked with orange. Sections entirely compliant or non-compliant as well as sections almost compliant or non-compliant have instead been marked with green and red respectively; the presence of limited non-compliant sub-sections within almost compliant sections is described in the text in the following paragraphs

Figure 12 Maximum train length compliance map



Source: BA Corridor study consortium elaboration based on TENtec data and sections as of 2014; Note: the map represents the maximum train length on the encoded TENtec sections excluding urban nodes; sections presenting a mix of compliant and non-compliant subsections have been generally marked with orange. Sections entirely compliant or non-compliant as well as sections almost compliant or non-compliant have instead been marked with green and red respectively; the presence of limited non-compliant sub-sections within almost compliant sections is described in the text in the following paragraphs

Figure 13 Maximum operating speed compliance map



Source: BA Corridor study consortium elaboration based on TENtec data and sections as of 2014; Note: the map represents the maximum operating speed on the encoded TENtec sections excluding urban nodes; sections presenting a mix of compliant and non-compliant subsections have been generally marked with orange. Sections entirely compliant or non-compliant as well as sections almost compliant or non-compliant have instead been marked with green and red respectively; the presence of limited non-compliant sub-sections within almost compliant sections is described in the text in the following paragraphs

Based on the maps above, the following sections present issues of compliance according to the Regulation (EU) 1315/2013:

Cross-border sections
- Opole (PL) – Ostrava (CZ) of 103.5 km length is 16% non-compliant regarding maximum axle load and 83% non-compliant with respect to maximum operating speed;
- Katowice (PL) – Ostrava (CZ) of 105 km length is 30% non-compliant in relation to maximum axle load and 7% non-compliant with regard to maximum operating speed;
- Katowice (PL) – Žilina (SK) of 164 km length is 62% non-compliant for maximum axle load and 53% non-compliant regarding maximum operating speed;
- Bratislava (SK) – Wien (AT) of 91 km length is 9% non-compliant regarding maximum operating speed;
- Graz (AT) – Maribor (SI) of 84 km length is 56% non-compliant regarding maximum axle load and 77% regarding maximum operating speed in Slovenia, therefore for the entire section it is 23% and 32% respectively;
- Trieste (IT) – Divača (SI) of 40 km length is 100% non-compliant with regard to the maximum axle load.

The cross-border section Brno (CZ) – Wien (AT) of 171 km length is fully compliant with regard to maximum axle load and maximum operating speed.

With reference to the national sections, the results of our analysis are as follows:
Poland
- Line E 30 Opole – Katowice section of 104 km length is almost entirely compliant in what concerns maximum axle load (only 1% is non-compliant) and 47% of the link is non-compliant regarding maximum operating speed. In greater detail, the issues of compliance are related to the following sections:
  - Chorzów Batory – Katowice Ligota;
  - Gliwice Labedy <--> Kedzierzyn Kozle;
  - Opole Groszowice <--> Kedzierzyn Kozle.
- Line E 59 Świnoujście – Poznań (including the by-pass section Poznań Górczyn - Poznań Starołęka - Poznań Franowo - Swarzędz/Zieliniec - Kiekrz) – Wrocław – Opole of 598 km length is 16% non-compliant regarding maximum axle load (which affects however the operation of the trains on the entire section) and 70% of the link is non-compliant with respect to maximum operating speed.
- Line C-E 65 Gdynia – Bydgoszcz – Katowice of 562 km length is fully compliant with regard to maximum axle load, whereas 17% of the link is non-compliant concerning maximum operating speed.
- Line E 65 Gdynia – Warszawa of 346 km length has already been modernized and is entirely compliant in what concerns maximum axle load; 4% of the link is not at standard with respect to maximum operating speed (due to constraints resulting from alignment geometry in Tczew, Iława and Modlin).
- The Warszawa node passenger section Warszawa Wschodnia - Warszawa Zachodnia (Line E65) of 7 km length as well as freight section Warszawa Piastów – Warszawa Praga of 22 km are both 100% not at standard regarding maximum operating speed.

Czech Republic
The freight railway network in the Czech Republic is entirely compliant. It is in any case worth adding that the passenger section Přerov – Brno (84.6 km in total) is 100% not at standard with regard to the maximum axle load parameter and around 27% of the line is not at standard with respect to maximum operating speed.

Slovakia

Except from the cross-border sections there are no major issues of compliance affecting the railway network in Slovakia.

Austria

Only the section Wien Meidling – Wien Inzersdorf is classified as non-compliant; however, since it stretches for 6.2 km, and is located in an urban area this is considered not critical at the corridor scale.

Italy

The freight railway network in Italy is overall compliant except for the cross-border section between Italy and Slovenia.

Slovenia

The freight railway network in Slovenia presents the following issues of compliance with Regulation (EU) 1315/2013, particularly regarding the maximum operating speed:

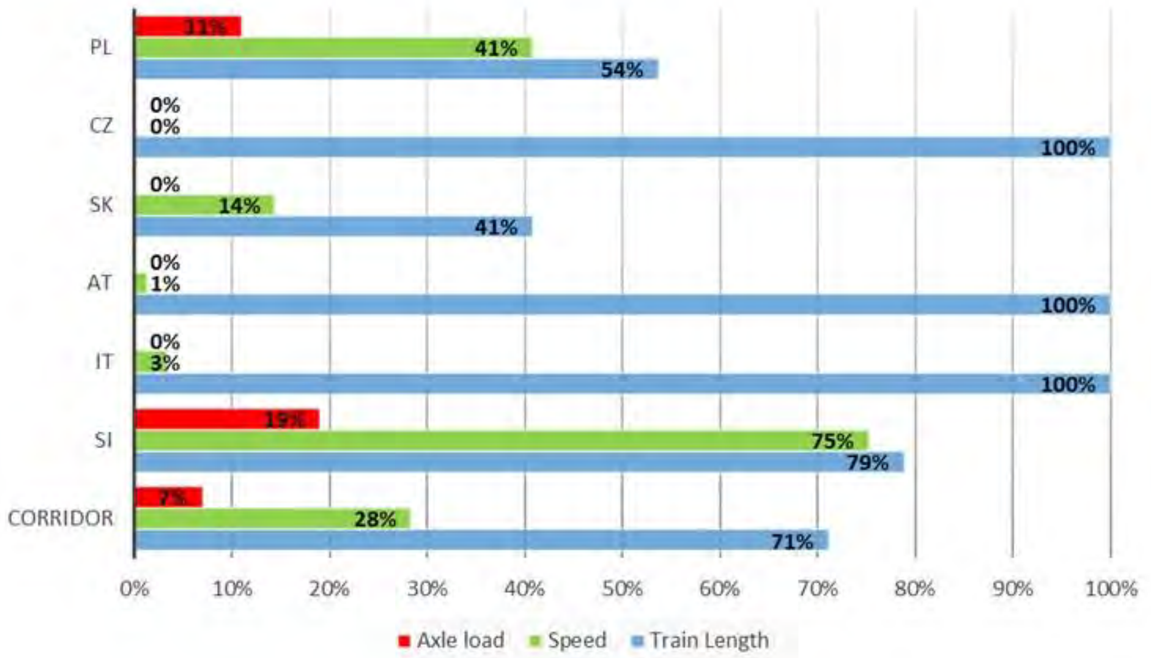
- 68% of the Ljubljana – Pragersko section of 137 km length fails to meet the maximum operating speed standard and is 35% non-compliant in relation to maximum axle load (sub-section Zidani Most-Celje of 28 km length).
- The Ljubljana – Divača section of 103 km length is fully compliant with regard to maximum axle load, whereas it is 81% not at standard with respect to maximum operating speed.
- The Divača – Koper section of 48 km length is 100% not at standard in relation to maximum operating speed; it is fully compliant concerning maximum axle load.

As a general comment, the overall BA freight network corridor is almost all not-compliant with regard to the maximum train length standard except for the following sections:

- Gdynia Port – Warszawa Zachodnia – Zawiercie in Poland of 616 km length (except for 22 km long freight section in Warszawa);
- Gdynia Port – Tczew – Tarnowskie Góry in Poland of 533 km length;
- Púchov – Leopoldov in Slovakia of 99 km length;
- Pivka – Koper in Slovenia of 71 km length.

The figure below summarises the outline in percentage (over the national sections of the corridor) and absolute km values of the non-compliant infrastructure with reference to main compliance parameters related to the rail freight infrastructure of the BA Corridor (axle load, line speed and train length), represented in the maps above.

Figure 14 Extension of the non-compliant rail freight infrastructure in km and % of the total length (2017)



Source: BA Corridor study consortium, elaboration based on the sections encoded in the TENtec database as of 2014, corresponding to a total length of the corridor links classified as freight or mixed passengers and freight railway lines, equal to 3,740 km; Data refers to November 2017

Further to axle load, speed and train length compliance, which are particularly relevant for freight transport, ERTMS deployment is also a relevant policy target set by the Regulation (EU) 1315/2013. ERTMS deployment is progressing and by 2017 the ERTMS related technology was available on 17% of the corridor sections. In Poland ETCS level 1 is available on subsections between Grodzisk Mazowiecki and Zawiercie. In Austria ERTMS (ETCS Level 2) is available on the subsections connecting Bernhardsthal to Wien's main station. In Slovakia the system is in operation on the Púchov – Trenčianska Teplá and Zlatovce – Bratislava railway sections, which are equipped with ERTMS (ETCS Level 1), and ERTMS (ETCS Level 2) is installed on the Žilina – Čadca railway line. In Slovenia all sections except Pragersko – Maribor – Šentilj / Spielfeld-Strass (border AT / SI) are equipped with ERTMS (ETCS Level 1). Albeit not yet in use, the system is also under implementation in the Czech Republic and Italy.

An additional rail interoperability issue on the BA Corridor other than the ones described above relates to the loading gauge; most of the corridor already complies or exceeds the combined classes 70/400 or 78/402. This issue is however not analysed in detail, as no requirements are set in Regulation (EU) 1315/2013, this parameter being relevant especially for the RFC 5.

Overall the compliance is mostly lagging behind for the ERTMS, line speed and train length parameters. Issues with the technical required standards for freight on the main sections of the railway infrastructure are specifically present in Poland and Slovenia and at the cross-border sections between Poland and Czech Republic, Poland and Slovakia, Slovakia and Austria, Austria and Slovenia, Italy and Slovenia.

Issues at railway stations and junctions

Although the analysis of the compliance of the railway infrastructure with Regulation (EU) 1315/2013 has been primarily undertaken with reference to the railway lines of the corridor, as part of our study an assessment of the status and conditions of the stations and junctions has been also undertaken to identify critical issues. This was based on the review of existing studies, discussions with the stakeholders and professional knowledge of the infrastructure and projects.

Along the corridor, stations and junctions are generally technically adequate in the Czech Republic, Slovakia, Austria and Italy and are gradually undergoing modernisation and upgrading in Poland and Slovenia. Limitations are however identified, particularly regarding speed in Brno (Czech Republic), Žilina (Slovakia), Udine (Italy) and Zidani Most (Slovenia). Issues have been also identified in the rail network, stations and/or junctions on the main lines within core urban nodes: speed restrictions exist in Warszawa, Ostrava, Bratislava and Wien as well as in Gdańsk, Łódź, Katowice, Szczecin, Poznań, Wrocław, and Ljubljana. The network is also not at standard in Łódź and Wrocław, and within the Ljubljana core urban node. 740 meters train operability is possible only in Gdańsk and Szczecin and partially within the Wien urban node. ERTMS is available in Ljubljana and only partially available in Wien; it is not available in the other nodes.

3.3.2. Road infrastructure

This section provides the analysis of the characteristics of the BA Corridor road infrastructure and its compliance with the standards identified in the TEN-T Regulation (EU) 1315/2013, focussing on the requirements set out in Art. 39.

Table 29 TEN-T Requirements set by REG EU 1315/2013 for roads

Requirement	Comprehensive Network	Core Network
Road Type: *Roads have to be either an express road or a motorway by 2030*	Art. 17(3). High-quality roads shall be specially designed and built for motor traffic, and shall be either motorways, express roads or conventional strategic roads: (a) A motorway is a road specially designed and built for motor traffic, which does not serve properties bordering on it and which: (i) is provided, except at special points or temporarily, with separate carriageways for the two directions of traffic *[...]*; (ii) does not cross at grade with any road, railway or tramway track, bicycle path or footpath; and (iii) is specially sign-posted as a motorway. (b) An express road is a road designed for motor traffic, which is accessible primarily from interchanges or controlled junctions and which: (i) prohibits stopping and parking on the running carriageway; and (ii) does not cross at grade with any railway or tramway track. (c) A conventional strategic road is a road which is not a motorway or express road	Art. 39 (2c). Requirements under points (a) or (b) of Article 17(3)

Requirement	Comprehensive Network	Core Network
Availability of Parking Areas. *Sufficient parking areas, at least every 100 km, by 2030*		Art. 39 (2c) The development of rest areas on motorways approximately every 100 km in line with the needs of society, of the market and of the environment, in order inter alia to provide appropriate parking space for commercial road users with an appropriate level of safety and security
Safety of Road Tunnels	Art. 18 (c). Road tunnels over 500 m in length comply with Directive 2004/54/EC of the European Parliament and of the Council	
Availability of alternative clean fuels. *By 2030*		Art. 39 (2c) Availability of alternative clean fuels

Source: Regulation (EU) 1315/2013

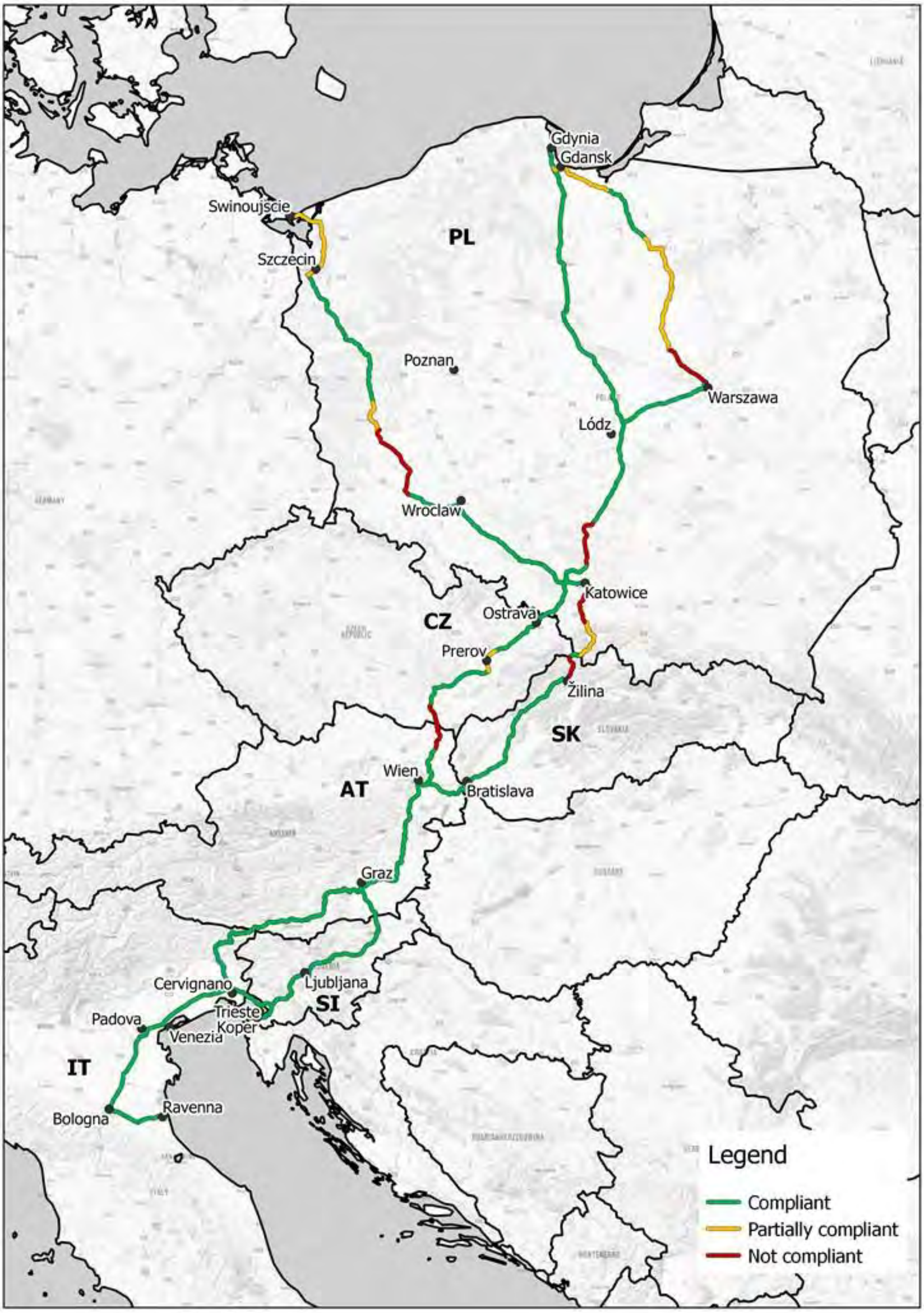
The total length of the BA Corridor road infrastructure is 3,611 km. The BA Corridor consists of a four to six lane road infrastructure except for the cross-border sections between Poland and Slovakia (segments Bielsko-Biała - Zwardoń – border between PL/CZ in Poland; and Svrčinovec – Žilina Brodno in Slovakia), and between the Czech Republic and Austria (segments Pohořelice - Mikulov – Drasenhofen - Schrick); as well as national sections Ostroda-Plonsk (J. 10/7), Świnoujście-Goleniow, Legnica-Sulechow and Gdańsk-Elblag (J. 7/504) in Poland, and Lipník nad Bečvou - Říkovice in the Czech Republic.

The map overleaf summarises the findings from our analysis with reference to the requirements described in the above table for the Core Network. On the basis of our analysis the following sections present issues of compliance according to the Regulation (EU) 1315/2013, with reference to the road type standard (motorway or expressway):

Cross-border sections
- Katowice (PL) – Žilina (SK) of 169 km length is 52% non-compliant;
- Brno (CZ) – Wien (AT) of 136 km length is 41% non-compliant.

The cross-border sections Katowice (PL) – Ostrava (CZ), Bratislava (SK) – Wien (AT), Graz (AT) – Maribor (SI) and Trieste (IT) – Divača (SI) are fully compliant. However the cross-border section between Villa Opicina and Sežana requires works for the removal of customs and policy check points buildings, still present on the road.

Figure 15 Road compliance map



Source: BA Corridor study consortium elaboration based on TENtec data and sections as of 2014

Regarding national sections, the following considerations apply:

Poland
- *S3 Świnoujście – Szczecin – Legnica* section of 408 km length is 47% non-compliant;
- *S7/S8: Gdańsk – Warszawa* section of 331 km length is 53% non-compliant;
- *A1 Gdańsk – Łódź – Katowice* section of 566 km length is 19% non-compliant;

Czech Republic
- *D1 Ostrava – Brno* of 176 km length is 14% non-compliant; particularly *Lipník nad Bečvou - Přerov - Říkovice* sub-section (31 km) presents an 80% non-compliance with the standards set in the Regulation (EU) 1315/2013.

Slovakia
Except from the cross-border sections there are no major issues of compliance in the road network in Slovakia.

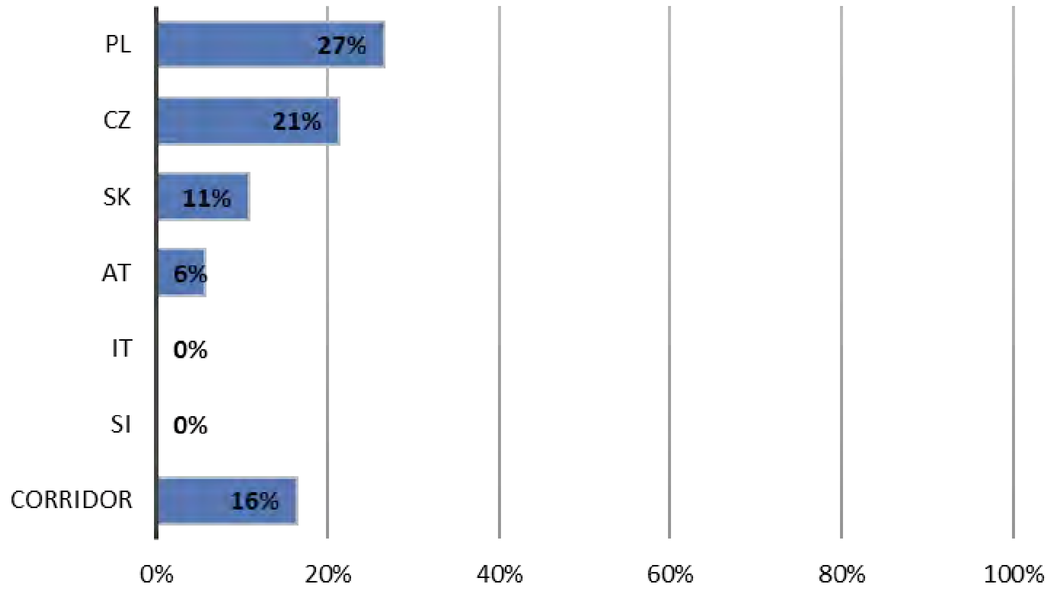
Austria
The road network in Austria is overall compliant, except for the above referred cross-border section.

Italy
The road network in Italy is overall compliant.

Slovenia
The road network in Slovenia is overall compliant.

The following figure provides an outline in percentage (over the total national corridor length) and absolute km values of the non-compliant infrastructure with reference to the road type parameter.

Figure 16 Extension of the non-compliant road infrastructure in km and % of the total length (2017)



Source: BA Corridor study consortium, elaboration based on the sections encoded in the TENtec database as of 2014, corresponding to a total length of the road corridor links of 3,611 km; Data refers to November 2017

As a result of this analysis the 3,600 km road infrastructure on the BA Corridor is not entirely compliant with the requirements of the Regulation (EU) 1315/2013, especially with regard to the type of infrastructure. The situation is particularly relevant for the Polish road network, whereas the corridor infrastructure in Italy and Slovenia is fully compliant. Currently, 16% of the road corridor infrastructure is constituted by ordinary roads which do not comply with the requirements.

Issues with the technical required standards of the main sections of the road infrastructure are also present at cross-border sections between Poland and Slovakia, Czech Republic and Austria. No compliance issues have been identified in core urban nodes where at least one urban motorway/expressway route exists interconnecting between the links outside the node.

Intelligent Transport Systems (ITS) activities are ongoing at the national level with respect to many of the measures foreseen by Directive 2010/40/EU, including the definition and implementation of multiannual strategies. The signature in 2015 of a Memorandum of Understanding between the motorway operators ASFINAG, Autovie Venete and DARS (also involving partners from Croatia and Hungary) is also worth mentioning. The exchange of traffic related data and information is expected to facilitate the harmonisation of traffic management measures and allow the provision of cross-border information services to road users. The European Electronic Toll Collection system – provisions of the Directive 2004/52/EC and subsequent Decision 2009/750/EC – are not yet implemented in the BA Corridor Member States.

Alternative clean fuels are available on the corridor road infrastructure. More in detail, electricity is available on several sections of the corridor and in all core urban nodes, including rapid charging stations with nominal power output of more than 40kW in the Czech Republic, Austria, in Slovakia and in Slovenia, where electric fuel is considered to be already available on the whole corridor. CNG is available in Poland, Czech Republic, Italy and Slovenia; LPG is available in all Member States. LNG is starting to be available in Poland and in Slovenia, and hydrogen in Austria. Biofuels are available in the Czech Republic. Table 2 provides the results of a study by the European Commission on *Clean Power for Transport Infrastructure Deployment* along the core network corridors, specifying the existing and required facilities to support the development of alternative clean fuels along the road corridor infrastructure.

Table 30 Existing and required CNG stations along the BA Corridor (2015)

Clean Fuel	Existing	Required Brownfield	Required Greenfield
EV	5	111	10
CNG	10	45	0
LNG	0	26	0
H2	0	52	0

Source: Clean Power for Transport Infrastructure Deployment; Data refers to end of 2015

Detailed information concerning the current status of the corridor infrastructure about the safety of road tunnels was not possible to be gathered and reported systematically as part of this study.

3.3.3. Ports

There are ten core ports in operation along the BA Corridor: five classified as maritime and inland waterway ports (Szczecin and Świnoujście, Trieste, Venezia and Ravenna), three classified as maritime ports (Gdynia, Gdańsk and Koper) and two inland waterway ports (Wien and Bratislava).

Table 31 TEN-T Requirements set by REG EU 1315/2013 for ports

Core Ports	Type of Port	Connection with rail	Waterway connection (CEMT class)	Availability of alternative clean fuels	Open access to terminal	Facilities for ship generated waste
Gdańsk (PL)	Maritime	Yes	I/II/III	No	Yes	Yes
Gdynia (PL)	Maritime	Yes	n.a.	No	Yes	Yes
Świnoujście (PL)	Maritime / IWW	Yes	Vb	No	Yes	Yes
Szczecin (PL)	Maritime / IWW	Yes	III-Vb	No	Yes	Yes
Bratislava (SK)	Inland Waterways	Yes	VIb	No	Yes	n.a.
Wien (AT)	Inland Waterways	Yes	VIb	No	Yes	n.a.
Trieste (IT)	Maritime / IWW	Yes	VIb	No	Yes	No
Venezia (IT)	Maritime / IWW	Yes	VIb	No	Yes	No
Ravenna (IT)	Maritime / IWW	Yes	V	No	Yes	No
Koper (SI)	Maritime	Yes	n.a.	No	Yes	Yes

Source: BA Corridor study consortium

All ports operate passengers' and freight services. General cargo, bulk and container services exist at all eight maritime ports as well as Motorway of the Sea (MoS) infrastructure and operations. At these ports, logistics platforms are also already in operation or under development to promote multimodal transport, which include Ro-La services, particularly advanced at the Adriatic Ports.

Regarding the analysis of the compliance of the port infrastructure, all ports have at least one terminal open to all operators in a non-discriminatory way and charges are applied transparently. Facilities for ship generated waste are available at all ports except sewage treatment equipment at Trieste, Venezia and Ravenna. All classified inland waterway ports fulfil the CEMT IV requirement.

As of 2017 alternative clean fuels were not available for maritime transport operations at any of the ten corridor ports. LNG fuel is available at the LNG terminal in Świnoujście, where it can be loaded onto road units.

Table 32 Infrastructure for last mile connections

Core Ports	Rail connection (no. of tracks)	Road connection (no. of lanes)
Gdańsk (PL)	3	8
Gdynia (PL)	3	4
Świnoujście (PL)	1	2
Szczecin (PL)	4	6
Bratislava (SK)	1	2
Wien (AT)	7	6
Trieste (IT)	2	6
Venezia (IT)	1	2
Ravenna (IT)	3	4
Koper (SI)	1	4

Source: BA Corridor study consortium

All ports are furthermore connected to the road and railway links of the corridor. However, last mile railway and/or road port interconnections issues are present and limit the development in all Baltic-Adriatic corridor seaports. About rail, last mile connections' improvements are required to increase the standards of the existing dedicated rail links in terms of electrification, axle load, speed and train length at all maritime ports except Venezia. Improvements of the rail infrastructure within the port areas is also needed in Gdynia, Bratislava and at all Adriatic ports. Improvements to respond to capacity expansion needs in view of future traffic increase are foreseen or already ongoing in Gdynia, Gdańsk and at the Adriatic ports. Due to their location within or in the proximity of urban nodes, measures to reduce/mitigate the impact of rail traffic either at present or in the future are also required in Venezia and Ravenna.

Table 33 Issues affecting rail last mile connections

Ports	Need to improve standards on dedicated link(s) (electrification, axle load, speed, train length as appropriate)	Need to upgrade or further develop the existing dedicated link(s) to increase capacity	Need to adequate infrastructure within the port area (including depot for services to RUs)	Reduce/ mitigate the impact of rail traffic on urban areas crossed by rail links to ports
Gdynia (PL)	X	X	X	
Gdańsk (PL)	X	X		
Szczecin (PL) **Świnoujście (PL)**	X			
Bratislava (SK)			X	
Wien (AT)				
Trieste (IT)	X	X	X	
Venezia (IT)		X	X	X
Ravenna (IT)	X	X	X	X
Koper (SI)	X	X	X	

Source: BA Corridor study consortium

As of road, works to increase the standards of the last mile connections are envisaged at the ports on the Baltic sea and at Koper. The internal road infrastructure requires modernisation/upgrading at all Baltic ports as well as in Bratislava, Venezia, Ravenna and Koper. Improvements to respond to capacity expansion needs in view of future traffic increase are foreseen or already ongoing in the Baltic ports, Venezia and Koper. In Gdynia, Szczecin, Świnoujście, Venezia, Ravenna and Koper solutions to mitigate the impact of road transport on the respective urban areas are also needed.

Table 34 Issues affecting road last mile connections

Ports	Need to improve standards on dedicated link(s)	Need to upgrade or further develop the existing dedicated link(s) to increase capacity	Need to adequate infrastructure within the port area (including parking)	Reduce/ mitigate the impact of road traffic on urban areas crossed by road links to ports
Gdynia (PL)	X	X	X	X
Gdańsk (PL)		X	X	
Szczecin (PL) **Świnoujście (PL)**	X	X	X	X
Bratislava (SK)			X	
Wien (AT)				
Trieste (IT)				
Venezia (IT)		X	X	X
Ravenna (IT)		X		X
Koper (SI)		X	X	X

Source: BA Corridor study consortium

Finally, VTMIS and e-Maritime services are available or under development at the ports, although they are not integrated and fully interoperable at the Union level (RIS deployment is also ongoing).

3.3.4. Airports

There are 13 core airports along the corridor which are all interconnected to the road network (Szczecin, Gdańsk, Poznań, Wrocław, Łódź, Warszawa, Katowice, Ostrava, Bratislava, Wien, Ljubljana, Venezia, Bologna).

The two core airports of Wien and Warszawa (Chopin) are already interconnected to the BA Corridor railway network, which satisfies the requirements of the Regulation. In addition, a rail connection exists for the Szczecin, Gdańsk and Ostrava airports.

The interoperable traffic management system for air traffic is currently under development as part of the ongoing Single European Sky Air Traffic Management Research and Development (SESAR) project, representing the technological pillar of the Single European Sky. Under the political oversight of the European Commission, a SESAR Deployment Manager (SDM) has been set up to develop and submit a Deployment Programme to the European Commission for its approval and execution. The SESAR Deployment Manager coordinates and monitors the realization of all implementation projects, with the ultimate goal of providing the Union by 2030 with a high performing air traffic management infrastructure. Initiatives are currently planned and ongoing which will develop SESAR in the Member States and airports along the BA Corridor.

Regarding interconnections with other modes and particularly with rail, initiatives are planned at Wien airport (the major airport along the BA Corridor with already more than 23 million passengers per year) to increase interconnectivity between the Austrian airport and the Czech Republic, Slovakia (as well as Hungary), also in view of future traffic growth at this multimodal cross-border hub, and in consideration of the recent trends in travel patterns, showing an increase in the demand for integrated high-speed railway and aviation services.

Table 35 BA Corridor core airports

BA Corridor Airports	Activity	N. of runways	Connection with rail	Open access to terminal	Availability of alternative clean fuels
Gdańsk (PL)	Passenger and Freight	1	Yes	Yes	No
Szczecin (PL)	Passenger and Freight	1	Yes	Yes	No
Poznan (PL)	Passenger and Freight	1	No	Yes	No
Warszawa (PL)	Passenger and Freight	2	Yes	Yes	No
Łódź (PL)	Passenger and Freight	1	No	Yes	No
Wrocław (PL)	Passenger and Freight	1	No	Yes	No
Katowice (Pyrzowice) (PL)	Passenger and Freight	1	No	Yes	No
Ostrava (CZ)	Passenger and Freight	1	Yes	Yes	No
Bratislava (SK)	Passenger and Freight	2	No	Yes	No
Wien (Schwechat) (AT)	Passenger and Freight	2	Yes	Yes	No
Ljubljana (SI)	Passenger and Freight	1	No	Yes	No
Venezia (IT)	Passenger and Freight	2	No	Yes	No
Bologna (IT)	Passenger and Freight	1	No	Yes	No

Source: BA Corridor study consortium based on TENtec

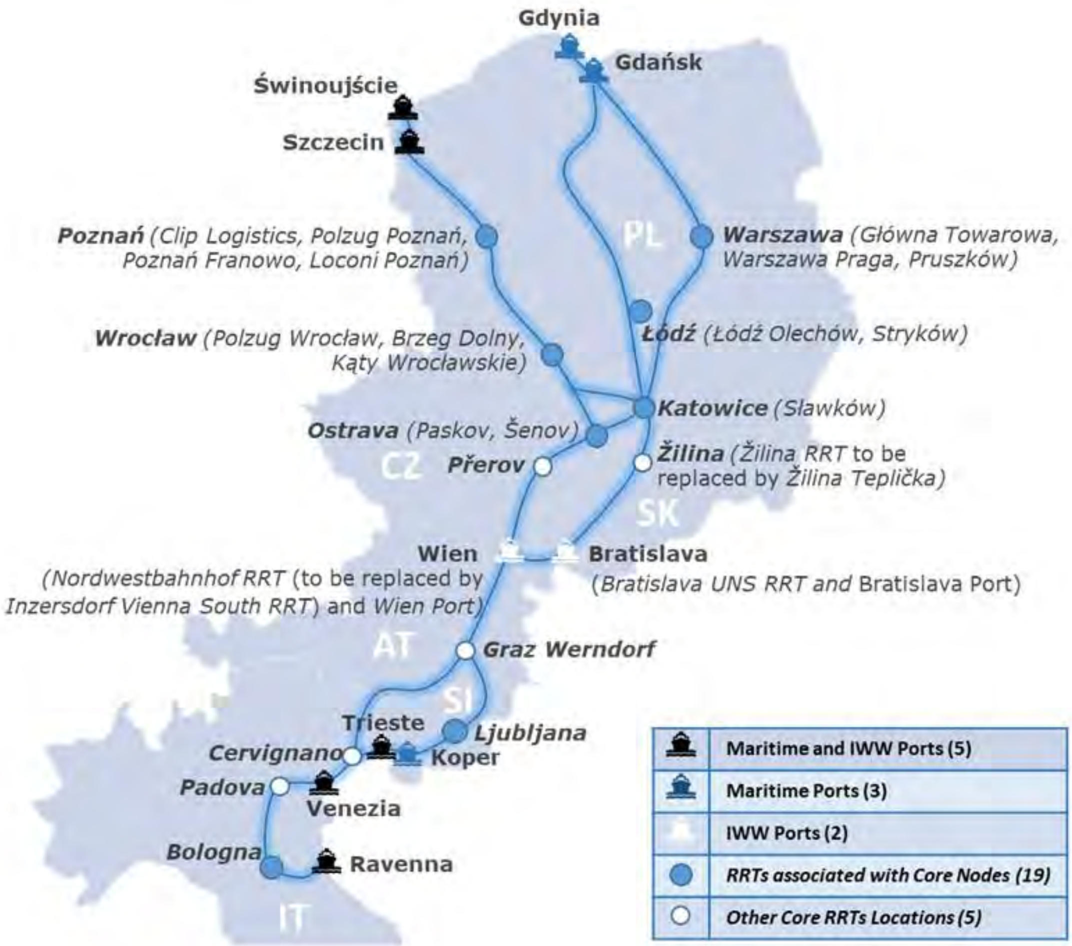
Projects of urban nature for the development of rail and transit interconnections are also planned for the improvement of last mile connections to airports. Investments are foreseen and ongoing in this regard at Venezia and Bologna airports, which represent with Warszawa and Wien the largest airports along the corridor. For Bologna and Venezia, the interconnection to the corridor railway network represents the possibility to directly connect high-speed rail to aviation services, increasing the attractiveness of rail transport and responding to the most recent request from the market of developing a network of high-speed nodes. Connection to the railway network is also under implementation/consideration at Katowice, Bratislava and Ljubljana as part of rail modernisation projects. The development of the Pomeranian Metropolitan Railway is expected to further extend the accessibility to the Gdańsk Airport in the Tricity (Gdynia, Gdańsk, Sopot) metropolitan area. Projects for the improvement of existing road links to the airports are also foreseen by the concerned infrastructure managers at Venezia as well as Warszawa, Katowice and Łódź.

As of 2016, the progressing analysis on the corridor KPIs shows that alternative clean fuels are not available at airports.

3.3.5. Rail-road terminals

Twenty-four rail-road terminals are currently in operation in the areas and vicinity of the BA Corridor core nodes as defined by Regulation (EU) 1315/2013. These are shown in the figure below together with the corridor port infrastructure, where additional multimodal terminals are located and in operation. A new rail-road terminal – Inzersdorf Wien South – is in operation in the Austrian capital city since January 2017, which will replace the Nordwestbahnhof terminal upon completion of its development. The existing terminal in Žilina is also assumed to be replaced by the new multimodal platform at Žilina Teplička, whose construction has already been completed.

Figure 17 Multimodal Transport Infrastructure (Rail-road terminals already in operation)



Source: BA Corridor study consortium

The 24 rail-road terminals located at the Baltic-Adriatic corridor core nodes are all interconnected to their respective national road and rail networks. About rail interconnections, with respect to the technical compliance of the rail accessibility to terminals, 9 out of 24 rail-road terminals have 740 meters train length accessibility and 18 out of 24 have electrified train terminal accessibility. No specific critical issues have been identified so far that would affect the quality of last mile connections, except capacity constraints at the Poznań railway bypass and Bratislava railway node. Referring to the infrastructure inside the terminals, 5 out of 24 terminals have a maximum length of loading/unloading tracks of minimum 740 meters, 12 terminals do not have electrified rail tracks at terminal. As of road last mile connections, issues have been reported which relate to local urban road accessibility and traffic in Poznań, Warszawa and Wrocław.

For the terminals located within seaports and inland waterway ports, similar considerations apply as the ones described for the ports in which they are situated in terms of conditions and issues associated to their accessibility by rail and road.

Table 36 BA Corridor core rail-road terminals

RRT		Rail Connection (no. of tracks)	Road Connection (no. of lanes)	Capability of handling intermodal	Number of loading/unloading	740m train terminal accessibility	Max. length of loading/unloading track	Electrified train terminal accessibility	Electrified rail tracks at terminal	Open Access
Warszawa	Główna Towarowa	2	2	Yes	2	No	350m	Yes	?	?
	Warszawa Praga	2	2	Yes	1	No	320m	Yes	?	?
	Pruszków	2	2	Yes	3	No	600m	Yes	?	?
Łódź	Łódź Olechów	1	2	Yes	2	No	400m	Yes	?	?
	Stryków	1	2	Yes	1	No	320m	Yes	?	?
Katowice	Sławków	2	2	Yes	7	No	700m	Yes	?	?
Poznań	Clip Logistics Poznań	2	2	Yes	1	Yes	1527m	Yes	Yes	Yes
	Polzug Poznań	2	2x2	Yes	4	No	610m	Yes	?	?
	Poznań Franowo	1	2x2	Yes	2	No	610m	Yes	?	?
	Loconi Poznań	2	2	Yes	2	Yes	900m	Yes	?	?
Wrocław	Polzug Wrocław	2	2x2	Yes	2	No	370m	Yes	?	?
	Brzeg Dolny	4	2	Yes	2	Yes	650m	Yes	No	Yes
	Kąty Wrocławskie	2	2	Yes	1	Yes	764,5m	Yes	No	Yes
Ostrava	Ostrava Paskov	1	1	Yes	3	No	270 m	No	No	Yes
	Ostrava Šenov	1	1	Yes	4	No	240 m	No	No	No
Přerov	Přerov	1	1	Yes	2	No	400 m	No	No	No
Bratislava	Bratislava UNS	1	1	Yes	2	No	325 m	No	No	No
Žilina	Žilina	1	1	Yes	2	Yes	400 m	Yes	No	No
Wien	Nordwestbahnhof	2	2	Yes	3	No	350-400 m	Yes	Yes	Yes
Graz	Graz Sud-Werndorf	1	2	Yes	4	Yes	700 m	Yes	No	Yes
Cervignano	Cervignano	1	2	Yes	6+2	Yes	750 m	No	No	Yes
Padova	Padova	1	4	Yes	8/8	Yes	750/450	Yes	No	Yes
Bologna	Bologna	2	2	Yes	15	Yes	700 m	Yes	No	Yes
Ljubljana	Ljubljana	1	1	Yes	2	No	550 m	No	No	Yes

Source: BA Corridor study consortium

With regard to the other parameters, all terminals are equipped to handle intermodal units. 10 rail-road terminals declare they have at least one freight terminal open to all operators in a non-discriminatory way and application of transparent charges, 14 does not meet this condition or did not confirm.

Concerning sustainable freight transport/innovation, at least six terminals (Warszawa Praga, PCC Brzeg Dolny, Wien Nordwestbahnhof, Padova, Bologna, Ljubljana) are active in the field of green logistics in urban areas for the promotion of low noise and low carbon urban freight delivery, which is becoming of particular relevance due to the increase in e-commerce.

3.3.6. Urban Nodes

"Urban nodes" have become an integral part of the development of the trans-European network (TEN-T): 88 urban nodes are listed in Annex II of the TEN-T Guidelines, including 13 Urban nodes located on the Baltic Adriatic Corridor. These nodes were identified on the basis of a set of socio-economic criteria, and ensure the connection between the different transport modes, as well as the connection between long-distance and urban/peri-urban/regional transport.

Article 30 of the TEN-T Guidelines specifies the role of urban nodes as integral parts of core network corridors, addressing in particular the connection of TEN-T infrastructure within nodes (through ports, airports, railway stations, logistic platforms and freight terminals) as well as access to these nodes and the seamless connection between TEN-T and urban and regional infrastructure. The article also mentions the mitigation of the exposure of urban areas to negative effects of transiting rail and road transport (also including bypassing of urban areas) and the decarbonisation and "greening" of transport, also with respect to urban freight delivery.

Table 37 Core urban nodes – Core network and BA Corridor

	Core Network	BA Corridor
Number of Core Urban Nodes	88	13
Inhabitants	57 over 500,000; 21 over 1 million	7 over 500,000; 2 over 1 million
Capital cities	28	4 (Warszawa, Bratislava, Wien, Ljubljana)
Core Maritime City Ports	40	3 (Gdańsk, Szczecin, Venezia)
Core IWW City Ports	27	2 (Wien, Bratislava)
Location of Core RRTs	61	12 (all except Venezia)
Location of Core Airports	80	13
High speed train services	54	3 (Wien, Venezia, Bologna)

Source: BA Corridor study consortium

In the sections below an overview of all the nodes along the BA Corridor is provided with reference to the main issues referred to in Article 30 of the TEN-T Regulation. Issues for each node are discussed more in detail in the Action sheets for urban nodes annexed to this report.

Under a methodological standpoint the definition of the boundaries of the 13 core urban nodes of the BA Corridor was based on a functional (and hence to a certain extent flexible) approach, their extent going beyond the city in its strict sense. On this basis, the analysis focussed on the needs of the 'functioning city' and its hinterland rather than on the municipal administrative region, hence including peri-urban zones, as well as the transport infrastructure of the TEN-T network, such as ports, airports, railway stations, logistic platforms and freight terminals which are connected with other parts of that infrastructure and with the infrastructure for regional and local traffic.

Continuity of the core network corridor infrastructure within the urban nodes

A first key issue for the seamless development of the corridor infrastructure is to ensure continuity of its road and rail network infrastructure along the entire extent of the corridor, including the segments within and crossing urban areas, and specifically including core urban nodes.

The issue of the continuity of the corridor infrastructure, not only in terms of physical continuity, but also in terms of infrastructure compliance to the TEN-T technical standards as well as available capacity within the large urban areas, is particularly challenging, given on one side the constraints that urban land use imposes on the development of transport infrastructure and on the other side the concentration and mixture of long distance and regional / local passenger and freight flows in and around main cities.

On the basis of the above considerations, the analysis has primarily focussed on the availability in core urban nodes of links in line with the TEN-T requirements specifically concerning rail interoperability: line electrification (passenger and freight lines), availability of ERTMS (passenger and freight lines), maximum permitted axle load (22.5 tons or higher for freight lines) and maximum train length (740 m or higher for freight lines).

Table 38 Condition of railway infrastructure within urban nodes

Parameter	Condition of the infrastructure		
	Fully at standard	Partially at standard	Not at standard
Electrification	Gdańsk, Warszawa, Łódź, Katowice, Szczecin, Poznań, Wrocław, Ostrava, Bratislava, Wien, Venezia, Bologna, Ljubljana*	-	-
Speed	Venezia, Bologna	Warszawa, Gdańsk, Ostrava, Bratislava, Wien	Łódź, Katowice, Szczecin, Poznań, Wrocław, Ljubljana
Train length	Gdańsk, Szczecin	Wien	Warszawa, Łódź, Katowice, Poznań, Wrocław, Ostrava, Bratislava, Venezia, Bologna, Ljubljana
Axle load	Gdańsk, Warszawa, Katowice, Szczecin, Poznań, Ostrava, Bratislava, Wien, Venezia, Bologna	Ljubljana	Łódź, Wrocław
ERTMS	Ljubljana*	Wien	Gdańsk, Warszawa, Łódź, Katowice, Szczecin, Poznań, Wrocław, Ostrava, Bratislava, Venezia, Bologna

*Source: BA Corridor study consortium; Notes: * regional lines are not at standard*

The analysis of the rail corridor infrastructure to the TEN-T standard for freight line speed (100 km/h or higher) within urban nodes has been also performed; under a functional standpoint, it shall be noticed that in the development of rail infrastructure within nodes consideration should be given to the generally relatively limited benefits associated with high maximum theoretical speed within urban areas, due to operational reasons (including traffic managements at nodes) and the relatively limited extent of the links in urban areas – as well as the existing land use and infrastructure constraints.

As shown in the table below, limitations and restrictions exist for all parameters, but to a different extent. In particular the entire corridor is electrified, although some issues are reported with respect to Ljubljana – but limited to regional lines; with reference to interoperability, issues exist also for axle load and more extensively for train length and ERTMS. Finally, in a significant number of cases the line speed within the nodes do not reach the standards set in the TEN/T regulation for freight lines.

On the other hand, with respect to the standards of the road infrastructure, there are no critical issues along the corridor: in all nodes at least one urban motorway/expressway route exists interconnecting between the links outside the node.

Connection between modes and between the TEN-T and urban and regional infrastructure

Integration of transport infrastructure and services requires establishing horizontal (between modes) and vertical (between long distance and regional flows) interconnections at nodes, in particular within large urban agglomerations.

The following table summarizes the modal interconnections already available at the major rail, airport and port nodes of the BA Corridor within core urban nodes: the corridor main railway stations are in all cases well interconnected to many urban and regional transport systems, whilst fewer dedicated infrastructure exist connecting airports or maritime passenger ports to urban city centres.

Table 39 Availability of connections between TEN-T and urban and regional infrastructure

Urban and regional transport infrastructure	System availability	Interconnection with BA Corridor:		
		Railway station	Airport	Port
Underground metro	Warszawa, Wien	Warszawa, Wien		
Suburban railway	Warszawa, Łódź, Wrocław, Poznań, Gdańsk, Szczecin, Katowice, Wien, Bologna, Ljubljana	Warszawa, Łódź, Wrocław, Poznań, Gdańsk, Szczecin, Katowice, Wien, Bologna, Ljubljana	Warszawa, Gdańsk, Szczecin, Wien	Gdańsk, Szczecin
Regional railway	Warszawa, Łódź, Wrocław, Poznań, Gdańsk, Szczecin, Katowice, Ostrava, Bratislava, Wien, Venezia, Bologna, Ljubljana	Warszawa, Łódź, Wrocław, Poznań, Gdańsk, Szczecin, Katowice, Ostrava, Bratislava, Wien, Venezia, Bologna, Ljubljana	Warszawa, Gdańsk, Szczecin, Ostrava, Wien	Gdańsk, Szczecin,
Tramway / Light Rail / Other fixed links	Warszawa, Łódź, Wrocław, Poznań, Gdańsk, Szczecin, Katowice, Ostrava, Bratislava, Wien, Venezia, Bologna	Warszawa, Łódź, Wrocław, Poznań, Gdańsk, Szczecin, Katowice, Ostrava, Bratislava, Wien, Venezia		Gdańsk, Szczecin, Bratislava, Venezia
Urban waterways services	Gdańsk, Venezia	Venezia	Venezia	Venezia

Source: BA Corridor study consortium

Sustainable passenger and freight transport

Initiatives for promoting sustainable passenger and freight services in urban agglomerations include measures for integrating different transport modes, thus providing seamless interconnections to passengers; projects for the deployment of innovative transport systems and technologies, including alternative clean fuels; and initiatives for the development of environmental friendly and low-carbon transport services for passenger and freight.

Initiatives for sustainable transport exists in all the core urban nodes along the BA Corridor, albeit the scope and extent of such measures varies significantly. Measures for the integration of passenger transport services, including bike / park & ride initiatives, integrated ticketing systems, ICT for public transport and buses and ITS for road are quite mature and most city administrations have already implemented them.

Table 40 Measures for integrated passenger transport

Bike / park and ride facilities	Warszawa, Łódź, Wrocław, Gdańsk, Ostrava, Wien, Venezia, Bologna, Ljubljana
Integrated Ticketing at urban level	Warszawa, Łódź, Wrocław, Poznań, Gdańsk, Szczecin, Katowice, Ostrava, Bratislava, Wien, Venezia, Bologna, Ljubljana
Integrated Ticketing at metropolitan/regional level for buses	Warszawa, Łódź, Wrocław, Poznań, Gdańsk, Szczecin, Katowice, Ostrava, Bratislava, Wien, Venezia, Bologna
Integrated Ticketing at metropolitan/regional level for buses and rail	Warszawa, Łódź, Wrocław, Poznań, Gdańsk, Szczecin, Ostrava, Bratislava, Wien, Venezia, Bologna
ICT real time information for public transport services	Warszawa, Łódź, Wrocław, Poznań, Gdańsk, Szczecin, Katowice, Ostrava, Bratislava, Wien, Venezia, Bologna, Ljubljana
ICT real time information for parking	Warszawa, Łódź, Wrocław, Poznań, Gdańsk, Szczecin, Ostrava, Wien, Venezia, Bologna, Ljubljana
ITS systems for road traffic management	Warszawa, Łódź, Wrocław, Poznań, Gdańsk, Szczecin, Katowice, Wien, Venezia, Bologna

Source: BA Corridor study consortium

Availability of alternative clean fuels is also a prominent area of action for cities along the corridor, with specific focus on electric mobility, CNG and LPG. On the opposite side, no hydrogen refuelling station is currently open to public in any of the urban nodes of the corridor and biofuels are only available in Ostrava.

Table 41 Availability of alternative clean fuels

Electricity	Warszawa, Łódź, Wrocław, Poznań, Gdańsk, Szczecin, Katowice, Ostrava, Bratislava, Wien, Venezia, Bologna, Ljubljana
Hydrogen	Wien (not open for public)
CNG	Warszawa, Łódź, Wrocław, Poznań, Katowice, Ostrava, Bratislava, Wien, Venezia, Bologna, Ljubljana
LNG for road transport	-
LPG	Warszawa, Łódź, Wrocław, Poznań, Gdańsk, Szczecin, Katowice, Ostrava, Bratislava, Venezia, Bologna, Ljubljana
Biofuels	Ostrava

Source: BA Corridor study consortium

Finally, initiatives for sustainable urban mobility are also generally present in most urban areas, with a prominent focus on vehicle sharing initiatives for cars and bikes. Sustainable Urban Mobility Plans have also been adopted in most cities.

Cities along the corridor do not appear to be specifically active in the field of initiatives aiming at sustainable freight services and delivery solutions; Wien seems to be the only case where such solutions are consolidated operations.

Table 42 Initiatives for sustainable urban mobility

Car sharing	Wrocław, Poznań, Szczecin, Katowice, Ostrava, Wien, Venezia, Bologna
Bike sharing	Warszawa, Łódź, Wrocław, Poznań, Szczecin, Katowice, Wien, Venezia, Bologna, Ljubljana
Sustainable Urban Mobility Plan (approved)	Warszawa, Łódź, Katowice, Wrocław, Poznań, Gdańsk, Szczecin, Ostrava, Bratislava, Wien, Ljubljana
Green/urban logistics delivery solutions	Warszawa (Warszawa Praga*), Wrocław (PCC Brzeg Dolny*), Wien (Wien Nordwestbahnhof*), Bologna*, Ljubljana*

*Source: BA Corridor study consortium; Note: * refers at least to the operations at the rail-road terminals*

3.4. Operational and administrative barriers

To develop the BA Corridor as an interoperable multimodal infrastructure part of a single EU wide TEN-T core network, efforts expended in the preparation and implementation of infrastructure projects to fulfil the requirements of the TEN-T Regulation alone, are not sufficient. Administrative and operational barriers exist at present, which predominantly affect cross-border transport operations hindering the seamless and continuous flow of passenger and goods. These barriers shall be gradually overcome to allow the development of the corridor generating the expected benefits for the EU society.

Railway transport is particularly affected by administrative and operational bottlenecks, namely those issues relating to procedural and organisational or legal aspects affecting the functioning of transport services along the corridor. In 2017, the Baltic Adriatic Rail Freight Corridor started an analysis of the operational bottlenecks along the rail freight corridor. The analysis is performed by the Performance Management and Operations Working Group (WG PM&O) within the governance structure of Baltic-Adriatic Rail Freight Corridor.

According to the analysis of this Working Group a disturbance was defined as operational bottleneck when it relates to:

- Communication between Infrastructure Managers (IMs’) Traffic Control Centres (TCCs) or among Railway Undertakings (RUs) or between RUs and IMs at the borders; or to
- Operational rules between RUs and IMs at the borders.

The main categories of operational bottlenecks and possible solutions have been identified accordingly to the above definitions:

- Bottlenecks related to communication:
  - a) Inadequate communication in situations of big disturbances. One of the preliminary results of the analysis is about malfunction in communication between IMs TCCs in situations of big disturbances on the network.

This kind of operational bottleneck could be eliminated when all IMs of the RFC use the RNE tool TCCCom and have English fluent staff available 24/7 at TCCs in the future.

– b) Faulty communication of delays and arrival sequence of trains. Untimely inter-system communication of delays and arrival sequence of freight trains at some border crossings represents an operational bottleneck.

  Solving of this bottleneck requires the deployment of TAF-TSI messages for data communication in train planning & operations and of TAF-TSI compliant interfaces between national IT tools and the RNE tools like Train Information System (TIS) and Path Coordination System (PCS), whose deployment is already ongoing.

  TIS usage as a RFC-wide tool is an important measure as well, but it is vital that IMs feed it on time with accurate data and that international trains running with different numbers are linked in the system.

– c) Long dwelling times at cross-border sections. Insufficient communication between railway undertakings in takeover of trains leads to prolonging dwelling times on cross-border sections, which are particularly sensitive to congestion.

  Communication between cooperating RUs for international traffic should be improved to reduce the trains dwelling times at the border crossings. Particularly for the ad hoc traffic, often the path is requested separately to each IM at a different time in not coordinated way. The use of path coordination tools like RNE PCS for ad hoc international trains would contribute to the solutions of this communication barrier.

- Bottlenecks related to operational rules:
  – a) Technical inspection of rolling stocks. Among operational rules leading to extensive dwelling times at international border crossings, the technical inspection of rolling stocks has been identified. For that, a better trust/cooperation scheme among RUs would be beneficial.
  – b) Necessity to change locomotives. In addition, to reduce idle times at the border crossings, RUs should extend the use of multi-system locomotives and/or fasten the operations of changing the locomotives. Higher punctuality of freight traffic would largely be beneficial as well.

In order to solve the above communication and operational barriers the Railway Sector, particularly the Rail Infrastructure Managers, has set up the RNE – RailNetEurope, an organisation through which railway experts started developing tools and processes that would enable a more effective and efficient operation of international rail traffic. By such approach many processes, templates, handbooks and guidelines were already developed which together with the developed Information Technology (IT) tools might provide a solution to the barriers affecting long-distance international transport by railway. In this regard the following IT tools, already mentioned in the paragraphs above are worth describing, which are considered the most relevant ones by the RFC5 and RNE:

- *Path Coordination System (PCS)* - which is an international path request coordination system for path applicants, e.g. Railway Undertakings (RUs), Infrastructure Managers (IMs) and Allocation Bodies (ABs). This internet-based application optimises international path coordination by ensuring that path requests and path offers are harmonised by all involved parties. Input for international path requests needs to be placed only once into one system – either into the domestic application or directly into PCS. For the efficient use the PCS or an interface between the national systems and the PCS has to be installed or developed.

- *Train Information System (TIS)* – which is a web-based application that supports international train management by delivering real-time train data concerning international passenger and freight trains. The relevant data is obtained directly from the Infrastructure Managers' systems.
- *Traffic Control Centres Communication „TCCCom" tool* – is a multilingual information exchange tool, working in 21 different languages to facilitate necessary communication between the Traffic Control Centres.

As also mentioned in the Rotterdam Sector Statement on Rail Freight Corridors titled Boosting International Rail Freight the further development and deployment of these IT tools is considered essential by the railway sector in order to solve the existing operational barriers and improve the performance of the European railway network, which shall also be financially supported by EU funds to accelerate the development of a Single Railway Area.

Further to the above, to support transition to a more rail-oriented transport market, open accessibility to terminals shall be always possible. Policy measures shall be also considered supporting the rail mode and mitigating external competition risks. These may also include pricing policies for road transport, also for the full internalisation of external costs of transport, inclusive of GHG emissions.

Regarding passenger transport by railways, some of the above-mentioned limitations concerning the infrastructure also apply. In addition when trying to enter the international rail passenger market, new operators are often facing barriers linked to inadequate implementation of previous railway packages or loopholes in previous EU legislation. Such barriers can be administrative (difficulties in obtaining a safety certificate or vehicle), operational (need for staff speaking all official languages along the route, volatility of infrastructure charges, access to operational facilities and services, difficulties to align train paths in domestic timetables to get suitable international paths, lack of the inter-availability of tickets) and also commercial (difficulties to use existing sales facilities on a fair and non-discriminatory basis or to rent space in stations). Due consideration shall be given to these barriers, especially in those cross-border areas where international rail passenger market services have some potential market or could be implemented to support cohesion between cross-border regions.

About multimodal transport operations of freights at the core ports and rail-road terminals no corridor specific issues are noticed. General aspects particularly relevant for the development of multimodal freight and combined transport fall however within the scope of the implementation of VTMIS and e-Maritime services and solutions aimed at promoting Single Window initiatives to access ports, track flows of vessels and transported intermodal vehicles, rolling stock and goods entering and exiting port areas; and/or simplifying administrative procedures associated to custom, safety and security processes. Activities and initiatives in these fields are already operative and under constant development/evolution (i.e. the Polish Port Community System under implementation by the Polski PCS Ltd., dedicated to the optimisation, automation and control of transport processes). These solutions are however found to apply more at the national/local scale and are not integrated and fully interoperable at the Union level.

Initiatives including pilot projects are also ongoing which relate to safety and security aspects of multimodal transport at rail-road terminals. Telematics solutions are furthermore in place or going to be implemented aimed at simplifying the administrative procedures related to multimodal transport. ICT real time information initiatives are in place or are being implemented even between nodes to monitor and increase the effectiveness and efficiency of the logistics chain and its basic operations. Still, these seem to be more local or in any case associated to the network of operations of the Multimodal Transport Operators rather than implemented at the European transport system scale. About these aspects the 2014 study "Analysis of the EU Combined Transport" by the European Commission notices how combined transport seems lacking an "open data" ICT platform for exchanging booking, operational and tracking and tracing data between relevant companies involved in the combined transport supply chain. "Open data" means that the system has standardised interfaces and is not determined or controlled by a single actor.

In the same study it is noticed that further to the interoperability issues associated with the characteristics of the rail infrastructure and national systems (also including train weight, axle weight, loading gauge not allowing 4m high semi-trailers or transport of 9'6" high-cube containers) the development of rail combined traffic is currently hindered by total handling costs. This applies to a higher extent to continental shipments with at least two additional handlings compared to road transport. Substantial cost savings on the rail leg are required for the feasibility of combined services, given also the additional cost of the pre- and post- carriage legs by road. In this respect, the availability of inland terminals within a short road distance is a main prerequisite for users of combined transport services to ensure competitive door-to-door costs. In fact, disproportionately high last-mile costs arise if terminals are located off the main line. Also, efficient last mile rail connections and rail logistics terminals in the main ports are essential to support the growth in the maritime-based rail combined transport.

Finally, no corridor specific barriers have been identified which affect other transport modes infrastructure and services. However, in view of the growing trends in cross-border traffic operations and the target for the core network to support the development of long distance traffic across the Union, due consideration shall be given to the promotion and development of digital links and initiatives for the exchange of traffic data and provision of information to the users. This objective is paramount for all transport modes and for both freight and passenger transport. However, these actions would be particularly beneficial for road transport, at urban nodes, particularly at multimodal and transfer hubs. The future outlook seems to point to the development of cross-modal and borderless commercial solutions of mobility services. Services information and travel planner multimodal platforms as well as Mobility as a Service solutions at different territorial and operational scales are currently under development and implementation which are facing challenges particularly concerning the governance models and trust mechanisms required to set up and manage a common database of sensitive and commercial data on both service operations and users. Legal and administrative actions are required in addition to technological solutions to support the development of the digitalisation of mobility services along and across the corridors and in their urban nodes. This would be required also to facilitate the implementation of development of interoperable toll collection systems on the EU agenda since more than a decade (Directive 2004/52/EC - 2009/750/EC), and the provision of key data to users, including real time information and passengers' rights at corridor links and nodes.

4. Market analysis: multimodal transport flows and capacity along the BA Corridor

A multi-modal transport market study that covers all corridor relevant modes of transport has been elaborated in 2014 and further complemented by the elaboration of market performance indicators and the consideration of the market analysis of the BA Rail Freight Corridor as presented in their Implementation Plan. This analysis has been prepared at the threefold purpose of:

- Providing a comprehensive view on the current multimodal transport flows on the rail and road corridor infrastructure and at the main interconnecting nodes (maritime and inland ports, airports);
- Measuring the current performance of rail and road transport along the corridor and developing a prognosis of its evolution during the time horizon of the corridor work plan (2014-2030), also including the effects of the investments planned to be implemented for the improvement of the corridor;
- Supporting the definition of the critical issues for the development of the corridor, complementing the analysis of the compliance and quality of the infrastructure with a view to identifying the possible issues related to the transport infrastructure capacity on the road and rail networks;
- Identifying the potential market uptake for rail transport in consideration of the spare capacity and providing recommendations activities for modal shift towards rail.

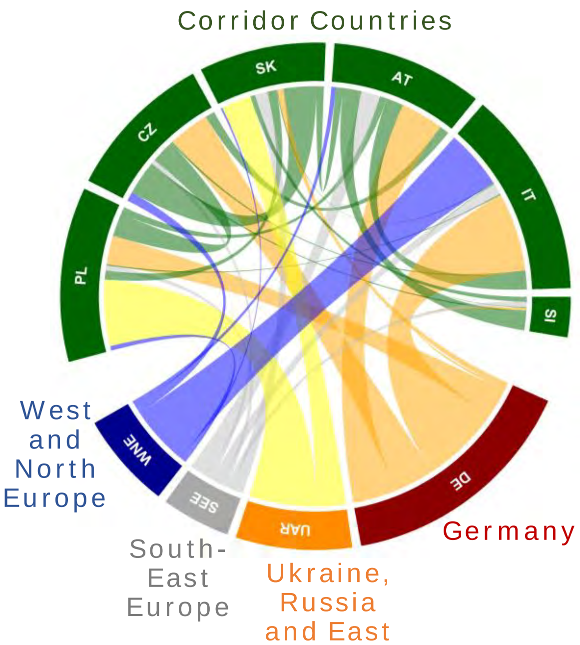
4.1. The current transport flows on the corridor

Indicators concerning the international inland transport flows (road and rail) on the BA Corridor, developed on the basis of officially available data (Eurostat), shows that in 2014 more than 530 million tons of freight were moved from/to the corridor countries, with a rail modal share of 36%. Flows between the six countries within the corridor accounted for 120 million tons (38% of rail modal share) – out of which 98.4 million tons along the North-South alignment (excluding the CZ – SK internal flow) (see overleaf chart).

Figure 18 International freight flows (in tonnes) by rail and road along the BA Corridor

Rail

Total import and export: 190 million tons (36%)
Internal (green): 45 million tons (38%)



Top five bidirectional flows by rail (overall):

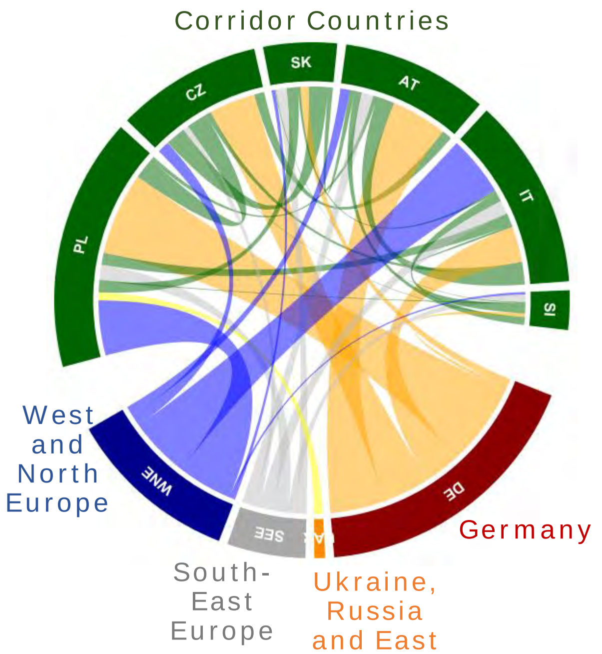
1. Italy-Germany (26 Mt)
2. Poland-Ukraine/Russia (22 Mt)
3. Italy–West and North Europe (20 Mt)
4. Austria-Germany (14 Mt)
5. Czech Republic-Germany (14 Mt)

Top five bidirectional flows by rail (internal):

1. Czech Republic-Slovakia (11 Mt)
2. Czech Republic-Poland (8 Mt)
3. Austria-Slovenia (6 Mt)
4. Austria-Italy (6 Mt)
5. Austria-Czech Republic (3 Mt)

Road

Total import and export: 340 million tons (64%)
Internal (green): 75 million tons (62%)



Top five bidirectional flows by road (overall):

1. Poland-Germany (49 Mt)
2. Italy–West and North Europe (35 Mt)
3. Austria-Germany (33 Mt)
4. Poland–West and North Europe (32 Mt)
5. Czech Republic-Germany (27 Mt)

Top five bidirectional flows by road (internal):

1. Czech Republic-Poland (12 Mt)
2. Czech Republic-Slovakia (11 Mt)
3. Austria-Italy (10 Mt)
4. Italy-Poland (7 Mt)
5. Poland-Slovakia (7 Mt)

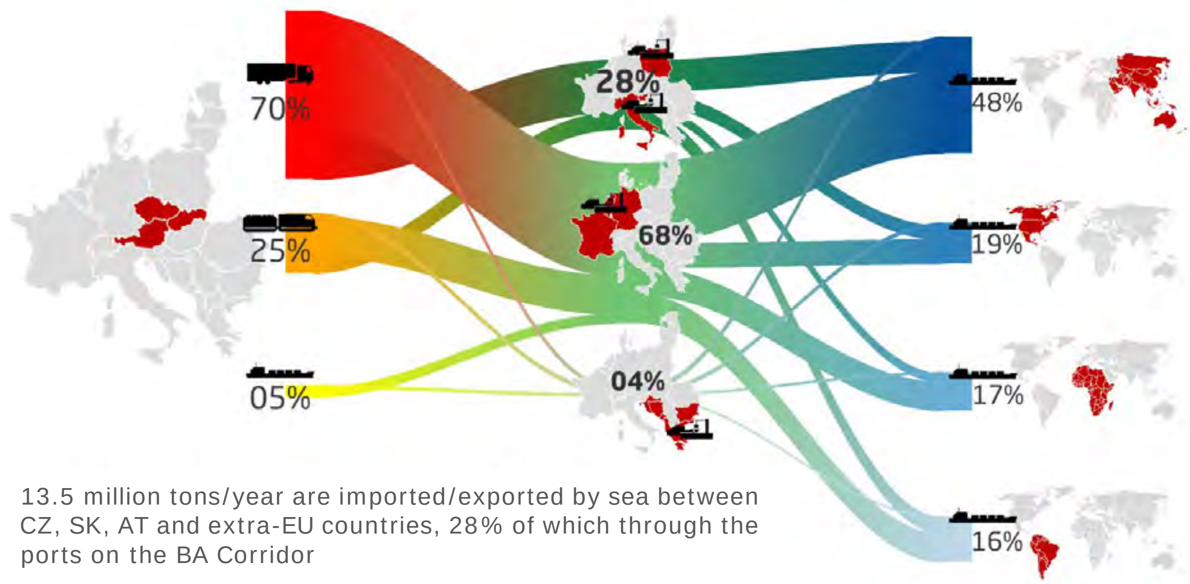
Source: BA Corridor study consortium based on Eurostat data

Overall, rail modal share for freight is around 35% in international transport to/from the six countries along the BA Corridor (see Figure 22) and 38% if considering only the flows between the six countries. This is a relatively good starting base for the development of international multimodal sustainable transport, also in consideration of the targets set in the White Paper for long distance freight transport (30% of rail or waterborne transport by 2030, and 50% by 2050). Critically to be noticed is however that rail transport along the corridor - and especially in the Eastern Member States - is still largely composed by traditional market segments of low added-value goods (coal and energy products, ores, metals and building materials). The development of competitive combined rail transport services for manufactured products is therefore of outmost relevance in order to maintain or increase the rail modal share in the medium-long term.

Freight transport services along the BA Corridor do not only allow for seamless intra-EU flows of goods, contributing to the development of the internal market, but also serve as first or last leg of the multimodal transport chains interconnecting the corridor regions to extra-EU commercial partners, especially through seaports (see overleaf).

In this respect, ports on the BA Corridor act as gateways to the world markets, and their role is increasingly developing, with ports inland catchments areas expanding outside the national boundaries. The case of the landlocked countries on the corridor (Austria, Czech Republic, Slovakia) shows that 28% of their traded goods flows through one of the seaports of the BA Corridor. The largest share of trade exchange is with China and the Far East (48%), while the other continents are below 20% each. The intra-EU transport leg to access / leave the ports is mostly undertaken by road (70%), with a relevant share of rail (25%) and lower for inland waterways (5%).

Figure 19 Multimodal freight transport chains between landlocked countries on the BA Corridor and extra-EU countries (2010)



Source: BA Corridor study consortium

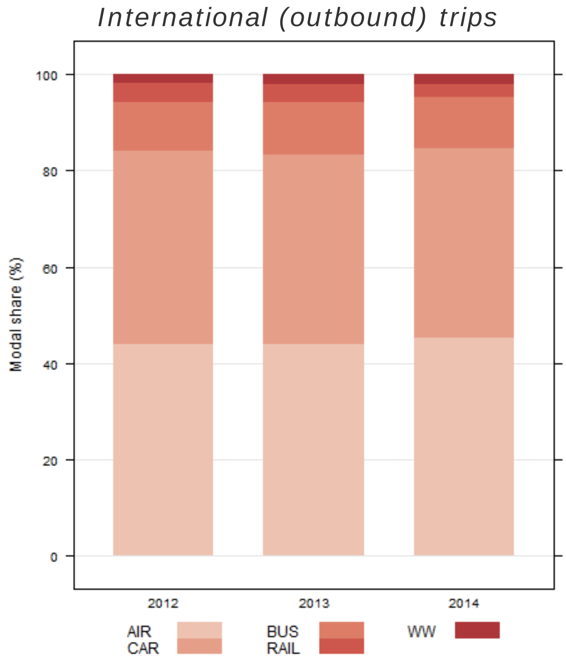
Modal shares for international and domestic passenger transport along the BA Corridor were also analysed on the basis of the official Eurostat statistics[1]. The overall picture is quite different than for freight transport, with a more significant role for aviation / especially for international trips, and strong dominance of road transport for domestic travel.

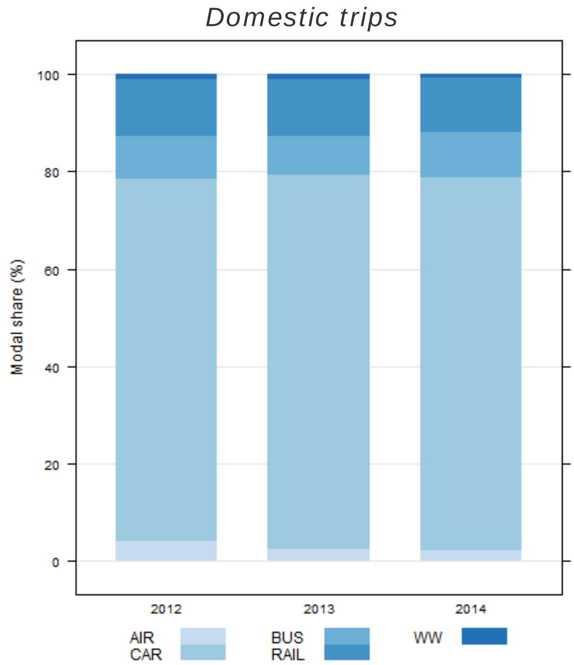
For international trips by residents in the six countries along the BA Corridor, air is the main mode, with a share slightly below 45%; passenger car accounts for approximately 40% of trips, while bus and coaches add another 10% of transport by road; rail and waterways (both maritime and inland) are relatively marginal, with a combined share between 6% and 4% depending on the year of observation.

Modal share is quite different if one looks at domestic trips, where road (car and bus) is dominant with approximately 85% of share, followed by rail at approximately 12%; shares for air and waterways are marginal (2% for air and 1% for waterways).

[1] Compared to freight, fewer and less comprehensive data are publicly available in order to elaborate indicators on the passenger modal share. The indicator is based on Eurostat data for the corridor countries concerning annual trips of EU residents, aged 15 or over, for personal or professional/business purpose, with at least 1 overnight stay.

Figure 20 Modal share indicators for passenger transport on the BA Corridor in 2014



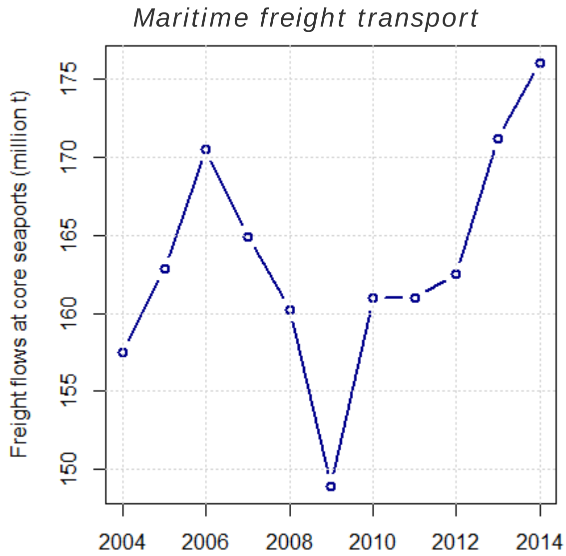


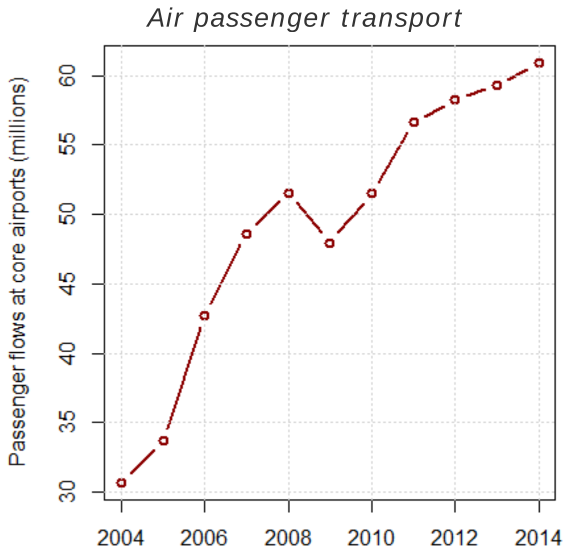
Collective transport modes lead in international passenger travel (Air, Bus, Rail and Waterways have a combined share of 60%), while personal car transport prevails in domestic trips (76%).

Source: BA Corridor study consortium based on Eurostat data

Looking at road and rail collective transport, railway transport has larger share than bus transport for domestic trips, but not in the international segment. This confirms that the market for international passenger trips is currently not well developed for railway compared to the bus mode.

Figure 21 Transport volumes at seaports and airports (2004-2014)





Freight flows at seaports recovered to pre-recession volumes only in 2013, 7 years after the 2006 peak. In comparison, recession hit air freight transport only in 2009 and recovery only took 1 year

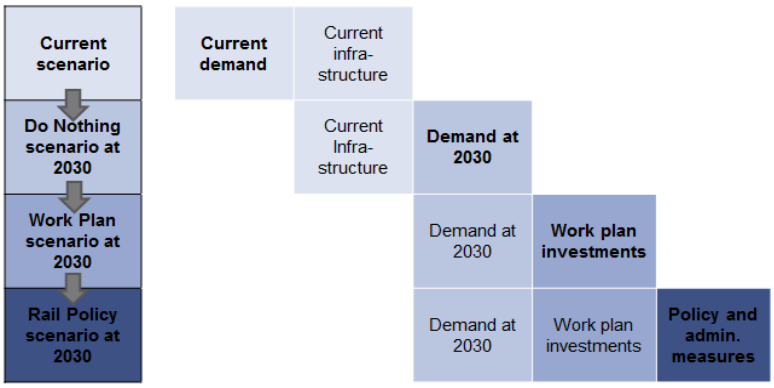
Source: BA Corridor study consortium based on Eurostat data

In 2014, more than 175 million tonnes of goods have been loaded or unloaded in the corridor core seaports. At the same year, the total passenger flow on regular lines (excluding cruises), reached almost 3.6 million. Both for freight and passenger, the total flows are above the pre-recession levels. Also in 2014, more than 60 million passengers have departed or landed in the corridor core airports. At the same year, the total freight flow reached almost 400 thousand tonnes. Total transport volumes by air have almost doubled since 2004, both for passenger and freight transport.

4.2. Prognosis of the transport market evolution until 2030

Four main scenarios were developed for the prognosis of the rail and road performance, gradually introducing different assumptions on a step-by-step basis, thus allowing for the separate assessment of their effects.

- *2014 (current scenario)* – describing the interaction of the current travel and transport demand and the current corridor infrastructure;
- *2030T (do-nothing scenario at 2030)* – describing the interaction of the travel and transport demand at 2030 with the current corridor infrastructure (as for the 2014 scenario);
- *2030WP (work plan scenario at 2030)* – describing the interaction of the travel and transport demand at 2030 (as for the 2030T scenario) and with the corridor infrastructure improved based on the major rail and road investments planned to be implemented for the development of the corridor;
- *2030RP (rail policy scenario at 2030)* – describing the interaction of the travel and transport demand at 2030 with the corridor investments (as in scenario 2030WP), combined with policy and administrative measures in support of rail transport (such as the internalisation of the total transport costs, the promotion of more attractive rail services, the fourth railway package, the removal of administrative and operational barriers).

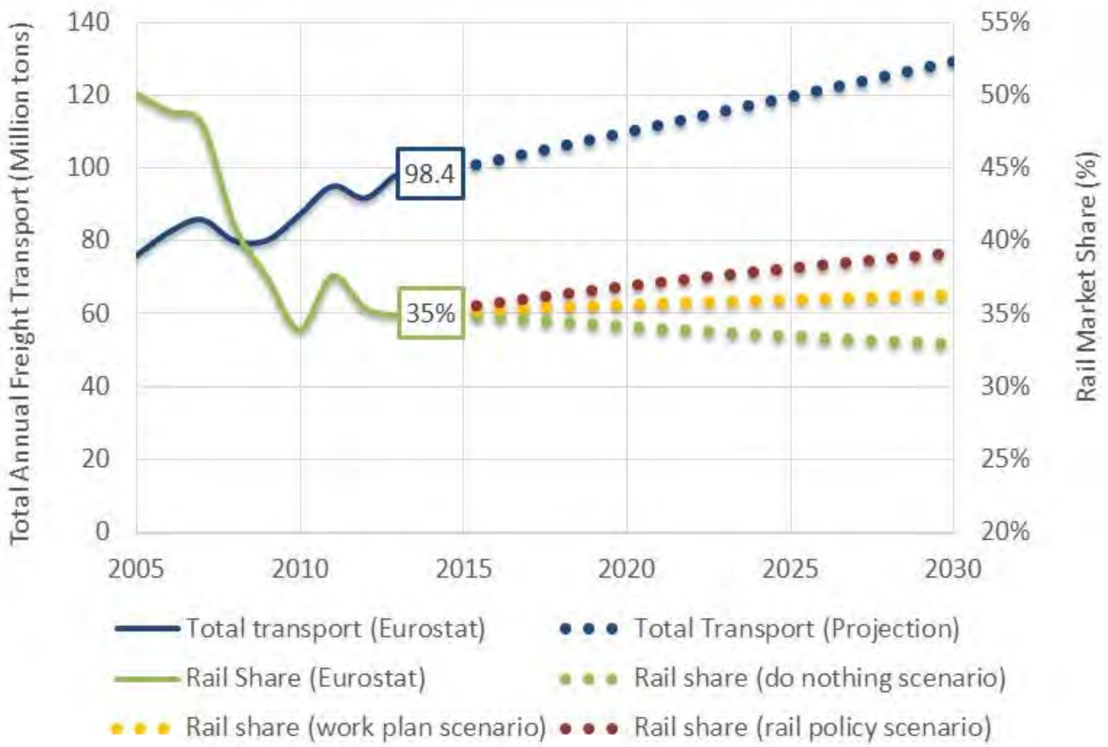


In the interpretation of the results of the transport market study for the corridor, the scope of the study, together with the very large area covered by the analysis and the limitations in the demand and traffic data available, should be kept in mind. Inevitably, significant margins of uncertainty affect the results in terms of absolute values and shares. Notwithstanding these limitations, by comparing the outcomes in the different scenarios and in consideration of the past trends, the analysis provides some clear indications concerning the main trends. Transport performance by mode, the potential effects of the planned rail and road transport investments in combination with policy measures aiming at supporting the use of railway and environmentally friendly transport systems are the most visible.

In what concerns the freight transport, the figure overleaf shows the aggregated international transport volumes and modal share along the BA Corridor in the last decade and the prognosis for the duration of the work plan:

- Notwithstanding the effect of the economic recession in 2008/2009 and 2012, total transport volumes have significantly increased since 2005 (from 75.8 million tons in 2005 to 98.4 in 2014, +30%, +2.9% average year-over-year), mainly driven by the economic growth in the Eastern European countries and their integration in the EU economy. This growth is expected to continue in the future, albeit at a reduced pace reaching 130 million in 2030 (+31%, +1.7% in average year-over-year).
- In the past, the rail modal share has declined progressively, from around 50% of the total transport in 2004 to around 35% in the last two years of analysis (2013 and 2014). This decline has been more rapid in the period 2004-2010. Whilst since then the modal share has stabilized, the decline in rail transport share was driven by the high growth in road transport in the Eastern European Countries, combined with the higher sensitivity to economic recession of rail transport.
- Without significant investments, the rail freight share is expected to further decline (32%). The investments in rail and road infrastructure planned to be implemented for the development of the corridor in addition to improving sustainability and cost efficiency in all transport modes, are expected to have a positive, although limited, effect in counterbalancing this trend, with a rail share slightly exceeding the current position (36%).
- Additional policy and administrative measures (including the implementation of the BA Rail Freight Corridor which became operational in autumn 2015) could contribute to a great extent in the promotion of rail transport, with market shares for this mode rising to 39%.

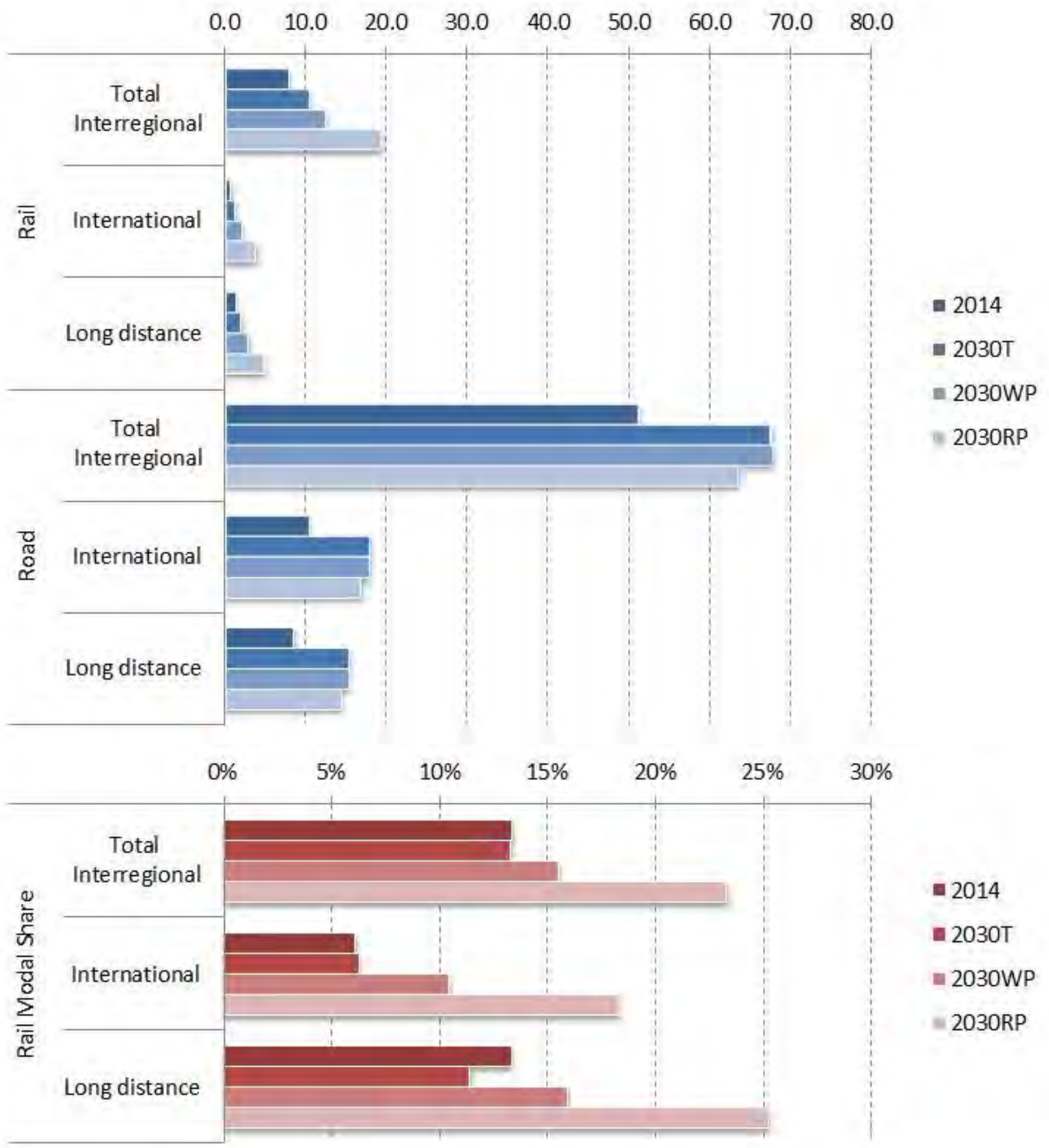
Figure 22 Total volume and rail market share of the international inland freight transport along the BA Corridor (millions of tons)



Source: BA Corridor study consortium

The results for passenger transport presented in the figure below focus on the rail and road interregional[2], international and long distance transport demand along the corridor, which are the key target of the EU and TEN-T transport policy.

Figure 23 Performance and modal share of the BA inland surface transport modes (millions of pax*km/year)



Source: BA Corridor study consortium

According to the performed analysis:

- The current rail modal share in interregional transport is around 13% overall (measured in pax*km) but much lower for international transport.
- The transport demand is expected to grow significantly by 2030 (+32% for passenger, +1.8% in average year-over-year).

[2] The interregional demands include only trips occurring between two distinct NUTS2 regions both located along the BA Corridor alignment. The long distance demand includes interregional trips longer than 300 km.

- Without significant investments, the rail share is expected to remain stable (13%). The investments in rail and road infrastructure, in addition to the positive impacts on environments and transport costs, will have a positive, although limited, effect on the rail modal share (15% in 2030 overall), with major increases in the international and long distance segments.
- Additional policy and administrative measures, also including significant steps in the development of a single EU transport market, could contribute to a great extent in the promotion of rail transport, with market shares for this mode rising to 23% of interregional demand (25% for long distance transport).

In conclusion, the prognosis of the market trends shows that in the time horizon of the work plan the total transport volumes are expected to continue growing, especially in the North-East part of the BA Corridor, where most of economic growth is also expected.

The investments in the inland rail and road networks are expected to generate significant benefits improving the sustainability within each transport mode and overall, increasing cost efficiency for transport providers and generating benefits for the users. More significant benefits in terms of sustainability and development of rail transport may be achieved if additional accompanying policy and administrative measures are put in place. In this case, the combination of the envisaged market shift and the natural growth of the rail market will lead to almost doubling of the current rail volumes in certain corridor sections. Based on the analysis of these current and potential capacity issues under the various scenarios described above, capacity issues have been analysed for the rail and road networks which are illustrated in the following section.

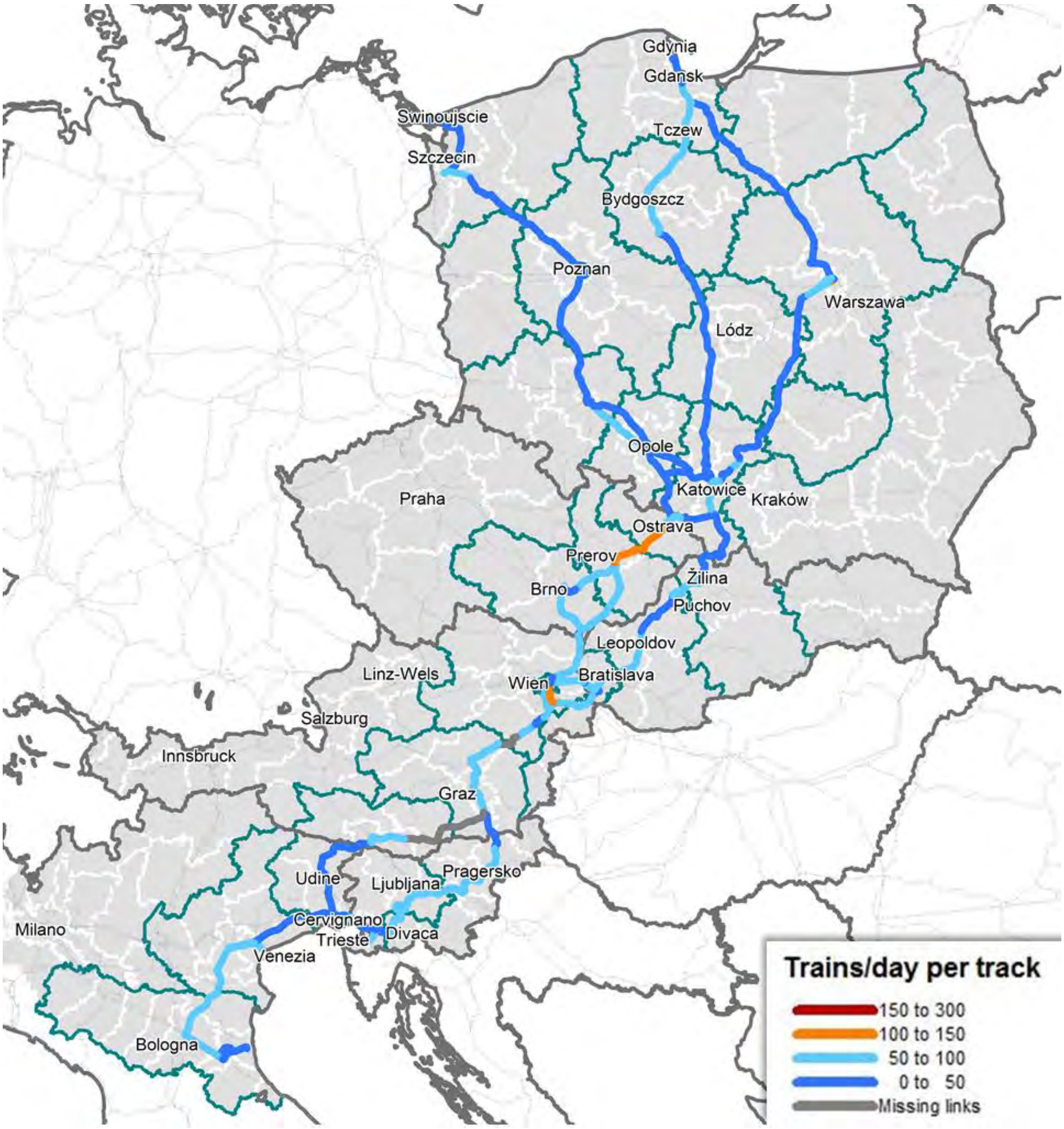
4.3. Capacity issues on the rail and road networks

The identification of the possible capacity issues on the rail and road corridor infrastructure is based on the analysis of the current and predicted traffic volumes in comparison with the available number of rail tracks and road lanes. It should be noted that this analysis does not constitute a complete assessment of the capacity of the infrastructure, which would require much more detailed analysis (especially for rail, where capacity limitations may refer to any of the rail subsystems and not necessarily the number of tracks). The main purpose of the analysis is to provide a comprehensive view on the use of the available capacity of the rail and road infrastructure and to contribute identifying in advance possible capacity issues in the mid and long term. To this respect, additional information concerning the assessment of capacity issues is derived from the list of capacity bottlenecks identified in the Implementation Plan of the BA Rail Freight Corridor.

4.3.1. Flows and capacity on the rail network

The following figure shows that current flows on the rail network are generally below the critical level, set in the corridor analysis at 150 trains per day per track for a double track line. Taking into account that rail infrastructure can also operate above this traffic level – especially if specific technological and signalling solutions are implemented – rail capacity is not a generalised short-term issue for the corridor.

Figure 24 Intensity of rail transport (2014, trains/day/track)



Source: BA Corridor study consortium, elaboration based on TENtec data and sections as of 2014

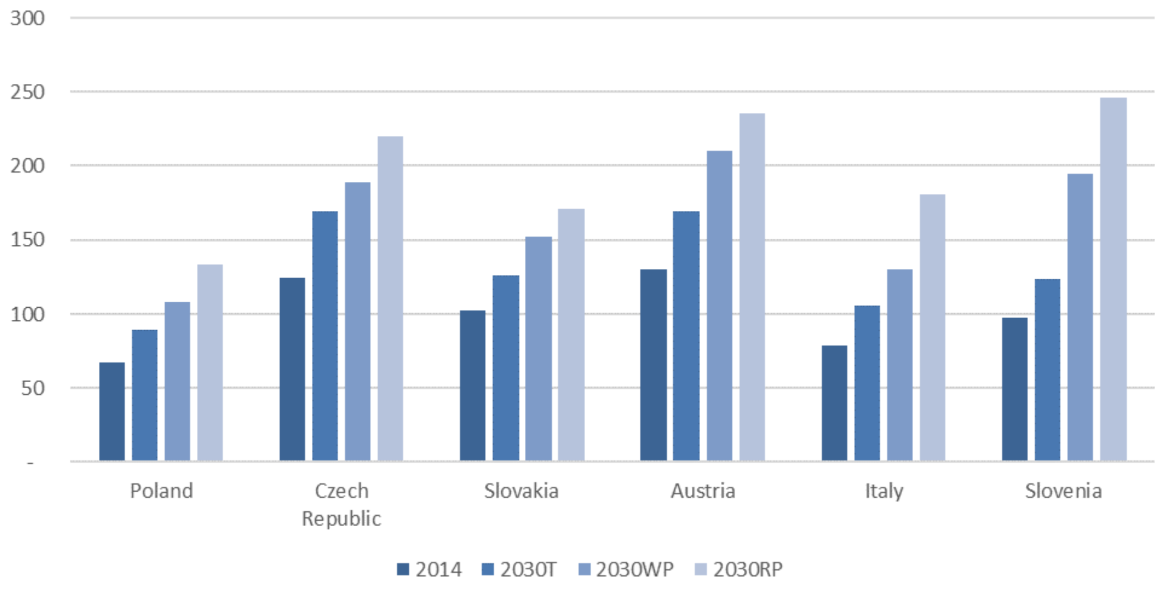
On the other hand, it should be underlined that by restricting the analysis to the work day rather than to the calendar day some sections of the corridor already present high levels of traffic, such as the Graz – Bruck/Mur section, with 240 trains per work day and the single line section connecting Werndorf to Spielfeld – Strass/Šentilj with 112 trains per work day between Werndorf and Leibnitz. The section Brno – Přerov is also worth mentioning in terms of capacity, although not directly resulting from the analysis as significantly critical due to the replacement of railway services with bus operations for capacity related issues.

Finally, it is worth noting that in certain sections of the corridor rail infrastructure, specific capacity issues exist due to poor technical parameters of the infrastructure limiting the capacity below the theoretical level allowed by the number of tracks. This is for instance the case in several sections in Slovenia requiring modernisation, including the single track section Koper – Divača, where investments are foreseen to solve current capacity constraints due to strong gradient and limited train length and hence the available residual capacity might be exhausted in the near future, should freight traffic growth continue at today's pace.

In the medium and long term, the improvement of the railway infrastructure will induce a significant growth in the corridor rail transport volumes, at the same time, increasing capacity by means of construction of new links and infrastructure and technological modernization of existing lines, including doubling of some of the existing single track sections.

In this respect, it should be noted that in certain urban and metropolitan areas, new services are being implemented, e.g. Bologna node, between Bologna and Castelbolognese, and Gdynia/Gdańsk where the Pendolino high-speed trains are in operation and the Pomerania Metropolitan rail services were introduced. These foreseen increases in rail services may lead to capacity issues particularly in view of the increase in freight traffic operations from the ports of Ravenna and Gdynia as well as Gdańsk respectively, which may be addressed by means of infrastructure and technological upgrading investments and timetabling/operational measures. Having specified this, it should be also noted that, under the applied approach, the growth in the corridor train traffic is also correlated to re-routing of services from alternative lines to take advantage of the improved infrastructure. This is of course an operational decision that might not be implemented by train operators and/or infrastructure managers, and subject to the availability of train paths. For this reason, the present assessment is likely to identify an upper limit in the increase in train flows on the corridor.

Figure 25 Average train flows along the corridor (trains/day)



Source: BA Corridor study consortium

Based on the analysis, the current available track capacity will be sufficient to accommodate train traffic growth along the corridor in the do-nothing scenario (2030T). This is also generally true for the work plan scenario, where the train volumes will further increase compared to the current situation (+60% in average along the corridor, but with growth mainly concentrated on the new or upgraded sections). However, local capacity issues would need to be appropriately managed – both in the detailed definition of the investments or in the management of the available capacity. These issues are considered to be mainly concentrated in urban agglomerations i.e. Warszawa and Katowice in Poland, Brno in the Czech Republic, Bratislava in Slovakia, Wien in Austria, and Ljubljana in Slovenia; and in specific sections such as the Ostrava – Přerov section in the Czech Republic. In addition, high traffic flows are expected to occur in the Austrian section between Werndorf and Wiener Neustadt, as a result of traffic induced by the completion of the two Alpine crossings (Semmering and Koralm).

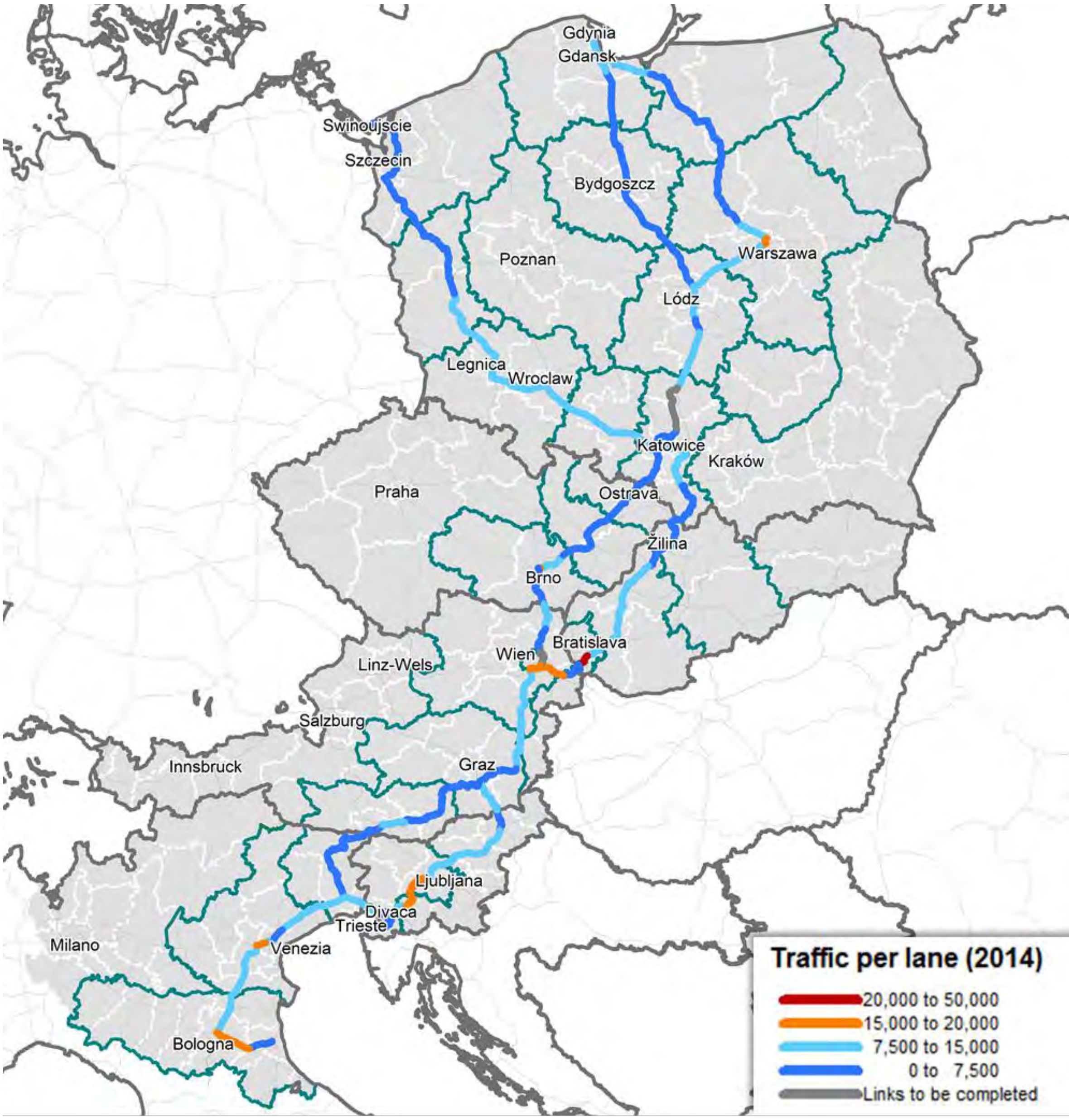
It is therefore only in the case of a more significant shift of transport demand towards the rail mode (such as the one depicted in the 2030RP scenario) that capacity issue might arise on the corridor, limiting the effective growth of the rail mode and the smooth flows of long distance transport. This is in particular the case for some single track sections along the corridor (such as the AT – SK cross-border section Wien – Marchegg – Devínska Nová Ves, the AT – SI cross-border section Werndorf – Maribor, the section Wien Meidling – Wampersdorf in Austria and the Udine – Cervignano section, including the Udine node, in Italy), but potentially also for other high traffic two-tracks sections. However, it should be noted that, in case this scenario will materialise, capacity to accommodate this additional demand might be provided not only with additional investments on the corridor, but also with the improvement of the comprehensive network, which can provide alternative routes to the main Baltic-Adriatic core network corridor. Such additional capacity needs would need to be fully analysed in due time should the traffic develop in line with the higher future projections.

4.3.2. Flows and capacity on the road network

The figure below shows that current road flows are generally below the critical level, set in this analysis at 20,000 vehicles per day per lane.

Taking into account that road infrastructure can also operate above this traffic level (although with reduced efficiency in terms of congestion), capacity is not a general issue for the corridor. The only section currently above the identified critical level is on the D4 motorway, within the urban area in Bratislava, where projects for a new external by-pass are being developed. By adding capacity to the existing D4 motorway between the intersection with the D1 and the border between Slovakia and Austria, the foreseen development of the D4 Bratislava motorway bypass is expected to solve this capacity bottleneck, diverting long-distance Light Duty Vehicles (LDV) and Heavy Duty Vehicles (HDV) from the D4 motorway crossing the Bratislava urban area.

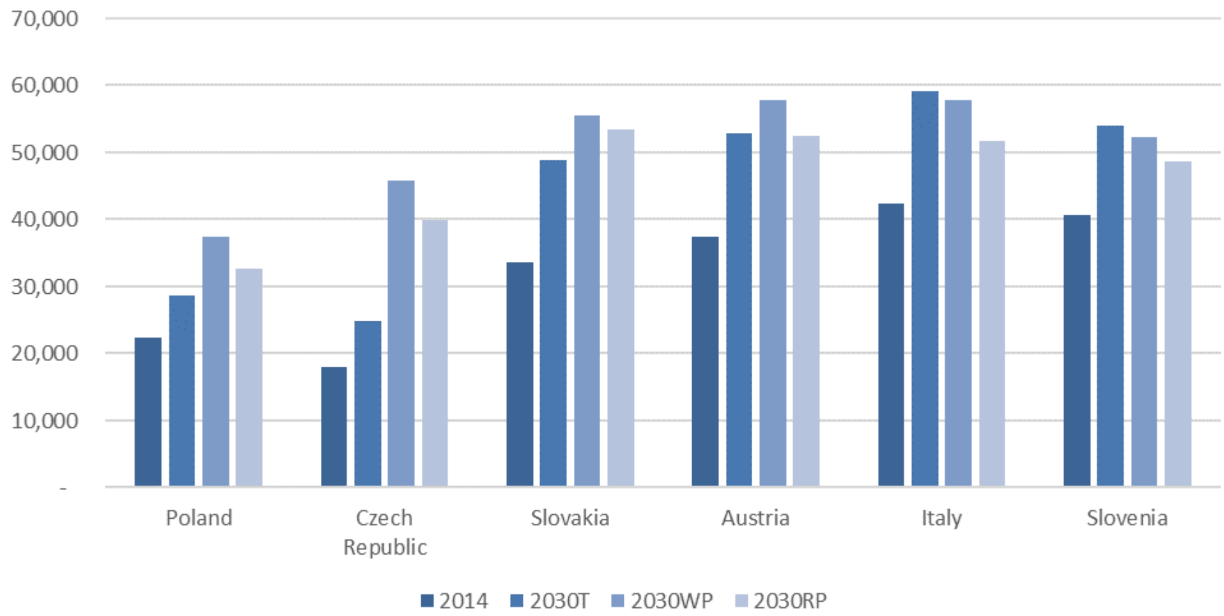
Figure 26 Intensity of road transport (2014, veh/day/lane)



Source: BA Corridor study consortium, elaboration based on TENtec data and sections as of 2014

The following chart shows that, as a result of the improvement of the infrastructure, the flows on the road infrastructure are expected to grow significantly in the time plan horizon, although this effect might be mitigated by improvements of the rail infrastructure and implementation of modal shift measures.

Figure 27 Intensity of road transport (vehicles/day)



Source: BA Corridor study consortium

The available infrastructure capacity (also taking into account the full implementation of all investments already included in the project list annexed to this work plan) will be generally adequate to accommodate growth in road transport volumes for all scenarios under assessment.

In a nutshell, the results of the transport market study show that with reference to existing and future likely flows of traffic on the BA Corridor no specific critical issues in terms of capacity are worth noting at present. This does not however aprioristically exclude that capacity problems may occur in the future, particularly in proximity of urban agglomerations and other major demand generation points as well as on the lines and roads interconnecting these nodes. In these terms, the corridor study may underestimate the extent and severity of specific situations where long distance flows add up and mix to the regional, metropolitan or even local traffic, which may be analysed in a more detailed way in future studies.

4.4. Analysis of potential market uptake and recommended activities for modal shift towards rail transport

The table overleaf provides in detail the estimated traffic volumes (in passegers*km and vehicle * km) along the BA Corridor alignment based on the results of the transport model for each of the various scenarios described above. At the following page, the graph shows the expected volumes of passenger and vehicle flow for the road and rail modes by Member State section of the corridor.

The results show that, should the rail mode performance improve substantially, as foreseen in the "Rail policy" scenario, the market uptake could be relevant, both for passenger and freight transport. This modal shift shall also allow using in a more efficient way the available spare capacity on the railway infrastructure as well as provide for positive environmental benefits due to reduced road transport.

Table 43 Transport activity volumes by mode for the modelling scenarios

Mode	Current Situation (2014)			
	Mpkm	Mtkm	Mvkm (pax)	Mvkm (freight)
Road	44,071	51,272	31,479	7,121
Rail	10,770	30,872	90	47
Total	54,840	82,143	n.a.	n.a.

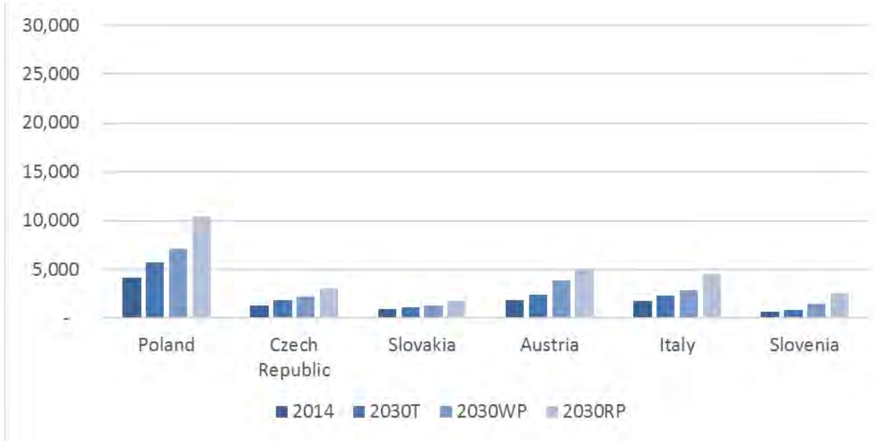
Mode	Trend Scenario (2030)				Trend Scenario (2030) - % change vs current			
	Mpkm	Mtkm	Mvkm (pax)	Mvkm (freight)	Mpkm	Mtkm	Mvkm (pax)	Mvkm (freight)
Road	60,271	65,449	43,051	9,090	37%	28%	37%	28%
Rail	14,320	39,906	119	61	33%	29%	33%	29%
Total	74,591	105,356	n.a.	n.a.	36%	28%	n.a.	n.a.

Mode	Work Plan Scenario (2030)				Work Plan Scenario (2030) - % change vs Trend			
	Mpkm	Mtkm	Mvkm (pax)	Mvkm (freight)	Mpkm	Mtkm	Mvkm (pax)	Mvkm (freight)
Road	69,278	82,000	49,484	11,389	15%	25%	15%	25%
Rail	18,907	49,339	158	76	32%	24%	32%	24%
Total	88,185	131,339	n.a.	n.a.	18%	25%	n.a.	n.a.

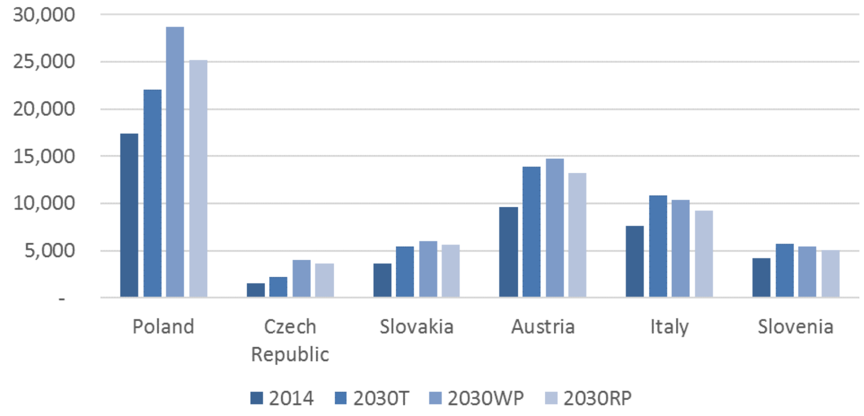
Mode	Rail Policy Scenario (2030)				Rail Policy Scenario (2030) - % change vs WP			
	Mpkm	Mtkm	Mvkm (pax)	Mvkm (freight)	Mpkm	Mtkm	Mvkm (pax)	Mvkm (freight)
Road	61,970	74,124	44,264	10,295	-11%	-10%	-11%	-10%
Rail	27,369	55,047	207	77	45%	12%	32%	1%
Total	89,339	129,171	n.a.	n.a.	1%	-2%	n.a.	n.a.

Note. Conversion from pkm to vkm is based on a unitary load of 1.4 pax/car and 120 pax/train. Conversion from pkm to vkm is based on a unitary load of 7.2 t/truck and 650 t/train. In line with the assumptions of the traffic model, unitary loads for rail are incremented by 10% in the rail policy scenario.

Figure 28 Transport activity volumes by mode and Member State for the modelling scenarios

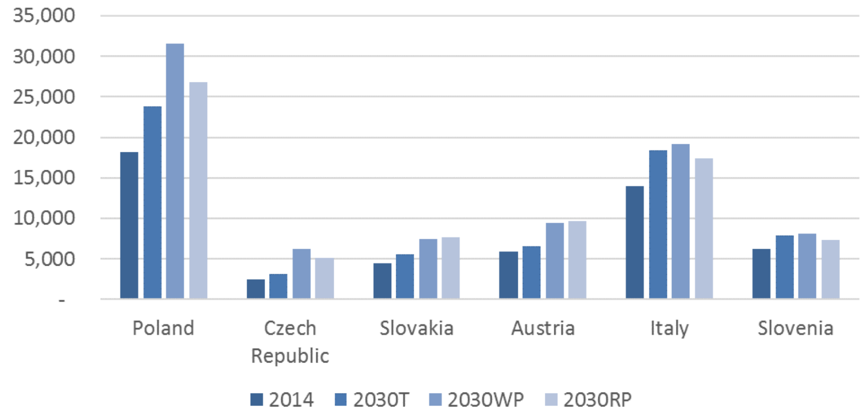


*Passenger Flows by Rail (pax*km/year, in million)*



*Passenger Flows by Road (pax*km/year, in million)*

*Freight Flows by Rail (tons*km/year, in million)*

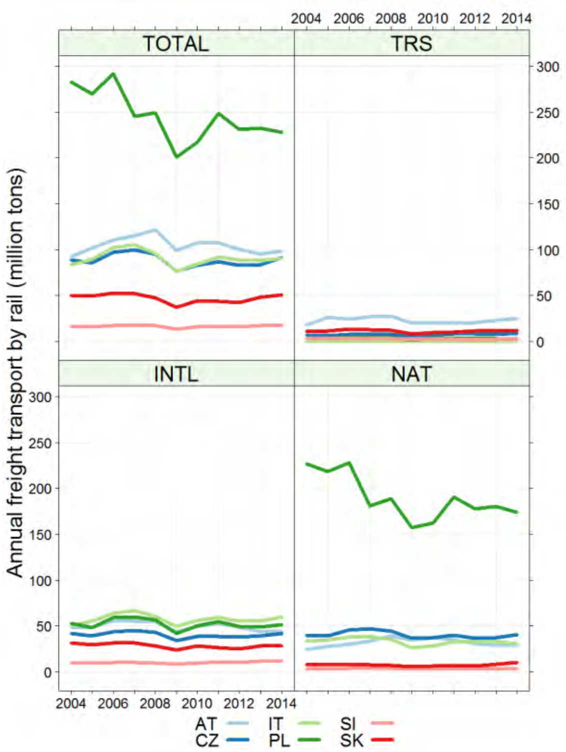


*Freight Flows by Road (tons*km/year, in million)*

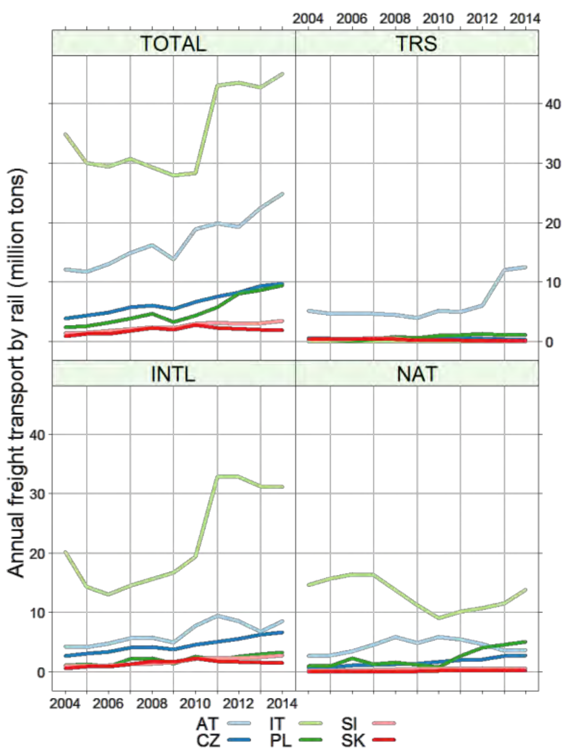
The analysis also confirms that infrastructure improvements alone will not suffice to promote such a modal shift towards rail. Several accompanying operational and policy measures to improve rail performance ought to be in place, which shall be specifically tailored to the more relevant existing and potential market segments for rail. These measures are discussed below, on the basis of the available market data and the results of the discussions with the BA Corridor stakeholders during the Forum and working group meetings.

Regarding the freight sector, the figure below shows that the total volumes in the corridor Member States is mainly composed by national traffic (particularly large in Poland), but that rail share has overall declined significantly. On the other side, the figure shows that, despite the general negative trend, international rail combined transport is gradually developing and increased by 81% in the last decade, from 12% to 23% of the total rail transport.

Figure 29 Annual rail freight transport in the corridor Member States by type of transport (Total, Transit, International and National) and handling class (Total rail transport and Unaccompanied combined transport)



Total Rail Transport

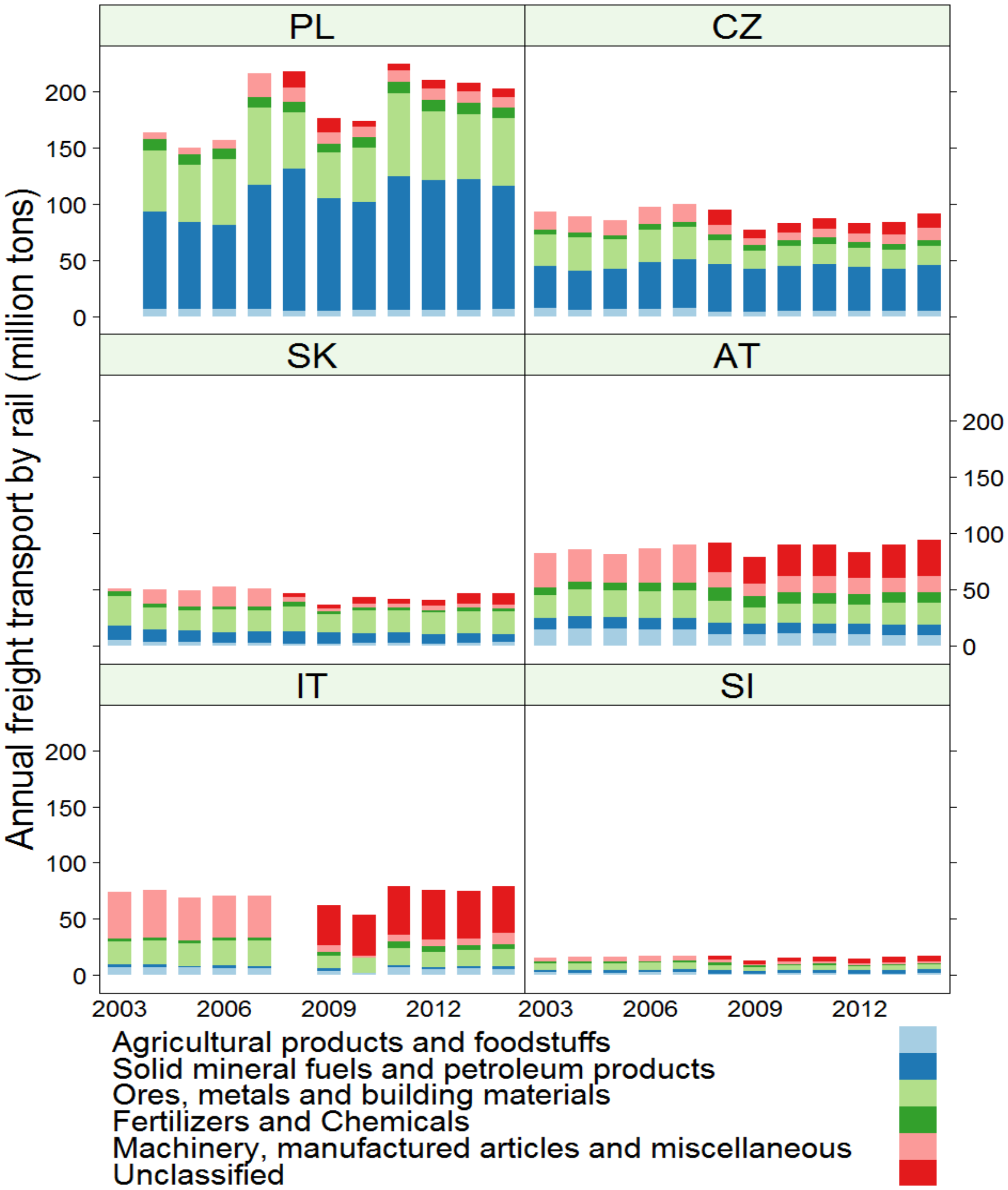


Unaccompanied Combined Transport

Source: Eurostat, UIC

In line with the still minor share of combined transport, the data on rail traffic composition by good category show that rail volumes (in tons) in the corridor Member States are still largely composed of commodities that fall in the traditional market for rail: solid mineral fuels (including coal), ore, metals and building materials, fertilizers and chemicals. The share of manufactured articles is generally low, especially in Poland and Czech Republic.

Figure 30 Annual rail freight transport in the Corridor Member States by commodity group



Source: Eurostat

Note: The data series has a discontinuity in 2007. Data before 2008 are included only for reference

In consideration of the observed market trend in the corridor Member States, as well as the general trend due to market globalisation, where growth in freight transport is higher for finished products, any modal shift towards rail in the BA Corridor will not only require maintaining the competitive advantage of rail in its traditional markets, but also to further develop rail combined transport (both continental and maritime).

In this regard the market study developed for the BA Corridor not only shows that the investments in the modernisation and improvement of the quality and standards of the railway infrastructure, including last mile connections to ports and rail-road terminals and provision of efficient and modern logistics platforms is essential to keep this transport mode competitive. Other measures than infrastructure development shall be implemented aimed at supporting multimodal and combined transport which relate to the removal of the operational and administrative barriers described at Section 3,4 above. The capacity of the BA Corridor to support the development of a more sustainable transport system across EU Member States and Regions significantly depends on the consideration of these additional measures, which may fall under the scope of what may be defined "Rail Policy" scenario.

5. Action plan for the removal of physical, technical, operational and administrative barriers between and within transport modes and for the enhancement of efficient multimodal transport and services

5.1. Specific BA Corridor objectives and critical issues

The analysis of the characteristics of the BA Corridor, in terms of consistency with the regulations, bottlenecks and missing links in the road and rail infrastructure, deployment of traffic management systems, intermodal nodes and their interconnections, operational and administrative barriers – as illustrated in the previous chapters – provides the recognition of the main development needs of the corridor, and allows for translating the general objectives and the priorities of the TEN-T policy into specific corridor objectives for each policy category. Unlike general TEN-T objectives and priorities, which are set out at Union level, specific objectives are defined at the corridor level, providing additional specifications to ensure appropriate targeting for the national and regional context.

Further to the analysis of the characteristics of the BA Corridor (i.e. in terms of its compliance with the technical requirements of the TEN-T Regulation (Chapter II, and particularly Art. 39), its capacity bottlenecks and missing links in the road and rail infrastructure, the deployment of traffic management systems, operational and administrative barriers as well as urban nodes and their interconnections), a number of critical issues have been identified for the BA Corridor. Indeed, the corridor analysis clearly points to the main development needs and specific objectives of the corridor towards the achievement of the general objectives and the priorities of the TEN-T policy:

- Removing the main rail and road bottlenecks to encourage the development of long-distance international traffic flows along the corridor, by improving the most critical cross-border rail and road connections (Poland – Czech Republic / Slovakia, Czech Republic – Austria, Austria – Slovakia, Slovenia – Austria / Italy), also promoting the development of digital cross-border links for the exchange of traffic data and provision of information services:
    - Among the critical cross-border sections the Katowice-Ostrava-Žilina Triangle rail cross-border sections between Poland, Czech Republic and Slovakia are particularly important for their localisation in relevant economic and industrial areas of the corridor, with sustained traffic of freights between Poland and the Czech Republic. The Bratislava-Wien cross-border section via Devínska Nová Ves and Marchegg, is the only non-electrified section of the whole corridor and is interconnecting two European capital cities, creating together a cross-national twin city metropolitan area;
    - Improve the performance of railway transport by means of identification and solution of operational and administrative barriers affecting the development of intermodal and combined traffic along the corridor and at its main logistics nodes.
- Ensuring the timely completion of the ongoing projects at the Alpine crossings in Austria in order to remove the two missing links along the corridor.

Figure 31 Critical cross-border sections and missing links on the BA Corridor

Source: BA Corridor study consortium

- Improving the infrastructure quality and standards with the target to comply with the technical requirements set in Regulation (EU) 1315/2013, in particular concerning transport infrastructure for rail (especially speed, axle load, train length of the core sections and train length and electrification of the rail access to the core freight terminals) and road transport (road class – motorways or expressways):
    - Substantial efforts are required for the modernisation of the national corridor railway links in the Eastern Member States where the gaps in reaching the standards set in the Regulation appear to be more extensive.
- Enhancing multimodal transport by supporting the optimal infrastructure integration and interconnection of all transport modes at transport nodes, and the deployment of ICT solutions to simplify administrative processes and improve the performance of the terminals in the wider logistics chain in terms of time savings, reliability and security:

  - Improvement of last mile connections outside and inside the ports and development of hinterland connections of ports are crucial to support growth of multimodal transport along the corridor and core network, with a need to focus on rail last mile connections to support competitiveness and growth of sustainable transport by railway.
- Improving interconnection in all urban nodes along the corridor between TEN-T and local transport infrastructure, for both passenger and freight traffic:
  - The development of the rail infrastructure at core urban nodes, including rail interconnections to core airports (or alternative fixed links) as well as the development of interchange and transit systems are considered of relevance to facilitate the transfer of passengers between the corridor nodes within the urban area and between long distance and regional/local traffic. ITS/ICT telematic applications for multimodal and integrated transport operations either within the metropolitan area or along the corridor are also important for the development of sustainable transport and mobility solutions for both passengers and freight.
- Support the development of interoperable transport networks, in particular through the promotion of transport digitalisation and the deployment of telematic applications and their further technological advancement, with a focus on ERTMS.

As reported at Section 2.4.1 above, several of the above specific objectives have been also defined in the work plan by the European Coordinator Prof. Kurt Bodewig as priorities for the development of the BA Corridor by 2030, and namely:

- The cross-border links both for rail and road, including digital cross-border links for the exchange of traffic data and provision of information services for both modes;
- The timely implementation of the major projects of the Alpine crossings in Austria in order to remove the two missing links;
- The compliance of the corridor infrastructure with the quality and standards set in Regulation (EU) 1315/2013, with a particular focus on the completion of the modernisation of the railway infrastructure in Cohesion Member States;
- The 'last mile' connection of the ports building the start and end point of the corridor;
- The interconnection in all urban nodes along the corridor between TEN-T and local transport infrastructure;
- The interoperability of the transport network, in particular through the full deployment of ERTMS along the corridor.

5.2. Actions for the development of the BA Corridor

In accordance with Art. 47 of Regulation (EU) 1315/2013, already in 2014 as part of the first BA Corridor study an analysis of the investments required to develop and implement the core network corridor by 2030 has been carried out for the BA Corridor. This first project list has been elaborated on the basis of a bottom-up approach involving all institutions members of the Corridor Forum and other relevant stakeholders. Rail, road, port, airport infrastructure managers as well as Member States and regional authorities have been consulted and their development plans reviewed in order to compile a list of projects for the development of the BA Corridor.

This first list has been subsequently expanded and integrated under the scope of the 2015-2017 BA Corridor study adding projects for the rail-road terminal related infrastructure and for the urban nodes. A set of parameters common to all 9 corridor studies have been also adopted to allow an accurate analysis of the projects with the ultimate goal to make sure that each corridor will develop by 2030 as a multimodal, interoperable, high quality standard infrastructure, interconnecting European core urban and transport nodes across the concerned Member States.

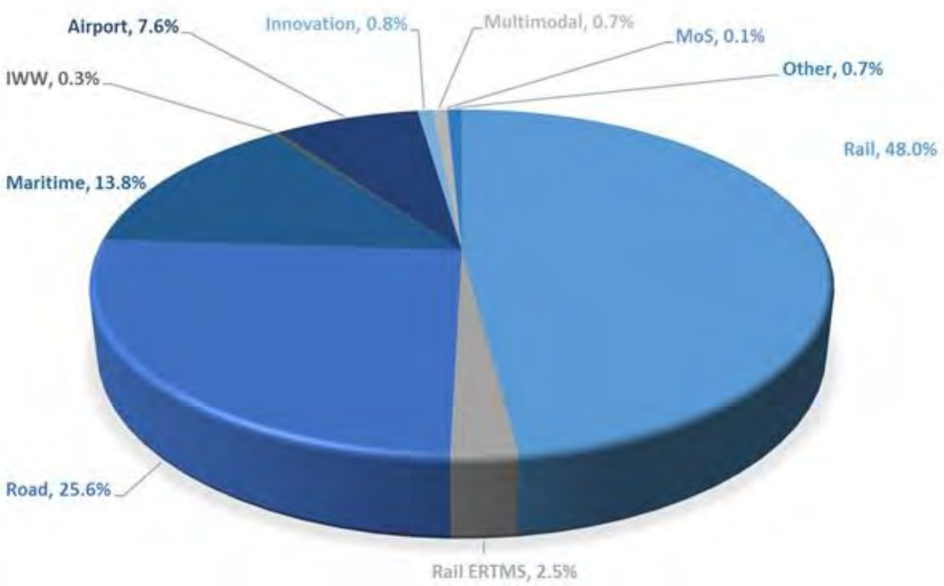
The new version of the BA Corridor project list has been elaborated in June 2016, which has been subsequently updated in June 2017. A latest revision of this list has been carried out early October 2016, in view of the eleventh BA Corridor Forum Meeting and to support the elaboration of the third version of the BA Corridor work plan.

At October 2017 the BA Corridor project list includes a total of 638 projects. Of these, 87 have been completed since the inception of the new TEN-T policy (see also Section 2.6.1 above), and 551 are ongoing or planned to be implemented in the future, totalling a volume of around 76.9 € billion.

In line with the structure of the project list common to the 9 core network corridor studies, projects have been classified with reference to the following 9 categories: rail, rail ERTMS, road, maritime ports, Motorways of the Sea (MoS), inland waterways and inland waterway ports (IWW), multimodal infrastructure (i.e. rail-road terminals), innovation, and other (e.g. transit schemes, interchange nodes).

The chart below provides the share on the total project list budget for each of the above categories. 50.5% of investments is allocated to railways and ERTMS, 25.6% to road, around 14.1% to ports, including their interconnections (3.0%) and MoS projects (0.1%), and 9.8% to airports (7.6%), rail-road terminals (0.7%), innovation (0.8%) and transit and multimodal interchange facilities in core urban nodes (0.7%). 9.2% of the total budget is allocated to cross-border sections related initiatives. The cost of the two Alpine crossings is equivalent to 11.5% of the total investment value. Compared to the 2014 study analysis, the total investment volume for the development of the corridor by 2030 has increased by 28.5%. This is due to the consolidation of the analysis of the investments for the development of the corridor infrastructure, including additional investments for the urban nodes and rail-road terminals, as well as the multi-country and multi-corridor CEF funded initiatives.

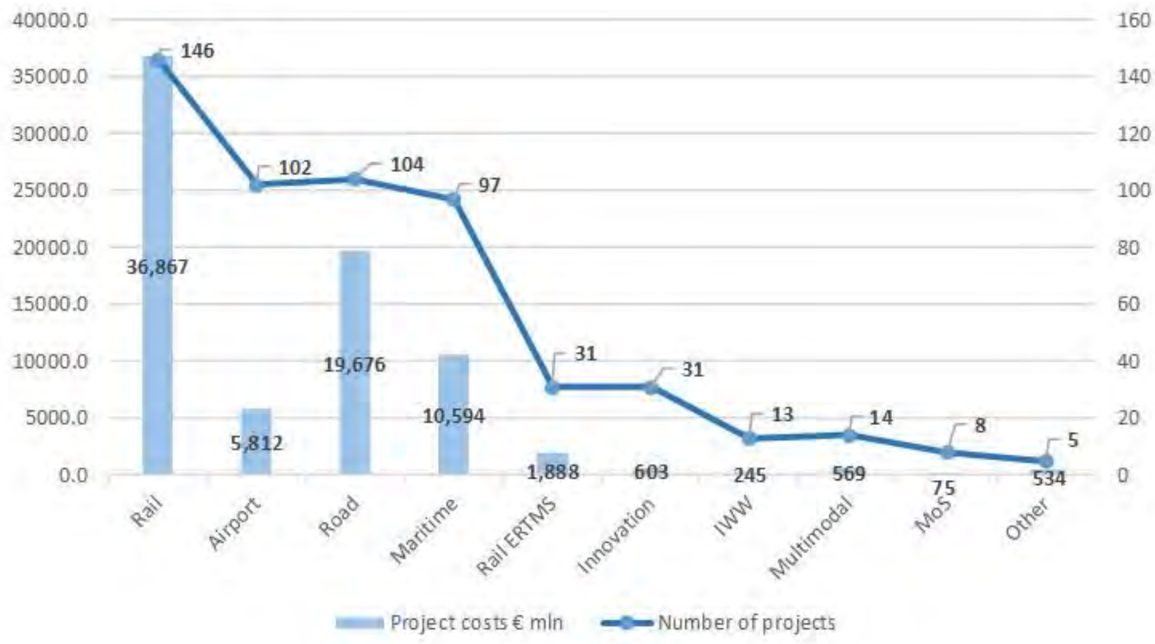
Figure 32 Share of the total BA project list budget by project category



Source: BA Corridor study consortium

The following figure summarises the number of projects and total investment costs by project category.

Figure 33 Projects and total investment costs by project category



Source: BA Corridor study consortium

In order to understand the impact of the planned projects on the development of the corridor by 2030 a detailed analysis of the investments has been performed also grouping the projects by action and re-elaborating the basic statistics on the analysis of the project list illustrated above with reference to the specific objectives and priorities of the BA Corridor work plan.

The identification of the actions responds on one side to the need to classify the proposed initiatives with reference to specific sections or nodes where the investments are going to be implemented; or with respect to type of activities foreseen to be implemented as part of their scope. On the other side grouping projects by action is also in line with the EU current practice for developing plans and programmes, usually underpinned by an *intervention logic* linking general objectives, specific objectives, actions and indicators. Accordingly, the intervention logic at the basis of the plan for the removal of the physical, technical, operational and administrative barriers and for the enhancement of efficient multimodal transport and services is structured as follows:

- *General objectives*, which are based on the overall EU TEN-T policy objectives and priorities, translated into *specific corridor objectives* on the basis of the characteristics and critical issues of the BA Corridor, as defined in the analysis presented at Chapter 3 above;
- *Actions*, which are the building blocks of the plan and reflect the logical framework for the investments and measures required to meet the specific corridor objectives;
- *Indicators*, which will be used to monitor the implementation of the action plan and measure the effects of the implemented actions in terms of reaching the work plan specific objectives.

The *intervention logic* of the action plan is defined by the cause-effect relationship between the actions (and, at finer detail, between the projects) and the specific objectives/priorities to be attained. The effectiveness and efficiency of the proposed actions in relationship with the objectives is also deemed relevant for setting up a coherent plan and provide a basis for implementation monitoring and evaluation.

The actions proposed in the corridor plan have been defined with respect to the general TEN-T objectives and priorities and further specified based on the corridor's specific objectives. They have been also structured for each component of the TEN-T core network infrastructure (rail, road, maritime, air, rail-road terminals and urban nodes), which is also in line with the structure of the priorities set in the TEN-T and CEF Regulations (1315/2013 and 1316/2013).

The organization of the actions by mode allows for a clear definition of the investment projects – which constitute the main component of the action plan. Within modes, actions which relate to infrastructure projects are distinguished between measures aimed at solving critical issues predominantly related to barriers of physical and/or technical standards nature, at cross-border sections, or bridging missing links as well as modernise, improve and further develop national sections or transport nodes.

The action plan also identifies those actions relating to telematic applications, aimed at solving interoperability and more generally operational and administrative barriers affecting the development and smooth flows of international, cross-border, intermodal traffic. In these category of actions projects aimed at promoting sustainable freight services, innovation (Art. 31, 32, 33 of REG. 1315/2013) and specific security, safety and accessibility measures (Art. 34, 35, 37 of REG. 1315/2013) have been also considered.

Finally, two actions dedicated to studies and horizontal projects have been identified grouping cross-mode, administrative and regulatory measures, aimed to enhance efficient multimodal transport and services along the BA Corridor.

Compared to the classification and statistical analysis presented adopting the categories in the common structure of the project list differences exist which are related in particular to core urban node projects. These include indeed rail, road and airport last mile initiatives belonging to the rail, road and airport categories. For consistency with the analysis by transport mode, innovation initiatives have been also included in the categories of the respective modes. The category "other" considered as a separate category in the project list common structure, is also included in the core urban nodes classification, being primarily related to interchange and transit systems in urban areas.

As a result of the above described exercise, the 551 projects included in the updated project list for the development of the BA Corridor have been allocated to 96 actions, which are grouped into 20 macro actions relating to the objectives of the plan and to the technical scope of the projects. These are subsequently comprised within a wider infrastructure mode classification. The main structure of the action plan is illustrated in the table overleaf, also providing cost details for each of the 20 macro actions and for the entire plan.

For 83 out of 96 actions specific to the BA Corridor sections and nodes a dedicated summary sheet has been elaborated which has been generated automatically from the project list. Each action sheet includes a description of the existing conditions of the section and node where the action is going to be implemented, the investments planned, including cost and maturity details, the impact on the Key Performance Indicators. No action summary sheet has been generated for those actions which include cross-corridor and multi-country initiatives; albeit relevant for the achievement of the TEN-T policy objectives and targets, these are not specific to the BA Corridor. The action summary sheets are included in Annex B.

Table 44 Summary of the action plan for the development of the BA Corridor

Project category			Projects	Budget (€ million)	APPROVED FUNDS (€ million and % of costs)	
RAIL	*1.1*	*Development of cross-border sections (WP priority)*	*22*	*4,028*	*1,730*	*43.0%*
	1.2	*Completion of missing links (WP priority)*	*2*	*8,854*	*9,199*	*100.0%*
	1.3	*Modernisation and upgrading of national railway lines, including junctions and nodes outside core urban areas in Cohesion Member States (WP priority)*	*31*	*7,570*	*2,966*	*39.2%*
		Other projects for the modernisation and upgrading of national railway lines, including junctions and nodes outside core urban areas	18	11,053	1,603	14.5%
	1.4	Technological upgrading, telematics applications and other horizontal measures (art. 31 to 37 of Reg. 1315/2013)	25	1,421	1,283	90.2%
		ERTMS including dedicated projects at cross border sections (WP priority)	*23*	*1,470*	*1,034*	*70.3%*
	1.5	Other railway projects	13	347	100	28.8%
ROAD	*2.1*	*Development of cross border sections (WP priority)*	*13*	*3,077.3*	*657.1*	*21.4%*
	2.2	Completion and upgrading of national roads outside core urban nodes	46	10,894.5	6,060.5	55.6%
	2.3	ITS, ETC and other horizontal measures (art. 31 to 37 of Reg. 1315/2013)	43	1,962.6	682.5	34.8%
SEAPORTS	*3.1*	*Developing interconnections (WP priority)*	*34*	*2,306.9*	*672.9*	*29.2%*
	3.2	Modernization / Expansion of the infrastructure	55	8,268.6	785.2	9.5%
	3.3	VTMIS and Innovation and other projects	19	322.0	178.5	55.4%
	3.4	Cross-corridor projects including MoS	6	59.0	59.0	100.0%
IWW PORTS	4.1	Development of inland ports and their accessibility	11	249.8	7.2	2.9%
	4.2	Telematics applications (including RIS), sustainable freight services, innovation (Art. 31, 32, 33) and specific security, safety and accessibility measures (Art. 34, 35, 37)	2	5.0	3.0	60.0%
AIRPORTS	5.1	Modernization / Expansion of the airport infrastructure	61	2,210.7	185.6	8.4%
	5.2	Telematics applications (including SESAR), sustainable freight services, innovation (Art. 31, 32, 33) and specific security, safety and accessibility measures (Art. 34, 35, 37)	32	2,753.2	2,721.2	98.8%
RRTs	6.1	Development of the RRTs and their accessibility	14	569.3	335.5	58.9%
URBAN NODES	*7.1*	*Development of the core network corridor within urban nodes and urban transport infrastructure ensuring interconnections between and within transport modes and a seamless connection between long distance and regional or local traffic flows (WP priority)*	*68*	*9,286.4*	*3,453.2*	*37.2%*
Additional horizontal studies and initiatives	8.1	Studies for the implementation of the EU transport policies including the TEN-T Regulation	7	14.5	14.0	96.3%
	8.2	Cross-corridors and multi-country initiatives for the promotion of multimodal and interoperable solutions	6	140.5	78.5	55.9%
Total project list			551	76,864	33,808	44.0%
Work plan priorities			*186*	*35,186*	*19,120*	*54.3%*

Source: BA Corridor study consortium based on the updated project list (status October 2017); Note: 1) ERTMS initiatives are also included in modernisation, upgrading and construction of railway lines and nodes; 2) For the purposes of the elaboration of this summary table and in the remaining of this document values for projects included in Polish or Czech planning/strategic documents have been estimated adopting the average exchange rate for the year 2015 as provided by the European Central Bank: 1EUR = PLN 4.1841, 1 EUR = CZK 27.279 – For the projects supported by the CEF instrument, the value reported in the grant agreement has been used as appropriate.

In the following sections a description of the action plan by mode is provided which includes summary details for the actions identified for the development of each mode component of the BA Corridor, including rail, road, maritime and inland ports, airports, rail-road terminals, and urban nodes.

For each mode, a summary table including the actions identified for the development of the BA Corridor is presented which comprises basic information for each action. This also includes the start and end dates of the actions, which have been calculated with reference to the start of the first and end of the last project belonging to the action. If a project does not have an indicated start and end date, this is also reflected in the maturity of the action. With reference to the above described corridor specific objectives a detailed description of the critical issues for the development of a fully compliant and functional corridor by 2030 is also provided, also commenting on the expected impact of the ongoing and planned investments by this time horizon, specifying the presence of persisting bottlenecks. More specific information on the actions, also including details for each project are provided in the action summary sheets in Annex B.

Further to the actions related to the development of the BA Corridor infrastructure, several initiatives and measures for the identification and removal of the operational and administrative barriers, have been described at Section 3.4 above, which complement the action plan proposed in this Chapter, and which are particularly important to support the growth of multimodal and combined operations towards a more sustainable rail oriented EU transport system.

5.3. Actions for the development of the railway infrastructure and ERTMS deployment

The table overleaf summarises the key elements of the actions identified for the development of the railway infrastructure based on the analysis of the updated BA Corridor project list.

29 actions have been identified including a total of 134 projects concerning the development of the railway infrastructure, for an overall budget of 34.7 € billion. Modernisation works to reach the TEN-T standards are ongoing and planned at the cross-border sections between Poland – Czech Republic / Slovakia, Slovakia – Austria, Austria – Slovenia and Slovenia – Italy as well as on the national network in Poland and Slovenia, including junctions and nodes. The further upgrading of the cross-border railway line between Brno and Wien is also foreseen. In the Czech Republic, Slovakia, Austria and Italy an upgrading of lines and improvements at junctions and nodes to increase capacity is in the needed focus, including studies and projects for the development of high-speed lines solutions. Initiatives aimed at improving the railway infrastructure and the stations by reaching the technical standards for interoperability are also planned.

Further to studies and works for the modernisation and upgrading of cross-border and national sections, stations and junctions, two projects also relate to the completion of the Alpine crossings in Austria, amounting to 8.9 € billion.

31 rail initiatives among the 134 are finally classified as Rail ERTMS projects for about 1.9 € billion investments. Eight out of these 31 projects relate to the instalment of ERTMS technology on rolling stock in the corridor and other EU Member States as well as initiatives to support the implementation of this technology at the multi-country and multi-corridor levels.

Table 45 Actions for the development of the BA Corridor rail infrastructure

Actions		Member State	KPIs	Start	End	Projects	Budget
1.1	Cross-border						
1.1.01	Upgrading of the corridor cross-border connection: Katowice (PL) – Ostrava (CZ) [Zebrzydowice (PL) – Petrovice u Karviné (CZ)]	PL, CZ	Freight lines: speed (100 km/h); Freight lines: Axle.load (22.5 t); Freight lines: train length (740m); Current or potential future capacity bottleneck	-	-	6	1,082.0
1.1.02	Upgrading of the corridor cross-border connection: Opole (PL) – Ostrava (CZ) [Chałupki (PL) – Bohumín (CZ)]	PL	Freight lines: speed (100 km/h); Freight lines: Freight lines: train length (740m); Current or potential future capacity bottleneck	-	-	2	197.2
1.1.03	Upgrading of the corridor cross-border connection: Katowice (PL) – Žilina (SK) [Zwardoń (PL) – Skalité (SK)]	PL, SK	Freight lines: speed (100 km/h); Freight lines: Axle.load (22.5 t); Freight lines: train length (740m); Current or potential future capacity bottleneck	2017	2023	2	267.8
1.1.04	Upgrading of the corridor cross-border connection: Brno (CZ) – Wien (Stadlau) (AT)	CZ, AT	ERTMS; Freight lines: speed (100 km/h); Freight lines: train length (740m); Current or potential future capacity bottleneck	2015	2030	5	1,388.4
1.1.05	Upgrading of the corridor cross-border connection: Bratislava (SK) – Wien (Stadlau) (AT) [Devínska Nová Ves (SK) – Marchegg (AT)]	SK, AT	Electrification; ERTMS; Freight lines: speed (100 km/h)	2007	2023	2	554.8
1.1.06	Upgrading of Railway Cross-Border Connection: Graz (AT) – Maribor (SI)	AT, SI	Electrification; Standard track gauge; ERTMS; Freight lines: speed (100 km/h); Freight lines: Axle.load (22.5 t); Freight lines: train length (740m); Current or potential future capacity bottleneck; Single track section	2014	2030	3	436.1
1.1.07	Upgrading of the corridor cross-border connection: Trieste (IT) - Divača (SI)	IT, SI	ERTMS; Freight lines: speed (100 km/h); Freight lines: Axle.load (22.5 t); Freight lines: train length (740m); Current or potential future capacity bottleneck	2018	2030	2	101.9
1.2	Alpine Rail Crossings (Semmering Base Tunnel, Koralm railway line and tunnel)						
1.2.01	Alpine Rail Crossings (Semmering Base Tunnel, Koralm railway line and tunnel)	AT	Electrification; Standard track gauge; ERTMS; Freight lines: speed (100 km/h); Freight lines: Axle.load (22.5 t); Freight lines: train length (740m); Current or potential future capacity bottleneck	1996	2026	2	8,854.3
1.3	Modernization and upgrading of the national railway networks						
1.3.02	Modernization of the Eastern Corridor Branch in Poland: Warszawa - Katowice	PL	ERTMS; Freight lines: speed (100 km/h); Freight lines: Axle.load (22.5 t); Freight lines: train length (740m); Current or potential future capacity bottleneck	2010	2019	2	389.6
1.3.03	Modernization of the Central Corridor Branch in Poland: Gdańsk - Katowice	PL	Freight lines: speed (100 km/h); Freight lines: Axle.load (22.5 t); Freight lines: train length (740m); Current or potential future capacity bottleneck	-	-	3	657.7

Actions		Member State	KPIs	Start	End	Projects	Budget
1.3.04	Modernization of the Western Corridor Branch in Poland: Świnoujście/Szczecin - Wrocław	PL	ERTMS; Freight lines: speed (100 km/h); Freight lines: Axle load (22.5 t); Freight lines: train length (740m); Current or potential future capacity bottleneck	2008	2023	5	1,635.9
1.3.05	Modernization of the Western Corridor Branch in Poland: Wrocław - Katowice	PL	Freight lines: speed (100 km/h); Freight lines: Axle.load (22.5 t); Freight lines: train length (740m); Current or potential future capacity bottleneck	-	-	5	521.4
1.3.06	Upgrading to HS of the Brno - Přerov (Ostrava) rail line in Czech Republic	CZ	ERTMS; Freight lines: speed (100 km/h); Freight lines: Axle.load (22.5 t); Freight lines: train length (740m)	2013	2024	6	1,768.3
1.3.07	Upgrading of the Zlatovce - Žilina rail line in Slovakia	SK	ERTMS; Freight lines: speed (100 km/h); Freight lines: train length (740m)	2012	2022	4	1,140.0
1.3.08	Upgrading of freight route Wien - Wampersdorf	AT	Electrification; ERTMS; Freight lines: train length (740m); Single track section	2000	2022	2	618.2
1.3.09	Station reconfigurations including 740m sidings in Austria between Wien and Graz	AT	Freight lines: train length (740m)	2005	2023	6	604.4
1.3.10	Upgrading of the Venezia - Trieste rail line	IT	Electrification; Standard track gauge; ERTMS; Freight lines: speed (100 km/h); Freight lines: Axle.load (22.5 t); Current or potential future capacity bottleneck	2019	-	2	9,247.0
1.3.11	Upgrading of Tarvisio - Udine - Villa Opicina freight route	IT	Current or potential future capacity bottleneck; Single track section	-	2030	2	356.0
1.3.12	Upgrading maximum train length to 750m in Italy	IT	Freight lines: train length (740m)	-	2026	2	180.0
1.3.13	Upgrading of the Ljubljana - Pragersko - Maribor rail line	SI	Freight lines: speed (100 km/h); Freight lines: Axle.load (22.5 t); Freight lines: train length (740m); Current or potential future capacity bottleneck	2012	2030	5	450.0
1.3.14	Upgrading of the Koper - Ljubljana rail line	SI	Electrification; Standard track gauge; ERTMS; Freight lines: speed (100 km/h); Freight lines: Axle.load (22.5 t); Freight lines: train length (740m); Current or potential future capacity bottleneck; Strong incline; Single track section	2013	2025	5	1,054.3
1.4	Technological upgrading, telematic applications (including ERTMS), sustainable freight services, innovation (Art. 31, 32, 33) and specific security, safety and accessibility measures (Art. 34, 35, 37)						
1.4.01	ERTMS deployment on the Baltic - Adriatic corridor	PL, CZ, AT, IT, SI	ERTMS; Current or potential future capacity bottleneck	-	2030	23	1,470.3
1.4.07	Horizontal measures for the deployment of ERTMS	Cross-corridors/Multi-country	-	-	2020	8	417.7
1.4.02	Measures for removal of level crossings and improving PRM accessibility in Poland	PL	-	2017	2022	2	181.6
1.4.03	Noise protection barriers in Austria	AT	-	2009	2021	4	36.6

Actions		Member State	KPIs	Start	End	Projects	Budget
1.4.04	Electronic interlocking in Austria	AT	Current or potential future capacity bottleneck	2007	2022	4	199.1
1.4.05	Train conditions checkpoints in Austria	AT	-	2013	2020	3	11.1
1.4.06	Technological upgrading and line performance improvements in Italy	IT	Current or potential future capacity bottleneck	2013	2021	4	575.0
1.5	Other operational or service improvements						
1.5.01	Other operational or service improvements	Cross-corridors/Multi-country	-	-	-	13	346.8
Totals						134	34,743.7

Source: BA Corridor study consortium based on the updated project list (status October 2017)

A dedicated project for the development and operation of the Baltic-Adriatic Rail Freight Corridor is also ongoing aimed at enhancing international and interoperable long distance transport along the corridor mitigating and solving operational and administrative solutions to rail transport.

5.3.1. Critical issues for the development of railway transport along the BA Corridor

Focussing on the specific objectives of the BA Corridor, the following considerations are worth noting on the development of the critical cross-border sections and removal of national railway bottlenecks.

Cross-border sections

Further to the analysis of the compliance to the requirements of the TEN-T Regulation in terms of electrification, axle load and speed, critical issues have been identified for six out of nine rail cross-border sections along the corridor. The following box provides a brief overview of the issues affecting these sections, and the expected impact of the planned investments.

Opole (PL) ***– Ostrava (CZ) [Chałupki (PL) –*** *Bohumín (CZ)]*: This rail section requires improvement works on the Polish side between Kędzierzyn Koźle and Chałupki (state border) to reach compliance in terms of speed and train length. Due to limited availability of financial resources the project comprised in the corridor project list to reach the required standards is included in the reserve list of the National Railway Programme; national funds are foreseen to secure only part of the works and the implementation dates are not defined (47 € million). Whilst the Polish Authorities assume that the project will be in any case completed by 2030 in line with the requirements set in the TEN-T Regulation, the possibility to implement the works during the current financing period (up to 2023) will be considered in the event additional financial resources will be identified. On the Czech side works were already completed to increase the speed up to 140 km/h, including the improvement of the Bohumín station. This cross-border section is also expected to benefit from the modernisation of the double track railway line E30 between Kędzierzyn Koźle – Opole Groszowice – Opole Zachodnie to increase maximum operational speed by 2022 (150.2 € million) as well as from the modernisation of the Ostrava junction on the Czech side by 2021 (222.2 € million). This cross-border section is currently expected to be at standard by 2030 at the latest, except for train length on the Czech side. (*Action Sheet 1.1.02*)

Katowice (PL) – Ostrava (CZ) [Zebrzydowice (PL) – Petrovice u Karviné (CZ)]: Preparatory works are ongoing on the Polish side for the modernisation of this rail section requiring major investments on the lines E30 and E65, especially in the area of Katowice, to increase the standards of the existing railway lines and stations. The modernisation of the existing dual track electrified line and stations is expected on the section Będzin – Sosnowiec – Katowice – Katowice Ligota and at exit from Katowice towards Gliwice (centre of agglomeration), where the railway tracks will be extended by an additional pair of tracks. The works will allow for separating long distance and agglomeration traffic. The action foresees the implementation of computer traffic control compatible with ERTMS/ETCS - Level 2. The modernisation works are expected to be implemented in three phases. The first phase includes works for the improvement of the sections Most Wisła – Czechowice-Dziedzice - Zabrzeg including Czechowice-Dziedzice station, currently expected to be completed by 2023 (370.5 € million). The second and third phases relate respectively to the modernisation of the section Tychy - Most Wisła and Zabrzeg - Zebrzydowice (state border); and to the modernisation of the network within the urban agglomeration of Katowice (sections Będzin – Sosnowiec – Katowice – Katowice Ligota and Katowice – Gliwice). For the latter phases the implementation dates are not defined yet. Whilst the Polish Authorities trust that the projects will be in any case completed by 2030 in line with the requirements set in the TEN-T Regulation, the possibility to implement the works during the current financing period (up to 2023) will be considered in the event additional financial resources will be identified (583.8 € million). On the Czech side, track optimisation works at the Dětmarovice station are planned to be finalised by 2019, which together with the instalment of remote traffic control system between Petrovice u Karviné and Ostrava during 2018, will further improve the performance of the line. The section from the state border to Petrovice u Karviné and Ostrava was already modernised; the works were completed in 2002, which increased the speed up to 120-140 km/h. Also this cross-border section is expected to benefit from the completion of the modernisation of the Ostrava junction by 2021 (222.2 € million). This cross-border section is currently planned to be at standard by 2030 at the latest except for train length on the Polish section Zebrzydowice – state border as well as on the Czech sections. (*Action Sheet 1.1.01*)

Katowice (PL) ***– Žilina (SK) [Zwardoń (PL) –*** *Skalité (SK)]*: On the Polish side works are foreseen to modernise 65 km of the existing predominantly single track electrified railway line between Czechowice-Dziedzice and Zwardoń. Due to limited availability of financial resources the project comprised in the corridor project list to reach the required standards (47.8 € million, expected to be completed by 2023) is included in the reserve list of the National Railway Programme; national funds are foreseen to secure only part of the works. Whilst the Polish Authorities assume that the project will be in any case completed by 2030 in line with the requirements set in the TEN-T Regulation, the possibility to implement the works during the current EU financing period (up to 2023) will be considered in the event additional financial resources will be identified. On the Slovak side, no works are foreseen on the single track section Zwardoń – Skalité – Čadca. The Skalité – Čadca section was already modernised and electrified with a maximum speed of 100 km/h, axle load of 225 kN and maximum train length of 650 m. The 7.1 km subsection Zwardoń – Skalité is compliant with regard to the axle load, but non-compliant with respect to speed (70 km/h) and has limited train length to 250 m (due to Zwardoń station limitations, but it cannot be upgraded above 350 m). The modernisation of the double track Krásno nad Kysucou – Čadca section, also common to the cross-border itinerary between Ostrava and Žilina, is expected to be completed by 2030 (220 € million). This cross-border section is currently expected to be compliant by 2030 except for train length on the Slovak section Čadca – Skalité – Zwardoń and speed limit on the short section Zwardoń – Skalité. No works are planned till 2030 to deploy ERTMS on the Čadca – Zwardoń section so far. (*Action Sheet 1.1.03*)

Bratislava (SK) – Wien (Stadlau) (AT) [Devínska Nová Ves (SK) – Marchegg (AT)]: Two cross-border railway lines are in operation between Bratislava and Wien, one passing through Petržalka (SK) – Kittsee (AT) and already compliant in the sections outside the Bratislava railway node, except for train length; another one for passenger transport going via Devínska Nová Ves (SK) and Marchegg (AT). The latter is the only non-electrified section along the BA Corridor, also requiring upgrading works. The electrification of the existing single track railway line on the Slovak side is planned to be completed by 2020 (4 € million); feasibility studies are also ongoing which relate to the construction of a second track on this line, also including the bridge over the river Morava, which may be subsequently developed. Upgrading of the line Wien Stadlau – Border AT/SK (next to Marchegg) including partial doubling of the section, full line electrification and railroad stations works are planned to be implemented by 2023 (550 € million). The doubling of the line in its entire extent on the Austrian side is foreseen to be subsequently developed, also based on the possibility to upgrade the cross-border section on the Slovak side. (*Action Sheet 1.1.05*)

Graz (AT) **–** *Maribor (SI) [Spielfeld-Straß (AT)* ***– Šentilj (SI)]***: The section on the Austrian side is already compliant in terms of axle load, speed and electrification. Studies and administrative procedures for the upgrading of the line to two tracks are envisaged to be undertaken between 2023 and 2026 (19.1 € million); the works for doubling the line to be implemented based on market developments. In Austria, train length compliance is also expected to be achieved by 2030. Rehabilitation works of the existing line are planned to be completed on the Slovenian side by 2022 which will allow increasing axle load, train length and speed to reach compliance (247 € million). The construction of the second track is also planned for 2030 (170 € million). The whole section is thus currently expected to be fully compliant by 2022 at the latest and doubled on the Slovenian side by 2030. (*Action Sheet 1.1.06*)

Trieste (IT) ***– Divača (SI) [Villa Opicina (IT) – Sežana (SI)]***: The studies for this cross-border railway section have been completed reconsidering the previous high-speed project solution. The new proposed studies for a conventional railway line are expected to allow reaching compliance on the section by 2030 on both sides, including train length and speed (envisaged total cost on both sides € 101.9 million). (*Action Sheet 1.1.07*)

Missing links

The two missing links along the Baltic-Adriatic axis are the major obstacles towards the full exploitation of the corridor: the 27.3-kilometer-long Semmering base tunnel between Gloggnitz in Lower Austria and Mürzzuschlag in Styria and the new 127 km long Koralm railway line connecting Graz in Styria with Klagenfurt in Carinthia, also comprising a 32.9 km long tunnel will remove these missing links.

The Semmering base tunnel and the Koralm railway line and tunnel are both under construction and are expected to be completed by 2026 and 2024 respectively (8.9 € billion). Upon completion of the two "Alpine Crossings" the TEN-T network will benefit from a new seamless high-speed railway connection for trans-European passenger and goods transportation and offer a modern level of comfort with substantially reduced journey times. As an example, the combined effect of the Koralm tunnel and the Semmering base tunnel will reduce travel time between Vienna and Venice by 120 minutes. (*Action Sheet 1.2.01*)

National railway lines

Besides the major issues and needs for upgrading at the borders and the completion of the two Alpine crossings, several national bottlenecks need to be addressed on the BA Corridor. Even though these bottlenecks are on the national transport network, their removal will bring important network benefits for the whole corridor. In particular, the railway network in Poland and Slovenia require modernisation to comply with the EU requirements.

In Poland works are currently under implementation and preparation to improve the quality and standards of the railway infrastructure. These include the modernisation of the major railway axis (E59, E30 and E65/C-E65) aimed at removing line speed bottlenecks, increase train length and axle load standards which will be particularly beneficial for freight transport along the corridor. In greater detail, modernisation works on the Eastern Branch, E65 railway line Gdynia – Warszawa were recently completed which allow reaching the standards required by Regulation (EU) 1315/2013 (1,130 € million), except from very short sections in Tczew (approx. 2 km of 60 km/h), Iława (approx. 4 km of 90 km/h) and near Modlin (approx. 7 km of 60-80 km/h) where due to technical constraints (line geometry) the required standard will not be reached. Furthermore, two actions are planned in the Warszawa node to solve critical issues on the main freight and passenger routes by 2018 and 2024 respectively (321.2 € million).

In addition, two projects to modernise and improve capacity on the section Warszawa – Grodzisk Mazowiecki are expected to be implemented by 2019 (389.6 € million). The line E65 is already compliant on the section from Grodzisk Mazowiecki to Zawiercie, and improvement works were already completed on the section Zawiercie – Dąbrowa Górnicza (towards Katowice; 88.9 € million). Modernisation works aiming at reaching compliance with the TEN-T Regulation on the Central Branch between Gdańsk and Katowice, C-E65 railway line, are envisaged to start in 2020 and are expected to be completed by 2022 except on section Bydgoszcz – Tczew, for which the implementation dates are not defined (656.2 € million). Further modernisation works are also planned on the line E65 and E30 – section Chorzów Batory – Gliwice Łabędy – at the interchange between the Central and Western Branches of the corridor (340.9 € million), but for this particular section the start and end date are not specified. On the Western Branch, railway axis E59, between Świnoujście and Gliwice, a number of projects is nearly completed which will result in speed, axle load and train length compliance. These include works between Poznań and Wrocław (754.7 € million) and on the passenger section Błotnica Strzelecka – Opole Groszowice (45.7 € million). Additional works are planned between Szczecin and Poznań, which are expected to be completed by 2023 (881.3 € million). The project for the modernisation of the Poznań central railway station is nearly completed (11.3 € million); works for the improvement of the freight Poznań bypass are also planned, for which the implementation dates are however to be defined (10.5 € million). Modernisation works are finally foreseen between Wrocław and Katowice, with no implementation dates specified as yet (134.6 € million). The investments considered by the Polish Authorities and listed in the current plans refer to the 2023 time horizon, including the ones for which implementation dates are not specified, which due to scarcity of financial resources are currently assumed to be realised after 2020, and completed by 2030. The implementation of these investments will contribute to the achievement of the required TEN-T standard on several corridor lines in Poland; however additional investments will be required to reach compliance by 2030. Based on the analysis of the corridor project list and of the impact of the investments on the KPIs at present, investments are missing to solve speed and axle load bottlenecks between Szczecin and Świnoujście as well as at the Wrocław node (sections Popowice – Mikołajów – Brochów). Speed limitations may also remain on the rail freight section Opole Groszowice – Rudziniec Gliwicki on the main itinerary Wrocław – Katowice (however the alternative routing Opole Groszowice – Gliwice Łabędy will be compliant, except from a very short non-compliant section in Kędzierzyn Koźle). 740 meters train length operating bottlenecks may remain between Szczecin and Świnoujście, between Wronki and Słonice along the main itinerary Szczecin – Poznań – Wrocław, at the Wrocław node (sections Popowice – Mikołajów – Brochów), on the main section Gdańsk – Tczew – Katowice, and between Opole and Gliwice on the main itinerary Wrocław – Katowice. Depending on limited availability of financial resources the achievement of the speed, axle load and 740 meters train length standards may be delayed at the Poznań node, and between Wrocław, Jelcz and Opole (the projects relating to the works on these sections are indeed included in the reserve list of the National Railway Programme and no national funds are foreseen to secure their full implementation). (*Action Sheets 1.3.02 to 1.3.05*)

In the Czech Republic, capacity and speed bottlenecks exist which affect operations of trains at the junctions in Ostrava and Brno where modernisation works are expected to be completed by 2022 (222.2 € million) and 2030 (756 € million) respectively. Upgrading works at the Břeclav node have been completed including instalment of remote control. The works for the reconstruction of the Přerov station have been divided into different construction phases. The first one has been already completed. The upgrade of the Přerov junction by developing the northern bypass, which represents the second construction phase, is planned to be completed by 2021 (84.6 € million). The third phase relating to the development of grade-separate crossing infrastructure between the Olomouc - Hranice and Prerov – Olomouc railway traffic is also foreseen to be completed by 2021 (26.1 € million). Except for speed limitations at the above mentioned nodes and train length on the entire corridor, the freight rail network is already compliant. At present it is expected that the network by 2030 will not be compliant only with respect to the 740 meters train length requirement, in particular on the mixed passenger and freight sections between Ostrava and Přerov. This is also due to the fact that most of the railway lines belonging to the corridor in the Czech Republic have been recently modernised in line with previous standards prescribing a lower train length parameter. Regarding the Ostrava - Přerov section, it is also noticed that this line may face capacity constrains in the future as commented in Chapter 3 above. About this a TEN-T comprehensive railway line parallel to the corridor is currently considered to be upgraded at high speed standard, between Břeclav and Ostrava, which could increase capacity and facilitate the identification of functional solutions for the operation of longer trains along the corridor. (*Action Sheet 1.3.06*)

In Slovakia, bottlenecks are concentrated at major railway junctions in particular Žilina and Bratislava, where maximum speed is respectively of 60 km/h and 40 km/h. Works for the modernisation of the Žilina railway junction, including connection to the Žilina Teplička rail-road terminal will be completed by 2021 (234 € million). Studies and works for the modernisation of the Bratislava railway node, including its interconnection to the airport and ERTMS are planned to be completed after 2030, although the Devínska Nová Ves – Bratislava cross-border section and stations are expected to be improved by 2030 (926.3 € million). As part of the modernisation of the node, speed and train length improvements on the cross-border itinerary Petržalka – Kittsee on the main route Bratislava – Wien are currently not expected to be undertaken. Except for speed limitations at the above mentioned nodes and on some very short sections between Žilina and Púchov and Krásno nad Kysucou and Čadca as well as train length on many corridor sections, the freight rail network is already compliant. At present it is expected that the network by 2030 will be fully compliant between Čadca and Bratislava with respect to all parameters. (*Action Sheet 1.3.07*)

In Austria, further to the two missing railway links, works for compliance to 740 meters train length operability are required. Some sections of the network are also operating close to capacity limits such as the Graz – Bruck/Mur railway line. As plans for the implementation of 740 meters train length are currently under development in Austria, it may be assumed that 740 meters train length standard will be achieved on all corridor sections by 2030. Concerning the other parameters, the national network is already at standard, except for line speed on the short section Wien Meidling – Wien Inzersdorf within the Wien urban node, where speed is in any case not expected to reach 100 km/h for freight trains even after completion of the upgrading of the section by 2023. This can be justified by topographic, noise and socio-economic cost-benefit considerations. (*Action Sheets 1.3.08 and 1.3.09*)

In Italy, works are required on the corridor lines to reach 740 meters train length operability. In the medium-long term capacity issues may exist on the Venezia – Trieste railway line. Upgrading works to support capacity expansion are also foreseen at the Venezia/Mestre and Udine nodes. The corridor lines are already compliant with respect to all parameters except train length. This KPI is assumed to be achieved by 2030. (*Action Sheets 1.3.10 to 1.3.12*)

In Slovenia, works are required to improve the standards of the network particularly with respect to speed and train length. Works for the modernisation and improvement of the section Poljčane – Slovenska Bistrica, including railway stations Poljčane and Slovenska Bistrica as well as works at the Pragersko station and on the section Zidani Most – Celje and Maribor Šentilj (Austrian border) are either ongoing or planned to start by 2018 at the latest, which are expected to be completed by 2020 (376.5 € million). Studies are ongoing for the improvement and upgrading of the sections Ljubljana –

Zidani Most (further to the border between Slovenia and Croatia) and Ljubljana – Divača, further to Sežana and to the border between Slovenia and Italy. The works are expected to be undertaken after 2020 and to be completed by 2030 at the latest (according to the first results of the prefeasibility study the total envisaged cost exceeds 1 € billion). The modernisation of the existing track between Koper and Divača was recently completed. Works for the elimination of a technical bottleneck at Bivje are ongoing and planned to be completed by 2020 (21.4 € million). Studies for the construction of the second track on the line Koper – Divača have been recently finalised. A special purpose vehicle company (Second Tracak Koper- Divača - 2TDK) has been established which will act as a promoter of this initiative. The works are planned for implementation in the period 2017-2025 in support of the planned expansion of the port terminal infrastructure (960.1 € million). Based on current planning activities, ongoing works and studies it can be concluded that the Slovenian BA Corridor network is expected to be compliant by 2030 with respect to axle load and train length. Whilst the planned projects are at least deemed to improve speed parameters on the corridor sections, studies have been finalised to ensure compliance will be achieved by reaching the standards set in the TEN-T Regulation and/or support requests for derogation according to Art. 39, point 3. (*Action Sheets 1.3.13 and 1.3.14*)

5.3.2. ERTMS deployment

ERTMS is currently planned to be deployed by 2030 on the entire corridor lines, investments are still missing on the corridor list which include the Polish central branch of the axis between Tczew and Katowice, the section Wrocław – Jelcz – Opole – Katowice, the Warsaw Railway Node and particularly the Polish side of the Opole – Ostrava and Katowice – Ostrava and Polish and Slovak sides of Katowice – Žilina sections. Project costs for ERTMS projects in Austria are also still to be defined. (*Action Sheet 1.4.01 and Action Sheet 1.4.07*)

In this section we summarise the status, progresses and plans for the deployment of ERTMS along the BA Corridor.

- In Poland, ETCS Level 1 was installed on the Eastern branch of the corridor, section CMK Grodzisk Mazowiecki – Zawiercie in 2014 (12.40 € million). The works for the modernisation of railway line E65/C-E65 on the section Gdynia – Warszawa which are planned for completion by mid of 2018 also include ETCS Level 2 instalment (142 € million). The ongoing modernisation of the railway line Warszawa – Łódź on the section Warszawa Zachodnia – Grodzisk Mazowiecki foresees ERTMS technology implementation works expected to be completed by mid of 2018. ETCS Level 2 is furthermore planned to be installed on the E59 between Wronki – Słonice as part of the works for the modernisation of the line, expected to be undertaken between 2020-2023. On railway line E30, section Legnica – Wrocław – Opole, ETCS Level 2 is expected to be installed by 2018 (26.46 € million). Works for the modernisation of the main passenger lines E30 and E65 in the Śląsk area (on section Będzin – Sosnowiec – Katowice – Katowice Ligota, without specified time schedule), include the instalment of the Remote Train Control system in view of future deployment of ETCS Level 2, subject to definition and confirmation of the National Plan for the Implementation of the Technical Specification for Interoperability "CCS". Finally, horizontal actions aiming at constructing ERTMS/ETCS on core TEN-T network lines as well as GSM-R on PKP PLK S.A. railway lines are also foreseen. The scope of the ERTMS/ETCS covers several national sections including sections Szczecin Dąbie – Poznań – Wrocław and Wrocław – Katowice, expected to be completed by 2023 (0.4 € billion). The scope of the GSM-R project covers the whole country network, approximately 13,800 km of railway lines, including all Baltic-Adriatic corridor lines, except the sections Gdynia – Warszawa – Grodzisk Mazowiecki and Wrocław – Brzeg – Opole, on which

GSM-R is implemented as part of the ongoing works to be completed by 2018 (0.7 € billion). The National Plan for the Implementation of the Technical Specification for Interoperability "CCS" approved in June 2017, foresees implementation of ERTMS on all corridor lines. Investments are however missing on the corridor project list for the implementation of ERTMS on the Central branch of the corridor between Tczew and Bytom, on the section Opole Groszowice – Rudziniec Gliwicki on the main itinerary Wrocław – Katowice as well as on the cross-border sections between Poland and the Czech Republic, Opole Groszowice – Kędzierzyn Koźle – Racibórz – Chałupki and Katowice – Pszczyna – Most Wisła – Zebrzydowice – state border, and on the cross-border section between Poland and Slovakia, Most Wisła – Żywiec – Zwardoń.

- In the Czech Republic, GSM-R is in operation on the entire corridor excluding the section Brno – Přerov. ETCS Level 2 is envisaged to be deployed on the same corridor sections by 2018. Works are ongoing on the sections between the border PL/CZ – Petrovice u Karviné – Ostrava – Přerov – Břeclav – border CZ/AT (24.1 € million). The railway line Brno – Břeclav is already equipped with ETCS Level 2 since March 2017, but it is still at the testing phase. The section Brno – Přerov and the Brno node will be equipped with ETCS Level 2 as part of the projects for the modernisation of the respective infrastructure by 2024 and by 2030.
- In Slovakia, GSM-R is in operation between Bratislava and Žilina. The Púchov – Trenčianska Teplá and Zlatovce – Bratislava sections are equipped with ETCS Level 1. ETCS Level 2 is installed on the Žilina – Čadca railway line. Deployment of ERTMS on the remaining sections of the corridor is planned as part of the improvement and upgrading works of the national rail infrastructure. ETSC Level 1 will be deployed on the section Zlatovce – Trenčianská Teplá by the end of 2017 and on the section Púchov – Žilina by 2020. Deployment of ETCS Level 2 at the Bratislava node is planned for completion by 2030 as part of the modernisation of the node, also including cross-border sections between Devínska Nová Ves (SK) – Marchegg (AT) and Petržalka (SK) – Kittsee (AT). There is no investment currently planned for the deployment of ERTMS at the cross-border section Čadca – Skalité, although ETCS Level 2 is foreseen to be deployed.
- In Austria, GSM-R is pervasive on all sections of the corridor, whereas ETCS Level 2 is installed so far only on the subsections connecting Bernhardsthal to Wien's main station. According to the investment plans of ÖBB Infra, other sections of the BA Corridor, Pottendorf/Wien – Wampersdorf and Graz – Klagenfurt (Koralm railway line), will be ETCS Level 2 compliant in 2024 and the section comprising the Semmering tunnel will be ready by 2026. Investments are included in the BA Corridor list which cover the entire axis; whilst the costs for these investments are still to be defined, it is assumed that ERTMS technology will be installed by 2030 on all corridor sections.
- In Italy, ETCS Level 1 or Level 2 are foreseen to be implemented on the sections between Padova and Villa Opicina by 2020 and on the remaining sections of the corridor by 2030 (217 € million). These investments are part of a wider project also including sections/nodes located on and/or common to the Mediterranean, Scandinavian-Mediterranean and Rhine-Alpine corridors. ERTMS on the cross-border section between Villa Opicina, Sezana and the border with Slovenia will be installed as part of the upgrading of the cross-border section.
- In Slovenia, with the exception of railway line Pragersko – Maribor – Sentilj/Spielfeld – Strass (border AT/SI), ETCS Level 1 technology is currently installed on the corridor sections of the BA Corridor. Works for GSM-R instalment on the entire corridor have been completed by September 2016. ETCS Level 1 on the Pragersko – Maribor – Šentilj section is currently planned to be installed by 2022 (7.5 € million).

5.3.3. Technical compliance map for railway infrastructure

A technical compliance map for the railway infrastructure has been developed (see figure overleaf) for a better representation of the likely status of the corridor at 2030, considering the impact on the critical issues of the corridor infrastructure of all the ongoing and planned investments.

The map is based on the TENtec system encoded sections as of 2014 and shows the prevailing standard on these segments with reference to electrification, axle load, line speed and track gauge. The colour of the lines refers to the planned works and their impact on the corridor compliance by 2030, whereas the non-compliance icons show the problems at the time of the analysis (early November 2017).

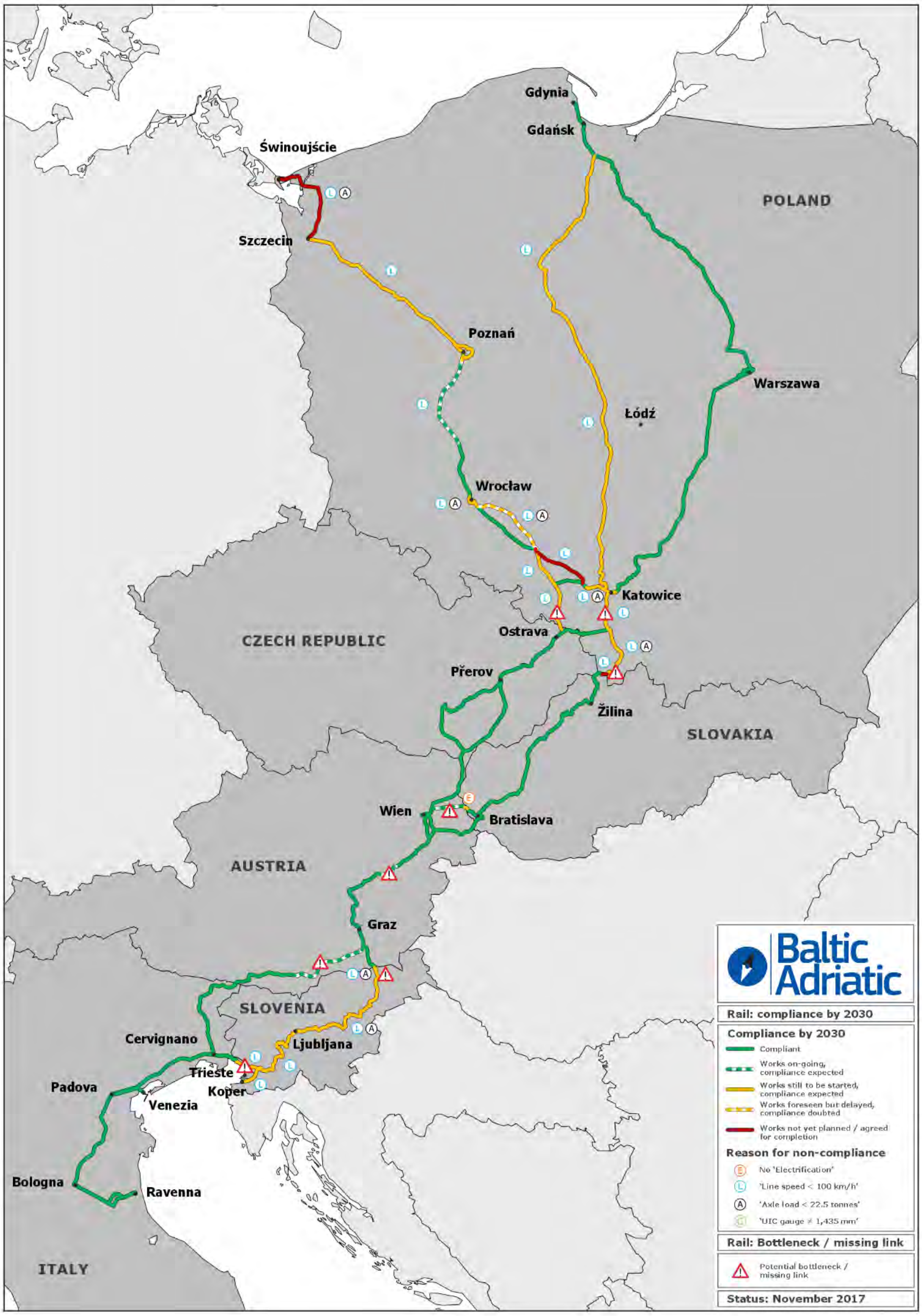
Based on current plans and foreseen projects, the rail network of the Baltic-Adriatic Corridor, including cross-border sections, is expected to be complete by 2030 (with the construction of the Koralm railway line and tunnel and Semmering tunnel) and overall modernised. The identification of all the required investments, the definition of the scope of the projects, their costs and their time-schedule for implementation is however missing for some sections or requirements set in the TEN-T Regulation, which makes the development of a fully compliant and functional corridor by 2030 still a potential bottleneck:

- There are some sections where no investments are planned yet to comply with the standards, particularly affecting speed. The requirements of the TEN-T Regulation are not fully met at present at some rail-road terminals, nodes and junctions and may not be achieved in the future. Sections crossing core urban nodes may also fall short in meeting the requirements of the Regulation especially for speed. However, all the above bottlenecks are not of any critical stage for the full functioning of the corridor.
- 740 meters train length compliance and full ERTMS deployment on many corridor sections are still open questions at present. In this regard plans by the concerned infrastructure managers are currently under definition/review which are expected to solve these gaps. Particularly regarding the 740 meters train length compliance, a study is currently foreseen to be implemented by the Baltic-Adriatic Rail Freight Corridor aimed at understanding the market needs and solutions to improve the operational performance of the corridor lines. The study may also propose solutions for the development of the investments gradually and progressively at specific nodes, stations and junctions, based on traffic and train scheduling.

Specific details are provided below concerning the possible persisting bottlenecks on the corridor railway lines at the critical cross-border sections and on the national railway lines. Overall the analysis of the project list vis-à-vis the functioning of the corridor lines seems more pointing to the need to turn the plans and project list into a mature and stable pipeline of projects, rather than showing gaps in terms of infrastructure development projects:

- *Critical cross-border sections*: The projects planned for the development of the Opole (PL) – Ostrava (CZ) and Katowice (PL) – Žilina (SK) cross-border sections on the Polish side are included in the reserve list of the National Railway Programme, and for some of them the implementation dates are to be confirmed. Whilst these projects may be either partially or fully implemented in the period after 2020, the required speed and axle load standards on these lines are in any case assumed to be reached by 2030 by the Polish Authorities. In addition to this, no works are planned on the Slovak side of the Zwardoń – Skalité subsection of the Katowice (PL) – Žilina (SK) cross-border section.

Figure 34 Rail infrastructure scenario by 2030 vis-à-vis the planned investments and main bottlenecks



Source: BA Corridor study consortium; Note: a) Based on Art. 39, point 3, Slovenia is evaluating the possibility to apply for an exemption to fulfil the requirement relating to speed for freight transport on part of their railway network should such case be justified.

Works for the partial double tracking, upgrading and electrification of the Bratislava (SK) – Wien (Stadlau) (AT) cross-border section have commenced in October 2016 on the Austrian side; these are expected to be completed by 2023. The full double tracking of the remaining single track sections will happen in a later phase depending on the transport demands. Other projects aimed to modernise and upgrade the other critical cross-border sections have not progressed since the inception of the new TEN-T policy in 2014. For these sections either one or all of the three main administrative steps of project implementation are still to be completed, namely: land acquisition, Environmental Impact Assessment and final project approval by relevant governmental and administrative authorities.

Finally, ERTMS is not expected to be deployed on the Polish side of the Opole – Ostrava and Katowice – Ostrava and Polish and Slovak sides of Katowice – Žilina sections. At the same cross-border sections, 740 meters length compliance is also currently not expected to be either partially or fully achieved except on the Polish and Czech side of the Opole-Ostrava and Polish and Slovak side of Katowice–Žilina cross-border sections. 740 meters length compliance is also not expected to be achieved between Bratislava and Wien on the Slovak section Bratislava – Petržalka. In Austria both ERTMS and 740 meters train length are assumed to be implemented on all corridor sections, although the investments in the project list are still to be fully defined also concerning cross-border sections.

The situation described above makes all critical cross-border sections still a potential bottleneck, particularly under the management and administrative stand points of the definition and implementation of the planned solutions.

- *National railway lines*: All the national sections are expected to be compliant with respect to axle load and speed by 2030, except between Szczecin and Świnoujście as well as at the Wrocław node (sections Popowice – Mikołajów – Brochów). At this stage, speed limitations will also remain on the rail freight section Opole Groszowice – Rudziniec Gliwicki on the main itinerary Wrocław – Katowice, although the alternative routing Opole Groszowice – Gliwice Łabędy will be compliant. The short cross-border section Zwardoń – Skalité will also not be at standard with respect to speed. These are the only non-compliant sections of the Baltic Adriatic Corridor where no investments are currently planned. Works are also planned for the modernisation and upgrading of the Slovenian railway network between Divača and Maribor, where a study is ongoing to confirm the scope of the works particularly regarding the definition of the speed standards of the planned solutions. The Slovenian authorities are fully committed to develop the corridor at standard by 2030; however based on Art. 39, point 3, they are also evaluating the possibility to apply for an exemption to fulfil the requirement relating to speed for freight transport on part of their railway network should such case be justified. In consideration of the fact that both the investments to modernise the whole section and the study to fully define the scope for possible derogations are already included in the BA Corridor project list, the work plan expects reaching compliance on the whole section between Divača and Maribor by 2030. The completion of the ongoing analysis either resulting in the confirmation of the scope of the investments to reach compliance or reflecting a need for a possible agreement between the Slovenian Authorities and the European Commission on the exemption from the speed standard is expected before the next revision of the work plan. In absence of agreement on the results, the current positive assessment will be revised on the basis of the effective impact of the construction works included in the project list, reflecting any possible doubt about the attainment of the standards of the network by 2030.

With respect to speed, infrastructure parameters will also fall short in meeting the KPI targets in some national short sections of the eastern branch of the corridor in Poland between Gdańsk and Warszawa, where modernisation works have already been completed. These are located by Tczew and Iława and between Nowy Dwór Mazowiecki and Modlin, due to technical constraints (line geometry). According to the list of investments planned up until 2023, on these lines speed targets will not be further improved. Within core urban nodes speed limitations are currently expected to persist after completion of the planned works at Warszawa, Wrocław, Katowice, Bratislava, Wien, and possibly Ljubljana. Finally, speed limitations currently exist at short subsections of the Ostrava and Brno rail nodes as well as at the Žilina node and following short sections between Žilina and Púchov, and between Krásno nad Kysucou and Čadca. These are expected to be solved by means of implementation of the planned investments. However, in all the above mentioned cases, the prevailing line speed of the sections is already up to the standard, and speed limitation at urban nodes could be subject of derogations from standard. Hence, these segments are not shown in the above technical compliance map in this report.

Due to limited availability of financial resources the achievement of the speed and axle load standards may be delayed in Poland at the Poznań node, and between Wrocław, Jelcz and Opole. The projects relating to the works on these sections are indeed included in the reserve list of the National Railway Programme and no national funds are foreseen to secure their full implementation. Whilst the works on these lines may be implemented in the period after 2020, the possibility to reach the required speed and axle load standards by 2030 remains uncertain at present.

Based on the analysis of the current investments, 740 meters train length compliance along the corridor will remain unachieved in many sections in Poland, Czech Republic and Slovakia, particularly in urban areas. Though not critical for the overall performance of the corridor, compliance of railway accessibility to rail-road terminals in terms of train length and electrification shall also be considered for improvement, especially where these facilitate open access to multimodal infrastructure.

5.4. Actions for the development of road transport

The table overleaf summarises the key elements of the actions identified for the development of the road infrastructure based on the analysis of the updated BA Corridor project list.

15 actions have been identified which comprise a total of 102 road projects, also including ITS dedicated initiatives and totalling 15.9 € billion. Works for the modernisation of the corridor network to reach compliance are planned for implementation at the cross-border sections between Poland – Slovakia, Czech Republic – Austria, Italy – Slovenia as well as on the national road networks in Poland, Czech Republic and Slovakia. In Austria, Italy and Slovenia works are also foreseen to upgrade the existing motorway infrastructure. Studies and works are also ongoing and planned for the implementation of ITS solutions to improve traffic management and flow orientation as well as to boost development and availability of alternative clean fuels across the BA Corridor network and Member States. Nearly half of these initiatives are multi-country and cross-corridors projects aiming at supporting ITS deployment and alternative clean fuels availability in Europe.

Table 46 Actions for the development of the BA Corridor road infrastructure

Actions		Member State	KPIs	Start	End	Projects	Budget
2.1	Cross-border						
2.1.01	Road section Katowice (PL) – Žilina (SK)	PL, SK	Express road or motorway standard	2016	2024	6	2,249.5
2.1.02	Brno (CZ) – Wien (AT): Road section Pohořelice (CZ) – Schrick (AT)	CZ, AT	Express road or motorway standard	2003	2030	5	808.7
2.1.03	Road section Trieste (IT) - Sežana (SI)	IT, SI	-	2016	2030	2	19.1
2.2	Completion and upgrading of the national road networks						
2.2.01	Completion of the Eastern Corridor Branch in Poland: S7 Gdańsk - Warsaw	PL	Express road or motorway standard	2014	2024	5	3,235.9
2.2.02	Completion of the Central Corridor Branch in Poland: A1 Stryków - Katowice	PL	Express road or motorway standard	2015	2020	3	1,521.9
2.2.03	Completion of the Western Corridor Branch in Poland: S3 Świnoujście - Legnica and A4 Legnica - Wrocław	PL	Express road or motorway standard	-	-	4	2,189.8
2.2.05	Completion of D1 in Czech republic section Lipník nad Bečvou – Říkovice and upgrading of the urban sections in Brno	CZ	Express road or motorway standard	-	2035	4	695.2
2.2.06	Upgrading of motorway D1 (section north of Bratislava) and D3 (Žilina bypass) in Slovakia	SK	Express road or motorway standard	2014	2027	6	1,087.5
2.2.07	Upgrading of motorway A2 and A4 in Austria	AT	-	2016	2020	2	166.2
2.2.08	Upgrading of the corridor motorway network in Italy (R.A. 13 and 14, A4, A14)	IT	-	-	-	20	1,914.7
2.2.09	Improvements of the corridor motorway network in Slovenia	SI	-	2017	2022	2	83.3
2.3	Telematic applications (including ITS and ETC), sustainable freight services, innovation (Art. 31, 32, 33) and specific security, safety and accessibility measures (Art. 34, 35, 37)						
2.3.01	ITS in Poland, Czech Republic, Austria, Italy and Slovenia (also including ETC and eCall)	PL, CZ, AT, IT, SI	-	-	-	17	1,491.1
2.3.02	Development of alternative clean fuels in the corridor Member States	PL, CZ, SK, AT, IT	Availability of clean fuels	-	2020	12	89.3
2.3.03	Cross-corridors and multi-country ITS measures	Cross-corridors/Multi-country	-	-	2020	6	244.5
2.3.04	Cross-corridors and multi-country alternative clean fuel measures	Cross-corridors/Multi-country	-	-	2020	8	137.7
Totals						102	15,934.4

Source: BA Corridor study consortium based on the updated project list (status October 2017)

The ITS projects also include eCall emergency system in Austria, and three studies relate to the implementation of C-ITS solutions (in Austria, Czech Republic and Slovenia). Most of the alternative clean fuel projects concern electric mobility in all corridor Member States. The projects are also under implementation for the development of LNG for road transport (in Poland, Italy, Slovenia); and one project is aimed at developing hydrogen in Austria.

5.4.1. Critical issues for the development of road transport along the BA Corridor

Focussing on the specific objectives of the BA Corridor, the following considerations are worth noting on the development of the critical cross-border sections and removal of national road bottlenecks. On the basis of the planned investments the road network is currently expected to be fully modernised at motorway/expressway standard by 2030, including cross-border sections.

Road cross-border sections

Two road cross-border sections (out of a total of seven along the corridor) have been identified as critical in terms of compliance as these two sections are neither motorways nor expressways.

Katowice (PL) ***– Žilina (Brodno) (SK) [Zwardoń (PL) –*** *Skalité (SK)]*: The works for the development of the S1 express road on the Polish side, sections Kosztowy – Bielsko-Biała – state border, including the Węgierska Górka bypass, is expected to be completed by 2022 (1,203.7 € million). The development of the D3 for the upgrading of the road infrastructure to motorway/express standards on the Slovak side are ongoing. The sections Svrcinovec – Skalite – Zwardoń have been already completed. The Čadca bypass between Čadca (Bukov) and Svrčinovec is currently under construction, with expected completion by 2020 (229.1 € million). The remaining segments between Žilina and Čadca are planned to be completed by 2024 (816.7 € million). (*Action Sheet 2.1.01*)

Brno (CZ) – Wien (Schwechat) (AT) [Mikulov (CZ) – Mistelbach (AT)]: On the Austrian side works are ongoing for the upgrading of the motorway A5 from Schrick to Poysbrunn, which are expected to be completed by 2017. Investments are also planned for the completion by 2018 of the last segment of the cross-border section, adopting a 2x1 lane carriageway project solution. The upgrading of the entire road to motorway standard up to the border is foreseen by 2027 (428.7 € million). On the Czech side, studies including an updated Environmental Impact Assessment have been finalised for the D52 Pohořelice – Perná – border CZ/AT section; the revision of the regional land use plan has been completed and the preparatory works for this road are under development. Works are planned to be completed by 2030 (380 € million). (*Action Sheet 2.1.02*)

National roads

As regards national roads, critical issues exist for Poland, Czech Republic and Slovakia where a completion of the modernisation of the motorway network is also needed in addition to the upgrading of the cross-border sections.

In Poland, part of the road infrastructure belonging to the corridor including section on the A1, S3, S7 and A4 are being upgraded or are planned to be upgraded by 2024 to comply with the Regulation (8,151.3 € million). (*Action Sheets 2.2.01 to 2.2.03*)

In the Czech Republic, the D1 motorway section between Říkovice – Přerov – Lipník nad Bečvou, including the Přerov bypass, is planned to be completed by 2022 to reach compliance (453.4 € million), the D1 section Brno – Holubice is planned to be upgraded to six lanes with expected completion by 2028 – 2035 (241.8 € million). (*Action Sheet 2.2.05*)

In Slovakia, the section of the D3 between Žilina (Brodno) and Žilina (Strážov), western bypass of Žilina city, is currently under implementation to solve traffic congestion on the existing roads I/11, I/60 and I/61. This D3 road stretch which is directly interconnected with the future Katowice – Žilina cross-border section is expected to be completed by 2017 (254.9 € million). Upgrading works for sections and junctions of the D1 motorway between Trnava and Bratislava are planned to be completed by 2027 (832.6 € million). (*Action Sheet 2.2.06*)

5.5. Actions for the development of ports and rail-road terminals

The table overleaf summarises the key elements of the actions identified for the development of the port and rail-road terminal infrastructure based on the analysis of the updated BA Corridor project list.

21 actions have been identified which comprise a total of 127 projects have been identified for the development of the maritime and IWW ports infrastructure, including terminals, last mile connections, MoS operations, alternative clean fuels and VTMIS and e-Maritime initiatives. These investments total a budget of 11.2 € billion for the development of both the maritime and inland waterway ports.

Initiatives aimed at developing port infrastructure and terminals, including dredging works and activities to improve maritime accessibility as well as navigability are ongoing and planned for the future to increase port capacity and improve the performance at all ports along the corridor.

At all maritime ports along the corridor projects are also ongoing and planned to increase the standards of the existing rail and road links and to further improve the interconnections between the ports and the other transport modes. These investments will be crucial to support the planned port expansions and to enhance multimodality along the corridor.

Projects for the development of LNG for maritime transport operations are furthermore included in the corridor project list for Gdynia, Świnoujście (LNG fuel is available at the LNG terminal in Świnoujście, where it can be loaded onto road units), Bratislava, Venezia and Ravenna to promote availability of alternative clean fuels for maritime transport operations.

VTMIS and e-Maritime solutions are under implementation for the development of interoperability and simplify/facilitate intermodal transport solutions and improve safe and secure maritime transport.

Table 47 Actions for the development of the BA Corridor port infrastructure and rail-road terminals

Actions		Member State	KPIs	Start	End	Projects	Budget
3.1	Developing hinterland interconnections inside and outside port areas						
3.1.01	Development of interconnections: Port of Gdynia	PL	Electrification; ERTMS; Freight lines: Axle.load (22.5 t); Freight lines: train length (740m); Current or potential future capacity bottleneck; Express road or motorway standard	-	2027	7	1,019.9
3.1.02	Development of interconnections: Port of Gdańsk	PL	Freight lines: speed (100 km/h); Freight lines: Axle.load (22.5 t); Freight lines: train length (740m); Current or potential future capacity bottleneck	2013	2022	7	297.8
3.1.03	Development of interconnections: Ports of Szczecin and Świnoujście	PL	Freight lines: Axle.load (22.5 t); Freight lines: train length (740m); Current or potential future capacity bottleneck	2016	2021	4	248.6
3.1.04	Development of interconnections: Port of Trieste	IT	Current or potential future capacity bottleneck	2016	2026	3	113.0
3.1.05	Development of interconnections: Port of Venice	IT	Current or potential future capacity bottleneck	2018	2030	4	217.5
3.1.06	Development of interconnections: Port of Ravenna	IT	Current or potential future capacity bottleneck	-	-	4	317.0
3.1.07	Development of interconnections: Port of Koper	SI	-	2015	2030	5	93.1
3.2	Modernization / Expansion of the infrastructure						
3.2.01	Infrastructure development: Port of Gdynia	PL	Connection to rail; Facilities for ship generated waste	-	2027	10	2,200.9
3.2.02	Infrastructure development: Port of Gdańsk	PL	Facilities for ship generated waste	2016	2030	10	832.6
3.2.03	Infrastructure development: Ports of Szczecin and Świnoujście	PL	-	-	-	7	584.3
3.2.04	Infrastructure development: Port of Trieste	IT	-	2015	2020	8	707.4
3.2.05	Infrastructure development: Port of Venice	IT	-	2016	2022	4	3,118.3
3.2.06	Infrastructure development: Port of Ravenna	IT	-	2019	2027	4	415.0
3.2.07	Infrastructure development: Port of Koper	SI	-	2015	2030	12	410.0
3.3	Telematic applications (including ITS and ETC), sustainable freight services, innovation (Art. 31, 32, 33) and specific security, safety and accessibility measures (Art. 34, 35, 37)						
3.3.01	Telematics applications in the corridor ports (including VTMIS)	PL, IT	-	2015	2027	10	34.4
3.3.02	Deployment of LNG fuel facilities at the corridor ports	PL, IT	Availability of clean fuels	2017	2027	4	203.4
3.3.03	Cross-corridors and multi-country alternative clean fuel measures	Cross-corridors/Multi-country	-	2015	2019	5	84.2

Actions		Member State	KPIs	Start	End	Projects	Budget
3.4	Cross-corridors and multi-country measures for the development of the maritime infrastructure and operations, including MoS initiatives						
3.4.01	Cross-corridors and multi-country measures for the development of the maritime infrastructure and operations, including MoS initiatives	Cross-corridors/Multi-country	-	-	2020	6	59.0
Totals						114	10,956.5
4.1	Development of inland ports and their accessibility						
4.1.01	Development of the port of Bratislava	SK	Availability of clean fuels	2013	2024	8	178.7
4.1.02	Development of the port of Vienna	AT	-	-	-	3	71.1
4.2.01	Cross-corridors and multi-country measures to promote and improve IWW transport	Cross-corridors/Multi-country	-	-	-	2	5.0
					Totals	13	254.8
6.1	Development of the RRTs and their accessibility						
6.1.01	Development of the terminal infrastructure, last mile connections and telematics applications	PL, CZ, SK, AT, IT, SI	Current or potential future capacity bottleneck; Capability of handling intermodal units; 740m train terminal accessibility; Electrified train terminal accessibility	-	-	14	569.3

Source: BA Corridor study consortium based on the updated project list (status October 2017)

Further to the actions for the development of the port infrastructure, 1 action for the development of the rail-road terminals has been also defined, which includes 14 projects for the development of rail-road terminals, totalling 569 € million. These relate to the development and expansion of infrastructure for multimodal transport at Wrocław (Kąty Wrocławskie), Ostrava Paskov, Přerov, Freight Centre Wien South (Inzersdorf), Graz Süd (planned to be expanded by 2024, also in view of the completion of the Koralm railway line and tunnel), Padova and Ljubljana. Improvement of interconnections are either part of these developments or presented as dedicated projects, as for the Warszawa, Łódź and Cervignano rail-road terminals. ICT and innovation initiatives are also ongoing and planned to promote intermodality and support the smooth flow of information along the logistic chain also including the terminals.

5.5.1. Critical issues for the development of the port infrastructure along the BA Corridor

Focussing on the specific objectives of the BA Corridor, the following considerations are worth noting on the improvement of last mile connections of ports.

All the sea and inland ports along the BA Corridor are already connected to the rail and road infrastructure. However, as also commented at Section 3.3.3 above, investments are required to improve the standards and performance of the last mile sections of the core network to ensure interoperability of the corridor infrastructure, increase its capacity facing port terminals expansion and mitigate the impact of transiting of long-distance traffic to and from core city ports in their urban areas. Specific details on the description of the critical issues at the ports and the planned investments are given in the box below. As a result of these projects, all last mile connections to the ports are planned to be improved towards reaching the requirements set in Regulation (EU) 1315/2013 and support port capacity and operation expansions. More details are provided in the paragraphs below relating to the description of the issues affecting last mile connections at the ports on the BA Corridor and the projects ongoing and planned for their improvement.

Port of Gdynia – Concerning rail transport, works for the improvement of the standards of the railway lines interconnecting the terminals to the main lines 202 and 201 belonging to the Baltic-Adriatic Corridor are required. Projects for the improvement of the technical parameters are foreseen, covering among others the implementation of Layout Command Control within the port area, electrification of access to the container terminal, instalment of Remote Train Control in view of future ETCS implementation as well as construction of road and railway bridges to improve safety and capacity. Works are planned to start in 2018, expected to be completed by 2020 (190.9 € million). Works inside the port area to increase the throughput capacity of the rail infrastructure are also expected to be implemented between 2021 and 2027 (59.8 € million). Some other modernisation works are also planned, including reconstruction of railway access to the Western port areas of the port of Gdynia, with expected completion of the works by 2020 (approximately 17.7 € million). Works on the TEN-T comprehensive partially non-electrified railway line 201 are also planned; this representing the railway line that will be predominantly used by the traffic generated by the port. Regarding road connections, the S6/S7 express road is already in good condition up to the junction with Morska Street in Gdynia. However, critical issues exist in the road network providing access to the port: the Kwiatkowski Viaduct although recently completed (2008) represents a critical issue in terms of axle load standards and the Kwiatkowski Route registers high traffic levels which may turn into a capacity issue particularly in view of the further development of the traffic at the port. The upgrading of the port's surrounding urban road network is also under consideration which could help solving the existing and future capacity bottlenecks. The actions addressing the road bottlenecks are under consideration/definition by the concerned stakeholders at present which may be implemented by 2030: reconstruction of Kwiatkowski viaduct, construction of Droga Czerwona and upgrading of Polska Street and Janka Wiśniewskiego Street. (*Action Sheet 3.1.01*)

Port of Gdańsk – About rail interconnections, modernisation works on railway line 226 are ongoing which include construction of the second track, increase in axle load and operating speed standards as well as reconstruction of bridges. All activities are expected to be completed by 2018 (76.2 € million). Investments aiming at improving the railway connection to the port (in particular improvement of railway infrastructure within the railway stations Gdańsk Port Północny, Gdańsk Zaspa Towarowa and Gdańsk Kanał Kaszubski, construction of a road viaduct and development of a Local Control Centre between Gdańsk Port Północny and Gdańsk Kanał Kaszubski, electrification of railroad no. 965 as well as instalment of Railway Traffic Control devices in view of future ETCS implementation) are foreseen to be implemented with expected completion date by 2020 (141.5 € million). Concerning road last mile connections, the construction of a road tunnel and a rail bridge to cross the Martwa Wisła River have been recently completed which improved accessibility to the port; the first one allowing direct interconnection with the A1 as an alternative to the existing interconnection with the S7, and the second one increasing capacity on the existing line. The improvement/upgrading of the Nowa Kościuszki street, resulting in the completion of the Gdańsk ring road, also represents a critical issue in terms of road accessibility to the port (*Action Sheet 3.1.02*)

Świnoujście and Szczecin ports – Regarding rail transport, train length and freight speed limitation are currently affecting railway accessibility to the ports. Modernisation works are planned to increase axle load to 221 kN/axis for the main existing line tracks and stations and up to 245 kN for the reconstructed and newly constructed sections. The reconstruction of the railway viaduct on line no. 990, the electrification of railway lines no. 990 and no. 996 and the elimination of bottlenecks at Szczecin Port Centralny and Świnoujście stations are also foreseen. All the initiatives are expected to be completed by 2020 (143.67 € million). About road interconnections, access to the port of Szczecin is primarily provided through the national road no. 10, Parnica viaduct and local roads. The reconstruction of the local road communication system in the area of Międzyodrze is currently under consideration, the works expected to be completed by 2020 (69.1 € million). Road access to the port of Świnoujście is provided by the national road no. 3 and lower class roads (Poviat roads). Short segments of both national road no. 3 and Poviat roads require upgrading works. (*Action Sheet 3.1.03*)

Wien and Bratislava inland waterways ports – The two inland waterway ports of Freudenau in Wien and Bratislava are both located on the Danube River. These ports are planned to be expanded aimed at further increasing their capacity and competitiveness to support the development and growth of intermodal services and transport. Also based on the relevant road and particularly rail services operated by Wiencont, investment plans at the Port of Wien emphasize the expansion of tri-modal facilities, particularly storage of containers and the modernisation of the handling equipment, in an endeavour to provide adequate service level required to encourage modal shift from road to rail and inland waterways. The expansion of the port's container handling capacities will emphasize land recovery and the construction of a new quay wall to optimise the operational efficiency. Regarding the interconnections of the two ports with the Baltic-Adriatic corridor by rail, the Freudenau port is connected with the railway network by a direct link (national code 124), parallel to national road 14. The Bratislava inland waterway port has its own siding network connected with the main railway network through the Bratislava – ÚNS freight station on the Baltic-Adriatic corridor freight branch (section Bratislava – Petržalka). As of road accessibility, the Fradenau port is interconnected with the A4 through national road 14 and motorway A 23. The Bratislava port has good connections with the motorway D1 on the Baltic-

Adriatic Corridor, being only 0.5 km distant from the Bratislava – Prievoz junction on the D1 and R7 under construction (expected to be completed by 2020). No specific problems have been identified which affect last mile connections at present for the two ports; however critical issues exist which affect the navigability of the Danube river between the two cities and particularly in Slovakia, for which works are already ongoing or planned to be implemented by 2018-2020. In addition to the need to improve navigability in the section Freudenau – Slovak border, in the National Park Donau-Auen, works are planned between km 1880,260 and km 1862,000 in Slovakia, including dredging of the river bed and removal of obstacles. The reconstruction of the "old bridge" in Bratislava (completed in December 2015) and the possibility to operate simultaneously the two Gabčíkovo locks represent relevant projects to develop inland waterway transport services along the Danube. Regarding the port of Bratislava, modernisation works are also required for the improvement of both the rail and road infrastructure inside the port area. (*Action Sheets 4.1.01 and 4.1.02*)

Port of Trieste – Concerning accessibility to the port by rail, a double track line is interconnecting the port to the Trieste – Venezia railway line, leaving from Campo Marzio, tunnelling and crossing the city. Furthermore, there is a single track line going from Campo Marzio directly to Villa Opicina, which is however temporary closed and with a steep gradient that prevents operation of heavy trains. Based on the current schedule, increases in the future traffic on the line in operation may lead to congestion. The port's development plans consider this "last mile" issue a critical one to ensure continuity in the operation of freight services. In addition to this, investments are deemed necessary to develop the railway terminal at Campo Marzio (Port Station) to improve operations at existing port terminals. Shunting and coupling of trains is indeed currently possible only at port terminals. Due to the limited length of tracks at these terminals more shunting operations and train manoeuvring is required to assemble trains even limited to 550 m length, which impacts on the effectiveness and efficiency of terminal operations. Investments to increase train length operations up to 750 m at Trieste C. Marzio station are planned for implementation as part of a wider initiative aimed at modernising the whole Trieste Campo Marzio station, increasing its capacity and performance in support of the development of intermodal services. The project, which also includes works for the improvement of the so called railway line "Linea di cintura" between Campo Marzio and Trieste Aquilinia, is planned to be completed by 2026 (77 € million). Works to improve the railway infrastructure within the port area and terminals as well as the construction of a new railway link in view of the development of the new logistics platform are also planned for implementation between 2016 and 2020 (36 € million). Concerning road last mile connections, a direct junction and a flyover (within the port) interconnect the Port of Trieste and its terminals to the main city road network and to the national highway and motorway networks, including the Baltic-Adriatic corridor links. Improvement works on the SS 202, also providing access to the port, have been completed for the stabilisation of the retaining walls (from km 9+850 to km 12+200) and for the structural repair of the viaduct "Molo VII". (*Action Sheet 3.1.04*)

Port of Venezia – The rail and road infrastructure interconnecting to the port and within the port areas and terminals is overall compliant thanks to recently completed modernisation and upgrading works. Rail accessibility will be improved by means of upgrading of the rail links between the South Industrial Area of Marghera and Marghera Scalo Station, construction of the second track to the Fusina Ro-Ro terminal as well as construction of a new rolling stock vehicle maintenance and repair depot, all works expected to be completed by 2025 (42.5 € million). A first phase of telematic application works for rail traffic have been developed (Railway telematics systems for shunting operations – SIMA); additional improvements of SIMA and its integration with PCS and additional information systems relating to rail operations are ongoing, expected to be completed by 2018 (1.55 € million). In the long term, the existing railway connection is expected to become a possible capacity bottleneck, also causing traffic congestion problems at the Mestre railway node, which will require development of a direct connection to the main railway line (following the railway section of the BAC and MED TEN-T CNC's and RFC 5 and 6 Corridors). Road investments have also been recently completed outside and inside the port area on the SR11, SS309 and SP81 up to the bridge located in via Volta; new parking areas near the Customs perimeter at the port have also been completed. Telematic application investments for road on the local roads interconnecting the port to the national motorway network have been completed in 2017 to increase fluidity and safety as well as to reduce congestion. (*Action Sheet 3.1.05*)

Port of Ravenna – Regarding rail transport, works are planned to eliminate one level crossing on the line interconnecting the port to the Baltic-Adriatic corridor network as well to upgrade to P/C 80 standard the line between Castelbolognese and Ravenna and extend the existing infrastructure on the right side of the port canal by 2021. Additional upgrading and improvements of the existing infrastructure is also planned for implementation by 2026 (70 € million for all the above rail related projects). Works for the improvement of road accessibility to the port are also planned for the upgrading of the SS 309Dir and its interconnection to the SS 16, expected to be completed by 2020 (175 € million) as well as for the upgrading of the SS 16 (72 € million). (*Action Sheet 3.1.06*)

Port of Koper – About rail last mile connections, the reconstruction of the existing track between Koper and Divača was recently completed. Works for the elimination of the technical bottleneck at Bivje are ongoing and planned to be completed by 2019 (21.4 € million). Studies for the construction of the second track on the line Koper and Divača are ongoing; the works are planned for implementation in the period 2016-2025 to solve capacity bottlenecks on the existing line expected in the short period and support traffic growth and development of the Port of Koper (960 € million). The port capacities will also be upgraded in the period 2016 – 2020 (300 € million – including public and private port infrastructure expansion and equipment). As of road accessibility, investments are also planned to start already in 2016 for the development of a direct interconnection between the A1 motorway and the port, which are expected to be completed by 2023 (23.1 € million). In addition to last mile connections, works for the improvement of the road and rail internal infrastructure are also foreseen to be implemented by 2020 to improve accessibility (40 € million), and subsequently by 2030 in view of the expansion of the port infrastructure and operations (30 € million). (*Action Sheet 3.1.07*)

Not strictly related to the specific corridor objectives, but still important to achieve full compliance by 2030, alternative clean fuels development shall be monitored closely at ports. LNG related projects for maritime transport operations are included on the corridor project list for Gdynia, Świnoujście (LNG fuel is already available at the LNG terminal in Świnoujście, where it can be loaded onto road units), Bratislava, Venezia and Ravenna; however projects or strategies for the provision of this fuel at the other core ports are still to be defined and included in the BA Corridor project list. Facilities for ship generated waste relating to sewage treatment are also still not available at the Adriatic ports in Italy and no investments are foreseen in the project list at present in this regard.

5.6. Actions for the development of airports

The table overleaf summarises the key elements of the actions identified for the development of the airport infrastructure based on the analysis of the updated BA Corridor project list. 13 actions have been identified which comprise a total of 93 projects, including airport terminals and runways expansions as well as technological works to improve safety and security and monitoring/mitigation of environmental impacts.

Table 48 Actions for the development of the BA Corridor airport infrastructure

Actions		Member State	KPIs	Start	End	Projects	Budget
5.1	Modernization / Expansion of the airport infrastructure						
5.1.01	Modernization / expansion of the airport of Gdańsk	PL	-	2017	2023	2	34.8
5.1.02	Modernization / expansion of the airport of Warsaw	PL	-	2006	2019	5	274.2
5.1.03	Modernization / expansion of the airport of Katowice	PL	-	-	-	13	235.2
5.1.04	Modernization / expansion of the airport of Łódź	PL	-	-	-	1	0.0
5.1.05	Modernization / expansion of the airport of Szczecin	PL	-	2014	2020	4	19.3
5.1.06	Modernization / expansion of the airport of Poznań	PL	-	2015	2019	8	37.8
5.1.07	Modernization / expansion of the airport of Wrocław	PL	-	2015	2020	7	65.6
5.1.08	Modernization / expansion of the airport of Ostrava	CZ	-	-	-	-	0.0
5.1.09	Modernization / expansion of the airport of Bratislava	SK	-	-	-	-	0.0
5.1.10	Modernization / expansion of the airport of Vienna	AT	Availability of clean fuels	2012	2028	2	880.0
5.1.11	Modernization / expansion of the airport of Venice	IT	Connection to rail	2013	2025	4	505.0
5.1.12	Modernization / expansion of the airport of Bologna	IT	Connection to rail	2008	2020	10	100.3
5.1.13	Modernization / expansion of the airport of Ljubljana	SI	-	2013	2025	5	58.6
5.2	Telematic applications (including SESAR), sustainable freight services, innovation (Art. 31, 32, 33) and specific security, safety and accessibility measures (Art. 34, 35, 37)						
5.2.01	Telematics applications (including SESAR) at corridor airports	PL, SI	-	-	-	14	63.9
5.2.02	Cross-corridor and multi-country telematic application initiatives (including SESAR)	Cross-corridors/Multi-country	-	-	2020	18	2,689.3
Totals						93	4,963.9

Source: BA Corridor study consortium based on the updated project list (status October 2017)

Whilst the majority of the investments relate to passenger transport operations, cargo facilities related improvements are also planned at Gdansk, Warszawa, Katowice and Ljubljana. These investments total a budget of about 5.0 € billion.

Telematic applications (mostly SESAR) are under implementation as part of projects not specific to the corridor but impacting on the airports located along the Baltic-Adriatic axis. One initiative has been identified at this stage for the promotion of alternative clean fuels, which is Sustainable airport area - CO2 neutral Airport implemented at Wien aiming at fulfilling the requirements and standard of the ACAS - Airport Carbon Accreditation and EMAS Eco Management Systems. Nonetheless the project list and more generally the BA Corridor work plan are missing investments and/or strategies for the provision of alternative clean fuels at the core airports. Albeit not strictly related to the corridor objectives, this is an important condition to achieve compliance by 2030.

So far no investments have been identified for the two airports at Ostrava and Bratislava, for which no action has been currently elaborated. The description of the rail interconnections to the airports (already existing at Ostrava and under development at Bratislava) has been described in the action sheets dedicated to the development of the urban nodes.

5.7. Actions for the development and integration of core urban nodes

In the framework of the new TEN-T policy, urban nodes play an important role within the development and functioning of the core network as a multimodal and interoperable infrastructure for both passenger and freight traffic. Urban nodes along the corridor connect network links – both of the core and the comprehensive networks. They also interconnect transport modes, thus enhancing multimodality. Finally, they connect long distance and/or international traffic with regional and local transport.

As such all the following different types of investments have been considered for the identification of relevant investments to ensure the corridor will develop as an interoperable infrastructure, which may affect both urban areas and core urban nodes:

- Projects for the improvement of the standards of the rail and road core network corridor links in urban areas, including stations, sidings, etc. as well as junctions (last mile sections);
- Actions for the improvement of rail and road links directly interconnecting the corridor with a core transport node in an urban area and possible alternatives to solve capacity issues (last mile connections);
- Initiatives for the improvement of interconnections between core transport nodes and between transport modes in core urban nodes, i.e. projects relating to regional and suburban railways, metro or tramway lines (and interchange facilities located on their alignment) which are directly interconnecting to at least one core transport node in a core urban area, where services are operated towards other core urban nodes belonging to the core network (core urban node projects);
- Initiatives to promote interconnection between different transport modes and sustainable transport solutions for both passengers and freight, including ICT, ITS, Clean fuel (or other sustainable transport and mobility) projects that are implemented in core urban areas or at a territorial scale involving at least one core urban area. These may also include any other soft or administrative measure for the promotion of integrated transport and mobility in core urban area towards Mobility as a Service solutions (other core urban node projects);
- Infrastructure solutions to mitigate the negative effects of long distance traffic along the corridor transiting urban areas, including corridor rail and road bypasses regardless their classification as core or comprehensive, provided that they are implemented to mitigate environmental impacts associated to the existing corridor sections.

Table 49 Actions for the development and integration of the core nodes of the BA Corridor

Actions		Member State	KPIs	Start	End	Projects	Budget
7.1	Development of the core network corridor within urban nodes and urban transport infrastructure ensuring interconnections between and within transport modes and a seamless connection between long distance and regional or local traffic flows						
7.1.01	Urban node: Gdańsk	PL	-	2015	2023	4	104.7
7.1.02	Urban node: Warsaw	PL	Freight lines: speed (100 km/h); Freight lines: Axle.load (22.5 t); Freight lines: train length (740m); Current or potential future capacity bottleneck	2015	2024	6	407.3
7.1.03	Urban node: Katowice	PL	Freight lines: speed (100 km/h); Freight lines: Axle.load (22.5 t); Freight lines: train length (740m); Express road or motorway standard; Connection to rail	2017	2021	3	228.8
7.1.04	Urban node: Łódź	PL	ERTMS; Freight lines: speed (100 km/h); Freight lines: Axle.load (22.5 t); Freight lines: train length (740m); Current or potential future capacity bottleneck	2011	2021	13	1,594.9
7.1.05	Urban node: Szczecin	PL	Current or potential future capacity bottleneck; Single track section; Express road or motorway standard	2017	2023	2	317.3
7.1.06	Urban node: Poznań	PL	Freight lines: speed (100 km/h); Freight lines: Axle.load (22.5 t); Freight lines: train length (740m); Current or potential future capacity bottleneck	-	-	3	241.8
7.1.07	Urban node: Wrocław	PL	-	-	-	-	0.0
7.1.08	Urban node: Ostrava	CZ	Freight lines: speed (100 km/h); Freight lines: train length (740m); Current or potential future capacity bottleneck	2019	2021	1	222.2
7.1.09	Urban node: Bratislava	SK	ERTMS; Freight lines: speed (100 km/h); Freight lines: train length (740m); Current or potential future capacity bottleneck; Connection to rail	-	-	16	2,646.3
7.1.10	Urban node: Vienna	AT	Current or potential future capacity bottleneck; Single track section	2003	2037	5	1,927.8
7.1.11	Urban node: Venice	IT	Current or potential future capacity bottleneck; Express road or motorway standard; Connection to rail	-	-	4	720.0
7.1.12	Urban node: Bologna	IT	Current or potential future capacity bottleneck; Express road or motorway standard; Connection to rail	-	-	5	565.5
7.1.13	Urban node: Ljubljana	SI	Current or potential future capacity bottleneck; Single track section	2010	2030	6	309.9
Totals						68	9,286.4

Source: BA Corridor study consortium based on the updated project list (status October 2017)

In line with the above categorisation 68 projects for a total of 9.3 € billion investment costs have been identified which have been included in 12 actions. No projects have been so far defined for the core urban node of Wrocław. (*Action Sheets 7.1.01 to 7.1.13*).

These 68 projects identified for the development and integration of the core urban nodes of the BA Corridor in the TEN-T core network include:

- Actions to improve the standards and increase the capacity of rail corridor sections at the following core urban nodes: Gdańsk, Warszawa, Łódź, Katowice, Szczecin, Poznań, Wrocław (Poland), Ostrava (Czech Republic), Bratislava (Slovakia), Wien (Austria) and Ljubljana (Slovenia);
- Investments to increase capacity, improve safety and reduce congestion on the corridor road infrastructure at core nodes, by means of development of corridor bypasses or upgrading of corridor sections and junctions. Projects are located in Gdańsk (including the project for the development of the S6 Tricity bypass, currently not included in the project list, but confirmed to be implemented after 2025), Warszawa, Łódź, Szczecin, Poznań (Poland), Ostrava (Czech Republic), Bratislava (Slovakia), Wien (Austria), Bologna (Italy) and Ljubljana (Slovenia):
- Projects to improve multimodal infrastructure for the interconnection between transport modes in order to support modal shift from road to rail are also included on the list (Gdańsk, Szczecin, Łódź, Bratislava, Bologna) focussing on the development of urban transit and interchange facilities as well as ITS and ICT solutions for both passenger and freight transport.

Further to the above projects at core urban nodes, last mile connections to the core airports presented in the previous section have been considered among the urban projects for their relevance at the metropolitan scale in terms of accessibility to the core airports within the core urban nodes. Last mile connections of ports and rail-road terminals even when affecting urban areas have instead been considered in the analysis of the respective modes because of the predominance of freight transport and the presence of core logistic nodes outside core urban areas. Similarly, the improvement of the standards of the corridor rail and road links in urban areas located outside core urban nodes have been considered in the development of the respective modes (e.g. modernisation of railway nodes, stations and junctions at Brno (Czech Republic), Žilina (Slovakia), Udine (Italy) and Zidani Most (Slovenia); or development of the D1 Přerov bypass and D52 Mikulov bypass (Czech Republic), and upgrading of the A2 Klagenfurt bypass (Austria)).

5.8. Other actions for the development of the BA Corridor

Two actions have been finally identified which relate to the development of studies or horizontal projects, and which are not specifically related to a BA Corridor section or node. Among these, one study relates to the development of a high-speed connection between Wien and its airport and Budapest. Another initiative concerns the study by Slovenia aimed at the identifying measures to ensure the railway network to be developed at TEN-T standards and bottlenecks will be solved on the corridor lines. Furthermore, the strategy for deployment of alternative fuels infrastructure in Slovenia is also included in this action as well as the study to develop intermodal passenger hubs in Slovenia. A dedicated project for the development and operation of the BA Rail Freight Corridor aimed at enhancing international and interoperable long distance transport along the corridor mitigating and solving operational and administrative solutions to rail transport is also worth mentioning together with a horizontal action aiming at coordinated and harmonised implementation of rail freight corridors and freight and passenger telematic applications. The remaining initiative relate to Regional and Transport Development in the Danube-Black Sea Region towards a Transnational Multiport Gateway Region – DBS Gateway Region.

Among the cross-corridors and multi-country initiatives for the promotion of multimodal and interoperable solutions the following are included: e-Freight Implementation Action aiming at implementing a study including market-ready pilot applications of e-Freight standards and technological infrastructures along three Core Network Corridors (Atlantic, Mediterranean and Baltic - Adriatic) in Core Network Ports in Portugal, Italy and Poland; DIGITMED-Digital Single Market in the Mediterranean targeting the realisation of smart solutions towards a single market for digitalized information supporting logistic services, across transport modes and countries; Linking Danube aiming at fostering the environmentally-friendly mobility options and balanced accessibility in the Danube Region; EUROSKY – Single European Secure Air-Cargo Space and CORE - Safety improvements. Another initiative among this project category relates to the development of intermodal and e-mobility in urban areas in Slovenia and Croatia.

Table 50 Other actions for the development of the BA Corridor

Actions		Member State	KPIs	Start	End	Projects	Budget
8.1	Studies and supporting actions						
8.1.01	Studies for the implementation of the EU transport policies including the TEN-T Regulation	Cross-corridors/Multi-country	-	2015	2020	7	14.5
8.2	Horizontal actions						
8.2.01	Cross-corridors and multi-country initiatives for the promotion of multimodal and interoperable solutions	Cross-corridors/Multi-country	-	0	2020	6	140.5

Source: BA Corridor study consortium based on the updated project list (status October 2017)

6. Infrastructure implementation by 2030

According to Art. 47 of Regulation (EU) 1315/2013, the work plan shall also include, in addition to the analysis and identification of the investments and measures for the development of a fully compliant and functional corridor by 2030, details on the implementation of the projects, including time-schedule and financial resources. This is required to assess the technical and financial maturity of the investments, particularly those identified to reach the specific corridor objectives and the targets of the TEN-T policy. Furthermore the work plan shall also include an analysis of the impact of the development of the corridor in deploying innovative solutions, generate jobs and economic growth and reduce external costs of transport (so called "wider elements" of the work plan). This Chapter focusses on the analysis of the project list as a relevant and mature pipeline of initiatives, for the development of the corridor by 20030 in compliance with the objectives of the New TEN-T policy. Chapter 7 is dedicated to the presentation of the results of the 2015-2017 BA Corridor study with respect to the wider elements of the work plan.

6.1 Relevance of the project list towards the achievement of the objectives of the TEN-T policy and the development of the BA Corridor

The 551 projects in the BA Corridor project list with a total investment volume of 76.9 € billion are likely to contribute to a significant development of the corridor towards the attainment of the requirements set in the TEN-T Regulation by 2030.

The specific objectives of the corridor and work plan priorities have been well addressed in the investment plans by the stakeholders. Indeed, as summarised in Table 44 above, 186 projects, corresponding to more than 45% of the project list's total investment costs are related to the work plan priorities. As regards the remaining 365 projects, these are not less relevant if compared to the general objectives of the new TEN-T Policy.

A cluster analysis has been undertaken in this regard aimed at classifying the projects in terms of their relevance towards the achievement of the targets set in Regulations (EU) 1315/2013 and 1316/2013. This has been performed by applying a methodology common to all the 9 core network corridors' studies and coordinated by PricewaterhouseCoopers – PWC, leading entity of the Mediterranean corridor study. 484 projects have been reviewed in total, excluding 67 initiatives related to studies only and/or horizontal projects (i.e. those not allocated to any core network corridor) and/or projects classified in the project list under the category 'other'.

The analysis has been undertaken referring to the transport modes: rail (also including ERTMS), IWW, roads, seaports, airports and multimodal transport. Further to the transport modes, an additional group of projects has been considered which relate to new technologies and telematic applications, except those associated with ERTMS, RIS, VTMIS, ITS for road and SESAR, which have been assessed in the respective mode clusters.

Within each transport mode and for the new technologies and telematic application category of analysis, projects have been classified in 4 different clusters of which one residual and as such not defined, and three structured according to the priorities and objectives identified in the TEN-T policy for the development of each mode and for the innovation projects. More specifically investments have been classified into four clusters, generally applying one or more of the following criteria:

- Projects located on the so called pre-identified sections of the CEF Regulation as defined in Part 2 of Annex I to Regulation (EU) 1316/2013 (Cluster 1);

- Projects having a direct impact on the achievement of the infrastructure standards set in Regulation (EU) 1315/2013 (Clusters 1 or 2);
- Projects related to the improvement of capacity and performance of the TEN-T core network or to the implementation of horizontal priorities as defined in Part 1 of Annex 1 to Regulation (EU) 1316/2013 (Clusters 1, 2 or 3);
- Projects included in the list for possible developments and further improvement of the infrastructure, with a relatively minor direct impact on priorities set in the TEN-T policy (Residual Cluster).

In the subsequent paragraphs the results of the clustering analysis are presented by mode, starting with the new technology and innovation horizontal category, also commenting on the rationale adopted for the definition of the clusters. Whilst the paragraphs below present the aggregated analysis of the project list, the information on the allocation of the individual project to the clusters is provided in the actions' summary sheets included at Annex B to this report. This is also aimed at giving relevance to the single projects within the wider actions identified for the development of the BA Corridor by 2030.

New technologies and telematic applications

The table below provides the results of the cluster analysis of the projects belonging to the new technologies and telematic applications category, other than ERTMS, VTMIS, ITS, RIS and SESAR, which have been assessed on the basis of the concerned transport mode.

Table 51 Cluster analysis for new technologies and telematic application projects

	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Totals
	Low Carbon & Decarbonisation/Clean fuels (Art. 33. a & b 1315/2013, Annex I.I. 1316/2013)	Telematic applications others than ERTMS, RIS, SESAR, ITS, VTMIS (ex. E-maritime services, data sharing & cooperation systems) Art. 33. d Reg. 1315/2013	Safety & Security, noise mitigation (Art. 33 letter c Reg. 1315/2013)	Residual interventions	
Projects	31	17	3	2	53
Investment costs	564.3	106.5	76.1	85.0	831.9
Approved funds	426.5	28.7	76.1	-	531.3
Financial gap	137.9	77.8	0.0	85.0	300.6

Source: BA Corridor study consortium

All measures aiming to support and promote decarbonisation of transport have been considered as cluster 1. In fact, Art. 33 of Regulation (EU) 1315/2013 highlights the importance of the availability of clean fuels; this basically apply to all transport modes. A total of 31 projects have been identified in this cluster relating to LNG initiatives for maritime and road transport, electric and hydrogen mobility pilot projects as well as MoS services contributing to modal shift.

Horizontal priorities other than ERTMS, RIS, VTMIS and ITS for road have been included in cluster 2, which totals 17 projects mostly related to e-Maritime solutions or ICT projects for multimodal transport for both freight and passengers. Safety, security and noise mitigation projects have been clustered in the third group of initiatives, totalling 3 projects related to the implementation of innovation solutions in the freight sector, involving the Bologna rail-road terminal. two project are included in the residual cluster which relates to measures to reduce environmental impacts associated to airport operations.

By comparing the total investment costs with the approved funds, a gap of about 300 € million is noticeable for the completion of the new technologies and telematic applications projects (other than ERTMS, ITS, VTMIS, RIS and SESAR), which is predominantly associated with the implementation of projects belonging to clusters 1 and 2.

Rail and Rail ERTMS

In the following table the outcome of the cluster analysis of the projects belonging to the rail and rail ETRMS category is provided.

Table 52 Cluster analysis for rail and rail ERTMS projects

	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Totals
	• PRE-IDENTIFIED PROJECTS (Reg. 1316/2013 Annex I, part.2) • ERTMS Deployment (Reg. 1315/2013 Art. 13, 39.2, 1316/2013 Annex I part I) • Achievement of compulsory technical parameters (ex. All compulsory parameters stated by Art. 39.2)	• Projects eliminating current or expected capacity bottlenecks (according to TMS carried out in 2013)	• Projects contributing to the achievement of technical parameters others than compulsory ones (ex. gabarit etc.)	• Residual interventions	
Projects	126	0	0	23	149
Investment costs	36,526.4	-	-	2,051.9	38,578.4
Approved funds	18,318.0	-	-	739.7	19,057.7
Financial gap	18,208.4	-	-	1,312.3	19,520.6

Source: BA Corridor study consortium

All the rail pre-identified section projects have been classified as cluster 1, together with the rail projects aiming at deploying ERTMS signalling system along the core corridor alignment, as well as projects focused on the achievement of compulsory technical parameters as stated in Art. 39.1 of Regulation (EU) 1315/2013. As a result cluster 1 includes 126 projects which relate to the completion of the modernisation of the network in Poland and Slovenia, as well as the improvement of the network in the Czech Republic and Slovakia and upgrading of the corridor in Austria and Italy. No projects are included in clusters 2 and 3. The residual cluster includes 23 projects not belonging to the previous classes of projects, and relating to the development of the corridor in urban nodes.

By comparing the total investment costs with the approved funds, a gap of about 19.5 € billion is noticeable for the completion of the rail and rail ERTMS projects. More specifically 18.2 € billion of required financial resources are associated with the implementation of projects belonging to cluster 1, and 1.3 € billion are related to investments planned for the improvement of the corridor infrastructure in urban nodes.

IWW and Inland Ports

The table below provides the results of the cluster analysis for the projects belonging to the IWW and Inland Ports categories, including RIS deployment as well as projects contributing to good navigation status, following the Art. 39.2 of Regulation (EU) 1315/2013.

Table 53 Cluster analysis for IWW and Inland Ports projects

	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Totals
	• PRE-IDENTIFIED PROJECTS (Reg. 1316/2013 Annex I, part.2) • ECMT Class >= IV (Reg. 1315/2013 Art. 16) • Last mile rail connection to inland ports (Reg. 1315/2013 Art. 16)	• RIS deployment & projects contributing to good navigation status (Reg. 1315/2013 Art. 39.2)	• Capacity expansion & safety interventions (Reg. 1315/2013 Art. 13)	• Residual interventions	
Projects	7	0	1	0	8
Investment costs	211.7	-	22.6	-	234.3
Approved funds	7.2	-	-	-	7.2
Financial Gap	204.5	-	22.6	-	227.1

Source: BA Corridor study consortium

IWW or inland ports pre-identified projects belong to cluster 1, together with IWW/inland port projects aiming at meeting at least ECMT Class IV requirement as well as projects addressing last mile railway connections to core Inland Ports, in line with Art. 16 of the Regulation (EU) 1315/2013. 7 projects are included in this cluster which belong to the BA Corridor updated project list, relating to expansion projects of multimodal platforms and/or interconnections with rail transport at the Wien and Bratislava ports. Cluster 2 comprises all those projects addressing the deployment of IWW telematic applications (RIS) or contributing to the good navigation status, as stated in Art. 39.2 of the Regulation (EU) 1315/2013. Also noticing that the BA Corridor does not include IWW sections – only the two ports of Bratislava and Wien – no projects are included in the corridor list which belong to cluster 2. 1 capacity expansion project at the port of Bratislava is included in cluster 3. No projects belong to the residual cluster.

The comparison between the total investment costs and the approved funds for IWW and inland ports' projects shows a gap of approximately 227.1 € million, which is needed for their completion. In greater detail, nearly 204.5 € million of financial resources relate to the implementation of projects classified as cluster 1.

Road

The following table summarises the results of the cluster analysis undertaken for road projects including ITS.

Table 54 Cluster analysis for road projects

	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Totals
	• Pre-identified projects (Reg. 1316/2013 Annex I, part.2) • Upgrading to express road/motorway (Reg. 1315/2013 Art. 19) • Creation of rest areas/parking spaces (Reg. 1315/2013 Art. 19, 39.2)	• ITS *(Reg. 1315/2013 Art. 19*)	• Upgrading/new construction within or bypassing an urban node *(Reg. 1315/2013 Art. 19.e)*	• Residual interventions	
Projects	25	22	11	33	91
Investment costs	9,887.4	1,702.4	3,764.9	4,140.8	19,495.5
Approved funds	5,399.3	370.3	1,952.9	1,298.8	9,021.2
Financial Gap	4,488.1	1,332.2	1,812.0	2,842.0	10,474.3

Source: BA Corridor study consortium

Cluster 1 comprises pre-identified projects together with initiatives aimed at upgrading the road core sections up to express road or motorway standards in line with Art. 19 of the Regulation (EU) 1315/2013, or projects addressing the availability of rest areas/parking spaces, as stated in Artt. 19 and 39.2 of the Regulation (EU) 1315/2013.

25 projects in the BA Corridor project list are classified as cluster 1, including the projects for the modernisation of the road network in Poland (S7, A1, S1 and S3), the Czech Republic (D1, D52), Slovakia (D3), and Austria (A5). These also comprise the initiatives for the development of the Katowice-Žilina and Brno-Wien critical cross border sections. Projects addressing the deployment of ITS for roads belong to cluster 2, totalling 22 initiatives. Upgrading or development or corridor bypasses in urban areas, whose main objective is to solve congestion issues, belong to cluster 3, totalling 11 initiatives in Warsaw, Szczecin, Bratislava, Wien, Klagenfurt, Bologna, Ljubljana. 33 projects are included in the residual cluster which relate to the expansion/upgrading of the corridor infrastructure in all Member States.

By comparing the total investment costs with the approved funds, a gap of about 10.5 € billion can be noticed, which is needed for the completion of the road projects. More specifically 4.5 € billion of the required amount is associated with the implementation of actions belonging to cluster 1, over 1.3 € billion relate to initiatives planned for the deployment of ITS, over 1.8 € billion is connected to the upgrading and/or new construction within or bypassing urban nodes.

Airport

In the table below the results of the cluster analysis of projects belonging to the airport category are provided.

Table 55 Cluster analysis for Airport projects

	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Totals
	• Pre-identified projects (Reg. 1316/2013 Annex I, part.2) • Horizontal priority for air (SESAR) *(1316 Annex I, part I/ 1315 Art. 31)* • Last mile connection to core rail network *(1315/2013 Art. 41.3 and Annex II part II, only main airports)*	• Last mile rail connection to other core airports; and road last mile connection to all core airports *(Reg. 1315/2013 Art. 26)*	• Airport capacity expansion *(Reg. 1315/2013 Art. 26)*	• Residual interventions	
Projects	8	8	19	44	79
Investment costs	28.0	829.0	1,566.2	591.6	3,014.8
Approved funds	10.9	148.5	-	183.3	342.7
Financial Gap	17.1	680.5	1,566.2	408.3	2,672.1

Source: BA Corridor study consortium

Airport pre-identified projects as defined in Annex I part.2 of the Regulation 1316/2013 belong to cluster 1, together with projects aiming at meeting airport horizontal priorities such as SESAR deployment, as well as projects addressing the last mile heavy rail connections to main Core Airports as listed under Annex II part.2 of the Regulation 1316/2013 (Conventional/HS links as stated in Art. 41.3 of the Regulation (EU) 1315/2013). 8 projects included in the BA Corridor project list are classified as cluster 1, which relate to SESAR deployment and logistics centre optimisation at the Ljubljana airport. Cluster 2 comprises all those projects addressing rail (also local rapid transit solutions) to other core airports and road links to all core airports, in line with Art. 26 of the Regulation (EU) 1315/2013. These total 8 initiatives in Warsaw (road), Katowice (rail and road), Łódź (road), Venice (rail and road), and Bologna (People Mover). Projects related to airport capacity expansion, 19 in total, belong to cluster 3. All the other interventions are classified as residual cluster, which equal 44 initiatives.

By comparing the total investment costs with the approved funds for airport projects a gap of approximately 2.7 € billion is identified, which would be needed for their completion. More in detail, nearly 17.1 € million of financial resources relate to the implementation of projects classified as cluster 1. Further 680.5 € million relate to last mile rail connections to other core airports as well as road last mile connections to all core airports – namely cluster 2 initiatives – and almost 1.6 € billion refer to implementation of initiatives aimed at airports capacity expansion.

Seaports and MoS

The table below provides the results of the cluster analysis for the projects belonging to the Seaports category, including MoS initiatives and VTMIS deployment, following Artt. 31 and 26 of Regulation (EU) 1315/2013.

Table 56 Cluster analysis for Seaports and MoS projects

	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Totals
	• Pre-identified projects *(Reg. 1316/2013 Annex I, part.2)* • MOS *(1316 Annex I, part I/ 1315 Art. 31)* • Last mile connection to core rail + IWW network *(1315/2013 Art. 41.2)*	• VTMIS *(Reg. 1315/2013 Art. 23)* • Seaports capacity expansion within the port area *(Reg. 1315/2013 Art. 23)*	• Last mile connection to road *(1315/2013 Art. 41.2)*	• Residual interventions	
Projects	86	3	0	2	91
Investment costs	10,557.4	26.6	-	7.2	10,591.2
Approved funds	1,457.0	9.6	-	1.3	1,467.8
Financial gap	9,100.3	17.0	-	6.0	9,123.3

Source: BA Corridor study consortium

Cluster 1 comprises the Maritime pre-identified projects as well as the initiatives enhancing MoS services, and interventions related to rail connection to inland ports as stated in Art. 16 of the Regulation (EU) 1315/2013. There are 86 projects classified in cluster 1, which include all development of multimodal platforms at the 8 maritime ports of the BA Corridor as well as the development of interconnections marked as pre-identified in Regulation 1316/2013. VTMIS deployment and seaport capacity expansion not located in pre-identified sections belong to cluster 2, including 1 VTMIS project in Gdynia and 2 passengers' terminal expansions at Trieste and Venezia. No projects are included in cluster 3 referring to last mile road connections to ports in line with Art. 41.2 of the 1315/2013 Regulation. 2 projects belong to the residual cluster, which relate to improvement of IT technology.

By comparing the total investment costs with the approved funds, a gap of about 9.1 € billion is noticed for the completion of the seaports and MoS projects, classified in cluster 1.

Multimodal

The following table summarises the results of the cluster analysis undertaken for multimodal projects.

Table 57 Cluster analysis for multimodal projects

	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Totals
	• Pre-identified projects *(Reg. 1316/2013 Annex I, part.2)* • Projects contributing to RRT rail or IWW accessibility *(Reg. 1315 Art. 29)*	• Projects contributing to RRT Road accessibility *(Reg. 1315 Art. 29)*	• Projects contributing to RRT capacity	• Residual interventions	
Projects	11	2	0	0	13
Investment costs	519.3	49.6	-	-	568.9
Approved funds	304.7	30.5	-	-	335.1
Financial gap	214.7	19.1	-	-	233.8

Source: BA Corridor study consortium

Among the 13 multimodal projects considered for analysis, 11 were classified as cluster 1 comprising pre-identified projects as stated in Annex I, part.2 of the Regulation 1316/2013, as well as projects contributing to RRT rail or IWW accessibility in line with Art. 29 of the 1315/2013 Regulation. These initiatives include development of multimodal platforms in Wrocław, Ostrava, Přerov, Bratislava, Wien, Graz, Cervignano, Padova, and Ljubljana. 2 projects are included in cluster 2 comprising initiatives contributing to RRT road accessibility in Warsaw and Łódź, in line with Art. 29 of the 1315/2013 Regulation. No projects are included in cluster 3 and in the residual cluster.

From the comparison of the total investment costs with the approved funds, it results that there is a gap of almost 234 € million for the completion of the multimodal projects. In greater detail, almost 215 € million of required financial resources are associated with the implementation of projects belonging to cluster 1 and 19 € million relate to investments contributing to the rail-road terminals accessibility.

Overall results of the clustering exercise

The table below summarises the cluster analysis for the different transport modes and categories of projects considered in the above presented assessment. The overall distribution of the projects confirms that the BA Corridor project list includes projects which are relevant to reach the objectives and targets of the TEN-T policy. In fact 346 projects belong to clusters 1 and 2, corresponding to over 70% of the assessed projects. 138 projects only belong to cluster 3 and to the residual cluster. This is also due to the fact that many projects are proposed for the development and improvement of corridor links and nodes, which correspond to the pre-identified sections of the CEF Regulation (about 200).

Table 58 Cluster analysis: overall results

	New technologies and telematic applications	Rail & Rail ERTMS	IWW	Road	Seaports	Airport	Multimodal	Total
Cluster 1	31	126	7	25	86	8	11	294
Cluster 2	17	0	0	22	3	8	2	52
Cluster 3	3	0	1	11	0	19	0	34
Residual Cluster	2	23	0	33	2	44	0	104
Total	53	149	8	91	91	79	13	484

Source: BA Corridor study consortium

Focussing on funding and financing, considerable financial resources are still required to implement the projects included in the BA Corridor list. The comparison of the total investment costs with the approved funds reveals a gap of over 42.5 € billion that would still be needed to complete all 484 corridor projects assessed as part of the clustering exercise. In greater detail it is noticed that 34.5 € billion of required financial resources relate to the implementation of projects belonging to cluster 1 and 2, of which over 32.4 € billion would be needed to complete projects in cluster 1.

Table 59 Cluster analysis: summary of financial results

	Cluster 1	Cluster 2	Cluster 3	Cluster 4	Totals
Projects	294	52	34	104	484
Investment costs	58,294.6	2,714.1	5,429.8	6,876.6	73,315.0
Approved funds	25,923.6	587.5	2,029.0	2,223.0	30,763.1
Financial gap	32,371.1	2,126.6	3,400.8	4,653.5	42,551.9

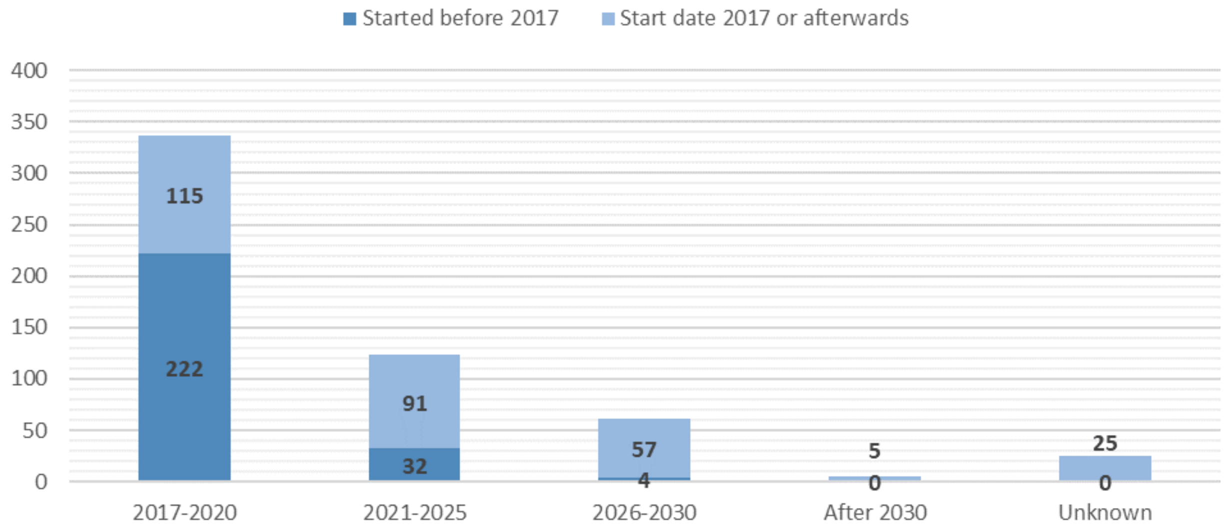
Source: BA Corridor study consortium

Noting that the projects in cluster 1 are specifically aimed at reaching the targets and requirements set in the TEN-T Regulation and that several projects included in clusters 2 and 3 are in any case related to the priorities identified in the BA Corridor work plan, due attention shall be given to the identification of funding and financial solutions to fill in the financial gap identified in this analysis.

6.2 Project Maturity

The figure below shows the total number of corridor projects by completion time until 2030, also reporting on the number of initiatives which are already ongoing.

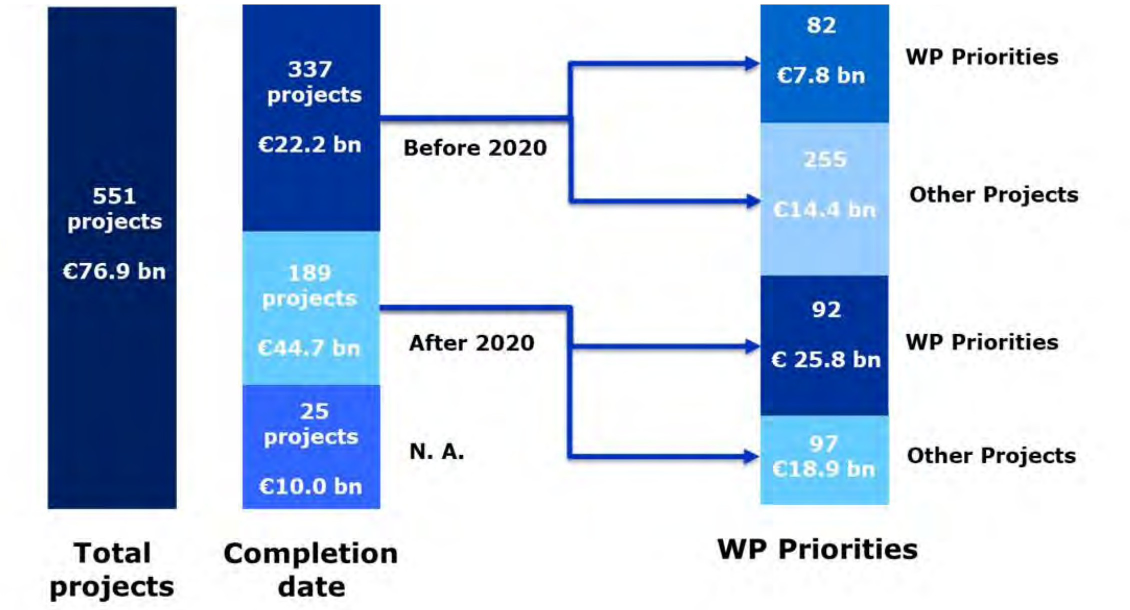
Figure 35 Total number of corridor projects by completion time



Source: BA Corridor study consortium

Although for several projects the start date refers to the beginning of studies and not of the works, most of the investments included in the updated BA Corridor project list – 337 – are expected to be completed by 2020; 222 out of 337 already started before 2017. 189 are planned to be completed after 2020, and for 25 projects the implementation dates are either not available or not defined at present. The work plan priorities encompass 186 investments, of which 12 without implementation dates specified as yet, 82 to be implemented by 2020 and 92 afterwards, totalling 35.2 € billion, equivalent to over 45% of the total project list.

Figure 36 Corridor projects (total and work plan priority projects) by completion date



Source: BA Corridor study consortium

These are overall positive figures which however partially contrast with the information available on the three main administrative steps of administrative project implementation identified in the project list for the 356 investments concerning construction works. Referring to these initiatives, land acquisition has been concluded for only 59 projects; the Environmental Impact Assessment has been approved for only 74 initiatives and the project has received final approval by the relevant governmental and administrative authorities only for 63 projects. Although the information on the project maturity included in the project list is partial and may be further refined and integrated, the status of the project administrative implementation shows that efforts are needed to develop a more mature list of projects.

As detailed under Chapter 5 the investments planned so far and the time-schedule indicated for their implementation seem confirming that the BA Corridor will be overall developed by 2030 with respect to its specific objectives; however, the information on the project maturity points to the need to closely monitor the implementation of the projects in order to avoid risks of timely completion.

In addition to the allocation of the projects to specific clusters according to their relevance in reaching the objectives and targets set in the TEN-T policy, an analysis of the maturity of the projects with respect to the main aspects of project development and implementation has been also performed as part of the above referred cluster analysis.

More specifically, in order to assess the effectiveness of the BA Corridor project list in providing a pipeline of mature projects to develop the corridor at standard by 2030 a scoring system has been developed considering the following elements:

- Technical readiness (Tm): showing high maturity if all necessary technical steps of project implementation (i.e. Detailed Design/Detailed Implementation Plan/Administrative Permits and Licences) have been concluded (score 1). Medium maturity (score 0.5) is associated to the completion of the preliminary technical analysis (i.e. Preliminary project analysis/ Feasibility studies). In absence of any of the above conditions projects are considered not mature (score 0).

- Institutional readiness (Im): all projects included in the project list are considered as mature in terms of institutional readiness. This is due to the fact that such projects have been proposed/revised/suggested by the relevant institutions involved in the implementation of the corridor (score 1).
- Financial/economic maturity (Fm): high maturity rate has been given if projects have their Cost-Benefit-Analysis completed and full financing is guaranteed (score 1), medium maturity rate (0.5) if only one of this two conditions is met. Projects are not mature in all the remaining cases (score 0).
- Social environmental maturity (Em): set according to the presence/absence of the Environmental Impact Assessment (EIA): high maturity is given in case of complete/approved EIA (score 1), low maturity in case of EIA under preparation as well as no EIA (score 0).
- Project Maturity Indicator: in order to evaluate each of the project maturity criteria (technical/Tm, institutional/Im, financial/Fm, environmental/Em) rating and awarding points for each project according to the following levels were provided, as already explained above: Low maturity level= 0; Medium maturity level= 0.5, High maturity level=1. The general assumption at the basis of this approach is that each maturity criteria has the same relative importance and accordingly a simple calculation was applied: *Project Maturity Indicator= (Tm+Im+Fm+Em)/4, which is below or equal to 1.* As a general methodological rule, in the calculation of this scoring exercise it has been agreed among the 9 corridors to assess as mature and as such to apply a score equal to 1 to the maturity indicator, all projects fully implementable thanks to the financial support from the CEF instrument.

The results of this scoring exercise are summarised in Table 5. The values in the table correspond to the averages of the whole set of projects included in each cluster.

Table 60 Cluster analysis: project maturity

	Technical readiness	Institutional readiness	Financial / economic maturity	Social environmental maturity	Project Maturity Indicator
Cluster 1	0.52	1.00	0.48	0.39	0.60
Cluster 2	0.54	1.00	0.50	0.54	0.64
Cluster 3	0.44	1.00	0.24	0.32	0.50
Residual Cluster	0.31	1.00	0.29	0.34	0.48

Source: BA Corridor study consortium

Considering the possible score range between 0 and 1, the projects on the list show an overall a low level of maturity. It is however positively noticed that the projects in cluster 1 and in cluster 2, which are more relevant to reach the priorities and targets set in the TEN-T policy show higher maturity indicators than the ones included in cluster 3 and in the residual cluster.

As part of the cluster analysis an additional scoring system has been finally elaborated combining the results of weighting both the relevance of each project according to the cluster in which it is classified and its maturity. This has been done by combining the scoring system as derived from the project maturity assessment presented above to a clustering score, namely by applying the following points to the projects according to its clusterisation: project relevance varies from 0.25 for cluster 4 (Residual Cluster); 0.5 for cluster 3; 0.75 for cluster 2; up to 1.00 for cluster 1. Once each project has been assessed in terms of its relevance and maturity, a unique overall project rank has been calculated by applying the following weighting factors: 0.6 applied to project relevance score and 0.4 applied to project maturity indicator; the resulting overall score is also lower or equal to 1. The results of this additional exercise are provided in the table below for the 485 projects. The values in the table below correspond to the averages of the whole set of projects included in each cluster.

Table 61 Weighting project relevance and maturity – ongoing and planned projects

	Project Maturity Indicator	Clustering Score	Overall score
Cluster 1	0.60	1.00	0.84
Cluster 2	0.64	0.75	0.71
Cluster 3	0.50	0.50	0.51
Residual Cluster	0.48	0.25	0.34

Source: BA Corridor study consortium

This additional calculation confirms overall the priority of the projects in the first two clusters both in terms of relevance and preparation, provided that the list is overall not sufficiently mature as already commented in the previous sections above.

Referring to the work plan priorities, the table below provides the main summary data for the projects identified for their development.

Table 62 Projects for the development of the BA Corridor – work plan priorities

Work plan priorities	Number of Projects	Budget in **€ mln**	Approved funds in %	Maturity index
Critical cross-border sections	*17*	*2,639.8*	*43.1%*	*0.52*
Katowice-Ostrava-Žilina Triangle cross-border sections	10	1,547.0	27.1%	0.63
Bratislava-Wien twin city cross-border section	2	554.8	100.4%	0.56
Other critical cross-border sections	5	538.0	30.1%	0.42
Missing links	*2*	*8,854.3*	*103.9%*	*1.00*
Modernisation and upgrading of the national railway networks - improvement of the quality and standards of the lines in Eastern Member States	*31*	*7,570.0*	*39.2%*	*0.74*
Deployment of ERTMS	*23*	*1,470.3*	*70.3%*	*0.55*
Critical road cross-border sections	*11*	*3,058.2*	*21.5%*	*0.80*

Work plan priorities	Number of Projects	Budget in **€ mln**	Approved funds in %	Maturity index
Developing hinterland interconnections inside and outside port areas	*34*	*2,306.9*	*29.2%*	*0.45*
Rail last mile connections outside port areas	9	923.9	69.4%	0.67
Rail last mile connections inside port areas	7	146.3	0.0%	0.32
Rail and road last mile connections inside port areas	3	66.8	43.1%	0.58
Road last mile connections outside port areas	11	1,126.6	0.0%	0.27
Road last mile connections inside port areas	4	43.3	6.7%	0.59
Development of the core network corridor within urban nodes and urban transport infrastructure ensuring interconnections between and within transport modes and a seamless connection between long distance and regional or local traffic flows	*68*	*9,286.4*	*37.2%*	*0.50*
Development of the rail infrastructure at core urban nodes	39	4,000.0	31.6%	0.53
Development of rail interconnections to core airports	3	675.0	20.3%	0.69
Development of interchange and transit systems at core urban nodes	4	533.3	18.8%	0.28
Development of the road infrastructure at core urban nodes	16	3,904.6	49.6%	0.47
Development of road interconnections to core airports	6	173.6	6.6%	0.50
Total project list	551	76,864.1	44.0%	0.65
Work plan priorities	*186*	*35,185.8*	*54.3%*	*0.65*

Source: BA Corridor study consortium

Also the analysis of the projects for the development of the work plan priorities both in terms of financial and technical maturity, confirms the need to develop a more stable and mature pipeline of transport investments for the development of the BA Corridor at standard by 2030. Based on the information included in the BA Corridor project list the level of maturity of most of the priorities is not satisfactory and there is a possibility that the projects identified for the development of the BA Corridor by 2030 may not be implemented due to the status of their preparation. The fact that projects are not ready for implementation may also represent a risk concerning the exact definition of their scope. This calls for specific measures to be put in place to mitigate risks relating to the development of the corridor by 2030:

- *Upgrading and modernisation of rail and road cross-border sections*: efforts shall be put in place by all concerned stakeholders including Infrastructure Managers and Member States to complete all the necessary steps and administrative procedures relating to the definition of the solutions and dates for the implementation of the actions for the development of these sections. Continuity shall be given to cross-border dialogues in order to ensure cross-border section projects are well defined and effectively implemented; and their development coordinated on both sides of the borders. The scope of the projects, particularly regarding ERTMS as well as speed and 740 meters train length for freight lines, shall allow the achievement of all the relevant standards.
- *Modernisation of national railway lines*: overall the persisting bottlenecks are deemed relatively marginal, which shall be filled in by means of identification of projects (e.g. on the Western branch of the corridor in Poland), or better definition of the projects already included on the list. The scope of the projects, particularly regarding ERTMS as well as speed and 740 meters train length for freight lines, shall

allow the achievement of all the relevant standards. Requests for derogation from standard to reach compliance shall be presented and agreed with the Commission by 2020 where applicable, in order to mitigate risks of delay in the implementation of relevant projects and ensure the corridor will be compliant by 2030. The ongoing activities and studies by the Baltic-Adriatic Rail Freight Corridor concerning the operation of 740 meters trains along the corridor shall be considered to ensure a functional solution can be found for the improvement of this KPI, in view of a gradual achievement of the target set in the Regulation for the corridor infrastructure.

- *Last mile and hinterland connections of ports*: due consideration shall be given to the development of port last mile connections to support the expansion of the terminals and promote the development of intermodal transport and Motorways of the Sea operations. Also in line with the priorities and pillars of the Motorways of the Sea Detailed Implementation Plan, specific attention shall be given to the improvement of the standards and performance of the rail infrastructure to ensure competitiveness of the corridor ports; and to transport digitalisation to simplify administrative procedures associated with maritime and intermodal operations.
- *Development of the corridor infrastructure at urban nodes*: make sure the projects on the list effectively promote the integration of the urban nodes into the TEN-T network, implementing measures and actions for the development of last mile sections, last mile connections and efficient transfer hubs for both passengers' and freight transport.
- *ERTMS deployment*: make sure the investments planned either specific to ERTMS technology or related to infrastructure modernisation and upgrading also including ERTMS equipment cover the entire network and are implemented in line with the updated European Deployment Plan.

In order to maximise the impact of the development of the corridor in terms of expected socio-economic and environmental benefits, the following shall also be considered:

- Identify and implement actions for the solution of operational bottlenecks affecting railway transport particularly across borders as well as policy measures in favour of railway transport. The analysis of the administrative and operational bottlenecks and the market study (see respectively Section 3.4 and Chapter 4 above) show indeed that infrastructure development projects are not sufficient to develop the corridor as an interoperable infrastructure and support modal shift from road to rail. Investments in the field of innovation i.e. alternative clean fuels and more efficient means of transport, in particular zero/low emission vehicles, as well as behavioural and sustainable freight transport actions to reduce the overall emissions generated from motorised mobility and transport shall also be encouraged to reduce the impact of transport on the environment and mitigate climate change (see also Section 7.1.3 below).
- Maximise the coordinated development of alternative clean fuels and telematic applications projects along the corridor to avoid fragmentation, gaps or concentration of facilities at the Member State, section or node levels. For the development of an interoperable corridor, solutions and measures shall ensure urban and transport nodes are effectively integrated into the corridor, also with respect to the availability of alternative clean fuels and ITS/ICT solutions for the development of multimodal transport.

6.3 Infrastructure funding and innovative financial instrument

With the adoption of the dual Regulation for the trans-European network for transport (TEN-T) and the Connecting Europe Facility (CEF) in December 2013 – setting out together a political objective and financial tools – the new TEN-T policy provides for a long-term strategy for the implementation of TEN-T by way of a core and comprehensive networks by 2030 and 2050.

The core network corridors are amongst the primary focus of funding through the Connecting Europe Facility. The CEF does however not represent the ultimate scope of the work plans and of the new TEN-T policy; it is rather a tool to emphasise the strategic relevance of the core network corridors in the Union transport policy; still representing only one of the possible sources for the financing of the investments needed to develop a seamless intermodal and interoperable core network across the Union by 2030.

The synergies that the core network corridors generate between infrastructure, transport and other policy actions, makes them an ideal case for combining the CEF with complementary funding from other EU sources, in particular the European Structural and Investment Fund (ESIF) (comprising the European Regional Development Fund and the Cohesion Fund), Horizon 2020, the Instrument for Pre-Accession (IPA) or the European Neighbourhood Instrument (ENI).

Loans from the European Investment Bank are also worth mentioning which have also already been extensively used and are being utilised for a number of projects, including port expansions at Ravenna, Trieste and Koper, widening of the A4 motorway between Mestre and Villesse, the Warszawa Ring-Road, the A1 motorway between Pyrzowice and Częstochowa as well as between Toruń, Stryków and Częstochowa, the D4/R7 Bratislava bypass and the construction of the S3 expressway between Gorzów and Legnica. Also railway projects have benefited from European Investment Bank support, including the Semmering Base Tunnel and Pottendorf Line as well as the new railway station in Wien (recently completed), the Warszawa Railway Node, the E 59 railway line between Rawicz and Czempiń and Poznań as well as between Wrocław and the border of the Lower Silesian, the Žilina Teplička rail-road terminal and GSM-R digital radio communication system installation on the entire public railway infrastructure network in Slovenia.

All this makes the core network corridors frontrunners of the Union's new infrastructure policy: they can be considered as the backbone of the economic and social development. In these terms it is reasonably expected that synergies will be established between the planning processes relating to national and regional transport plans across Europe and between Member States and regions to be also reflected in the targets and objectives of the national and regional operational programmes as well as transnational territorial cooperation and macro-regional strategies.

Three sets of annual and multiannual CEF calls have been launched and completed between 2014 and 2017. The results of these calls have been particularly beneficial for the development of the BA Corridor. An overall EU contribution of more than 2 € billion has been indeed assigned to projects located on the corridor. More importantly nearly all the infrastructure projects co-financed by the CEF relate to the development of the specific objectives and priorities of the work plan. Successful applications include indeed studies and works for the development of the rail critical cross-border section between Katowice and Ostrava; studies and works for the two road critical cross-border sections between Katowice and Žilina and between Brno and Wien; construction works for the development of the Koralm railway line and tunnel in Austria; studies and works for the modernisation of national railway lines on the Eastern and Central branches of the corridor in Poland, Czech Republic and Slovenia, including modernisation works of the lines in Warsaw and at the Přerov junction; studies and works for development of rail last mile connections at all maritime ports, deployment of ERTMS in Poland, Czech Republic, Italy and Slovenia.

Furthermore developments of ports and MoS infrastructure in Gdańsk, Swinoujscie, Trieste, Venezia and Koper and rail-road terminals in Padova and Ostrava (Paskov) have been also supported by the CEF as well as horizontal ITS and alternative clean fuel projects along the core network corridors, including at transport and urban nodes. Finally, the CEF instrument is also co-financing the deployment of SESAR at the wider EU scale, including at the corridor Member States.

Figure 37 Ongoing and planned projects and funding approval status

Source: BA Corridor study consortium

Despite the significant amount of funds received under the scope of the CEF instrument and the additional sources already committed to the projects as detailed in the table below, the amount of financial resources required for the development of the corridor is still very high. The funding and financial structure of 313 projects out of 551 investments included in the corridor list is still to be fully defined and approved.

Table 63 Approved and potential funds for the development and implementation of corridor projects

Funds by type	Approved	Potential
MS/ public grants / regional and local /own sources for road and rail infra managers and port authorities/ (Declared EIB non-revenue based)	18,929.7	3,326.5
Declared private/ own resources of motorway / airport / port terminals and RRTs	3,936.5	2,709.6
EU grants (CEF, TEN-T, CF, ERDF, IPA, H2020)	8,606.09	5,518.4
CEF	4,152.6	2,024.2
TEN-T	27.4	-
ESIF (CF/ERDF) 2014-2020	2,718.4	3,449.4
CF/ERDF 2007-2013	1,708.0	44.9
Other EU Fund	0.4	-
Declared EIB/ bank loan (revenue-based)	270.0	193.5
Other, not specified	2,065.4	232.9
Total funds	33,808.4	11,981.0

Source: BA Corridor study consortium

As also detailed in Table 44 and in Table 62 above, the share of approved funds on the total investment costs for the whole BA Corridor project list is only 44.0%. The same figure for the work plan priorities is higher, 54.3%. However, if excluding the Alpine crossings and ERTMS, the share of approved funds on total investment costs is in line or below the average for the entire list and more specifically: 43.1% for the rail cross-border sections, 39.2% for the modernisation of the railway lines in Cohesion Member States, 21.5% for the road cross-border sections, 29.2% for the port last mile connections, 37.2% for the urban nodes projects.

In order to face the challenges imposed by the huge amount of demanded funding and the limited sources available from public or equivalent sources, including the EU funds, all different possible sources shall be considered also depending on the type of projects and their suitability for mixed and multiple financing options. The projects to be developed can be ranked in three different categories from the point of view of funding and financing needs:

- A) For several revenue generating projects "closer to the market" in terms of development (technological components, including on large infrastructure of key European interest, brownfield upgrade) or service provision (terminals for freight / passengers, enhancement of infrastructure capacity / performances), a substantial component of the project funding can come from own resources (e.g. equity) and financing resources gathered by the project promoters on the market (e.g. in the form of equity, loans or bonds). The private investors would need to recover their initial costs of capital and receive a reward for the risk born (the higher the risk the higher the return required).

  The project may look at conventional lending from public and private banks, alternative financing from institutional investors (e.g. bonds) and at financial instruments for instance to cope with the unbalances of cash-flow during its construction and rump-up phase until a sustainable flow of revenues is secured, and to address particular risks and market failures, and to secure lending with long maturity. Financial instruments could be provided in the form of credit enhancing and guarantees (be it a specific legal guarantee or a financial guarantee to ease access to financing).
- B) Hard-infrastructure, greenfield, risky and long-term projects might require a substantial public support through public funding, even if innovative approaches can apply to project development and/or to specific components of the investment. Public funding can be structured in different ways (also depending on the budgetary constraints of the public authorities) such as lump sum subsidy (grant), fiscal incentives, operational deficit coverage and availability payment schemes.
- C) In a variety of intermediate cases the project will require a more limited funding component in order to reinforce its financial viability – these projects could be supported through a blending of funding (e.g. grants) and financing.

  In this respect, beside the national budget, the funding contribution can effectively come from the EU centralized managed funds, such as the Connecting Europe Facility (CEF) and from decentralized managed funds such as the European Structural and Investment Funds (ESIF) while the financing resources may come from the EU financial instruments, such as the CEF Debt Instruments and financial products available under the European Fund for Strategic Investment (EFSI).

For all these three different categories of projects the public intervention with the different degree of intensity is justified on the ground that these projects of high socio-economic and EU added value, substantially address overall public service obligations, suboptimal investment level, market failures and distortion due to externalities (positive, for the projects supported, including in terms of strategic added-value, and negative for competing modes), and therefore calls for the transfer of resources.

When considering the project funding structure in a comprehensive and multimodal setting, earmarking of revenues and cross-financing solutions, applying "polluter-pays" and "user-pays" principles ought to be duly explored.

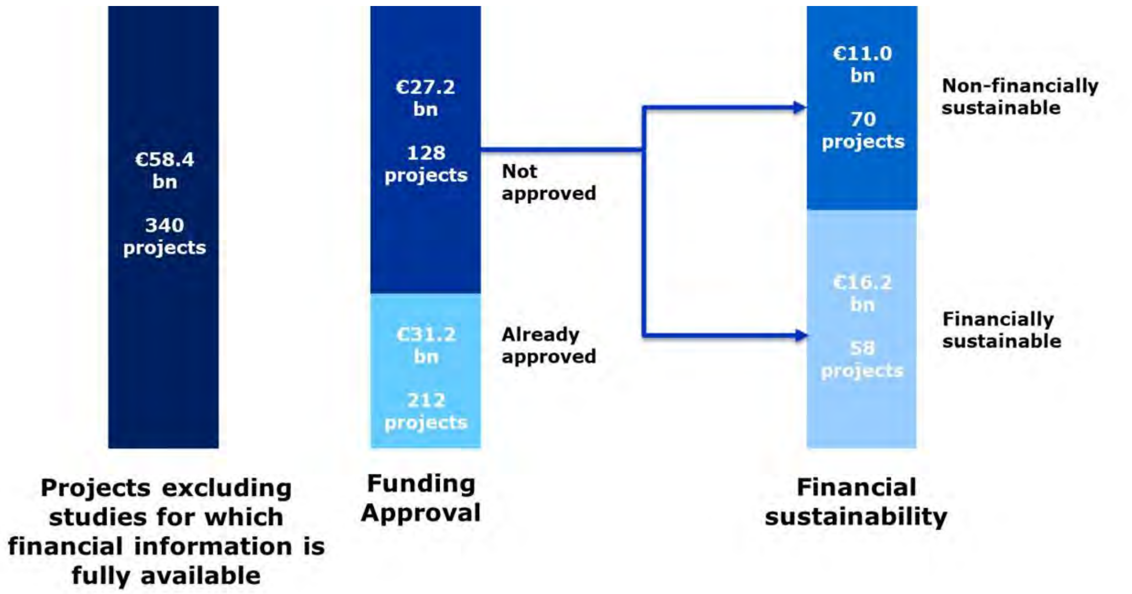
A project can be fully developed through project financing if the revenue stream (secured by public and/or private funding) exceeds the investment and operational costs (CAPEX+OPEX). Such an approach calls for a careful risk sharing between the Member States (project management) and private partners.

Notwithstanding the project self-financing potential linked to user fees, a cautious and innovative approach aimed at exploiting the project's life-cycle and define clear responsibilities and risk sharing between project promoters, sponsors and implementing bodies is more and more needed to deliver projects on time, cost and quality and to fully exploit the potential, while minimising future liabilities on public budgets.

A pre-condition for project financing is a conducive regulatory and legal environment, in order to set the incentives right to enhance the public and private sector involvement in the delivery of infrastructure investment.

In light of the above a high level review of the project list has been undertaken, aimed at identifying the so called financially sustainable or partially financially sustainable projects. The analysis excluded the initiatives related to studies and considered the projects for which full financial information was available. The corridor list includes 340 ongoing and planned projects totalling 58.4 € billion. Out of these, 212 projects are fully financed for a total of about 31.2 € billion investment costs. 128 projects are either only partially or not financed, for a budget of 27.2 € billion. 58 investments amounting to 16.2 € billion are considered either fully or partially financially sustainable, most of them related to road, port, airport and rail-road terminal upgrading and expansion initiatives.

Figure 38 Funding and financial sustainability of the investments included in the project list



Source: BA Corridor study consortium

Whilst this assessment is rather preliminary, as many of the details to fully confirm the financial sustainability and best financial structure of project development and implementation depends on many elements and conditions, the number of projects potentially suitable for innovative and multiple financing options and the overall amounts seem supporting the case for their further analysis, towards their possible implementation by means of innovative financial instruments.

Several of these projects were also submitted under the scope of the recent CEF blending call which was launched in 2017 with the aim of developing an innovative approach to infrastructure funding in favour of those initiatives implementable by means of more and diversified financial source. According to the results of the call published in December 2017, among the proposals that have been recommended for funding the following ones are worth mentioning, totalling together over 315 € million of allocated CEF funds. These projects will significantly contribute to the achievement of the specific objectives identified for the development of the BA Corridor and the development of its infrastructure towards the targets set in the Regulation (EU) 1315/2013:

- Optimisation works of the critical cross-border section between Katowice and Ostrava, located on the Czech side, between Dětmarovice and Petrovice u Karviné and the border with Poland;
- Upgrading and electrification on the Austrian side of the critical passenger cross-border section between Wien Stadlau / Ganserndorf and the border with Slovakia, near Marchegg;
- Modernisation works and ETCS deployment on the Western branch of the corridor in Poland along the itinerary of the E59 railway line;
- Works for the development of the second track of the Divača-Koper railway line;
- Construction of a LNG terminal at the port of Venezia;
- Expansion of the Port of Gdańsk;
- Dredging activities and expansion of the Port of Ravenna.

7. Impacts of the development of the BA Corridor by 2030

After the completion of the 2014 corridor studies undertaken in view of the elaboration of the first versions of the work plans by the 9 European Coordinators in 2015, several areas of improvement were identified which required additional and further analysis. One of these areas was related to the so called wider elements of the work plan. In order to fulfil the requirements set in Art. 47 of Regulation (EU) 1315/2013 the work plan shall indeed also include an analysis of:

- The possible impacts of climate change on the infrastructure and, where appropriate, proposed measures to enhance resilience to climate change;
- The measures to be taken in order to mitigate greenhouse gas emissions, noise and, as appropriate, other negative environmental impacts.

Furthermore Art. 47 also foresees that the European Coordinator shall support Member States in implementing the work plan, in particular as regards the definition of measures aimed at promoting the introduction of new technologies in traffic and capacity management and, where appropriate, reducing external costs, and specifically greenhouse gas emissions and noise.

In order to address the above "wider elements of the work plan" an analysis of the following topics has been performed:

- Impact of the work plan on innovation deployment;
- Impact of the work plan in implementing measures aimed at improving resilience to climate change;
- Impact of the work plan on environment.

In addition to the analysis of the wider elements of the work plan, the impact of the work plan on jobs and economic growth has been also estimated. This Chapter provides the results of the 2015-2017 corridor studies for the above elements.

7.1. Wider elements of the work plan

7.1.1. Impact of the BA Corridor project list on innovation deployment

Criteria and approach adopted for the analysis of innovation projects

Since the start of the 21st Century innovation has become one of the key policy areas of the European Union, notably after the Lisbon European Council of March 2000 which set as the new strategic goal for the EU to become a competitive and dynamic knowledge-based economy. During the last years' innovation has been reflected across European policies, including those targeting transport infrastructure. As already mentioned above, the Regulation (EU) 1315/2013 notes in its Art. 47 that the *European Coordinator shall support Member States in implementing the work plan, in particular as regards (…) defining measures aimed at promoting the introduction of new technologies in traffic and capacity management*. In addition, Artt. 31, 32 and 33 of the Regulation define new technologies and innovations which shall be deployed across the Union and which implementation should be encouraged within the TEN-T network:

- Deployment of telematic applications (Article 31);
- Deployment of sustainable freight transport services (Article 32);
- Deployment of other new technologies and innovation (Article 33).

Furthermore, as reported at Chapter 2 above, Issues Papers have been elaborated by the European Coordinators in 2016, which have been presented at the TEN-T days in Rotterdam in June 2016, and which see the core network corridors as test cases for innovative approaches related to technological, legal, and organisational aspects of the definition, development and implementation of transport solutions. More specifically four out of five issues papers include recommendations relating to the deployment and use of innovation projects and solutions in the core network corridors to support the development and implementation of the EU transport policies:

- Enabling multi-modality and efficient freight logistics;
- Boosting intelligent transport systems (ITS);
- Boosting new technologies & innovation;
- Effectively integrating urban nodes.

In line with the above and in order to understand the impact of the development of the BA Corridor within the wider TEN-T network in terms of deployment of innovative solutions, different categories of possible innovation projects have been identified matching with the criteria and requirements set in Articles 31, 32, 33 of Regulation (EU) 1315/2013 and with the findings and recommendations presented in the Issue Papers. The three tables overleaf present the different possible categories of innovation projects for the three referred articles, also providing examples of projects and solutions fitting to the categories, which may generally applicable to all core network corridors.

The three tables below and overall the methodology proposed for the analysis of the impact on innovation deployment associated to the development of the 9 core network corridors has been defined by a working group involving all corridor consortia and coordinated by TIS (*Transportes Inovação e Sistemas*) – leading entity of the Atlantic Corridor study consortium.

Table 64 Innovation: Matching between Regulation (EU) 1315/**2013 and European Coordinators' Issue Paper –** Telematic Applications

Mode(s)	Specific Innovation Field (Regulation (EU) 1315/2013)	Suggested Tag for PL *[IP-specific topics]*	Issue Paper 1	Issue Paper 2	Issue Paper 3	Issue Paper 4	Examples
Rail	ERTMS	ERTMS		X	X		- ERTMS deployment or upgrade
Rail	possibly also future wireless systems	Other telematic applications		X	X		
IWW	RIS	RIS		X	X		- RIS deployment
Road	ITS	ITS		X	X		- Vehicle-vehicle and road-vehicle communication (C-ITS) - Automated driving - GEAR 2030 - SCOOP@F - E-CALL
Maritime	VTMIS	VTMIS		X	X		- VTMIS deployment
Maritime	e-Maritime services, including single-window services such as the maritime single window, port community systems and relevant customs information systems	Other telematic applications	X	X	X		- National port single window systems - Port community systems
Air	Air traffic management systems, in particular those resulting from the SESAR system	SESAR (ATM)		X	X		- FAB implementation - Any SESAR-related project
All	Applications that enable traffic management and the exchange of information within and between transport modes for multimodal transport operations and value-added transport-related services, improvements in safety, security and environmental performance, and simplified administrative procedures	Data sharing, cooperation systems and real-time predictive analysis for multimodal transport		X	X		- *ES: "Repsol Security Parking"* - *BE: "Safe and secure infrastructure in Flandes"* - *e-Manifest*

Source: Atlantic Corridor study consortium; Notes: Issues papers: 1) Enabling multi-modality and efficient freight logistics; 2) Boosting intelligent transport systems (ITS); 3) Boosting new technologies & innovation; 4) Effectively integrating urban nodes

Table 65 Innovation: Matching between Regulation (EU) 1315/2013 and European Coordinators' **Issue Paper –** Sustainable Freight Transport Services

Mode(s)	Specific Innovation Field (Regulation (EU) 1315/2013)	Suggested Tag for PL *[IP-specific topics]*	Issue Paper 1	Issue Paper 2	Issue Paper 3	Issue Paper 4	Examples
All	Measures aiming to improve sustainable use of transport infrastructure, including its efficient management	Efficient management and governance structures	X				
	Measures aiming to promote the deployment of innovative transport services, including through motorways of the sea and telematic applications	Innovative transport services	X		X	X	- MoS - Rolling highways - Measures (soft or infrastructure) enabling or encouraging multimodality (e.g. automatic people mover between rail station and airport), with particular novel components (i.e. a traditional people mover - just an automated rail link, without anything else - should not be considered as an innovation)
	and the development of the ancillary infrastructure necessary to achieve mainly environmental and safety- related goals of those services,	Safety & security	X	X	X		
	as well as the establishment of relevant governance structures	Efficient management and governance structures	X		X	X	- URBAN NODE BERLIN-BRANDENBURG
	Measures aiming to facilitate multimodal transport service operations, including the necessary accompanying information flows, and improve cooperation between transport service providers	Data sharing, cooperation systems and real-time predictive analysis for multimodal transport	X				- HELSINKI-TALLIN TWIN PORT - CO-GISTICS
	Measures aiming to stimulate resource and carbon efficiency, in particular in the fields of vehicle traction, driving/steaming, systems and operations planning	Low carbon & Decarbonisation			X		- Development of efficient engine technologies

Mode(s)	Specific Innovation Field (Regulation (EU) 1315/2013)	Suggested Tag for PL *[IP-specific topics]*	Issue Paper 1	Issue Paper 2	Issue Paper 3	Issue Paper 4	Examples
	Measures aiming to analyse and provide information on fleet characteristics and performance, administrative requirements and human resources	Data sharing, cooperation systems and real-time predictive analysis for multimodal transport	X				- Logistic single window
	Measures aiming to improve links to the most vulnerable and isolated parts of the Union, in particular outermost, island, remote and mountain regions	Integration of remote areas					

Source: Atlantic Corridor study consortium; Notes: Issues papers: 1) Enabling multi-modality and efficient freight logistics; 2) Boosting intelligent transport systems (ITS); 3) Boosting new technologies & innovation; 4) Effectively integrating urban nodes

Table 66 Innovation: Matching between Regulation (EU) 1315/**2013 and European Coordinators' Issue Paper –** Other new technologies and innovation

Mode(s)	Specific Innovation Field (Regulation (EU) 1315/2013)	Suggested Tag for PL *[IP-specific topics]*	Issue Paper 1	Issue Paper 2	Issue Paper 3	Issue Paper 4	Examples
All	Measures aiming to support and promote the decarbonisation of transport through transition to innovative and sustainable transport technologies	Low carbon & Decarbonisation			X		
	Measures aiming to make possible the decarbonisation of all transport modes by stimulating energy efficiency, introduce alternative propulsion systems and fuels, including electricity supply systems, and provide corresponding infrastructure	Low carbon & Decarbonisation			X		- RAPID CHARGE NETWORK - Deployment of LNG/CNC refuelling stations
	N/A	Cybersecurity & data protection	X				
	Measures aiming to improve the safety and sustainability of the movement of persons and of the transport of goods	Safety & security	X	X	X		- ES: "Repsol Security Parking" - BE: "Safe and secure infrastructure in Flandes"
	Measures aiming to improve the operation, management, accessibility, interoperability, multimodality and efficiency of the network, including through multimodal ticketing and coordination of travel timetables	Data sharing, cooperation systems and real-time predictive analysis for multimodal transport	X	X			- System standardisation/interoperability projects (e.g. HeERO) - Systems for information exchange vehicle-traffic management control centres - Multimodal ticketing
	Measures aiming to promote efficient ways to provide accessible and comprehensible information to all citizens regarding interconnections, interoperability and multimodality	Data sharing, cooperation systems and real-time predictive analysis for multimodal transport	X	X		X	- Real time traffic and travel information
	Innovative Measures aiming to reduce external costs, such as congestion, damage to health and pollution of any kind including noise and emissions	Externalities reduction	X		X	X	
	Innovative Measures aiming to introduce security technology and compatible identification standards on the networks	Safety & security	X	X	X		

Mode(s)	Specific Innovation Field (Regulation (EU) 1315/2013)	Suggested Tag for PL *[IP-specific topics]*	Issue Paper 1	Issue Paper 2	Issue Paper 3	Issue Paper 4	Examples
	Innovative Measures aiming to improve resilience to climate change	Climate change resilience & transport greening			X		- RE-ROAD - TRIMM
	Innovative Measures aiming to further advance the development and deployment of telematic applications within and between modes of transport.	Other telematic applications		X	X		
	N/A	Innovation dissemination			X	X	- EIBIP (EUROPEAN INLAND BARGING INNOVATION PLATFORM) - Mechanisms for best practice interchange and policy transferability - Coordination between energy and transport sectors - URBACT

Source: Atlantic Corridor study consortium; Notes: Issues papers: 1) Enabling multi-modality and efficient freight logistics; 2) Boosting intelligent transport systems (ITS); 3) Boosting new technologies & innovation; 4) Effectively integrating urban nodes

On the basis of the identified possible categories an analysis of the BA Corridor project list has been undertaken considering the categories and elements of analysis included in the three referred tables.

In addition to the classification of the innovation projects included in the project list, a quick assessment of the projects has been also performed based on the following criteria:

- *Assessment of the type of innovation*:
  - *Catch-up innovation*: refers to projects mostly addressing the transferability of innovative approaches from other projects (e.g. CEF or Horizon 2020) to a new reality. This is the case for example of implementing a port community system PCS (it already exists in other ports), the setup of a new rolling highway service or installing ITS in a highway;
  - *Incremental innovations*: relate to the implementation of known and tested technology in a way that a substantial increase of performance can be achieved. For the railway sector the ERMTS with ETCS level 3 represents such type of innovation, the technology is known and partly applied for pilot links, and it will bring substantial progress if it is implemented as a standard EU-wide. Another example could be automated coupling systems for freight railcars. For the case of freight centres new processes for horizontal transhipments can be regarded as incremental innovations, such as ModaLohr or Cargo Beamer;
  - *Radical innovations*: can occur through the introduction of new technology which can generate a step-change of attractiveness for the users. In the case of the railways this could be automated guidance, self-controlled wagons or wagon groups, and automated processing at terminals.
- *Assessment of project innovation character*:
  - *Impacts*; Impacts refer to the project's expected contribution to achieve EU's transport policy objectives through innovation and/or their contribution to the European technological industry and jobs creation. The following areas have been considered as possible impacts: transport digitalisation; safety improvement; transport decarbonisation (both direct or indirect impacts); transport efficiency improvement through data sharing; contribution to development of European technological industry;
  - *Barriers*; Barriers refer to issues that may hinder the success of the project or the market uptake of its results. The following types of barriers have been considered; insufficient standardisation and regulation; high investment costs and lack of sufficient public funding support;
  - *Enablers*; Enablers refer to issues that may facilitate the success of the project or accelerate the market uptake of its results. The following types of enablers have been identified for analysis: research and industrial sectors coordination (which minimises death valley risk); existing public/private funding for real implementation of the innovation idea; joint initiative from the transport and energy sectors;
  - *Scalability*; Scalability essentially refers to the capacity to do more with a given product or innovation. For example, investments in physical infrastructure are usually not scalable, in the sense that adding capacity or 'features' requires massive new investments. On the other hand investments in control systems or intelligent transport systems usually

present some scalability, as small investments may allow to better exploit the opportunities these systems bring.
  - *Transferability*; Transferability refers to the capacity to apply the learnings from one project in different locations. In general learnings from projects which address very specific local problems or that exploit local circumstances are difficult to transfer to other locations. For example, investments on technologies with high levels of standardization – e.g. electric vehicles – are usually highly transferable, while investments strongly related with specific business models or conditions – e.g. public transport ticketing systems – usually have less transferability;
- Assessment of the impact on decarbonisation; This additional aspect of innovation project analysis is aimed at pre-identifying projects that may have a substantial direct impact in terms of decarbonization. Virtually any investment in transport infrastructure may contribute to reduce GHG emissions, however the aim in this analysis was to identify those projects with larger impact (i.e. projects that promote the use of less carbon intensive energy sources like electromobility, or projects which may have a substantial direct impact on modal shift, for example, Motorways of the Sea).

Mapping and quick assessment of innovation projects in the BA Corridor project list

Overall 161 innovation projects have been identified in the BA Corridor project list, of which 147 ongoing or planned for development/implementation and 14 already completed. The 14 already completed projects relate to GSM-R or ERTMS deployment (6), MoS infrastructure and services (3) telematic applications and data sharing solutions at the ports of Wien and Venezia (3) and low carbon and decarbonisation (1), sustainable transport by freight (1). Both considering the overall limited number of innovation completed projects and the need to focus on the ongoing and planned initiatives and identification of possible gaps, the analysis in the following paragraphs focusses on the ongoing and planned projects.

The results of the analysis of the ongoing and planned projects are summarised in the following paragraphs referring to Articles 31, 32 and 33 of Regulation (EU) 1315/2013. Out of 147 ongoing and planned innovation projects 90 relate to telematic applications (Art. 31). The main findings of the analysis of the BA Corridor project list are summarised in the table overleaf for this category of innovation projects:
- *Type of projects*: telematic application projects include 31 ERTMS, 24 ITS and 25 SESAR deployment dedicated initiatives. Particularly regarding ERTMS and ITS, the geographical scope of these projects affects the BA Corridor and or the core network in the Member States crossed by the corridor (some of them also affect comprehensive infrastructure). The SESAR initiatives are usually multi-corridor and multi-country and affect the core and comprehensive network at the wider EU scale. One project is included in the BA Corridor list to be implemented at the port of Gdynia, which both include VTMIS and e-Maritime activities (Data sharing, cooperation systems and real-time predictive analysis for multimodal transport). At the same port another initiative relates to implementation of Global Maritime Distress and Safety System – GMDSS (Other telematic applications). Finally 9 initiatives relate to data sharing, cooperation systems and real-time predictive analysis for multimodal transport, foreseen to be implemented at the BA Corridor nodes, including the ports of Gdynia, Gdańsk, Venezia, Ravenna; the rail-road terminals in Padova and Bologna, the Ljubljana Airport. RIS projects are not present on the BA Corridor list as the corridor does not include IWW links.

Table 67 Telematic **applications' initiatives included in the BA Corridor project list**

	ERTMS	*RIS*	*ITS*	*VTMIS*	*SESAR (ATM)*	*Other telematic applications*	*Data sharing, cooperation systems and real-time predictive analysis for multimodal transport*
Total projects	31	0	24	1	25	1	9
IP1: Enabling multi-modality and efficient freight logistics	0	0	0	0	0	1	0
IP2: Boosting intelligent transport systems (ITS)	31	0	24	1	25	1	9
IP3: Boosting new technologies & innovation	31	0	24	1	25	1	9
IP4: Effectively integrating urban nodes	0	0	0	0	0	0	0
Type of Innovation							
Catch-up	23	0	21	1	25	1	9
Incremental	8	0	3	0	0	0	0
Radical	0	0	0	0	0	0	0
Impacts							
Transport digitalisation	0	0	21	1	25	1	9
Safety improvement	31	0	23	1	25	1	1
Transport decarbonisation	0	0	0	0	0	0	0
Transport efficiency improvement through data sharing	31	0	20	1	25	1	5
Contribution to development of European technological industry	31	0	0	0	25	0	0
Others	0	0	0	0	0	0	0
Barriers							
Insufficient standardisation and regulation	0	0	0	0	0	0	0
High investment costs	0	0	0	0	0	0	0
Lack of sufficient public funding support	14	0	10	0	4	1	2
Enablers							
Research and industrial sectors coordination (which minimises death valley risk)	0	0	0	0	0	0	0
Existing public/private funding for real implementation of the innovation idea	14	0	10	0	4	1	2
Joint initiative from the Transport and Energy sectors	0	0	0	0	0	0	0
Scalability & Transferability							
Scalability	31	0	24	1	25	1	8
Transferability	31	0	24	0	24	0	0

Source: BA Corridor study consortium

- *Contribution to Issue Papers*: all the 90 telematic application projects are relevant to the scope of the *Boosting intelligent transport systems (ITS)* and *Boosting new technologies & innovation* issue papers. The GMDSS initiative at the port of Gdynia is also relevant to the scope of *Enabling multi-modality and efficient freight logistics* issue paper.

- *Assessment of the type of innovation*: Most of the telematic application projects – 79 – are considered catch-up innovation initiatives as they transfer or contribute to the diffusion of already tested and even commercialised solutions to the network. Considering that ERTMS initiatives relate to ETCS level 1 and 2 technology and that most of SESAR and ITS projects contribute to the achievement of standards set in the relevant EU regulations and deployment plans, these projects may even questionable to be considered as "innovative solutions". Only 11 projects can in fact be considered as incremental innovative solutions, which relate to ERTMS ETCS level 3 technology on rolling stock (8), and C-ITS for road (3). No telematic applications in the BA Corridor project list are radical innovations.
- *Assessment of project innovation character*:
  - *Impacts*; in terms of impacts, ERTMS projects contribute to safety improvement, transport efficiency improvement through data sharing, development of European technological industry. ITS initiatives have a significant impact on transport digitalisation, safety improvement as well as transport efficiency improvement through data sharing. SESAR solutions contribute to transport digitalisation, safety improvement, transport efficiency improvement through data sharing and contribution to development of European technological industry. VTMIS, e-Maritime and the other initiatives on data sharing, cooperation systems and real-time predictive analysis for multimodal transport, ae deemed to impact on transport digitalisation, safety improvement, transport decarbonisation, transport efficiency improvement through data sharing. The telematic application initiatives are not considered to have a direct impact on transport decarbonisation, although ERTMS and ITS may contribute to modal shift and/or rationalisation of traffic flows.
  - *Barriers*; Considering that most of the initiatives on the list relate to the implementation of already adopted technologies, to be eventually transferred and deployed in the network, and that most of them are already fully financed, the barriers associated to the implementation of the individual projects predominantly relate to lack of public funds for those solutions still to be financed and implemented at the infrastructure network level, including ERTMS, ITS, and SESAR.
  - *Enablers*; In line with the identification of the above barriers, enablers for the projects identified on the BA Corridor list relate to the availability of public/private funding for the implementation of the innovation.
  - *Scalability*; Considering the "soft" nature of the assessed telematic application projects, and the fact that they mostly relate to the adoption and diffusion of technology, all of them are considered examples of scalability solutions.
  - *Transferability*; The telematic application projects on the list are also considered example of transferability projects, except for the studies and solutions which are specific to networks and nodes (*mostly relating to data sharing, cooperation systems and real-time predictive analysis for multimodal transport*).
- *Assessment of the impact on decarbonisation*: as specified above, albeit contributing indirectly to modal shift, telematic applications are not considered to impact directly on decarbonisation.

The following table summarises the results of the analysis of the innovation projects falling under the scope of Art. 32 of Regulation (EU) 1315/2013: sustainable freight transport services.

Table 68 Sustainable freight transport initiatives included in the BA Corridor project list

	Efficient management and governance structures	*Innovative transport services*	*Safety & security*	*Data sharing, cooperation systems and real-time predictive analysis for multimodal transport*	*Low carbon & Decarbonisation*	*Integration of remote areas*
Total projects	3	3	0	3	0	0
IP1: Enabling multi-modality and efficient freight logistics	3	3	0	3	0	0
IP2: Boosting intelligent transport systems (ITS)	0	0	0	0	0	0
IP3: Boosting new technologies & innovation	0	3	0	0	0	0
IP4: Effectively integrating urban nodes	3	3	0	0	0	0
Type of Innovation						
Catch-up	3	3	0	3	0	0
Incremental	0	0	0	0	0	0
Radical	0	0	0	0	0	0
Impacts						
Transport digitalisation	2	0	0	3	0	0
Safety improvement	0	0	0	1	0	0
Transport decarbonisation	1	3	0	0	0	0
Transport efficiency improvement through data sharing	2	0	0	3	0	0
Contribution to development of European technological industry	0	0	0	0	0	0
Others	0	0	0	0	0	0
Barriers						
Insufficient standardisation and regulation	0	0	0	0	0	0
High investment costs	0	0	0	0	0	0
Lack of sufficient public funding support	0	0	0	1	0	0
Enablers						
Research and industrial sectors coordination (which minimises death valley risk)	0	0	0	0	0	0
Existing public/private funding for real implementation of the innovation idea	0	0	0	1	0	0
Joint initiative from the Transport and Energy sectors	0	0	0	0	0	0
Scalability & Transferability						
Scalability	1	0	0	3	0	0
Transferability	3	3	0	3	0	0
Decarbonisation						
Addresses decarbonisation directly	1	3	0	0	0	0
Alternative Fuels (electricity or hydrogen)	0	0	0	0	0	0
Alternative Fuels (Natural Gas or Biofuels)	0	0	0	0	0	0
Efficiency	0	0	0	0	0	0
Modal Shift	1	3	0	0	0	0

Source: BA Corridor study consortium

9 projects included in the BA Corridor project list refer to sustainable freight transport services (Art. 2):

- *Type of projects*: sustainable freight transport projects include:
  - 3 efficient management and governance structures solutions:
    - Med-Atlantic Ecobonus;
    - DAPHNE - Danube Ports Network;
    - Regional and Transport Development in the Danube-Black Sea Region towards a Transnational Multiport Gateway Region - DBS Gateway Region.
  - 3 innovative transport services projects, related to Motorways of the Sea services:
    - 2 initiatives relate to the "Sweden-Poland Sustainable Sea-Hinterland Services";
    - 1 concerns development of Fresh Food Corridors in the Mediterranean basin;
  - 3 data sharing, cooperation systems and real-time predictive analysis for multimodal transport:
    - Coordinated and harmonised implementation of rail freight corridors and freight and passenger telematic applications;
    - e-Freight Implementation Action (e-Impact);
    - DIGITMED-Digital Single Market in the Mediterranean.
- *Contribution to Issue Papers*: all the 9 sustainable freight transport services projects are relevant to the scope of the *Boosting intelligent transport systems (ITS)* issue paper. The MoS projects also contribute to the *Boosting new technologies & innovation* issue paper objectives and the efficient management and governance structures solutions initiatives seem also supporting the achievement of the targets of the *Effectively integrating urban nodes* issue paper.
- *Assessment of the type of innovation*: Based on their scope, the identified projects are considered catch-up innovation initiatives.
- *Assessment of project innovation character*:
  - *Impacts*; in terms of impacts, most of the sustainable freight transport services solutions contribute to transport digitalisation. The efficient management and governance structures solutions also contribute to transport decarbonisation and transport efficiency improvement through data sharing. MoS initiatives impact on transport decarbonisation. Projects related to data sharing, cooperation systems and real-time predictive analysis for multimodal transport, contribute to safety improvement, and particularly transport efficiency improvement through data sharing, as well as development of European technological industry.
  - *Barriers*; Considering that most of the initiatives on the list relate to implementation of already adopted technologies or solutions, and that most of them are already fully financed, the barriers associated to the implementation of the individual projects only relate to lack of public funds for one solution still to be funded (DIGITMED-Digital Single Market in the Mediterranean).
  - *Enablers*; In line with the identification of the above barriers, enablers for the projects identified in the BA Corridor list relate to the availability of public/private funding for the implementation of the innovation.
  - *Scalability*; Among the efficient management and governance structures solutions the Med-Atlantic Ecobonus is considered an example of

scalability solution. The other two projects are more tailored solutions to specific situations and are not considered scalable. This is also the case of the two MoS services projects. The projects relating to data sharing, cooperation systems and real-time predictive analysis for multimodal transport are actually aimed at identifying and promote scalable and transferable solutions.

 – *Transferability*; All projects are considered examples of transferability solutions.

- *Assessment of the impact on decarbonisation*: among the assessed initiatives, the MED-Atlantic Ecobonus and two MoS services are assumed to contribute directly to transport decarbonisation, positively impacting on modal share.

Out of 147 ongoing and planned innovation projects 48 relate to other new technologies and innovation projects (Art. 33). The main findings of the analysis of the BA Corridor project list are summarised in the table overleaf for this category of innovation projects:

- *Type of projects*: most of the innovation projects included in this category relate to low carbon & decarbonisation initiatives. More specifically 35 projects are included in the list that concern alternative clean fuels, including LNG (comprising projects at the ports of Gdynia, Świnoujście, Bratislava, Venezia and Ravenna) pilot studies on electric mobility (in all Member States) and hydrogen (in Austria). Studies and projects for the development of LNG and electric mobility solutions are also included in the list. Furthermore decarbonisation and clean fuel development solutions at the Wrocław and Wien airports are foreseen to be implemented; in the latter airport e-mobility initiatives are also planned for development. In addition to the low carbon and decarbonisation projects, 4 safety & security initiatives are included in the list:
  - Preventing incident and accident by safer ships on the oceans - PI-CASSO;
  - GETUP Green Danube Ports;
  - EUROSKY - Environmental and safety improvements;
  - CORE - Safety improvements;

  8 projects are also present in the BA Corridor list which refer to data sharing, cooperation systems and real-time predictive analysis for multimodal transport:
  - The information system of the integrated transport system of Bratislava region;
  - 6 initiatives for the implementation of TAF TSI by private railway operators in Poland, Czech Republic and Slovakia;
  - One horizontal project "Linking Danube" aiming at fostering the environmentally-friendly mobility options and balanced accessibility in the Danube Region.

  Finally one project is included in the list aimed at reducing externalities, which relates to the modernisation of freight cars in Poland, to improve the standards of the rolling stock to mitigate the impact of train operations on noise.
- *Contribution to Issue Papers*: all the 35 projects relating to low carbon and decarbonisation are relevant to the scope of the *Boosting new technologies & innovation* issue paper. The 4 safety and security projects contribute to the targets of the three issues papers: *Enabling multi-modality and efficient freight logistics, Boosting intelligent transport systems (ITS)* and *Boosting new technologies & innovation*. The 8 projects associated with data sharing, cooperation systems and real-time predictive analysis for multimodal transport, support the achievement of the targets of the following issues papers: *Enabling multi-modality and efficient freight logistics, Boosting intelligent transport systems (ITS)* and *Effectively*

integrating urban nodes. The modernisation of the rolling stock in Poland seems contributing to the goals of the *Enabling multi-modality and efficient freight logistics*, *Boosting new technologies & innovation* and *Effectively integrating urban nodes* issues papers.

- *Assessment of the type of innovation*: The LNG initiatives and electric mobility projects for road transport have been overall considered catch-up projects except the LNG initiatives aimed at promoting incremental pilot solutions. Hydrogen for road transport and electric mobility solutions associated to maritime transport have been classified as radical. The PICASSO, EUROSKY and CORE initiatives have been respectively classified as incremental and radical solutions. All the other projects have been classified as catch-up initiatives.

Table 69 Other new technologies and innovation projects included in the BA Corridor project list

	Low carbon & Decarbonisation	*Cybersecurity & data protection*	*Safety & security*	*Data sharing, cooperation systems and real-time predictive analysis for multimodal transport*	*Externalities reduction*	*Climate change resilience & transport greening*	*Other telematic applications*	*Innovation dissemination*
Total projects	35	0	4	8	1	0	0	0
IP1: Enabling multi-modality and efficient freight logistics	0	0	4	8	1	0	0	0
IP2: Boosting intelligent transport systems (ITS)	0	0	4	8	0	0	0	0
IP3: Boosting new technologies & innovation	35	0	4	0	1	0	0	0
IP4: Effectively integrating urban nodes	0	0	0	8	1	0	0	0
Type of Innovation								
Catch-up	30	0	1	8	1	0	0	0
Incremental	1	0	1	0	0	0	0	0
Radical	4	0	2	0	0	0	0	0
Impacts								
Transport digitalisation	0	0	2	8	0	0	0	0
Safety improvement	0	0	3	0	0	0	0	0
Transport decarbonisation	34	0	0	2	0	0	0	0
Transport efficiency improvement through data sharing	0	0	2	8	0	0	0	0
Contribution to development of European technological industry	0	0	0	0	0	0	0	0
Others	1	0	1	0	1	0	0	0
Barriers								
Insufficient standardisation and regulation	0	0	0	0	0	0	0	0
High investment costs	5	0	0	0	0	0	0	0
Lack of sufficient public funding support	7	0	0	2	1	0	0	0

	Low carbon & Decarbonisation	Cybersecurity & data protection	Safety & security	Data sharing, cooperation systems and real-time predictive analysis for multimodal transport	Externalities reduction	Climate change resilience & transport greening	Other telematic applications	Innovation dissemination
Enablers								
Research and industrial sectors coordination (which minimises death valley risk)	0	0	0	0	0	0	0	0
Existing public/private funding for real implementation of the innovation idea	7	0	0	2	1	0	0	0
Joint initiative from the Transport and Energy sectors	5	0	0	0	0	0	0	0
Scalability & Transferability								
Scalability	35	0	4	8	1	0	0	0
Transferability	33	0	4	0	1	0	0	0
Decarbonisation								
Addresses decarbonisation directly	33	0	0	0	0	0	0	0
Alternative Fuels (electricity or hydrogen)	16	0	0	0	0	0	0	0
Alternative Fuels (Natural Gas or Biofuels)	15	0	0	0	0	0	0	0
Efficiency	2	0	0	0	0	0	0	0
Modal Shift	0	0	0	0	0	0	0	0

Source: BA Corridor study consortium

- *Assessment of project innovation character*:
  - *Impacts*; in terms of impacts, all low carbon and decarbonisation classified solutions contribute to transport decarbonisation, either directly or indirectly. The Wrocław Airport - Decarbonization" and the "Sustainable Airport Area - CO2 Neutral Airport" at Wien, also contribute to the overall mitigation of environmental impacts (Other impacts). The 4 safety and security projects contribute to transport digitalisation and safety improvement as well as transport efficiency improvement through data sharing. The GETUP Green Danube Ports is also impacting on environmental solutions; it also impacts on the improvement of the efficiency of the logistics chain (Other impacts). The 8 projects associated with data sharing, cooperation systems and real-time predictive analysis for multimodal transport impact on transport digitalisation, transport decarbonisation, as well as transport efficiency improvement through data sharing. Finally the project for the improvement of the performance of the rolling stock in Poland, to reduce noise emissions, impacts positively on the quality of life.
  - *Barriers*; Considering that most of the initiatives on the list relate to the implementation of already adopted technologies, to be eventually transferred and deployed in the network, and that most of them are already fully financed, the barriers associated with the implementation

  of the individual projects predominantly relate to high investment costs and/or lack of public funds, depending on the involvement of both private and public infrastructure managers and promoters in the development of the solutions.
  - *Enablers*; In line with the identification of the above barriers, enablers for the projects identified in the BA Corridor list relate to the availability of public/private funding for real implementation of the innovation and the possible joint initiative from the transport and energy sectors for those projects associated with the development of alternative clean fuels.
  - *Scalability*; All the projects classified as other new technologies and innovation initiatives are considered examples of scalability solutions.
  - *Transferability*; Most of the projects classified as other new technologies and innovation initiatives with the only exception of those related to specific/local solutions (i.e. Wrocław and Wien decarbonisation projects) and the 8 initiatives related to data sharing, cooperation systems and real-time predictive analysis for multimodal transport) are also considered examples of transferability initiatives.
- *Assessment of the impact on decarbonisation*: the other new technologies and innovation projects falling under the scope of Art. 33, are the most relevant ones in terms of direct impact on decarbonisation. This is mostly due to the fact that they include alternative clean fuels solutions. Indeed the project list includes 16 electric and hydrogen fuel projects for road transport, further to 15 LNG projects for maritime and road transport of freights. The two decarbonisation projects at the Wrocław and Wien airports may also contribute directly to decarbonisation.

Main findings and considerations to support innovation deployment along the BA Corridor

The aggregated statistical analysis of the BA Corridor project list with respect to innovation projects seems to support the following considerations:

- The project list is satisfactorily addressing the definition, development and implementation of telematic applications as defined in the Regulation (EU) 1315/2013, including the ERTMS, ITS, VTMIS/e-Maritime and SESAR horizontal priorities.
  - Efforts shall be made in this regard aimed at monitoring project preparation and implementation to ensure the BA Corridor will be fully compliant by 2030.
  - Regarding ITS, the list includes projects aimed at providing real-time information to users, rationalise traffic flows, implement e-calls and develop C-ITS solutions. Yet the project list and additional information available are not adequate to understand the grade of coverage and availability of these solutions at the corridor level. Measures and/or actions could be considered for the coordinated development of these solutions along the corridor.
- The project list is also increasingly including clean fuel innovation projects. However particularly regarding solutions for road transport (but also LNG) most projects seem relating to pilot initiatives. This seems mostly due to the lack of sufficient demand and consolidated commercial/business solutions.
  - The project list and additional information available are not entirely adequate to understand the grade of coverage and availability of these solutions at the corridor level. Measures and/or actions could be considered for the coordinated development of these innovations along

the corridor. Particularly regarding clean fuel availability at transport nodes, including ports and airports, the infrastructure managers shall either include projects on the BA Corridor list or present their strategy to fulfil the requirements set in the Regulation (EU) 1315/2013.
    - Regarding alternative clean fuel innovation projects, the list positively includes initiatives promoted and/or implemented by entities from both the transport and energy sector, also co-financed by private stakeholders. This is deemed to represent a successful result of the CEF, also in terms of contribution to the future development of innovative financial instruments.
- It is also positively noted that the project list includes an increasing number of initiatives for the development of interoperable solutions for multimodal transport, including data sharing, cooperation systems and real-time predictive analysis and sustainable transport services. On the other hand the overall number of projects impacting on the scope of the *Enabling multi-modality and efficient freight logistics* issue paper is overall very limited (17). The number of projects impacting on the *Effectively integrating urban nodes issue paper* is even lower (11), which may let assume the focus on the development of innovation projects concentrates so far more on the links and transport nodes of the corridor than in the urban nodes.
- Finally the number of incremental and radical innovation projects is overall very limited (19 out of 147 ongoing projects). The fact that the majority of the projects relates to catch-up innovations shows however the attention by the stakeholders on the priority of reaching the standards set in the Regulation (EU) 1315/2013.

7.1.2. BA Corridor projects' implementation and resilience to climate change

In this section a review of the impacts of climate change on the BA Corridor infrastructure is provided together with a case study analysis of the measures identified and proposed by the Member States and infrastructure managers to enhance resilience to climate change. It is indeed worth noticing that Art. 35 of Regulation (EU) 1315/2013 foresees that during infrastructure planning, Member States shall give due consideration to improving resilience to climate change and to environmental disasters.

Climate change impacts, threats and vulnerabilities

A methodology common to the 9 core network corridors and coordinated by TIS (*Transportes Inovação e Sistemas*) – leading entity of the Atlantic Corridor study consortium – has been adopted to undertake the analysis presented in the following paragraphs. In order to assess and describe the impact of climate change on the corridor infrastructure, a review of the existing literature has been undertaken aimed at identifying the most relevant possible impacts of climate change.

Existing projects modelling impacts of climate change have been considered which include the PESETA II initiative[3], the work of Nemry and Demirel (2012)[4] and the FP7 WEATHER project[5]. On this basis the table below has been elaborated which outlines

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[4] Françoise Nemry, Hande Demirel, 2012. Impacts of Climate Change: A focus on road and rail transport infrastructures. European Commission. Joint Research Centre. Institute for Prospective Technological Studies.

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the most important climate change related threats that may impact transport systems, together with the vulnerabilities.

Table 70 Climate impacts and vulnerabilities by transport modes, overview based on bibliography

Climate Impact	Transport Mode	Vulnerabilities
Increased Summer Temperatures	Road	- Heat stress for asphalt road pavement
		- Heat and Drought
	Rail	- Rail buckling
Increased Winter Temperatures	Road and Rail	- No major vulnerabilities (eventually positive impacts may be observed)
Increased Precipitation and Floods	Road	- Precipitation-induced road degradation (no estimated negative impacts)
		- Floods
		- Bridge scour
	Inland Waterways	- Floods
	Aviation	- Floods
	Rail	- Bridge scour
Increased summer droughts	Inland Waterways	- Drought periods causing low water levels and resulting in lower load factors,
		- Lower speeds, more fuel consumption and possibly a disruption of traffic (in particular for bigger vessels)
Increased and more frequent extreme winds	Road	- Storms (affecting signs, overhead structures, cables etc)
	Rail	- Storms (affecting signs, overhead structures, cables etc)
	Maritime	- Storms
	Air	- Storms, air traffic management (ATM) disruptions, delays
Sea Level Rise and sea storm surges	Road, Rail	- Erosion of coastal infrastructure
	Maritime	- Higher tides
		- Sea storm surges
Change in frequency of Winter Storms	Road	- Winter storms (traffic interruption and de-icing)
	Rail	- Winter storms (delays caused by freezing elements of infrastructure, heavy snow, interruptions due to external impacts e.g. fallen trees on tracks or broken cables)
	Aviation	- Airport operations (de-icing substances and the clearance of movement surfaces)

Regions) funded under the 7th framework program of the European Commission (http://www.weather-project.eu/weather/index.php).

Climate Impact	Transport Mode	Vulnerabilities
Permafrost degradation and thawing	Road, Rail, Aviation	- Thawing
Reduced Arctic sea ice cover	Maritime	- New Northern shipping routes
Earlier River Ice Breakup	Inland Waterways	- Ice-jam flooding risk

Source: Atlantic Corridor study consortium

Regarding the identified impacts and vulnerabilities, the above quoted work by Nemry and Daniel (2012) identifies two main types of vulnerabilities:

- Weather-induced infrastructure degradation; and
- Extreme weather-induced damages.

The three main weather-induced infrastructure degradation factors focus on paved roads, which are reported to represent the biggest share of road network in Europe. The table below summarizes the main considerations from the above referred study, not only applying to road but also to rail infrastructure. Overall, the analysis concludes that weather-induced degradation could reduce if road and rail infrastructures are properly adapted to the increasing summer heat-stress.

Table 71 Main factors for weather induced transport infrastructure degradation

Climate factor	Threats
Increased precipitation	Precipitation-induced road degradation is assumed to be significantly aggravated where average annual precipitation increases by ~100 mm/day. Under the considered climate scenarios (A1B, E1, RCP8.5), such an increase in average precipitation is not projected in any EU country by 2040-2070.
Increased summer temperatures	Heat stress is particularly relevant for asphalt road pavement for which binder needs to be adapted accordingly. On the average, the relevant temperature index for that impact (7-day maximum temperature) is projected to increase all over Europe. This indicates that heat-stress degradation will increase and that adaptation will be needed in the future. Similar conclusion can be made for rail track.
Increased winter temperatures	Winter conditions may severely affect the road pavement, and after winter season maintenance represents a high maintenance & repairing cost. The same holds true for rail tracks. Road pavement degradation models use the Freezing-Day index as one of the main explanatory variable to simulate the cold climate contribution. It is projected to decrease all over Europe.

Source: Atlantic Corridor study consortium

Extreme weather events represent an important influencing element in transport infrastructure design and transport management. Infrastructure are designed to cope with various stresses along their life, including extreme weather events as currently experienced. Transport services have also to be managed to reduce as much as possible disruption and maintain minimum safety standard in case of adverse weather conditions.

BA Corridor exposure to climate change impacts and risks

Further to the identification of the climate impacts and vulnerabilities by mode, a detailed review of the national action plans on adaptation to climate change for the 6 Member States crossed by the BA Corridor has been performed.

This was aimed at assessing the 'exposure' of the corridor links and nodes to the climate change impacts and vulnerabilities, and understand the probability and potential severity of a given system and section to be affected by a given threat. The national action plans are available at the Commissions' Climate Adaptation website (http://climate-adapt.eea.europa.eu/countries-regions/countries).

Basically, regarding the exposure analysis, the sections and nodes of the corridor that are affected by the identified threats and possible vulnerabilities have been identified. The analysis does not consider TENtec sections, rather geographical/functional sections, also in line with the units of analysis considered in the mentioned national reports. Concerning the risk assessment, i.e. the identification of those areas where the climatic impacts are more likely to occur and where the infrastructure seems particularly exposed and vulnerable to them, a qualitative approach has been adopted to assess 3 elements:

- Threat probability (Low, Medium, High);
- Exposure of the infrastructure (Low, Medium, High);
- Criticality for the network (Low, Medium, High).

More specifically, in order to ensure consistency in the analysis among the different corridors and Member States the criteria summarized at the table below have been applied.

Table 72 Criteria for assessing climatic risks in transport infrastructure

Element	Criteria
Threat probability	By analysing the maps in annex III and/or the national action plans on adaptation to climate change the teams shall develop a sense on what are the climatic threats which have higher probability of occurrence and the most severe intensity. For example, road pavement stress due to heat risk seems "high" in Southern France, "Medium" in Northern France and "Low" in the United Kingdom.
Exposure of the infrastructure	The assessment of the magnitude of the risks associated with its 'exposure' are mostly related with the sort of impacts that can be expected. For example, when looking at the effect of extreme winds they are expected to be potentially 'high' for aviation but only 'medium' or 'low' to road or rail.
Criticality for the network	The impacts of a given climatic related perturbation on a transport network are highly dependent on the criticality of the network in question. For example, the road network is in general quite dense, suggesting that in most cases it would have 'low' criticality. However, some sections may have limited alternatives and, in some cases, the threats may affect extensive areas, suggesting that in some situations criticality may be 'medium' or 'high' (e.g. in a flood it is quite possible that the entire road network within a given valley will be disturbed, suggesting 'high' criticality). On the other hand airports or rail have often little alternatives, suggesting that threats that may impose temporary closures or disruptions may have 'high' criticality.

Source: Atlantic Corridor study consortium

The results of the application of the above described approach are presented at the tables overleaf by Member State, which identify for each mode the most important risks to be taken into account, including a qualitative assessment of the relevance of such risks.

Table 73 Climate change risks analysis along the BA Corridor - Poland

Mode of Transport	Climate Impact	Vulnerabilities	Exposure	Qualitative Risk Assessment
Rail	Increased summer temperature *(Progressive warming process)*	• Rail buckling • Fires of rail facilities may increase • Work conditions and comfort of travel will deteriorate	Applicable to the whole country, slightly higher on sections: • E65 Warszawa – Katowice • CE 65 Bydgoszcz – Katowice • E59 Szczecin - Poznań – Wrocław – Opole	• Medium-high; the closer to Katowice the higher • Medium; high in the area of Katowice • Medium
	Increased precipitation and floods *(Heavy rains, that cause flooding and landslides)*	• Damage in rail infrastructure elements • Disturb smoothness of transport operations	Applicable to the whole country, slightly higher in: • Southern areas of Poland (Katowice – Bielsko-Biała – state border)	• Medium
	Increased and more frequent extreme winds *(Strong winds and hurricanes)*	• Damage in rail infrastructure elements (e.g. signals, power cables) • Disturb smoothness of transport operations	Applicable to the whole country, slightly higher in: • Warsaw area • Southern areas of Poland (Katowice – Bielsko-Biała – state border)	• Medium • Medium
Road	Increased summer temperature *(Long-lasting heat periods)*	• Affect negatively both vehicles and road infrastructure elements • Pavement deterioration and subsidence • Reduced life of asphalt road surfaces (e.g. surface cracks) • Increased wildfires can damage infrastructure	Applicable to the whole country, slightly higher in the central and southern part of Poland on sections: • S7 Nidzica – Warszawa • A1 Włocławek – CZ state border • S3 Szczecin – Legnica • A4 Legnica – Wrocław – Katowice)	• Medium to high the further to the south • Medium • High

Mode of Transport	Climate Impact	Vulnerabilities	Exposure	Qualitative Risk Assessment
	Increased Winter Temperatures *(More frequent occurrence of temperatures close to zero in winter - multiple passage through the point of 0°C in the absence of snow cover)*	• Escalated occurrence of fog, which, by reducing the visibility, will have a negative impact on road transport • Rapid degradation of the surface	Applicable to the whole country, slightly higher in the central part of Poland: • S7 Nidzica – Warszawa	• Medium
	Increased Precipitation and Floods *(Rapid rainfall and snowfall)*	• Damage of infrastructure • Road submersion • Scour to structures • Underpass flooding • Overstain drainage systems • Risk of landslides • Instability of embankments • Disturb smoothness of transport operations	Applicable to the whole country, slightly higher for: • The northern part of S7 Gdańsk- Olsztyn And the southern part of Poland: • A1 Częstochowa – state border • S1 section Katowice - state border	• Medium • Medium • Medium
	Increased and more frequent extreme winds	• Blocked roads and damaged road infrastructure and vehicles	Applicable to the whole country, with increasing trend occurring in the southern part of Poland and in particular: • S1 Katowice – state border	• Medium
	Sea Level Rise and sea storm surges	• Damage of infrastructure • Coastal erosion	Applicable to Ports' road infrastructure (Gdańsk, Gdynia, Szczecin and Świnoujście)	• Medium
Maritime	Increased and more frequent extreme winds	• Devastation of infrastructure • Impact on the level of implemented transhipments and the possible development of these ports	Ports of Gdańsk, Gdynia, Szczecin and Świnoujście	• Medium

Mode of Transport	Climate Impact	Vulnerabilities	Exposure	Qualitative Risk Assessment
	Sea Level Rise and sea storm surges	• Damage of infrastructure • Impact on the level of implemented transhipments and the possible development of these ports	Ports of Gdańsk, Gdynia, Szczecin and Świnoujście	• Medium
Airport	Increased summer temperature	• Greater need for ground cooling • Degradation of runways	Applicable to the whole country, slightly higher for Warszawa, Łódź, Szczecin, Poznań, Wrocław airports	• Medium
	Increased Precipitation and Floods	• Flood damage to runways and other infrastructure • Water runoff exceeds capacity of drainage system	Applicable to the whole country with slightly higher trend for Katowice Airport	• Low
	Increased and more frequent extreme winds *(Strong winds and icing as well as problem of fogs)*	• Damage of terminals, equipment • Disturb of navigation conditions • May periodically completely stop air operations	Applicable to the whole country with slightly higher trend for Łódź, Wrocław and Katowice Airport	• Medium

Source: BA Corridor study consortium, based on Polish National Strategy for adaptation to climate change

Table 74 Climate change risks analysis along the BA Corridor – Czech Republic

Mode of Transport	Climate Impact	Vulnerabilities	Exposure	Qualitative Risk Assessment
Rail	Increased summer temperature and extreme weather conditions *(Progressive warming process)*	• Rail buckling • Fires of rail facilities may increase • Work conditions and comfort of travel will deteriorate	Applicable to the whole country, slightly higher on sections: • Břeclav - Přerov • Suchdol n.O.- Petrovice u.K.	• Medium
	Increased Precipitation and Floods (*Heavy rains, that cause flooding and landslides)*	• Damage in rail infrastructure elements • Disturb smoothness of transport operations	Applicable to the whole country, slightly higher in: • Hulín – Břeclav track	• High
	Increased and more frequent extreme winds *(Strong winds and hurricanes)*	• Damage in rail infrastructure elements (e.g. signals, power cables) • Disturb smoothness of transport operations	Applicable to the whole country.	• Low
Road	Increased summer temperature *(Long-lasting heat periods)*	• Affect negatively both vehicles and road infrastructure elements • Pavement deterioration and subsidence • Reduced life of asphalt road surfaces (e.g. surface cracks) • Increased wildfires can damage infrastructure	Applicable to the whole country, slightly higher in the northern and southern lowlands of Moravia: • D1 Věřňovice – Suchdol n.O. • D1 Lipník nad Bečvou – Kroměříž • D52 Brno - Mikulov	• Medium

Mode of Transport	Climate Impact	Vulnerabilities	Exposure	Qualitative Risk Assessment
	Increased Winter Temperatures *(More frequent occurrence of temperatures close to zero in winter - multiple passage through the point of 0°C in the absence of snow cover)*	• Escalated occurrence of fog, which, by reducing the visibility, will have a negative impact on road transport • Rapid degradation of the surface	Applicable to the whole country, slightly higher in the northern and southern lowlands of Moravia: • D1 Věřňovice – Suchdol n.O. • D1 Lipník nad Bečvou – Kroměříž • D52 Brno - Mikulov	• Medium
	Increased Precipitation and Floods *(Rapid rainfall and snowfall)*	• Damage of infrastructure • Road submersion • Scour to structures • Underpass flooding • Overstain drainage systems • Instability of embankments • Disturb smoothness of transport operations	Applicable to the whole country	• Medium
	Increased and more frequent extreme winds	• Blocked roads and damaged road infrastructure and vehicles	Applicable to the whole country, slightly higher for: D52 Brno - Mikulov.	• Medium
Airport	Increased summer temperature	• Greater need for ground cooling • Degradation of runways	Applicable to the whole country, slightly higher for Ostrava airport	• Medium

Mode of Transport	Climate Impact	Vulnerabilities	Exposure	Qualitative Risk Assessment
	Increased Precipitation and Floods	• Flood damage to runways and other infrastructure • Water runoff exceeds capacity of drainage system	Applicable to the whole country, slightly higher for Ostrava airport	• Medium
	Increased and more frequent extreme winds *(Strong winds and icing as well as problem of fogs)*	• Damage of terminals, equipment • Disturb of navigation conditions • May periodically completely stop air operations	Applicable to the whole country, slightly higher for Ostrava airport	• Medium

Source: BA Corridor study consortium, based on Comprehensive study of impacts, vulnerabilities and sources of climate change related risks in the Czech Republic

Table 75 Climate change risks analysis along the BA Corridor – Slovakia

Mode of Transport	Climate Impact	Vulnerabilities	Exposure	Qualitative Risk Assessment
Rail	Increased summer temperature and extreme weather conditions *(Progressive warming process)*	• Rail buckling • Fires of rail facilities may increase • Disturb of working conditions and comfort of travel	Applicable to the whole country, slightly higher on section: • Trenčín – Bratislava track	• Medium to high
	Increased Precipitation and Floods *(Heavy rains, that cause flooding and landslides)*	• Damage of infrastructure • Disturb smoothness of transport operations	Applicable to the whole country, slightly higher in: • Svrčinovec – Žilina track	• High

Mode of Transport	Climate Impact	Vulnerabilities	Exposure	Qualitative Risk Assessment
	Increased and more frequent extreme winds *(Strong winds and hurricanes)*	• Damage in rail infrastructure elements (e.g. signals, power cables) • Disturb smoothness of transport operations	Applicable to the whole country, slightly high in: • Trnava –Bratislava track.	• Low
Road	Increased summer temperature *(Long-lasting heat periods)*	• Affect negatively both vehicles and road infrastructure elements • Pavement deterioration and subsidence • Reduced life of asphalt road surfaces (e.g. surface cracks) • Increased wildfires can damage infrastructure	Applicable to the whole country, slightly higher in the Danube lowland: • D1 Trenčín - Bratislava Petržalka • D2 BA Petržalka – BA Jarovce • D4 BA Jarovce – Kittsee	• Medium
	Increased Winter Temperatures *(More frequent occurrence of temperatures close to zero in winter - multiple passage through the point of 0°C in the absence of snow cover)*	• Escalated occurrence of fog, which, by reducing the visibility, will have a negative impact on road transport • Rapid degradation of the surface	Applicable to the whole country, slightly higher in the Danube lowland: • D1 Trenčín - Bratislava Petržalka • D2 BA Petržalka – BA Jarovce • D4 BA Jarovce – Kittsee	• Medium

Mode of Transport	Climate Impact	Vulnerabilities	Exposure	Qualitative Risk Assessment
	Increased Precipitation and Floods *(Rapid rainfall and snowfall)*	• Damage of infrastructure • Road submersion • Scour to structures • Underpass flooding • Overstain drainage systems • Instability of embankments • Disturb smoothness of transport operations	Applicable to the whole country, slightly higher for: • D3 Skalité – Čadca	• Medium
	Increased and more frequent extreme winds	• Blocked roads and damaged road infrastructure and vehicles	Applicable to the whole country, slightly higher in the Danube lowland: • D1 Trnava - Bratislava Petržalka • D2 BA Petržalka – BA Jarovce • D4 BA Jarovce – Kittsee	• Medium
Airport	Increased summer temperature	• Greater need for ground cooling • Degradation of runways	Applicable to the whole country, slightly higher for Bratislava airport	• Low
	Increased Precipitation and Floods	• Damage of terminals, equipment • Disturb of navigation conditions • May periodically completely stop air operations	Applicable to the whole country, slightly higher for Bratislava airport	• Low

Mode of Transport	Climate Impact	Vulnerabilities	Exposure	Qualitative Risk Assessment
	Increased and more frequent extreme winds *(Strong winds and icing as well as problem of fogs)*	• Wind damage to terminals, navigation, equipment • May periodically completely stop the possibility of transport by air	Applicable to the whole country, slightly higher for Bratislava airport	• Medium
Inland Waterways	Increased Precipitation and Floods	• May stop the possibility of transport operations • Damage of infrastructure	Port of Bratislava	• Medium

Source: BA Corridor study consortium, based on Consequences of climate change and possible adaptation measures in individual sectors Final report

Table 76 Climate change risks analysis along the BA Corridor – Austria

Mode of Transport	Climate Impact	Vulnerabilities	Exposure	Qualitative Risk Assessment
Rail	Increased temperature *(Heat stress, heat weaves, decrease in the amount of snow in lower and middle elevations, reduced certainty of snow;* thawing *of permafrost can lead to instability in infrastructural facilities and increase the risk of rock falls)*	• Damage of materials and structures • Deformation of rail infrastructure (rail buckling) • Risk of failure for electronic equipment (signal systems) • Risk of avalanches in certain regions	Applicable to the whole country, especially high in north-eastern part: • Bernrardstahl – Graz • Alpine crossings	• High
	Changes in precipitation and floods *(Decrease in the frequency of precipitation during summer months and an increase in the winter)*	• Damage in rail infrastructure elements • Disturbs the transport smoothness • Erosion and washouts potentially threatening the stability of railroad embankments • Increasing risk of mass movements (landslides, mud flows)	Applicable to the whole country, higher in north-eastern part in winter: • Bernrardstahl – Graz • Alpine crossings	• High

Mode of Transport	Climate Impact	Vulnerabilities	Exposure	Qualitative Risk Assessment
	Storms and extreme winds *(Strong winds and hurricanes)*	• Damage in rail infrastructure elements (e.g. signals, power cables) • Disturbs the transport smoothness	Applicable to the whole country.	• Low
Road	Increased temperature *(Heat stress, heat weaves, decrease in the amount of snow in lower and middle elevations, reduced certainty of snow; thawing of permafrost can lead to instability in infrastructural facilities and increase the risk of rock falls)*	• Affect negatively both vehicles and road infrastructure elements • Pavement deterioration and subsidence • Reduced life of asphalt road surfaces (e.g. surface cracks) • Increased wildfires can damage infrastructure • Increasing risk of land movements (landslides, mud flows)	Applicable to the whole country, especially high in north-eastern part: • Drasenhofen - Graz	• High
	Increased Precipitation and Floods *(Rapid rainfall and snowfall)*	• Damage of infrastructure • Road submersion • Scour to structures • Underpass flooding • Overstain drainage systems • Erosion and washouts can threaten the stability of and road beds	Applicable to the whole country, higher in North-Eastern part of Austria in the Winter: • Drasenhofen - Graz	• High

Mode of Transport	Climate Impact	Vulnerabilities	Exposure	Qualitative Risk Assessment
		• Increasing risk of mass movements (landslides, mud flows		
		• Disturb smoothness of transport operations		
	Increased and more frequent extreme winds	• Blocked roads and damaged road infrastructure and vehicles	Applicable to the whole country.	• Low
Airport	Increased temperature	• Greater need for ground cooling	Applicable to the Vienna airport	• Medium
		• Degradation of runways		
	Increased Precipitation and Floods	• Flood damage to runways and other infrastructure • Water runoff exceeds capacity of drainage system	Applicable to the Vienna airport	• Medium
	Increased and more frequent extreme winds	• Damage of terminals, equipment • Disturb of navigation conditions • May periodically completely stop air operations	Applicable to the Vienna airport	• Low

Mode of Transport	Climate Impact	Vulnerabilities	Exposure	Qualitative Risk Assessment
Inland Waterways	Increased temperature	• Damage of materials and structure, as well as road, rail and crane tracks buckling	Vienna IWW port	• Low
	Precipitation and Floods *(Low river flow through decreased runoff in summer; decrease in frequency of precipitation; and decrease in the amount of snow in winter)*	• Insufficient navigation conditions deviating from internationally agreed ones and thus reduced loading capacity for freight vessels • Inability to berth and/or load/unload vessels. (Vessels being unable to approach the quay wall due to low water levels) • Breaks in IWW cargo flows and land-side supply chains	Vienna IWW port	• Medium
	Precipitation and Floods *(High river flow through increased runoff in winter (increase in the frequency of precipitation)*	• Damage to materials and structure, as well as road, rail and crane tracks • Loss of handling and stacking areas, stoppage of port operations • Loss of radar and/or radio equipment due to extreme floods		

Mode of Transport	Climate Impact	Vulnerabilities	Exposure	Qualitative Risk Assessment
	Increased intensity of storms; high-speed winds	• Closure of linked modes of transport, affecting supply and distribution of goods to and from ports • Toppling of containers in stacking yards • Damage to navigation and communication equipment • Delays/stoppages in loading/unloading of vessels • Damage to determined buildings and structures	Vienna IWW port	• Low
	Increased intensity of storm surge	• Increased wave action at waterfront structures and consequently an increase in overtopping rates and flooding of berth facilities • River bank erosion		• Medium

Source: Rhine-Danube Corridor study consortium, based on The Austrian Strategy for adaptation to climate change

Table 77 Climate change risks analysis along the BA Corridor – Italy

Mode of Transport	Climate Impact	Vulnerabilities	Exposure	Qualitative Risk Assessment
Rail	Increased summer temperature *(Progressive warming process)*	• Melting / Rail buckling • Electric system failure • Increased vegetation • Desiccation of track earthworks --> water infiltration / collapse • Fires of rail facilities may increase	Applicable to the whole country, in particular to section • Bologna - Ravenna - Venezia - Udine - Trieste	• Medium
	Increased winter temperature	• Snowfalls • Rail contraction, catenaries, ice in electric systems	Applicable to the whole country.	• Low
	Permafrost degradation and thawing	• Falling rocks and rockslides • Stability of hillsides	Applicable to the area of Trieste.	• Low
	Changes in precipitation and floods *(Heavy rains, that cause flooding and landslides)*	• Damage of rail infrastructure elements • Disturbs smoothness of transport operations • Overstain drainage system • Damage to earthworks track circuit problems	Applicable to the whole country, higher in north-eastern part: • Verona - Ravenna - Venezia	• High
	Storms and extreme winds *(Strong winds and hurricanes)*	• Damage in rail infrastructure elements (e.g. signals, power cables) • Disturbs the transport smoothness	Applicable to the whole country.	• Medium
	Sea Level Rise and sea storm surges	• Flooding of tracks	Applicable to the Adriatic Sea ports: Ravenna, Venice, Trieste	• Medium

Mode of Transport	Climate Impact	Vulnerabilities	Exposure	Qualitative Risk Assessment
Road	Increased temperature	• Affect negatively both vehicles and road infrastructure elements • Pavement deterioration and subsidence • Reduced life of asphalt road surfaces (e.g. surface cracks) • Increased wildfires can damage infrastructure • Fires of road facilities may increase • Escalated occurrence of fog in case of winter temperatures increase, which, by reducing the visibility, will have a negative impact on road transport	Applicable to the whole country.	• Medium for summer temperature increase • Low for winter temperature increase
	Increased Precipitation and Floods *(Rapid rainfall and snowfall)*	• Damage of infrastructure • Road submersion • Scour to structures • Underpass flooding • Overstain drainage systems • Erosion of the roadside • Disturbs the transport smoothness	Applicable to the whole country, higher in north-eastern part: • Verona - Ravenna - Venezia	• High
	Increased and more frequent extreme winds	• Blocked roads and damaged road infrastructure and vehicles	Applicable to the whole country.	• Low

Mode of Transport	Climate Impact	Vulnerabilities	Exposure	Qualitative Risk Assessment
	Sea Level Rise and sea storm surges	• Damage infrastructure • Coastal erosion	Applicable to the Adriatic Sea ports: Ravenna, Venice, Trieste	• Low
Maritime	Increased and more frequent extreme winds High amplitude wave	• Safe navigation interruption • Risk of ship sinking • Devastation of infrastructure	Applicable to the Adriatic Sea ports: Ravenna, Venice, Trieste	• High
	Sea Level Rise and sea storm surges	• Devastation of infrastructure • Impact on the level of implemented transhipments and the possible development of these ports • Devastation of infrastructure	Applicable to the Adriatic Sea ports: Ravenna, Venice, Trieste	• Medium
Airport	Increased Precipitation and Floods	• Flood damage to runways and other infrastructure • Water runoff exceeds capacity of drainage system	Applicable to the Venice airport	• Medium
	Increased and more frequent extreme winds	• Damage of terminals, equipment • Disturb of navigation conditions • May periodically completely stop air operations	Applicable to the Venice airport	• Medium
	Sea Level Rise and sea storm surges	• Infrastructure damage	Applicable to the Venice airport	• Low

Source: Mediterranean Corridor study consortium, based on Strategia Nazionale di Adattamento ai Cambiamenti Climatici; Rapporto sullo stato delle conoscenze scientifiche su impatti, vulnerabilità ed adattamento ai cambiamenti climatici in Italia

Table 78 Climate change risks analysis along the BA Corridor – Slovenia

Mode of Transport	Climate Impact	Vulnerabilities	Exposure	Qualitative Risk Assessment
Rail	Increased summer temperature *(Progressive warming process)*	• Rail buckling • Increased material fatigue • Equipment/engine overheating • Increased fires alongside rail tracks causing infrastructure/facilities damage • Deterioration of working conditions and comfort of travel	Applicable to the whole country, slightly lower on section: • E65 Ljubljana – Jesenice	• Medium (slightly higher closer to Koper)
	Increased Precipitation and Floods *(Heavy rains, that cause flooding and landslides)*	• Scour to structures • Damage on rail infrastructure due to flooding and/or landslides • Destabilisation of embankment (erosion)	Applicable to the whole country, slightly higher in central areas of Slovenia, sections: • E69 Ljubljana-Divača	• Medium
	Increased and more frequent extreme winds *(Strong winds and hurricanes)*	• Damage of rail infrastructure elements (e.g. signals, overhead structures power cables) • Disturb smoothness of transport operations	Applicable to the whole country, slightly higher for section: • E69 Ljubljana-Divača	• Low
	Increased summer temperature	• Pavement deterioration and subsidence	Applicable to the whole country, slightly lower on section:	• Medium (slightly higher closer to Koper)

Mode of Transport	Climate Impact	Vulnerabilities	Exposure	Qualitative Risk Assessment
Road	*(Long-lasting heat periods)*	• Expansion/buckling of bridges due to heat stress • Increased occurrence of wildfires can damage infrastructure • Reduced life of asphalt road surfaces (e.g. surface cracks)	• E65 Ljubljana – Jesenice	
	Increased Precipitation and Floods *(Rapid rainfall and snowfall)*	• Scour to structures • Damage of infrastructure due to flooding and/or landslides • Destabilisation of embankment (erosion) • Road submersion • Underpass flooding • Overstain drainage systems	Applicable to the whole country, slightly higher in central areas of Slovenia, sections: • Ljubljana ring • E61 Ljubljana-Divača	• Low – Medium
	Change in frequency of Winter storms (*Increased incidence of thick fog*)	• Damage of infrastructure elements (e.g. overhead structures, signs) • Glaze/sleet (traffic interruption, damage to signs, overhead structures, fallen roadside trees/vegetation can block roads • Traffic interruption caused by low visibility and higher number of accidents	Applicable to the whole country	• Medium

Mode of Transport	Climate Impact	Vulnerabilities	Exposure	Qualitative Risk Assessment
	Increased and more frequent extreme winds	• Damage of infrastructure elements (e.g. overhead structures, signs) • Blocked roads	Applicable to the whole country	• Low
Maritime	Increased and more frequent extreme winds	• Extreme winds affecting port operations and damaging port's infrastructure • Change in see conditions might affect vessels	Port of Koper	• Medium
	Sea Level Rise and sea storm surges	• Damage of port infrastructure and interruption of port operations • Damage of vessels	Port of Koper	• Low
	Change in frequency of Winter storms	• Glaze/sleet (damage of port infrastructure)	Port of Koper	• Low
	Increased incidence of thick fog	• Reduced visibility affecting port operations	Port of Koper	• Low

Mode of Transport	Climate Impact	Vulnerabilities	Exposure	Qualitative Risk Assessment
Airport	Increased summer temperature	• Degradation of runway and runway foundations • Greater need for ground cooling	Ljubljana Airport	• Low
	Increased Precipitation and Floods	• Flood damage of runway and other infrastructure • Water runoff exceeds capacity of drainage system	Ljubljana Airport	• Low
	Increased and more frequent extreme winds *(strong winds and icing as well as problem of fogs)*	• Wind damage of terminals, equipment, signage and aircrafts	Ljubljana Airport	• Low
	Change in frequency of Winter storms	• Airport operations (de-icing substances and clearance of movement surfaces)	Ljubljana Airport	• Low

Source: BA Corridor study consortium, based on Transport Development Strategy in the Republic of Slovenia (2015); Basis for the preparation assessment of climate change risks and opportunities assessment for Slovenia (2014); Questionnaire on Climate Change Impacts and adaptation for Transport Networks and Nodes - Slovenia (2016)

Main impacts affecting the BA Corridor

Whilst the analysis of the national action plans on adaptation to climate change seems confirming an overall coherence in terms of type of impacts and vulnerabilities identified and considered in the different Member States, some differences may possibly exist in the assessment of the degree of exposure and risk of the corridor sections and nodes to same types of threats between the Member States. This may be due to different criteria and methodologies adopted in the national action plans and the interpretations of the exposure and degree of threat probability by the corridor consultants involved in the analysis. This specified a review of the above tables has been undertaken aimed at identifying the impacts and vulnerabilities that most affect the BA Corridor sections and nodes, focussing on those presenting a high threat probability at least in one Member State:

Rail transport:

- *Increased temperature* causing potential damages to materials and structures, deformation of rail infrastructure (rail buckling), failure of electronic equipment (signal systems) and engines due to overheating, and risk of avalanches in certain regions;
- *Increase in precipitation and floods* causing potential damages in rail infrastructure elements, disturbs in the transport smoothness, erosion and washouts potentially threatening the stability of railroad embankments, land movements (landslides, mud flows);

Road transport:

- *Increased temperature* affecting negatively both vehicles and road infrastructure elements and causing potential pavement deterioration and subsidence, reduced life of asphalt road surfaces (e.g. surface cracks); increased wildfires can also damage infrastructure, and land movements (landslides, mud flows);
- *Increased precipitation and floods* causing potential damages of infrastructure, road submersion, scour to structures, underpass flooding, overstain drainage systems, erosion and washouts can threaten the stability of road beds, land movements (landslides, mud flows), disturb the smoothness of transport operations.

Maritime transport:

- *Increased and more frequent extreme winds* causing potential interruption of safe navigation, and risk of ship sinking;
- *High amplitude wave* causing potential damages to infrastructure.

The above impacts defined as highly impacting on the infrastructure and services are clearly associated to disaster events or unforeseen interruption of services. In the mid-long terms all maritime ports will also be affected by Sea Level Rise.

For IWW and airport transport modes, the analysis does not seem to reveal high threat probability impacts.

Main considerations and examples of resilience to climate change mitigation measures

Referring to Art. 35 of Regulation (EU) 1315/2013, the analysis undertaken as part of the 2015-2017 core network corridor studies and particularly the review of the national action plans on adaptation to climate change shows that there is an increasing awareness of climate change impacts. The Member States are progressively undertaking studies to identify and monitor the impacts due to climate change, assess vulnerability and risks of specific areas and infrastructure and define measures to mitigate negative effects and consequences.

Infrastructure managers seem also starting to consider climate change resilience measures. The stakeholders have been consulted who provided some examples of projects including measures to mitigate climate change impacts along the BA Corridor. Three case studies have been developed which are summarised in the tables below, including key basic information such as:

- Awareness about the level of risks associated with climate change that the project is exposed to;
- Consideration of measures to address those risks and to increase resilience;
- Brief description of identified measures;
- Estimated investments costs of the measures when calculated and available.

Table 79 Climate change impact mitigation measures at planning stage – E 65 modernisation in Poland

Project	Works on main passenger lines (E 30 and E 65) in **Śląsk** area, phase I: line E 65 section **Będzin** – Katowice – Tychy – Czechowice Dziedzice – Zebrzydowice A resilience to climate change assessment was performed for two sections of this cross-border railway line as part of the EIA studies: Section Katowice – Szopienice Section Katowice – Zebrzydowice
Project Promoter	PKP Polskie Linie Kolejowe S.A. – PKP PLK S.A.
Risk awareness (no awareness /low/medium /high awareness)	High awareness A detailed description of the potential impact of climate change is included in the EIA reports, together with a description of the proposed mitigation measures
Measures to increase resilience (yes/no)	Yes
Type of measures	The following mitigation measures are recommended in the EIA reports for the two sections: • Installation of electric power heating to avoid freezing of switches during the winter season; • Modernization of line drainage system mitigating the effects of tracks' scouring during strong rainfalls; • Elimination of trees in a 15-meters security zone radius – mitigating power supply and catenary damage and blockage of rail tracks during strong winds/hurricanes; fixing the pillars in concrete foundations; • Adoption of track fastening systems to mitigate the risk of tracks deformation and cracks during high or low temperatures; as well as monitoring of the track fasteners • Construction of two-level crossings eliminating the effect of fogs – increases traffic safety • Deployment of non-flammable materials Additionally, PKP PLK S.A. introduced the SMS-PW-06 procedure "Emergency management". According to Art. 5 p. 8 of the procedure, the Meteorology and Water Management Institute submits e-mail communications regarding any weather disturbances and fire threats related to atmospheric phenomena. This system allows for recognition of atmospheric phenomena and appropriate preventive reaction.
Estimated investment in the measures	Not available

Sources: BA Corridor study consortium

Table 80 Climate change impact mitigation measures at planning stage – Brno junction modernisation in the Czech Republic

Project title	Brno junction modernisation A resilience to climate change assessment was performed as part of the feasibility study elaborated for this project
Project promoter	Správa železniční dopravní cesty/Railway Infrastructure Manager - SŽDC
Risk awareness (no awareness /low/medium /high awareness)	High awareness A detailed description of the potential impact of climate change is included in the feasibility study from November 2016 (SUDOP Brno, Moravia Consult, AF Cityplan) in Chapter 5: Climate change influence evaluation
Measures to increase resilience (yes/no)	Yes
Type of measures	The following mitigation measures related to potential increased precipitation and floods are recommended in the feasibility study in Chapter 5 and its Subchapter 5.8: Final recommendations regarding climate change for the different identified project alternatives: • Alternative A (station by the river): Accessibility to the new station by road and pedestrians shall be enabled via estacade bridge; accessibility by suburban railway shall be provided avia the diametral railway to mitigate flloding risk during 100 year (Q100); • Alternative B (station in the city). The proposed underground platforms are to be protected from flooding by complex devices and facilities, closures of entrances or higher positioning of the underground station in the rock massive of Petrov; • New rail banks shall be designed or be replaced by estacade bridges to avoid risks of flooding • The junction design shall consider a potential influence of 500 years flood (Q500) and appropriate resilience measures adopted. • Potential discharges from the notch and surrounding slopes at the Tuřany Airport shall be considered for intense short-term precipitation together with appropriate measures to ensure its safe and continuous operation.
Estimated investment in the measures	Cost to be defined in the detailed project design upon selection of the preferred project alternative

Sources: BA Corridor study consortium

Table 81 Climate change impact mitigation measures at planning stage – A5 in Austria

Project title	Design and construction of the A5 Wien – CZ border (- Brno) motorway, Drasenhofen bypass, 5km, 2x1 lanes (A5 Construction Poysbrunn - Border AT/CZ 1st Part) A resilience to climate change assessment was performed as part of the studies and administrative procedures required to develop and implemented the project
Project promoter	Autobahnen- und Schnellstraßen-Finanzierungs-Aktiengesellschaft – ASFINAG
Risk awareness (no awareness /low/medium /high awareness)	High awareness as reflected in the following measures: • The Austrian national construction guidelines (RVS) includes a mandate for consideration of identification and analysis of climate change & environmental impacts and of their mitigation measures. This is overall reflected in all current EIA/SEA processes. • Furthermore the Austrian national water regulations require renewal of the permits every 30 years. This shall be based on the results of environmental research activities. • The highways that are built at the expense of wetlands have to create supplementary wetlands to compensate loss of habitat and loss of water resource. • The Austrian Environmental Agency is participating in several climate change related research projects, influencing national policies.
Measures to increase resilience (yes/no)	Yes
Type of measures	The following mitigation measures have been considered for the project: • Increase of thickness of asphalt and other surface layers to mitigate the effect of warmer temperature as well as the anticipated usage of the motorways by heavier trucks. • Protection along river beds (dams, road drainage systems in anticipation of more frequent and heavier flooding. (ensure high availability of roads) • Steeper cross sections on lanes to accommodate faster removal of water (runoff) in the wake of heavy rainstorms, as a means to ensure high availability of roads. More precipitation and heavier storms are expected as a consequence of the rise in temperature.
Estimated investment in the measures	Not available

Sources: BA Corridor study consortium

Despite the growing attention to the analysis of climate change impacts and identification of the measures to mitigate their negative effects, the study and the consultations with the concerned stakeholders seems supporting the consideration that the approach to this subject is rather inceptional and somehow fragmented, which would call for a more consistent and standardised approach.

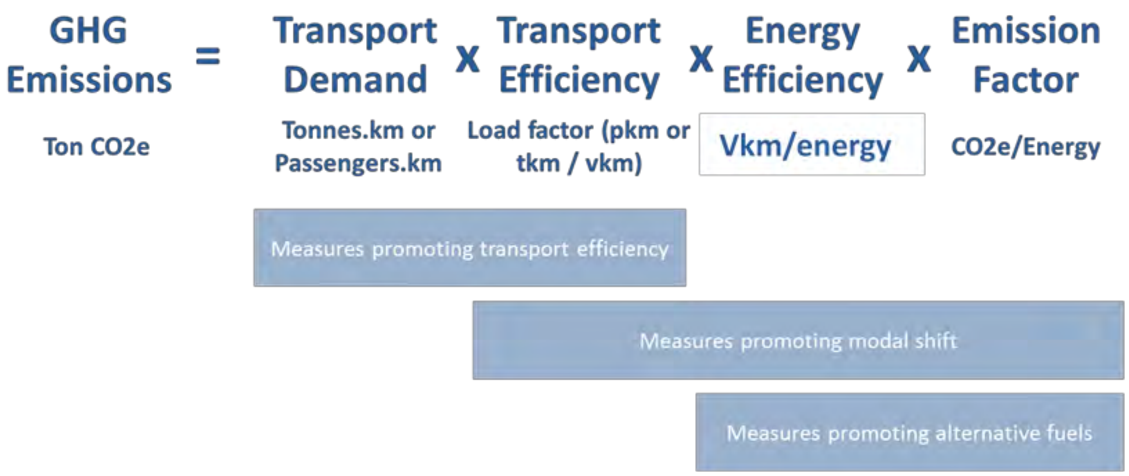
7.1.3. Contribution of the development of the BA Corridor to decarbonisation

Based on a common methodology defined for the 9 core network corridor studies and coordinated by *Transportes Inovação e Sistemas* (TIS) – leading entity of the Atlantic Corridor study consortium – an assessment of the BA Corridor project lists' contribution to transport decarbonisation has been performed. The main steps of the proposed methodology are as follow:

- Step 1: Transport Activity Volumes. An estimate of transport activity volumes along the TEN-T has been undertaken, based on the transport market studies developed for the 2014 CNCs studies. The time horizons for the analysis are 2014 and 2030;
- Step 2: Modal Shares. Subsequently, modal shares have been obtained from the existing market studies. In addition to the base year, some different scenarios have been assessed for the 2030 time horizon, in order to test the potential market uplifts for more sustainable transport modes;
- Step 3: Mitigation through Modal Shift. Based on these input data, the environmental impacts in each scenario have been estimated, notably for: a) GHG emissions, expressed in tons of CO2 equivalents and external costs due to climate change (expressed in Million €); b) Air pollutant emissions, based on an evaluation of external costs due to air pollution (expressed in Million €); c) Noise, based on an evaluation of external costs due to noise (expressed in Million €);
- Step 4: Mapping of Projects. Based on the content of the project lists, the activities throughout the corridor that may impact emissions of GHG have been identified and classified in terms of type of contribution to reduced GHG emission that they provide (for instance, alternative fuels, efficiency, modal shift);
- Step 5: Project contribution to mitigation of environmental impacts. Individual solutions (case studies) have been identified and described among the ones included in the 2015-2017 CNCs studies' project lists, to comment on how they can contribute to reduce GHG emissions in their specific area of intervention.

The principle of measuring GHG emissions has been basically derived from the Intergovernmental Panel on Climate Change – IPCC 5th Assessment Report, Working Group III, Chapter 8 (Transport) and aggregated in the formula in the figure overleaf.

Figure 39 Overview of the calculation of GHG emissions



Source: Atlantic Corridor study consortium

Referring to the main 5 steps identified above and based on the available information, the analysis of the impact of the development of the BA Corridor by 2030 on decarbonisation was based on two main 'pillars': estimating impacts of CNC on modal shift (Step 3) and contribution from other projects, notably those related to innovation deployment case studies (Step 5). This is of particular importance since there are some concerns over the real contribution of infrastructure investment projects for GHG emissions mitigation; while there is modal shift, the improved infrastructure also induces new traffic. Accordingly, the methodology foresees focussing on estimating the potential contribution of innovation projects (i.e. alternative fuels, charging infrastructures, etc.), in particular in what concerns decarbonization of transport (see also Section 7.1.1 above, i.e. the three case studies on the development of alternative clean fuels).

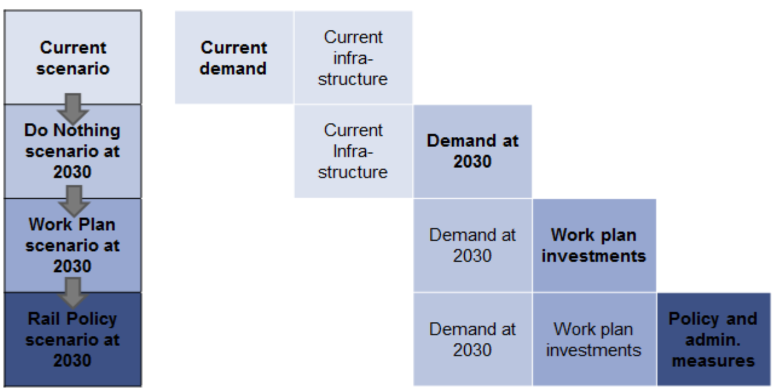
The next sections will describe the results of the analysis for the BA Corridor concerning: the estimated transport volumes by mode in the different scenarios developed for the market study (steps 1 and 2); an assessment of the potential mitigation by modal shift (step 3); and the qualitative analysis and description of 3 relevant case studies (step 5). The initiatives included in the BA Corridor project list which impact directly on decarbonising transport have been described at the previous section 7.1.1 above (step 4).

Transport Activity Volumes and Modal Shares

In line with the proposed approach, the estimate of transport activity volumes by mode along the TEN-T is based on the results of the transport market study for the current situation (year 2014) and the future scenarios at the time horizon of the work plan (2030).

As described at Chapter 4 above, in the BA Corridor market study, four main scenarios were developed for the prognosis of the rail and road performance, gradually introducing different assumptions on a step-by-step basis, thus allowing for the separate assessment of their effects.

- *2014 (current scenario)* – describing the interaction of the current travel and transport demand and the current corridor infrastructure;
- *2030T (do-nothing scenario at 2030)* – describing the interaction of the travel and transport demand at 2030 with the current corridor infrastructure (as for the 2014 scenario);
- *2030WP (work plan scenario at 2030)* – describing the interaction of the travel and transport demand at 2030 (as for the 2030T scenario) and with the corridor infrastructure improved based on the major rail and road investments planned to be implemented for the development of the corridor;
- *2030RP (rail policy scenario at 2030)* – describing the interaction of the travel and transport demand at 2030 with the corridor investments (as in scenario 2030WP), combined with policy and administrative measures in support of rail transport (such as the internalisation of the total transport costs, the promotion of more attractive rail services, the fourth railway package, the removal of administrative and operational barriers).



The results of the 2014 market study allowed estimating flows by rail and road at two geographic levels:

- At the regional level, passenger and freight activities by mode of transport (road and rail passenger*km and tons*km) between pairs of regions (NUTS2) along the corridor; this level of analysis also discriminated between national and international transport and short and long-distance transport and was used to assess the modal share along the corridor;
- At the corridor level, flows in road vehicles*km and trains*km were estimated for each section of the Baltic Adriatic Corrido, with the main purpose of identifying any capacity bottleneck on the road and rail network.

The methodology for the estimate of the corridor environmental impact was based on the second geographic level, corresponding to the total flows on the corridor sections.

Regarding the above illustrated methodology it is worth clarifying that:

- The flows include all type of transport (local, national and international);
- A set of corridor-average load factors was assumed to convert the total corridor flows form vehicle to passengers and tons, based on available statistics for the base year (2014). For road transport: 1.4 pax/car; 7.2 t/truck. For rail transport: 120 pax/train and 650 t/train. In line with the market study assumptions, the rail load factors were assumed increasing both for passengers and freight by 10% in the 2030 rail policy scenario.

The table overleaf summarises the transport activity volumes and modal shares for the current situation and the future scenarios.

Table 82 Transport activity volumes and modal shares. Current situation and future scenarios

Mode	Current Situation (2014)			
	Mpkm	Mtkm	Mvkm (pax)	Mvkm (freight)
Road	44,071	51,272	31,479	7,121
Rail	10,770	30,872	90	47
Total	54,840	82,143	n.a.	n.a.

Mode	Trend Scenario (2030)				Trend Scenario (2030) - % change vs current			
	Mpkm	Mtkm	Mvkm (pax)	Mvkm (freight)	Mpkm	Mtkm	Mvkm (pax)	Mvkm (freight)
Road	60,271	65,449	43,051	9,090	37%	28%	37%	28%
Rail	14,320	39,906	119	61	33%	29%	33%	29%
Total	74,591	105,356	n.a.	n.a.	36%	28%	n.a.	n.a.

Mode	Work Plan Scenario (2030)				Work Plan Scenario (2030) - % change vs Trend			
	Mpkm	Mtkm	Mvkm (pax)	Mvkm (freight)	Mpkm	Mtkm	Mvkm (pax)	Mvkm (freight)
Road	69,278	82,000	49,484	11,389	15%	25%	15%	25%
Rail	18,907	49,339	158	76	32%	24%	32%	24%
Total	88,185	131,339	n.a.	n.a.	18%	25%	n.a.	n.a.

Mode	Rail Policy Scenario (2030)				Rail Policy Scenario (2030) - % change vs WP			
	Mpkm	Mtkm	Mvkm (pax)	Mvkm (freight)	Mpkm	Mtkm	Mvkm (pax)	Mvkm (freight)
Road	61,970	74,124	44,264	10,295	-11%	-10%	-11%	-10%
Rail	27,369	55,047	207	77	45%	12%	32%	1%
Total	89,339	129,171	n.a.	n.a.	1%	-2%	n.a.	n.a.

Source: BA Corridor study consortium, based on the Market Study.

Mitigation through modal shift

Based on the previous steps, an estimate of the environmental impacts in each scenario was computed, notably for:

- GHG emissions, expressed in tons of CO2 equivalents and external costs due to climate change (expressed in Million €);
- Air pollutant emissions, based on an evaluation of external costs due to air pollution (expressed in Million €);
- Noise, based on an evaluation of external costs due to noise (expressed in Million €).

It shall be noted that this exercise only aims to provide an overall estimate and the analysis is subjected to many limitations. In addition to the limitations concerning the availability of detailed information on rail and road flows along the corridor at the base year and the uncertainties in the forecasts, the evaluation of the emissions is largely based on general emission factors and external costs evaluation functions presented in the January 2014 *Update to the European Commission Handbook on external costs of transport*[6] and/or the emission factors from the TREMOVE v.3.3.2 model[7]. Some parameters are also based on the 2012 German methodology (*UBA Methodenkonvention 2.0*).

The table overleaf provides the detailed calculation of the environmental impact of the passenger and freight transport activities along the BA rail and road corridor infrastructure. The base for the estimate are the corridor flows in vehicle*km in each scenario, therefore, the adopted emission factors are always referred to vehicles. In few cases, the recommended values suggested in the common methodology are based on pax*km or t*km; these factors were converted to the corresponding factors in vehicle*km based on the load factors suggested in the common methodological guidance (1.47 persons per car, 10.52 tons per truck, 120 Persons per train and 586.5 tons per train). Although these factors are not the same as those adopted in the corridor market study, it was deemed more appropriate to use the values provided in the same publications, as these were presumably originally used to convert emission factors from vehicles to passengers or tons. Finally, for cars, the average emission factor for gasoline and diesel fuel was adopted; for trains, the values for electric trains were adopted, in consideration that the BA Corridor is almost entirely electrified.

[6] https://ec.europa.eu/transport/themes/sustainable/studies/sustainable_en
[7] http://www.tmleuven.be/methode/tremove/home.htm

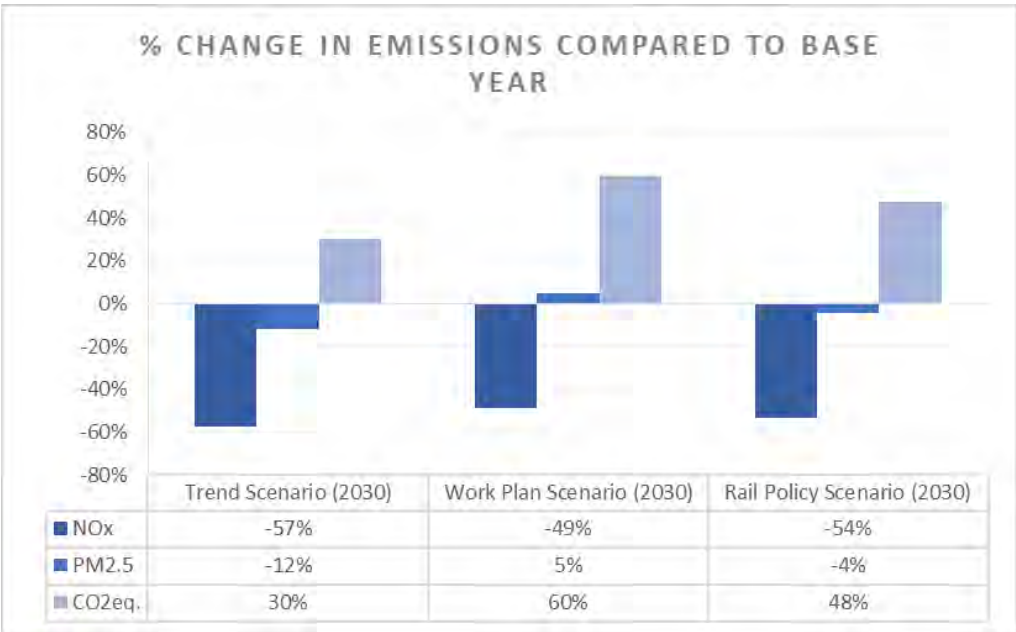
Table 83 Environmental impacts by scenario for the BA Corridor

Base Case 2014										
Mode	Traffic (Mvkm)		Emissions (t/year)			**Monetary impact (M€/year)**				
	P	F	NOx	PM2.5	CO2eq.	NOx	PM2.5	CO2eq.	Noise	Total
			P+F	P+F	P+F	P+F	P+F	P+F	P+F	P+F
Road	31,479	7,121	40,609	994	19,845,054	432	28	1,588	25	2,072
Rail	90	47	563	32	1,218,656	6	1	97	6	110
Total	n.a.	n.a.	41,172	1,026	21,063,711	438	29	1,685	30	2,182
Do nothing										
Mode	Traffic (Mvkm)		Emissions (t/year)			**Monetary impact (M€/year)**				
	P	F	NOx	PM2.5	CO2eq.	NOx	PM2.5	CO2eq.	Noise	Total
			P+F	P+F	P+F	P+F	P+F	P+F	P+F	P+F
Road	43,051	9,090	17,143	872	25,830,081	182	25	3,745	32	3,985
Rail	119	61	424	32	1,610,331	5	1	233	7	246
Total	n.a.	n.a.	17,567	904	27,440,412	187	25	3,979	39	4,231
Work Plan Scenario										
Mode	Traffic (Mvkm)		Emissions (t/year)			**Monetary impact (M€/year)**				
	P	F	NOx	PM2.5	CO2eq.	NOx	PM2.5	CO2eq.	Noise	Total
			P+F	P+F	P+F	P+F	P+F	P+F	P+F	P+F
Road	49,484	11,389	20,496	1,036	31,589,212	218	29	4,580	40	4,867
Rail	158	76	548	41	2,096,759	6	1	304	9	320
Total	n.a.	n.a.	21,044	1,077	33,685,971	224	30	4,884	49	5,187
Rail Policy Scenario										
Mode	Traffic (Mvkm)		Emissions (t/year)			**Monetary impact (M€/year)**				
	P	F	NOx	PM2.5	CO2eq.	NOx	PM2.5	CO2eq.	Noise	Total
			P+F	P+F	P+F	P+F	P+F	P+F	P+F	P+F
Road	44,264	10,295	18,425	930	28,474,154	196	26	4,129	36	4,387
Rail	207	77	667	50	2,628,523	7	1	381	11	400
Total	n.a.	n.a.	19,092	980	31,102,677	203	28	4,510	46	4,787

Source: BA Corridor study consortium, based on the Market Study. Note: P: Passengers, F: Freight

The figures below provide the graphic results of the calculation of the environmental impact of the passenger and freight transport activities along the BA rail and road corridor infrastructure. The results of the performed analysis show that the environmental impacts of the transport flows along the corridor are expected to increase with the implementation of the foreseen projects, mainly driven by the increase of transport activity. It shall be noted that the growth in volumes is not only driven by the general demand growth but also by the increased attractiveness of the corridor compared to alternative routes thanks to its development. Among the scenarios considered in the study it is only by promoting modal shift to more sustainable modes (rail policy scenario) that the corridor development may mitigate the impacts of the growth of transport activity along the corridor.

Figure 40 Emissions (tons/year)



Source: BA Corridor study consortium; Note: With reference to the transport demand scenarios developed in the market study, the graph shows the levels of emissions foreseen to be generated by the Traffic along the BA Corridor by 2030, in comparison to 2014. Three scenarios are considered at 2030, one with no investments (trend scenario), one assuming all investments in the work plan will be implemented (work plan scenario), and one foreseeing the adoption of policies in favour of rail transport in addition to the implementation of the investments included in the project list (rail policy scenario).

In order to mitigate the negative effects of transport on the economy, on society and on the environment, the TEN-T policy and more generally the European Union policies on mobility and transport consider a priority investing in the development of alternative clean fuels, in addition to supporting the improvement of the railway transport infrastructure and promoting multimodal and combined transport solutions. These measures are of particular relevance for the CNCs as they specifically affect long-distance traffic. Soft measures to support behavioural changes, particularly in urban areas, are also worth mentioning which also fall under the scope of the TEN-T and EU policy, particularly those related to transport and mobility in urban areas.

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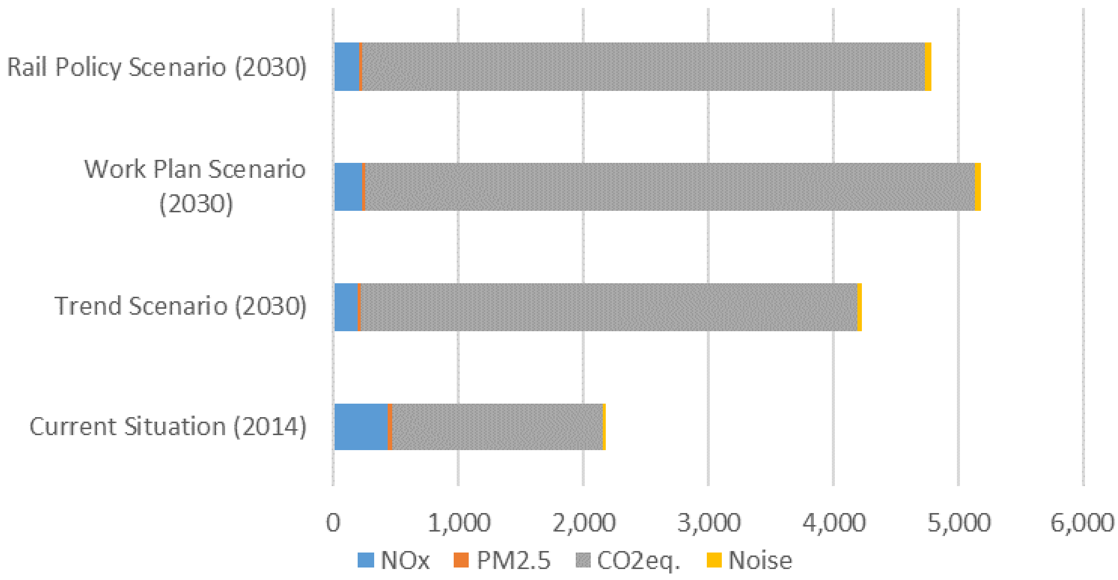
Figure 41 **Monetary impact (€ million/year)**



Source: BA Corridor study consortium

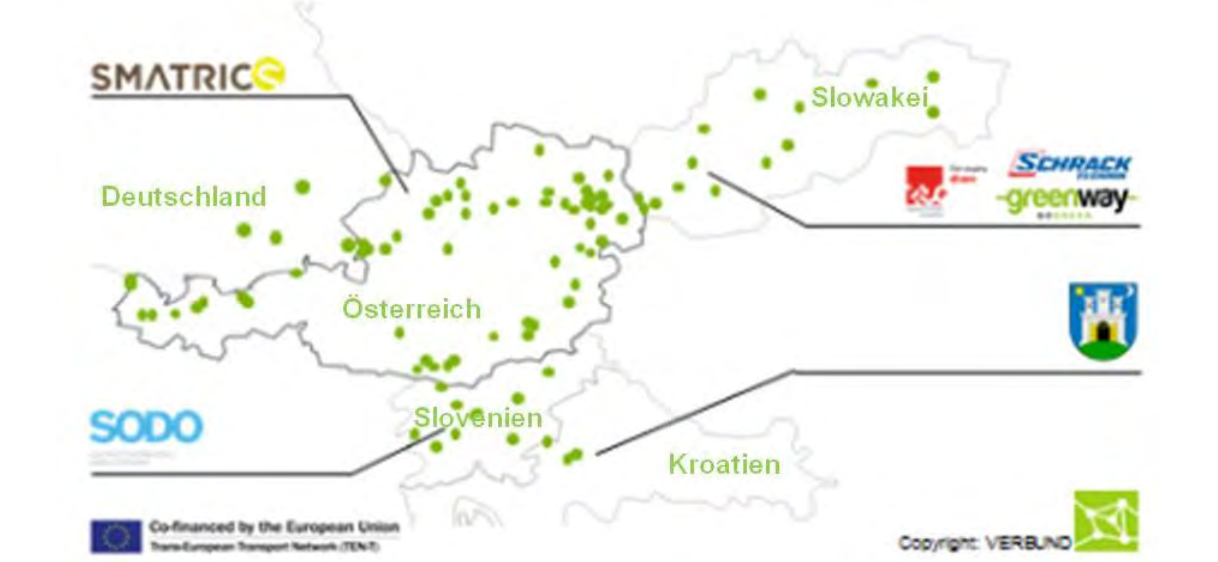
The impact of the BA Corridor project list on the development of rail and multimodal transport as well as on the integration of the urban nodes into the core network have already been commented at Chapter 5 above. Section 7.1.1 above concerning the contribution of the corridor development to the deployment of innovation, includes the description of the main scope and impact of 35 initiatives that are included in the BA Corridor project list, which relate to the implementation of alternative clean fuels.

In line with the proposed methodology for the analysis of the contribution of the development of the BA Corridor to transport decarbonisation, three case studies have been identified among these 35 initiatives for which a project sheet has been elaborated to describe qualitatively the expected effects and impacts generated by these projects in terms of mitigation of environmental impacts. The first one - *CEGC Central European Green Corridors* – relates to the development of electric mobility in four Member States, including Austria, Slovakia and Slovenia along the BA Corridor. This project is particularly relevant for the wide spectrum of stakeholders involved in the initiative, including both the energy and transport sectors and many of the most important car manufacturers in Europe. The second case study – *CarEsmatic* – is a relevant example of a MoS initiative between the Port of Koper and the Port of Barcelona, also impacting on the development of electric mobility. The third one – *LNG supply facilities implementation at the Port of Venice* – is about the development of LNG for both road and waterborne transport in the Adriatic basin. A summary sheet for each of the three identified case studies is provided in the following pages.

The three projects can be considered as examples of the significant number of initiatives and actions on the development of alternative clean fuels that are already included in the BA Corridor project list. All these projects together constitute a relevant evidence of the ongoing efforts by the European Union and the stakeholders to decarbonise transport. These activities are strategically relevant in an overall context of growth of transport and mobility, which is both a consequence and a premise of socio-economic activities and further development.

As also already commented at Section 7.1.1 above, most of these initiatives are however pilot projects. It is thus auspicated that in the future many of the pilot projects will turn into permanent commercial operations and that actions will be proposed by the stakeholders to maximise the coordinated development of alternative clean fuels. Market studies and ex-post assessment studies shall also be undertaken aimed at estimating and monitoring the possible and real effects of these measures at the wider corridor scale in order to provide guidelines and directions towards the maximisation of the impacts of these projects in mitigating the negative effects of the growth of mobility along the corridor. A CBA analysis for the majority of these projects was not undertaken. This type of analysis should be undertaken at the ex-ante and ex-post stages of project implementation in order to allow for a quantitative assessment of the impact of these projects on decarbonising transport.

Table 84 Innovation projects proposed for case study analysis - CEGC Central European Green Corridors

<table>
<tr><th colspan="2">PROJECT BASICS</th></tr>
<tr><td>Project title</td><td>CEGC Central European Green Corridors</td></tr>
<tr><td colspan="2">


</td></tr>
<tr><td>Project coordinator</td><td>VERBUND AG, Austria (Energy Utility)</td></tr>
<tr><td>Project promoters</td><td>BMW, Nissan, Renault Volkswagen (OEMs), Bayern Innovativ (regional Institution), ZSE (Energy Utility, SK), Schrack Technick (Technology Provider, SK), OMV (Oil&Gas, A), Republic of Slovenia, City of Zagreb</td></tr>
<tr><td>Project geographic location</td><td>Austria, Slovakia, Slovenia, Germany (Bavaria), Croatia (Zagreb)</td></tr>
<tr><td>Project start date</td><td>March 15th 2014</td></tr>
<tr><td>Project end date</td><td>December 31st 2015</td></tr>
<tr><td>Project status</td><td>completed</td></tr>
<tr><td>Total costs in € million</td><td>7,124,000 EUR</td></tr>
<tr><td>Project funding</td><td>3,562,000 EUR (TEN T Studies)</td></tr>
<tr><th colspan="2">PROJECT DESCRIPTION</th></tr>
<tr><td colspan="2">Main purpose</td></tr>
<tr><td colspan="2">The main purpose of the CEGC project was to deploy e-mobility charging infrastructure in the project area, providing non-discratory access to the charging network for EV users as well as cross-border services. The charging network technology was based on state-of-the-art fast</td></tr>
</table>

charging technology (i.e. 43/50kW) for electric-vehicles on the market. The charging infrastructure and accompanied services allow for charging an EV in 20 min. In addition, network planning for the global project was developed, as well as user needs and experiences studied to better align services for the customers.
Activities and outputs
The project CEGC Central European Green Corridors is driven by the emerging need for decarbonisation and electrification of EU road transportation and by the related interoperability and synergy opportunities. The project aims at deploying infrastructure in Central Europe making driving of all vehicles with an electric power train a viable alternative to vehicles with internal combustion engines. CEGC focusses on the roll out of the technologies ready for mass market deployment in the short term (high power re-charging for battery electric vehicles) and additionally carry out studies examining the preparation required for the roll-out that will be ready in the mid-term (future customers, clean energy for transport, network planning) thereby opening the market for an even larger customer base in the future. *The project deployed 115 high power charging stations in Austria, Croatia, Germany, Slovakia, and Slovenia to create a recharging network with country-wide coverage in Austria, Slovenia and Slovakia. A limited number of the high power charging stations provided connections from this network to major cities in Croatia (Zagreb) and Germany (Munich). At each charging station, service for vehicles with AC/Type 2, DC/Combo 2 as well as DC/CHAdeMO interfaces is provided, thus being compatible with most electric vehicles with high power recharging interfaces technology on the market. All charging stations form one interoperable network.* *The studies elaborated as part of this initiative dealt with customer expectations, service quality and network planning for roll out of an EV fast charging network, as well as impacts of e-mobility on the energy sector(*www.cegc-project.eu*).*
PROJECT EXPECTED IMPACTS
Expected Beneficiaries and Impacts
The CEGC project − by deploying 115 fast charging stations in the project region − contributes to the decarbonisation of the transport sector by providing infrastructure for electric vehicles. With the infrastructure deployed, EV users can access the charging network and therefore switch from fossil fuelled vehicles to electric vehicles. Besides CO2 reduction, electric mobility contributes to noise reduction, especially in urban areas. *E-Mobility providers in the project consortium not only enlarged their charging network but developed and implemented new services for EV customers.*
PROJECT CONTRIBUTION TO INNOVATION DEPLOYMENT
The CEGC project was one major step towards a Europe wide network of e-mobility charging infrastructure, providing end users with a reliable, easy to use and interoperable network. CEGC partners closely cooperated with other European EV projects to align on service levels and deployment of charging network. CEGC was also a leverage for follow-up e-mobility infrastructure projects like EVA+ (Fast charging network in Italy and Austria) and ULTRA E (Ultra Fast charging network in Germany, Belgium, The Netherlands and Austria − deploying next generation of ultra fast chargers for electric vehicles). *One of the main CEGC lessons learnt was that EV infrastructure deployment builds on a large number of stakeholders involved on site: From site owners and landlords to local DSOs and service providers. CEGC partners experienced significant differences in cost structure for EV charging stations on local level (grid connection costs). A streamlining of administrator processes on country level would speed up the deployment of infrastructure, keeping in mind how many stakeholders are involved in deployment. Besides provision of a reliable EV charging network, communication of electro-mobility to end customers remains crucial to support mass roll-out of sustainable mobility solutions.*

Source: Project coordinator - VERBUND AG, Austria (Energy Utility)

Table 85 Innovation projects proposed for case study analysis - CarEsmatic

PROJECT BASICS	
Project title	*CarEsmatic – Supporting cars and electric cars distribution using Motorways of Sea's solutions and promoting sustainable shipping concepts*
	
Project coordinator	*Luka Koper, d.d.*
Project promoters	*Autoridad Portuaria de Barcelona – Port de Barcelona* *Autoterminal S.A.* *Neptune Lines Shipping and Managing Enterprises S.A.*
Project geographic location	*Slovenia, Spain, Greece*
Project start date	*1.3.2016*
Project end date	*31.12.2018*
Project status	*ongoing*
Total costs in € million	*17.142.880 € (indicative)*
Project funding	*5.230.280 € EU co-financing through CEF (approved)*
PROJECT DESCRIPTION	
Main purpose	
The global project aims at increasing the use of Motorways of the Sea for transportation of cars in the Mediterranean area by upgrading and modernising the infrastructure in the core ports of Koper and Barcelona. The project therefore contributes to the development of the TEN-T core network as defined by the TEN-T Regulation 1315/2013 through the development of Motorways of the Sea services as defined in article 21, developing port infrastructure for sea and land access at two core ports. Further, the project will contribute to the creation of a resource efficient network since it consists of development of port infrastructure, but also of optimisations as it is the case of adaptations foreseen at the port of Barcelona.	

Cargo flows related to the automotive industry and in particular finished vehicles are frequently linked to road transportations. CarEsmatic aims at enhancing the maritime transportation of finished cars. Due to a strong presence of car makers in the Mediterranean area, both in the North and in the South, the Action will upgrade MoS service between Koper and Barcelona supported by the shipping line Neptune in order to provide more efficient transportation for finished vehicles in the Mediterranean basin. *The project will also increase the knowledge about the distribution of electric and hybrid vehicles, contributing to prepare Mediterranean ports to cope with future developments in relation to the automotive industry.* *By improving land access of the Port of Koper, the project will contribute also to the development of the BA Corridor.*
Activities and outputs
Project main tasks include some project design and construction works at the Port of Koper and construction works at the Port of Barcelona. *In the framework of the project it is foreseen that a new ro-ro berth in Basin III will be constructed at the Port of Koper. The new berth will be dedicated to vessels specialized in car transportation (car carriers) of a max. length of 240. In the hinterland of the ro-ro berth new railway infrastructure will be developed, including 4 railway tracks to ease rail operations.* *Works at Barcelona port consists of an adaptation of the existing rail terminal located at the Príncipe de España wharf. After the conclusion of the project such terminal, which will offer three different gauges (standard UIC, Iberian and metric), will allow operation of 750 m length trains. As a result, this terminal will be the first terminal in Spain for cars, adapted to EU standards (gauge and length). As part of the project also a new gate will be constructed.* *Since the project aims at supporting a greater penetration of electric vehicles, CarEsmatic partners will focus on studies dedicated to improving knowledge regarding electric vehicles and in particular needs during their distribution. To support such distribution piloting activities that include installation of charging stations will interest both ports as well as 2 Neptune vessels.*
PROJECT EXPECTED IMPACTS
Expected Beneficiaries and Impacts
Through the upgrade of port infrastructure in Koper and Barcelona it is expected that there will be a greater use of MoS service for transportations of new vehicles in the area of the Mediterranean basin. In particular it is expected that by year 2020 additional 25.000 cars yearly will choose the upgraded MoS service between Koper and Barcelona. *With a greater use of the maritime link for cars' distribution positive socio-economic benefits will be generated, since the modal shift will influence a decrease in the number of trucks transporting cars on European roads on long distances. With investments in railway infrastructure, but in particular with adaptations of railway infrastructure at Barcelona, there will be also a strong push in favour of the use of railway for the last mile distribution in Spain, which will help decongest roads, favouring less Co2 emissions from trucks, but also increasing safety on roads.* *Indirect environmental benefits are expected also from the promotion of the use of electric cars and project piloting activities.* *It is expected that the Action's implementation will positively affect also jobs and economic growth. In the short run there will be positive direct impacts from infrastructural works both in Slovenia and in Spain due to ongoing construction works. But more importantly there will be new jobs created on the account of greater use of MoS service and the ability to attract further traffic at the ports of Koper and Barcelona. It is estimated that over 160 new jobs will be created by the port industry, including stevedores, shipping agents, forwarding agents, railway carriers and others.* *Development of ports and especially sustainable development enables a positive growth of port capacities that helps generate value added from port activity, from which not just port and logistics operator can benefit, but the whole region in a transversal manner. A special emphasis should go to education as well as research and development centres that can support the sector growth by providing highly skilled and motivated labour force as well as advanced knowledge.*

PROJECT CONTRIBUTION TO INNOVATION DEPLOYMENT
As part of activity 4 that aims at promoting electro mobility, CarEsmatic foresees the development of pilot activities that are meant to give a concrete support to a greater take off of electric cars in the European union. In this context partners will study charging needs of electric vehicles during their distribution using MoS lines. Results that consist of an analysis of needs of electric vehicles during their distribution, but also of pilot installations of charging columns (considering vehicles autonomy, storage period in ports, temperature, connectors' specifics etc.), could be of interest to all Mediterranean ports and inland terminals present in the area that handle vehicles, but also to shipping lines and other transport operators, specialized in cars transportations. *Details on limitations or barriers connected to the piloting activity will be identified during the implementation of the activity.*

Source: Project coordinator - Luka Koper, d.d.

Table 86 Innovation projects proposed for case study analysis – LNG supply facilities implementation at the Port of Venice

PROJECT BASICS	
Project title	*LNG supply facilities implementation at the Port of Venice*

Project promoters	*Decal SpA and S. Marco Petroli Spa (SMP)*
Project geographic location	*Italy (Port of Venice)*
Project start date	*2018 (indicative)*
Project end date	*2020 (completion of works - indicative)*
Project status	*Detailed design*
Total costs in € million	*100 € (indicative)*
Project funding	*Own, CEF and EIB*

PROJECT DESCRIPTION
Main purpose
The project consists of the design and building of an LNG multi-modal terminal in the North Adriatic area to support the development of a LNG network to supply road, maritime and inland waterways transport. *The project promoters are Decal SpA and S. Marco Petroli Spa (SMP), two oil companies with facilities located in the Port of Venice.* *According to the current project layout under study, the new LNG Terminal will consist of three tanks (1x30.000 m3 and 2x 1.000 m3) for a total LNG storage capacity of 32.000 m3. The*

terminal maximum capacity will be 900.000 m3/years of LNG: these will be in part loaded on trucks, in part loaded on barges and on rail tanks.
Activities and outputs
Project main tasks include some project design and construction works at the Port of Venice The new LNG port storage will be located on the east area of Decal terminal in Porto Marghera (Venice) in the north shore of the basin of the south industrial Canal. The Terminal foresees the construction of a berth for up to 30.000 m3 capacity gas carrier and a berth for 2000 m3 barge, a truck loading section with 5 loading aisles for LNG tank trucks and construction of LNG rail tanks loading/unloading section and dedicated railway and road connections. *The Terminal operator also owns a network of retail stations and 4 stations will be reconverted in LNG refuelling point for road transport use and will ensure the development of LNG supply chain along Mediterranean and Baltic-Adriatic Core Network Corridors.*
PROJECT EXPECTED IMPACTS
Expected Beneficiaries and Impacts
The main beneficiaries are the transport and logistics companies operating in the port of Venice and North-Eastern Italy: in particular logistics and maritime operators (road operators, cruise ships, tugboat company, local public transport company etc.) and others. *Information campaigns and demonstrations are foreseen to improve social acceptance of new technology concepts and inform citizens.* *The project will have a wide impact not only serving the Port of Venice market but also the North Adriatic area, including the North Adriatic ports (Trieste, Ravenna) and the Italian inland waterways system (ports of Mantua and Cremona).* *The project will foster the development of the Adriatic LNG grid by supporting initial demand for LNG as a bunker fuel, thus providing strong impulse to the related supply chain. The initiative is expected to support the gradual decarbonisation of transport, which is a key objective of the Europe 2020 strategy, towards the target of a 60% reduction of CO2 emissions from transport by 2050.*
PROJECT CONTRIBUTION TO INNOVATION DEPLOYMENT
The project contribution to innovation and its impact on the local transport system in terms of reduced pollution and emissions will be significant since in the area both LNG storage facilities and LNG retail gas stations are missing at present. The project will thus contribute to foster the deployment of LNG for transport (maritime and road). It will also contribute to the deployment of LNG in transport sector to gradually replace oil with alternative clean fuels and build up the necessary infrastructure for the local / national market development of LNG. *The new LNG port infrastructure is also expected to boost economic growth and generate a wide range of jobs as well as create new market opportunities for the LNG European industry.*

Source: Port of Venice

7.2. Effects of the development of the BA Corridor by 2030 on jobs creation and economic growth

7.2.1. Direct jobs generated by large investments

In order to collect relevant data and monitor the impact of TEN-T projects on jobs growth, public sources have been reviewed and stakeholders consulted in order to gather data on Full Time Equivalent[8] jobs generated by the main ongoing projects along the corridor.

As part of the 2015-2017 BA Corridor study data have been requested in this regard to all project promoters for those initiatives with budget higher than 75 € million. The table below provides the details of the projects for which data are available.

Table 87 **Direct jobs generated by projects with budget higher than 75 € million**

Project Name	Promoter	Member State	Start Date	End Date	N. of jobs created- Direct Employment (FTE)	Total cost (million euro)
First phase: construction of a new quay **called "Logistic Platform"**	Triest Port Authority	IT	2015	2018	90	132.4
Introduction of traffic remote control on a section of railway line Zidani Most-Ljubljana	Ministry of infrastructure	SI	2017	2023	80	241.35
Assuring D4 down the whole section Zidani Most – Celje	Ministry of infrastructure	SI	2017	2020	220	239.74
Rehabilitation of existing line Maribor-**Šentilj**-state border (new tunnel and viaduct)	Ministry of infrastructure	SI	2014	2022	180	233.8
Bologna airport: People Mover	Emilia Romagna Region	IT	2008	2018	311	119.1

Source: BA Corridor study consortium

[8] Number of full-time equivalent construction workers employed for the construction of the company or project's hard assets during the reporting period. Part-time jobs for construction are converted to full-time equivalent jobs on a pro rata basis, based on local definition (e.g., if working week equals 40 hours, a 24 hr/week job would be equal to 0.6 FTE job; a full-time position for three months would be equal to a 0.25 FTE job if the reporting period is one year). If the information is not available, the rule-of-thumb is two part-time jobs equal a full-time job.

Further to the above projects, the two Alpine Crossings are also worth mentioning in terms of significant impact on jobs and economic growth generation. Although the estimation of the impact of the construction of the two missing links is not available in terms of FTE jobs, the Koralm line and Semmering tunnel are expected to generate 98,196 and 45,959 jobsyears respectively, over the entire duration of the construction of the projects (including both direct and indirect jobs).

The availability of data regarding the impact of transport infrastructure projects on jobs creation and economic development seems to be very limited at present; however this topic is increasingly becoming relevant to support politically, financially and economically the development and funding of transport investments at the EU level. This calls for analysis and estimates by project promoters on jobs creation and economic growth as these constitute important effects of infrastructure development and implementation.

7.2.2. Updating the results of the *Study on the cost of non-completion of the TEN-T*

In order to estimate the impact of the development of the 9 core network corridors on the employment and economy, the results of the *Study on the cost of non-completion of the TEN-T* presented at Chapter 2 above have been updated for each corridor, including the Baltic-Adriatic.

This exercise has been performed by extrapolating multipliers factors for jobs and economic growth from the ASTRA Input/Output model developed for the above referred study, applying them to the investments cost of the BA Corridor project list updated at October 2017. For the analysis the projects contained in the list have been classified into three mutually exclusive categories:

- Cross-border projects.
- Innovation projects.
- Other and thus average projects.

Only those projects were considered that were not completed before 2016. The total costs of the investments planned for the period 2016 until 2030 have been aggregated under each category and the respective multiplier applied to the total budget for both GDP growth and Jobs. The table below provides the multipliers adopted for each category of projects.

Table 88 Multipliers for GDP and Jobs gowth estimation

Categories	Type of measurement			Unit of measurement
	Average	Cross-border	Innovation	
GDP-Multiplier	4,35	16,8	17,7	bn€-GDP / bn€-INV
JOB-Multiplier	16.300	37.000	38.700	FTE-JobY / bn€-INV

Source: MFIVE based on the 2015 study lead by the Fraunhofer Institut für System und Innovations-forschung (ISI)

The table overleaf details the different cost categories used as inputs for the estimation of the jobs and GDP that would be lost if the BA Corridor would not be developed.

Table 89 Project costs used for the estimation of the cost of non completion of the BA Corridor

Cost category	**Amount in € billion**
All projects ongoing 2016 and later	64.9
Cross-border projects	7.3
Innovation (by project category from the project list)	2.5
Innovation (alternative clean fuels)	0.2
Innovation (telematic applications)	4.6
Rail works including ERTMS*	14.3

*Source: BA Corridor study consortium; Note: * only the 10% of this total investment cost has been considered*

By applying the above multipliers to the investment costs of the updated project list, the following estimates have been calculated.

Table 90 GDP and Jobs lost assuming the BA Corridor project list would not be implemented by 2030

Impact of CNC	GDP Growth	Jobs
Unit of measurement	bn € (2015)	Job-years
Total by CNC	489	1,403,661
Cross-border projects	123	271,552
Innovation	153	335,394
Other projects	213	796,715

Source: BA Corridor study consortium

The projects for which cost estimates and implementation dates are available and that are planned to be implemented over the period 2016 until 2030 amount to an investment of 64.9 € billion (year 2015). The implementation of these projects will lead to an increase of GDP over the period 2016 until 2030 of 489 € billion (year 2015) in total. Further benefits will also occur after the year 2030.

The investments will also stimulate additional employment. The direct, indirect and induced job effects of these projects will amount to 1,403,661 additional job-years created over the period 2016 to 2030. It can be expected that also after 2030 further job-years will be created by the projects.

Whilst the above results are deemed preliminary a new *Study on the impact of TEN-T completion on growth, jobs and the environment* is currently ongoing to update the results of the first assessment on the impact of the development of the TEN-T core network on jobs and economic growth, which considers as input data the updated project lists elaborated under the scope of the 2015-2017 core network corridor studies, namely over 3,000 projects for a total investment cost of about 750 € billion. Further to the assessment of the impact of TEN-T completion on the economy and on the employment (including direct and indirect jobs during construction as well as wider economic benefits of permanent nature) the study will also assess the impact of the development of the core corridors on the environment (notably carbon and other harmful emissions).

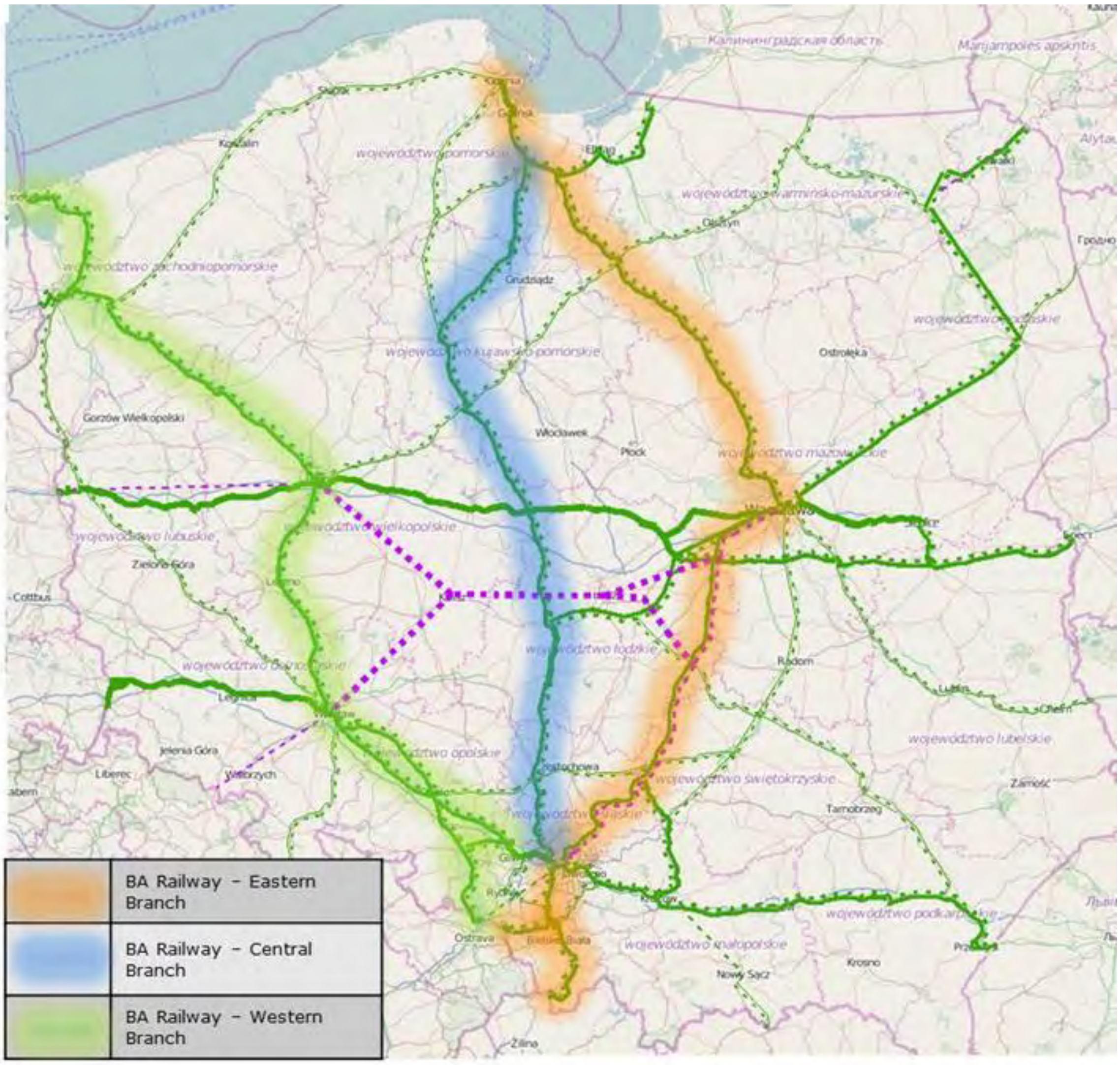
Annex A – Description of the links of the BA Corridor

Railway infrastructure

In this section an overview of the main corridor railway infrastructure for each of the Member States is provided. It should be noted that the corridor infrastructure also includes all the "last mile" connections to the corridor terminals, even if not explicitly mentioned in our description. The national codes for the rail lines are provided for reference.

Poland. The BA Corridor railway infrastructure in Poland is constituted of three main branches, one on the Western side of Poland and two (Eastern and Central branches) through Central Poland, as shown in the map below.

Figure A1 Railway route of the BA Corridor (Poland)



Source: Own elaboration based on TENtec

The following main railway lines are included in the BA Corridor:

- Eastern branch (Central Poland):
  - 18654; (201, 202); [E65/C-E65]: Gdynia Port Centralny – Gdańsk Główny;

  - 140519155800000 (226); [E65/C-E65]: Gdańsk Port Północny – Pruszcz Gdański;
  - 18700, 18715, 18644, 18649, 18703; (9); [E65/C-E65]: Gdańsk Główny – Tczew – Malbork – Iława - Działdowo – Warszawa Wschodnia;
  - 140519161700000; (20, 509, 19, 1): Warszawa Praga – Warszawa Główna Towarowa – Józefinów – Piastów;
  - 18709; (1, 2); [E65/C-E65]: Warszawa Wschodnia – Warszawa Zachodnia;
  - 18723; (1); [E65/C-E65]: Warszawa Zachodnia – Grodzisk Mazowiecki;
  - 18658, 18667, 18721, 18659; (4); [E65/CE-65]: Grodzisk Mazowiecki – Szeligi – Idzikowice - Zawiercie;
  - 18751, 18752, 18727; (1); [E65]: Zawiercie – Dąbrowa Górnicza Ząbkowice – Katowice;
  - 18728, 2039653187, 18720, 18645; (139); [E65; C63]: Katowice – Czechowice Dziedzice (Most Wisła) – Żywiec - Zwardoń – (Skalité, SK);
  - 2039653185, 2039653188; (150, 93); [C-E65]: Czechowice Dziedzice (Most Wisła) – Zebrzydowice – (Petrovice u Karviné, CZ);
- Central branch (Central Poland):
  - 18718, 18731, 18676, 18725, 18655, 18688, 18753; (131, 201, 131, 741, 131); [C-E65]: Tczew – Bydgoszcz – Inowrocław - Ponętów – Tarnowskie Góry – Bytom - Chorzów Batory;
  - 18653; (137); [E30]: Chorzów Batory – Katowice;
  - 140604101200000; (164, 651, 141) [E59]: Chorzów Batory - Katowice Ligota.
- Western branch (Western Poland):
  - 18685, 18651; (401); [E59/C-E59]: Świnoujście – Goleniów – Szczecin Dąbie;
  - 18746, 140519160200000; (351, 855); [E59/C-E59]: Szczecin Dąbie – Szczecin Zdroje – Szczecin Port Centralny;
  - 18701, 18716, 18656; (351); [E59]: Szczecin Dąbie – Stargard Szczeciński – Krzyż Wielkopolski – Kiekrz – Poznań Główny;
  - 140519162700000; (395, 394, 352, 802); [E59]: Kiekrz – Zieleniec – Poznań Franowo – Poznań Starołęka – Luboń koło Poznania.
  - 18706, 18670, 18742; (271); [E59]: Poznań Główny - Leszno – Wrocław Popowice;
  - 18697; (271); [E59]: Wrocław Popowice – Wrocław Mikołajów;
  - Node of Wrocław 18647; (271, 132); [C-E30]: Wrocław Mikołajów – Wrocław Główny – Wrocław Brochów;
  - By-passing line in Wrocław 140519164500000; (756, 349): Wrocław Mikołajów – Wrocław Stadion – Wrocław Brochów;
  - 18646; (132); [C-E30]: Wrocław Brochów – Brzeg – Opole Główne - Opole Groszowice;
  - 18698, 18699; (277); [C-E30]: Wrocław Brochów – Jelcz – Opole Groszowice;
  - 18682; (136); [E30]: Opole Groszowice – Kędzierzyn Koźle;
  - 18748, 18744; (151); [E59]: Kędzierzyn Koźle – Chałupki – (Bohumín/Ostrava, CZ);
  - 18749, 18741, 18691; (137); [E30]: Kędzierzyn Koźle – Gliwice Łabędy – Chorzów Batory;
  - 21600017; (132, 135): Opole Groszowice – Pyskowice - Gliwice Łabędy.

In addition to the above lists, the relevant railway infrastructure in the main railway nodes and the interconnections to the passenger and freight terminals also belong to the Corridor as well as the "last mile connections" to the Ports like Gdańsk Główny – Gdańsk Zaspa Towarowa, as indicated by Port authorities.

It is worth noting that there are some railway sections that are part of the TEN-T comprehensive network and remain relevant bottleneck in terms of railway connection to the Baltic ports of Gdynia and Gdańsk:

- 21600016; 21600015; (201, 203) Comprehensive freight line Bydgoszcz - Trójmiasto, phase I, including line 201 and 203;

- 21600016; 21600015; (201, 203) Comprehensive freight line Bydgoszcz - Trójmiasto, phase II (together with electrification), including line 201 and 203.

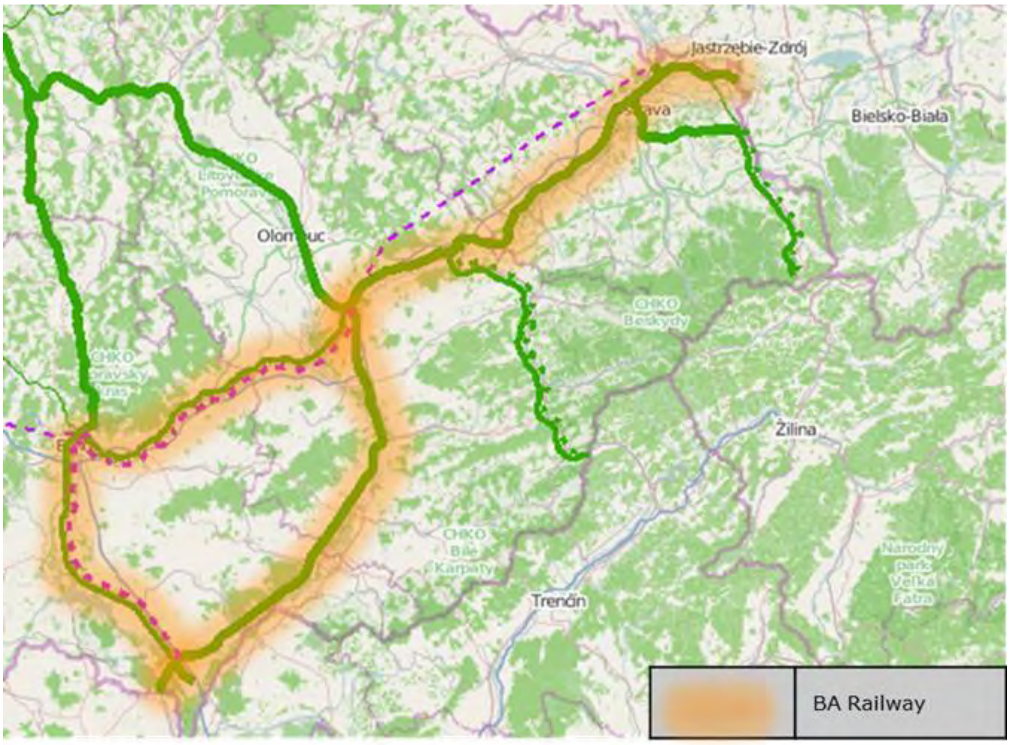
Both of these sections are foreseen to be implemented under the Multiannual Financial Framework 2014-2020. Our analysis takes into account these lines, which are relevant for the corridor multimodal integration, even if they are not included in the BA core network corridor alignment.

Czech Republic. The BA Corridor railway infrastructure in the Czech Republic includes the main line (Katowice) – Ostrava - Brno/Otrokovice – (Wien) and is composed of the following railway sections:

- 20392; (833): Petrovice u Karviné <--> Zebrzydowice;
- 20380; (320): Petrovice u Karviné <--> Detmarovice;
- 18808; (320): Dětmarovice <--> Bohumín;
- 18809; (836): Bohumín <--> Chałupki;
- 20298; (270): Bohumín <--> Ostrava;
- 20302; (270): Hranice na Moravě <--> Ostrava;
- 20301; (270): Hranice na Moravě <--> Přerov;
- 65435; (330): Přerov <--> Nedakonice (freight branch of BA Corridor only);
- 65351; (330): Nedakonice <--> Břeclav (freight branch of BA Corridor only);
- 20398; (300): Přerov <--> Holubice (passenger branch of BA Corridor only);
- 20404; (340): Brno <--> Holubice (passenger branch of BA Corridor only);
- 20300; (250): Brno <--> Břeclav (passenger branch of BA Corridor only);
- 18806; (801): Břeclav <--> Hohenau / Bernhardsthal (border CZ/A).

In addition to the above list, the Corridor also includes the relevant railway infrastructure in the main railway nodes and the interconnections to the rail-road terminals (Ostrava, Přerov) and airport (Ostrava).

Figure A2 Railway route of the BA Corridor (Czech Republic)



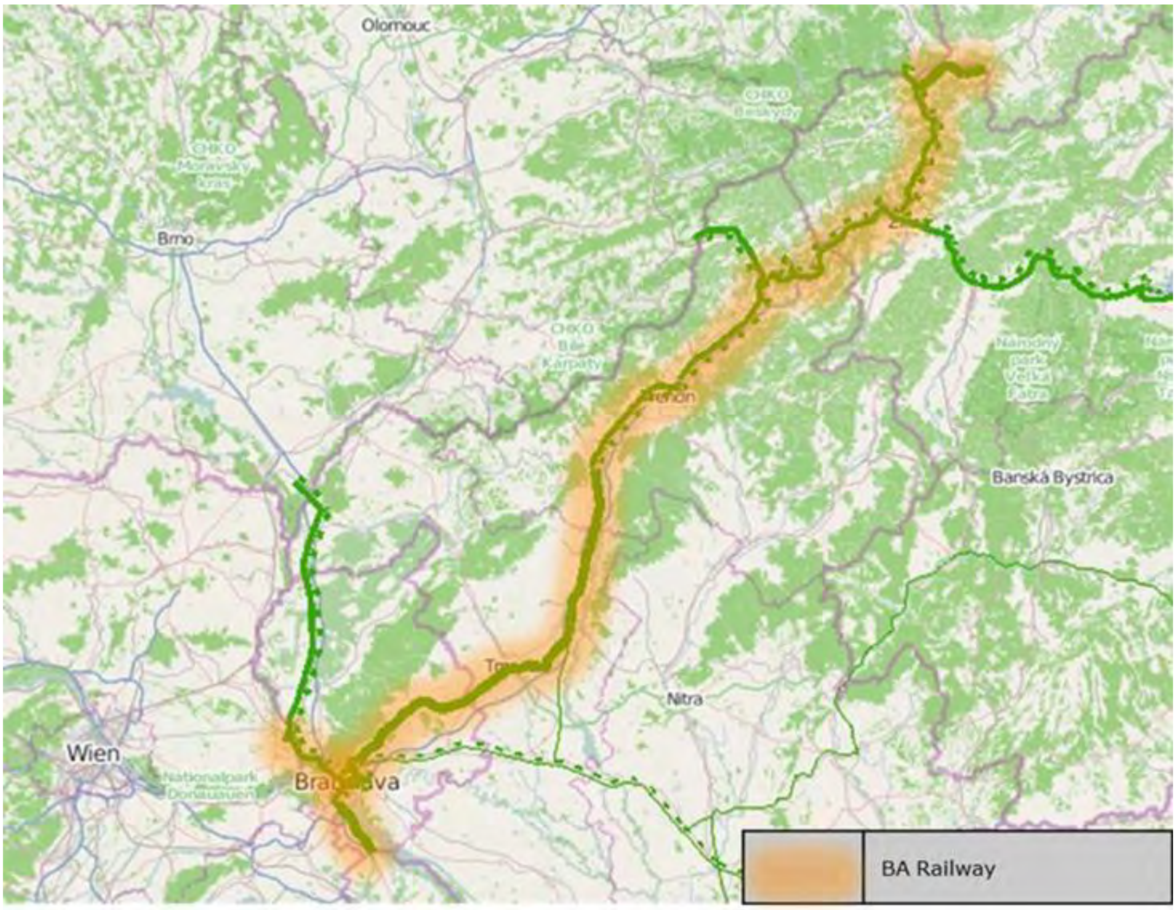
Source: Own elaboration based on TENtec

The double track section Brno - Blažovice is used by all trains to Uherské Hradiště and express trains to Přerov with no stops in this section (there are only three daily stop trains Brno - Vyškov and back together). The section from Holubice is used by trains Brno - Přerov using Holubice - Blažovice connecting line and passenger trains from Vyškov to Přerov. There is missing capacity to operate more passenger stop trains Brno - Přerov and bus service is organised instead.

Slovakia. The BA Corridor railway infrastructure in Slovakia includes the main line (Katowice) – Žilina - Bratislava – (Wien) and is created by these railway sections:

- 18509; (129) Skalité <--> Zwardoń;
- 18508; (129) Čadca <--> Skalité;
- 18477; (127) Žilina <--> Čadca;
- 140519173000000; Žilina <--> Žilina (RRT) (freight only);
- 18490; (120) Púchov <--> Žilina;
- 72600; (120) Nové Mesto Nad Váhom <--> Púchov;
- 72601; (120) Leopoldov <--> Nové Mesto Nad Váhom;
- 18499; (120) Bratislava <--> Leopoldov;
- 18479; (132) Bratislava <--> Petržalka;
- 18498; (110) Devínska Nová Ves <--> Bratislava;
- 18506; (A) Marchegg <--> Devínska Nová Ves (passenger only);
- [Austrian TENtec ID 20520: (B) Kittsee <--> Petržalka (freight only)]

Figure A3 Railway route of the BA Corridor (Slovakia)



Source: Own elaboration based on TENtec

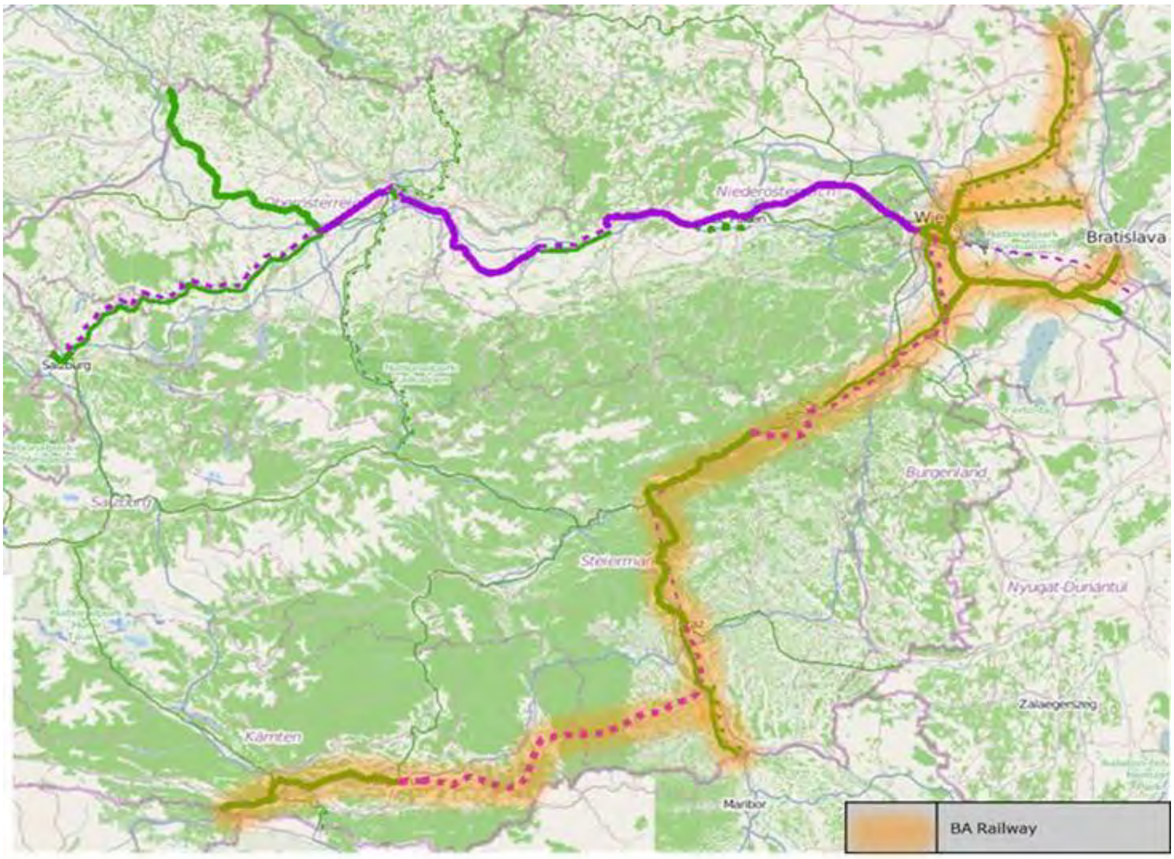
In addition to the above list, the Corridor also includes the relevant railway infrastructure in the main railway nodes and the interconnections to the rail-road terminals (Žilina, Bratislava), and inland port (Bratislava).

Track 129 and Track 127 are parallel in the section Svrčinovec – Čadca, only single track section Svrčinovec – Čadca belongs to BA Corridor. There is no passenger service on the corridor branch section Bratislava – Bratislava, Petržalka. Passenger service towards Wien on Kittsee line starts in Bratislava at Petržalka station.

Austria. The BA Corridor railway infrastructure in Austria includes the following main lines:

- 19700055; (11401/11601): (Břeclav, CZ) - Bernhardsthal Fbf - Wien Hauptbahnhof;
- 20503/20519; (11801/19401): Wien Hauptbahnhof – Kittsee - (Bratislava Petržalka, SK);
- 20464; (10501): Wien Hauptbahnhof – Wien Meidling;
- 20487; (10601): Wien Meidling – Wiener Neustadt Hauptbahnhof;
- 190700005; (10501): Wiener Neustadt Hauptbahnhof – Spielfeld-Straß - (Sentilj, SI);
- 20466; []: Graz – Klagenfurt (Koralm Tunnel) [under construction]
- 20457; (41301): Klagenfurt – Thörl-Maglern - (Tarvisio B., IT);
- 19700033; []: Gloggnitz–Mürzzuschlag (Semmering Base Tunnel) [under construction];
- 20516; (11701): Stadlau (Wien) –Marchegg – (Devínska Nová Ves, SK);
- 19700010; (11901): Gramatneusiedl – Wampersdorf.

Figure A4 Railway route of the BA Corridor (Austria)



Source: Own elaboration based on TENtec

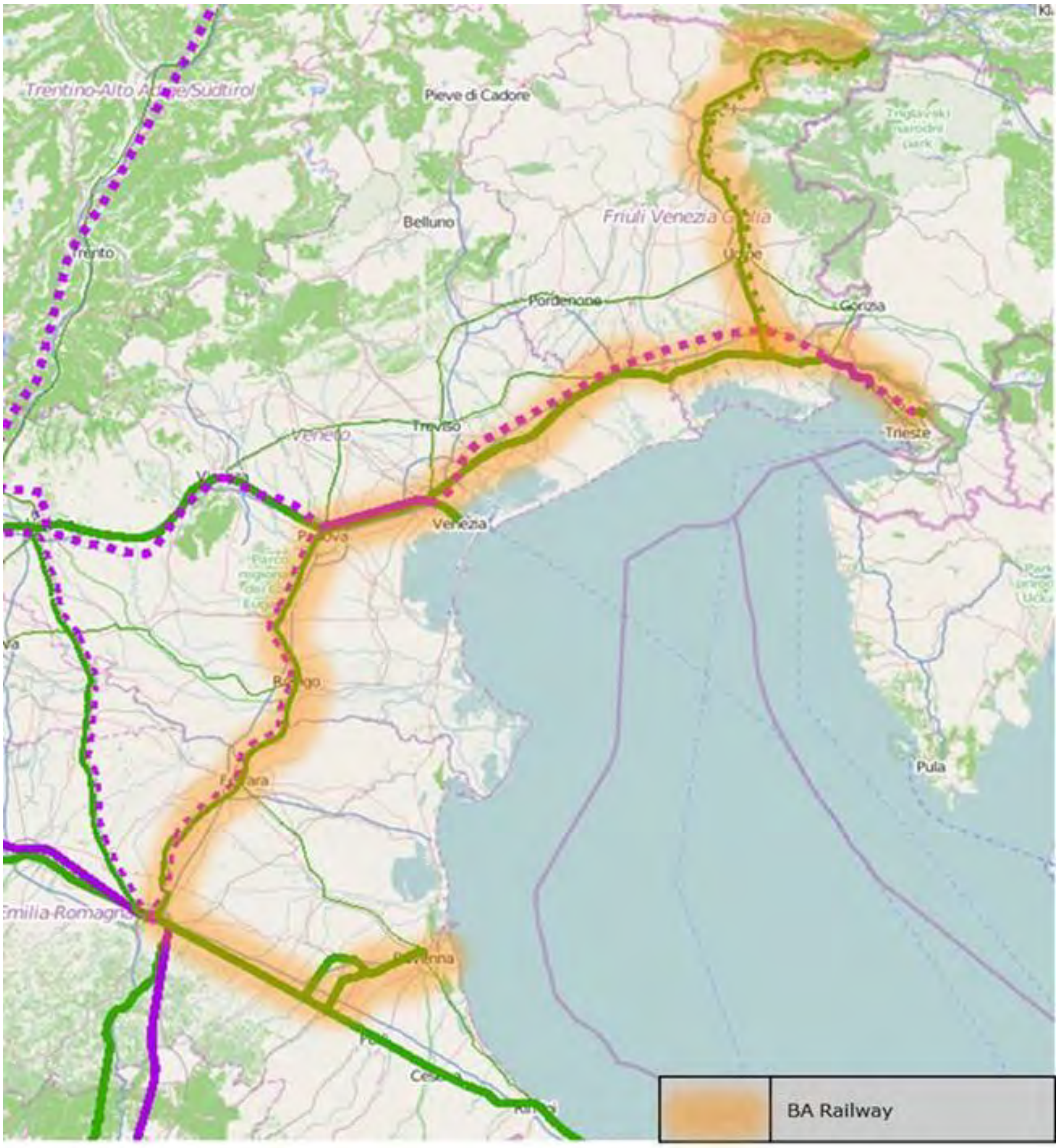
Based on the currently available information, we understand that the line Wien Meidling – Wiener Neustadt Hauptbahnhof (section of line number 10501) is not included in the corridor, although it is the main passenger traffic line for this connection.

Italy. The BA Corridor railway infrastructure in Italy includes the following lines belonging to the core network:

- 18947; (J37, J38): Tarvisio <--> Thoerl-Maglern (border A/I) / Border IT/AT II
- 22400030; (J37, J38): Tarvisio <--> Carnia
- 22400031; (J37, J38) Carnia <--> PM VAT
- 19251; (J37, J38) PM VAT <--> Udine
- 22400196; (K94, K95) Udine <--> Privano
- 22400197 (K94, K95) Privano <--> Cervignano A.G.
- 19032; (J35, J36) Border IT/SL I / Sežana II <--> Villa Opicina
- 19035; (J35, J36) Villa Opicina <--> Bivio Aurisina
- 22400033; (J35, J36) S. Polo Junction <--> Bivio Aurisina
- 22400032; (J35, J36) Ronchi dei Legionari Sud <--> S. Polo Junction
- 18953; (J35, J36) Cervignano A.G. <--> Ronchi dei Legionari Sud
- 18902; (J35, J36) Portoguaro <--> Cervignano A.G.
- 18962; (J35, J36) Venezia Mestre <--> Portoguaro
- 18785; (J35, J36) Venezia Mestre <--> Venezia S.L.
- 18954; (J35, J36) Padova <--> Venezia Mestre (high-speed)
- 18989; (J35, J36) Padova <--> Venezia Mestre
- 22400143; (J31, J32) Padova <--> Monselice
- 22400144; (J31, J32) Monselice <--> Rovigo
- 22400142; (J31, J32) Rovigo <--> Ferrara
- 22400014; (J31, J32) Ferrara <--> San Pietro in Casale
- 22400012; (R5) San Pietro in Casale <--> Castel Maggiore
- 22400013; (R5) Castel Maggiore <--> Bologna Centrale
- 22400023; (R5) Bologna Centrale <--> San Vitale Junction
- 22400022; (R5, J63) San Vitale Junction <--> Castel Bolognese
- 22400027; (J63) Castel Bolognese <--> Faenza
- 22400026; (K106-7-8) Castel Bolognese <--> Ravenna
- 22400024; (K103) Granarolo <--> Faenza
- 22400025; (K108-9) Ravenna <--> Granarolo

It is worth mentioning that the BA passenger rail corridor include the planned high-speed line between Venezia and Trieste, while the freight corridor follows the existing route along the conventional rail line. In addition to the above list, the Corridor also includes the relevant railway infrastructure in the main urban nodes and the interconnections to the passenger and freight terminals.

Figure A5 Railway route of the BA Corridor (Italy)



Source: Own elaboration based on TENtec

It is worth noting that there are some railway section that are part of the TEN-T comprehensive network and, until the realization of Venezia-Trieste high-speed line and Udine-Cervignano doubling, represent the most utilized freight link to Venezia, Ravenna and Trieste ports:

- Udine-Gorizia;
- Gorizia-Bivio S. Polo;
- Udine-Treviso;
- Venezia Mestre-Treviso;
- Castelfranco-Treviso;
- Caltelfranco-Camposampiero;
- Camposampiero- Padova.

Our analysis will take into account these lines, which are relevant for the corridor multimodal integration, even if they are not included in the BA core network corridor alignment.

Slovenia. The BA Corridor railway infrastructure in Slovenia includes the following main lines:

- 18189, 18186, 18177; (E67): (Spielfeld-Straß, AT) - Šentilj – Maribor – Pragersko – Celje - Zidani Most;
- 18190 (E70): Zidani Most – Ljubljana;
- 22000003, 2000002, 2000001, 18185, 18183, 18193, 18180; (E65): Ljubljana – Postojna – Divača/Sežana - (Villa Opicina/Trieste, IT);
- 18197; E69: Divača – Koper.

In addition to the above list, the Corridor also includes the relevant railway infrastructure in the main railway nodes and the interconnections to the passenger and freight terminals.

Figure A6 Railway route of the BA Corridor (Slovenia)

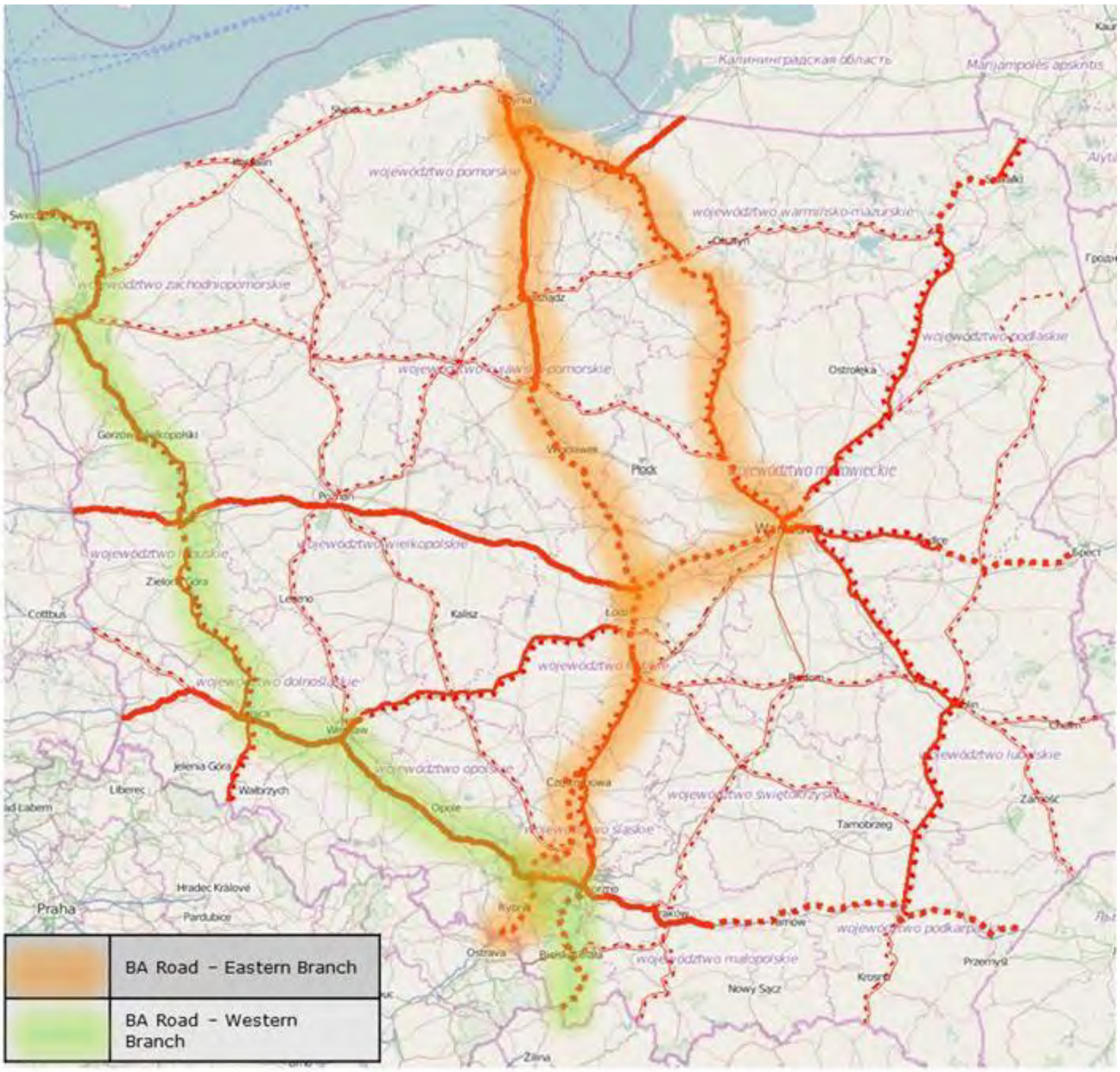
Source: Own elaboration based on TENtec

Road infrastructure

In this section an overview of the main corridor road infrastructure for each of the Member States is provided, also including for reference the official national road codes. It should be noted that the corridor infrastructure also includes all the connections to the corridor terminals, although not explicitly mentioned in our description.

Poland. The BA Corridor road infrastructure in Poland includes two main routes, an Eastern branch one through Central Poland and one Western Branch through Western Poland, as shown in the map overleaf.

Figure A7 Road route of the BA Corridor (Poland)



Source: Own elaboration based on TENtec

The following express road and highways are included in the Corridor:

- Eastern/central branch (Central Poland):
  - 21600040; (S6): Gdynia – Gdańsk;
  - 24209, 24249, 24259, 24196, 24206, 24233; (S7, 7): Gdańsk – Elbląg – Ostróda – Olsztynek – Płońsk – Załuski – Warszawa;
  - 64585, 24202; (7, S8): Warszawa;
  - 24242; (A2): Warszawa (Konotopa) – Łódź (Stryków);

  - 21600041, 24231, 24218, 24274, 24275, 7, 24193, 24265, 14, 24237, 21, 24273, 24276; (A1, 1): Gdańsk (Rusocin) – Nowe Marzy – Toruń – Czereniewice – Bedlno – Stryków (Łódź) – Tuszyn – Piotrków Trybunalski – Częstochowa – Pyrzowice – Gliwice (Sośnica) – Gorzyczki – (Věřňovice, CZ);
- Western branch (Western Poland):
  - 24221, 24197, 21600034, 21600035, 3, 24247, 24211, 24208; (S3, 3, A6): Świnoujście - Goleniów – Szczecin – Gorzów Wielkopolski – Jordanowo – Świebodzin – Sulechów – Nowa Sól – Legnica;
  - 24226, 73201, 24228, 24222, 24229, 24257, 24238, 24264, 24212, 24220, 24213; (A4): Legnica – Bielany Wrocławskie – Gliwice (Sośnica) – Katowice (Kosztowy);
  - 24272; (S1, 1): Katowice (Kosztowy) – Tychy – Bielsko-Biała;
  - 24214; (S69, 69): Bielsko-Biała – Żywiec – Zwardoń – (Skalité, SK).

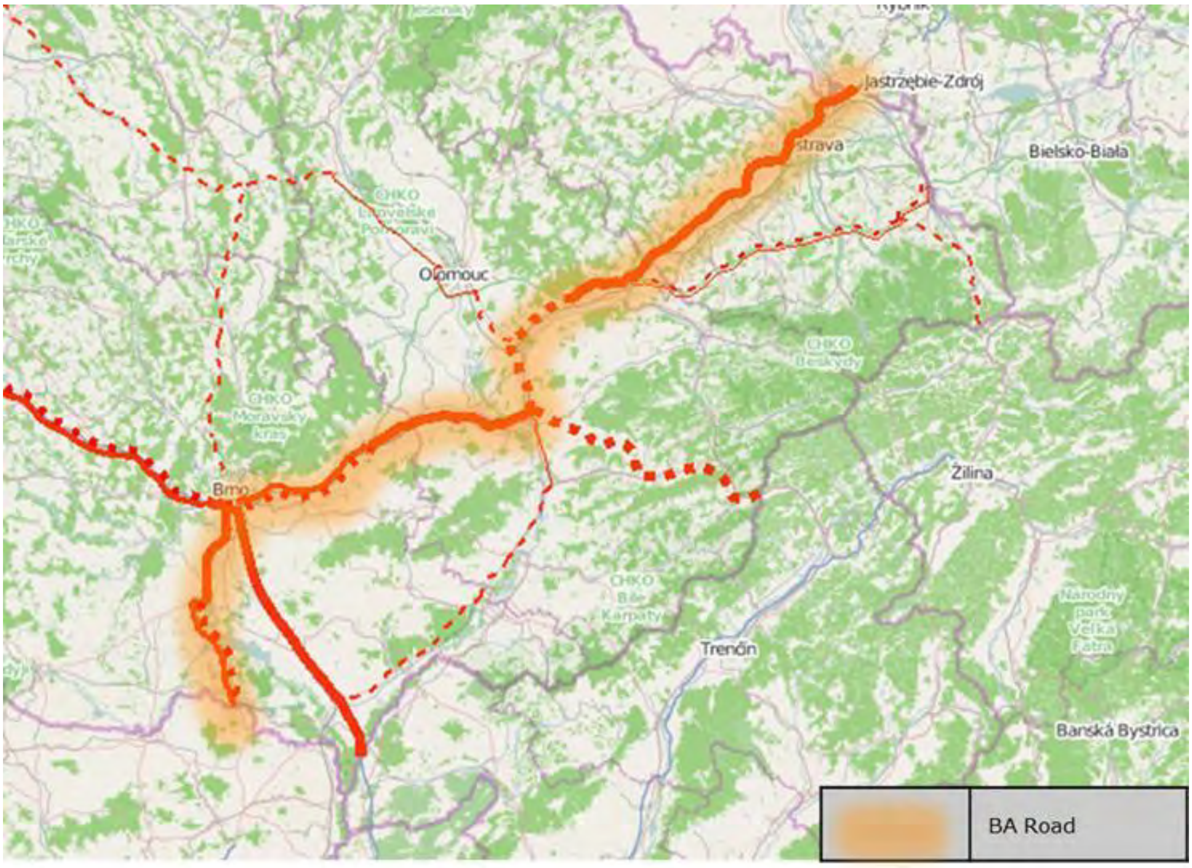
In addition to the above lists, the Corridor also includes the interconnections to the passenger and freight terminals. We note that the section Warszawa – Radziejowice of the S8, will be modernised during the 2014-2020 Multiannual Funding Framework. Section Warszawa – Piotrków Trybunalski (length of approximately 130 km, which contains section Warszawa – Radziejowice) as such is not part of the BA Corridor, it belongs to the TEN-T comprehensive network by legal definition (Reg. EU 1315/2013), but could be considered alterative road connection to A2 Warszawa – Łódź and A1 Stryków – Łódź – Piotrków Trybunalski. We also note that Polish authorities identified the need of including S1 express road starting from Pyrzowice (not Katowice) to Bielsko - Biała. The A1 and S1 meet in Pyrzowice, where from the A1 road splits into two directions into South: Czech Republic (via A1) and Slovakia (via S1 and S69).

Section Pyrzowice – Katowice (Kosztowy) has a status of express road and partially belongs to the core network, but part if it - section Pyrzowice – Wojkowice Kościelne does not belong to the core network (not even comprehensive). This alternative connection from Pyrzowice towards South could be considered as functionally relevant for the traffic along the BA Corridor to Slovakia, allowing for going straight forward through Śląsk area (without bypassing Gliwice).

Czech Republic. The BA Corridor road infrastructure in the Czech Republic on the mail line (Katowice) – Ostrava - Brno – (Wien) includes the following sections:
- 26012; (D1) Gorzyczki/Věřňovice <--> Bělotín;
- 26017; (D1) Bělotín <--> Lipník;
- 26038; (I/47, I/55) Lipník <--> Kroměříž;
- 26010; (D1) Kroměříž <--> Vyškov;
- 26037; (D1) Vyškov <--> Brno (jih);
- 26003; (D1) Brno <--> Brno (jih);
- 26006; (D52, I/52) Pohořelice <--> Brno;
- 26057; (I/52) Pohořelice <--> Mikulov / Drasenhofen (boarderline).

In addition to the above list, the Corridor also includes the interconnections to the freight terminals in Ostrava and Přerov and to Ostrava airport. Future D1 motorway in the section Lipník nad Bečvou – Říkovice is defined as the part of corridor, this part is in construction preparation planned to be finished till 2021 and it is bypassed using D35 and D46 motorways nowadays. Based on the current definition of the corridor infrastructure, the four lanes express urban road I/52 with TEN-T core standards is part of corridor in Brno-Modřice section and express road I/52 in short section Modřice – Rajhrad. The two lane first class road I/52 with level junctions and pedestrian crossings is part of the corridor in the section Pohořelice – Mikulov (border to Austria), where the expressway is in preparation, Perná – Mikulov part of section is to be finished till 2020, the time horizon for the construction of the rest of section being still unclear.

Figure A8 Road infrastructure of the BA Corridor (Czech Republic)



Source: Own elaboration based on TENtec

Slovakia. The BA Corridor road infrastructure in Slovakia on the mail line (Katowice) – Žilina - Bratislava – (Wien) includes the following sections:

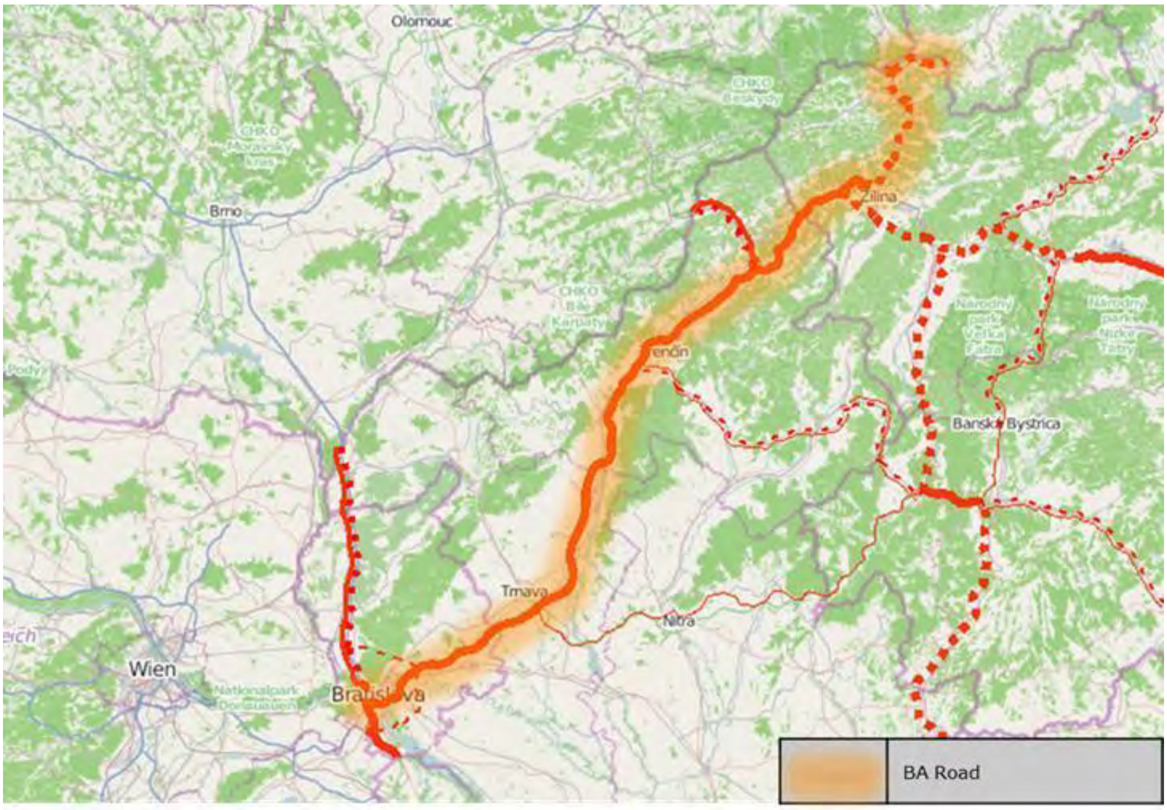
- 71462; (D3, I/12): Zwardoń (border PL/SK) <--> Skalité;
- 23867; (I/12): Skalité <--> Svrčinovec (D3 half profile, under construction);
- 71332; (I/11): Svrčinovec <--> Čadca (D3 under preparation);
- 73203; (I/11): Čadca <--> Oščadnica (upgrading to motorway D3 under preparation);
- 71340; (I/11): Oščadnica <--> Kysucké Nové Mesto (D3 in preparation);
- 23888; (I/11): Kysucké Nové Mesto <--> Žilina (Brodno) (D3 under preparation);
- 71476; (I11/I60, I/I61): Žilina (Brodno) <--> Žilina (Strážov) (D3 under construction);
- 71455; (D3): Žilina (Strážov) <--> Hričovské Podhradie;
- 23892; (D1): Hričovské Podhradie <--> Vrtižer;
- 71232; (D1): Vrtižer <--> Sverepec;
- 71239; (D1): Sverepec <--> Ivanka pri Dunaji – sever;
- 71441; (D1): Ivanka pri Dunaji - sever <--> Petržalka/Berg (border SK/A);
- 21900015; (D2): Petržalka/Berg (border SK/A) <--> Jarovce/Kittsee (border SK/A);
- 21900013; (D4): Petržalka/Berg (border SK/A)* <--> Border (SK/A)

* Wrong name of the junction. It is Jarovce/Kittsee in relation to previous section.

In addition to the above list, the Corridor also includes the interconnections to the freight terminal under construction in Žilina, Teplička, to the inland port with rail-road terminal in Bratislava and to the airport in Bratislava.

Based on the current definition of the corridor, the future D3 motorway is defined as the part of corridor, although there are parts (Žilina, Strážov – Žilina, Brodno and Skalité – Svrčinovec) in construction and parts (Žilina, Brodno – Svrčinovec) in preparation, the plan being to complete it by 2020. The currently existing road infrastructure is not included in the corridor definition. The section Skalité - Svrčinovec is using narrow road I/12 with speed limits 40 km/h and no access of freight transport above 7.5 t.

Figure A9 Road infrastructure of the BA Corridor (Slovakia)

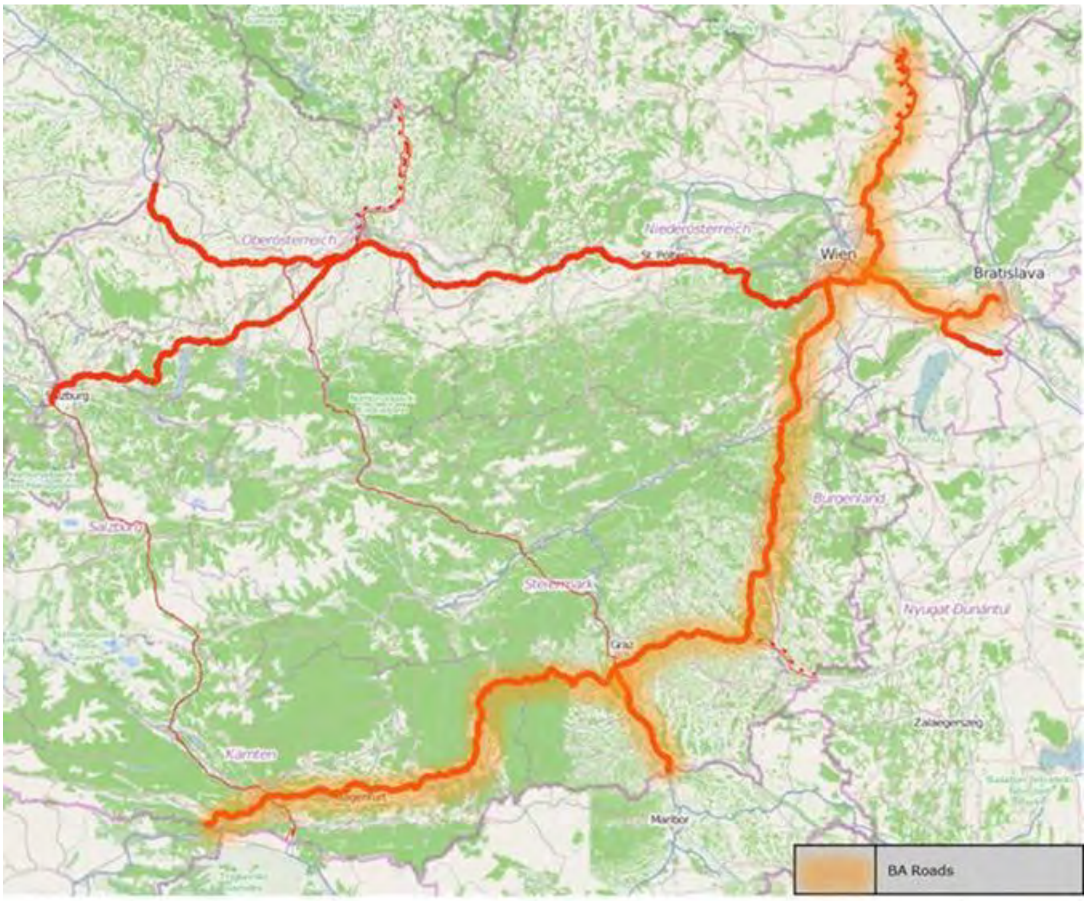


Source: Own elaboration based on TENtec

Austria. The BA Corridor road infrastructure in Austria includes the following main links:

- 26244; A5: Schrick – Drasenhofen - (Mikulov, CZ) [part of section under construction];
- 26247; S1: Süßenbrunn – Eibesbrunn;
- 26248; S1: Vösendorf - Schwechat – Süßenbrunn [part of section planned];
- 26246; A4: Bruckneudorf – Schwechat;
- 26242; A6: (Jarovce, SK) - Kittsee – Bruckneudorf;
- 26264; A2: (Tarvisio, IT) - Arnoldstein– Villach;
- 26262; A9: Graz West – Spielfeld-Straß – (Šentilj, SI).

Figure A10 Road infrastructure of the BA Corridor (Austria)



Source: Own elaboration based on TENtec

Italy. The BA Corridor road infrastructure in Italy includes the following highways:

- 24437, 24436, 24499; (A23): (Arnoldstein, AT) - Tarvisio – Udine – Palmanova [Cervignano];
- 24404, 22400334, 22400071; (A4): (Sežana, SI) - Trieste – Palmanova - Venezia;
- 24507, 22400319; (A57): Tangenziale di Mestre;
- 22400255, 24480; 22400181, 22400222, A13: Padova – Bologna;
- 24544, 22400004; (A14): Bologna – Ravenna;
- 24562 (RA13): Sistiana–Cattinara;
- 22400206 (RA14): Opicina – Fernetti.
- 22400047 7.9 14.490 km

In addition to the above list, the Corridor also includes the interconnections to the passenger and freight terminals. Based on the current definition of the corridor infrastructure, the highway sections of the Raccordo Autostradale Villesse – Gorizia (not included in the TEN-T network, part of the A4 concession) and the Passante di Mestre (comprehensive TEN-T network, also part of the A4 Concession) are not part of the Corridor, although they both serve long distance traffic and are functionally relevant for the international traffic flows. Similar consideration could also be done for the E55 between Venezia and Ravenna (at its planning development stage) and the E45 between Cesena and Ravenna. Part of the Core Network, but not included in the alignment of the BA Corridor is also the section Villa Opicina (J. RA13/RA14) – Padriciano (Trieste Porto R13) [TENtec Id 22400205]. These roads will be however taken into account in our analysis and in particular in the market study.

Figure A11 Road infrastructure of the BA Corridor (Italy)

Source: Own elaboration based on TENtec

Slovenia. The BA Corridor road infrastructure in Slovenia includes the following highways:

- 23837, 23851, 23848, 23843, 23841, 23847, 23853; (A1): (Spielfeld-Straß, AT) – Šentilj – Maribor – Celje – Ljubljana – Postojna – Razcep Razdrto - Razcep Gabrk – Koper;
- 23845; (A3): Razcep Gabrk – Sežana – (Trieste, IT).

In addition to the above list, the Corridor also includes the interconnections to the passenger and freight terminals. We therefore understand that the road section link to the airport Ljubljana – section A2: Ljubljana Kosece – Kranj-vzhod is also part of the BA Corridor.

Based on the current definition of the corridor infrastructure, the H4 highway Razcep Razdrto – Nanos – Ajdovščina - Vrtojba towards Gorizia is not part of the Corridor, although it currently serves long distance traffic.

Figure A12 Road infrastructure of the BA Corridor (Slovenia)

Source: Own elaboration based on TENtec

Annex B – Summary Sheets for the Actions for the Development of the BA Corridor

Table of content[1]

[1] The action summary sheets relating to the priorities of the BA Corridor work plan are highlighted in bold

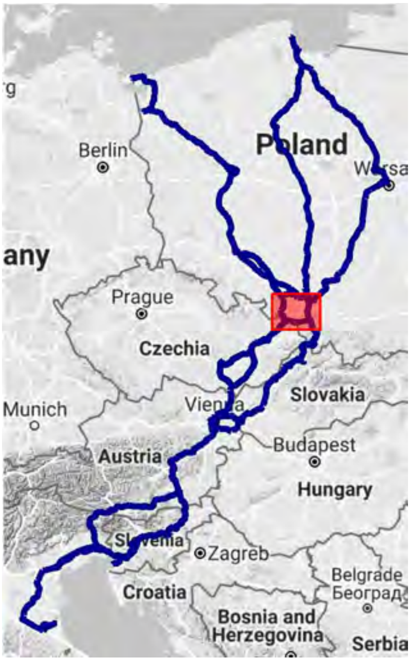
Action sheets for the development of rail transport – cross border sections

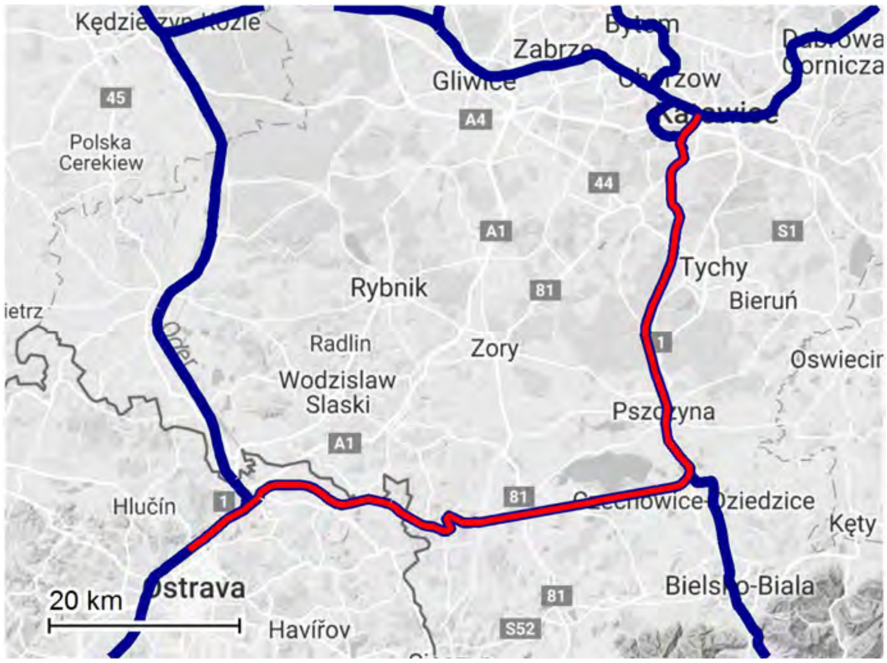
A. DESCRIPTION OF THE ACTION:

A.1. Action Title:

1.1.01 - Upgrading of the corridor cross-border connection: Katowice (PL) – Ostrava (CZ) [Zebrzydowice (PL) – Petrovice u Karviné (CZ)]

A.2. Location of the action:





Source: Map data ©2016 Google GeoBasis-DE/BKG (©2009), Google

A.3. Description of the action:

Member States involved: *Poland, Czech Republic*	**Section or Node:** *Katowice (PL) - Ostrava (CZ)*	**Estimated total cost [Mio €]:** *1,082.0 EUR million*
Other CNC involved: -	**Implementation schedule:** *Start year: N.A.* *End year: N.A.*	**Project Promoter:** *PKP Polskie Linie Kolejowe S.A. , SŽDC*

The action aims at improving the cross-border connection between Poland and the Czech Republic, between the urban agglomerations of Katowice and Ostrava. The most significant improvements are required on the Polish side, and especially in the proximity of Katowice, while the infrastructure in the Czech Republic was already modernized.
Preparatory works are ongoing on the Polish side for the modernisation of this rail section requiring major investments on the lines E30 and E65, especially in the area of Katowice, to increase the standards of the existing railway lines and stations. The modernisation of the existing dual track electrified line and stations is planned on the section Będzin – Sosnowiec – Katowice – Katowice Ligota and at exit from Katowice towards Gliwice (centre of agglomeration), where the railway tracks will be extended by an additional pair of tracks. The works will allow separating long distance and agglomeration traffic. The action foresees the implementation of computer traffic control compatible with ERTMS/ETCS - Level 2. The modernisation works are expected to be implemented in three phases. The first phase includes works for the improvement of the sections Most Wisła - Czechowice Dziedzice - Zabrzeg including Czechowice Dziedzice station. The second phase relates to the modernisation of the section Tychy - Most Wisła and Zabrzeg - Zebrzydowice (state border). Both phases are planned to be implemented by 2023. A third phase for the modernisation of the network within the urban agglomeration of Katowice (sections Będzin – Sosnowiec – Katowice – Katowice Ligota and Katowice – Gliwice) is also foreseen, for which the implementation dates are not yet defined.
On the Czech side, limited track optimisation works at the Dětmarovice station are foreseen which together with the instalment of the remote traffic control system between Petrovice u Karviné and Ostrava will further improve the performance of the line. This cross-border section is also expected to benefit from the completion of the modernisation of the Ostrava junction.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
ERTMS; Freight lines: speed (100 km/h); Freight lines: Axle.load (22.5 t); Freight lines: train length (740m); Current or potential future capacity bottleneck

Source: Corridor Project List

B. STATUS OF THE EXISTING INFRASTRUCTURE:

B.1. Description of the existing infrastructure

On the Polish side, the main infrastructure barriers are within the Katowice node, and from Katowice to Czechowice Dziedzice; the section from Czechowice Dziedzice (Most Wisła) to the PL/CZ state border is already compliant with the main infrastructural parameters. The total length of the line from Katowice to Zebrzydowice on the Polish side is 74 km, the section is double track and electrified. Both tracks have the same speed limits for passenger and freight trains. The highest maximum speed on this section is 120 km/h, applying to 72% of the total section length. The lowest maximum speed on the section is 70 km/h, only applying to 12% of the total section length. The section on the Polish side allows traffic of trains with maximum length up to 600 - 650 m. Under the operational stand point the Polish institutions would aim at separating long distance from local passenger traffic, as well as freight and passenger traffic.

On the Czech side, the section from the state border to Petrovice u Karviné, Bohumín and Ostrava was modernised and since 2002 the maximum speed of the line was increased up to 120 - 140 km/h. Speed limitations are still present at Petrovice u Karviné station (65 km/h) and Dětmarovice station (60 km/h). The maximum train length for the line is 650 m.

With the exception of the Katowice urban node, train flows on the cross-border connections are currently relatively low, especially in what concern both regional and long distance passenger services, whilst freight services are more relevant. According to the 2017 timetable, the long distance international services on this link offers: 8 pairs of EC/EN trains (5 of them via Zebrzydowice and 3 via Rybnik and Chałupki) connecting Gdynia/Warszawa/Kraków to Wien/Budapest/Praha/Ostrava; and 1 pair of trains/week connecting Moscow to Nice. In addition, 3 pairs of regional trains are operated between Katowice and Bohumín via Rybnik and Chałupki.

B.2. Technical parameters of the existing infrastructure

TENTEC ID	SECTION	MS	LINE ID	LENGTH (km)	TRACKS	TRACTION	VOLTAGE	MAX SPEED	MAX GRADIENT	AXLE LOAD (kN)	MAX TRAIN LENGTH
18728	Pszczyna <--> Katowice	PL	139	35.54	2	Electrified	3 000 Volts; DC	120	8.5	225*	600
2039653187	Pszczyna <--> Most Wisla	PL	139	6.52	2	Electrified	3 000 Volts; DC	120	10.1	225	600
2039653185	Most Wisla <--> Zebrzydowice	PL	150;93	29.20	2	Electrified	3 000 Volts; DC	120	9.7	225	650
2039653188	Zebrzydowice <--> Zebrzydowice Gr. (border PL/CZ)	PL	93	4.36	2	Electrified	3 000 Volts; DC	120	5.2	225	650
20392	Petrovice u Karivne <--> Zebrzydowice Gr. (border PL/CZ)	CZ	833	6.20	2	Electrified	3 000 Volts; DC	120	4.76	225	700
20380	Petrovice u Karvine <--> Detmarovice	CZ	320	6.20	2	Electrified	3 000 Volts; DC	120	4.76	225	700
18808	Detmarovice <--> Bohumin	CZ	320	8.50	2	Electrified	3 000 Volts; DC	140	3	225	700
20298	Bohumin <--> Ostrava	CZ	270	8.60	2	Electrified	3 000 Volts; DC	140	9	225	720
	TOTAL			**105**	**2**	**Electrified**		**120-140**	**10.1**	**196-225**	**600-720**

Source: TENtec 2014, updated by the Contractor to 2017
(*) The value could be lower in some sub-sections

B.3. TEN-T CNC KPIs on the project sections

YEAR	ERTMS (P/F)	ELECTRIFICATION (P/F)	AXLE LOAD (F)	MAX SPEED (F)	TRAIN LENGTH (F)
2013	0%	100%	70%	92%	0%
2015	0%	100%	70%	93%	0%
2016	0%	100%	70%	93%	0%
2017	0%	100%	100%	93%	0%

Source: CNC KPIs

C. Project Implementation

C.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1032	Works on main passenger lines (E 30 and E 65) in Śląsk area, phase I: line E 65 section Będzin – Katowice – Tychy – Czechowice Dziedzice – Zebrzydowice ; LOT C	PL	PKP Polskie Linie Kolejowe S.A.	Warszawa-Katowice-state border (towards Ostrava)	Infrastructure (Upgrade),	141.6	Total estimated cost
1032 a	Works on main passenger lines (E 30 and E 65) in Śląsk area, phase I: line E 65 section Będzin – Katowice – Tychy – Czechowice Dziedzice – Zebrzydowice, lots A, A1	PL	PKP Polskie Linie Kolejowe S.A.	Warszawa-Katowice-state border (towards Ostrava)	Infrastructure (Upgrade),	442.1	Total estimated cost
1032 b	Works on main passenger lines (E 30 and E 65) in Śląsk area, phase I: line E 65 section Będzin – Katowice – Tychy – Czechowice Dziedzice – Zebrzydowice, lots B, D	PL	PKP Polskie Linie Kolejowe S.A.	Warszawa-Katowice-state border (towards Ostrava)	Infrastructure (Upgrade),	370.5	Total estimated cost
1532	Works on main passenger lines (E 30 and E 65) in Śląsk area, phase I: line E 65 section Będzin – Katowice – Tychy – Czechowice Dziedzice – Zebrzydowice - preparatory works	PL	PKP Polskie Linie Kolejowe S.A.	Warszawa-Katowice-state border (towards Ostrava)	, OTHER	9.0	Total value in the National Railway Programme [PLN]
1396	Track optimisation Český Těšín - Dětmarovice , only Dětmarovice station belongs to BAC	CZ	SŽDC	Detmarovice	,	108.0	
1397	Remote traffic control of the section Ostrava, Svinov – Petrovice u Karviné and Dětmarovice - Mosty u Jablunkova	CZ	SŽDC	Ostrava, Svinov – Petrovice u Karviné Dětmarovice - Mosty u Jablunkova	, OTHER	10.8	
	TOTAL					**1,082.0**	

Source: Corridor Project List

C.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1032	Works on main passenger lines (E 30 and E 65) in Śląsk area, phase I: line E 65 section Będzin – Katowice – Tychy – Czechowice Dziedzice – Zebrzydowice ; LOT C	PL	2018	2023	concluded	concluded	In progress	0%	Land acquisition: Not completed // EIA: EIA under preparation or updating // Final Approval: submitted, decision pending // CBA: Performed // Other: LoI signed between IMs
1032 a	Works on main passenger lines (E 30 and E 65) in Śląsk area, phase I: line E 65 section Będzin – Katowice – Tychy – Czechowice Dziedzice – Zebrzydowice, lots A, A1	PL	n.a.	n.a.	concluded	concluded	In progress	0%	Land acquisition: Not completed // EIA: EIA under preparation or updating // Final Approval: submitted, decision pending // CBA: Performed // Other: LoI signed between IMs
1032 b	Works on main passenger lines (E 30 and E 65) in Śląsk area, phase I: line E 65 section Będzin – Katowice – Tychy – Czechowice Dziedzice – Zebrzydowice, lots B, D	PL	2019	2023	concluded	concluded	In progress	0%	Land acquisition: Not completed // EIA: EIA under preparation or updating // Final Approval: submitted, decision pending // CBA: Performed // Other: LoI signed between IMs
1532	Works on main passenger lines (E 30 and E 65) in Śląsk area, phase I: line E 65 section Będzin – Katowice – Tychy – Czechowice Dziedzice – Zebrzydowice - preparatory works	PL	2017	2019				25%	Land acquisition: NA // EIA: NA // Final Approval: approved // CBA: NA // Other: LoI signed between IMs
1396	Track optimisation Český Těšín - Dětmarovice , only Dětmarovice station belongs to BAC	CZ	2017	2019	concluded	concluded	concluded	0%	Land acquisition: Completed // EIA: EIA approved // Final Approval: approved // CBA: Performed // Other: NA
1397	Remote traffic control of the section Ostrava, Svinov – Petrovice u Karviné and Dětmarovice - Mosty u Jablunkova	CZ	2017	2017	concluded	concluded		23%	Land acquisition: NA // EIA: NA // Final Approval: submitted, decision pending // CBA: NA // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

C.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR) TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1032	Works on main passenger lines (E 30 and E 65) in Śląsk area, phase I: line E 65 section Będzin – Katowice – Tychy – Czechowice Dziedzice – Zebrzydowice ; LOT C	PL	1	141.6	141.6	66.0 75.6	national funds CEF
1032 a	Works on main passenger lines (E 30 and E 65) in Śląsk area, phase I: line E 65 section Będzin – Katowice – Tychy – Czechowice Dziedzice – Zebrzydowice, lots A, A1	PL	1	442.1	0	0	
1032 b	Works on main passenger lines (E 30 and E 65) in Śląsk area, phase I: line E 65 section Będzin – Katowice – Tychy – Czechowice Dziedzice – Zebrzydowice, lots B, D	PL	1	370.5	0	0	
1532	Works on main passenger lines (E 30 and E 65) in Śląsk area, phase I: line E 65 section Będzin – Katowice – Tychy – Czechowice Dziedzice – Zebrzydowice - preparatory works	PL	1	9.0	8.9	1.3 7.6	national funds CEF
1396	Track optimisation Český Těšín - Dětmarovice , only Dětmarovice station belongs to BAC	CZ	1	108.0	108.0	75.6 32.4	SFDI OPT I
1397	Remote traffic control of the section Ostrava, Svinov – Petrovice u Karviné and Dětmarovice - Mosty u Jablunkova	CZ	1	10.8	10.8	1.6 9.2	SFDI OPT II
	TOTAL			**1,065**	**269.3**		

Source: Corridor Project List

C.4. Other complementary network projects

Modernisation of Ostrava railway junction is being prepared as a part of the Ostrava TEN-T urban core node actions 6.4.01. ERTMS is planned to be implemented in Poland by network or corridor-based actions by 2030, although no specific investments are foreseen for this section at present. In the Czech Republic ERTMS will be deployed by means of the activities and projects described in action 1.4.01.

Source: Corridor Project List

D. Gap analysis and Implementation Risks

D.1 Level of compliance attained in 2030:

YEAR	ERTMS (P/F)	ELECTRIFICATION (P/F)	AXLE LOAD (F)	MAX SPEED (F)	TRAIN LENGTH (F)
2030	28%	100%	100%	100%	68%

Source: Corridor Project List

D.2 Remaining technical and operational barriers of the infrastructure and implementation risks:

With regards to the administrative procedures for the implementation of this project, the two national Infrastructure Managers are proceeding separately, each focussing on the respective national section. In order to harmonize and coordinate the planning, design and implementation process, an intention letter has been signed between PKP PLK S.A. and Czech railway infrastructure manager (SŽDC or Správa železniční dopravní cesty, státni organizace) concerning modernisation of cross border railway line section Zebrzydowice – Petrovice u Karviné. Moreover, the Trilateral Letter of Intent between PL, CZ and SK Ministries was signed in October 16th 2016, including in particular this cross border section.

Concerning project maturity, construction has started on the Czech side, while on the Polish side some studies and preparatory works are still on-going and planned to be completed by 2018. As such, the construction of the main project aiming at significantly upgrading the cross-border section is foreseen to start not earlier than 2018.

This cross-border section is currently planned to be at standard by 2030 at the latest except for train length on the Polish section Zebrzydowice – state border as well as on the Czech sections. Limited availability of financial resources and possible delays in the implementation of the works, may challenge the achievement of the compliance to the speed standard on the Polish side. However this is deemed to be achieved by the Polish Authorities at present.

Source: Own assessment based on available information

A. DESCRIPTION OF THE ACTION:

A.1. Action Title:

1.1.02 - Upgrading of the corridor cross-border connection: Opole (PL) – Ostrava (CZ) [Chałupki (PL) – Bohumín (CZ)]

A.2. Location of the action:

Source: Map data ©2016 Google GeoBasis-DE/BKG (©2009), Google

A.3. Description of the action:

Member States involved: *Poland, Czech Republic*	**Section or Node:** *Kędzierzyn Koźle (PL) - Ostrava (CZ)*	**Estimated total cost [Mio €]:** *197.2 EUR million*
Other CNC involved: *-*	**Implementation schedule:** *Start year: N.A.* *End year: N.A.*	**Project Promoter:** *PKP Polskie Linie Kolejowe S.A.*

This action aims at improving railway cross-border connections between Poland and the Czech Republic, and in particular between the urban agglomerations of Opole (and further north Wroclaw) in Poland and Ostrava in the Czech Republic. This rail section requires improvement works on the Polish side between Kędzierzyn Koźle and Chałupki (state border) to reach compliance in terms of speed, axle load and train length. Due to limited availability of financial resources the project comprised in the corridor project list to reach the required standards is included in the reserve list of the National Railway Programme. National funds are foreseen to secure only part of the works and the implementation dates are not defined. Whilst the Polish Authorities assume that the project will be in any case completed by 2030 in line with the requirements set in the TEN-T Regulation, the possibility to implement the works during the current financing period (up to 2023) will be considered in the event additional financial resources will be identified. On the Czech side works were already completed to increase the speed up to 140 km/h, including the improvement of the Bohumín station. This cross-border section is also expected to benefit from the modernisation of the double track railway line E30 between Kędzierzyn Koźle – Opole Groszowice – Opole Zachodnie to increase maximum operational speed by 2022 as well as from the modernisation of the Ostrava junction on the Czech side by 2021. This cross-border section is currently expected to be at standard by 2030 at the latest, except for train length on the Czech side.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
Freight lines: speed (100 km/h); Freight lines: Axle.load (22.5 t); Freight lines: train length (740m); Current or potential future capacity bottleneck

Source: Corridor Project List

B. STATUS OF THE EXISTING INFRASTRUCTURE:

B.1. Description of the existing infrastructure

On the Polish side the line is not compliant between Kędzierzyn Koźle and Chałupki (state border) in terms of speed, axle load and train length. The short subsection Chałupki – Bohumín is composed of two different single tracks electrified lines: Bohumín Vrbice / Bohumín - Chałupki allowing a maximum speed of 100 km/h for passenger and freight transport, the works for the modernisation of the Bohumín were completed in 2005 including switches to Chałupki. The 20 km long section Racibórz-Chałupki (part of Opole-Chałupki section) requires modernisation, due to speed limitations for freight and passengers traffic (50 km/h affecting almost 17 km of line) on one of the tracks. In addition to this, 80% of this section lacks the required axle load standard (allowing only 206 kN/axle). Moreover, the section on the Polish side allows operating trains of length only up to 600 m. On the Czech side works were already completed which increased the speed up to 140 km/h on the Ostrava – Bohumín section, including the improvement of the Bohumín station.

On this cross-border section, passenger traffic is currently limited: no long distance cross-border services are operated (3 pairs of EC trains Katowice – Chałupki – Ostrava are operated on this route but already counted in the Katowice-Ostrava cross-border), while 2 pairs of regional trains connect daily Bohumín to Racibórz (2 additional pairs of regional trains Katowice – Chałupki – Bohumín avoiding Racibórz are also using the line which are however not considered here).

B.2. Technical parameters of the existing infrastructure

TENTEC ID	SECTION	MS	LINE ID	LENGTH (km)	TRACKS	TRACTION	VOLTAGE	MAX SPEED	MAX GRADIENT	AXLE LOAD (kN)	MAX TRAIN LENGTH
18682	Opole Groszowice <--> Kedzierzyn Kozle	PL	136	37.72	2	Electrified	3 000 Volts; DC	100	9.6	225*	600
18748	Kedzierzyn Kozle <--> Raciborz	PL	151	32.23	2	Electrified	3 000 Volts; DC	100	12	225	600
18744	Raciborz <--> Chalupki	PL	151	20.34	2	Electrified	3 000 Volts; DC	90	4	225*	600
18809	Bohumin <--> Chalupki	CZ	836	4.60	2	Electrified	3 000 Volts; DC	100	4.5	225	600
	TOTAL			**95**	**2**	**Electrified**		**90-100**	**12**	**225-225**	**600**

Source: TENtec 2014, updated by the Contractor to 2017
(*) The value could be lower in some sub-sections

B.3. TEN-T CNC KPIs on the project sections

YEAR	ERTMS (P/F)	ELECTRIFICATION (P/F)	AXLE LOAD (F)	MAX SPEED (F)	TRAIN LENGTH (F)
2013	0%	100%	82%	10%	0%
2015	0%	100%	82%	10%	0%
2016	0%	100%	82%	10%	0%
2017	0%	100%	82%	10%	0%

Source: CNC KPIs

C. PROJECT IMPLEMENTATION

C.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1033	Works on railway line E 30 section Kędzierzyn Koźle - Opole Zachodnie	PL	PKP Polskie Linie Kolejowe S.A.	Wrocław - Ostrava	Infrastructure (Upgrade),	150.2	Total value in the National Railway Programme [PLN]
1044	Works on railway line E-59 section Kędzierzyn Koźle - Chałupki (state border)	PL	PKP Polskie Linie Kolejowe S.A.	Wrocław - Ostrava	Infrastructure (Upgrade),	47.0	Total value in the National Railway Programme [PLN]
	TOTAL					**197.2**	

Source: Corridor Project List

C.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL				ADMINISTRATIVE ISSUES
					L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	
1033	Works on railway line E 30 section Kędzierzyn Koźle - Opole Zachodnie	PL	2019	2022	concluded	concluded	not started	0%	Land acquisition: Not completed // EIA: EIA under preparation or updating // Final Approval: submitted, decision pending // CBA: Performed // Other: NA
1044	Works on railway line E-59 section Kędzierzyn Koźle - Chałupki (state border)	PL	n.a.	n.a.	not started	not started	not started	n.a.	Land acquisition: Not completed // EIA: NA // Final Approval: not submitted yet // CBA: Not performed // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

C.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR)		
					TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1033	Works on railway line E 30 section Kędzierzyn Koźle - Opole Zachodnie	PL	1	150.2	150.2	55.3 94.9	national funds CEF
1044	Works on railway line E-59 section Kędzierzyn Koźle - Chałupki (state border)	PL	1	47.0	0		
	TOTAL			**197.2**	**150.2**		

Source: Corridor Project List

C.4. Other complementary network projects

ERTMS is planned to be implemented in Poland by network or corridor-based actions by 2030, although no specific investments are foreseen for this section at present. ERTMS will be deployed by action 1.4.01 - ERTMS deployment, in the Czech Republic. Furthermore, on the Czech side, this action will be complemented by the planned modernisation of the Ostrava junction on the Czech side, which is a major investment included in the action for the development of the urban core node of Ostrava.

The project "Remote traffic control of the section Ostrava, Svinov – Petrovice u Karviné and Dětmarovice - Mosty u Jablunkova" referring to the subsection Ostrava - Bohumin is already included in the Action Summary Sheet 1.1.01.

Source: Corridor Project List

D. Gap Analysis and Implementation Risks

D.1 Level of compliance attained in 2030:

YEAR	ERTMS (P/F)	ELECTRIFICATION (P/F)	AXLE LOAD (F)	MAX SPEED (F)	TRAIN LENGTH (F)
2030	5%	100%	100%	100%	95%

Source: Corridor Project List

D.2 Remaining technical and operational barriers of the infrastructure and implementation risks:

The action aims at rehabilitating the existing line, allowing to reach full compliance by 2030 except for train length on the Czech side and for line speed on short subsections of the Polish side near the urban area of Kędzierzyn Koźle. Due to limited availability of financial resources, train length may also not be implemented on the Polish side at Kędzierzyn Koźle and Nędza stations, and between Racibórz and Chałupki. A Trilateral Letter of Intent between PL, CZ and SK Ministries was signed at October 16th 2016, also including the development of this cross border section.

About project maturity, works on railway line E-59 section Kędzierzyn Koźle - Chałupki (state border) were expected to start in 2016, but at present (and based on the available information), preparatory works are still to be completed and the main administrative steps are still to be finalized including EIA still to start. The start and end dates are not defined at present. Feasibility studies and project design have already been completed for the section Kędzierzyn Koźle - Opole Zachodnie, which is scheduled to be implemented starting from 2019.

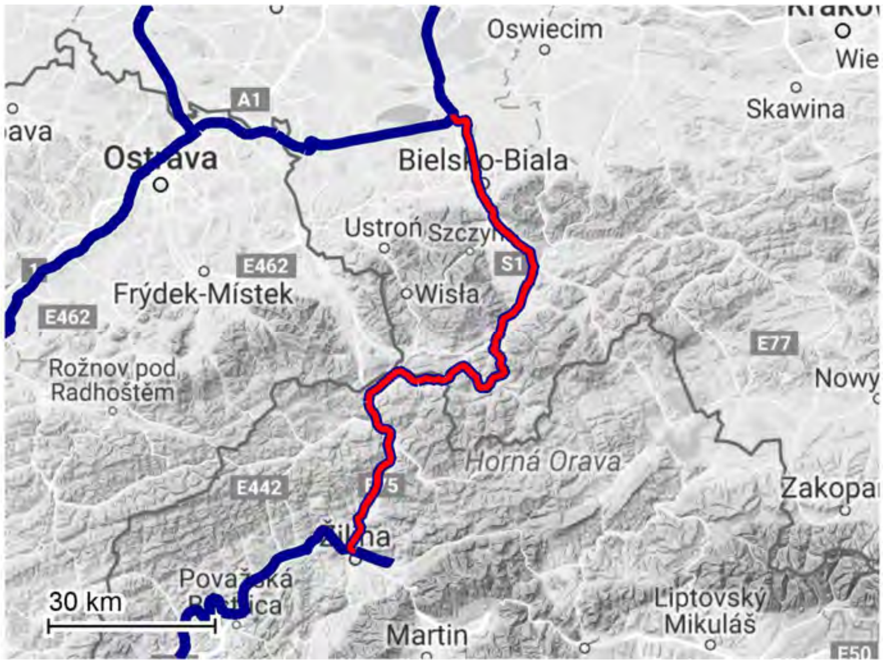
Source: Own assessment based on available information

A. Description of the Action:

A.1. Action Title:

1.1.03 - Upgrading of the corridor cross-border connection: Katowice (PL) – Žilina (SK) [Zwardoń (PL) – Skalité (SK)]

A.2. Location of the action:



Source: Map data ©2016 Google GeoBasis-DE/BKG (©2009), Google

A.3. Description of the action:

Member States involved:	Section or Node:	Estimated total cost [Mio €]:
Poland, Slovakia	*Czechowice-Dziedzice (PL) - Žilina (SK)*	*267.8 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
Rhine-Danube (Zilina-Cadca)	*Start year: 2017* *End year: 2023*	*PKP Polskie Linie Kolejowe S.A., ŽSR*

The action aims at improving the railway cross-border connection between Poland and Slovakia, between the urban areas of Katowice and Žilina. On the Polish side works are foreseen to modernise 65 km of the existing predominantly single track electrified railway line between Czechowice-Dziedzice and Zwardoń. Due to limited availability of financial resources the project comprised in the corridor project list to reach the required standards (expected to be completed by 2023) is included in the reserve list of the National Railway Programme; national funds are foreseen to secure only part of the works. Whilst the Polish Authorities assume that the project will be in any case completed by 2030 in line with the requirements set in the TEN-T Regulation, the possibility to implement the works during the current EU financing period (up to 2023) will be considered in the event additional financial resources will be identified.

On the Slovak side, no works are foreseen on the single track section Zwardoń – Skalité – Čadca. The Skalité – Čadca section was already modernised with a maximum speed of 100 km/h, maximum train length of 650 m and maximum axle load 225 kN. The 7.1 km subsection Zwardoń – Skalité is non-compliant with respect to speed and has limited train length to 250 m, which can be slightly improved after the removal of Zwardoń station limitations to 350 m only. The modernisation of the double track Krásno nad Kysucou – Čadca section, also common to the cross-border itinerary between Ostrava and Žilina, is expected to be completed by 2023. The final project layout is still to be defined after abandonment of the high cost tunnel alternative. This cross-border section is currently expected to be compliant by 2023 except for train length and ERTMS on the Slovak section Čadca – Zwardoń – Skalité and speed limit on the short section Zwardoń – Skalité. No fixed plan for ERTMS deployment on the Čadca – Skalité section is approved by ŽSR, it could be finalised by 2030 if the decision is made in the future. The change of the electricity traction system from 3kV DC to 25 kV AC is foreseen on entire Slovak section after 2025 (no project defined so far).

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
Freight lines: speed (100 km/h); Freight lines: Axle.load (22.5 t); Freight lines: train length (740m); Current or potential future capacity bottleneck

Source: Corridor Project List

B. STATUS OF THE EXISTING INFRASTRUCTURE:

B.1. Description of the existing infrastructure

The railway connection between Katowice and Žilina is located in mountainous area, and it is characterised in many subsections by low technical parameters (single track, with limited maximum speed for passenger and freight trains, axle load and train length below the TEN-T standards).

On the Polish side, the section Katowice - Žilina (in particular: Czechowice-Dziedzice–Zwardoń), consists of one electrified railway line. The total length of the section is 70 km, but only 20 km (Czechowice-Dziedzice-Bielsko Biała-Wilkowice Bystra) has characteristics of double track railway line. In Slovakia, within the section Zwardoń - Žilina, the subsection Zwardoń – Čadca is a single track electrified line reconstructed between 1999 and 2002. The maximum speed is 100 km/h and the maximum train length is 650 m on the link Skalité - Čadca. The 7.1 km subsection between the borderline and Skalité, represents a bottleneck with maximum speed of 70 km/h and maximum train length limited to only 250 m (also due to Zwardoń station limitations). The section Čadca till Krásno nad Kysucou (35 % of the section Čadca – Žilina) is double track with speed limit at 80 - 100 km/h (expected to be modernised); the subsection Krásno nad Kysucou - Žilina was already modernised to the speed of 140 km/h. Construction works aimed at modernising the infrastructure on Slovak Republic side were undertaken and completed on the following sections: Electrification and modernisation of railway section Čadca – Skalité 1999 – 2002; Modernisation of railway section Žilina – Krásno nad Kysucou 2008 – 2011; ERTMS deployment in the section Žilina – Čadca 2014 -2015.

Currently, train services on the cross-border link are very limited, both passenger and freight. The southern sections between Čadca and Žilina has more significant freight traffic connecting Slovakia to the Czech Republic via the TEN-T core network link Čadca – Ostrava, but there are also freight trains operated from Žilina to Katowice via Zwardoń. No long distance passenger services are operated along the PL/SK cross-border sections; the rail connection between Zwardoń and Skalité/Žilina is provided exclusively by 4 pairs of regional trains /day, 13 pairs of regional trains daily connect Zwardoń with Katowice and 1 pair operates between Zwardoń and Warszawa on weekends. 9 additional long distance express trains and 11 regional trains are operated between Bielsko-Biała and Czechowice-Dziedzice.

B.2. Technical parameters of the existing infrastructure

TENTEC ID	SECTION	MS	LINE ID	LENGTH (km)	TRACKS	TRACTION	VOLTAGE	MAX SPEED	MAX GRADIENT	AXLE LOAD (kN)	MAX TRAIN LENGTH
18720	Zywiec <--> Most Wisla	PL	139	34.04	2	Electrified	3 000 Volts; DC	100	19.6	196	400
18645	Zwardon <--> Zywiec	PL	139	36.88	1	Electrified	3 000 Volts; DC	60	21.7	196	352
18509	Skalite <--> Zwardon	SK	129	7.10	1	Electrified	3 000 Volts; DC	70	28	225	250
18508	Cadca <--> Skalite	SK	129	13.50	1	Electrified	3 000 Volts; DC	100	14	225	650
18477	Zilina <--> Cadca	SK	127	30.50	2	Electrified	3 000 Volts; DC	140	6	225	700
	TOTAL			**122**	**1-2**	**Electrified**		**60-140**	**28**	**196-225**	**250-700**

Source: TENtec 2014, updated by the Contractor to 2017
(*) The value could be lower in some sub-sections

B.3. TEN-T CNC KPIs on the project sections

YEAR	ERTMS (P/F)	ELECTRIFICATION (P/F)	AXLE LOAD (F)	MAX SPEED (F)	TRAIN LENGTH (F)
2013	0%	100%	42%	44%	0%
2015	0%	100%	42%	34%	16%
2016	0%	100%	42%	34%	16%
2017	0%	100%	42%	34%	16%

Source: CNC KPIs

C. Project Implementation

C.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1049	Works on railway line no. 139 section Czechowice Dziedzice - Bielsko Biała - Zwardoń (state border)	PL	PKP Polskie Linie Kolejowe S.A.	Katowice - Žilina - Bratislava - Wien	Infrastructure (Upgrade),	47.8	Total value in the National Railway Programme [PLN]
1088	Modernisation of railway corridor State border CZ/SK – Čadca – Krásno nad Kysucou, section Čadca - Krásno nad Kysucou (outside)	SK	ŽSR	Zilina <--> Cadca	Infrastructure (Upgrade),	220.0	
	TOTAL					**267.8**	

Source: Corridor Project List

C.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL: L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1049	Works on railway line no. 139 section Czechowice Dziedzice - Bielsko Biała - Zwardoń (state border)	PL	2017	2023	not started	not started	not started	5%	Land acquisition: Not completed // EIA: NA // Final Approval: not submitted yet // CBA: Not performed // Other: NA
1088	Modernisation of railway corridor State border CZ/SK – Čadca – Krásno nad Kysucou, section Čadca - Krásno nad Kysucou (outside)	SK	2021	2023		concluded	concluded	0%	Land acquisition: Not completed // EIA: EIA approved // Final Approval: submitted, decision pending // CBA: Not performed // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

C.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR): TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1049	Works on railway line no. 139 section Czechowice Dziedzice - Bielsko Biała - Zwardoń (state border)	PL	1	47.8	0		
1088	Modernisation of railway corridor State border CZ/SK – Čadca – Krásno nad Kysucou, section Čadca - Krásno nad Kysucou (outside)	SK	1	220.0	0		
	TOTAL			**267.8**	**0**		

Source: Corridor Project List

C.4. Other complementary network projects

ERTMS is planned to be implemented in Poland by network or corridor-based actions by 2030, although no specific investments are foreseen for this section at present; similarly there are plans to complete ERTMS implementation on the corridor subsections Čadca – Zwardoń in Slovakia with no specific investments are foreseen at present to be implemented by 2030.

Source: Corridor Project List

D. Gap analysis and Implementation Risks

D.1 Level of compliance attained in 2030:

YEAR	ERTMS (P/F)	ELECTRIFICATION (P/F)	AXLE LOAD (F)	MAX SPEED (F)	TRAIN LENGTH (F)
2030	27%	100%	100%	94%	83%

Source: Corridor Project List

D.2 Remaining technical and operational barriers of the infrastructure and implementation risks:

This cross-border section is currently expected to be fully compliant by 2023 except for train length on the Slovak section Čadca – Zwardoń as well as speed limit on the short section Zwardoń – Skalité and on the Polish side between Żywiec and Zwardoń where speed increase is expected between 80-100 km/h. Due to limited availability of financial resources the achievement of the required standards on the Polish side is also uncertain at present with respect to line speed, axle load and train length. ERTMS implementation on the section Čadca - Zwardoń is also not assured by 2030. A Trilateral Letter of Intent between PL, CZ and SK Ministries was signed at October 16th 2016, including in particular this cross border section.

The planned start of the works was 2017 on the Polish side and 2021 on the Slovak side. Studies and preliminary works, including EIA and project approval, have not been completed on the Polish side. On the Slovak side, the construction of a tunnel as foreseen in the original design for the modernisation of the double track Krásno nad Kysucou – Čadca section has been abandoned as not cost effective. A new project solution is still to be defined and approved.

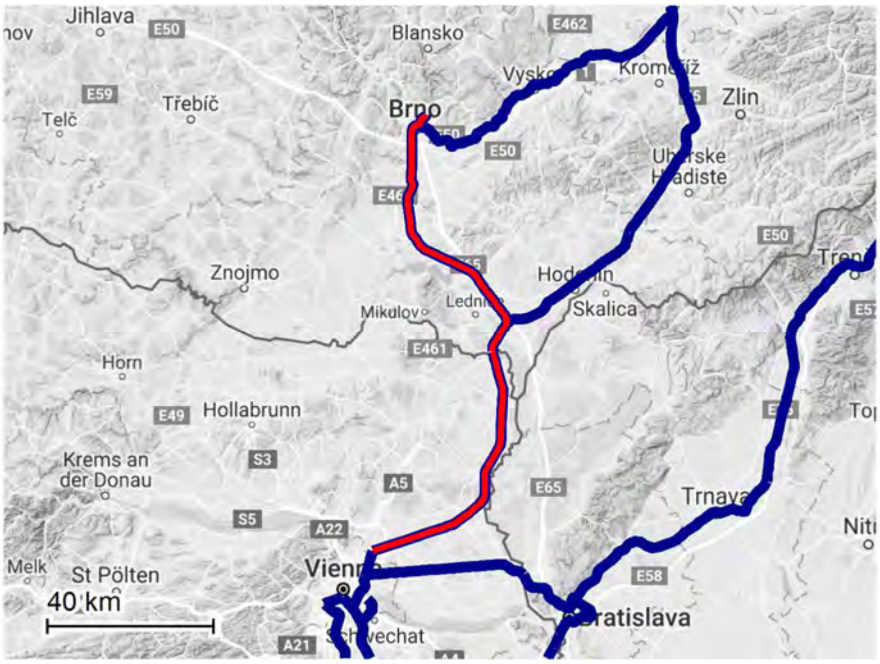
Source: Own assessment based on available information

A. Description of the Action:

A.1. Action Title:

1.1.04 - Upgrading of the corridor cross-border connection: Brno (CZ) – Wien (Stadlau) (AT)

A.2. Location of the action:



Source: Map data ©2016 Google GeoBasis-DE/BKG (©2009), Google

A.3. Description of the action:

Member States involved:	**Section or Node:**	**Estimated total cost [Mio €]:**
Czech Republic, Austria	*Brno (CZ) – Břeclav (CZ) – Wien (Stadlau) (AT)*	*1,388.4 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
Orient-East Med	*Start year: 2015* *End year: 2030*	*Railway Infrastructure Administration, state organization (SZDC), SŽDC, ÖBB-Infrastruktur AG*

This action includes projects for the further development of the freight and passenger connection between the Czech Republic and Austria.

On the Czech side, works to reconstruct the bridge on the Hohenau (AT) - Břeclav section (at km 80,930) and to upgrade the remote traffic control system in Břeclav were finished in 2017. Maximum speed for passenger trains is 120 km/h on the Bernhardstal – Břeclav section and 160 km/h in the northern Czech section between Břeclav and Brno. Short-term planned works include the modernisation of Šakvice station together with the adjacent track between Šakvice and Hustopeče, which will enable the operation of the trains until 740 m lengths. Brno - Břeclav line as a high-speed Rail line (200-350 km/h) will be upgraded, with the construction of a new high-speed link in the section Brno – Vranovice (200 – 350 km/h) and the modernisation of the section Vranovice – Břeclav to 200+ km/h in a subsequent phase, to be implemented after 2020. The foreseen investments also include after 2025 the modernization of the railway junction in Brno and the construction of the new railway station.

On the Austrian side, the action includes investments for upgrading the Nordbahn Wien Süßenbrunn - Bernhardstal (incl. Süßenbrunn) railway section to a line speed of 160 km/h, including increase in the availability of the train block system technology to improve the capacity from 180 to 300 train paths. The works will also allow reaching 740 meters' train length compliance.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
ERTMS; Freight lines: speed (100 km/h); Freight lines: train length (740m); Current or potential future capacity bottleneck

Source: Corridor Project List

B. STATUS OF THE EXISTING INFRASTRUCTURE:

B.1. Description of the existing infrastructure

On the Czech side, two distinct segments compose the cross-border connection between Brno and Wien. The section from Břeclav (CZ) to the Austrian state border was modernised in the period 1997 – 1998 increasing the speed up to 120 km/h. The reconstruction of the railway junction in Břeclav including remote control was completed in the period 2007-2017. The operational train length is up to 650 m; the line is double track electrified (25 kV AC) until the borderline. This cross-border section is part of the 2nd National Transit Railway Corridor and was already part of Priority Project 22 as well as of Priority Project 23, defined as a non-priority section between the Austrian border and Vienna, according to the 2004 Guidelines. The second segment on the Czech side is the Brno – Břeclav line, part of the 1st National Transit Railway Corridor. The line was modernised between 1997 and 2001 increasing the speed parameter to 160 km/h, and the maximum train length up to 650 m. At a later stage the works were also implemented on the short section Modřice – Horní Heršpice at Brno, which were completed by year 2015. The line is equipped with GSM-R and ETCS.

On the Austrian side, the connection between the state border in Bernhardstal and Wien is a double track electrified line with maximum speed of 140 km/h. The electrification is with a voltage of 15kV in AC.

The entire cross-border link is part of the (Prague-) Brno-Břeclav-Wien route and plays an important role for both passenger and freight traffic, as it constitutes the main railway connection between the two countries.

Currently, long distance connections between Brno / Prague, Wien / Graz are provided by 7 pairs of trains per day (operated by ÖBB and České dráhy by means of “Railjet” trains). 4 pairs of EC/EN trains from Gdynia/Warszawa/Bohumín to Wien. One pair of trains per week connecting Moscow – Wien/Nice also use the border crossing Břeclav – Hohenau. Finally, 5 pairs of regional cross-border trains on the itinerary Břeclav – Wien Hauptbahnhof are also operated on this line.

B.2. Technical parameters of the existing infrastructure

TENTEC ID	SECTION	MS	LINE ID	LENGTH (km)	TRACKS	TRACTION	VOLTAGE	MAX SPEED	MAX GRADIENT	AXLE LOAD (kN)	MAX TRAIN LENGTH
20300	Brno <--> Breclav	CZ	250	60.4	2	Electrified	25 000 Volts; 50Hz	160	5.4	225	720
18806	Breclav <--> Hohenau / Bernhardsthal (border CZ/A)	CZ	801	18.3	2	Electrified	25 000 Volts; 50Hz	120	2.3	225	720
19700055	Bernhardstal (border CZ/A) <--> Suessenbrunn	AT	11401	66.4	2	Electrified	15 000 Volts; 16.7 Hz	140	7	225	650
	TOTAL			**145**	**2**	**Electrified**		**120-160**	**7**	**225**	**650-720**

Source: TENtec 2014, updated by the Contractor to 2017
(*) The value could be lower in some sub-sections

B.3. TEN-T CNC KPIs on the project sections

YEAR	ERTMS (P/F)	ELECTRIFICATION (P/F)	AXLE LOAD (F)	MAX SPEED (F)	TRAIN LENGTH (F)
2013	0%	100%	100%	100%	0%
2015	46%	100%	100%	100%	0%
2016	46%	100%	100%	100%	0%
2017	46%	100%	100%	100%	0%

Source: CNC KPIs

C. PROJECT IMPLEMENTATION

C.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
4132	Railway junction Brno (Study) (also: Brno Rail Node)	CZ	Railway Infrastructure Administration, state organization (SZDC)	Brno	,	11.0	
4133	Railway junction Brno (Works) (also: Brno Rail Node)	CZ	Railway Infrastructure Administration, state organization (SZDC)	Brno	, ERTMS	745.0	
1705	Modernisation of the track Šakvice - Hustopeče	CZ	SŽDC	Brno <--> Breclav	,	40.4	
1070	Upgrade of Brno - Breclav line as a High Speed Rail line	CZ	SŽDC	Brno <--> Breclav (HS)	,	To be defined	
1098	Upgrade Nordbahn Wien Süßenbrunn - Bernhardsthal	AT	ÖBB-Infrastruktur AG	Suessenbrunn - Bernhardsthal	,	592.0	valorised costs (2,5%)
	TOTAL					**1,388.4**	

Source: Corridor Project List

C.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
4132	Railway junction Brno (Study) (also: Brno Rail Node)	CZ	2015	2024	concluded	in progress	in progress	21%	Land acquisition: not completed // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: performed // Other: Existing Decree on the the selection of final variant
4133	Railway junction Brno (Works) (also: Brno Rail Node)	CZ	2025	2030	concluded	in progress	not started	0%	Land acquisition: not completed // EIA: NA // Final Approval: not submitted yet // CBA: performed // Other: NA
1705	Modernisation of the track Šakvice - Hustopeče	CZ	2018	2019	in progress	in progress		0%	Land acquisition: NA // EIA: NA // Final Approval: not submitted yet // CBA: Performed // Other: NA
1070	Upgrade of Brno - Breclav line as a High Speed Rail line	CZ	2020	2030	in progress	not started	not started	0%	Land acquisition: Not completed // EIA: NA // Final Approval: not submitted yet // CBA: Not performed // Other: NA
1098	Upgrade Nordbahn Wien Süßenbrunn - Bernhardsthal	AT	2015	2025		concluded		20%	Land acquisition: Not completed // EIA: NA // Final Approval: NA // CBA: Performed // Other: not required

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

C.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR) TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
4132	Railway junction Brno (Study) (also: Brno Rail Node)	CZ		11.0	0		
4133	Railway junction Brno (Works) (also: Brno Rail Node)	CZ	1	745.0	0		
1705	Modernisation of the track Šakvice - Hustopeče	CZ	1	40.4	0		
1070	Upgrade of Brno - Breclav line as a High Speed Rail line	CZ	1	To be defined	0		
1098	Upgrade Nordbahn Wien Süßenbrunn - Bernhardsthal	AT	1	592.0	592.0	592	Rahmenplan 2017-22
	TOTAL			**1,388.4**	**592.0**		

Source: Corridor Project List

C.4. Other complementary network projects

ERTMS as well as other technological upgrading's and investments for the reduction of impacts on the environment in Austria are assumed to be implemented as part of other initiatives either specific to the section (project 1807 in Austria) or actions covering the entire corridor 1.4.01 (ERTMS). Action 1.3.06 (Upgrading of the Brno-Přerov railway line to high speed standard) is complementary to Brno junction design and cannot be completed without its modernisation and new main station constructions.

Source: Corridor Project List

D. Gap Analysis and Implementation Risks

D.1 Level of compliance attained in 2030:

YEAR	ERTMS (P/F)	ELECTRIFICATION (P/F)	AXLE LOAD (F)	MAX SPEED (F)	TRAIN LENGTH (F)
2030	100%	100%	100%	100%	100%

Source: Corridor Project List

D.2 Remaining technical and operational barriers of the infrastructure and implementation risks:

The line is expected to be fully compliant by 2030. The planned projects should allow reaching homogeneous standards on the line i.e. 160 km/h for passenger trains and 740 m maximum train lengths. No final decision on the modernisation of the Brno node layout has been so far formulated. The finalisation of the Brno node reconstruction until 2030 is dependent on reaching an agreement on the future node layout on time. Further initiatives aiming at developing the line to high speed on the Czech side are still at an early stage of preparation and are complementary to the modernisation of the Brno junction Action 1.3.06.

The feasibility study for the Brno node has been finalised, but it did not identify a preferred layout solution. Public consultations and discussions are ongoing in Brno to define the location of new main railway station which could obstacle the further development of the modernisation of the node.

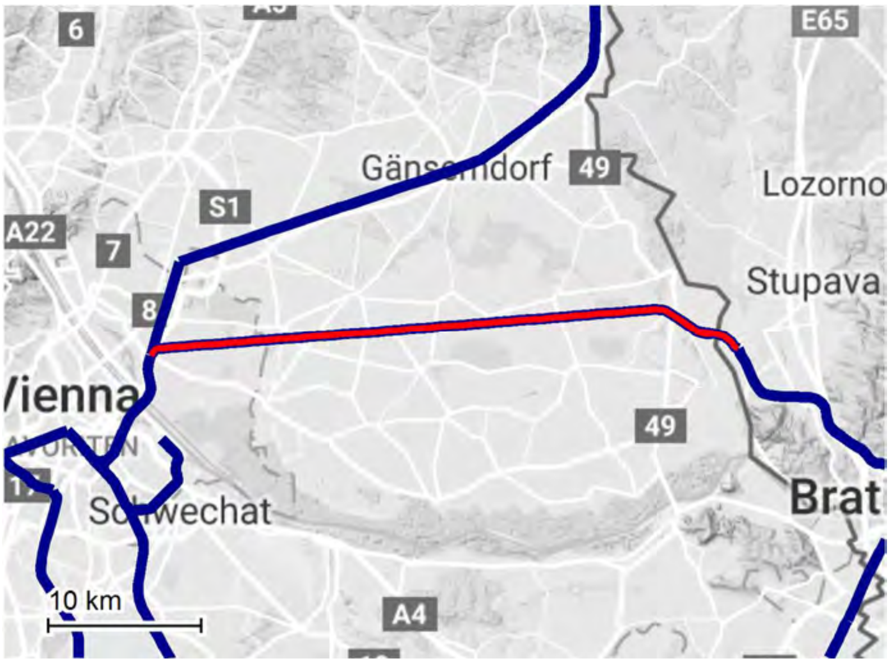
Source: Own assessment based on available information

A. Description of the Action:

A.1. Action Title:

1.1.05 - Upgrading of the corridor cross-border connection: Bratislava (SK) – Wien (Stadlau) (AT) [Devínska Nová Ves (SK) – Marchegg (AT)]

A.2. Location of the action:



Source: Map data ©2016 Google GeoBasis-DE/BKG (©2009), Google

A.3. Description of the action:

Member States involved:	**Section or Node:**	**Estimated total cost [Mio €]:**
Slovakia, Austria	*Bratislava (SK) – Wien (Stadlau) (AT)*	*554.8 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
Orient/East – Med	*Start year: 2007* *End year: 2023*	*ŽSR, ÖBB-Infrastruktur AG*

The alignment of the Baltic-Adriatic corridor includes two distinct railway connections between Bratislava and Wien: a southern route for mixed freight and passenger transport via Kittsee and a northern route for passenger transport via Marchegg. The latter is the only non-electrified section along the Baltic-Adriatic Corridor, also requiring upgrading works. This action aims at improving the northern route via Marchegg, modernizing and upgrading the infrastructure.

Currently, works are planned to electrify the existing single track railway line on the short subsection between Devínska Nová Ves and Marchegg, and to deploy ERTMS till 2023 on the Slovak side; feasibility studies are also ongoing which relate to the construction of a second track on this line, also including the bridge over the river Morava, which may be subsequently developed.

On the Austrian side, works are ongoing and planned for the partial doubling of the section, full line electrification and railroad stations works, to be implemented by 2023. The doubling of the line in its entire extension on the Austrian side is foreseen to be subsequently developed, also based on the possibility to upgrade the cross-border section on the Slovak side.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
Electrification; ERTMS; Freight lines: speed (100 km/h)

Source: Corridor Project List

B. Status of the Existing Infrastructure:

B.1. Description of the existing infrastructure

The routing via Marchegg (ŽSR section A and OBB section 117), connecting Bratislava, Devínska Nová Ves to Wien, running North of the Danube, is a single track, non-electrified section used primarily for passenger traffic, with maximum speed of 80 km/h on the Slovak side and 120 km/h on the Austrian side.

The section is quite intensively used by national and particularly cross-border regional connections, with an average utilization of the theoretical capacity (60 pairs of trains/day) around 60%. Currently, around 17 pairs of cross-border regional express trains are operated between Wien and Bratislava on this line, and about 15 additional pairs of regional trains are operated daily between Marchegg and Wien Stadlau. Should the second track not being built, on the Austrian side the theoretical capacity of a single track line might not be sufficient to seamlessly accommodate traffic volumes by 2030 in case the number of operations will increase. Such capacity issues are not present nor expected on the short cross/border section between Marchegg and Devínska Nová Ves.

B.2. Technical parameters of the existing infrastructure

TENTEC ID	SECTION	MS	LINE ID	LENGTH (km)	TRACKS	TRACTION	VOLTAGE	MAX SPEED	MAX GRADIENT	AXLE LOAD (kN)	MAX TRAIN LENGTH
18506	Marchegg <--> Devinska Nova Ves	SK	A	6.0	1	Diesel		80	8	225	700
20516	Wien Stadlau <--> Marchegg	AT	11701	37.9	1	Diesel	Others	120	13	225	650
	TOTAL			**44**	**1**	**Diesel**		**80-120**	**13**	**225**	**650-700**

Source: TENtec 2014, updated by the Contractor to 2017
(*) The value could be lower in some sub-sections

B.3. TEN-T CNC KPIs on the project sections

YEAR	ERTMS (P/F)	ELECTRIFICATION (P/F)	AXLE LOAD (F)	MAX SPEED (F)	TRAIN LENGTH (F)
2013	0%	0%	n.a.	n.a.	n.a.
2015	0%	0%	n.a.	n.a.	n.a.
2016	0%	0%	n.a.	n.a.	n.a.
2017	0%	0%	n.a.	n.a.	n.a.

Source: CNC KPIs

C. Project Implementation

C.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1086	Devínska Nová Ves - state border SK/AT: railway electrification	SK	ŽSR	Marchegg <--> Devinska Nova Ves	Infrastructure (Upgrade),	4.8	
1093	Upgrade Stadlau-Marchegg	AT	ÖBB-Infrastruktur AG	Wien Stadlau <--> Marchegg	Study, ERTMS	550.0	valorised costs (2,5%)
	TOTAL					**554.8**	

Source: Corridor Project List

C.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1086	Devínska Nová Ves - state border SK/AT: railway electrification	SK	2020	2020			concluded	0%	Land acquisition: Completed // EIA: EIA under preparation or updating // Final Approval: approved // CBA: Not performed // Other: NA
1093	Upgrade Stadlau-Marchegg	AT	2007	2023			not started	64%	Land acquisition: Not completed // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: Performed // Other: not required

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

C.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR)		
					TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1086	Devínska Nová Ves - state border SK/AT: railway electrification	SK	1	4.8	4.8	4.8	OPII
1093	Upgrade Stadlau-Marchegg	AT	1	550.0	552	550.0 2.2	Rahmenplan 2017-22 TENT-T
	TOTAL			**554.8**	**556.8**		

Source: Corridor Project List

C.4. Other complementary network projects

According to the available information, ERTMS (ETCS Level 2) is to be deployed on the Slovak section together with electrification works in coordination with ERTMS implementation on the section Kúty – Štúrovo (OEM corridor) by 2020. The modernisation of the Bratislava node will also improve the station Devínska Nová Ves and standards of adjacent link from Devínska Nová Ves to Bratislava hlavná stanica up to 160-200 km/h speed and 740 m train length by 2030.

Source: Corridor Project List

D. Gap Analysis and Implementation Risks

D.1 Level of compliance attained in 2030:

YEAR	ERTMS (P/F)	ELECTRIFICATION (P/F)	AXLE LOAD (F)	MAX SPEED (F)	TRAIN LENGTH (F)
2030	100%	100%	n.a.	n.a.	n.a.

Source: Corridor Project List

D.2 Remaining technical and operational barriers of the infrastructure and implementation risks:

The line is expected to reach compliance to the TEN-T standard requirements for rail passenger lines (Electrification and ERTMS) by 2023. The works are already ongoing on the Austrian side and are foreseen to start in 2020 in Slovakia. The line is expected to be fully compliant by 2023 and partially upgraded to two tracks in Austria. Studies are on-gong for the upgrading of the line to two tracks also in Slovakia; the line may be doubled in its entire length by 2030. Finally, additional improvements are expected on the Devínska Nová Ves – Bratislava subsection as part of the works for the modernisation of the Bratislava node by 2030.

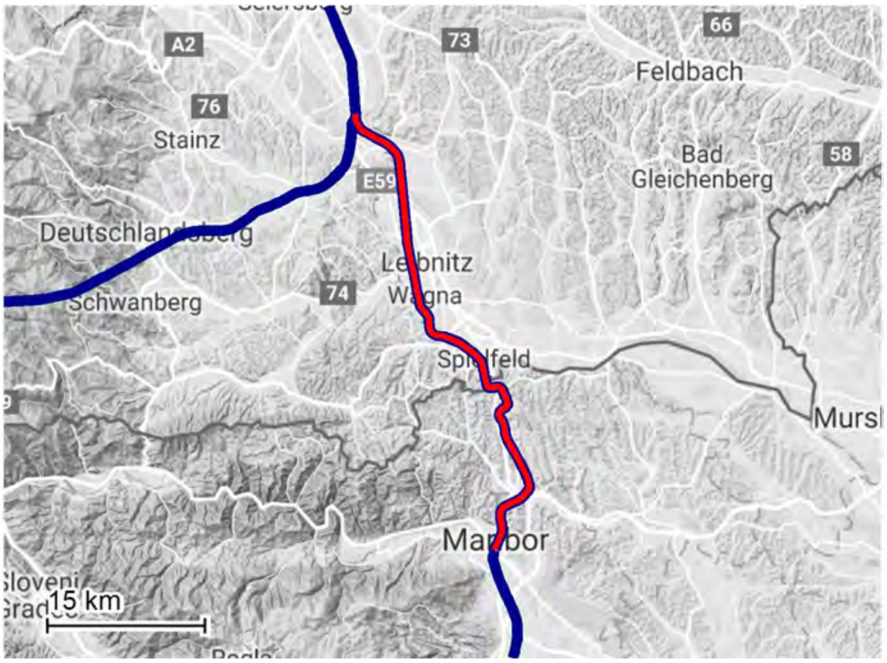
Source: Own assessment based on available information

A. Description of the Action:

A.1. Action Title:

1.1.06 - Upgrading of Railway Cross-Border Connection: Graz (AT) – Maribor (SI)

A.2. Location of the action:



Source: Map data ©2016 Google GeoBasis-DE/BKG (©2009), Google

A.3. Description of the action:

Member States involved: *Austria, Slovenia*	**Section or Node:** *Graz (AT) – Maribor (SI)*	**Estimated total cost [Mio €]:** *436.1 EUR million*
Other CNC involved: -	**Implementation schedule:** *Start year: 2014* *End year: 2030*	**Project Promoter:** *ÖBB-Infrastruktur AG, Ministry of infrastructure, Ministry of infrastructure*

The action includes studies and works for the upgrading of the existing single track electrified cross-border connection between Austria and Slovenia via Sentilj / Spielfeld-Straß.

On the Austrian side, the line is already TEN-T compliant, except for train length and ERTMS, with a maximum speed for passenger trains of 160 km/h. The projects planned before 2030 are limited to preliminary actions (planning, studies and administrative procedures) for the upgrade to two tracks of the section Graz Hbf - Spielfeld-Straß. In Austria deployment of ERTMS and compliance to 740 meters train length are currently envisaged to apply to the entire corridor, although no detailed investments are included on the project list.

On the Slovenian side, modernization and upgrading of the line is planned in two stages. In the first stage, rehabilitation works of the existing line are planned to be completed by 2021-2022, which will allow increasing axle load, speed and train length to reach compliance. At this stage, the line will also be equipped with ERTMS (ETCS Level 1). In the second stage, the construction of a second track on a separate alignment is planned, expected to be completed by 2030. This staged approach should also allow avoiding temporary closure of the line during works.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
Electrification; Standard track gauge; ERTMS; Freight lines: speed (100 km/h); Freight lines: Axle.load (22.5 t); Freight lines: train length (740m); Current or potential future capacity bottleneck; Single track section

Source: Corridor Project List

B. Status of the Existing Infrastructure:

B.1. Description of the existing infrastructure

This cross-border railway link is a single-track electrified line between Werndorf (AT) and Maribor (SI), crossing the state border at Sentilj / Spielfeld-Straß.
The section on the Austrian side is already compliant in terms of axle load, speed and electrification. It is not compliant in terms of ERTMS and train length. The Slovenian section is currently not compliant for axle load, max speed for freight trains, ERTMS and train length. The two national sections also have different electrification systems (15 kV, AC in Austria and 3kV, DC in Slovenia).

Train operations on the cross-border section are currently almost entirely dedicated to freight transport. Cargo from the RRT in Werndorf destined for Koper currently fill 2 system trains per day; volume growth rates in the order of 25% for major economic operators. Long distance passenger connections are limited to a daily pair of trains on the route Wien-Graz-Ljubljana.

B.2. Technical parameters of the existing infrastructure

TENTEC ID	SECTION	MS	LINE ID	LENGTH (km)	TRACKS	TRACTION	VOLTAGE	MAX SPEED	MAX GRADIENT	AXLE LOAD (kN)	MAX TRAIN LENGTH
19700005	Sentilj / Spielfeld-Strass (border A/SLO) <--> Werndorf	AT	10501	31.1	1	Electrified	15 000 Volts; 16.7 Hz	160	7	225	650
18189	Sentilj / Spielfeld-Strass (border A/SLO) <--> Maribor	SI	30 (E67)	16.5	1	Electrified	3 000 Volts; DC	80	9	200	560
	TOTAL			**48**	**1**	**Electrified**		**80-160**	**9**	**200-225**	**560-650**

Source: TENtec 2014, updated by the Contractor to 2017
(*) The value could be lower in some sub-sections

B.3. TEN-T CNC KPIs on the project sections

YEAR	ERTMS (P/F)	ELECTRIFICATION (P/F)	AXLE LOAD (F)	MAX SPEED (F)	TRAIN LENGTH (F)
2013	0%	100%	65%	73%	0%
2015	0%	100%	65%	73%	0%
2016	0%	100%	65%	73%	0%
2017	0%	100%	65%	73%	0%

Source: CNC KPIs

C. Project Implementation

C.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1096	Upgrade Graz - Spielfeld-Straß	AT	ÖBB-Infrastruktur AG	Graz - Spielfeld	Study,	19.1	valorised costs (2,5%)
1900	Rehabilitation of existing line Maribor-Šentilj-state border (new tunnel and viaduct)	SI	Ministry of infrastructure	Maribor - Šentilj - State Border	Study, Infrastructure (Upgrade), Infrastructure (New construction),	247.0	
1901	Construction of the 2nd track (new line) on the section Maribor-Šentilj-state border	SI	Ministry of infrastructure	Maribor - Šentilj - State Border	Study, Infrastructure (New construction), ERTMS	170.0	
	TOTAL					**436,1**	

Source: Corridor Project List

C.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1096	Upgrade Graz - Spielfeld-Straß	AT	2022	2026				0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: not required
1900	Rehabilitation of existing line Maribor-Šentilj-state border (new tunnel and viaduct)	SI	2014	2022	concluded	in progress	in progress	36%	Land acquisition: Not completed // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: Performed // Other: Signed agreement beetween Austria and Slovenia
1901	Construction of the 2nd track (new line) on the section Maribor-Šentilj-state border	SI	2014	2030	in progress	in progress		19%	Land acquisition: Not completed // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: Performed // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

C.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR) TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1096	Upgrade Graz - Spielfeld-Straß	AT		19.1	19.9	19.1 0.8	Rahmenplan 2017-22 TEN-T
1900	Rehabilitation of existing line Maribor-Šentilj-state border (new tunnel and viaduct)	SI	1	247.0			MzI CEF
1901	Construction of the 2nd track (new line) on the section Maribor-Šentilj-state border	SI	1	170.0	0		
	TOTAL			**436,1**	**19.9**		

Source: Corridor Project List

C.4. Other complementary network projects

In Austria, plans for the implementation of ERTMS technology are currently under definition. However, even if specific projects are still to be defined, it is assumed that ERTMS technology will be installed by 2030 on all corridor sections. Similarly train length compliance is also expected to be achieved by 2030 in all corridor sections, although investments on the network to conform to this standard are still to be fully defined.

Source: Corridor Project List

D. Gap Analysis and Implementation Risks

D.1 Level of compliance attained in 2030:

YEAR	ERTMS (P/F)	ELECTRIFICATION (P/F)	AXLE LOAD (F)	MAX SPEED (F)	TRAIN LENGTH (F)
2030	100%	100%	100%	100%	100%

Source: Corridor Project List

D.2 Remaining technical and operational barriers of the infrastructure and implementation risks:

The section on the Slovenian side will be fully compliant by 2021-2022. The section is also expected to be upgraded to two tracks by 2030 on the Slovenian side, whereas the works to double the line on the Austrian side are subject to market developments. Although detailed investments for ERTMS and train length are missing on the BA Corridor project list, it is currently assumed that the cross-border section on the Austrian side will be also compliant with respect to these parameters by 2030.

Source: Own assessment based on available information

A. Description of the Action:

A.1. Action Title:

1.1.07 - Upgrading of the corridor cross-border connection: Trieste (IT) - Divača (SI)

A.2. Location of the action:

Source: Map data ©2016 Google GeoBasis-DE/BKG (©2009), Google

A.3. Description of the action:

Member States involved:	Section or Node:	Estimated total cost [Mio €]:
Italy, Slovenia	*Trieste - Divaca*	*101.9 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
Mediterranean	*Start year: 2018* *End year: 2030*	*MoT, Ministry of infrastructure*

The action foresees the development of the cross-border connection between Italy and Slovenia in accordance to the TEN-T standards.

Preliminary pre-feasibility studies for the development of this cross-border railway section have been recently completed reconsidering the previous high-speed project solution; the new proposed studies and works for a conventional railway line are assumed to allow reaching compliance standards.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
ERTMS; Freight lines: speed (100 km/h); Freight lines: Axle.load (22.5 t); Freight lines: train length (740m); Current or potential future capacity bottleneck

Source: Corridor Project List

B. Status of the Existing Infrastructure:

B.1. Description of the existing infrastructure

The interconnection between Italy and Slovenia is a dual track rail line through Bivio d'Aurisina (on the Venezia – Trieste line) - Villa Opicina (also connected with a secondary line to Trieste Campo Marzio) – Sežana - Divača (along the Koper – Ljubljana line). The total length of this connection between Bivio d'Aurisina and Divača is around 33km. The technical standards of the line are quite poor, with maximum gradient of 15‰ and maximum allowed speed of 75km/h.

Currently train services on the line are rather limited. The line is basically used by freight trains (between 8 and 10 daily pairs of trains).

B.2. Technical parameters of the existing infrastructure

TENTEC ID	SECTION	MS	LINE ID	LENGTH (km)	TRACKS	TRACTION	VOLTAGE	MAX SPEED	MAX GRADIENT	AXLE LOAD (kN)	MAX TRAIN LENGTH
19035	Villa Opicina <--> Bivio Aurisina	IT	J35;J36	14.2	3	Electrified	3 000 Volts; DC	80	15	225	600
19032	Border IT/SL I / Sezana II <--> Villa Opicina	IT	J35;J36	5.0	3	Electrified	3 000 Volts; DC	80	n.a.	225	600
18180	Sezana <--> Sezana (border IT/SLO)	SI	50 (E70)	3.3	2	Electrified	3 000 Volts; DC	75	10	225	600
18185	Divaca <--> Sezana	SI	50 (E70)	9.6	2	Electrified	3 000 Volts; DC	75	10	225	600
	TOTAL			**32**	**2-3**	**Electrified**		**75-80**	**NA**	**225**	**600**

Source: TENtec 2014, updated by the Contractor to 2017
(*) The value could be lower in some sub-sections

B.3. TEN-T CNC KPIs on the project sections

YEAR	ERTMS (P/F)	ELECTRIFICATION (P/F)	AXLE LOAD (F)	MAX SPEED (F)	TRAIN LENGTH (F)
2013	0%	100%	100%	0%	0%
2015	40%	100%	100%	0%	0%
2016	40%	100%	100%	0%	0%
2017	40%	100%	100%	0%	0%

Source: CNC KPIs

C. Project Implementation

C.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
3642	Upgrading of the railway line Trieste-Divača	IT	MoT	Trieste-Divača	Study, Infrastructure (Upgrade), ERTMS	40.0	Cost concerns Italian elementary section B. Aurisina - Villa Opicina only.
1144	Upgrading of the section Trieste-Divača (Divača-state border)	SI	Ministry of infrastructure	Trieste-Divača - State Border	Study, Infrastructure (Upgrade),	61.9	
	TOTAL					**101.9**	

Source: Corridor Project List

C.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	MATURITY LEVEL L2: FEAS.	MATURITY LEVEL L3: PERMIT	MATURITY LEVEL L4: CONSTR.	ADMINISTRATIVE ISSUES
3642	Upgrading of the railway line Trieste-Divača	IT	2019	2026				0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: Performed // Other: NA
1144	Upgrading of the section Trieste-Divača (Divača-state border)	SI	2018	2030	concluded	not started	not started	0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

C.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR)		
					TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
3642	Upgrading of the railway line Trieste-Divača	IT	1	40.0	3.0	3.0	CDP
1144	Upgrading of the section Trieste-Divača (Divača-state border)	SI	1	61.9	0		
	TOTAL			**101.9**	**3.0**		

Source: Corridor Project List

C.4. Other complementary network projects

ERTMS will be implemented as part of the projects for the development of the cross-border section.

Source: Corridor Project List

D. Gap analysis and Implementation Risks

D.1 Level of compliance attained in 2030:

YEAR	ERTMS (P/F)	ELECTRIFICATION (P/F)	AXLE LOAD (F)	MAX SPEED (F)	TRAIN LENGTH (F)
2030	100%	100%	100%	100%	100%

Source: Corridor Project List

D.2 Remaining technical and operational barriers of the infrastructure and implementation risks:

Construction works on the line are planned to be completed by 2030; at present, project maturity is relatively low, as studies and administrative procedures are still to be finalised based on the revised technical concept (upgrading of the existing conventional line rather than construction of a new high-speed link). The line is expected to be compliant by 2030 on both sides.

Source: Own assessment based on available information

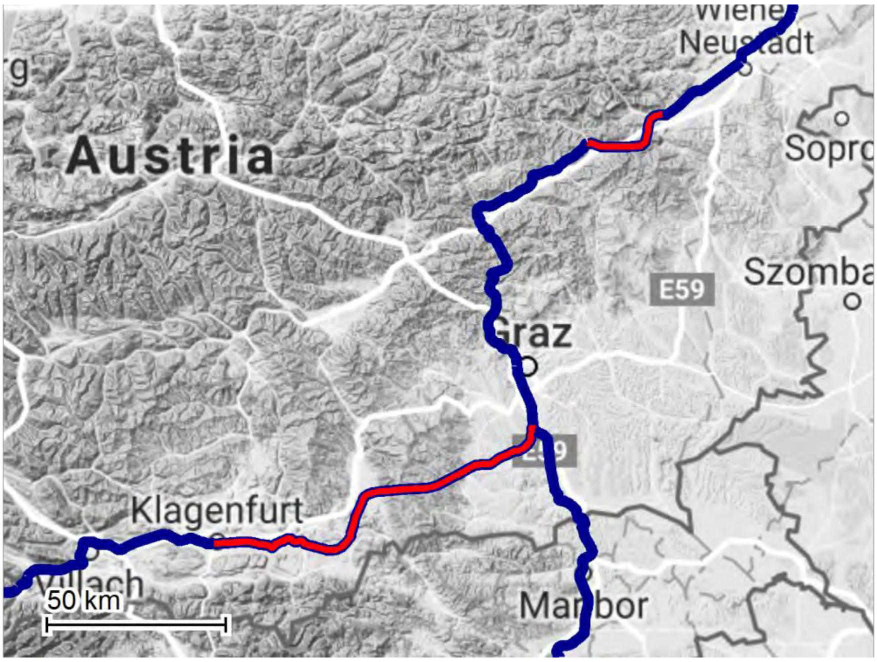
Action sheets for the development of rail transport – missing links

A. Description of the Action:

A.1. Action Title:

1.2.01 - Alpine Rail Crossings (Semmering Base Tunnel, Koralm railway line and tunnel)

A.2. Location of the action:



Source: Map data ©2016 Google GeoBasis-DE/BKG (©2009), Google

A.3. Description of the action:

Member States involved:	**Section or Node:**	**Estimated total cost [Mio €]:**
Austria	*Missing Links in Austria*	*8,854.3 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
	Start year: 1996 *End year: 2026*	*ÖBB-Infrastruktur AG*

Two projects are on-going for the construction of the two Austrian alpine crossings, which are already at the construction stage. The new Semmering base tunnel is a 27.3-kilometer-long, twin-bore tunnel, with an emergency stop in the middle, connecting Gloggnitz in Lower Austria with Mürzzuschlag in Styria. The new base tunnel was designed with a shallow inclination, resulting in a significant improvement for heavy freight trains. Therefore, it will be possible to operate trains with only one locomotive. In addition, the overall travel time between Vienna and Graz will be shortened by 30 minutes. The Koralm railway will be a 130-kilometre double-track line, directly connecting the cities of Klagenfurt and Graz and reducing the time of travel from currently three hours to about one hour. The core of this line is the 32.9 km long Koralm tunnel with two completely new Intercity railway stations at its portals. From Graz tol Werndorf the new line runs almost in parallel to the historical Southern Railway Line in the direction of Spielfeld; from there the new infrastructure continues in a completely new alignment through the Lavant Valley, the Granitz Valley, the Drau Valley and then finally in Mittlern enters the existing railway line in the direction of Klagenfurt. Starting from Althofen, a second track will be added to the railway line. This will create a flat railway connection between the Mürz Valley and the City of Villach at an approximate altitude of 400 m where trains may be operated at a speed of 200 km/h.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
Electrification; Standard track gauge; ERTMS; Freight lines: speed (100 km/h); Freight lines: Axle.load (22.5 t); Freight lines: train length (740m); Current or potential future capacity bottleneck

Source: Corridor Project List

B. Status of the Existing Infrastructure:

B.1. Description of the existing infrastructure

The BMVIT (Austrian Federal Ministry of Transport, Innovation and Technology) study "The Baltic-Adriatic Axis" identified the underperformance at the existing Semmering line section (mountain route) due to long passenger travel time as well as tonnage and clearance gauge limitations. The construction of the Semmering Base Tunnel and the related line is meant to increase the attractiveneess of this line, reducing travel times and energy consumption, particularly for freight transport. Regarding the Koralm railway line, the same study refers to the fact that "the connection of the central regions of Graz and Klagenfurt by railway is currently only possible via Bruck/Mur and the Neumarkter Sattel. The Koralm railway line will close the existing railway gap between the two important Austrian central regions of Graz and Klagenfurt/Villach" by providing "a short, efficient and fast connection for freight trains and passenger services." The sub sections from Graz to Wettmannstätten as well as from Grafenstein to Klagenfurt are bottlenecks (single track, not electrified) which have to be upgraded. The sub section in the middle between Wettmannstätten and Grafenstein is a missing link. With the opening of the Koralmbahn, traffic will preliminary run via Werndorf as long as the existing double tracked line between Graz and Werndorf has enough capacity. As soon as capacity is no longer sufficient, the new line between Weitendorf and Graz, which has already obtained all required approvals, will be needed. The section between Werndorf and Wettmannstätten has been in operation since 2010 but is only single track and not electrified.

B.2. Technical parameters of the existing infrastructure

TENTEC ID	SECTION	MS	LINE ID	LENGTH (km)	TRACKS	TRACTION	VOLTAGE	MAX SPEED	MAX GRADIENT	AXLE LOAD (kN)	MAX TRAIN LENGTH
19700033	Gloggnitz <--> Muerzzuschlag	AT	n.a.	25.8	0	Electrified	Others	0	0	0	0
20466	Klagenfurt <--> Werndorf	AT	n.a.	107.8	0	Unselected	Others	0	0	225	0
	TOTAL			133.6	0	Electrified/ Unselected		0	0	0-225	0

Source: TENtec 2014, updated by the Contractor to 2017
(*) The value could be lower in some sub-sections

B.3. TEN-T CNC KPIs on the project sections

YEAR	ERTMS (P/F)	ELECTRIFICATION (P/F)	AXLE LOAD (F)	MAX SPEED (F)	TRAIN LENGTH (F)
2013	NA%	NA%	NA%	NA%	NA%
2015	NA%	NA%	NA%	NA%	NA%
2016	NA%	NA%	NA%	NA%	NA%
2017	NA%	NA%	NA%	NA%	NA%

Source: CNC KPIs

C. Project Implementation

C.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1091	Semmering base tunnel	AT	ÖBB-Infrastruktur AG	Gloggnitz - Muerzzuschlag	Study, Infrastructure (New construction), ERTMS	3,315.0	valorised costs (2,5%)
1092	Graz - Klagenfurt; Koralm line	AT	ÖBB-Infrastruktur AG	Graz - Klagenfurt	Study, Infrastructure (New construction), ERTMS	5,539.3	valorised costs (2,5%)
	TOTAL					8,854.3	

Source: Corridor Project List

C.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1091	Semmering base tunnel	AT	2006	2026			concluded	53%	Land acquisition: Completed // EIA: EIA completed // Final Approval: approved // CBA: Performed // Other: not required
1092	Graz - Klagenfurt; Koralm line	AT	1996	2024			concluded	76%	Land acquisition: Not completed // EIA: EIA completed // Final Approval: approved // CBA: Performed // Other: not required

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

C.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR) TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1091	Semmering base tunnel	AT	1	3,315.0	3,316.2	3,315.0 1.2	Rahmenplan 2017-22 TEN-T
1092	Graz - Klagenfurt; Koralm line	AT	1	5,539.3	5,882.6	5,540 280.0 62.6	Rahmenplan 2017-22 Regional authorities TENT-T + CEF
	TOTAL			8,854.3	9198.8		

Source: Corridor Project List

C.4. Other complementary network projects

ERTMS (ETCS Level 2) will be implemented as part of the projects for the development of the two missing links.

Source: Corridor Project List

D. Gap analysis and Implementation Risks

D.1 Level of compliance attained in 2030:

YEAR	ERTMS (P/F)	ELECTRIFICATION (P/F)	AXLE LOAD (F)	MAX SPEED (F)	TRAIN LENGTH (F)
2030	100%	100%	100%	100%	100%

Source: Corridor Project List

D.2 Remaining technical and operational barriers of the infrastructure and implementation risks:

The Semmering Tunnel and the Koralm railway line and tunnel are expected to be completed and fully compliant by 2026 and 2024 respectively.

Source: Own assessment based on available information

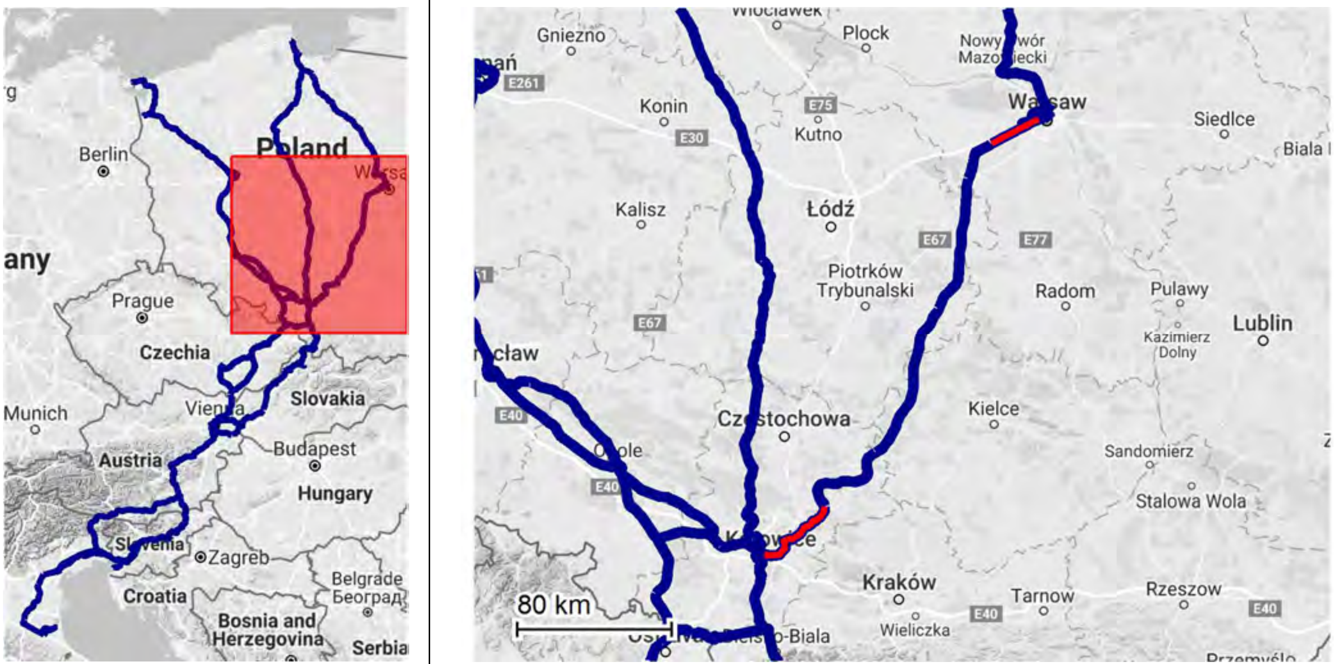
Action sheets for the development of rail transport – national networks

A. Description of the Action:

A.1. Action Title:

1.3.02 - Modernization of the Eastern Corridor Branch in Poland: Warszawa - Katowice

A.2. Location of the action:



Source: Map data ©2016 Google GeoBasis-DE/BKG (©2009), Google

A.3. Description of the action:

Member States involved:	Section or Node:	Estimated total cost [Mio €]:
Poland	*Warszawa - Katowice*	*389.6 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
NSB Corridor	*Start year: 2010* *End year: 2019*	*PKP Polskie Linie Kolejowe S.A., PKP Polskie Linie Kolejowe S.A.*

This section covers the railway lines no. 1 (E 65). This is a double track, electrified railway line, continuous and in operation with axle load compliant on almost entire section length. Main critical issues in the section include speed limitations on section Warszawa – Grodzisk Mazowiecki and Zawiercie – Dąbrowa Górnicza Ząbkowice – Katowice Szopienice Południowe as well as train length on the latter. This branch is a passenger section however also used for freight traffic. Short subsection of section Warszawa – Grodzisk Mazowiecki (Warszawa Zachodnia – Warszawa Włochy – Warszawa Ursus Północny) will constitute part of high speed rail alignment connecting Warszawa – Łódź – Poznań/Wrocław and further to Berlin belonging to the North Sea Baltic corridor. Plan for high speed construction is in place since early 90-ties. Programme for its construction was elaborated in 2010 with planned launch date of construction in 2020, but postponed in 2011 and then the concept was brought back in last years with the feasibility study completed in 2015.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
ERTMS; Freight lines: speed (100 km/h); Freight lines: Axle.load (22.5 t); Freight lines: train length (740m); Current or potential future capacity bottleneck

Source: Corridor Project List

B. Status of the Existing Infrastructure:

B.1. Description of the existing infrastructure

NA

B.2. Technical parameters of the existing infrastructure

TENTEC ID	SECTION	MS	LINE ID	LENGTH (km)	TRACKS	TRACTION	VOLTAGE	MAX SPEED	MAX GRADIENT	AXLE LOAD (kN)	MAX TRAIN LENGTH
18723	Warszawa Zach. <--> Grodzisk Maz.	PL	1	24.47	2	Electrified	3 000 Volts; DC	160	11.9	216	750
18751	Zawiercie <--> Dabrowa Gornicza Zabkowice	PL	1	18.67	2	Electrified	3 000 Volts; DC	120	6.8	225	600
18752	Dabrowa Gornicza Zabkowice <--> Katowice Poludniowe Szopienice	PL	1	20.01	2	Electrified	3 000 Volts; DC	120	7	225	600
18727	Katowice <--> Katowice Szoplenice pld.	PL	1	5.47	2	Electrified	3 000 Volts; DC	100	8.4	225	330
	TOTAL			**69**	**2**	**Electrified**		**100-160**	**11.9**	**216-225**	**330-750**

Source: TENtec 2014, updated by the Contractor to 2017
(*) The value could be lower in some sub-sections

B.3. TEN-T CNC KPIs on the project sections

YEAR	ERTMS (P/F)	ELECTRIFICATION (P/F)	AXLE LOAD (F)	MAX SPEED (F)	TRAIN LENGTH (F)
2013	0%	100%	18%	0%	0%
2015	0%	100%	100%	49%	82%
2016	0%	100%	100%	49%	82%
2017	0%	100%	100%	49%	82%

Source: CNC KPIs

C. Project Implementation

C.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1040	Modernisation of railway line Warszawa – Łódź, lot A section Warszawa Zachodnia – Skierniewice (Miedniewice) and lot C - other works	PL	PKP Polskie Linie Kolejowe S.A.	Warszawa - Katowice	Infrastructure (Upgrade), ERTMS	306.9	including contingency budget
1007	Works on railway line Warszawa Wlochy - Grodzisk Mazowiecki (line no. 447)	PL	PKP Polskie Linie Kolejowe S.A.	section Warszawa-Katowice	Infrastructure (Upgrade),	82.7	Total value in the National Railway Programme [PLN]
	TOTAL					**389.6**	

Source: Corridor Project List

C.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1040	Modernisation of railway line Warszawa – Łódź, lot A section Warszawa Zachodnia – Skierniewice (Miedniewice) and lot C - other works	PL	2010	2018	concluded	concluded	concluded	90%	Land acquisition: Completed // EIA: EIA approved // Final Approval: approved // CBA: Performed // Other: NA
1007	Works on railway line Warszawa Wlochy - Grodzisk Mazowiecki (line no. 447)	PL	2017	2019	concluded	concluded	in progress	21%	Land acquisition: NA // EIA: EIA approved // Final Approval: approved // CBA: Performed // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

C.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR) TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1040	Modernisation of railway line Warszawa – Łódź, lot A section Warszawa Zachodnia – Skierniewice (Miedniewice) and lot C - other works	PL	1	306.9	306.9	74.4 232.5	national funds OPIE 2007-2013 OPIE 2014-2020
1007	Works on railway line Warszawa Wlochy - Grodzisk Mazowiecki (line no. 447)	PL	1	82.7	82.7	21.1 61.6	national funds CEF - Cohesion Call
	TOTAL			**389.6**	**389.6**		

Source: Corridor Project List

C.4. Other complementary network projects

ETCS Level 1 was installed on the Eastern branch of the corridor, section CMK Grodzisk Mazowiecki – Zawiercie in 2014. The ongoing modernisation of the railway line Warszawa – Łódź on the section Warszawa Zachodnia – Grodzisk Mazowiecki foresee ERTMS technology implementation works expected to be completed by mid of 2018. Moreover, Works for the modernisation of the main passenger lines E30 and E65 in the Śląsk area (on section Będzin – Sosnowiec – Katowice – Katowice Ligota, without specified time schedule), include the instalment of the Remote Train Control system in view of future deployment of ETCS Level 2, subject to definition and confirmation of the National ERTMS Deployment Plan. Finally, horizontal actions aiming at constructing ERTMS/ETCS on core TEN-T network lines as well as GSM-R on PKP PLK S.A. railway lines are also foreseen. The scope of projects covers the whole country network, approximately 12,000 km of railway lines, including all Baltic-Adriatic corridor lines, except the sections Gdynia – Warszawa – Grodzisk Mazowiecki and Wrocław – Brzeg – Opole, on which GSM-R is implemented as part of the planned modernisation works to be completed by 2018.

Source: Corridor Project List

D. Gap analysis and Implementation Risks

D.1 Level of compliance attained in 2030:

YEAR	ERTMS (P/F)	ELECTRIFICATION (P/F)	AXLE LOAD (F)	MAX SPEED (F)	TRAIN LENGTH (F)
2030	100%	100%	100%	100%	100%

Source: Corridor Project List

D.2 Remaining technical and operational barriers of the infrastructure and implementation risks:

The section is already compliant in terms of axle load. It is expected to be fully compliant with respect to maximum speed and train length by 2019. This passenger branch (although with freight traffic) is considered a high speed on section between Grodzisk Mazowiecki and Zawiercie, where maximum speed of 160 km/h is already achieved however line geometry, catenary system and surface allow for maximum speed of 250 km/h.

In terms of project maturity sections Warszawa Zachodnia – Skierniewice Miedniewice is already under implementation with expected completion date in 2018. The parallel pair of tracks on section Warszawa Włochy - Grodzisk Mazowiecki is expected to be completed in 2019. For sections without ERTMS/ETCS in place, its deployment is planned up to 2030.

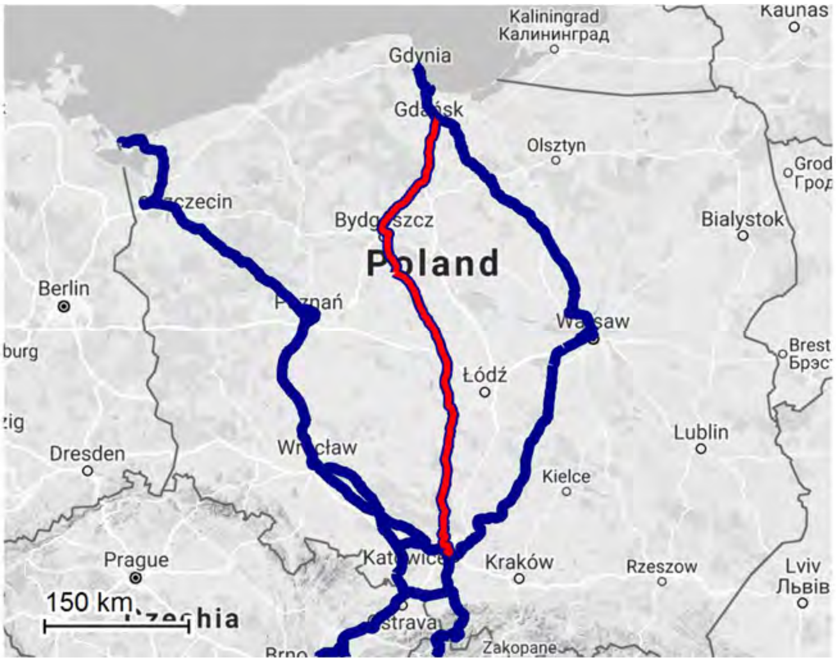
Source: Own assessment based on available information

A. DESCRIPTION OF THE ACTION:

A.1. Action Title:

1.3.03 - Modernization of the Central Corridor Branch in Poland: Gdańsk - Katowice

A.2. Location of the action:



Source: Map data ©2016 Google GeoBasis-DE/BKG (©2009), Google

A.3. Description of the action:

Member States involved:	Section or Node:	Estimated total cost [Mio €]:
Poland	*Gdańsk - Katowice*	*657.7 EUR million*
Other CNC involved:	**Implementation schedule:** *Start year: 2015** *End year: 2022** **n.a. for section Bydgoszcz-Tczew*	**Project Promoter:** *PKP Polskie Linie Kolejowe S.A.*

The action comprises the modernization of the freight railway line C-E 65 sections Gdańsk – Katowice in order to reach the interoperability criteria, including increase of the maximum speed for passenger trains up to 120-160 km/h (as passenger trains also occur on this section) and for freight trains to 100-120 km/h. After completion of the action the axle load of 221 kN will be assured and train length of 740 m will be improved. Adjustment of station platforms to TSI requirements is also foreseen within the Action.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
Freight lines: speed (100 km/h); Freight lines: Axle.load (22.5 t); Freight lines: train length (740m); Current or potential future capacity bottleneck

Source: Corridor Project List

B. STATUS OF THE EXISTING INFRASTRUCTURE:

B.1. Description of the existing infrastructure

This section covers the railway lines 131-201-741-137 (C-E 65). This is a double track, electrified railway line, continuous and in operation. Main critical issues in the section include inconsistency in freight and passenger trains traffic speeds between two tracks (railway line C-E 65), limitations in freight speed. Axle load is already compliant on the most of the section except Chorzów Batory – Katowice Ligota and the train length on most of the section except from subsection Tarnowskie Góry – Bytom – Chorzów Batory – Katowice.

B.2. Technical parameters of the existing infrastructure

TENTEC ID	SECTION	MS	LINE ID	LENGTH (km)	TRACKS	TRACTION	VOLTAGE	MAX SPEED	MAX GRADIENT	AXLE LOAD (kN)	MAX TRAIN LENGTH
18718	Inowroclaw <--> Tczew	PL	131;201;741	172.97	2	Electrified	3 000 Volts; DC	160	8.1	225*	750
18731	Inowroclaw <--> Ponetow	PL	131	84.48	2	Electrified	3 000 Volts; DC	120	6.4	225	750
18676	Ponetow/Barlogi <--> Zdunska Wola Karsz.	PL	131	71.65	2	Electrified	3 000 Volts; DC	120	6.4	225	750
18725	Rusiec <--> Zdunska Wola Karsz.	PL	131	32.34	2	Electrified	3 000 Volts; DC	120	6.5	225	750
18655	Rusiec <--> Tarnowskie Gory	PL	131	102.58	2	Electrified	3 000 Volts; DC	120	8	225	750
18688	Tarnowskie Gory <--> Bytom	PL	131	16.52	2	Electrified	3 000 Volts; DC	120	19.7	225	600
18753	Chorzow Batory <--> Bytom	PL	131	11.84	2	Electrified	3 000 Volts; DC	100	10.4	225*	600
18653	Chorzow Batory <--> Katowice	PL	137	5.79	2	Electrified	3 000 Volts; DC	100	5.7	225*	330
	TOTAL			**498**	**2**	**Electrified**		**100-160**	**19.7**	**225-225**	**330-750**

Source: TENtec 2014, updated by the Contractor to 2017
(*) The value could be lower in some sub-sections

B.3. TEN-T CNC KPIs on the project sections

YEAR	ERTMS (P/F)	ELECTRIFICATION (P/F)	AXLE LOAD (F)	MAX SPEED (F)	TRAIN LENGTH (F)
2013	0%	100%	99%	69%	93%
2015	0%	100%	100%	82%	93%
2016	0%	100%	100%	82%	93%
2017	0%	100%	100%	82%	93%

Source: CNC KPIs

C. PROJECT IMPLEMENTATION

C.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1045	Works on railway line C-E 65 section Bydgoszcz - Tczew	PL	PKP Polskie Linie Kolejowe S.A.	Gdańsk - Katowice	Infrastructure (Upgrade),	167.3	Total value in the National Railway Programme [PLN]
1041	Works on railway line C-E 65 section Chorzów Batory - Tarnowskie Góry - Karsznice - Inowrocław - Bydgoszcz - Maksymilianowo	PL	PKP Polskie Linie Kolejowe S.A.	Gdańsk - Katowice	Infrastructure (Upgrade),	488.9	Total value in the National Railway Programme [PLN]
1059	Elaboration of Pre-design documentation for Modernisation of railway line E65 section Chorzów Batory – Tarnowskie Góry – Karsznice – Inowrocław – Bydgoszcz – Tczew	PL	PKP Polskie Linie Kolejowe S.A.	Gdańsk - Katowice	Study,	1.6	Including contingency budget
	TOTAL					**657.7**	

Source: Corridor Project List

C.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1045	Works on railway line C-E 65 section Bydgoszcz - Tczew	PL	n.a.	n.a.	not started	in progress	not started	n.a.	Land acquisition: Not completed // EIA: NA // Final Approval: not submitted yet // CBA: Not performed // Other: NA
1041	Works on railway line C-E 65 section Chorzów Batory - Tarnowskie Góry - Karsznice - Inowrocław - Bydgoszcz - Maksymilianowo	PL	2020	2022	in progress	in progress	in progress	0%	Land acquisition: Not completed // EIA: EIA approved // Final Approval: approved // CBA: Performed // Other: NA
1059	Elaboration of Pre-design documentation for Modernisation of railway line E65 section Chorzów Batory – Tarnowskie Góry – Karsznice – Inowrocław – Bydgoszcz – Tczew	PL	2015	2017		in progress		94%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

C.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR) TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1045	Works on railway line C-E 65 section Bydgoszcz - Tczew	PL	1	167.3	0		
1041	Works on railway line C-E 65 section Chorzów Batory - Tarnowskie Góry - Karsznice - Inowrocław - Bydgoszcz - Maksymilianowo	PL	1	488.9	488.9	113.9 375.0	national funds OPIE 2014 - 2020
1059	Elaboration of Pre-design documentation for Modernisation of railway line E65 section Chorzów Batory – Tarnowskie Góry – Karsznice – Inowrocław – Bydgoszcz – Tczew	PL		1.6	1.6	1.6	national funds
	TOTAL			**657.7**	**490.5**		

Source: Corridor Project List

C.4. Other complementary network projects

The National ERTMS Deployment Plan, which foresees implementation of ERTMS on all corridor lines is currently under review; based on planned investments ERTMS is not currently envisaged to be installed on the Central branch of the corridor between Tczew and Bytom. A horizontal action is foreseen for implementation aiming at installing GSM-R infrastructure on PKP PLK S.A. railway lines; the scope of project covers the whole country network, approximately 12 thousand km of railway lines, including all Baltic-Adriatic corridor lines, except some sections of Eastern and Western Branch (Gdynia – Warszawa – Grodzisk Mazowiecki and Wrocław – Brzeg – Opole) on which GSM-R is implemented as part of the planned modernisation works.

Source: Corridor Project List

D. GAP ANALYSIS AND IMPLEMENTATION RISKS

D.1 Level of compliance attained in 2030:

YEAR	ERTMS (P/F)	ELECTRIFICATION (P/F)	AXLE LOAD (F)	MAX SPEED (F)	TRAIN LENGTH (F)
2030	4%	100%	100%	100%	100%

Source: Corridor Project List

D.2 Remaining technical and operational barriers of the infrastructure and implementation risks:

The Central Branch is expected to be fully compliant by 2030. Due to limited financial resources implementation of the section Tczew-Bydgoszcz might be postponed after 2020. The operating bottleneck of the 740 train length will remain between Tarnowskie Góry and Katowice.

There is different level of maturity among the actions planned for implementation for improvement of this section. Section Chorzów Batory - Tarnowskie Góry - Karsznice - Inowrocław - Bydgoszcz – Maksymilianowo is at the stage of EIA approval with final project approval by the relevant administrative authorities, whereas for section Bydgoszcz – Tczew EIA procedure has not started yet.

Source: Own assessment based on available information

A. Description of the Action:

A.1. Action Title:

1.3.04 - Modernization of the Western Corridor Branch in Poland: Świnoujście/Szczecin - Wrocław

A.2. Location of the action:

Source: Map data ©2016 Google GeoBasis-DE/BKG (©2009), Google

A.3. Description of the action:

Member States involved:	**Section or Node:**	**Estimated total cost [Mio €]:**
Poland	*Świnoujście/Szczecin - Wrocław*	*1,635.9 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
	Start year: 2008 *End year: 2023*	*PKP Polskie Linie Kolejowe S.A. , PKP Polskie Linie Kolejowe S.A.*
The action comprises modernization works of the railway line E 59 sections Świnoujście – Szczecin – Poznań – Wrocław in order to increase passenger's speed up to 160 km/h and freight speed up to 120 km/h; instalment of remote control and command system and improvement of the catenary system, as well as modernisation of the engineering structures.		

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
ERTMS; Freight lines: speed (100 km/h); Freight lines: Axle.load (22.5 t); Freight lines: train length (740m); Current or potential future capacity bottleneck

Source: Corridor Project List

B. Status of the Existing Infrastructure:

B.1. Description of the existing infrastructure

This section covers railway lines 401-351-395-394-352-802-271-132-756-349 (E59). The corridor alignment in the branch from Świnoujście to Wrocław follows the line E59, which is double track, electrified, continuous and in operation. The technical parameters of the E59 line are in many subsections below the standards set in the TEN-T Regulation. In the section Świnoujście-Szczecin-Poznań, numerous sub-sections have freight trains speed limitations of 60-80 km, and in short part of the section (4%) axle load is limited to 196 kN. In the section Wrocław-Poznań, very low speeds are allowed on most of section Poznań–Leszno (maximum 50-60 km/h) for freight and passenger trains; also, short part of the section (<5%) is limited by 205-211 kN of max axle load parameter.

B.2. Technical parameters of the existing infrastructure

TENTEC ID	SECTION	MS	LINE ID	LENGTH (km)	TRACKS	TRACTION	VOLTAGE	MAX SPEED	MAX GRADIENT	AXLE LOAD (kN)	MAX TRAIN LENGTH
18685	Swinoujscie <--> Wolin	PL	401	31.24	2	Electrified	3 000 Volts; DC	120	10.2	225*	630
18651	Wolin <--> Szczecin Dabie	PL	401	68.32	2	Electrified	3 000 Volts; DC	130	9	225*	630
18701	Stargrad Szczecinski <--> Szczecin Dabie	PL	351	22.63	2	Electrified	3 000 Volts; DC	130	3.5	225	650
18716	Stargrad Szczecinski <--> Krzyz	PL	351	89.58	2	Electrified	3 000 Volts; DC	140	6.7	225	650
18656	Krzyz <--> Poznan I	PL	351	83.73	2	Electrified	3 000 Volts; DC	140	6.6	225	650
18706	Lubon k. Poznania <--> Poznan Glowny	PL	271	6.52	2	Electrified	3 000 Volts; DC	100	9.3	225	650
18670	Lubonk k. Poznania <--> Leszno	PL	271	62.13	2	Electrified	3 000 Volts; DC	120	6.2	225	650
18742	Leszno <--> Wroclaw Mikolow	PL	271	92.10	2	Electrified	3 000 Volts; DC	140	10.88	225	650
18697	Wroclaw Popowice <--> Wroclaw Mikolajow	PL	271	0.90	2	Electrified	3 000 Volts; DC	80	4.5	211	650
18647	Wroclaw Mikolajow <--> Wroclaw Brochow	PL	271; 132	5.32	2	Electrified	3 000 Volts; DC	110	3.12	200*	520
	TOTAL			**462**	**2**	**Electrified**		**80-140**	**10.88**	**211-225**	**520-650**

Source: TENtec 2014, updated by the Contractor to 2017
(*) The value could be lower in some sub-sections

B.3. TEN-T CNC KPIs on the project sections

YEAR	ERTMS (P/F)	ELECTRIFICATION (P/F)	AXLE LOAD (F)	MAX SPEED (F)	TRAIN LENGTH (F)
2013	0%	100%	98%	30%	0%
2015	0%	100%	98%	37%	0%
2016	0%	100%	98%	37%	0%
2017	0%	100%	98%	37%	0%

Source: CNC KPIs

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C. Project Implementation

C.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1006	Works on the E 59 railway line, Poznan Glowny - Szczecin Dabie section	PL	PKP Polskie Linie Kolejowe S.A.	section Poznań - Szczecin/Świnoujście	Study, Infrastructure (Upgrade)	531.6	Total value in the National Railway Programme [PLN]
1006a	Works on the E 59 railway line, Wronki - Słonice section	PL	PKP Polskie Linie Kolejowe S.A.	section Poznań - Szczecin/Świnoujście	Study, Infrastructure (Upgrade), ERTMS	349.7	Total value in the National Railway Programme [PLN]
1036	Modernisation of railway line E59 Wrocław – Poznań, phase III, section Czempiń – Poznań	PL	PKP Polskie Linie Kolejowe S.A.	Wrocław - Poznań - Szczecin/Świnoujście	Infrastructure (Upgrade), OTHER	157.1	Project value according to Multiannual Rail Investment Programme and National Railway Programme
1005	Works on the E 59 railway line on the Wroclaw-Poznan section, stage IV, border of Dolnoslaskie Voivode-ship-Czempin section	PL	PKP Polskie Linie Kolejowe S.A.	section Poznań - Wrocław	Infrastructure (Upgrade), OTHER	364.8	Total value in the National Railway Programme [PLN]
1035	Modernisation of railway line E59 Wrocław – Poznań, phase II, section Wrocław – Dolnosląskie Voivodship border	PL	PKP Polskie Linie Kolejowe S.A.	Wrocław - Poznań - Szczecin/Świnoujście	Infrastructure (Upgrade), OTHER	232.7	Including contingency budget
	TOTAL					**1,635.9**	

Source: Corridor Project List

C.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1006	Works on the E 59 railway line, Poznan Glowny - Szczecin Dabie section	PL	2018	2020	in progress	concluded	in progress	0%	Land acquisition: Not completed // EIA: EIA approved // Final Approval: approved // CBA: Performed // Other: NA
1006a	Works on the E 59 railway line, Wronki - Słonice section	PL	2020	2023	in progress	concluded	in progress	0%	Land acquisition: Not completed // EIA: EIA approved // Final Approval: approved // CBA: Performed // Other: NA
1036	Modernisation of railway line E59 Wrocław – Poznań, phase III, section Czempiń – Poznań	PL	2011	2017	concluded	concluded	concluded	96%	Land acquisition: Completed // EIA: EIA approved // Final Approval: approved // CBA: Performed // Other: NA
1005	Works on the E 59 railway line on the Wroclaw-Poznan section, stage IV, border of Dolnoslaskie Voivode-ship-Czempin section	PL	2016	2020	concluded	concluded	in progress	29%	Land acquisition: Not completed // EIA: EIA approved // Final Approval: approved // CBA: Performed // Other: NA
1035	Modernisation of railway line E59 Wrocław – Poznań, phase II, section Wrocław – Dolnosląskie Voivodship border	PL	2008	2017	concluded	concluded	concluded	97%	Land acquisition: Completed // EIA: EIA approved // Final Approval: approved // CBA: Performed // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

C.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR)		
					TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1006	Works on the E 59 railway line, Poznan Glowny -Szczecin Dabie section	PL	1	531.6	531.6	94.2 437.4	national funds CEF - Cohesion Call
1006a	Works on the E 59 railway line, Wronki - Słonice section	PL	1	349.7	53.1	53.1	national funds
1036	Modernisation of railway line E59 Wrocław – Poznań, phase III, section Czempiń – Poznań	PL	1	157.1	157.1	34.1 123.0	national funds OPIE 2007 - 2013, OPIE 2014 - 2020
1005	Works on the E 59 railway line on the Wroclaw-Poznan section, stage IV, border of Dolnoslaskie Voivode-ship-Czempin section	PL	1	364.8	364.8	84.7 280.1	national funds CEF - Cohesion Call
1035	Modernisation of railway line E59 Wrocław – Poznań, phase II, section Wrocław – Dolnosląskie Voivodship border	PL	1	232.7	232.7	61.6 171.1	national funds OPIE 2007 - 2013
	TOTAL			**1,635.9**	**1339.3**		

Source: Corridor Project List

C.4. Other complementary network projects

ETCS Level 1 is planned to be installed on the E59 between Wronki and Słonice as part of the works for the modernisation of the line, expected to be undertaken between 2020-2023; Furthermore, ERTMS deployment is planned as part of ERTMS horizontal project covering the core TEN-T network lines including sections Wrocław – Poznań – Szczecin/Świnoujście, BY border – Warszawa – Poznań – DE border, UA border – Kraków – Katowice – Wrocław – Drezno , where this is not done in a line-specific investment project to be completed by 2023.

Source: Corridor Project List

D. GAP ANALYSIS AND IMPLEMENTATION RISKS

D.1 Level of compliance attained in 2030:

YEAR	ERTMS (P/F)	ELECTRIFICATION (P/F)	AXLE LOAD (F)	MAX SPEED (F)	TRAIN LENGTH (F)
2030	100%	100%	98%	77%	77%

Source: Corridor Project List

D.2 Remaining technical and operational barriers of the infrastructure and implementation risks:

On the Western Branch, railway axis E59, between Świnoujście and Wrocław, based on current plans most of the corridor lines will be compliant by 2030 with respect to axle load, speed and train length. Speed bottlenecks will remain between Szczecin and Świnoujście, where prevailing passenger speed is currently 100-130 km/h and 70-80 km/h for freight, as well as at the Wrocław node (sections Popowice – Mikołajów – Brochów). 740 train length operating bottlenecks will remain between Szczecin and Świnoujście, and at the Wrocław node (sections Popowice – Mikołajów – Brochów). Depending on limited availability of financial resources the achievement of the speed, axle load and 740 train length standards may be delayed at the Poznań node (the project relating to the works on this node is included the reserve list of the National Railway Programme and no national funds are foreseen to secure their full implementation).

In terms of maturity the most advanced section is the one between Czempiń and Poznań, where construction works are almost completed as well as between Wrocław and the Dolnosląskie - Voivodship border. The works for the modernisation of the other section between the border of Dolnoslaskie Voivodeship and Czempiń are already ongoing and expected to be completed by 2020. Works on section between Szczecin and Poznań are still to start; which are foreseen to to be completed by 2023.

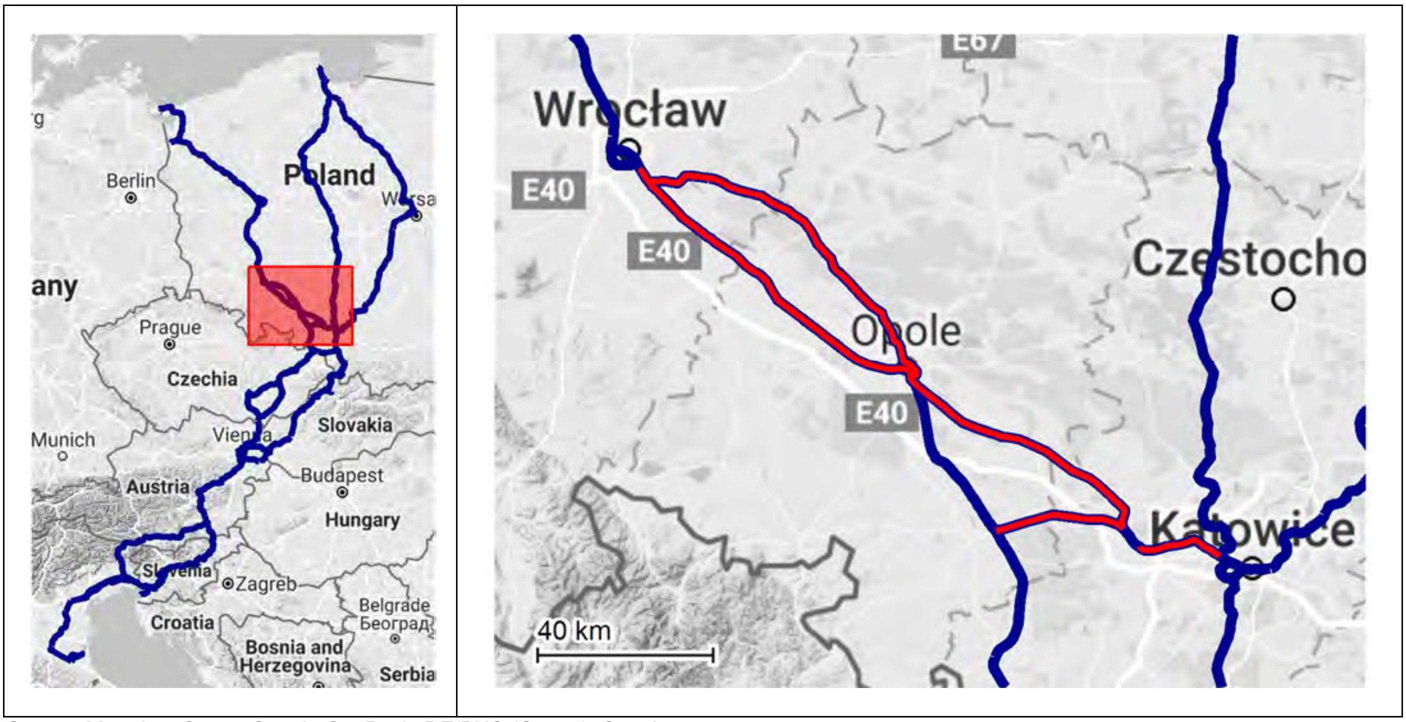
Source: Own assessment based on available information

A. Description of the Action:

A.1. Action Title:

1.3.05 - Modernization of the Western Corridor Branch in Poland: Wrocław - Katowice

A.2. Location of the action:



Source: Map data ©2016 Google GeoBasis-DE/BKG (©2009), Google

A.3. Description of the action:

Member States involved: *Poland*	Section or Node: *Wrocław - Katowice*	Estimated total cost [Mio €]: *521.4 EUR million*
Other CNC involved:	**Implementation schedule:** *Start year: NA* *End year: NA*	**Project Promoter:** *PKP Polskie Linie Kolejowe S.A.*
The action includes initiative to modernize the Western Branch of the corridor infrastructure between Wrocław and Katowice in order to reach the interoperability criteria, including increase of passenger trains speed up to 120-160 km/h (100-120 km/h for freight trains), axle load up to 221 kN and train length up to 750 m. Action also encompasses improvement of engineering structures. On section Opole Groszowice – Jelcz – Wrocław Brochów separation of freight traffic (via Brzeg) from long distance passenger traffic (via Brzeg) is expected. Furthermore, reconstruction of Chorzów Batory and Gliwice Łabędy stations is foreseen.		

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
Freight lines: speed (100 km/h); Freight lines: Axle.load (22.5 t); Freight lines: train length (740m); Current or potential future capacity bottleneck

Source: Corridor Project List

B. Status of the Existing Infrastructure:

B.1. Description of the existing infrastructure

The corridor infrastructure in the branch from Wrocław to Katowice comprises section Wroclaw-Jelcz-Opole (line 277), section Wroclaw-Brzeg-Opole (line 132) and section Opole Groszowice – Błotnica Strzelecka – Gliwice (line 132/135) as well as section Gliwice Łabędy – Kędzierzyn Koźle (line 137) and Gliwice – Chorzów Batory (line 137). All these sections are electrified, the branch is continuous and in operation. Most of the sections are affected by insufficient technical parameters (speed for passenger and freight, axle load and train length) affecting the passenger and freight train operations.

B.2. Technical parameters of the existing infrastructure

TENTEC ID	SECTION	MS	LINE ID	LENGTH (km)	TRACKS	TRACTION	VOLTAGE	MAX SPEED	MAX GRADIENT	AXLE LOAD (kN)	MAX TRAIN LENGTH
18698	Wroclaw Brochow <--> Jelcz Miloszyce	PL	277	15.31	1	Electrified	3 000 Volts; DC	120	7.07	225*	630
18646	Wroclaw Brochow <--> Opole Groszowice	PL	132	77.32	2	Electrified	3 000 Volts; DC	160	4.78	225*	640
18699	Jelcz Miloszyce<--> Opole Groszowice	PL	277	70.26	2	Electrified	3 000 Volts; DC	120	4.92	225*	630
21600017	Opole Groszowice <--> Rudziniec Gliwicki	PL	132;135	61.00	2	Electrified	3 000 Volts; DC	120	9.72	225*	630
18749	Gliwice Labedy <--> Kedzierzyn Kozle	PL	137	31.18	2	Electrified	3 000 Volts; DC	120	6.22	225*	650
18691	Gliwice <--> Chorzow Batory	PL	137	20.93	2	Electrified	3 000 Volts; DC	120	14.4	206	380
	TOTAL			**276**	**1-2**	**Electrified**		**120-160**	**14.4**	**206-206**	**380-650**

Source: TENtec 2014, updated by the Contractor to 2017
(*) The value could be lower in some sub-sections

B.3. TEN-T CNC KPIs on the project sections

YEAR	ERTMS (P/F)	ELECTRIFICATION (P/F)	AXLE LOAD (F)	MAX SPEED (F)	TRAIN LENGTH (F)
2013	0%	100%	40%	32%	0%
2015	0%	100%	53%	33%	0%
2016	0%	100%	53%	33%	0%
2017	0%	100%	53%	33%	0%

Source: CNC KPIs

C. Project Implementation

C.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1042	Works on railway line C-E 30 section Opole Groszowice - Jelcz - Wrocław Brochów	PL	PKP Polskie Linie Kolejowe S.A.	Wrocław - Ostrava	Infrastructure (Upgrade),	134.6	Total value in the National Railway Programme [PLN]
1043	Improvement of transport services through improvement of technical conditions of railway line 132 section Błotnica Strzelecka–Opole Groszowice	PL	PKP Polskie Linie Kolejowe S.A.	Wrocław - Ostrava	Infrastructure (Upgrade),	45.7	Including contingency budget
1065	Works on railway line E 30 section Kędzierzyn Koźle – Opole Zachodnie (preparatory works)	PL	PKP Polskie Linie Kolejowe S.A.	Wrocław - Ostrava	Study,	0.2	Including contingency budget
1048	Works on main passenger lines (E 30 and E 65) in Śląsk area, phase II: line E 30 section Katowice - Chorzów Batory and Gliwice Łabędy	PL	PKP Polskie Linie Kolejowe S.A.	Wrocław - Ostrava	Infrastructure (Upgrade),	78.0	Including contingency budget

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1527	Works on main passenger lines (E 30 and E 65) in Śląsk area, phase III: line E 30 section Chorzów Batory - Gliwice Łabędy	PL	PKP Polskie Linie Kolejowe S.A.	Wrocław - Ostrava	Infrastructure (Upgrade),	262.9	Total value in the National Railway Programme [PLN]
	TOTAL					**521.4**	

Source: Corridor Project List

C.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL: L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1042	Works on railway line C-E 30 section Opole Groszowice - Jelcz - Wrocław Brochów	PL	n.a.	n.a.	in progress	concluded	not started	NA%	Land acquisition: Not completed // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: Performed // Other: NA
1043	Improvement of transport services through improvement of technical conditions of railway line 132 section Błotnica Strzelecka–Opole Groszowice	PL	2013	2017	concluded	concluded	concluded	93%	Land acquisition: Completed // EIA: EIA approved // Final Approval: approved // CBA: Performed // Other: NA
1065	Works on railway line E 30 section Kędzierzyn Koźle – Opole Zachodnie (preparatory works)	PL	2015	2016		concluded		nearly completed	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: Performed // Other: NA
1048	Works on main passenger lines (E 30 and E 65) in Śląsk area, phase II: line E 30 section Katowice - Chorzów Batory and Gliwice Łabędy	PL	n.a.	n.a.	not started	concluded	not started	NA%	Land acquisition: Not completed // EIA: NA // Final Approval: not submitted yet // CBA: Performed // Other: NA
1527	Works on main passenger lines (E 30 and E 65) in Śląsk area, phase III: line E 30 section Chorzów Batory - Gliwice Łabędy	PL	n.a.	n.a.	not started	concluded	not started	NA%	Land acquisition: Not completed // EIA: NA // Final Approval: not submitted yet // CBA: Performed // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

C.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR): TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1042	Works on railway line C-E 30 section Opole Groszowice - Jelcz - Wrocław Brochów	PL	1	134.6	0		
1043	Improvement of transport services through improvement of technical conditions of railway line 132 section Błotnica Strzelecka–Opole Groszowice	PL	1	45.7	45.7	7.3 38.4	national funds OPIE 2007 - 2013
1065	Works on railway line E 30 section Kędzierzyn Koźle – Opole Zachodnie (preparatory works)	PL		0.2	0.2	0.2	national funds
1048	Works on main passenger lines (E 30 and E 65) in Śląsk area, phase II: line E 30 section Katowice - Chorzów Batory and Gliwice Łabędy	PL	1	78.0	0		
1527	Works on main passenger lines (E 30 and E 65) in Śląsk area, phase III: line E 30 section Chorzów Batory - Gliwice Łabędy	PL	1	262.9	0		
	TOTAL			**521.4**	**45.9**		

Source: Corridor Project List

C.4. Other complementary network projects

ETCS Level 1 will be installed on the section Chorzów Batory – Gliwice Łabędy by 2023. On railway line E30, section Legnica – Wrocław – Opole, ETCS Level 2 is already under implementation expected to be completed by 2018 and implementation of GSM-R system is expected to be finalised by 2023 as part of a horizontal project covering the whole country core network. A horizontal action aiming at implementation of ERTMS/ETCS on core TEN-T network lines including sections Wrocław – Poznań – Szczecin/Świnoujście, BY border – Warszawa – Poznań – DE border, UA border – Kraków – Katowice – Wrocław – Drezno, in particular covering section Będzin – Sosnowiec – Katowice – Katowice Ligota as well as part of the section Katowice – Gliwice and also section Chorzów batory – Gliwice Łabędy, where this is not done in a line-specific investment project. Finally, a horizontal action is foreseen for implementation aiming at installing GSM-R infrastructure on PKP PLK S.A. railway lines; the scope of project covers the whole country network, approximately 12 thousand km of railway lines, including all Baltic-Adriatic corridor lines, except the section Wrocław – Brzeg – Opole, on which GSM-R is implemented as part of the planned modernisation works to be completed by 2023. According to current status of the National ERTMS Deployment Plan, ERTMS is not currently envisaged to be installed on the section Opole Groszowice – Rudziniec Gliwicki on the main itinerary Wrocław – Katowice.

Source: Corridor Project List

D. Gap analysis and Implementation Risks

D.1 Level of compliance attained in 2030:

YEAR	ERTMS (P/F)	ELECTRIFICATION (P/F)	AXLE LOAD (F)	MAX SPEED (F)	TRAIN LENGTH (F)
2030	67%	100%	100%	76%	64%

Source: Corridor Project List

D.2 Remaining technical and operational barriers of the infrastructure and implementation risks:

On the Western Branch, railway axis E59, between Wrocław and Gliwice, based on current plans most of the corridor lines will be compliant by 2030 with respect to axle load, speed and train length. Speed limitations will remain on the rail freight section Opole Groszowice – Rudziniec Gliwicki on the main itinerary Wrocław – Katowice, however the alternative routing Opole Groszowice – Gliwice Łabędy will be compliant, except from a very short non-compliant section in Kędzierzyn Koźle. 740 train length operating bottlenecks will remain at the Wrocław node (sections Popowice – Mikołajów – Brochów) and between Opole and Gliwice as well as on section Gliwice Łabędy – Kędzierzyn Koźle, on the main itinerary Wrocław – Katowice. Depending on limited availability of financial resources the achievement of the speed, axle load and 740 train length standards may be delayed between Wrocław - Jelcz and Opole (the projects relating to the works on these sections are indeed reserve list of the National Railway Programme and no national funds are foreseen to secure their full implementation). In terms of maturity for all the three sections comprising Opole Groszowice - Jelcz - Wrocław Brochów, Katowice - Chorzów Batory and Gliwice Łabędy, Chorzów Batory - Gliwice Łabędy the start date has not been defined. Section Opole Groszowice - Jelcz - Wrocław Brochów has the EIA under preparation, whereas for the other two sections it has not started yet.

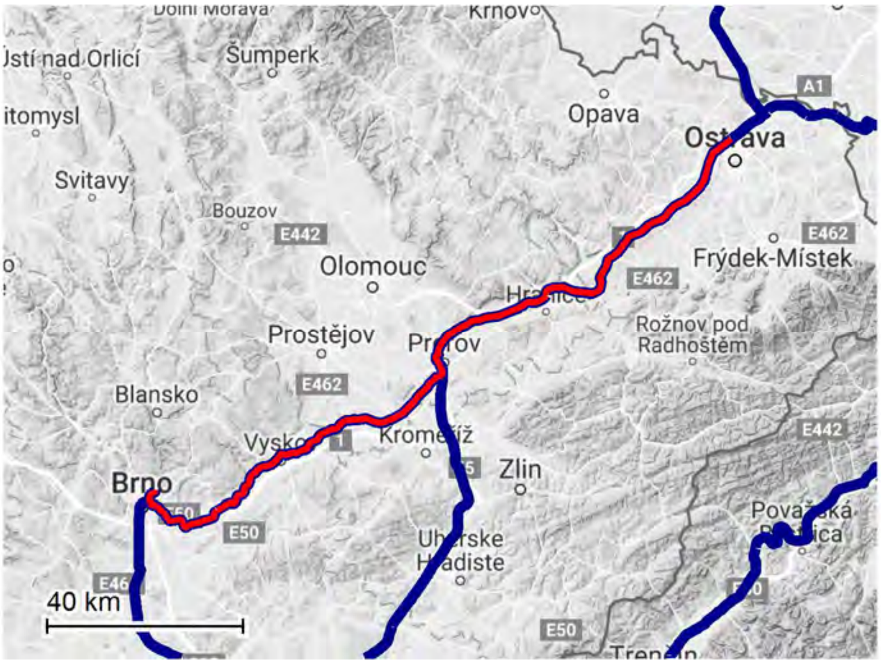
Source: Own assessment based on available information

A. Description of the Action:

A.1. Action Title:

1.3.06 - Upgrading to HS of the Brno - Přerov (Ostrava) rail line in the Czech Republic

A.2. Location of the action:



Source: Map data ©2016 Google GeoBasis-DE/BKG (©2009), Google

A.3. Description of the action:

Member States involved:	Section or Node:	Estimated total cost [Mio €]:
Czech Republic	*Brno - Prerov*	*1,768.3 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
Rhine – Danube (Přerov – Ostrava)	*Start year: 2013* *End year: 2024*	*SŽDC*

The action includes the reconstruction of railway bypass of Přerov node with the change of its layout caused by recent change of direction of train traffic to the right side on Bohumín – Břeclav track as 2 phases of Přerov junction modernization till 2021 and the upgrade of single track electrified passenger TEN-T core link with partially limited speed to 70 - 80 km/h and limited axle load by 196 kN and train lengths only to 534 m to double track with the speed 200 km/h and full compliance even with the requirements for freight transport till 2024 including GSM-R and ETCS Level 2 deployment. Future extension of high speed line parallel to existing track is foreseen to Ostrava and scheduled for completion till 2050

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
ERTMS; Freight lines: speed (100 km/h); Freight lines: Axle.load (22.5 t); Freight lines: train length (740m)

Source: Corridor Project List

B. STATUS OF THE EXISTING INFRASTRUCTURE:

B.1. Description of the existing infrastructure

The Přerov – Brno section, part of the BA Corridor alignment as part of its passenger branch, includes the single electrified track section Přerov – Holubice with 3kV AC power system (foreseen to be switched to 25 kV AC before 2030), till Nezamyslice and 25kV AC power system from Chválkovice na Hané (with speed limit 100 km/h), and double track electrified (25kV AC) section Blažovice – Brno (with speed limit 80 km/h) interconnected by short electrified (25kV AC) single section Holubice – Blažovice with speed limit 70 km/h. The double track section Brno - Blažovice is used by 18 pairs of trains towards Uherské Hradiště (S6) and 15 pairs express trains from Brno to Vyškov and Přerov and Bohumín (R56) with no other stops in this section. The single section from Holubice to Přerov is used by trains 15 pairs of Brno - Přerov – Bohumín (R56) express trains using Holubice - Blažovice connecting line and 6 pairs of passenger trains from Vyškov to Nezamyslice and 11 pairs of passenger trains Nezamyslice - Přerov (S71 – the service is limited due to capacity constraints and parallel regional buses are operated). Freight trains are operated on both parts of the section too. The section Přerov – Brno was not part of any international or national main line or corridor before it was defined as a part of Priority Project 23 of TEN-T. It is either not equipped with GSM-R or ETCS. It is planned to be upgraded to high speed (200 km/h) double track.

The section Brno-Přerov has issues in terms of available capacity, although not directly resulting from our analysis as significantly critical due to the replacement of regional railway services with regional bus operations for capacity related issues. Ostrava – Přerov part of the section is very heavily used by Budapest/Wien/Břeclav/Brno/Praha/Přerov – Ostrava/Bohumín/Žilina/Košice/Warszawa/Kraków/Gdynia express trains and regional trains and has lack of spare capacity in peak hours for more freight transport. Most of capacity is used by national long distance trains from Praha and Brno to Ostrava and Slovakia, only 5 pairs of trains connect Břeclav and Bohumín along all Czech section of BAC, 5 of them are international. Critical section is between Ostrava Svinov and Ostrava hlavní nádraží stations, where trains from Opava and trains to Ostrava airport operate too. There are 93 daily pairs of trains operation on this section.

B.2. Technical parameters of the existing infrastructure

TENTEC ID	SECTION	MS	LINE ID	LENGTH (km)	TRACKS	TRACTION	VOLTAGE	MAX SPEED	MAX GRADIENT	AXLE LOAD (kN)	MAX TRAIN LENGTH
20302	Hranice na Morave <--> Ostrava	CZ	270	55.5	2	Electrified	3 000 Volts; DC	160	9	225	720
20301	Hranice na Morave <--> Prerov	CZ	270	28.4	2	Electrified	3 000 Volts; DC	160	9.66	225	720
20404	Brno <--> Holubice	CZ	340	22.8	2	Electrified	25 000 Volts; 50Hz	80	16.3	196	513
20398	Prerov <--> Holubice	CZ	300	61.8	1	Electrified	3 000 Volts; DC	100	7.7	196	566
	TOTAL			**168**	**1-2**	**Electrified**		**80-160**	**16.3**	**196-225**	**513-720**

Source: TENtec 2014, updated by the Contractor to 2017
(*) The value could be lower in some sub-sections

B.3. TEN-T CNC KPIs on the project sections

YEAR	ERTMS (P/F)	ELECTRIFICATION (P/F)	AXLE LOAD (F)	MAX SPEED (F)	TRAIN LENGTH (F)
2013	0%	100%	100%	100%	0%
2015	0%	100%	100%	100%	0%
2016	0%	100%	100%	100%	0%
2017	0%	100%	100%	100%	0%

Source: CNC KPIs

C. Project Implementation

C.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1071	Reconstruction of Přerov railway station, construction II	CZ	SŽDC	Prerov	Study, Infrastructure (Upgrade), OTHER	84.6	
1703	Modernisation of the railway junction Přerov, 3rd phase	CZ	SŽDC	Prerov	Study, Infrastructure (Upgrade),	26.1	
1073	Blažovice - Nezamyslice: railway modernisation to 200 km/h	CZ	SŽDC	Prerov <--> Holubice (HS)	Infrastructure (New construction), ERTMS	896.8	
1074	Nezamyslice - Přerov: railway modernisation to 200 km/h	CZ	SŽDC	Prerov <--> Holubice (HS)	Infrastructure (New construction), ERTMS	453.1	
1075	Brno - Blažovice: railway modernisation to 200 km/h	CZ	SŽDC	Brno <--> Holubice (HS)	Infrastructure (New construction), ERTMS	262.3	
1999	Modernisation of selected sections of the Brno - Prerov railway line	CZ	SŽDC	Katowice - Ostrava - Brno - Wien and Katowice - Zilina - Bratislava - Wien	Study,	45.5	CEF - Recommended total eligible costs [CEF Brochure]
	TOTAL					**1,768.3**	

Source: Corridor Project List

C.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1071	Reconstruction of Přerov railway station, construction II	CZ	2018	2021	concluded	concluded	concluded	0%	Land acquisition: Not completed // EIA: EIA completed // Final Approval: submitted, decision pending // CBA: Performed // Other: NA
1703	Modernisation of the railway junction Přerov, 3rd phase	CZ	2019	2021	concluded	concluded	in progress	0%	Land acquisition: Not completed // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: Performed // Other: NA
1073	Blažovice - Nezamyslice: railway modernisation to 200 km/h	CZ	2020	2023	concluded	concluded	not started	0%	Land acquisition: Not completed // EIA: NA // Final Approval: not submitted yet // CBA: Not performed // Other: NA
1074	Nezamyslice - Přerov: railway modernisation to 200 km/h	CZ	2020	2023	concluded	concluded	not started	0%	Land acquisition: Not completed // EIA: NA // Final Approval: not submitted yet // CBA: Not performed // Other: NA
1075	Brno - Blažovice: railway modernisation to 200 km/h	CZ	2023	2024	concluded	concluded	not started	0%	Land acquisition: Not completed // EIA: NA // Final Approval: not submitted yet // CBA: Not performed // Other: NA
1999	Modernisation of selected sections of the Brno - Prerov railway line	CZ	2013	2024				33%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

C.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR)		
					TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1071	Reconstruction of Přerov railway station, construction II	CZ	1	84.6	84.6	25.4 59.2	SFDI OPT II
1703	Modernisation of the railway junction Přerov, 3rd phase	CZ	1	26.1	26.1	7.8 18.3	SFDI OPT II
1073	Blažovice - Nezamyslice: railway modernisation to 200 km/h	CZ	1	896.8	0		
1074	Nezamyslice - Přerov: railway modernisation to 200 km/h	CZ	1	453.1	0		
1075	Brno - Blažovice: railway modernisation to 200 km/h	CZ	1	262.3	0		
1999	Modernisation of selected sections of the Brno - Prerov railway line	CZ	1	45.5	45.5	6.8 38.7	SFDI CEF 2nd call
	TOTAL			**1,768**	**156.2**		

Source: Corridor Project List

C.4. Other complementary network projects

Brno junction modernisation as a part of Action 1.1.4 is crucial for the design and construction of Brno – Blažovice section, which have two alternative connections to Brno node according of the place for new Brno main stations chosen. Ostrava core TENT-T urban node railway junction modernisation (included in the core urban node projects in Ostrava) is complementary for the design of new highs speed line through Ostrava node foreseen to 2050.

Source: Corridor Project List

D. Gap analysis and Implementation Risks

D.1 Level of compliance attained in 2030:

YEAR	ERTMS (P/F)	ELECTRIFICATION (P/F)	AXLE LOAD (F)	MAX SPEED (F)	TRAIN LENGTH (F)
2030	100%	100%	100%	100%	0%

Source: Corridor Project List

D.2 Remaining technical and operational barriers of the infrastructure and implementation risks:

The project maturity is very good for Přerov junction modernisation; high speed line construction has however only feasibility study elaborated and no detailed design, EIA and other permits are available. Planning and approvals can be available for Ponětovice – Blažovice – Holubice - Přerov section if CBA procedure shows the feasibility, but there is the risk, that the design of Brno – Ponětovice section will not be prepared on time due to lengthy process of design and negotiations of the layout out of Brno node. Ongoing pubic discussion in Brno to define the position of new main railway station could obstacle further preparation both of node modernisation and modernisation of Brno – Ponětovice section if not concluded on time.

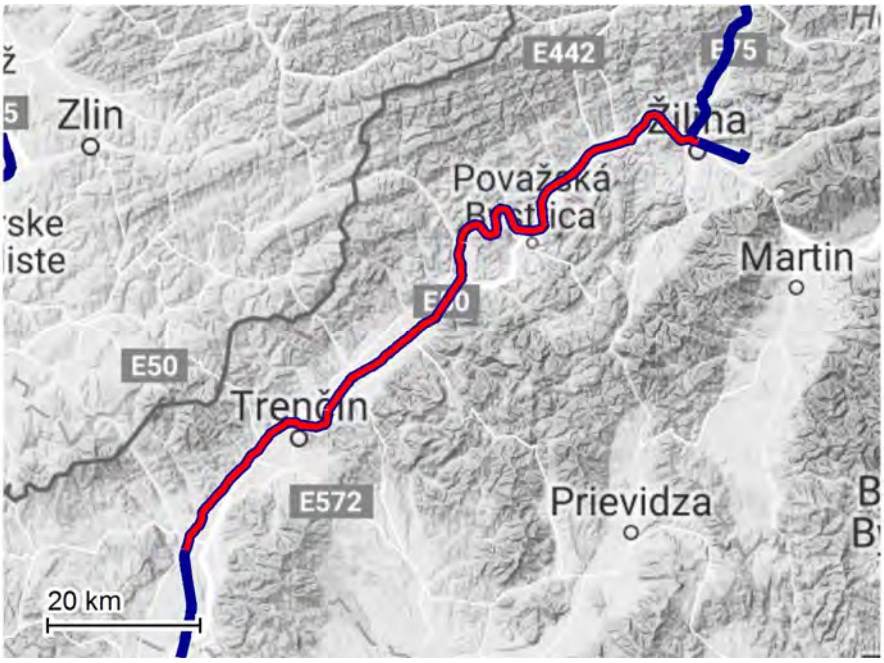
Source: Own assessment based on available information

A. DESCRIPTION OF THE ACTION:

A.1. Action Title:

1.3.07 - Upgrading of the Zlatovce - Žilina rail line in Slovakia

A.2. Location of the action:



Source: Map data ©2016 Google GeoBasis-DE/BKG (©2009), Google

A.3. Description of the action:

Member States involved:	Section or Node:	Estimated total cost [Mio €]:
Slovakia	*Nové Mesto nad Váhom - Žilina*	*1,140.0 EUR million*
Other CNC involved: *Rhine - Danube (Púchov – Žilina)*	**Implementation schedule:** *Start year: 2012* *End year: 2022*	**Project Promoter:** *ŽSR*

The actions consist of the finalisation of ongoing modernisation of railway track from Bratislava Rača to Žilina. The sections Zlatovce – Trenčianská Teplá and Považská Teplá – Žilina were finished on 30th November 2017 and the last section Púchov – Považská Teplá is under construction with planned finalisation till 2020. Modernisation of Žilina railway node and the connecting track to Žilina Teplička freight station and rail-road terminal and to Varín station is planned to run from 2017 till 2022 ERTMS will be deployed, the speed will be increased from current 80-100 km/h to 160 km/h due to new layout of the railway track, all level crossings will be reconstructed to multi-level and maximum train length will be 740 m.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
ERTMS; Freight lines: speed (100 km/h); Freight lines: train length (740m)

Source: Corridor Project List

B. Status of the Existing Infrastructure:

B.1. Description of the existing infrastructure

NA

B.2. Technical parameters of the existing infrastructure

TENTEC ID	SECTION	MS	LINE ID	LENGTH (km)	TRACKS	TRACTION	VOLTAGE	MAX SPEED	MAX GRADIENT	AXLE LOAD (kN)	MAX TRAIN LENGTH
72600	Nove Mesto Nad Vahom <--> Puchov	SK	120	59.0	2	Electrified	25 000 Volts; 50Hz	160	5	225	750
18490	Puchov <--> Zilina	SK	120	43.4	2	Electrified	3 000 Volts; DC	100-160	7	225	650
	TOTAL			**102**	**2**	**Electrified**		**100-160**	**7**	**225**	**650-750**

Source: TENtec 2014, updated by the Contractor to 2015
(*) The value could be lower in some sub-sections

B.3. TEN-T CNC KPIs on the project sections

YEAR	ERTMS (P/F)	ELECTRIFICATION (P/F)	AXLE LOAD (F)	MAX SPEED (F)	TRAIN LENGTH (F)
2013	0%	100%	100%	92%	46%
2015	0%	100%	100%	92%	46%
2016	33%	100%	100%	92%	46%
2017	33%	100%	100%	92%	46%

Source: CNC KPIs

C. Project Implementation

C.1 Project cost

ID	PROJECT TITLE	MS	PROMO TER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1089	Modernisation of railway node Žilina (documentation + construction)	SK	ŽSR	Žilina node and stations Žilina - Teplička nad Varín	Study, Infrastructure (Upgrade), ERTMS	390.0	
1082	Zlatovce – Trenčianska Teplá: railway modernisation	SK	ŽSR	Nove Mesto Nad Vahom <--> Puchov	Infrastructure (Upgrade), ERTMS	245.0	
1085	Považská Teplá – Žilina: railway modernisation to 160 km/h	SK	ŽSR	Puchov <--> Zilina	Infrastructure (Upgrade), ERTMS	126.5	
1087	Púchov - Považská Teplá: railway modernisation to 160 km/h	SK	ŽSR	Puchov <--> Zilina	Infrastructure (Upgrade), ERTMS	374.0	
	TOTAL					**1,140.0**	

Source: Corridor Project List

C.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1089	Modernisation of railway node Žilina (documentation + construction)	SK	2017	2022		concluded	concluded	0%	Land acquisition: Not completed // EIA: EIA approved // Final Approval: submitted, decision pending // CBA: Not performed // Other: NA
1082	Zlatovce – Trenčianska Teplá: railway modernisation	SK	2012	2017		concluded	concluded	85%	Land acquisition: Completed // EIA: EIA completed // Final Approval: NA // CBA: Performed // Other: NA
1085	Považská Teplá – Žilina: railway modernisation to 160 km/h	SK	2014	2017		concluded	concluded	79%	Land acquisition: Completed // EIA: EIA completed // Final Approval: approved // CBA: Performed // Other: NA
1087	Púchov - Považská Teplá: railway modernisation to 160 km/h	SK	2016	2020		concluded	concluded	24%	Land acquisition: Not completed // EIA: EIA approved // Final Approval: approved // CBA: Not performed // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

C.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR) TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1089	Modernisation of railway node Žilina (documentation + construction)	SK	1	390.0	0		
1082	Zlatovce – Trenčianska Teplá: railway modernisation	SK	1	245.0	0		
1085	Považská Teplá – Žilina: railway modernisation to 160 km/h	SK	1	131.0	131.0	131.0	OPT (73.53) OPII (57.47)
1087	Púchov - Považská Teplá: railway modernisation to 160 km/h	SK	1	374.0	0		
	TOTAL			**1,140.0**	**0**		

Source: Corridor Project List

C.4. Other complementary network projects

The section Žilina – Krásno nad Kysucou was already modernised to the speed 140 km/h till 2012, there is the project of Rhine-Danube corridor section Žilina – Košice modernisation being prepared, adjacent subsection from Varín to Vrútky was already partially modernised to 120 km/h and higher capacity till 2014. The electrification system of the section Púchov – Žilina will be switched to 25 kV AC till 2022 and Žilina node and section to Varín till 2025.

Source: Corridor Project List

D. Gap analysis and Implementation Risks

D.1 Level of compliance attained in 2030:

YEAR	ERTMS (P/F)	ELECTRIFICATION (P/F)	AXLE LOAD (F)	MAX SPEED (F)	TRAIN LENGTH (F)
2030	100%	100%	100%	100%	100%

Source: Corridor Project List

D.2 Remaining technical and operational barriers of the infrastructure and implementation risks:

Except for speed limitations at the nodes and on some short sections between Žilina and Púchov, as well as train length and missing ETCS on unmodernised part of the corridor sections, the freight rail network is already compliant; at present it is expected that the network by 2030 will be fully compliant between Čadca and Bratislava with respect to all parameters including the nodes.

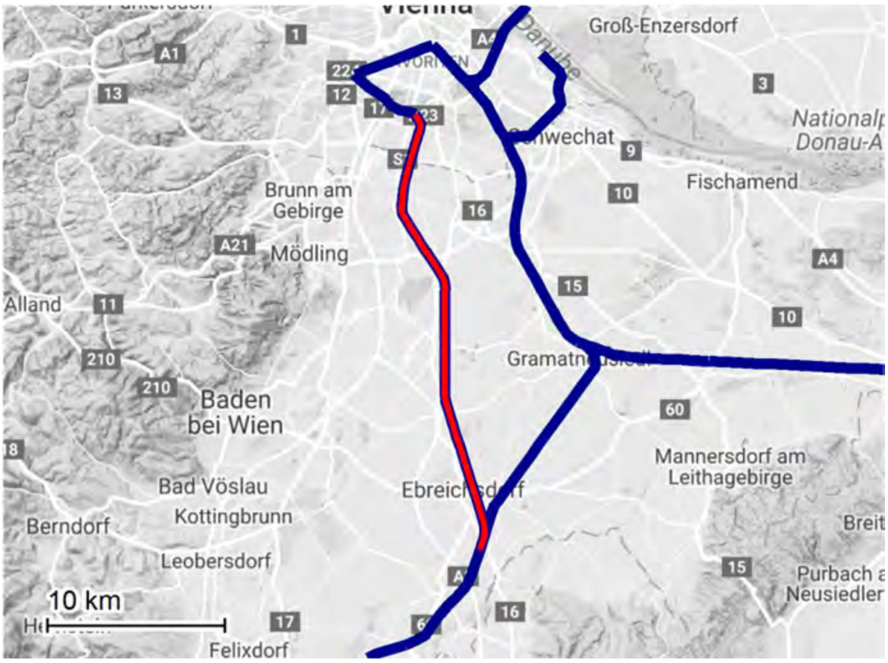
Source: Own assessment based on available information

A. Description of the Action:

A.1. Action Title:

1.3.08 - Upgrading of freight route Wien - Wampersdorf

A.2. Location of the action:



Source: Map data ©2016 Google GeoBasis-DE/BKG (©2009), Google

A.3. Description of the action:

Member States involved:	Section or Node:	Estimated total cost [Mio €]:
Austria	*Wien - Wampersdorf*	*618.2 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
	Start year: 2000 *End year: 2022*	*ÖBB-Infrastruktur AG*

The Pottendorfer line extends from Wien/Meidling via Wampersdorf to Wiener Neustadt. Sections between Wampersdorf and Wiener Neustadt have been upgraded to double tracks previously. The planned action has its focus on the extension to double tracks between Hennersdorf and Wampersdorf and will proceed in two phases. In the first phase the section between Hennersdorf and Münchendorf is expanded. The expansion involves adding a second track as well as station modernizations in Hennersdorf, Achau and Münchendorf and the elimination of all level crossings in the project area. Phase 1 is already in progress and will be completed by the end of 2019. Phase 2, covering the section between Münchendorf and Wampersdorf is expected to be in operation by the end of 2022.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
Electrification; ERTMS; Freight lines: train length (740m); Single track section

Source: Corridor Project List

B. Status of the Existing Infrastructure:

B.1. Description of the existing infrastructure

The current connection between Inzersdorf and Wampersdorf is a single track, electrified section, accommodating train lengths of 650m only. The section is used for both passenger and freight trains. Whereas in 2015 about 5000 freight trains per year have used this section, the number is expected to increase in the wake of the planned opening of the RRT Cargo Centre Vienna South (Inzersdorf) by the end of 2016.

B.2. Technical parameters of the existing infrastructure

TENTEC ID	SECTION	MS	LINE ID	LENGTH (km)	TRACKS	TRACTION	VOLTAGE	MAX SPEED	MAX GRADIENT	AXLE LOAD (kN)	MAX TRAIN LENGTH
19700021	Wien Inzersdorf <--> Wampersdorf	AT	10601	25.7	1	Electrified	15 000 Volts; 16.7 Hz	120	10	225	650
	TOTAL			**25.7**	**1**	**Electrified**		**120**	**10**	**225**	**650**

Source: TENtec 2014, updated by the Contractor to 2017
(*) The value could be lower in some sub-sections

B.3. TEN-T CNC KPIs on the project sections

YEAR	ERTMS (P/F)	ELECTRIFICATION (P/F)	AXLE LOAD (F)	MAX SPEED (F)	TRAIN LENGTH (F)
2013	0%	100%	100%	100%	0%
2015	0%	100%	100%	100%	0%
2016	0%	100%	100%	100%	0%
2017	0%	100%	100%	100%	0%

Source: CNC KPIs

C. Project Implementation

C.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1097	Pottendorf line	AT	ÖBB-Infrastruktur AG	Wien Inzersdorf - Wampersdorf	Study, Infrastructure (Upgrade), Infrastructure (New construction), ERTMS	618.2	valorised costs (2,5%)
1839	Upgrade Wampersdorf - Wiener Neustadt	AT	ÖBB-Infrastruktur AG	Wampersdorf - Wiener Neustadt	Study, Infrastructure (Upgrade), ERTMS	To be defined	valorised costs (2,5%)
	TOTAL					**618.2**	

Source: Corridor Project List

C.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL: L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1097	Pottendorf line	AT	2000	2022			in progress	75%	Land acquisition: Not completed // EIA: EIA under preparation or updating // Final Approval: submitted, decision pending // CBA: Performed // Other: not required
1839	Upgrade Wampersdorf - Wiener Neustadt	AT	2017	2022		concluded		4%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: Performed // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

C.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR)		
					TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1097	Pottendorf line	AT	1	618.2	619.6	618.2 1.4	Rahmenplan 2017-22 TEN-T
1839	Upgrade Wampersdorf - Wiener Neustadt	AT	1	To be defined	52.3	52.3	Rahmenplan 2017-22
	TOTAL			**618.2**	**671.9**		

Source: Corridor Project List

C.4. Other complementary network projects

ERTMS (ETCS Level 2) will be implemented as part of the project.

Source: Corridor Project List

D. Gap analysis and Implementation Risks

D.1 Level of compliance attained in 2030:

YEAR	ERTMS (P/F)	ELECTRIFICATION (P/F)	AXLE LOAD (F)	MAX SPEED (F)	TRAIN LENGTH (F)
2030	100%	100%	100%	100%	100%

Source: Corridor Project List

D.2 Remaining technical and operational barriers of the infrastructure and implementation risks:

The section will be upgraded and compliant with the TEN-T requirements by 2030.

Source: Own assessment based on available information

A. Description of the Action:

A.1. Action Title:

1.3.09 - Station reconfigurations including 740m sidings in Austria between Wien and Graz

A.2. Location of the action:

Source: Map data ©2016 Google GeoBasis-DE/BKG (©2009), Google

A.3. Description of the action:

Member States involved:	Section or Node:	Estimated total cost [Mio €]:
Austria	*Wien - Graz*	*604.4 EUR million*
Other CNC involved:	**Implementation schedule:** *Start year: 2005* *End year: 2023*	**Project Promoter:** *ÖBB-Infrastruktur AG*

This action includes reconfiguration efforts in a sequence of railroad stations on sections between Wien and Bruck a.d. Mur, i.e. Himberg, Ternitz, Wartberg and Frohnleiten, including the implementation of 740m sidings. An upgrade of the section between Wiener Neustadt Main Station and Gloggnitz, the construction of 740m sidings and changes in the tracks to allow speeds of 160 km/h are expected to increase the available capacity.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
Freight lines: train length (740m)

Source: Corridor Project List

B. Project Implementation

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
9461	Reconfiguration of the accessibility of Himberg Station	AT	ÖBB-Infrastruktur AG	Kledering - Gramatneusiedl	Study, Infrastructure (Upgrade),	10.5	valorised costs (2,5%)
1820	Upgrade Wiener Neustadt - Gloggnitz	AT	ÖBB-Infrastruktur AG	Wr.Neustadt - Gloggnitz	Study, Infrastructure (Upgrade),	81.2	valorised costs (2,5%)
1821	Ternitz station reconfiguration	AT	ÖBB-Infrastruktur AG	Ternitz	Study, Infrastructure (Upgrade), OTHER	41.3	valorised costs (2,5%)
1822	Station reconfigurations Mürzzuschlag - Bruck a.d.M.	AT	ÖBB-Infrastruktur AG	Muerzzuschlag - Bruck/Mur	Study, Infrastructure (Upgrade),	116.3	valorised costs (2,5%)
1100	Station reconfigurations Bruck a.d.M - Graz	AT	ÖBB-Infrastruktur AG	Bruck/Mur - Graz	Study, Infrastructure (Upgrade),	204.9	valorised costs (2,5%)
1101	Graz Hauptbahnhof	AT	ÖBB-Infrastruktur AG	Bruck/Mur - Graz	Infrastructure (Upgrade),	150.2	valorised costs (2,5%)
	TOTAL					**604.4**	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
9461	Reconfiguration of the accessibility of Himberg Station	AT	2016	2020	not required	not required	not required	25%	Land acquisition: not required // EIA: not required // Final Approval: not required // CBA: Performed // Other: not required
1820	Upgrade Wiener Neustadt - Gloggnitz	AT	2017	2018				11%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: Performed // Other: not required
1821	Ternitz station reconfiguration	AT	2016	2022		concluded		18%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: Performed // Other: not required
1822	Station reconfigurations Mürzzuschlag - Bruck a.d.M.	AT	2017	2019		concluded		7%	Land acquisition: Not completed // EIA: NA // Final Approval: NA // CBA: Performed // Other: not required
1100	Station reconfigurations Bruck a.d.M - Graz	AT	2005	2023		concluded		64%	Land acquisition: Not completed // EIA: NA // Final Approval: NA // CBA: Performed // Other: not required
1101	Graz Hauptbahnhof	AT	2008	2017		concluded		92%	Land acquisition: Completed // EIA: NA // Final Approval: approved // CBA: Performed // Other: not required

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR) TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
9461	Reconfiguration of the accessibility of Himberg Station	AT	1	10.5	10.5	10.5	Rahmenplan 2016-2021
1820	Upgrade Wiener Neustadt - Gloggnitz	AT	1	81.2	81.2	81.2	Rahmenplan 2017-22
1821	Ternitz station reconfiguration	AT	1	41.3	41.3	41.3	Rahmenplan 2017-22
1822	Station reconfigurations Mürzzuschlag - Bruck a.d.M.	AT	1	116.3	116.3	116.3	Rahmenplan 2017-22
1100	Station reconfigurations Bruck a.d.M - Graz	AT	1	204.9	204.9	204.9	Rahmenplan 2017-22
1101	Graz Hauptbahnhof	AT	1	150.2	150.2	150.2	Rahmenplan 2017-22
	TOTAL			**604.4**	**604.4**		

Source: Corridor Project List

B.4. Other complementary network projects

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Source: Corridor Project List

C. GAP ANALYSIS AND IMPLEMENTATION RISKS

C.1 Remaining technical and operational barriers of the infrastructure and implementation risks:

After implementation of the planned projects, the Baltic – Adriatic corridor infrastructure in Austria is expected to be compliant to the 740 TEN-T requirements.

Source: Own assessment based on available information

A. Description of the Action:

A.1. Action Title:

1.3.10 - Upgrading of the Venezia - Trieste rail line

A.2. Location of the action:

Source: Map data ©2016 Google GeoBasis-DE/BKG (©2009), Google

A.3. Description of the action:

Member States involved: *Italy*	**Section or Node:** *Venezia-Trieste*	**Estimated total cost [Mio €]:** *9,247.0 EUR million*
Other CNC involved:	**Implementation schedule:** *Start year: 2019* *End year: NA*	**Project Promoter:** *RFI S.p.A.*
New High-Speed rail tracks are included in the TEN-T core passenger corridor between Venezia and the border with Slovenia. A detailed design of the new line has been completed in 2010, but the timing of the project implementation is currently not foreseen in the short/medium term, due to the high cost and environmental concerns. An alternative solution is currently under study, envisaging the upgrading of the existing line.		

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
Electrification; Standard track gauge; ERTMS; Freight lines: speed (100 km/h); Freight lines: Axle.load (22.5 t); Current or potential future capacity bottleneck

Source: Corridor Project List

B. Status of the Existing Infrastructure:

B.1. Description of the existing infrastructure

The existing Mestre – Trieste line is a conventional double track electrified line. Whilst the line is generally well performing and of acceptable TEN-T standards, there are capacity issues related to the rail node in Venezia and the access to Trieste. There are also performance and safety limitations due to the existing level crossing on the line. The line is currently not at standard with respect to ERTMS and 740 meters train length.

B.2. Technical parameters of the existing infrastructure

TENTEC ID	SECTION	MS	LINE ID	LENGTH (km)	TRACKS	TRACTION	VOLTAGE	MAX SPEED	MAX GRADIENT	AXLE LOAD (kN)	MAX TRAIN LENGTH
18953	Cervignano A.G. <--> Ronchi dei Legionari Sud	IT	J35;J36	12.74	2	Electrified	3 000 Volts; DC	150	7	225	600
22400032	Ronchi dei Legionari Sud <--> S. Polo Junction	IT	J35;J36	2.20	2	Electrified	3 000 Volts; DC	105	13	225	595
22400033	S.Polo Junction <--> Bivio Aurisina	IT	J35;J36	14.20	2	Electrified	3 000 Volts; DC	105	12	225	600
18962	Venezia Mestre <--> Portoguaro	IT	J35;J36	59.34	2	Electrified	3 000 Volts; DC	150	8	225	650
18902	Portoguaro <--> Cervignano A.G.	IT	J35;J36	42.00	2	Electrified	3 000 Volts; DC	150	9	225	600
	TOTAL			**130**	**2**	**Electrified**		**105-150**	**13**	**225**	**595-650**

Source: TENtec 2014, updated by the Contractor to 2017
(*) The value could be lower in some sub-sections

B.3. TEN-T CNC KPIs on the project sections

YEAR	ERTMS (P/F)	ELECTRIFICATION (P/F)	AXLE LOAD (F)	MAX SPEED (F)	TRAIN LENGTH (F)
2013	0%	100%	100%	100%	0%
2015	0%	100%	100%	100%	0%
2016	0%	100%	100%	100%	0%
2017	0%	100%	100%	100%	0%

Source: CNC KPIs

C. Project Implementation

C.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
3298	New high-speed line Venice-Trieste	IT	RFI S.p.A.	Venice-Trieste (HS)	Study, Infrastructure (New construction),	7,447.0	
3232	Upgrading of Venezia-Trieste railway line (speed up works)	IT	RFI S.p.A.	Venice-Trieste (conventional line)	Study, Infrastructure (Upgrade), Infrastructure (New construction),	1,800.0	
	TOTAL					**9,247.0**	

Source: Corridor Project List

C.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL: L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
3298	New high-speed line Venice-Trieste	IT	2028		concluded	concluded	not started	NA%	Land acquisition: NA // EIA: NA // Final Approval: not submitted yet // CBA: Performed // Other: NA
3232	Upgrading of Venezia-Trieste railway line (speed up works)	IT	2019	2031	concluded	not started	not started	0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: Performed // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

C.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR)		
					TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
3298	New high-speed line Venice-Trieste	IT	1	7,447.0	21.0	12.0 1.0 8.0	CDP Regione FVG TEN
3232	Upgrading of Venezia-Trieste railway line (speed up works)	IT	1	1,800.0	200.0	200.0	CDP
	TOTAL			**9,247.0**	**221.0**		

Source: Corridor Project List

C.4. Other complementary network projects

ERTMS is planned to be deployed under as separate action (1.4.01). Also, compliance to 740m train length standard will be achieved in a dedicated horizontal action (1.3.12).

Source: Corridor Project List

D. GAP ANALYSIS AND IMPLEMENTATION RISKS

D.1 Level of compliance attained in 2030:

YEAR	ERTMS (P/F)	ELECTRIFICATION (P/F)	AXLE LOAD (F)	MAX SPEED (F)	TRAIN LENGTH (F)
2030	100%	100%	100%	100%	100%

Source: Corridor Project List

D.2 Remaining technical and operational barriers of the infrastructure and implementation risks:

The upgrading of the corridor infrastructure to High Speed standard was originally foreseen to be implemented by 2030 but it has been delayed due to financial and permitting issues. The final design concept of this passenger link is yet to be finalized, as an alternative solution of upgrading the existing line is under consideration.

Source: Own assessment based on available information

A. Description of the Action:

A.1. Action Title:

1.3.11 - Upgrading of the BA Corridor freight routes in the Friuli Venezia-Giulia Region

A.2. Location of the action:

Source: Map data ©2016 Google GeoBasis-DE/BKG (©2009), Google

A.3. Description of the action:

Member States involved:	**Section or Node:**	**Estimated total cost [Mio €]:**
Italy	*Tarvisio - Udine - Villa Opicina*	*356.0 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
	Start year: NA *End year: 2030*	*RFI spa*

The action includes investments for the upgrading of the freight routes in the Friuli Venezia Giulia Region. The project is planned to be implemented in phases. In the short term, investments will be focussed on the improvement of freight routes and Udine Node, including new station plan and traffic control and signalling technology for the operation of train traffic. In a second phase, the action also includes the completion of the upgrading to two tracks of the Udine-Cervignano railway line, between Strassoldo - PM Vat.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
Current or potential future capacity bottleneck; Single track section

Source: Corridor Project List

B. STATUS OF THE EXISTING INFRASTRUCTURE:

B.1. Description of the existing infrastructure

The railway corridor infrastructure from the Austrian border to Udine (Linea Pontebbana) was already upgraded in early 2000s to High Capacity standards. South of Udine and up to Cervignano, the line is single-track and compliant to the TEN-T standards, mainly used for regional trains, while international and freight trains to Venice are currently routed on an alternative RFC alignment trough Pordenone and Treviso. In Cervignano, the action covers the lines to Trieste and the Slovenian border. All these sections are compliant to the TEN-T standards, except the cross/border section between Bivio Aurisina and Villa Opicina (which is not compliant for speed).

The entire section is not compliant with the TEN-T standards with respect to ERTMS and maximum train length, which is generally around 600 m.

B.2. Technical parameters of the existing infrastructure

TENTEC ID	SECTION	MS	LINE ID	LENGTH (km)	TRACKS	TRACTION	VOLTAGE	MAX SPEED	MAX GRADIENT	AXLE LOAD (kN)	MAX TRAIN LENGTH
18947	Tarvisio <--> Thoerl-Maglern (border A/I) / Border IT/AT II	IT	J37;J38	5.46	2	Electrified	15 000 Volts; 16.7 Hz	120	2.3	225	0
22400030	Tarvisio <--> Carnia	IT	J37;J38	49.12	2	Electrified	3 000 Volts; DC	160	19	225	625
22400031	Carnia <--> PM VAT	IT	J37;J38	35.18	2	Electrified	3 000 Volts; DC	160	10	225	625
19251	PM VAT <--> Udine	IT	J37;J38	4.49	1	Electrified	3 000 Volts; DC	140	7	225	625
22400196	Udine <--> Privano	IT	K94;K95	17.94	1	Electrified	3 000 Volts; DC	120	9	225	625
22400197	Privano <--> Cervignano A.G.	IT	K94;K95	10.40	1	Electrified	3 000 Volts; DC	120	9	225	625
18953	Cervignano A.G. <--> Ronchi dei Legionari Sud	IT	J35;J36	12.74	2	Electrified	3 000 Volts; DC	150	7	225	600
22400032	Ronchi dei Legionari Sud <--> S.Polo Junction	IT	J35;J36	2.20	2	Electrified	3 000 Volts; DC	105	13	225	595
22400033	S.Polo Junction <--> Bivio Aurisina	IT	J35;J36	14.20	2	Electrified	3 000 Volts; DC	105	12	225	600
	TOTAL			**152**	**1-2**	**Electrified**		**105-160**	**19**	**225**	**0-625**

Source: TENtec 2014, updated by the Contractor to 2017
(*) The value could be lower in some sub-sections

B.3. TEN-T CNC KPIs on the project sections

YEAR	ERTMS (P/F)	ELECTRIFICATION (P/F)	AXLE LOAD (F)	MAX SPEED (F)	TRAIN LENGTH (F)
2013	0%	100%	100%	100%	0%
2015	0%	100%	100%	100%	0%
2016	0%	100%	100%	100%	0%
2017	0%	100%	100%	100%	0%

Source: CNC KPIs

C. Project Implementation

C.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1866	Improvement of freight routes and Udine Node	IT	RFI spa	Tarviso - Udine - Villa Opicina	Study, Infrastructure (Upgrade), Infrastructure (New construction),	186.0	
1123	Completion of the upgrading to two tracks of the Udine-Cervignano railway line	IT	RFI spa	Udine - Cervignano	Study, Infrastructure (Upgrade), Infrastructure (New construction),	170.0	
	TOTAL					356.0	

Source: Corridor Project List

C.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL: L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1866	Improvement of freight routes and Udine Node	IT	2013	2025	concluded	concluded	concluded	33%	Land acquisition: NA // EIA: NA // Final Approval: approved // CBA: Performed // Other: NA
1123	Completion of the upgrading to two tracks of the Udine-Cervignano railway line	IT		2030				NA%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

C.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR): TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1866	Improvement of freight routes and Udine Node	IT	1	186.0	53.0	51.0 2.0	CDP Regione FVG
1123	Completion of the upgrading to two tracks of the Udine-Cervignano railway line	IT	1	170.0	5.0	5.0	CDP
	TOTAL			356.0	58.0		

Source: Corridor Project List

C.4. Other complementary network projects

ERTMS is planned to be deployed under as separate action (1.4.01). Improvement of the sections to allow operating 740m long trains is also foreseen as described in the Action 1.3.12.

Source: Corridor Project List

D. Gap Analysis and Implementation Risks

D.1 Level of compliance attained in 2030:

YEAR	ERTMS (P/F)	ELECTRIFICATION (P/F)	AXLE LOAD (F)	MAX SPEED (F)	TRAIN LENGTH (F)
2030	100%	100%	100%	100%	100%

Source: Corridor Project List

D.2 Remaining technical and operational barriers of the infrastructure and implementation risks:

The section is already compliant to the TEN-T requirements, with the exception of ERTMS and train length, which will be addressed by separate actions. The maturity of the projects included in the first phase of the action (Udine Node) is high, as the main preliminary phases (planning, feasibility and permitting) have been completed.

Source: Own assessment based on available information

A. DESCRIPTION OF THE ACTION:

A.1. Action Title:

1.3.12 - Upgrading maximum train length to 750m in Italy

A.2. Location of the action:

Source: Map data ©2016 Google GeoBasis-DE/BKG (©2009), Google

A.3. Description of the action:

Member States involved:	Section or Node:	Estimated total cost [Mio €]:
Italy	*Baltic-Adriatic Corridor Railway Infrastructure*	*180.0 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
	Start year: NA *End year: 2026*	*RFI S.p.A., RFI spa*
The action aims at upgrading equipment and sidings at stations in order to allow operating 740m long trains on the Baltic-Adriatic corridor infrastructure.		

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
Freight lines: train length (740m)

Source: Corridor Project List

B. Project Implementation

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
3240	All Italian corridor sections: Upgrade of train length to 740 m	IT	RFI S.p.A.	All corridor sections	Study, Infrastructure (Upgrade),	100.0	
1107	Works to allow train length operation to 750 m along the corridor	IT	RFI spa	CNC lines	Study, Infrastructure (Upgrade),	80.0	
	TOTAL					**180.0**	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
3240	All Italian corridor sections: Upgrade of train length to 740 m	IT	2013	2021				43%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1107	Works to allow train length operation to 750 m along the corridor	IT		2026				NA%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR) TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
3240	All Italian corridor sections: Upgrade of train length to 740 m	IT	1	100.0	0.0		
1107	Works to allow train length operation to 750 m along the corridor	IT	1	80.0	0.0		
	TOTAL			**180.0**	**0.0**		

Source: Corridor Project List

B.4. Other complementary network projects

-

Source: Corridor Project List

C. Gap Analysis and Implementation Risks

C.1 Remaining technical and operational barriers of the infrastructure and implementation risks:

As a result of the completion of this action, the Baltic-Adriatic corridor sections in Italy will be compliant to the TEN-T standard concerning maximum train length.

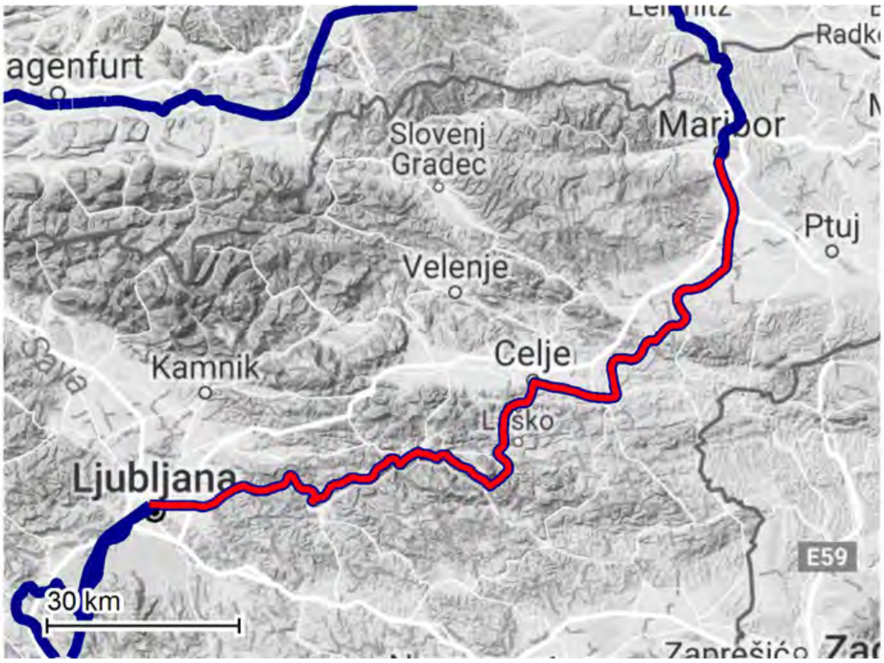
Source: Own assessment based on available information

A. Description of the Action:

A.1. Action Title:

1.3.13 - Upgrading of the Ljubljana - Pragersko - Maribor rail line

A.2. Location of the action:



Source: Map data ©2016 Google GeoBasis-DE/BKG (©2009), Google

A.3. Description of the action:

Member States involved:	Section or Node:	Estimated total cost [Mio €]:
Slovenia	*Ljubljana - Pragersko - Maribor*	*450.0 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
	Start year: 2012 *End year: 2030*	*Ministry of infrastructure*

The action includes projects for the upgrading of the existing lines and upgrading of stations along the line: upgrading of the railway hub Pragersko to meet the required TEN-T standards regarding interoperability (first phase), upgrading of railway line on the section Poljčane - Slovenska Bistrica and railway stations Poljčane and Slovenska Bistrica, assuring D4 down the whole section Zidani Most – Celje and upgrading and reconstruction of the section Ljubljana - Zidani Most.

The target of the action is to assure achievement of the D4 standard, increase of throughput and capacity of the line, improve the operating speed and enable the use of longer trains up to 740m.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
Freight lines: speed (100 km/h); Freight lines: Axle.load (22.5 t); Freight lines: train length (740m); Current or potential future capacity bottleneck

Source: Corridor Project List

B. Status of the Existing Infrastructure:

B.1. Description of the existing infrastructure

Section Ljubljana – Zidani Most: Maximum axle load on the track is D3 (except Zagorje–Sava (right track), Sava–Litija (right track); on 40% of the track, maximum operating speed is lower than 100km/h; Gabarit profile is not assured, track is only partially equipped with train block system.

Section Zidani Most – Pragersko: Maximum axle load on the track is C3 or D4, operating speed is 80 km/h.

Section Pragersko – Maribor: Maximum axle load on the track is C3 or D4, maximum operating speed is 120 km/h.

B.2. Technical parameters of the existing infrastructure

TENTEC ID	SECTION	MS	LINE ID	LENGTH (km)	TRACKS	TRACTION	VOLTAGE	MAX SPEED	MAX GRADIENT	AXLE LOAD (kN)	MAX TRAIN LENGTH
18177	Zidani Most <--> Pragersko	SI	30 (E67)	73.2	2	Electrified	3 000 Volts; DC	80	9	200	597
18186	Maribor <--> Pragersko	SI	30 (E67)	18.7	2	Electrified	3 000 Volts; DC	120	9	225	597
18190	Zidani Most <--> Ljubljana	SI	10 (E70)	63.9	2	Electrified	3 000 Volts; DC	100	4	225	570
	TOTAL			**156**	**2**	**Electrified**		**80-120**	**9**	**200-225**	**570-597**

Source: TENtec 2014, updated by the Contractor to 2017
(*) The value could be lower in some sub-sections

B.3. TEN-T CNC KPIs on the project sections

YEAR	ERTMS (P/F)	ELECTRIFICATION (P/F)	AXLE LOAD (F)	MAX SPEED (F)	TRAIN LENGTH (F)
2013	0%	100%	59%	28%	0%
2015	88%	100%	66%	28%	0%
2016	88%	100%	68%	38%	0%
2017	88%	100%	68%	38%	0%

Source: CNC KPIs

C. Project Implementation

C.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1903	Railway station Pragersko - Upgrading of the railway hub to meet the required TEN-T standards regarding interoperability (first phase)	SI	Ministry of infrastructure	Pragersko Station	Study, Infrastructure (Upgrade),	78.1	first phase
1134	Upgrading of railway line on the section Poljčane - Slovenska Bistrica and railway stations Poljčane and Slovenska Bistrica	SI	Ministry of infrastructure	Poljčane - Slovenska Bistrica Poljčane Station Slovenska Bistrica Station	Infrastructure (Upgrade),	58.7	confirmed investment program
1136	Assuring D4 down the whole section Zidani Most - Celje	SI	Ministry of infrastructure	Zidani Most - Celje	Infrastructure (Upgrade),	239.7	source: approved investment program VAT = 292,74 mio EUR
1137	Upgrading and reconstruction of the section Ljubljana - Zidani Most	SI	Ministry of infrastructure	Ljubljana - Zidani Most stations: Hrastnik, Zagorje, Trbovlje, Sava, Litija, Kresnice,	Study, Infrastructure (Upgrade),	To be defined	
1942	Introduction of traffic remote control on a section of railway line Zidani Most-Ljubljana	SI	Ministry of infrastructure	Zidani Most-Ljubljana (up to and including station Laze)	Study, OTHER	73.5	
	TOTAL					**450.0**	

Source: Corridor Project List

C.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1903	Railway station Pragersko - Upgrading of the railway hub to meet the required TEN-T standards regarding interoperability (first phase)	SI	2012	2020	in progress	in progress	in progress	58%	Land acquisition: Not completed // EIA: EIA under preparation or updating // Final Approval: NA // CBA: Not performed // Other: NA
1134	Upgrading of railway line on the section Poljčane - Slovenska Bistrica and railway stations Poljčane and Slovenska Bistrica	SI	2016	2019	concluded	concluded	concluded	31%	Land acquisition: Completed // EIA: EIA completed // Final Approval: submitted, decision pending // CBA: Performed // Other: NA
1136	Assuring D4 down the whole section Zidani Most - Celje	SI	2017	2020	concluded	concluded	concluded	6%	Land acquisition: NA // EIA: EIA completed // Final Approval: approved // CBA: Performed // Other: NA
1137	Upgrading and reconstruction of the section Ljubljana - Zidani Most	SI	2015	2030	not started	not started	not started	14%	Land acquisition: NA // EIA: NA // Final Approval: not submitted yet // CBA: Performed // Other: NA
1942	Introduction of traffic remote control on a section of railway line Zidani Most-Ljubljana	SI	2017	2023	concluded	concluded	concluded	1%	Land acquisition: Completed // EIA: NA // Final Approval: NA // CBA: Performed // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

C.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR) TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1903	Railway station Pragersko - Upgrading of the railway hub to meet the required TEN-T standards regarding interoperability (first phase)	SI	1	78.1	0		
1134	Upgrading of railway line on the section Poljčane - Slovenska Bistrica and railway stations Poljčane and Slovenska Bistrica	SI	1	58.7	58.7	23.7 18.4 16.6	MzI CEF NA
1136	Assuring D4 down the whole section Zidani Most - Celje	SI	1	239.7	239.7	165.5 74.2	MzI CEF
1137	Upgrading and reconstruction of the section Ljubljana - Zidani Most	SI	1	To be defined	0		
1942	Introduction of traffic remote control on a section of railway line Zidani Most-Ljubljana	SI	1	73.5	73.5	73.5	MZI
	TOTAL			**450**	**371.9**		

Source: Corridor Project List

C.4. Other complementary network projects

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Source: Corridor Project List

D. Gap analysis and Implementation Risks

D.1 Level of compliance attained in 2030:

YEAR	ERTMS (P/F)	ELECTRIFICATION (P/F)	AXLE LOAD (F)	MAX SPEED (F)	TRAIN LENGTH (F)
2030	100%	100%	100%	100%	100%

Source: Corridor Project List

D.2 Remaining technical and operational barriers of the infrastructure and implementation risks:

The planned projects are deemed to improve speed parameters on the corridor sections and additional investments may be considered to further improve the standards of the infrastructure towards the targets set in the TEN-T Regulation. the corridor is expected to be compliant by 2030.

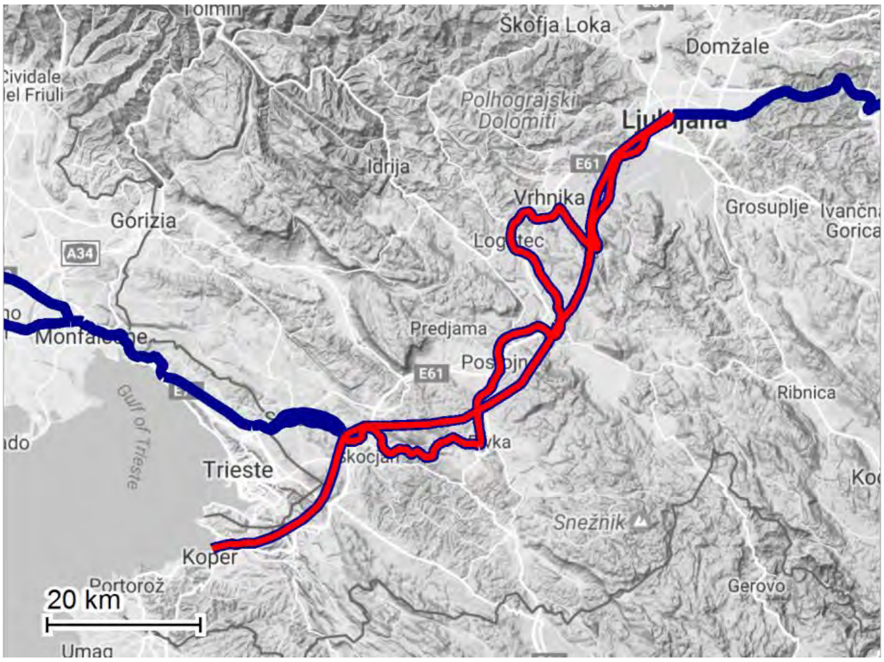
Source: Own assessment based on available information

A. Description of the Action:

A.1. Action Title:

1.3.14 - Upgrading of the Koper - Ljubljana rail line

A.2. Location of the action:



Source: Map data ©2016 Google GeoBasis-DE/BKG (©2009), Google

A.3. Description of the action:

Member States involved: *Slovenia*	**Section or Node:** *Koper - Ljubljana*	**Estimated total cost [Mio €]:** *1,054.3 EUR million*
Other CNC involved:	**Implementation schedule:** *Start year: 2013* *End year: 2025*	**Project Promoter:** *Ministry of infrastructure*

Works are required to improve the standards of the network particularly with respect to speed and train length. Studies are completed for the improvement and upgrading of the section between Ljubljana and Divača, the works are expected to be undertaken after 2020 for completion by 2030 at the latest. The modernisation of the existing track between Koper and Divača was recently completed; works for the elimination of technical bottleneck at Bivje are on-going, to be completed by 2020 (21.4 € million). Studies for the construction of the second track on the line Koper – Divača have been recently completed; the works are planned for implementation in the period 2017-2025 to solve capacity bottlenecks on the existing line in support of the planned expansion of the port infrastructure (960 € million).

The target of the project is to increase the capacity and performance of the line, reducing travel times, by increasing the operating speed as well as improve safety and traffic management. Works for the upgrading of the existing track (creation of siding, pax tracks, extra tracks) are on-going and construction of the 2nd track (new line, tunnels, bridges) is expected to be completed by 2025.

All planned railways in Slovenia will be designed for conventional railway speeds of up to 160 km/h, construction of high speed rail is not planned (high-speed railway transport is prove to be not economically viable as shown in feasibility study financed by EU).

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
Electrification; Standard track gauge; ERTMS; Freight lines: speed (100 km/h); Freight lines: Axle.load (22.5 t); Freight lines: train length (740m); Current or potential future capacity bottleneck; Strong incline; Single track section

Source: Corridor Project List

B. STATUS OF THE EXISTING INFRASTRUCTURE:

B.1. Description of the existing infrastructure

The existing one-track line between Divača and Koper does not meet the standards set in the TEN-T regulation for speed. On the section Divača–Ljubljana, the maximum axle load is 22.5 t/axle; on the majority of the line (87%) maximum operating speed for freight is lower than 100km/h; Gabarit profile is not assured, block system is not available on some parts of the line.

With reference to the analysis of the available capacity, it is worth noting that on the section Koper-Ljubljana, specific capacity issues exist due to poor technical parameters of the infrastructure limiting the capacity below the theoretical level allowed by the number of tracks. This is for instance the case of the single track section Koper – Divača, where capacity is constrained by strong gradient and limited availability of power. On the double track section Divača-Ljubljana capacity is also constrained by limitations in the command & control and train block system. Therefore, in case the planned improvements are not timely implemented on the line, the available residual capacity might be exhausted in the near future, should freight traffic growth continue at today's pace.

B.2. Technical parameters of the existing infrastructure

TENTEC ID	SECTION	MS	LINE ID	LENGTH (km)	TRACKS	TRACTION	VOLTAGE	MAX SPEED	MAX GRADIENT	AXLE LOAD (kN)	MAX TRAIN LENGTH
18183	Pivka <--> Ljubljana	SI	50 (E70)	81.2	2	Electrified	3 000 Volts; DC	100	12	225	600
18197	Divaca <--> Koper	SI	60;62 (E69)	48.0	1	Electrified	3 000 Volts; DC	70	25	225	740
18193	Divaca <--> Pivka	SI	50 (E70)	22.5	2	Electrified	3 000 Volts; DC	80	8	225	600
	TOTAL			152	1-2	Electrified		70-100	25	225	600-740

Source: TENtec 2014, updated by the Contractor to 2017
(*) The value could be lower in some sub-sections

B.3. TEN-T CNC KPIs on the project sections

YEAR	ERTMS (P/F)	ELECTRIFICATION (P/F)	AXLE LOAD (F)	MAX SPEED (F)	TRAIN LENGTH (F)
2013	0%	100%	100%	13%	0%
2015	100%	100%	100%	13%	46%
2016	100%	100%	100%	13%	46%
2017	100%	100%	100%	13%	46%

Source: CNC KPIs

C. PROJECT IMPLEMENTATION

C.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1141	Verification of reconstruction or upgrading of the track Ljubljana – Divača, 2. phase	SI	Ministry of infrastructure	Ljubljana - Divača	Study, Infrastructure (Upgrade),	To be defined	
1941	Upgrading the railway line between Ljubljana and Divača, 1 phase	SI	Ministry of infrastructure	Ljubljana - Divača	Study, Infrastructure (Upgrade),	72.8	
1906	Identification of additional measures for upgrading (increase abilities) of the existing line Divača-Koper	SI	Ministry of infrastructure	Divača - Koper	Study,	0.1	
1143	Construction of the 2nd track Divača-Koper	SI	Ministry of infrastructure	Divača - Koper	Infrastructure (New construction), ERTMS	960.0	Application CEF 2014-2020
1907	Elimination of bottleneck Bivje on the railway section Divača-Koper	SI	Ministry of infrastructure	Divača - Koper	Infrastructure (Rehabilitation), Infrastructure (Upgrade), Infrastructure (New construction),	21.4	
	TOTAL					1,054.3	

Source: Corridor Project List

C.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1141	Verification of reconstruction or upgrading of the track Ljubljana - Divača	SI	2013	2023				38%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1941	Upgrading the railway line between Ljubljana and Divača	SI	2017	2023	concluded	concluded	concluded	1%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: Performed // Other: NA
1906	Identification of additional measures for upgrading (increase abilities) of the existing line Divača-Koper	SI	2016	2017		in progress		98%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1143	Construction of the 2nd track Divača-Koper	SI	2017	2025	concluded	concluded	concluded	0%	Land acquisition: Completed // EIA: EIA completed // Final Approval: NA // CBA: Performed // Other: NA
1907	Elimination of bottleneck Bivje on the railway section Divača-Koper	SI	2016	2020				19%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

C.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR) TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1141	Verification of reconstruction or upgrading of the track Ljubljana - Divača	SI	1	To be defined	0		
1941	Upgrading the railway line between Ljubljana and Divača	SI	1	72.8	15.6	15.6	MzI
1906	Identification of additional measures for upgrading (increase abilities) of the existing line Divača-Koper	SI		0.1	0.05	0.05	Mzi
1143	Construction of the 2nd track Divača-Koper	SI	1	960.0	0		
1907	Elimination of bottleneck Bivje on the railway section Divača-Koper	SI	1	21.4	21.4	3.2 18.2	Mzi EU
	TOTAL			1,054.3	37.1		

Source: Corridor Project List

C.4. Other complementary network projects

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Source: Corridor Project List

D. Gap Analysis and Implementation Risks

D.1 Level of compliance attained in 2030:

YEAR	ERTMS (P/F)	ELECTRIFICATION (P/F)	AXLE LOAD (F)	MAX SPEED (F)	TRAIN LENGTH (F)
2030	100%	100%	100%	100%	100%

Source: Corridor Project List

D.2 Remaining technical and operational barriers of the infrastructure and implementation risks:

The planned projects are deemed to improve speed parameters on the corridor sections and additional investments may be considered to further improve the standards of the infrastructure towards the targets set in the TEN-T Regulation. The corridor is expected to be compliant by 2030.

Source: Own assessment based on available information

A. Description of the Action:

A.1. Action Title:

1.4.01 - ERTMS deployment on the Baltic - Adriatic corridor

A.2. Description of the action:

Member States involved:	**Section or Node:**	**Estimated total cost [Mio €]:**
Poland , Czech Republic, Austria, Italy, Slovenia	*BA Corridor in Poland, Czech Republic, Austria, Italy and Slovenia (Pragersko - Maribor - State Border)*	*1,470.3 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
NSB,OEM,RD,Med,Scan-Med	*Start year: NA* *End year: 2030*	*PKP Polskie Linie Kolejowe S.A., SŽDC, ÖBB-Infrastruktur AG, RFI S.p.A., Ministry of infrastructure*

Significant progresses have been made regarding the instalment of ERTMS related technology on the BA Corridor since the inception of the new TEN-T policy early 2014. 23 investments, totalling about 1.5 € billion are included in the BA Corridor project list which will significantly contribute to the achievement of the goal of the TEN-T Regulation in terms of deployment of ERTMS on the core network by 2030.

- In Poland ETCS Level 1 was installed on the Eastern branch of the corridor, section CMK Grodzisk Mazowiecki – Zawiercie in 2014 (12.40 € million). The works for the modernisation of railway line E65/C-E65 on the section Gdynia – Warszawa which are planned for completion by mid of 2018 also include ETCS Level 2 instalment (142 € million). The ongoing modernisation of the railway line Warszawa – Łódź on the section Warszawa Zachodnia – Grodzisk Mazowiecki foresees ERTMS technology implementation works expected to be completed by mid of 2018. ETCS Level 2 is furthermore planned to be installed on the E59 between Wronki – Słonice as part of the works for the modernisation of the line, expected to be undertaken between 2020-2023. On railway line E30, section Legnica – Wrocław – Opole, ETCS Level 2 is expected to be installed by 2018 (26.46 € million). Works for the modernisation of the main passenger lines E30 and E65 in the Śląsk area (on section Będzin – Sosnowiec – Katowice – Katowice Ligota, without specified time schedule), include the instalment of the Remote Train Control system in view of future deployment of ETCS Level 2, subject to definition and confirmation of the National Plan for the Implementation of the Technical Specification for Interoperability "CCS". Finally, horizontal actions aiming at constructing ERTMS/ETCS on core TEN-T network lines as well as GSM-R on PKP PLK S.A. railway lines are also foreseen. The scope of the ERTMS/ETCS covers several national sections including sections Szczecin Dąbie – Poznań – Wrocław and Wrocław – Katowice, expected to be completed by 2023 (0.4 € billion). The scope of the GSM-R project covers the whole country network, approximately 13,800 km of railway lines, including all Baltic-Adriatic corridor lines, except the sections Gdynia – Warszawa – Grodzisk Mazowiecki and Wrocław – Brzeg – Opole, on which GSM-R is implemented as part of the ongoing works to be completed by 2018 (0.7 € billion). The National Plan for the Implementation of the Technical Specification for Interoperability "CCS" approved in June 2017, foresees implementation of ERTMS on all corridor lines. Investments are however missing on the corridor project list for the implementation of ERTMS on the Central branch of the corridor between Tczew and Bytom, on the section Opole Groszowice – Rudziniec Gliwicki on the main itinerary Wrocław – Katowice as well as on the cross-border sections between Poland and the Czech Republic, Opole Groszowice – Kędzierzyn Koźle – Racibórz – Chałupki and Katowice – Pszczyna – Most Wisła – Zebrzydowice – state border, and on the cross-border section between Poland and Slovakia, Most Wisła – Żywiec – Zwardoń.
- In the Czech Republic GSM-R is in operation on the entire corridor excluding the section Brno – Přerov. ETCS Level 2 is envisaged to be deployed on the same corridor sections by 2018. Works are ongoing on the sections between the border PL/CZ – Petrovice u Karviné – Ostrava – Přerov – Břeclav – border CZ/AT (24.1 € million). The railway line Brno – Břeclav is already equipped with ETCS Level 2 since March 2017, but it is still at the testing phase. The section Brno – Přerov and the Brno node will be equipped with ETCS Level 2 as part of the projects for the modernisation of the respective infrastructure by 2024 and by 2030.
- In Slovakia GSM-R is in operation between Bratislava and Žilina. The Púchov – Trenčianska Teplá and Zlatovce – Bratislava sections are equipped with ETCS Level 1. ETCS Level 2 is installed on the Žilina – Čadca railway line. Deployment of ERTMS on the remaining sections of the corridor is planned as part of the improvement and upgrading works of the national rail infrastructure. ETSC Level 1 will be deployed on the section Zlatovce – Trenčianská Teplá by the end of 2017 and on the section Púchov – Žilina by 2020. Deployment of ETCS Level 2 at the Bratislava node is planned for completion by 2030 as part of the modernisation of the node, also including cross-border sections between Devínska Nová Ves (SK) – Marchegg (AT) and Petržalka (SK) – Kittsee (AT). There is no investment currently planned for the deployment of ERTMS at the cross-border section Čadca – Skalité, although ETCS Level 2 is foreseen to be deployed.

- In Austria GSM-R is pervasive on all sections of the corridor, whereas ETCS Level 2 is installed so far only on the subsections connecting Bernhardsthal to Wien's main station. According to the investment plans of ÖBB Infra, other sections of the Baltic-Adriatic Corridor, Pottendorf/Wien – Wampersdorf and Graz – Klagenfurt (Koralm railway line), will be ETCS Level 2 compliant in 2023 and the section comprising the Semmering tunnel will be ready by 2026. Investments are included in the Baltic-Adriatic corridor list which cover the entire axis; whilst the costs for these investments are still to be defined, it is assumed that ERTMS technology will be installed by 2030 on all corridor sections.
- In Italy ETCS Level 1 or Level 2 are foreseen to be implemented on the sections between Padova and Villa Opicina by 2020 and on the remaining sections of the corridor by 2030 (217 € million). These investments are part of a wider project also including sections/nodes located on and/or common to the Mediterranean, Scandinavian-Mediterranean and Rhine-Alpine corridors. ERTMS on the cross-border section between Villa Opicina, Sezana and the border with Slovenia will be installed as part of the upgrading of the cross-border section.
- In Slovenia, with the exception of railway line Pragersko – Maribor – Sentilj/Spielfeld – Strass (border AT/SI), ETCS Level 1 technology is currently installed on the corridor sections of the Baltic-Adriatic Corridor. Works for GSM-R instalment on the entire corridor have been completed by September 2016. ETCS Level 1 on the Pragersko – Maribor – Šentilj section is currently planned to be installed by 2022 (7.5 € million).

Source: Corridor Project List

A.3. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
ERTMS; Current or potential future capacity bottleneck

Source: Corridor Project List

B. Project Implementation

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1406	Modernisation of railway line E30, phase II. Implementation of ERTMS/ETCS and ERTMS/GSM-R in Poland on section Legnica - Wrocław - Opole	PL	PKP Polskie Linie Kolejowe S.A.	Wrocław - Opole	ERTMS	26.5	with buget for risks
1404	Modernisation of railway line E65/C-E65 on section Warszawa - Gdynia in the scope of supreme layer of LCC, ETRMS/ETCS/GSM-R, DSAT and traction power supply	PL	PKP Polskie Linie Kolejowe S.A.	Gdynia - Warszawa	ERTMS	142.0	with buget for risks
1057	Construction of ERTMS/ETCS on core TEN-T network lines	PL	PKP Polskie Linie Kolejowe S.A.	horizontal	ERTMS	356.8	Total value in the National Railway Programme [PLN]
1409	Construction of GSM-R infrastructure on railway lines according to the schedule from the ERTMS National Implementation Programme, phase I - preparatory works	PL	PKP Polskie Linie Kolejowe S.A.	horizontal	ERTMS	0.05	with buget for risks
1530	Construction of GSM-R infrastructure on PKP PLK S.A. railway lines according to the ERTMS National Implementation Programme	PL	PKP Polskie Linie Kolejowe S.A.	horizontal	ERTMS	670.2	Total value in the National Railway Programme
1009	ETCS Petrovice u Karvine - Ostrava - Prerov - Breclav	CZ	SŽDC	Petrovice u Karvine <--> Ostrava <--> Prerov <--> Breclav	ERTMS	24.1	CEF - Recommended total eligible costs [CEF Brochure]
1807	ETCS deployment Wien - Süßenbrunn	AT	ÖBB-Infrastruktur AG	Wien - Suessenbrunn	ERTMS	16.4	valorised costs (2,5%)
9464	ETCS deployment in ETCS gap between Westbahn and Ostbahn	AT	ÖBB-Infrastruktur AG	Wien Node	ERTMS	9.8	valorised costs (2,5%)
1838	ERTMS deployment Wien – Marchegg	AT	ÖBB-Infrastruktur AG	Wien – Marchegg	ERTMS	To be defined	
9414	ERTMS deployment Wien – Parndorf	AT	ÖBB-Infrastruktur AG	Wien – Parndorf	ERTMS	To be defined	
9415	ERTMS deployment Parndorf – Kittsee / Petrzalka (border AT/SK)	AT	ÖBB-Infrastruktur AG	Parndorf – Kittsee / Petrzalka (border AT/SK)	ERTMS	To be defined	
1837	ERTMS deployment Wampersdorf – Gramatneusiedl	AT	ÖBB-Infrastruktur AG	Wampersdorf – Gramatneusiedl	ERTMS	To be defined	
1836	ERTMS deployment Wampersdorf – Wien	AT	ÖBB-Infrastruktur AG	Wampersdorf – Wien	ERTMS	To be defined	

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1835	ERTMS deployment Wr. Neustadt – Wampersdorf	AT	ÖBB-Infrastruktur AG	Wr. Neustadt – Wampersdorf	ERTMS	To be defined	
1834	ERTMS deployment Graz – Wr. Neustadt	AT	ÖBB-Infrastruktur AG	Graz – Wr. Neustadt	ERTMS	To be defined	
1842	ERTMS deployment Werndorf – Graz	AT	ÖBB-Infrastruktur AG	Werndorf – Graz	ERTMS	To be defined	
1833	ERTMS deployment Sentilj / Spielfeld-Strass (border AT/SLO) – Werndorf	AT	ÖBB-Infrastruktur AG	ERTMS deployment Sentilj / Spielfeld-Strass (border AT/SLO) – Werndorf	ERTMS	To be defined	
1841	ERTMS deployment Klagenfurt – Werndorf	AT	ÖBB-Infrastruktur AG	Klagenfurt – Werndorf	ERTMS	To be defined	
1840	ERTMS deployment Border AT/IT – Klagenfurt	AT	ÖBB-Infrastruktur AG	Thoerl-Maglern (border A/I) / Border IT/AT II - Klagenfurt	ERTMS	To be defined	
3644	Enhancement of signalling system to ERTMS	IT	RFI S.p.A.	Vicenza - Trieste/ Villa Opicina	ERTMS	57.0	
3645	Enhancement of signalling system to ERTMS	IT	RFI S.p.A.	Novara - Padova - Venezia Mestre	ERTMS	48.0	
3646	Enhancement of signalling system to ERTMS	IT	RFI S.p.A.	All corridor sections	ERTMS	112.0	
1908	Signalling enhancement (ERTMS/ETCS…) and implementation of the ETCS level 1 - Pragersko-Šentilj-state border	SI	Ministry of infrastructure	Pragersko - Šentilj - State Border	ERTMS	7.5	CEF Recommended total eligible costs
	TOTAL					1,470.3	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL: L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1406	Modernisation of railway line E30, phase II. Implementation of ERTMS/ETCS and ERTMS/GSM-R in Poland on section Legnica - Wrocław - Opole	PL	2014	2018	concluded	concluded	concluded	65%	Land acquisition: Completed // EIA: EIA approved // Final Approval: approved // CBA: Performed // Other: NA
1404	Modernisation of railway line E65/C-E65 on section Warszawa - Gdynia in the scope of supreme layer of LCC, ETRMS/ETCS/GSM-R, DSAT and traction power supply	PL	2008	2018	not started	concluded	concluded	88%	Land acquisition: Completed // EIA: EIA approved // Final Approval: approved // CBA: Performed // Other: NA
1057	Construction of ERTMS/ETCS on core TEN-T network lines	PL	2019	2023	concluded	concluded	in progress	0%	Land acquisition: Not completed // EIA: EIA under preparation or updating // Final Approval: submitted, decision pending // CBA: Performed // Other: NA
1409	Construction of GSM-R infrastructure on railway lines according to the schedule from the ERTMS National Implementation Programme, phase I - preparatory works	PL	2014	2016		concluded		NA%	Land acquisition: NA // EIA: NA // Final Approval: approved // CBA: Performed // Other: NA
1530	Construction of GSM-R infrastructure on PKP PLK S.A. railway lines according to the ERTMS National Implementation Programme	PL	2017	2023	concluded	concluded	concluded	0%	Land acquisition: Not completed // EIA: EIA completed // Final Approval: submitted, decision pending // CBA: Performed // Other: NA
1009	ETCS Petrovice u Karvine - Ostrava - Prerov - Breclav	CZ	2016	2018	concluded	concluded		48%	Land acquisition: NA // EIA: NA // Final Approval: approved // CBA: Performed // Other: NA
1807	ETCS deployment Wien - Süßenbrunn	AT	2010	2017		concluded		90%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: Performed // Other: not required
9464	ETCS deployment in ETCS gap between Westbahn and Ostbahn	AT	2015	2019	not required	concluded	not required	45%	Land acquisition: not required // EIA: not required // Final Approval: not required // CBA: Performed // Other: not required
1838	ERTMS deployment Wien – Marchegg	AT		2030				NA%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
9414	ERTMS deployment Wien – Parndorf	AT		2022				NA%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
9415	ERTMS deployment Parndorf – Kittsee / Petrzalka (border AT/SK)	AT		2030				NA%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1837	ERTMS deployment Wampersdorf – Gramatneusiedl	AT		2023				NA%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1836	ERTMS deployment Wampersdorf – Wien	AT		2023				NA%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1835	ERTMS deployment Wr. Neustadt – Wampersdorf	AT		2023				NA%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1834	ERTMS deployment Graz – Wr. Neustadt	AT		2030				NA%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1842	ERTMS deployment Werndorf – Graz	AT		2023				NA%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1833	ERTMS deployment Sentilj / Spielfeld-Strass (border AT/SLO) – Werndorf	AT		2023				NA%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1841	ERTMS deployment Klagenfurt – Werndorf	AT		2023				NA%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1840	ERTMS deployment Border AT/IT – Klagenfurt	AT		2030				NA%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
3644	Enhancement of signalling system to ERTMS	IT	2017	2020				6%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: Performed // Other: NA
3645	Enhancement of signalling system to ERTMS	IT	2017	2020				6%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: Performed // Other: NA
3646	Enhancement of signalling system to ERTMS	IT		2030				NA%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1908	Signalling enhancement (ERTMS/ETCS…) and implementation of the ETCS level 1 - Pragersko-Šentilj-state border	SI	2017	2022				4%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR) TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1406	Modernisation of railway line E30, phase II. Implementation of ERTMS/ETCS and ERTMS/GSM-R in Poland on section Legnica - Wrocław - Opole	PL	1	26.5	26.5	6.7 19.8	national funds OPIE 2007 - 2013
1404	Modernisation of railway line E65/C-E65 on section Warszawa - Gdynia in the scope of supreme layer of LCC, ETRMS/ETCS/GSM-R, DSAT and traction power supply	PL	1	142.0	142.0	26.4 115.6	national funds OPIE 2014-2020 OPIE 2007-2013
1057	Construction of ERTMS/ETCS on core TEN-T network lines	PL	1	356.8	356.8	53.5 303.3	national funds CEF - Cohesion Call
1409	Construction of GSM-R infrastructure on railway lines according to the schedule from the ERTMS National Implementation Programme, phase I - preparatory works	PL		0.05	0.05	0.05	national funds
1530	Construction of GSM-R infrastructure on PKP PLK S.A. railway lines according to the ERTMS National Implementation Programme	PL	1	670.2	345.6	345.6	national funds
1009	ETCS Petrovice u Karvine - Ostrava - Prerov - Breclav	CZ	1	24.1	24.1	7.2 16.9	SFDI CEF
1807	ETCS deployment Wien - Süßenbrunn	AT	1	16.4	16.4	16.4	Rahmenplan 2016-21
9464	ETCS deployment in ETCS gap between Westbahn and Ostbahn	AT	1	9.8	9.8	9.8	Rahmenplan 2016-2021
1838	ERTMS deployment Wien – Marchegg	AT	1	To be defined	0		

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR)		
					TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
9414	ERTMS deployment Wien – Parndorf	AT	1	To be defined	0		
9415	ERTMS deployment Parndorf – Kittsee / Petrzalka (border AT/SK)	AT	1	To be defined	0		
1837	ERTMS deployment Wampersdorf – Gramatneusiedl	AT	1	To be defined	0		
1836	ERTMS deployment Wampersdorf – Wien	AT	1	To be defined	0		
1835	ERTMS deployment Wr. Neustadt – Wampersdorf	AT	1	To be defined	0		
1834	ERTMS deployment Graz – Wr. Neustadt	AT	1	To be defined	0		
1842	ERTMS deployment Werndorf – Graz	AT	1	To be defined	0		
1833	ERTMS deployment Sentilj / Spielfeld-Strass (border AT/SLO) – Werndorf	AT	1	To be defined	0		
1841	ERTMS deployment Klagenfurt – Werndorf	AT	1	To be defined	0		
1840	ERTMS deployment Border AT/IT – Klagenfurt	AT	1	To be defined	0		
3644	Enhancement of signalling system to ERTMS	IT	1	57.0	57.0	28.8 28.2	CDP CEF
3645	Enhancement of signalling system to ERTMS	IT	1	48.0	48.0	48.0	CDP
3646	Enhancement of signalling system to ERTMS	IT	1	112.0	0		
1908	Signalling enhancement (ERTMS/ETCS…) and implementation of the ETCS level 1 - Pragersko-Šentilj-state border	SI	1	7.5	7.5	1.1 6.4	MzI CEF
	TOTAL			1,470.3	1033.8		

Source: Corridor Project List

B.4. Other complementary network projects

In Slovakia, instalment of ERTMS on the remaining sections of the corridor is planned as part of the improvement and upgrading works of the national rail infrastructure, which are listed in the corresponding actions. In the Czech Republic Brno node and Brno – Přerov section will be equipped by ERTMS during their modernisations too (Actions 1.1.04 and 1.3.06) .
In Austria, investments for the enhancement of the interlocking systems are also planned and are necessary in support of the planned ETCS deployment on all rail sections in Austria (Action 1.4.04).

Source: Corridor Project List

C. Gap Analysis and Implementation Risks

C.1 Remaining technical and operational barriers of the infrastructure and implementation risks:

ERTMS is currently planned to be deployed by 2030 on the entire corridor lines, investments are still missing on the corridor list which include the Polish central branch of the axis between Tczew and Katowice, the section Wrocław – Jelcz – Opole – Katowice, the Warsaw Railway Node and particularly the Polish side of the Opole – Ostrava and Katowice – Ostrava and Polish and Slovak sides of Katowice – Žilina sections. Project costs for ERTMS projects in Austria are also still to be defined.

Source: Own assessment based on available information

A. Description of the Action:

A.1. Action Title:

1.4.02 - Measures for removal of level crossings and improving PRM accessibility in Poland

A.2. Location of the action:

Source: Map data ©2016 Google GeoBasis-DE/BKG (©2009), Google

A.3. Description of the action:

Member States involved:	Section or Node:	Estimated total cost [Mio €]:
Poland	*Baltic-Adriatic Corridor in Poland*	*181.6 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
-	*Start year: 2017* *End year: 2022*	*PKP Polskie Linie Kolejowe S.A.*

The action includes several multi-location projects implemented horizontally on the whole railway network area in Poland.

A fist initiative includes implementation of modern traffic devices and replacement of railway and road superstructure on the level crossings with reconstruction of its drainage. Also with respect to level crossings, the action aims at completing the modernisation of level crossings not implemented during previous perspective (39 level crossings), for which environmental decisions are issued as well as modernisation of level crossings in new localisations (130 level crossings), for which administrative decisions are still pending.

A second initiative, also carried with a similar horizontal approach, aims at improving the infrastructure for passenger service with its adjustment to TSI PRM requirements, in particular on lines where previous investment projects did not cover this activity. For the Baltic/Adriatic Corridor, the modernisation covers Szczecin (continuation of project ID 1413) and Gdańsk (platforms were not covered by project ID 1060).

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
-

Source: Corridor Project List

B. Project Implementation

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1415	Safety improvement on rail/road crossings	PL	PKP Polskie Linie Kolejowe S.A.	horizontal	Infrastructure (Upgrade), Infrastructure (New construction),	95.6	Total value in the National Railway Programme [PLN]
1416	Improvement of technical condition of passengers services infrastructure (including TSI PRM)	PL	PKP Polskie Linie Kolejowe S.A.	horizontal	Infrastructure (Upgrade), OTHER	86.0	Total value in the National Railway Programme [PLN]
	TOTAL					181.6	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL				ADMINISTRATIVE ISSUES
					L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	
1415	Safety improvement on rail/road crossings	PL	2018	2021	not started	in progress	in progress	0%	Land acquisition: Not completed // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: Not performed // Other: NA
1416	Improvement of technical condition of passengers services infrastructure (including TSI PRM)	PL	2017	2022	not started	in progress	in progress	0%	Land acquisition: Not completed // EIA: NA // Final Approval: submitted, decision pending // CBA: Not performed // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR)		
					TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1415	Safety improvement on rail/road crossings	PL	1	95.6	22.4	22.4	national funds
1416	Improvement of technical condition of passengers services infrastructure (including TSI PRM)	PL	1	86.0	20.5	20.5	national funds
	TOTAL			181.6	42.9		

Source: Corridor Project List

B.4. Other complementary network projects

(reference to network/corridor wide initiatives for ERTMS and 750m)

Source: Corridor Project List

C. Gap Analysis and Implementation Risks

C.1 Remaining technical and operational barriers of the infrastructure and implementation risks:

The action is undertaken in continuity and in completion of previous projects undertaken in the previous EC financing perspective. With regard to the improvements at stations, the projects in Szczecin is the continuation of project the ID 1413 and the project in Gdańsk concerns the platforms not covered by project ID 1060.

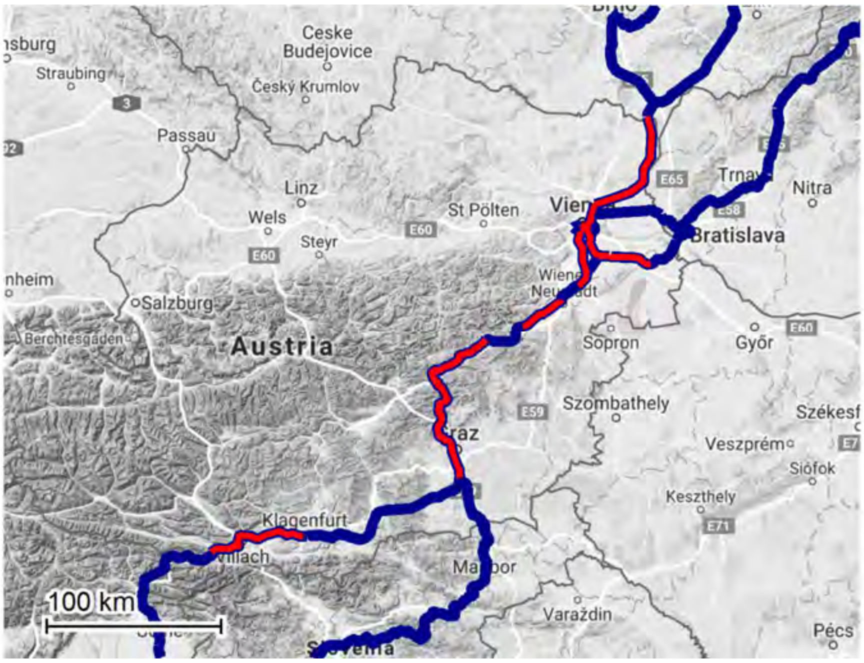
Source: Own assessment based on available information

A. Description of the Action:

A.1. Action Title:

1.4.03 - Noise protection barriers in Austria

A.2. Location of the action:



Source: Map data ©2016 Google GeoBasis-DE/BKG (©2009), Google

A.3. Description of the action:

Member States involved: *Austria*	**Section or Node:** *Baltic-Adriatic Corridor in Austria*	**Estimated total cost [Mio €]:** *36.6 EUR million*
Other CNC involved: *Orient-East Med , Rhine-Danube*	**Implementation schedule:** *Start year: 2009* *End year: 2021*	**Project Promoter:** *ÖBB-Infrastruktur AG*
This action comprises noise protection installations along existing lines in compliance with TSI regulations between Wien and Villach, Wien and Bernhardsthal, Wien and Nickelsdorf as well as in the Vienna node itself.		

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
-

Source: Corridor Project List

B. PROJECT IMPLEMENTATION

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1811	Noise protection Wien - Bernhardsthal	AT	ÖBB-Infrastruktur AG	Wien - Bernhardsthal	Infrastructure (Upgrade), Sustainable Freight,	3.6	valorised costs (2,5%)
9466	Noise protection (Vienna)	AT	ÖBB-Infrastruktur AG	Wien Node	Infrastructure (Upgrade), Sustainable Freight,	13.4	valorised costs (2,5%)
9469	Noise protection Wien - Nickelsdorf	AT	ÖBB-Infrastruktur AG	Wien - Nickelsdorf	Infrastructure (Upgrade), Sustainable Freight,	1.7	valorised costs (2,5%)
1806	Noise protection Wien - Villach	AT	ÖBB-Infrastruktur AG	Wien - Villach	Infrastructure (Upgrade), Sustainable Freight,	17.9	valorised costs (2,5%)
	TOTAL					**36.6**	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1811	Noise protection Wien - Bernhardsthal	AT	2012	2020		concluded		58%	Land acquisition: Not completed // EIA: NA // Final Approval: NA // CBA: Performed // Other: not required
9466	Noise protection (Vienna)	AT	2010	2020	not required	concluded	not required	66%	Land acquisition: In progress // EIA: not required // Final Approval: not required // CBA: Performed // Other: not required
9469	Noise protection Wien - Nickelsdorf	AT	2016	2017	not required	concluded	not required	61%	Land acquisition: In progress // EIA: not required // Final Approval: not required // CBA: Performed // Other: not required
1806	Noise protection Wien - Villach	AT	2009	2021		concluded		63%	Land acquisition: Not completed // EIA: NA // Final Approval: NA // CBA: Performed // Other: not required

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR) TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1811	Noise protection Wien - Bernhardsthal	AT	1	3.6	3.6	3.6	Rahmenplan 2016-21
9466	Noise protection (Vienna)	AT	1	13.4	13.4	13.5	Rahmenplan 2016-2021
9469	Noise protection Wien - Nickelsdorf	AT	1	1.7	1.7	1.7	Rahmenplan 2016-2021
1806	Noise protection Wien - Villach	AT	1	17.9	17.9	17.9	Rahmenplan 2016-21
	TOTAL			**36.6**	**36.6**		

Source: Corridor Project List

B.4. Other complementary network projects

-

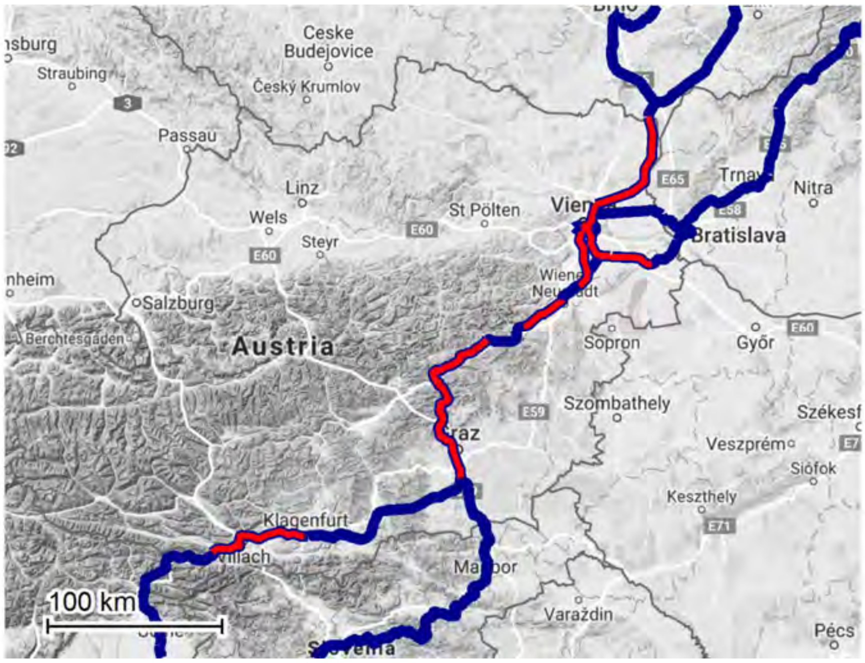
Source: Corridor Project List

A. Description of the Action:

A.1. Action Title:

1.4.04 - Electronic interlocking in Austria

A.2. Location of the action:



Source: Map data ©2016 Google GeoBasis-DE/BKG (©2009), Google

A.3. Description of the action:

Member States involved: *Austria*	**Section or Node:** *Baltic-Adriatic Corridor in Austria*	**Estimated total cost [Mio €]:** *199.1 EUR million*
Other CNC involved: *Orient-East Med , Rhine-Danube*	**Implementation schedule:** *Start year: 2007* *End year: 2022*	**Project Promoter:** *ÖBB-Infrastruktur AG*

The action aims at the installation of electronic interlockings (Neunkirchen, Semmering, Krieglach, Kindberg, Peggau-Deutschfeistritz, Leoben-Göss) as well as the integration of existing electronic interlockings into signalling & dispatching centres between Marchegg - Arnoldstein, Wr.Neudtadt - Graz, Wien - Bernhardsthal and in the Vienna node. These investments are necessary in support of the planned ETCS deployment on all rail sections in Austria.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
Current or potential future capacity bottleneck

Source: Corridor Project List

B. Project Implementation

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1810	Integration of interlockings into signalling & dispatching centres Wien - Bernhardsthal	AT	ÖBB-Infrastruktur AG	Wien - Bernhardsthal	, OTHER	10.5	valorised costs (2,5%)
1804	Integration of interlockings into signalling & dispatching centres Marchegg - Arnoldstein	AT	ÖBB-Infrastruktur AG	Marchegg - Arnoldstein	, OTHER	98.6	valorised costs (2,5%)
9465	Integration of interlockings into signalling & dispatching centres (Vienna)	AT	ÖBB-Infrastruktur AG	Wien Node	, OTHER	25.7	valorised costs (2,5%)
1805	Electronic interlocking: Wr. Neustadt - Graz	AT	ÖBB-Infrastruktur AG	Wr. Neustadt - Bruck/Mur - Graz	, OTHER	64.3	valorised costs (2,5%)
	TOTAL					**199.1**	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1810	Integration of interlockings into signalling & dispatching centres Wien - Bernhardsthal	AT	2007	2018		concluded		85%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: Performed // Other: not required
1804	Integration of interlockings into signalling & dispatching centres Marchegg - Arnoldstein	AT	2014	2016		concluded		NA%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: Performed // Other: not required
9465	Integration of interlockings into signalling & dispatching centres (Vienna)	AT	2007	2017	not required	not required	not required	93%	Land acquisition: not required // EIA: not required // Final Approval: not required // CBA: Performed // Other: not required
1805	Electronic interlocking: Wr. Neustadt - Graz	AT	2013	2022		concluded		42%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: Performed // Other: not required

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR) TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1810	Integration of interlockings into signalling & dispatching centres Wien - Bernhardsthal	AT	1	10.5	10.5	10.5	Rahmenplan 2016-21
1804	Integration of interlockings into signalling & dispatching centres Marchegg - Arnoldstein	AT	1	98.6	98.6	98.6	Rahmenplan 2016-21
9465	Integration of interlockings into signalling & dispatching centres (Vienna)	AT	1	25.7	25.7	25.7	Rahmenplan 2016-2021
1805	Electronic interlocking: Wr. Neustadt - Graz	AT	1	64.3	64.3	64.3	Rahmenplan 2016-21
	TOTAL			**199.1**	**199.1**		

Source: Corridor Project List

B.4. Other complementary network projects

The improvements of the electronic interlocking is a prerequisite to the deployment of ERTMS, which is foreseen on the Baltic-Adriatic Corridor sections in Austria and it is included in the Action 1.4.01 (ERTMS deployment in Poland, Czech Republic, Austria, Italy and Slovenia).

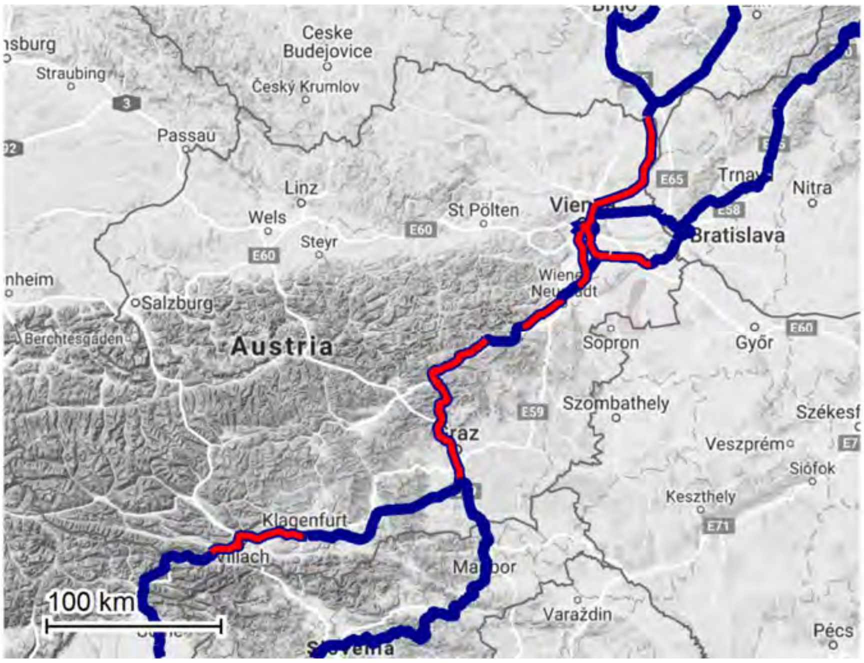
Source: Corridor Project List

A. DESCRIPTION OF THE ACTION:

A.1. Action Title:

1.4.05 - Train conditions checkpoints in Austria

A.2. Location of the action:



Source: Map data ©2016 Google GeoBasis-DE/BKG (©2009), Google

A.3. Description of the action:

Member States involved: *Austria*	**Section or Node:** *Baltic-Adriatic Corridor in Austria*	**Estimated total cost [Mio €]:** *11.0 EUR million*
Other CNC involved: *Orient-East Med , Rhine-Danube*	**Implementation schedule:** *Start year: 2013* *End year: 2020*	**Project Promoter:** *ÖBB-Infrastruktur AG*

Train condition checkpoints will be established on sections between Marchegg - Arnoldstein, Wien - Bernhardsthal and Wien-Nickelsdorf to increase the safety of the rolling stock. Measures to increase safety will not only reduce maintenance costs but will also increase availability of transport capacity.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
-

Source: Corridor Project List

B. Project Implementation

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1809	Train condition checkpoints Wien -Bernhardsthal	AT	ÖBB-Infrastruktur AG	Wien - Bernhardsthal	, OTHER	0.7	valorised costs (2,5%)
1803	Train condition checkpoints Marchegg - Arnoldstein	AT	ÖBB-Infrastruktur AG	Marchegg - Arnoldstein	, OTHER	9.5	valorised costs (2,5%)
9468	Train condition checkpoints Wien - Nickelsdorf	AT	ÖBB-Infrastruktur AG	Wien - Nickelsdorf	, OTHER	0.8	valorised costs (2,5%)
	TOTAL					11.0	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL				ADMINISTRATIVE ISSUES
					L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	
1809	Train condition checkpoints Wien -Bernhardsthal	AT	2017	2018		concluded		11%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: Performed // Other: not required
1803	Train condition checkpoints Marchegg - Arnoldstein	AT	2013	2020		concluded		53%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: Performed // Other: not required
9468	Train condition checkpoints Wien - Nickelsdorf	AT	2016	2017	not required	concluded	not required	29%	Land acquisition: not required // EIA: not required // Final Approval: not required // CBA: Performed // Other: not required

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR)		
					TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1809	Train condition checkpoints Wien -Bernhardsthal	AT	1	0.7	0.7	0.7	Rahmenplan 2016-21
1803	Train condition checkpoints Marchegg - Arnoldstein	AT	1	9.5	9.5	9.5	Rahmenplan 2016-21
9468	Train condition checkpoints Wien - Nickelsdorf	AT	1	0.8	0.8	0.8	Rahmenplan 2016-2021
	TOTAL			11.0	11.0		

Source: Corridor Project List

B.4. Other complementary network projects

-

Source: Corridor Project List

A. Description of the Action:

A.1. Action Title:

1.4.06 - Technological upgradings and line performance improvements in Italy

A.2. Location of the action:

Source: Map data ©2016 Google GeoBasis-DE/BKG (©2009), Google

A.3. Description of the action:

Member States involved: *Italy*	**Section or Node:** *Baltic-Adriatic Corridor in Italy*	**Estimated total cost [Mio €]:** *575.0 EUR million*
Other CNC involved: *Mediterranean, Scandinavian-Mediterranean*	**Implementation schedule:** *Start year: 2013* *End year: 2021*	**Project Promoter:** *RFI S.p.A.*
The action includes initiatives to improve the line performance of various corridor sections in Italy, including the deployment of a new management system in Veneto and Friuli Region lines and on the line Bologna – Padova. The action includes specific interventions for upgrading the infrastructure and the signalling system in order to increase the speed in the sections Bologna / Bari and Milano-Venezia -Trieste (conventional line). Finally, between Bologna and Rimini, the planned investments are aimed at increasing the line capacity.		

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
Current or potential future capacity bottleneck

Source: Corridor Project List

B. Project Implementation

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
3228	Speed upgrading works	IT	RFI S.p.A.	Milano-Venezia -Trieste (conventional line)	Study, Infrastructure (Upgrade),	35.0	
3295	Bologna- Padua railway line: upgrading of the traffic management system	IT	RFI S.p.A.	Bologna-Padova	Study, OTHER	160.0	
1398	Speed increase of the Adriatic Line Bologna-Bari	IT	RFI spa	Bologna - Ancona + (Ancona - Foggia) + Foggia - Bari	Study, Infrastructure (Upgrade), OTHER	350.0	
3643	Technological upgrading of the Bologna-Castelbolognese railway line	IT	RFI S.p.A.	Bologna-Rimini	Study, Infrastructure (Upgrade), OTHER	30.0	
	TOTAL					**575.0**	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL				ADMINISTRATIVE ISSUES
					L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	
3228	Speed upgrading works	IT	2013	2018	concluded	concluded	concluded	74%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
3295	Bologna- Padua railway line: upgrading of the traffic management system	IT	2018	2021	concluded	concluded	in progress	0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1398	Speed increase of the Adriatic Line Bologna-Bari	IT	2015	2018	concluded	concluded	concluded	54%	Land acquisition: NA // EIA: NA // Final Approval: approved // CBA: Performed // Other: NA
3643	Technological upgrading of the Bologna-Castelbolognese railway line	IT	2018	2021				0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR)		
					TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
3228	Speed upgrading works	IT	1	35.0	35.0	35.0	National budget
3295	Bologna- Padua railway line: upgrading of the traffic management system	IT	1	160.0	160.0	160.0	National budget
1398	Speed increase of the Adriatic Line Bologna-Bari	IT	1	350.0	350.0	350.0	CDP
3643	Technological upgrading of the Bologna-Castelbolognese railway line	IT	1	30.0	30.0	30.0	National budget
	TOTAL			**575.0**	**575.0**		

Source: Corridor Project List

B.4. Other complementary network projects

The technological improvements do not include the deployment of ERTMS, which is also foreseen on the Baltic-Adriatic Corridor sections in Italy and it is included in the Action 1.4.01 (ERTMS deployment in Poland, Czech Republic, Austria, Italy and Slovenia).

Source: Corridor Project List

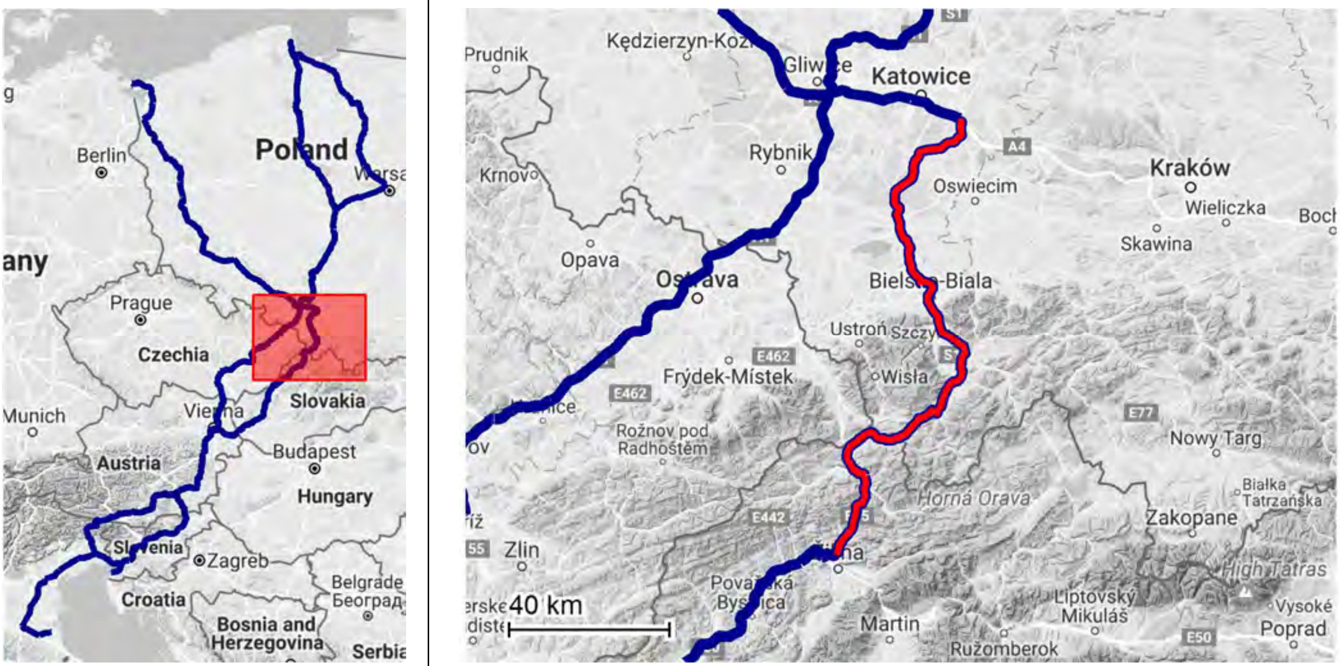
Action sheets for the development of road transport – cross border sections

A. Description of the Action:

A.1. Action Title:

2.1.01 - Road section Katowice (PL) – Žilina (SK)

A.2. Location of the action:



Source: Map data ©2016 Google GeoBasis-DE/BKG (©2009), Google

A.3. Description of the action:

Member States involved: *Poland, Slovakia*	**Section or Node:** *Katowice (PL) – Žilina (SK)*	**Estimated total cost [Mio €]:** *2,249.5 EUR million*
Other CNC involved: -	**Implementation schedule:** *Start year: 2016* *End year: 2024*	**Project Promoter:** *Generalna Dyrekcja Dróg Krajowych i Autostrad, NDS a.s.*

The action includes works for further development of the road cross-border connection between the urban areas of Katowice (PL) – Žilina (SK) as a 4 lanes (2x2) dual carriageway or 2 lanes express road / motorway and 4 lanes motorway.

Works for the upgrading of the road infrastructure to motorway/express road standards already started in 2017 on the Polish side and are also already ongoing on the D3 sections on the Slovak side. The whole section is expected to be completed by 2024.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
Express road or motorway standard

Source: Corridor Project List

B. PROJECT IMPLEMENTATION

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1164	S1: express road section Kosztowy - Bielsko-Biała	PL	Generalna Dyrekcja Dróg Krajowych i Autostrad	Katowice - Zilina	Infrastructure (Upgrade), Infrastructure (New construction),	853.0	
1163	S1: Construction of S1 expressway Bielsko Biała – state border, section Węgierska Górka bypass	PL	Generalna Dyrekcja Dróg Krajowych i Autostrad	Bielsko-Biała - Zilina	Infrastructure (Upgrade), Infrastructure (New construction),	350.7	
1028	Motorway D3 Cadca, Bukov - Svrcinovec	SK	NDS a.s.	Svrcinovec <--> Cadca	Infrastructure (New construction),	229.1	CEF Recommended total eligible
1180	Oščadnica – Čadca: motorway D3 construction	SK	NDS a.s.	Cadca <--> Oscadnica	Infrastructure (New construction),	102.2	
1179	Kysucké Nové Mesto – Oščadnica: motorway D3 construction	SK	NDS a.s.	Oscadnica <--> Kysucke Nove Mesto	Infrastructure (New construction),	303.6	
1178	Žilina Brodno - Kysucké Nové Mesto: motorway D3 construction	SK	NDS a.s.	Kysucke Nove Mesto <--> Zilina (Brodno)	Infrastructure (New construction),	410.9	
	TOTAL					2,249.5	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1164	S1: express road section Kosztowy - Bielsko-Biała	PL	2019	2022	concluded	concluded	in progress	0%	Land acquisition: NA // EIA: EIA completed // Final Approval: NA // CBA: NA // Other: NA
1163	S1: Construction of S1 expressway Bielsko Biała – state border, section Węgierska Górka bypass	PL	2017	2020	concluded	concluded	in progress	0%	Land acquisition: NA // EIA: EIA approved // Final Approval: approved // CBA: NA // Other: NA
1028	Motorway D3 Cadca, Bukov - Svrcinovec	SK	2016	2020	concluded	concluded	concluded	8%	Land acquisition: Completed // EIA: EIA completed // Final Approval: submitted, decision pending // CBA: Performed // Other: Yes
1180	Oščadnica – Čadca: motorway D3 construction	SK	2020	2023	concluded	concluded	in progress	2%	Land acquisition: Not completed // EIA: EIA completed // Final Approval: not submitted yet // CBA: Not performed // Other: Yes
1179	Kysucké Nové Mesto – Oščadnica: motorway D3 construction	SK	2021	2024	concluded	concluded	in progress	0%	Land acquisition: Not completed // EIA: EIA completed // Final Approval: not submitted yet // CBA: Not performed // Other: Yes
1178	Žilina Brodno - Kysucké Nové Mesto: motorway D3 construction	SK	2021	2024	concluded	concluded	in progress	0%	Land acquisition: Not completed // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: Not performed // Other: Yes

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR)		
					TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1164	S1: express road section Kosztowy - Bielsko-Biała	PL	1	853.0	0		
1163	S1: Construction of S1 expressway Bielsko Biała – state border, section Węgierska Górka bypass	PL	1	350.7	0		
1028	Motorway D3 Cadca, Bukov - Svrcinovec	SK	1	229.1	229.1	80.2 148.9	State budget CEF Cohesion Call/ Cohesion Fund
1180	Oščadnica – Čadca: motorway D3 construction	SK	1	102.2	0		
1179	Kysucké Nové Mesto – Oščadnica: motorway D3 construction	SK	1	303.6	0		
1178	Žilina Brodno - Kysucké Nové Mesto: motorway D3 construction	SK	1	411.0	0		
	TOTAL			**2,249.5**	**229.1**		

Source: Corridor Project List

C. GAP ANALYSIS AND IMPLEMENTATION RISKS

C.1. Remaining technical and operational barriers of the infrastructure and implementation risks:

The cross border express road / motorway S1 – D3 is expected to be fully compliant with the TEN-T standards by 2024. The section Katowice – Żywiec will be a 4 lanes express road, section Żywiec – Zwardoń will be a 2 lane express road with all multilevel junctions. The Slovak section of D3 Skalité – Svrčinovec will be a 2 lanes motorway without any intermediate junction. The segment Svrčinovec – Žilina will be a 4 lanes D3 motorway.

On the Polish side preparatory works for the development of the express road sections of the S1 Kosztowy – Bielsko-Biała as well as S1 (former S69) between Przybędza and Milówka (Węgierska Górka by-pass) are advancing. For the S1 Kosztowy – Bielsko-Biała the environmental decision was issued in June 2016; whereas for the S1 (former S69) Węgierska Górka by-pass construction works are expected to start in 2018. Due to the challenging technical scope of this project (two tunnels are to be constructed), some delays might occur during project implementation. On the Slovak side, whereas the D3 section Skalité – Svrčinovec is completed, construction of the motorway section of D3 Čadca, Bukov – Svrčinovec started in 2016, sections Oščadnica – Čadca, Kysucké Nové Mesto – Oščadnica and Žilina Brodno - Kysucké Nové Mesto are at the stage of permitting procedure.

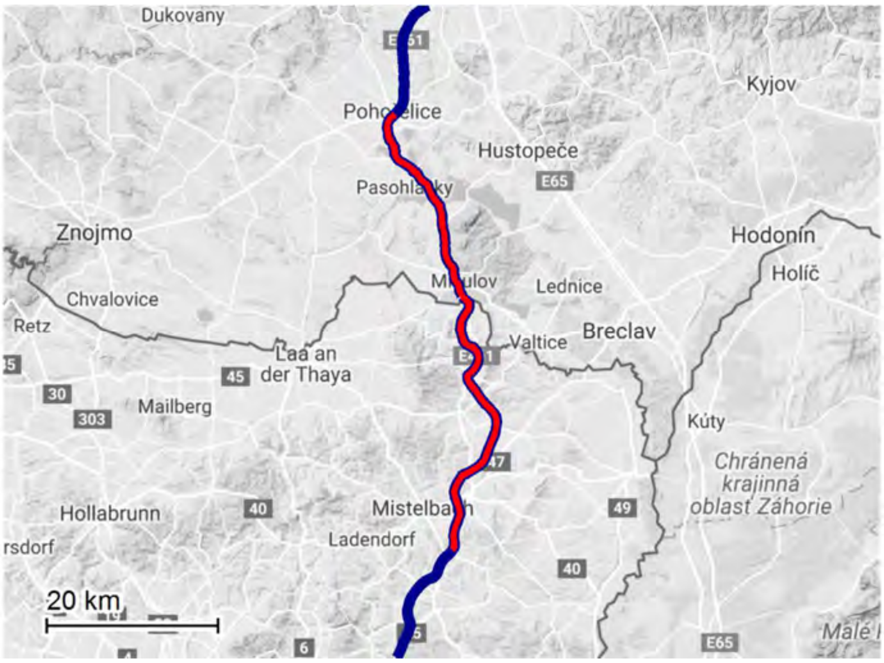
Source: Own assessment based on available information

A. Description of the Action:

A.1. Action Title:

2.1.02 - Brno (CZ) – Wien (AT): Road section Pohořelice (CZ) – Schrick (AT)

A.2. Location of the action:



Source: Map data ©2016 Google GeoBasis-DE/BKG (©2009), Google

A.3. Description of the action:

Member States involved: *Czech Republic, Austria*	**Section or Node:** *Pohořelice (CZ) – Schrick (AT)*	**Estimated total cost [Mio €]:** *808.7 EUR million*
Other CNC involved: -	**Implementation schedule:** *Start year: 2003* *End year: 2030*	**Project Promoter:** *ŘSD ČR, ASFINAG (Austrian Road Infrastructure Manager)*

The action includes works for the development of the road connection between the urban areas of Brno (CZ) and Vienna (AT) as a 4 lanes (2x2) dual carriageways motorway, providing cross border continuity to the existing D52 in the Czech Republic and the A5 in Austria.

On the Czech side, studies including an updated Environmental Impact Assessment have been completed for the D52 Pohořelice – Perná – border CZ/AT section, where works are planned to be completed by 2030 (380 € million). The development of the project has been delayed in the past due to the need to revise the regional land use plan. The revision of this plan is currently under completion and the preparatory works for this road are under development also supported by the CEF.

On the Austrian side works were finished to upgrade the motorway A5 from Schrick to Poysbrunn on 8th of December 2017. Investments are also planned for the gradual improvement and completion of the road up to the border by 2027 by developing in the last segment of the cross-border a 2x2 lane carriageway project solution. This is subject to a solution found for the environmental related administrative issues on the Czech side (428.7 € million).

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
Express road or motorway standard

Source: Corridor Project List

B. Project Implementation

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1700	D52 Pohořelice - state border	CZ	ŘSD ČR	Pohorelice <--> Mikulov / Drasenhofen (borderline)	Study, Infrastructure (New construction),	380.0	
1189	Planning and construction of the A5 North motorway. Schrick-Poysbrunn section	AT	ASFINAG (Austrian Road Infrastructure Manager)	Schrick - Mikulov / Drasenhofen (borderline)	Study, Infrastructure (New construction),	283.0	valorised costs (2,5%)
1190	A5 Construction Poysbrunn - Border AT/CZ 1st Part	AT	ASFINAG (Austrian Road Infrastructure Manager)	Schrick - Mikulov / Drasenhofen (borderline)	Infrastructure (New construction),	49.6	valorised costs (2,5%)
1191	A5 Construction Poysbrunn - Border AT/CZ 2nd Part	AT	ASFINAG (Austrian Road Infrastructure Manager)	Schrick - Mikulov / Drasenhofen (borderline)	Infrastructure (New construction),	91.1	valorised costs (2,5%)
1802	Planning of the A5 North motorway, section between Poysbrunn and the Austria-Czech border	AT	ASFINAG (Austrian Road Infrastructure Manager)	Schrick - Mikulov / Drasenhofen (borderline)	Study,	5.0	valorised costs (2,5%)
	TOTAL					**808.7**	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1700	D52 Pohořelice - state border	CZ	2018	2030	concluded	concluded	concluded	0%	Land acquisition: Not completed // EIA: EIA approved // Final Approval: submitted, decision pending // CBA: Not performed // Other: NA
1189	Planning and construction of the A5 North motorway. Schrick-Poysbrunn section	AT	2003	2017	concluded	concluded	concluded	100%	Land acquisition: Completed // EIA: EIA approved // Final Approval: approved // CBA: Performed // Other: not required
1190	A5 Construction Poysbrunn - Border AT/CZ 1st Part	AT	2017	2018	concluded	concluded	concluded	0%	Land acquisition: Not completed // EIA: EIA completed // Final Approval: not submitted yet // CBA: Performed // Other: not required
1191	A5 Construction Poysbrunn - Border AT/CZ 2nd Part	AT	2022	2027	concluded	concluded	concluded	0%	Land acquisition: Not completed // EIA: EIA completed // Final Approval: not submitted yet // CBA: Performed // Other: Required for alignment
1802	Planning of the A5 North motorway, section between Poysbrunn and the Austria-Czech border	AT	2015	2018	concluded	concluded	concluded	70%	Land acquisition: Not completed // EIA: EIA completed // Final Approval: not submitted yet // CBA: Performed // Other: Required for alignment

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR) TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1700	D52 Pohořelice - state border	CZ	1	380.0	0.0	266.0 114.0	SFDI Co-funding by EU (CEF)
1189	Planning and construction of the A5 North motorway. Schrick-Poysbrunn section	AT	1	283.0	283.0	3.5 258.4 21.1	co-financed by state government cash flow (ASFINAG) CEF
1190	A5 Construction Poysbrunn - Border AT/CZ 1st Part	AT	1	49.6	48.3	4.5 43.8	co-financed by federal state government cash flow (ASFINAG) other
1191	A5 Construction Poysbrunn - Border AT/CZ 2nd Part	AT	1	91.1	91.1	91.1	cash flow (ASFINAG)
1802	Planning of the A5 North motorway, section between Poysbrunn and the Austria-Czech border	AT		5.0	5.0	3.7 1.3	cash flow (ASFINAG) CEF
	TOTAL			808.7	427.4		

Source: Corridor Project List

C. Gap analysis and Implementation Risks

C.1. Remaining technical and operational barriers of the infrastructure and implementation risks:

The completion of works in Austria in 2017 lead to a compliant layout in the sections Brno – Pohořelice and Poysbrunn – Wien. The intermediate section between Poysbrunn and Pohořelice will remain a 2x1 lane road with many level junctions, bus stops, pedestrian and bicycle crossings, also crossing the urban areas of Drasenhofen and Mikulov. The development of the road at standard will be possible after the completion of the revision of the regional land use plan of Southern Moravia. Design works and preparation works both on the Czech side to finalise the D52 and on the Austrian side to complete the A5, also including the development of the Drasenhofen and Mikulov bypasses are ongoing.

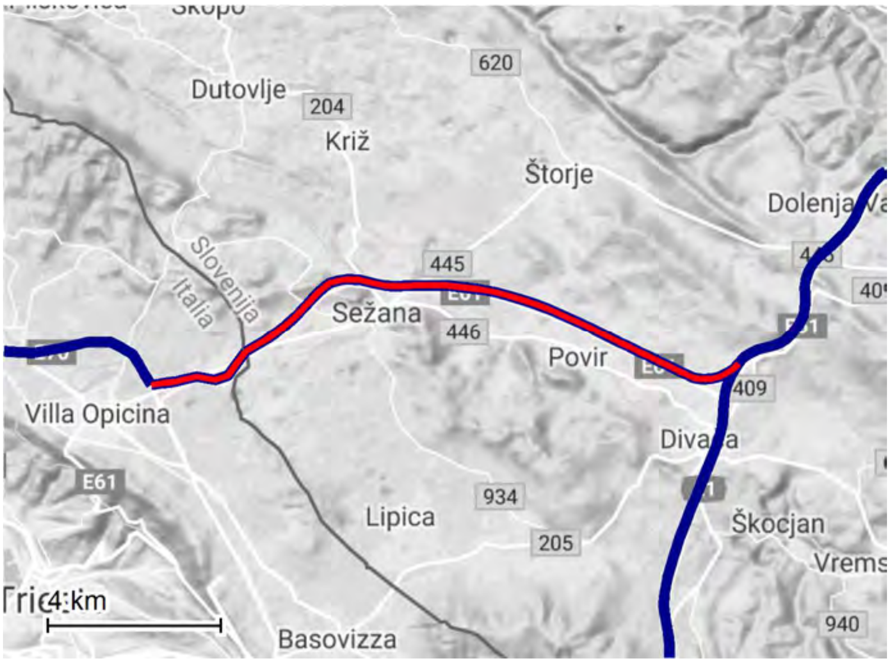
Source: Own assessment based on available information

A. Description of the Action:

A.1. Action Title:

2.1.03 - Road section Trieste (IT) - Sežana (SI)

A.2. Location of the action:



Source: Map data ©2016 Google GeoBasis-DE/BKG (©2009), Google

A.3. Description of the action:

Member States involved: *Italy, Slovenia*	**Section or Node:** *Trieste (IT) - Sežana (SI)*	**Estimated total cost [Mio €]:** *19.1 EUR million*
Other CNC involved: -	**Implementation schedule:** *Start year: 2016* *End year: 2030*	**Project Promoter:** *ANAS S.p.A., DARS*

The cross border section between Trieste (IT) and Sezana (SI) already meets the requirements of TEN-T regulation in terms of road standard (motorway or express road). However, improvement of the R.A. 14 motorway cross-border road section is planned on Italian side due to realisation of a new connection with Slovenia in Fernetti site and the securing of the RRT. This action is expected to be implemented by 2020. On the Slovenian side arrangements for MW and HW in the context of land on the former MMP (International Border Crossing) are expected to be completed by 2030, covering both the Italian and Austrian cross-border links. In terms of maturity, for the first action preliminary project analysis/feasibility study has not yet started. The latter initiative has no CBA performed yet and EIA has not started.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
-

Source: Corridor Project List

B. Project Implementation

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
3246	Cross-border Road section between Italy and Slovenia	IT	ANAS S.p.A.	IT/SI Cross border section	Study, Infrastructure (Upgrade),	3.0	
1932	Arrangements for MW and HW in the context of land on the former MMP	SI	DARS	Cross Border Sections	Study, Infrastructure (Upgrade), ITS	16.1	
	TOTAL					**19.1**	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL				ADMINISTRATIVE ISSUES
					L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	
3246	Cross-border Road section between Italy and Slovenia	IT	2016	2019	in progress	in progress	not started	10%	Land acquisition: NA // EIA: NA // Final Approval: not submitted yet // CBA: Performed // Other: NA
1932	Arrangements for MW and HW in the context of land on the former MMP	SI	2018	2030	in progress	not started	not started	0%	Land acquisition: Not completed // EIA: NA // Final Approval: not submitted yet // CBA: Not performed // Other: not available

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR)		
					TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
3246	Cross-border Road section between Italy and Slovenia	IT	Residual	3.0	0.6	0.6	CDP ANAS 2014
1932	Arrangements for MW and HW in the context of land on the former MMP	SI	2	16.1	0		
	TOTAL			**19.1**	**0.6**		

Source: Corridor Project List

C. Gap Analysis and Implementation Risks

C.1. Remaining technical and operational barriers of the infrastructure and implementation risks:

Measure include: development of resting/parking areas on the highway network, renovation of former international border crossings (land redevelopment). First the measures will focus on ensuring appropriate speed (at the moment speed limit of 40 km/h is enforced), border crossings with Schengen area countries will be prioritized. This measure will improve safety and mitigate congestion. The implementation will be done in phases, first in the areas outside the scope of the NSP (National Spatial Plan). In parallel appropriate procedures will be started for areas under the scope of the NSP. All activities should be finalized until 2030 when this project is planned to be completed.

Source: Own assessment based on available information

Action sheets for the development of road transport – national networks

A. Description of the Action:

A.1. Action Title:

2.2.01 - Completion of the Eastern Corridor Branch in Poland: S7 Gdańsk - Warsaw

A.2. Location of the action:

Source: Map data ©2016 Google GeoBasis-DE/BKG (©2009), Google

A.3. Description of the action:

Member States involved:	Section or Node:	Estimated total cost [Mio €]:
Poland	*Gdańsk - Warsaw*	*3,236.0 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
-	*Start year: 2014* *End year: 2024*	*Generalna Dyrekcja Dróg Krajowych i Autostrad*

The status of S7 express road is as follows: the whole section Gdańsk-Warszawa operates with a number of km still without the status of express road (dual carriageway, one – two lanes, axle load 115 kN/axis, design speed 100 km/h). The following sections are foreseen for modernisation / construction:

- South by-pass of Gdańsk by-pass has been constructed and is under operation;
- Section Koszwały-Kazimierzowo-Elbląg (40 km) is under construction and expected to be completed by 2018;
- Section Elbląg-Pasłęk-Miłomłyn (60 km) is ready and in operation;
- Section Miłomłyn by-pass-Olsztynek is under modernisation and expected to be completed by 2018;
- Section Olsztynek-Nidzica is ready and operational;
- Section Nidzica-Płońsk as well as Płońsk-Warszawa (approximately 180 km) are foreseen to be constructed under the Multiannual Funding Framework 2014-2020; except Płońsk by-pass, which has already been constructed. This long section has different maturity status for different sub-sections. Nidzica – Napierki is already nearly completed and to be open for traffic in 2017. Sections Napierki – Płońsk and Płońsk – Warszawa are both under permitting stage and planned for completion by 2020.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
Express road or motorway standard

Source: Corridor Project List

B. PROJECT IMPLEMENTATION

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1152	S7: section Koszwały – Kazimierzowo	PL	Generalna Dyrekcja Dróg Krajowych i Autostrad	Gdańsk - Warszawa	Infrastructure (Upgrade), Infrastructure (New construction),	880.1	
1153	S7: section Miłomłyn – Olsztynek	PL	Generalna Dyrekcja Dróg Krajowych i Autostrad	Gdańsk - Warszawa	Infrastructure (Upgrade), Infrastructure (New construction),	628.7	
1156	S7: section Nidzica – Napierki	PL	Generalna Dyrekcja Dróg Krajowych i Autostrad	Gdańsk - Warszawa	Infrastructure (Upgrade), Infrastructure (New construction),	150.5	
1157	S7: section Napierki – Płońsk	PL	Generalna Dyrekcja Dróg Krajowych i Autostrad	Gdańsk - Warszawa	Infrastructure (Upgrade), Infrastructure (New construction),	632.6	
1158	S7: section Płońsk – Warszawa	PL	Generalna Dyrekcja Dróg Krajowych i Autostrad	Gdańsk - Warszawa	Infrastructure (Upgrade), Infrastructure (New construction),	944.1	
	TOTAL					**3,236.0**	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	 L2: FEAS.	 L3: PERMIT	 L4: CONSTR.	ADMINISTRATIVE ISSUES
1152	S7: section Koszwały – Kazimierzowo	PL	2015	2018	concluded	concluded	concluded	47%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1153	S7: section Miłomłyn – Olsztynek	PL	2014	2017	concluded	concluded	concluded	83%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1156	S7: section Nidzica – Napierki	PL	2015	2017	concluded	concluded	concluded	91%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1157	S7: section Napierki – Płońsk	PL	2015	2021	concluded	concluded	concluded	26%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1158	S7: section Płońsk – Warszawa	PL	2019	2024	concluded	concluded	in progress	0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR) TOTAL FUNDS	 FUNDS BY SOURCE	 FUNDING SOURCE
1152	S7: section Koszwały – Kazimierzowo	PL	1	880.1	880.1	401.9 478.2	national funds OPIE2014-2020
1153	S7: section Miłomłyn – Olsztynek	PL	1	628.7	628.7	277.1 351.6	national funds OPIE2014-2020
1156	S7: section Nidzica – Napierki	PL	1	150.5	150.5	79.7 70.8	national funds OPIE2014-2020
1157	S7: section Napierki – Płońsk	PL	1	632.6	0		
1158	S7: section Płońsk – Warszawa	PL	1	944.1	0		
	TOTAL			**3,236.0**	**1659.3**		

Source: Corridor Project List

C. GAP ANALYSIS AND IMPLEMENTATION RISKS

C.1. Remaining technical and operational barriers of the infrastructure and implementation risks:

Status of implementation of the non-compliant sections of the S7 express road between Gdańsk and Warsaw varies depending from the subsection. Construction works are already ongoing on sections Koszwały – Kazimierzowo – Elbląg, as well as Miłomłyn by-pass-Olsztynek. All these sections are expected to be completed in 2018. For section Napierki – Płońsk the D&B tender was launched in September 2015 and the contractor has been selected in May 2017. Due to some protests raised against amended environmental decision, some delays may occur on this section. Section Płońsk – Warszawa is still under preparation.

Construction of all the above sections aims at attainment of following technical parameters: dual carriageway (or 2x3 on some stretches) express road with design speed of 100 km/h and axle load of 11,5 t/axis. Implementation of all the above sections will contribute to resolution of all bottlenecks existing on the Eastern Corridor Branch in Poland.

Source: Own assessment based on available information

A. Description of the Action:

A.1. Action Title:

2.2.02 - Completion of the Central Corridor Branch in Poland: A1 Stryków - Katowice

A.2. Location of the action:

Source: Map data ©2016 Google GeoBasis-DE/BKG (©2009), Google

A.3. Description of the action:

Member States involved:	**Section or Node:**	**Estimated total cost [Mio €]:**
Poland	*Stryków - Katowice*	*1,521.9 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
-	*Start year: 2015* *End year: 2020*	*Generalna Dyrekcja Dróg Krajowych i Autostrad*

The action includes project for the completion of the main North-South motorway axis of Poland, the A1 motorway, between Stryków – Katowice. The status of A1 highway section Gdańsk (Rusocin) - Stryków – Gorzyczki is the following:

- Section Rusocin – Stryków is under operation;
- Section Stryków-Tuszyn was recently completed and opened for traffic in July 2016;
- Section Tuszyn-Pyrzowice is planned to be constructed; this section was divided into three sub-sections among which Częstochowa by-pass – Pyrzowice is most advanced in terms of maturity with the construction works already started and expected completion planned by 2018. Section Tuszyn – Piotrków Trybunalski is planned for upgrade to the parameters of motorway standards, this section is currently at the permitting stage. Section Piotrków Trybunalski – Częstochowa is also at the permitting stage – for implementation of this section creation of special purpose road company was envisaged, however status of this process is unclear at present, which makes the completion date not defined;
- Section Pyrzowice-Gorzyczki-Bohumín is completed.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
Express road or motorway standard

Source: Corridor Project List

B. PROJECT IMPLEMENTATION

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1501	A1 motorway: Tuszyn - Piotrków Trybunalski	PL	Generalna Dyrekcja Dróg Krajowych i Autostrad	Warszawa-Katowice	Infrastructure (Upgrade), Infrastructure (New construction),	161.6	
1147	A1: Pyrzowice-Częstochowa by-pass	PL	Generalna Dyrekcja Dróg Krajowych i Autostrad	Warszawa - Katowice	Infrastructure (Upgrade), Infrastructure (New construction),	624.9	
1148	A1: Piotrków Trybunalski - Częstochowa	PL	Generalna Dyrekcja Dróg Krajowych i Autostrad	Warszawa - Katowice	Infrastructure (Upgrade), Infrastructure (New construction),	735.4	
	TOTAL					1,521.9	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL				ADMINISTRATIVE ISSUES
					L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	
1501	A1 motorway: Tuszyn - Piotrków Trybunalski	PL	2017	2020	concluded	concluded	concluded	0%	Land acquisition: NA // EIA: EIA approved // Final Approval: NA // CBA: NA // Other: NA
1147	A1: Pyrzowice-Częstochowa by-pass	PL	2015	2019	concluded	concluded	concluded	41%	Land acquisition: NA // EIA: EIA approved // Final Approval: NA // CBA: NA // Other: NA
1148	A1: Piotrków Trybunalski - Częstochowa	PL	2017	2020	concluded	concluded	in progress	0%	Land acquisition: NA // EIA: EIA under preparation or updating // Final Approval: NA // CBA: NA // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR)		
					TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1501	A1 motorway: Tuszyn - Piotrków Trybunalski	PL	1	161.6	0		
1147	A1: Pyrzowice-Częstochowa by-pass	PL	1	624.9	624.9	301.0 323.9	national funds OPIE 2014-2020
1148	A1: Piotrków Trybunalski - Częstochowa	PL	1	735.4	735.4	735.4	national funds
	TOTAL			1,522	1,360.3		

Source: Corridor Project List

C. GAP ANALYSIS AND IMPLEMENTATION RISKS

C.1. Remaining technical and operational barriers of the infrastructure and implementation risks:

Section Stryków – Tuszyn was recently completed and opened for traffic in July 2016. Implementation of section Pyrzowice – Częstochowa by-pass is ongoing with expected completion date in 2018. For section Tuszyn – Częstochowa planned for implementation by the special purpose road company its formal settlement is still unclear also affecting the implementation period.

Completion of all the above sections will result in attainment of motorway standard on the entire A1 motorway constituting the Central Corridor Branch in Poland.

Source: Own assessment based on available information

A. Description of the Action:

A.1. Action Title:

2.2.03 - Completion of the Western Corridor Branch in Poland: S3 Świnoujście - Legnica and A4 Legnica - Wrocław

A.2. Location of the action:

Source: Map data ©2016 Google GeoBasis-DE/BKG (©2009), Google

A.3. Description of the action:

Member States involved:	Section or Node:	Estimated total cost [Mio €]:
Poland	*Świnoujście - Legnica - Wrocław*	*2,189.9 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
-	*Start year: NA* *End year: NA*	*Generalna Dyrekcja Dróg Krajowych i Autostrad*

Most of the section of S3 express road Świnoujście-Szczecin is currently either under preparation or construction / for upgrading to the parameters of an express road (dual carriageway with one or two lanes, axle load 115 kN/axis, design speed 100 km/h); except Troszyn and Miękowo by-passes which were opened to traffic in 2011 and 2012 respectively. This section of S3 express road, being currently at permitting stage, is expected to be finalised by 2020. Section Klucz-Pyrzyce-Myślibórz-Gorzów Wielkopolski (approx. 100 km) has already the parameters of an express road, including the partially completed Gorzów Wielkopolski by-pass. Section Gorzów Wielkopolski – Międzyrzecz (approximately 40 km long) has been opened to traffic in May 2014. 43 km long section Międzyrzecz-Sulechów is also completed and opened to traffic. Sections Sulechów-Nowa Sól with one line ready, as well as section Nowa Sól-Legnica are already under construction with planned completion date by 2019.

The dual carriageway section Legnica-Wrocław of A4 motorway is in operation with some construction of third lane in the near future. Foreseen completion date has not been specified, however this section is at permitting stage at present.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
Express road or motorway standard

Source: Corridor Project List

B. Project Implementation

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1161	S3: express road Świnoujście - Szczecin	PL	Generalna Dyrekcja Dróg Krajowych i Autostrad	Szczecin / Świnoujście	Infrastructure (Upgrade), Infrastructure (New construction),	348.2	
1160	S3: Sulechów (Kruszyna junction) – Nowa Sól, II lane of Gorzów Wielkopolski by-pass and II lane of Międzyrzecze by-pass	PL	Generalna Dyrekcja Dróg Krajowych i Autostrad	Szczecin - Wrocław	Infrastructure (Upgrade), Infrastructure (New construction),	321.7	
1162	S3: Nowa Sól (Nowe Miasto junction) – Legnica (A4, Legnica II junction)	PL	Generalna Dyrekcja Dróg Krajowych i Autostrad	Szczecin - Wrocław	Infrastructure (Upgrade), Infrastructure (New construction),	694.3	
1502	A4 motorway: extension of A4 motorway on section Wrocław - Legnica (within section Wrocław-Krzyżowa); construction of third lane	PL	Generalna Dyrekcja Dróg Krajowych i Autostrad	Szczecin - Wrocław	Infrastructure (Upgrade), Infrastructure (New construction),	825.7	
	TOTAL					**2,189.9**	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL: L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1161	S3: express road Świnoujście - Szczecin	PL	2017	2023	concluded	concluded	in progress	0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1160	S3: Sulechów (Kruszyna junction) – Nowa Sól, II lane of Gorzów Wielkopolski by-pass and II lane of Międzyrzecze by-pass	PL	2014	2019	concluded	concluded	concluded	51%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1162	S3: Nowa Sól (Nowe Miasto junction) – Legnica (A4, Legnica II junction)	PL	2014	2019	concluded	concluded	concluded	49%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1502	A4 motorway: extension of A4 motorway on section Wrocław - Legnica (within section Wrocław-Krzyżowa); construction of third lane	PL			concluded	in progress	in progress	NA%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR): TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1161	S3: express road Świnoujście - Szczecin	PL	1	348.2	0		
1160	S3: Sulechów (Kruszyna junction) – Nowa Sól, II lane of Gorzów Wielkopolski by-pass and II lane of Międzyrzecze by-pass	PL	1	321.7	321.7	154.2 167.5	national funds OPIE2014-2020
1162	S3: Nowa Sól (Nowe Miasto junction) – Legnica (A4, Legnica II junction)	PL	1	694.3	694.3	320.9 373.4	national funds OPIE2014-2020
1502	A4 motorway: extension of A4 motorway on section Wrocław - Legnica (within section Wrocław-Krzyżowa); construction of third lane	PL	Residual	825.7	0		
	TOTAL			**2,189.9**	**1,016.0**		

Source: Corridor Project List

C. Gap analysis and Implementation Risks

C.1. Remaining technical and operational barriers of the infrastructure and implementation risks:

Regarding S3 express road the least advanced section is Świnoujście – Szczecin, which is on most of its length still under preparation. Sections Sulechów – Nowa Sól and Nowa Sól – Legnica are under construction with expected completion dates in 2019 and 2018 respectively. Completion of all these sections will contribute to attainment of express road parameters on the Western Corridor Branch in Poland.

Source: Own assessment based on available information

A. DESCRIPTION OF THE ACTION:

A.1. Action Title:

2.2.05 - Completion of D1 in Czech republic section Lipník nad Bečvou – Říkovice and upgrading of the urban sections in Brno

A.2. Location of the action:

Source: Map data ©2016 Google GeoBasis-DE/BKG (©2009), Google

A.3. Description of the action:

Member States involved:	Section or Node:	Estimated total cost [Mio €]:
Czech Republic	*Lipník – Říkovice*	*695.2 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
Orient/East - Med-(Brno centrum – Brno jih)	*Start year: N.A.* *End year: 2035*	*Ministry of Transport, Road and Motorway Directorate (RSD), ŘSD ČR*

The action aims at providing continuity to the D1 in the Czech Republic. The current status of D1 section Lipník nad Bečvou - Říkovice is the following: the motorway D1 is in operation from Prague to Říkovice and from Lipník nad Bečvou to Věřňovice/Gorzyczki border crossing to Poland. There is a national two lanes road I/47 in operation in the section Přerov – Lipník nad Bečvou and two lanes national road I/55 in the section Přerov – Říkovice, the road is passing through the centre of Přerov town. At present, the motorways D35 and D46 Lipník and Bečvou – Olomouc – Vyškov are used to bypass missing D1 part with no detour and only minor delay due to lower speed limits on D46. D1 section inside Brno city is heavily loaded by international, national and local traffic and is going to its capacity limit. There is speed limit 100 km/h implemented and the section can become capacity bottleneck in short future.

Concerning the missing part of D1, section Přerov – Lipník is currently under construction with expected completion date by 2018. Another planned for construction D1 section Říkovice – Přerov is at the stage of EIA updating, foreseen construction completion date for this section is 2022. Section Starý Lískovec – Brno-jih of which only section Brno – Brno-jih is on BAC, is at preparatory phase with EIA approved but construction permit process did not started yet and forecasted completion date is by 2028. Planned upgrade of section Brno-jih – Holubice is expected to finish in 2035. At present EIA is under preparation for this section.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
Express road or motorway standard

Source: Corridor Project List

B. Project Implementation

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
4098	B22 D1 01191 Starý Lískovec – Brno-jih 6,7 km	CZ	Ministry of Transport, Road and Motorway Directorate (RSD)	D1 Praha - Brno	Infrastructure (Rehabilitation), Infrastructure (Upgrade), Infrastructure (New construction),	110.7	
1709	D1 01311-3 Brno-jih – Holubice: Upgrade (for increasing the absorption capacity)	CZ	ŘSD ČR	Vyskov <--> Brno (jih)	Study, Infrastructure (Upgrade),	131.1	
1169	D1 0137 Přerov - Lipník: motorway D1 construction	CZ	ŘSD ČR	Lipnik <--> Kromeriz	Infrastructure (New construction),	177.9	
1170	D1 0136 Říkovice - Přerov: motorway D1 construction	CZ	ŘSD ČR	Lipnik <--> Kromeriz	Infrastructure (New construction),	275.5	
	TOTAL					**695.2**	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
4098	B22 D1 01191 Starý Lískovec – Brno-jih 6,7 km	CZ	2019	2028	concluded	concluded	not started	0%	Land acquisition: not completed // EIA: EIA approved // Final Approval: not submitted yet // CBA: performed // Other: NA
1709	D1 01311-3 Brno-jih – Holubice: Upgrade (for increasing the absorption capacity)	CZ		2035	in progress	in progress	not started	NA%	Land acquisition: Not completed // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: Not performed // Other: NA
1169	D1 0137 Přerov - Lipník: motorway D1 construction	CZ	2015	2018	concluded	concluded	concluded	48%	Land acquisition: Completed // EIA: EIA approved // Final Approval: approved // CBA: Not performed // Other: NA
1170	D1 0136 Říkovice - Přerov: motorway D1 construction	CZ	2018	2022	concluded	concluded	concluded	0%	Land acquisition: Not completed // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: Not performed // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR) TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
4098	B22 D1 01191 Starý Lískovec – Brno-jih 6,7 km	CZ	Residual	110.7	0		
1709	D1 01311-3 Brno-jih – Holubice: Upgrade (for increasing the absorption capacity)	CZ	Residual	131.1	0		
1169	D1 0137 Přerov - Lipník: motorway D1 construction	CZ	1	177.9	177.9	53.4 124.5	SFDI Co-funding by EU (OPD I&II)
1170	D1 0136 Říkovice - Přerov: motorway D1 construction	CZ	1	275.5	275.5	82.6 192.9	SFDI Co-funding by EU (OPD I&II)
	TOTAL			**695.2**	**453.4**		

Source: Corridor Project List

C. GAP ANALYSIS AND IMPLEMENTATION RISKS

C.1. Remaining technical and operational barriers of the infrastructure and implementation risks:

D1 motorway used by BAC from Brno to Polish border will be fully compliant after finalisation of missing section Říkovice – Lipník nad Bečvou. The project 1170 Říkovice – Přerov was subject of negotiation between MS and EC concerning the validity of EIA in 2016, the exception was awarded for the project in spite of EIA elaborated according to old legislation. Simplified actualised assessment is being done. The project 1170 has minor implementation risk connected with land acquisition and demolitions at Přerov – Dluhonice due to the conflict with local community (Přerov city neighbourhood).

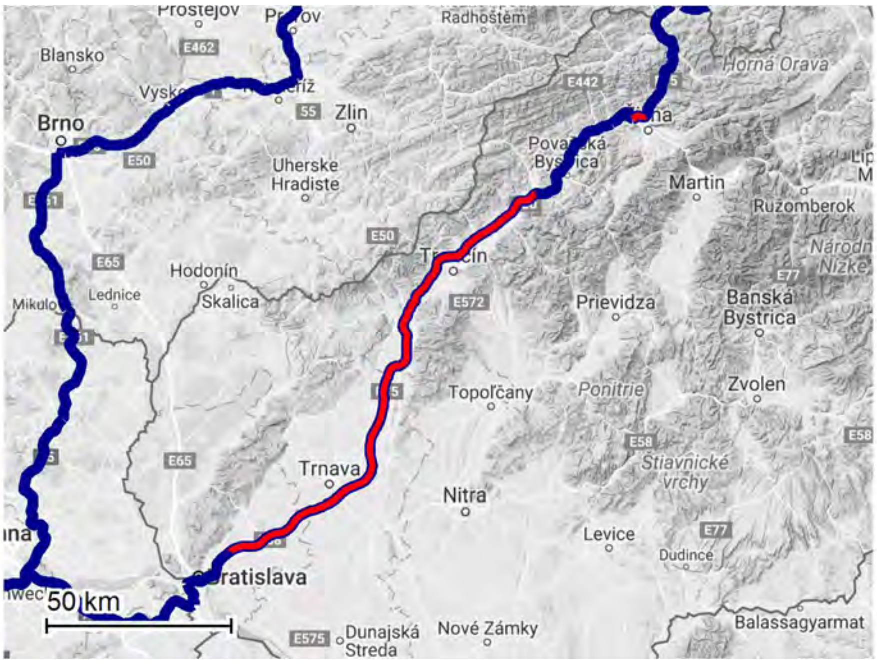
Source: Own assessment based on available information

A. Description of the Action:

A.1. Action Title:

2.2.06 - Upgrading of motorway D1 (section north of Bratislava) and D3 (Žilina bypass) in Slovakia

A.2. Location of the action:



Source: Map data ©2016 Google GeoBasis-DE/BKG (©2009), Google

A.3. Description of the action:

Member States involved: *Slovakia*	**Section or Node:** *Bratislava - Trnava, Zilina*	**Estimated total cost [Mio €]:** *1,087.5 EUR million*
Other CNC involved: *-*	**Implementation schedule:** *Start year: 2014* *End year: 2027*	**Project Promoter:** *NDS a.s.*

The urban express roads I/61 and I/60 bypassing Žilina centre was used for the connection of road I/11 (future D3) to existing four lane section of D3 Žilina, Strážov – Hričovské Podhradie for many years. The motorway D3 was finished in the section Žilina, Brodno – Žilina, Strážov (Žilina bypass) on 2nd December 2017. D3 is in operation in four lanes in the section from Hičovské Podhradie to Žilina Brodno.

The status of D1 section Trnava - Bratislava is as follows:

- Section Trnava – Bratislava, Vajnory constructed as four lane motorway is in operation with six marked lanes and speed limit set at 110 km/h due to high traffic volumes in peak hours;
- D1 in the city of Bratislava from Vajnory to Prístavný Bridge with four lanes is severely congested during most of the working day and has legal speed limit 90 km/h. The D1 sections Bratislava – Senec and Blatné – Trnava are expected to be upgraded up to 8 lanes by 2023 and 6 lanes by 2027 respectively. At present both sections are at similar maturity level with EIA completed and permitting in progress.

Furthermore, two D1 junctions were planned to be constructed. Blatné junction construction was finished on 27th November 2017 and Triblavina is under construction with planned completion by 2018.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
Express road or motorway standard

Source: Corridor Project List

B. Project Implementation

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1177	Žilina Strážov - Žilina Brodno: motorway D3 construction	SK	NDS a.s.	Zilina (Brodno) <--> Zilina (Strazov)	Infrastructure (New construction)	254.9	
1173	Triblavina junction construction	SK	NDS a.s.	Sverepec <--> Ivanka pri Dunaji - sever	Infrastructure (New construction)	30.2	
1174	Bratislava – Senec: motorway D1 widening to 8 lanes	SK	NDS a.s.	Sverepec <--> Ivanka pri Dunaji - sever	Infrastructure (Upgrade),	79.7	
1181	Bratislava – Senec: motorway D1 widening to 8 lanes (Triblavina - Senec)	SK	NDS a.s.	Sverepec <--> Ivanka pri Dunaji - sever	Infrastructure (Upgrade)	214.4	
1175	Blatné junction construction	SK	NDS a.s.	Sverepec <--> Ivanka pri Dunaji - sever	Infrastructure (New construction)	29.5	
1176	Blatné – Trnava: motorway D1 widening to 6 lanes	SK	NDS a.s.	Sverepec <--> Ivanka pri Dunaji - sever	Infrastructure (Upgrade)	478.8	
	TOTAL					**1,087.5**	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL				ADMINISTRATIVE ISSUES
					L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	
1177	Žilina Strážov - Žilina Brodno: motorway D3 construction	SK	2014	2017	concluded	concluded	concluded	95%	Land acquisition: Completed // EIA: EIA completed // Final Approval: approved // CBA: Performed // Other: Yes
1173	Triblavina junction construction	SK	2015	2018	concluded	not started	in progress	67%	Land acquisition: Completed // EIA: EIA completed // Final Approval: approved // CBA: Not performed // Other: NA
1174	Bratislava – Senec: motorway D1 widening to 8 lanes	SK	2017	2022	concluded	not started	in progress	0%	Land acquisition: Not completed // EIA: EIA completed // Final Approval: not submitted yet // CBA: Not performed // Other: NA
1181	Bratislava – Senec: motorway D1 widening to 8 lanes (Triblavina - Senec)	SK	2020	2023	concluded	not started	in progress	0%	Land acquisition: Not completed // EIA: EIA completed // Final Approval: not submitted yet // CBA: Not performed // Other: NA
1175	Blatné junction construction	SK	2016	2017	concluded	not started	in progress	86%	Land acquisition: Completed // EIA: EIA completed // Final Approval: approved // CBA: Not performed // Other: NA
1176	Blatné – Trnava: motorway D1 widening to 6 lanes	SK	2019	2023	concluded	not started	in progress	0%	Land acquisition: Not completed // EIA: EIA completed // Final Approval: not submitted yet // CBA: Not performed // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR)		
					TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1177	Žilina Strážov - Žilina Brodno: motorway D3 construction	SK	1	254.9	254.9	71.4 183.5	State budget Cohesion fund
1173	Triblavina junction construction	SK	Residual	30.2	30.2	30.2	State budget
1174	Bratislava – Senec: motorway D1 widening to 8 lanes	SK	Residual	79.7	0		
1181	Bratislava – Senec: motorway D1 widening to 8 lanes (Triblavina - Senec)	SK	Residual	214.4	0		
1175	Blatné junction construction	SK	Residual	29.5	29.5	29.5	State budget
1176	Blatné – Trnava: motorway D1 widening to 6 lanes	SK	Residual	478.8	0		
	TOTAL			**1,078**	**314.6**		

Source: Corridor Project List

A. Description of the Action:

A.1. Action Title:

2.2.07 - Upgrading of motorway A2 and A4 in Austria

A.2. Location of the action:

Source: Map data ©2016 Google GeoBasis-DE/BKG (©2009), Google

A.3. Description of the action:

Member States involved:	**Section or Node:**	**Estimated total cost [Mio €]:**
Austria	*-*	*166.2 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
-	*Start year: 2016* *End year: 2020*	*ASFINAG (Austrian Road Infrastructure Manager)*

The Austrian BA corridor road infrastructure, comprises the A5 motorway from the AT/CZ border (Mikulov/Drasenhofen) to Wien /Eibesbrunn, the S1 ("Wiener Außenring Schnellstraße") - a missing link of sorts, where the A23 is used to connect Wien (Eibesbrunn) with the south of Wien (Vösendorf) where the A2 motorway starts. The latter is the route to the AT/IT border via Graz [Arnoldstein (AT) – Tarvisio (IT)]. The A9 motorway runs from Graz to the AT/SI border [Spielfeld-Straß (AT) - Sentilj (SI)].

Getting back to Wien (Schwechat) the A4 connects the capital with the airport in Wien/Schwechat and Bruckneudorf where the A6 motorway branches off to the northeast (AT/SK border, Kittsee/Jarovce). Rehabilitation and expansion of the section of A4 between Fischamend and Bruck up to 6 lanes is planned by 2020. This action is currently at permitting stage.

Furthermore, upgrade of northern by-pass of Klagenfurt within the A2 motorway is expected to be completed by 2018. At present this initiative has planning and feasibility stage concluded. No EIA is required.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
-

Source: Corridor Project List

B. PROJECT IMPLEMENTATION

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
9336	A4 - Fischamend – Bruck a. d. Leitha 6-lane expansion and rehabilitation	AT	ASFINAG (Austrian Road Infrastructure Manager)	Schwechat - Bruckneudorf	Infrastructure (Upgrade),	151.7	valorised (2,5% interest rate p.a.)
1801	A2 motorway: northern by-pass Klagenfurt, general overhaul (stage 2)	AT	ASFINAG (Austrian Road Infrastructure Manager)	Graz West - Klagenfurt West	Infrastructure (Upgrade),	14.5	valorised costs (2,5%)
	TOTAL					**166.2**	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL: L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
9336	A4 - Fischamend – Bruck a. d. Leitha 6-lane expansion and rehabilitation	AT	2017	2020	concluded	concluded	in progress	0%	Land acquisition: Not completed // EIA: NA // Final Approval: submitted, decision pending // CBA: Performed // Other: not required
1801	A2 motorway: northern by-pass Klagenfurt, general overhaul (stage 2)	AT	2016	2018	concluded	concluded	not required	24%	Land acquisition: NA // EIA: NA // Final Approval: approved // CBA: Performed // Other: not required

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR): TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
9336	A4 - Fischamend – Bruck a. d. Leitha 6-lane expansion and rehabilitation	AT	Residual	151.7	151.7	151.7	cash flow (ASFINAG)
1801	A2 motorway: northern by-pass Klagenfurt, general overhaul (stage 2)	AT	3	14.5	14.5	14.6	cash flow (ASFINAG)
	TOTAL			**166.2**	**166.2**		

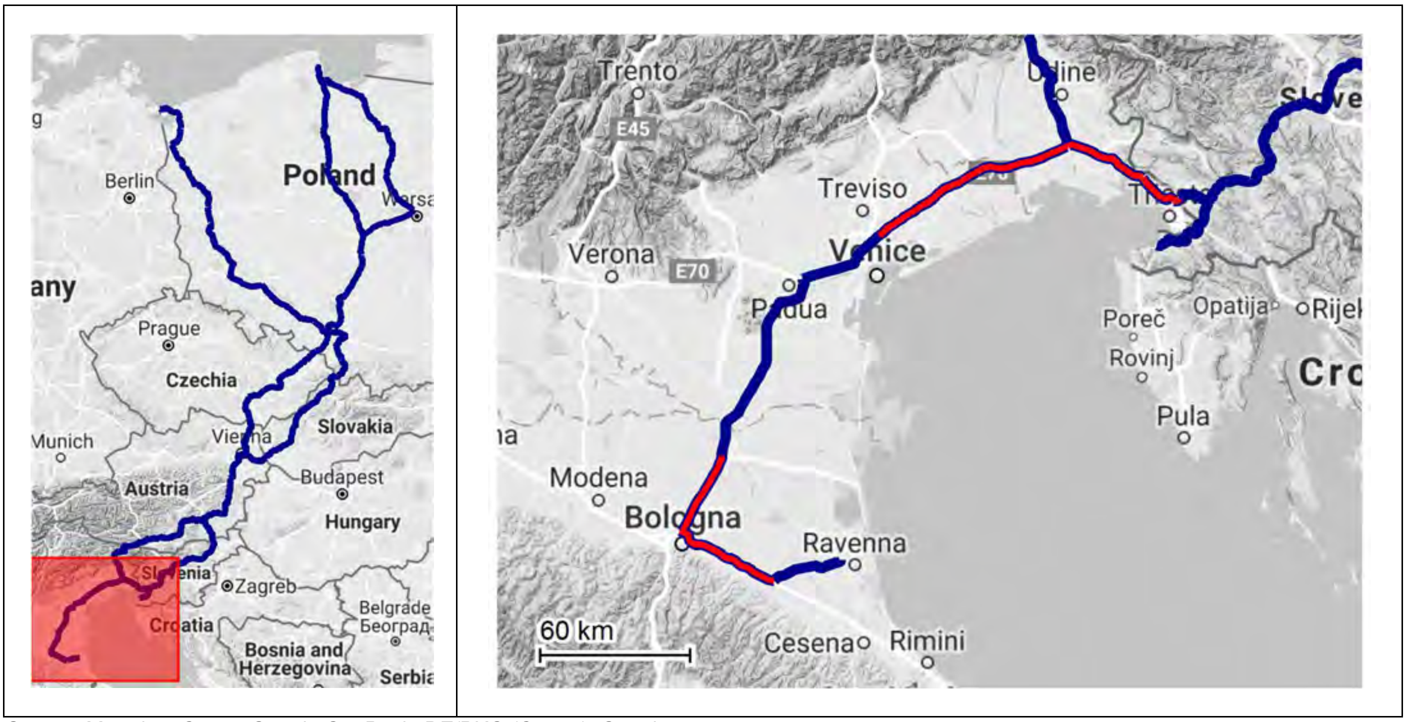
Source: Corridor Project List

A. Description of the Action:

A.1. Action Title:

2.2.08 - Upgrading of the corridor motorway network in Italy (R.A. 13 and 14, A4, A14)

A.2. Location of the action:



Source: Map data ©2016 Google GeoBasis-DE/BKG (©2009), Google

A.3. Description of the action:

Member States involved: *Italy*	**Section or Node:** *Motorway Network in Italy*	**Estimated total cost [Mio €]:** *1,914.7 EUR million*
Other CNC involved: -	**Implementation schedule:** *Start year: NA* *End year: NA*	**Project Promoter:** *ANAS S.p.A., Autovie Venete S.p.A., Autostrade per l'Italia S.p.A.*

The road network in Italy is overall compliant. Improvements are however foreseen on many sections along the alignment of the Baltic-Adriatic Corridor to improve Level of Service and accessibility as well as service areas.

The action comprises construction of the third lane along stretches of A4 motorway Venezia - Trieste planned to be completed by 2029. Upgrade to third lane of the A13 motorway between Bologna and Ferrara is also planned as well as upgrade to fourth lane of the A14 Motorway between Bologna and Castelbolognese. Finally, upgrading works are also foreseen in Trieste node, including improvement of the R.A. 14 motorway with permitting in progress and R.A.13 Interventions with permitting process concluded.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
-

Source: Corridor Project List

B. Project Implementation

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
3303	Improvement of the R.A. 14 motorway	IT	ANAS S.p.A.	Trieste node	Study, Infrastructure (Rehabilitation),	8.0	
3304	R.A.13 Interventions	IT	ANAS S.p.A.	Trieste node	Study, Infrastructure (Upgrade),	3.0	
1200	New toll station of Alvisopoli junction with major road SS14	IT	Autovie Venete S.p.A.	Venezia-Trieste	Infrastructure (New construction),	28.7	16,23 works 12,50 available funds
1202	Widening of motorway A4 with a third lane (from 2x2 to 3x2 lanes): Sub section N.1 San Donà di Piave - Alvisopoli	IT	Autovie Venete S.p.A.	Venezia-Trieste	Infrastructure (Upgrade),	162.5	94,71 works 67,83 available funds
3673	Widening of motorway A4 with a third lane (from 2x2 to 3x2 lanes): Sub section N.2 San Donà di Piave - Alvisopoli	IT	Autovie Venete S.p.A.	Venezia-Trieste	Infrastructure (Upgrade),	182.9	106,51 works 76,39 available funds
3672	Widening of motorway A4 with a third lane (from 2x2 to 3x2 lanes): Sub section N.3 San Donà di Piave - Alvisopoli	IT	Autovie Venete S.p.A.	Venezia-Trieste	Infrastructure (Upgrade),	227.9	133,73 works 94,17 available funds
1203	Widening of motorway A4 with a third lane (from 2x2 to 3x2 lanes): Sub section N.1 Gonars - Villesse	IT	Autovie Venete S.p.A.	Venezia-Trieste	Infrastructure (Upgrade),	65.4	38,45 works 26,96 available funds
3675	Widening of motorway A4 with a third lane (from 2x2 to 3x2 lanes): Sub section N.2 Gonars - Villesse	IT	Autovie Venete S.p.A.	Venezia-Trieste	Infrastructure (Upgrade),	48.6	29,30 works 19,27 available funds
3674	Widening of motorway A4 with a third lane (from 2x2 to 3x2 lanes): Sub section N.3 Gonars - Villesse	IT	Autovie Venete S.p.A.	Venezia-Trieste	Infrastructure (Upgrade),	91.3	59,13 works 32,12 available funds
3670	Widening of motorway A4 with a third lane (from 2x2 to 3x2 lanes): Alvisopoli - Gonars, new interchange of Palmanova and by-pass major road SS352 - 1 section	IT	Autovie Venete S.p.A.	Venezia-Trieste	Infrastructure (Upgrade),	442.3	293,96 works 148,29 available funds
3686	Venice-Trieste Motorway section: upgrading works on the tollgate barriers of Portogruaro	IT	Autovie Venete S.p.A.	Venezia-Trieste	Infrastructure (Upgrade),	4.4	1,84 works 2,58 available funds
3678	Venice-Trieste Motorway section: Revamping of existing barriers	IT	Autovie Venete S.p.A.	Venezia-Trieste	Infrastructure (Upgrade),	14.9	7,27 works 7,64 available funds
3684	S. Donà di Piave barracks	IT	Autovie Venete S.p.A.	Venezia-Trieste	Infrastructure (New construction),	1.9	0,99 works 0,90 available funds
3685	Further works for modernization and extension service areas	IT	Autovie Venete S.p.A.	Venezia-Trieste	Infrastructure (New construction),	3.9	7,27 works 7,64 available funds
3682	Rehabilitation plan acoustic: additional works of acoustic barriers	IT	Autovie Venete S.p.A.	Venezia-Trieste	Infrastructure (New construction),	10.2	7,27 works 7,64 available funds
3681	New building service centre of Palmanova	IT	Autovie Venete S.p.A.	Venezia-Trieste	Infrastructure (Upgrade),	13.3	7,27 works 7,64 available funds
3683	Acoustic Rehabilitation plan: acoustic barriers of Duino Aurisina	IT	Autovie Venete S.p.A.	Venezia-Trieste	Infrastructure (New construction),	5.5	7,27 works 7,64 available funds
1864	Third lane upgrading of the A13 Motorway between Monselice and Padova	IT	Autostrade per l'Italia S.p.A.	Monselice-Padova	Infrastructure (Upgrade),	To be defined	Evaluation on-going
1204	Third lane upgrading of the A13 Motorway between Bologna and Ferrara	IT	Autostrade per l'Italia S.p.A.	Bologna-Ferrara	Infrastructure (Upgrade),	To be defined	Evaluation on-going
1205	Fourth lane upgrading of the A14 Motorway between Bologna and Castelbolognese	IT	Autostrade per l'Italia S.p.A.	Bologna-Castelbolognese	Infrastructure (Upgrade),	600.0	
	TOTAL					**1,914.7**	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
3303	Improvement of the R.A. 14 motorway	IT	2017	2017			in progress	23%	Land acquisition: NA // EIA: NA // Final Approval: not submitted yet // CBA: Not performed // Other: NA
3304	R.A.13 Interventions	IT	2016	2017			concluded	NA%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1200	New toll station of Alvisopoli junction with major road SS14	IT	2023	2028	concluded	concluded	not started	0%	Land acquisition: NA // EIA: EIA approved // Final Approval: not submitted yet // CBA: Performed // Other: NA
1202	Widening of motorway A4 with a third lane (from 2x2 to 3x2 lanes): Sub section N.1 San Donà di Piave - Alvisopoli	IT	2014	2018	concluded	concluded	in progress	72%	Land acquisition: Not completed // EIA: EIA approved // Final Approval: not submitted yet // CBA: Performed // Other: NA
3673	Widening of motorway A4 with a third lane (from 2x2 to 3x2 lanes): Sub section N.2 San Donà di Piave - Alvisopoli	IT	2024	2028	concluded	concluded	not started	0%	Land acquisition: NA // EIA: EIA approved // Final Approval: not submitted yet // CBA: Performed // Other: NA
3672	Widening of motorway A4 with a third lane (from 2x2 to 3x2 lanes): Sub section N.3 San Donà di Piave - Alvisopoli	IT	2024	2029	concluded	concluded	not started	0%	Land acquisition: NA // EIA: EIA approved // Final Approval: not submitted yet // CBA: Performed // Other: NA
1203	Widening of motorway A4 with a third lane (from 2x2 to 3x2 lanes): Sub section N.1 Gonars - Villesse	IT	2014	2018	concluded	concluded	in progress	76%	Land acquisition: Not completed // EIA: EIA approved // Final Approval: not submitted yet // CBA: Performed // Other: NA
3675	Widening of motorway A4 with a third lane (from 2x2 to 3x2 lanes): Sub section N.2 Gonars - Villesse	IT	2016	2019	concluded	concluded	not started	23%	Land acquisition: NA // EIA: EIA approved // Final Approval: not submitted yet // CBA: Performed // Other: NA
3674	Widening of motorway A4 with a third lane (from 2x2 to 3x2 lanes): Sub section N.3 Gonars - Villesse	IT	2024	2028	concluded	concluded	not started	0%	Land acquisition: NA // EIA: EIA approved // Final Approval: not submitted yet // CBA: Performed // Other: NA
3670	Widening of motorway A4 with a third lane (from 2x2 to 3x2 lanes): Alvisopoli - Gonars, new interchange of Palmanova and by-pass major road SS352 - 1 section	IT	2014	2019	concluded	concluded	in progress	58%	Land acquisition: NA // EIA: EIA approved // Final Approval: not submitted yet // CBA: Performed // Other: NA
3686	Venice-Trieste Motorway section: upgrading works on the tollgate barriers of Portogruaro	IT	2014	2017	concluded	concluded	in progress	84%	Land acquisition: NA // EIA: NA // Final Approval: not submitted yet // CBA: Performed // Other: NA
3678	Venice-Trieste Motorway section: Revamping of existing barriers	IT	2014	2018	concluded	concluded	in progress	75%	Land acquisition: NA // EIA: EIA completed // Final Approval: not submitted yet // CBA: Performed // Other: NA
3684	S. Donà di Piave barracks	IT	2023	2027	concluded	concluded	not started	0%	Land acquisition: NA // EIA: NA // Final Approval: not submitted yet // CBA: Performed // Other: NA
3685	Further works for modernization and extension service areas	IT	2025	2029	concluded	concluded	not started	0%	Land acquisition: NA // EIA: NA // Final Approval: not submitted yet // CBA: Performed // Other: NA
3682	Rehabilitation plan acoustic: additional works of acoustic barriers	IT	2019	2022	concluded	concluded	not started	0%	Land acquisition: NA // EIA: NA // Final Approval: not submitted yet // CBA: Performed // Other: NA
3681	New building service centre of Palmanova	IT	2014	2017	concluded	concluded	in progress	86%	Land acquisition: Completed // EIA: NA // Final Approval: not submitted yet // CBA: Performed // Other: NA
3683	Acoustic Rehabilitation plan: acoustic barriers of Duino Aurisina	IT	2014	2017	concluded	concluded	in progress	92%	Land acquisition: Completed // EIA: NA // Final Approval: not submitted yet // CBA: Performed // Other: NA
1864	Third lane upgrading of the A13 Motorway between Monselice and Padova	IT						NA%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1204	Third lane upgrading of the A13 Motorway between Bologna and Ferrara	IT	2014	2020				46%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1205	Fourth lane upgrading of the A14 Motorway between Bologna and Castelbolognese	IT	2014	2020				46%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR)		
					TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
3303	Improvement of the R.A. 14 motorway	IT	Residual	8.0	0.0		
3304	R.A.13 Interventions	IT	Residual	3.0	0.0		
1200	New toll station of Alvisopoli junction with major road SS14	IT	Residual	28.7	28.7	28.7	Cash flows
1202	Widening of motorway A4 with a third lane (from 2x2 to 3x2 lanes): Sub section N.1 San Donà di Piave - Alvisopoli	IT	Residual	162.5	2.5	2.5	Cash flows
3673	Widening of motorway A4 with a third lane (from 2x2 to 3x2 lanes): Sub section N.2 San Donà di Piave - Alvisopoli	IT	Residual	182.9	146	146	Cash flows
3672	Widening of motorway A4 with a third lane (from 2x2 to 3x2 lanes): Sub section N.3 San Donà di Piave - Alvisopoli	IT	Residual	227.9	227.9	227.9	Cash flows
1203	Widening of motorway A4 with a third lane (from 2x2 to 3x2 lanes): Sub section N.1 Gonars - Villesse	IT	Residual	65.4	65.4	65.4	Cash flows
3675	Widening of motorway A4 with a third lane (from 2x2 to 3x2 lanes): Sub section N.2 Gonars - Villesse	IT	Residual	48.6	48.6	48.6	Cash flows
3674	Widening of motorway A4 with a third lane (from 2x2 to 3x2 lanes): Sub section N.3 Gonars - Villesse	IT	Residual	91.3	91.3	91.3	Cash flows
3670	Widening of motorway A4 with a third lane (from 2x2 to 3x2 lanes): Alvisopoli - Gonars, new interchange of Palmanova and by-pass major road SS352 - 1 section	IT	Residual	442.3	442.3	292.3 150.0	Cash flows Funding of Cassa Depositi e Prestiti
3686	Venice-Trieste Motorway section: upgrading works on the tollgate barriers of Portogruaro	IT	Residual	4.4	1.4	1.4	Cash flows
3678	Venice-Trieste Motorway section: Revamping of existing barriers	IT	Residual	14.9	1.9	1.9	Cash flows
3684	S. Donà di Piave barracks	IT	Residual	1.9	1.9	1.9	Cash flows
3685	Further works for modernization and extension service areas	IT	1	3.9	3.9	3.9	Cash flows
3682	Rehabilitation plan acoustic: additional works of acoustic barriers	IT	Residual	10.2	10.2	10.2	Cash flows
3681	New building service centre of Palmanova	IT	Residual	13.3	13.3	13.3	Cash flows
3683	Acoustic Rehabilitation plan: acoustic barriers of Duino Aurisina	IT	Residual	5.5	5.5	5.5	Cash flows
1864	Third lane upgrading of the A13 Motorway between Monselice and Padova	IT	Residual	To be defined	0.0		
1204	Third lane upgrading of the A13 Motorway between Bologna and Ferrara	IT	Residual	To be defined	0.0		
1205	Fourth lane upgrading of the A14 Motorway between Bologna and Castelbolognese	IT	Residual	600.0	0.0		
	TOTAL			**1,914.7**	**1090.8**		

Source: Corridor Project List

A. Description of the Action:

A.1. Action Title:

2.2.09 - Improvements of the corridor motorway network in Slovenia

A.2. Location of the action:

Source: Map data ©2016 Google GeoBasis-DE/BKG (©2009), Google

A.3. Description of the action:

Member States involved:	Section or Node:	Estimated total cost [Mio €]:
Slovenia	*Motorway Network in Slovenia*	*83.3 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
-	*Start year: 2017* *End year: 2022*	*DARS*

The construction or modernization of the main road infrastructure relevant for the BA Corridor has been completed in previous years under the National Motorway Construction Programme of the Republic of Slovenia meaning that the road network in Slovenia is overall compliant. However, some infrastructure improvements are planned with reference to connection Brezovica/Dragomer at Brezovica junction planned for completion by 2018 with EIA already approved. Permit process is in progress as well as construction of noise barriers in HW and MW in Slovenia expected to be implemented by 2022, which are currently at the feasibility and permitting level of maturity.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
-

Source: Corridor Project List

B. Project Implementation

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1911	Connection Brezovica/Dragomer	SI	DARS	Brezovica Junction	Study, Infrastructure (New construction),	33.3	
1937	Noise barrier	SI	DARS	HW and MW in Slovenia	Infrastructure (New construction), Sustainable Freight,	50.0	
	TOTAL					**83.3**	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL				ADMINISTRATIVE ISSUES
					L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	
1911	Connection Brezovica/Dragomer	SI	2017	2018	concluded	concluded	in progress	11%	Land acquisition: Not completed // EIA: EIA approved // Final Approval: not submitted yet // CBA: NA // Other: NA
1937	Noise barrier	SI	2018	2022	in progress	in progress	in progress	0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR)		
					TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1911	Connection Brezovica/Dragomer	SI	Residual	33.3	0		
1937	Noise barrier	SI	Residual	50.0	0		
	TOTAL			**83.3**	**0**		

Source: Corridor Project List

A. Description of the Action:

A.1. Action Title:

2.3.01 - ITS in Poland, Czech Republic, Austria, Italy and Slovenia (also including ETC and eCall)

A.2. Description of the action:

Member States involved:	**Section or Node:**	**Estimated total cost [Mio €]:**
Poland, Czech Republic, Austria, Italy and Slovenia	*Various*	*1,491.1 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
-	*Start year: NA* *End year: NA*	*Generalna Dyrekcja Dróg Krajowych i Autostrad, Ministry of Transport, Road and Motorway Directorate of the Czech Republic, ASFINAG (Austrian Road Infrastructure Manager), Bundesministerium für Verkehr, Innovation und Technologie , Bundesministerium fur Verkehr, Innovation und Technologie, ANAS S.p.A., Ministry of infrastructure, DARS, Ministry of Infrastructure, Republika Slovenija, Ministrstvo za infrastrukturo (Republic of Slovenia, Ministry of Infrastructure)*

Intelligent Transport Systems (ITS) activities are ongoing with respect to many of the measures foreseen by Directive 2010/40/EU. Specifically regarding the European Electronic Toll Collection system - as per Directive 2004/52/EC and subsequent Decision 2009/750/EC - this is not yet implemented in the Baltic-Adriatic Corridor Member States. To this respect number of initiatives is envisaged in Poland, Czech Republic, Austria, Italy and Slovenia.

In Poland the National Road Traffic Management System on TEN-T network, phase I covering the entire Baltic-Adriatic Corridor is going to be implemented by 2020; the initiative is receiving financial support from the CEF. In the Czech Republic the introduction and development of ITS for road transport on highways, limited access highways and 1st class roads (incl. Operation or toll system) is to be installed by 2023.

In the Czech Republic ITS projects, including C-ITS solutions are under implementation.

In Austria projects for the development of the roadside network information system as well as eCall services are at their completion stage. A Memorandum of Understanding between DARS, ASFINAG and AutoVie Venete for the exchange of traffic related data and information has been signed to harmonize traffic management measures as well as traveller information services.

In Italy ITS Road 3 including installation of several road telematics systems on all corridor sections is planned without specified completion date.

In Slovenia Traffic Management Integration in the National Traffic Management Centre is foreseen by 2019 and 2020. Moreover, implementation of the ITS system on Motorway and Highway - Maribor – Celje by 2019 as well as implementation of the ITS system on Motorway and Highway – Koper on section Koper – Ljubljana together with implementation of the C-ITS system on Motorway and Highway - pilot project Koper – Ljubljana are scheduled by 2017 and 2020 respectively. More generally, by this same deadline C-ITS solutions are expected to be implemented widely on the Slovenian road network including the corridor infrastructure. Furthermore, on the section Maribor – Koper the implementation of the ITS system on Motorway and Highway - resting areas as well as safety Management on HW and MW are planned for completion, both actions by 2020. Finally, examination of the number of required parking spaces is going to be implemented by 2018 in Slovenia on various corridor sections.

The deployment of ITS telematic applications along the BA Corridor will be also facilitated by the ongoing implementation of 6 other cross-corridor and multi-country initiatives, totalling 244.5 € million (grouped in a different action 2.3.03 for classification purposes, as these are not specific to the BA Corridor), such as the Crocodile and Ursa Major projects and the EU ITS Platform (EU EIP), also financed by the CEF. The latter is a European wide forum where partners from the private and public sectors of almost all EU Member States will cooperate in order to foster current and future ITS deployments in Europe in a harmonised way. Among these international projects the I_HeERO - Harmonized eCall European initiative is based on a protocol on cross-border cooperation between the Administration of the Republic of Slovenia for Civil Protection and Disaster Relief and the Civil Protection of the Autonomous County of Friuli Venezia Giulia; this project aims to forecasting, prevent and mutual assistance in the events of natural and other disasters signed in 2006.

Source: Corridor Project List

A.3. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
-

Source: Corridor Project List

B. Project Implementation

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1166	National Road Traffic Management System on TEN-T network, phase I	PL	Generalna Dyrekcja Dróg Krajowych i Autostrad	horizontal	ITS	145.0	
4100	Introduction and development of ITS for road transport on highways, limited access highways and 1st class roads (incl. Operation or toll system)	CZ	Ministry of Transport	Czech Road Network	ITS	1,272.0	
1423	URSA Czech Republic	CZ	Road and Motorway Directorate of the Czech Republic	Czech Road Network	ITS	1.0	Total eligible costs
9691	Roadside network information system	AT	ASFINAG (Austrian Road Infrastructure Manager)	Austrian motorway network	ITS	4.1	valorised (2,5% interest rate p.a.)
1876	eCall.at	AT	Bundesministerium für Verkehr, Innovation und Technologie	Austria	ITS	8.0	CEF - Recommended total eligible costs [CEF Brochure]
9604	C-Roads Austria	AT	Bundesministerium fur Verkehr, Innovation und Technologie	Vienna area, the motorway section from Vienna to Salzburg, as well as around Innsbruck and the greater Graz area	ITS	19.1	
3687	ITS Road 3 (Installation of several road telematics systems)	IT	ANAS S.p.A.	All corridor sections	ITS	3.2	
1936	Implementation of the ITS system on Motorway and Highway - Maribor - Celje	SI	DARS	Maribor - Celje	ITS	6.5	
1935	Implementation of the ITS system on Motorway and Highway - Koper	SI	DARS	Koper-Ljubljana	ITS	1.8	
1945	Traffic management integration in the National Traffic Management Centre	SI	Ministry of Infrastructure	Horizontal	ITS	4.9	CEF total eligible recommended
1938	Traffic Management Integration in the National Traffic Management Centre 2	SI	Ministry of infrastructure	Horizontal	ITS	5.6	CEF total eligible costs
1914	Implementation of the C-ITS system on Motorway and Highway - pilot project Koper - Ljubljana	SI	DARS	Koper - Ljubljana	ITS	2.0	
1944	C-Roads Slovenia	SI	Ministry of Infrastructure	Ljubljana - Koper; Divača - Sežana; Razdrto – Vipava	ITS	2.3	CEF total eligible recommended
1429	C-Roads Slovenia 2	SI	Republika Slovenija, Ministrstvo za infrastrukturo (Republic of Slovenia, Ministry of Infrastructure)	Horizontal	ITS	3.1	Total eligible costs
1915	Implementation of the ITS system on Motorway and Highway - resting place	SI	DARS	Maribor - Koper	ITS	6.0	
1918	Safety Management on HW and MW	SI	DARS	Maribor - Koper	ITS	6.0	
1931	Examination of the number of required parking spaces	SI	DARS	Various corridor sections		0.5	
	TOTAL					**1,491.1**	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1166	National Road Traffic Management System on TEN-T network, phase I	PL	2016	2020				9%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
4100	Introduction and development of ITS for road transport on highways, limited access highways and 1st class roads (incl. Operation or toll system)	CZ	2014	2023				32%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1423	URSA Czech Republic	CZ		2020				NA%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
9691	Roadside network information system	AT	2016	2018	concluded	concluded	concluded	40%	Land acquisition: Completed // EIA: not required // Final Approval: approved // CBA: Performed // Other: NA
1876	eCall.at	AT	2015	2017				74%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
9604	C-Roads Austria	AT	2016	2020				23%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
3687	ITS Road 3 (Installation of several road telematics systems)	IT						NA%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1936	Implementation of the ITS system on Motorway and Highway - Maribor - Celje	SI	2016	2019	not started	not started	not started	32%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1935	Implementation of the ITS system on Motorway and Highway - Koper	SI	2015	2017	not started	not started	not started	75%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1945	Traffic management integration in the National Traffic Management Centre	SI	2016	2019				23%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1938	Traffic Management Integration in the National Traffic Management Centre 2	SI	2018	2020	concluded	concluded	concluded	0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1914	Implementation of the C-ITS system on Motorway and Highway - pilot project Koper - Ljubljana	SI	2016	2020	not started	not started	not started	25%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1944	C-Roads Slovenia	SI	2016	2020				23%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1429	C-Roads Slovenia 2	SI		2020				NA%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1915	Implementation of the ITS system on Motorway and Highway - resting place	SI	2017	2020	not started	not started	not started	6%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1918	Safety Management on HW and MW	SI	2016	2020	not started	not started	not started	25%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1931	Examination of the number of required parking spaces	SI	2016	2018	not started	not started	not started	41%	Land acquisition: Not completed // EIA: EIA completed // Final Approval: not submitted yet // CBA: Not performed // Other: Not available

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR)		
					TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1166	National Road Traffic Management System on TEN-T network, phase I	PL	2	145.0	145.0	21.7 123.3	state budget CEF
4100	Introduction and development of ITS for road transport on highways, limited access highways and 1st class roads (incl. Operation or toll system)	CZ	2	1,272.0	16.1	16.1	Co-funding by EU (CEF)
1423	URSA Czech Republic	CZ	2	1.0	1.0	0.8 0.2	CEF NA
9691	Roadside network information system	AT	2	4.1	4.1	4.1	cash flow (ASFINAG)
1876	eCall.at	AT	2	8.0	8.0	4.8 3.2	NA CEF
9604	C-Roads Austria	AT	2	19.1	19.1	9.6 9.5	NA CEF
3687	ITS Road 3 (Installation of several road telematics systems)	IT	2	3.2	0		
1936	Implementation of the ITS system on Motorway and Highway - Maribor - Celje	SI	2	6.5	0		
1935	Implementation of the ITS system on Motorway and Highway - Koper	SI	2	1.8	1.8	1.8	DARS
1945	Traffic management integration in the National Traffic Management Centre	SI	2	4.9	4.9	2.3 2.6	MZI CEF
1938	Traffic Management Integration in the National Traffic Management Centre 2	SI	2	5.6	5.6	4.5 1.1	MZI CEF
1914	Implementation of the C-ITS system on Motorway and Highway - pilot project Koper - Ljubljana	SI	2	2.0	0		
1944	C-Roads Slovenia	SI	2	2.3	2.4	1.2 1.2	CEF NA
1429	C-Roads Slovenia 2	SI	2	3.1	3.1	1.6 1.5	CEF NA
1915	Implementation of the ITS system on Motorway and Highway - resting place	SI	2	6.0	0		
1918	Safety Management on HW and MW	SI	2	6.0	0		
1931	Examination of the number of required parking spaces	SI		0.5	0		
	TOTAL			**1,491.1**	**211.1**		

Source: Corridor Project List

A. Description of the Action:

A.1. Action Title:

2.3.02 - Development of alternative clean fuels in the corridor Member States

A.2. Description of the action:

Member States involved: *Poland, Czech Republic, Austria and Slovenia*	**Section or Node:** *Various*	**Estimated total cost [Mio €]:** *89.3 EUR million*
Other CNC involved: -	**Implementation schedule:** *Start year: NA* *End year: 2020*	**Project Promoter:** *Remontowa LNG Systems Sp. z o.o., Lotos Paliwa Sp.z o.o., Przemyslowy Instytut Motoryzacji , Gaspol Spolka Akcyjna , CEZ, a. s., Slovensky plynarensky priemysel, a.s., GreenWay Infrastructure s.r.o., ST Logistic s.r.o, GreenWay Infrastructure, s.r.o., Zapadoslovenska energe-tika, a.s., EnelSpA*

12 projects are included in the BA Corridor project list which relate to the development of alternative clean fuels for road transport and that are specific to the corridor Member States. These relate to the development of electric mobility in Poland, the Czech Republic, Slovakia, Austria and Italy. LNG projects for road transport are also under implementation in Poland. The list also includes 8 other cross-corridor and multi-country initiatives, totalling 137.7 € million (grouped in a different action 2.3.03 for classification purposes, as these are not specific to the BA Corridor). These will further contribute to the development of electric mobility in the Czech Republic, Slovakia, Austria, Italy and Slovenia, and to the availability of LNG in Poland, Italy and Slovenia as well as Hydrogen in Austria.

Source: Corridor Project List

A.3. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
Availability of clean fuels

Source: Corridor Project List

B. Project Implementation

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1418	Construction of a pilot docking station, as a part of an LNG distribution system based on cryogenic tank containers	PL	Remontowa LNG Systems Sp. z o.o.	horizontal	Study, Clean Fuels,	1.9	Total eligible costs
1419	LEM project – pilot implementation of electromobility along the TEN-T base network	PL	Lotos Paliwa Sp.z o.o.	horizontal	Study,	0.8	Total eligible costs
1010	Study optimizing the functioning and deployment of alternative fuel stations of the TENT-T core network	PL	Przemyslowy Instytut Motoryzacji	TEN-T core network	Study, Clean Fuels,	1.8	CEF - Recommended total eligible costs [CEF Brochure]
1003	Development of LNG infrastructure in Poland - the pilot project	PL	Gaspol Spolka Akcyjna	Study covers whole Poland; 2 pilot LNG stations are to be located near Poznań and Jarosty	Study, Clean Fuels,	0.007	CEF - Recommended total eligible costs [CEF Brochure]
1422	CEZ EV TEN-T Fast Charging Network	CZ	CEZ, a. s.	Czech Road Network	Study, ITS	2.9	Total eligible costs
4532	EV fast charging backbone network Central Europe	CZ	CEZ, a. s.	CZ	Study, Clean Fuels,	2.8	
1425	fuelCNG	SK	Slovensky plynarensky priemysel, a.s.	Slovakia	Study, Clean Fuels,	18.5	Total eligible costs
1426	NCE - AdvancedEvNet	SK	GreenWay Infrastructure s.r.o.	Slovakia	Study, Clean Fuels,	7.3	Total eligible costs

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1427	LNG: Fuelling Renewable Transport in the Visegrad countries	SK	ST Logistic s.r.o	Slovakia	Study, Clean Fuels,	32.4	Total eligible costs
4502	NCE - FastEvNet	SK, PL	GreenWay Infrastructure, s.r.o.	SK, PL	Study, Clean Fuels,	4.8	
1878	FAST-E (SK\CZ)	CZ, SK	Zapadosloven ska energe-tika, a.s.	Horizontal	Study, Clean Fuels,	2.6	CEF - Recommended total eligible costs [CEF GA]
5507	EVA+ (Electric Vehicles Arteries in Italy and Austria)	AT, IT	EnelSpA	Horizontal	Study, Clean Fuels,	13.6	
	TOTAL					**89.3**	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL: L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1418	Construction of a pilot docking station, as a part of an LNG distribution system based on cryogenic tank containers	PL		2020				NA%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1419	LEM project – pilot implementation of electromobility along the TEN-T base network	PL		2020				NA%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1010	Study optimizing the functioning and deployment of alternative fuel stations of the TENT-T core network	PL	2015	2018				61%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1003	Development of LNG infrastructure in Poland - the pilot project	PL	2015	2016				NA%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1422	CEZ EV TEN-T Fast Charging Network	CZ		2020				NA%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
4532	EV fast charging backbone network Central Europe	CZ	2016	2018				39%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1425	fuelCNG	SK		2020				NA%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1426	NCE - AdvancedEvNet	SK		2020				NA%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1427	LNG: Fuelling Renewable Transport in the Visegrad countries	SK		2020				NA%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
4502	NCE - FastEvNet	SK, PL	2016	2019				34%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1878	FAST-E (SK\CZ)	CZ, SK	2014	2017				83%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
5507	EVA+ (Electric Vehicles Arteries in Italy and Austria)	AT, IT	2016	2018				29%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR) TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1418	Construction of a pilot docking station, as a part of an LNG distribution system based on cryogenic tank containers	PL	1	1.9	1.9	0.95 0.95	CEF NA
1419	LEM project – pilot implementation of electromobility along the TEN-T base network	PL	1	0.8	0.8	0.4 0.4	CEF NA
1010	Study optimizing the functioning and deployment of alternative fuel stations of the TENT-T core network	PL		1.8	1.8	0.28 1.52	to be confirmed CEF - Cohesion Call
1003	Development of LNG infrastructure in Poland - the pilot project	PL	1	0.007	0.007	0.0035 0.0035	national funds CEF - Multi Annual Call, funding objective 2
1422	CEZ EV TEN-T Fast Charging Network	CZ	1	2.9	2.9	2.50 0.44	CEF NA
4532	EV fast charging backbone network Central Europe	CZ	1	2.8	2.8	1.97 0.87	CEF NA
1425	fuelCNG	SK	1	18.5	18.5	15.7 2.8	CEF NA
1426	NCE - AdvancedEvNet	SK	1	7.3	7.3	6.2 1.1	CEF NA
1427	LNG: Fuelling Renewable Transport in the Visegrad countries	SK	1	32.4	32.4	27.5 4.9	CEF NA
4502	NCE - FastEvNet	SK, PL	1	4.8	4.8	3.3 1.5	CEF NA
1878	FAST-E (SK\CZ)	CZ, SK	1	2.6	2.6	2.17 0.38	CEF NA
5507	EVA+ (Electric Vehicles Arteries in Italy and Austria)	AT, IT	1	13.6	13.6	4.2 9.4	CEF NA
	TOTAL			**89.3**	**89.3**		

Source: Corridor Project List

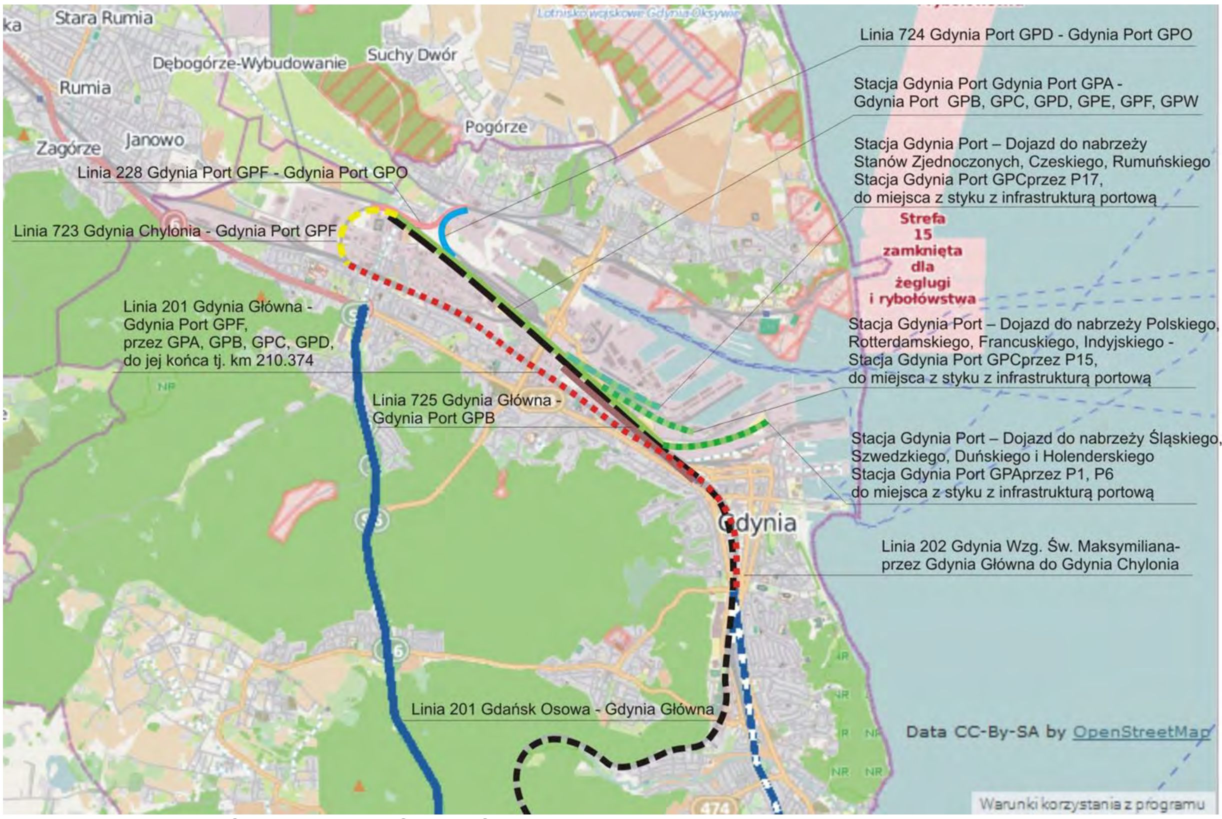
Action sheets for the development of maritime transport

A. Description of the Action:

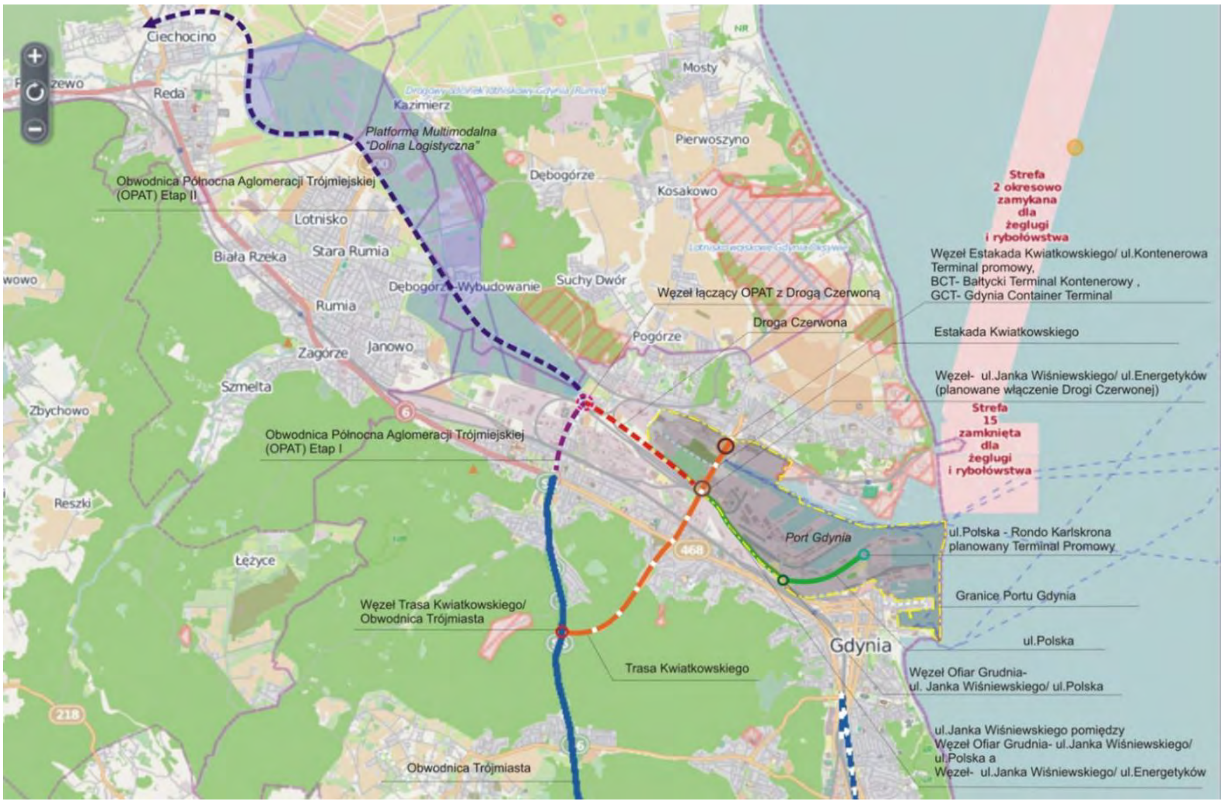
A.1. Action Title:

3.1.01 - Development of interconnections: Port of Gdynia

A.2. Location of the action:



Rail map accessibility - Source: 2014 BA Corridor Study



Road map accessibility - Source: 2014 BA Corridor Study

A.3. Description of the action:

Member States involved:	Section or Node:	Estimated total cost [Mio €]:
-	-	*1,019.9 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
-	*Start year: 2017* *End year: 2027*	*PKP Polskie Linie Kolejowe S.A., Zarząd Morskiego Portu Gdynia*

The maritime Port of Gdynia is connected to the BA Corridor core network by railway lines 201/202 and by road infrastructure (S6 express road). The following additional railway infrastructure interconnected with lines 201 and 202 is relevant in providing accessibility to the port and terminals: lines 228, 723, 228, 724, 725.

Concerning rail transport, works for the improvement of the standards of the railway lines interconnecting the terminals to the main lines 202 and 201 belonging to the Baltic-Adriatic Corridor are required. Projects for the improvement of the technical parameters are foreseen, covering among others the implementation of Layout Command Control within the port area, electrification of access to the container terminal, instalment of Remote Train Control in view of future ETCS implementation as well as construction of road and railway bridges to improve safety and capacity. Works are planned to start in 2018, expected to be completed by 2020 (190.9 € million). Works inside the port area to increase the throughput capacity of the rail infrastructure are also expected to be implemented between 2021 and 2027 (59.8 € million). Some other modernisation works are also planned, including reconstruction of railway access to the Western port areas of the port of Gdynia, with expected completion of the works by 2020 (approximately 17.7 € million). Works on the TEN-T comprehensive partially non-electrified railway line 201 are also planned; this representing the railway line that will be predominantly used by the traffic generated by the port.

Regarding road connections, the S6/S7 express road is already in good condition up to the junction with Morska Street in Gdynia. However, critical issues exist in the road network providing access to the port: the Kwiatkowski Viaduct although recently completed (2008) represents a critical issue in terms of axle load standards and the Kwiatkowski Route registers high traffic levels which may turn into a capacity issue particularly in view of the further development of the traffic at the port. The upgrading of the port's surrounding urban road network is also under consideration which could help solving the existing and future capacity bottlenecks. The actions addressing the road bottlenecks are under consideration/definition by the concerned stakeholders at present which may be implemented by 2030: reconstruction of Kwiatkowski viaduct, construction of Droga Czerwona and upgrading of Polska Street and Janka Wiśniewskiego Street.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
Electrification; Freight lines: Axle.load (22.5 t); Freight lines: train length (740m); Current or potential future capacity bottleneck

Source: Corridor Project List

B. Project Implementation

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1050	Improvement of railway connection to Maritime Port in Gdynia	PL	PKP Polskie Linie Kolejowe S.A.	Port of Gdynia	Infrastructure (Upgrade),	190.9	Total value in the National Railway Programme [PLN]
1149	Reconstruction of Kwiatkowski viaduct in Gdynia to the full TEN-T requirements	PL	Urząd Miasta w Gdyni	Port of Gdynia	Infrastructure (Upgrade), Administrative procedures,	95.60	
1150	Via Maris - Construction of north by-pass of Tricity agglomeration (works partly affecting last mile connection to Gdynia port)	PL	Generalna Dyrekcja Dróg Krajowych i Autostrad	Port of Gdynia	Infrastructure (New construction), Administrative procedures,	380.0	
1167	Via Maris - Droga Czerwona road in Gdynia (from Janka Wiśniewskiego Street to Gdynia-Północ junction)	PL	Urząd Miasta Gdyni / Zarząd Morskiego Portu Gdynia / Generalna Dyrekcja Dróg Krajowych i Autostrad	Port of Gdynia	Infrastructure (Upgrade), Infrastructure (New construction), Administrative procedures,	200.0	
1169	Via Maris - Further integration and modernization of national roads and motorways links with the port's road infrastructure	PL	Urząd Miasta Gdyni / Zarząd Morskiego Portu Gdynia / Generalna Dyrekcja Dróg Krajowych i Autostrad	Port of Gdynia	Study, Infrastructure (Upgrade), Infrastructure (New construction), Administrative procedures,	76.0	
1218	Reconstruction of railway access to western part of Gdynia Port	PL	Zarząd Morskiego Portu Gdynia	Port of Gdynia	Infrastructure (Upgrade), Infrastructure (New construction),	17.7	
1224	Increasing the throughput capacity of rail tracks within the administrative borders of the Port of Gdynia according to TEN-t requirements	PL	Zarząd Morskiego Portu Gdynia	Port of Gdynia	Infrastructure (Upgrade), Infrastructure (New construction),	59.8	
	TOTAL					1019.9	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1050	Improvement of railway connection to Maritime Port in Gdynia	PL	2018	2020	NA	concluded	in progress	0%	Land acquisition: Not completed // EIA: EIA approved // Final Approval: approved // CBA: Performed // Other: NA
1149	Reconstruction of Kwiatkowski viaduct in Gdynia to the full TEN-T requirements	PL	After completion of 1167 and 1150	2027	concluded	in progress	in progress	0%	Land acquisition: NA // EIA: EIA NA // Final Approval: NA // CBA: NA // Other: NA
1150	Via Maris - Construction of north by-pass of Tricity agglomeration (works partly affecting last mile connection to Gdynia port)	PL	After 2021	2024	concluded	in progress	in progress	0%	Land acquisition: NA // EIA: EIA NA // Final Approval: NA // CBA: NA // Other: NA
1167	Via Maris - Droga Czerwona road in Gdynia (from Janka Wiśniewskiego Street to Gdynia-Północ junction)	PL	After 2021	2024	concluded	concluded	in progress	0%	Land acquisition: NA // EIA: EIA NA // Final Approval: not submitted yet // CBA: NA // Other: NA
1169	Via Maris - Further integration and modernization of national roads and motorways links	PL	After 2024	2027	in progress	not started	in progress	0%	Land acquisition: NA // EIA: EIA NA // Final Approval: not submitted yet // CBA: NA // Other: NA

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
	with the port's road infrastructure								
1218	Reconstruction of railway access to western part of Gdynia Port	PL	2017	2020	concluded	not started	in progress	0%	Land acquisition: NA // EIA: NA // Final Approval: not submitted yet // CBA: Not performed // Other: NA
1224	Increasing the throughput capacity of rail tracks within the administrative borders of the Port of Gdynia according to TEN-t requirements	PL	2020	2030	not started	not started	not started	0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR) TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1050	Improvement of railway connection to Maritime Port in Gdynia	PL	1	190.9	190.9	28.6 162.3	national funds CEF - Cohesion Call
1149	Reconstruction of Kwiatkowski viaduct in Gdynia to the full TEN-T requirements	PL	1	95.60	0		
1150	Via Maris - Construction of north by-pass of Tricity agglomeration (works partly affecting last mile connection to Gdynia port)	PL	1	380.0	0		
1167	Via Maris - Droga Czerwona road in Gdynia (from Janka Wiśniewskiego Street to Gdynia-Północ junction)	PL	1	200.0	0		
1169	Via Maris - Further integration and modernization of national roads and motorways links with the port's road infrastructure	PL	1	76.0	0		
1218	Reconstruction of railway access to western part of Gdynia Port	PL	1	17.7	0		
1224	Increasing the throughput capacity of rail tracks within the administrative borders of the Port of Gdynia according to TEN-t requirements	PL	1	59.8	0		
	TOTAL			1019.9	190.9		

Source: Corridor Project List

C. Gap Analysis and Implementation Risks

C.1. Remaining technical and operational barriers of the infrastructure and implementation risks:

Although the Port of Gdynia is already interconnected to the rail and road core network corridor, implementation of the above initiatives will allow for removal of existing bottlenecks and attainment of improved technical parameters related to rail speed, axle load as well as train length, especially on railway lines 201 and 202 interconnecting the core network with the port but also within the port area (including electrification). Improvement works planned on the comprehensive line no. 201 (freight transport line alternative to BAC) are aimed at contributing to a significant reduction of freight traffic through the congested Tricity (section Tczew – Gdańsk of railway line no. 9). With respect to the road access to the port, attainment of compliance in terms of axle load standards as well as resolution of capacity bottlenecks issues is expected due to the road investments implementation. All the schemes are foreseen to be implemented by 2030.

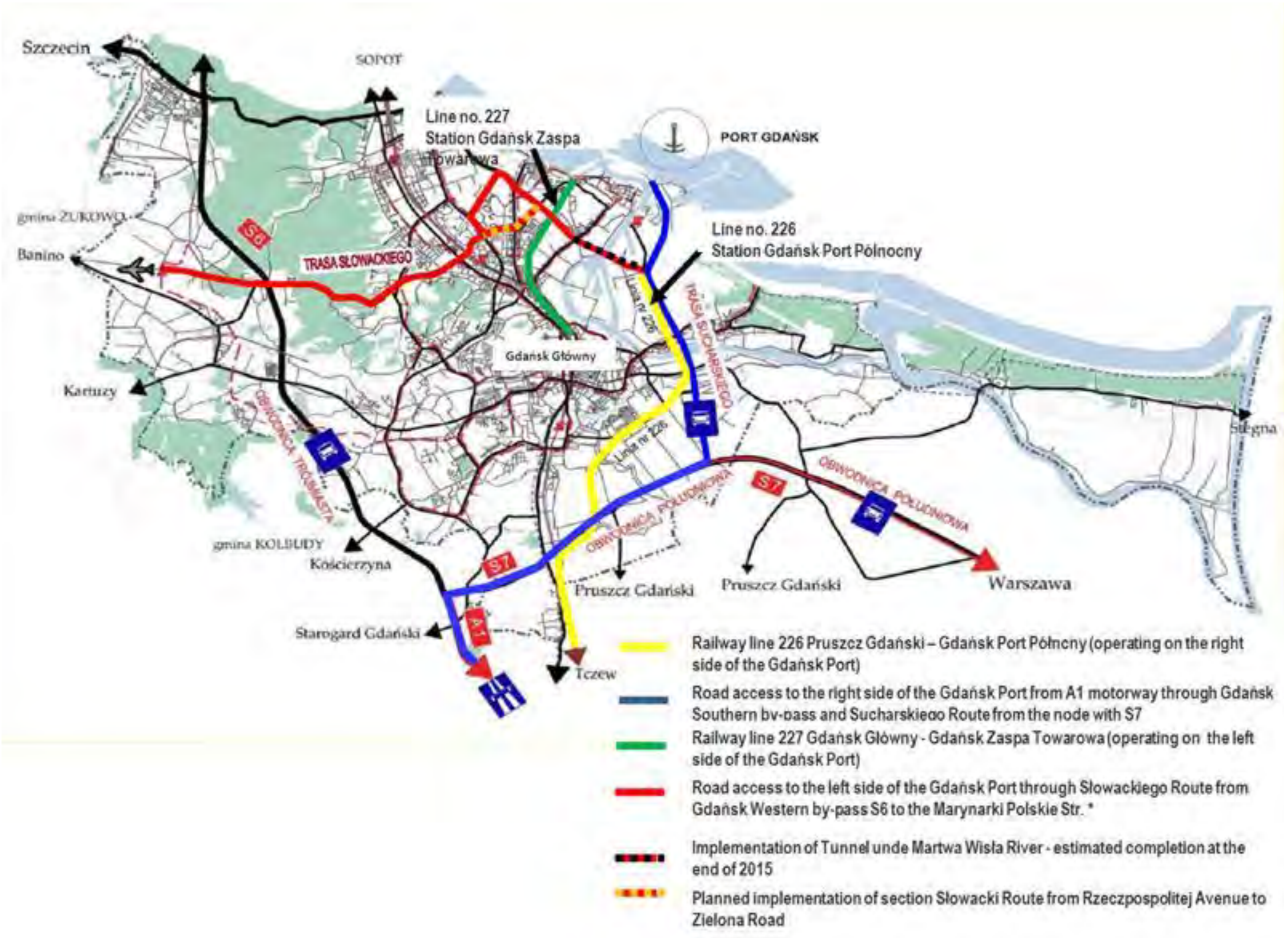
Source: Own assessment based on available information

A. Description of the Action:

A.1. Action Title:

3.1.02 - Development of interconnections: Port of Gdańsk

A.2. Location of the action:



Rail and Road accessibility map - Source: 2014 BA Corridor Study

Source: Project fiches

A.3. Description of the action:

Member States involved:	Section or Node:	Estimated total cost [Mio €]:
-	-	*297.9 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
-	*Start year: 2013* *End year: 2022*	*Municipality of Gdansk, Zarząd Morskiego Portu Gdańsk, PKP Polskie Linie Kolejowe S.A.*

About rail interconnections, modernisation works on railway line 226 are ongoing which include construction of the second track, increase in axle load and operating speed standards as well as reconstruction of bridges. All activities are expected to be completed by 2018 (76.2 € million). Investments aiming at improving the railway connection to the port (in particular improvement of railway infrastructure within the railway stations Gdańsk Port Północny, Gdańsk Zaspa Towarowa and Gdańsk Kanał Kaszubski, construction of a road viaduct and development of a Local Control Centre between Gdańsk Port Północny and Gdańsk Kanał Kaszubski, electrification of railroad no. 965 as well as instalment of Railway Traffic Control devices in view of future ETCS implementation) are foreseen to be implemented with expected completion date by 2020 (141.5 € million).

Concerning road last mile connections, the construction of a road tunnel and a rail bridge to cross the Martwa Wisła River have been recently completed which improved accessibility to the port; the first one allowing direct interconnection with the A1 as an alternative to the existing interconnection with the S7, and the second one increasing capacity on the existing line. The improvement/upgrading of the Nowa Kościuszki street, resulting in the completion of the Gdańsk ring road, also represents a critical issue in terms of road accessibility to the port.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
ERTMS; Freight lines: speed (100 km/h); Freight lines: Axle.load (22.5 t); Freight lines: train length (740m); Current or potential future capacity bottleneck

Source: Corridor Project List

B. PROJECT IMPLEMENTATION

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1575	Extension and modernisation of road network in External Port of Gdańsk	PL	Municipality of Gdansk	Port of Gdańsk	Infrastructure (New construction),	12.3	
1020	Design and environmental documentation for expansion and modernization of the road and rail infrastructure at the Port of Gdańsk	PL	Zarząd Morskiego Portu Gdańsk	Port of Gdańsk	Study,	1.1	CEF-Multi Annual Call funding objective 3
1027	Extension and modernisation of road and railway network in the Gdańsk outer port	PL	Zarząd Morskiego Portu Gdańsk	Port of Gdańsk	Study, Infrastructure (Rehabilitation), Infrastructure (Upgrade),	28.8	CEF Cohesion Call
1051	Improvement of railway connection to Maritime Port in Gdańsk	PL	PKP Polskie Linie Kolejowe S.A.	Port of Gdańsk	Infrastructure (Upgrade), OTHER	141.5	Total value in the National Railway Programme [PLN]
1054	Project of improvement of railway connection to Gdańsk Port (bridge + double track railway line)	PL	PKP Polskie Linie Kolejowe S.A.	Port of Gdańsk	Infrastructure (Upgrade), Infrastructure (New construction),	76.2	with buget for risks
1563	Expansion and modernization of core network node in the Port of Gdańsk concerning road and rail infrastructure	PL	Zarząd Morskiego Portu Gdańsk	Port - Municipality Node	Infrastructure (Upgrade), Infrastructure (New construction),	22.0	CEF / POIiŚ
1564	Expansion and modernization of core network node in the Port of Gdańsk concerning road and rail infrastructure	PL	Zarząd Morskiego Portu Gdańsk	Port - Municipality Node	Infrastructure (Upgrade), Infrastructure (New construction),	16.0	CEF / POIiŚ
	TOTAL					297.9	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1575	Extension and modernisation of road network in External Port of Gdańsk	PL	2013	2020	concluded	concluded	concluded	50%	Land acquisition: Not completed // EIA: EIA approved // Final Approval: not submitted yet // CBA: Performed // Other: The cooperation agreement between the Port of Gdańsk SA, and the Municipality of the City of Gdańsk dated 11.16.2014 r.
1020	Design and environmental documentation for expansion and modernization of the road and rail infrastructure at the Port of Gdańsk	PL	2016	2018	concluded	concluded	in progress	52%	Land acquisition: NA // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: NA // Other: NA
1027	Extension and modernisation of road and	PL	2016	2020	concluded	concluded	concluded	23%	Land acquisition: NA // EIA: EIA approved // Final Approval: not

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
	railway network in the Gdańsk outer port								submitted yet // CBA: Performed // Other: NA
1051	Improvement of railway connection to Maritime Port in Gdańsk	PL	2018	2020	not started	concluded	in progress	0%	Land acquisition: Not completed // EIA: EIA under preparation or updating // Final Approval: approved // CBA: Performed // Other: NA
1054	Project of improvement of railway connection to Gdańsk Port (bridge + double track railway line)	PL	2014	2018	concluded	concluded	concluded	62%	Land acquisition: Completed // EIA: EIA approved // Final Approval: approved // CBA: Performed // Other: NA
1563	Expansion and modernization of core network node in the Port of Gdańsk concerning road and rail infrastructure	PL	2018	2022	concluded	concluded	in progress	0%	Land acquisition: NA // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: Not performed // Other: NA
1564	Expansion and modernization of core network node in the Port of Gdańsk concerning road and rail infrastructure	PL	2018	2022	concluded	concluded	in progress	0%	Land acquisition: NA // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: Not performed // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR) TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1575	Extension and modernisation of road network in External Port of Gdańsk	PL	1	12.3	1.8	1.8	own contribution, municipality budget
1020	Design and environmental documentation for expansion and modernization of the road and rail infrastructure at the Port of Gdańsk	PL		1.1	1.1	0.53 0.53	own contribution CEF 2015 call
1027	Extension and modernisation of road and railway network in the Gdańsk outer port	PL	1	28.8	28.8	4.3 24.5	own contribution CEF 2015 call
1051	Improvement of railway connection to Maritime Port in Gdańsk	PL	1	141.5	141.5	25.9 115.6	national funds CEF - Cohesion Call
1054	Project of improvement of railway connection to Gdańsk Port (bridge + double track railway line)	PL	1	76.2	76.2	25.2 51.0	national funds OPIE 2007 - 2013, OPIE 2014 - 2020
1563	Expansion and modernization of core network node in the Port of Gdańsk concerning road and rail infrastructure	PL	1	22.0	0		
1564	Expansion and modernization of core network node in the Port of Gdańsk concerning road and rail infrastructure	PL	1	16.0	0		
	TOTAL			297.9	249.4		

Source: Corridor Project List

C. Gap Analysis and Implementation Risks

C.1. Remaining technical and operational barriers of the infrastructure and implementation risks:

Although the Port of Gdańsk is already interconnected to the rail and road core network corridor, implementation of the above initiatives will allow for removal of existing bottlenecks and attainment of improved technical parameters related to rail speed, axle load as well as train length on railway lines no. 227 and 226 interconnecting to the core network (line no. 9) as well as within the port area. With respect to the roads, improvement of hinterland access to the Outer Port of Gdansk by means of improvement of road infrastructure is envisaged.

All the schemes are foreseen to be implemented by 2022.

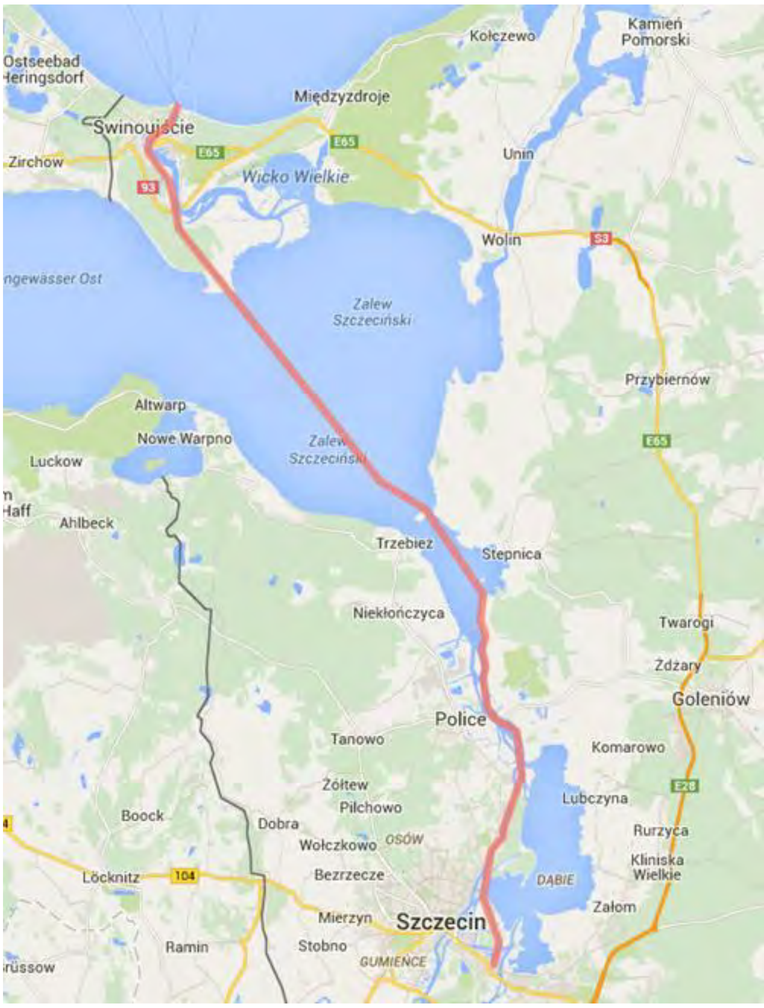
Source: Own assessment based on available information

A. Description of the Action:

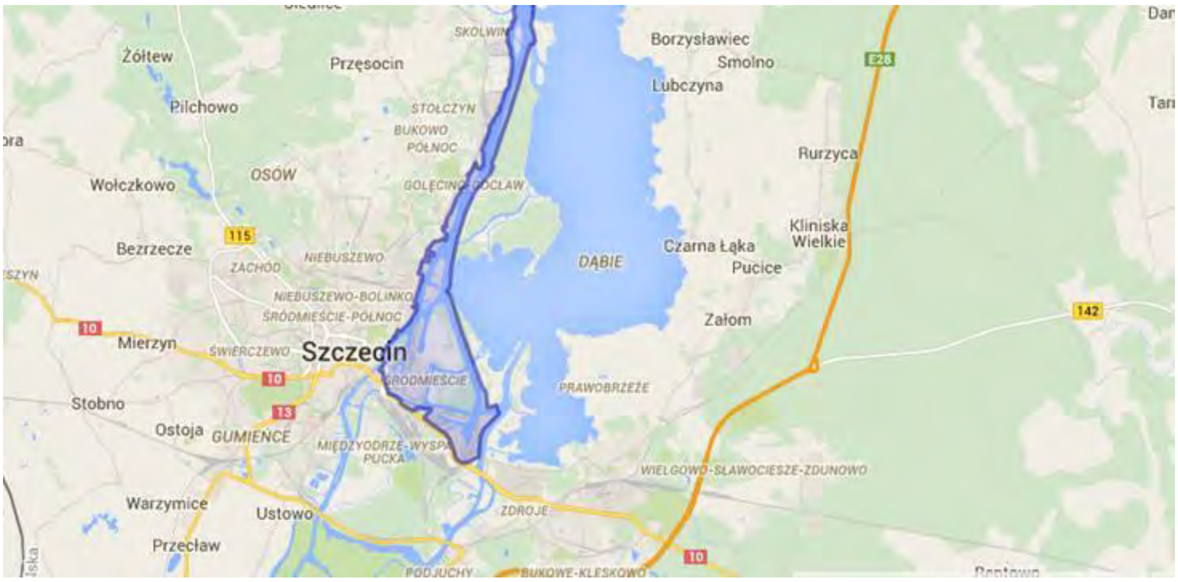
A.1. Action Title:

3.1.03 - Development of interconnections: Ports of Szczecin and Świnoujście

A.2. Location of the action:



Szczecin and Świnoujście fairway interconnection – Source: 2014 BA Corridor Study; Map data ©2016 Google GeoBasis-DE/BKG (©2009), Google



Rail accessibility map – Source: 2014 BA Corridor Study; Map data ©2016 Google GeoBasis-DE/BKG (©2009), Google

Road accessibility map – Source: 2014 BA Corridor Study; Map data ©2016 Google GeoBasis-DE/BKG (©2009), Google

Source: Project fiches

A.3. Description of the action:

Member States involved: -	**Section or Node:** -	**Estimated total cost [Mio €]:** *248.6 EUR million*
Other CNC involved: -	**Implementation schedule:** *Start year: 2016* *End year: 2021*	**Project Promoter:** *Gmina Miasto Świnoujście, Gmina Miasto Szczecin , PKP Polskie Linie Kolejowe S.A. Port of Szczecin/Świnoujście*

The ports of Szczecin and Świnoujście have connections with a complex system of land facilities transportation. The two ports are also interconnected through a 68 km long fairway, which is deemed not adequate to support the interconnection between the two ports via water; studies and investments are already planned in this respect aimed at deepening the fairway works and improving ferry and intermodal connection between the two ports.

Regarding rail transport, tTrain length and freight speed limitation are currently affecting railway accessibility to the ports. Modernisation works are planned to upgrade the speed up to 160 km and increase axle load to 221 kN/axis for the main existing line tracks and stations and up to 245 kN for the reconstructed and newly constructed sections. The reconstruction of the railway viaduct on line no. 990, the electrification of railway lines no. 990 and no. 996 and the elimination of bottlenecks at Szczecin Port Centralny and Świnoujście stations are also foreseen. All the initiatives are expected to be completed by 2020 (143.67 € million).

About rRoad interconnections, access to the port of Szczecin is primarily provided through the national road no. 10, Parnica viaduct and local roads. The reconstruction of the local road communication system in the area of Międzyodrze is currently under consideration, the works expected to be completed by 2020 (69.1 € million). Road access to the port of Świnoujście is provided by the national road no. 3 and lower class roads (Poviat roads). Short segments of both national road no. 3 and Poviat roads require upgrading works.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
Freight lines: Axle.load (22.5 t); Freight lines: train length (740m); Current or potential future capacity bottleneck

Source: Corridor Project List

B. Project Implementation

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1247	Functional and environmentally friendly access to Świnoujście Port infrastructure, phase I	PL	Gmina Miasto Świnoujście	Port of Szczecin / Świnoujście	Infrastructure (Upgrade), Infrastructure (New construction),	22.9	To be confirmed
1248	Functional and environmentally friendly access to Świnoujście Port infrastructure, phase II	PL	Gmina Miasto Świnoujście	Port of Szczecin / Świnoujście	Infrastructure (Upgrade), Infrastructure (New construction),	12.9	To be confirmed
1151	Modernisation of road access to Szczecin Port: reconstruction of communication network in the area of Międzyodrze	PL	Gmina Miasto Szczecin	Port of Szczecin	Infrastructure (Upgrade), Infrastructure (New construction),	69.1	
1052	Improvement of railway connection to Maritime Ports in Szczecin and Świnoujście	PL	PKP Polskie Linie Kolejowe S.A. Port of Szczecin/Świnoujście	Ports of Szczecin / Świnoujście	Infrastructure (Upgrade),	143.7	Total value in the National Railway Programme [PLN]
	TOTAL					248.6	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1151	Modernisation of road access to Szczecin Port: reconstruction of communication network in the area of Międzyodrze	PL	2017	2020	concluded	concluded	in progress	6%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: Performed // Other: NA
1052	Improvement of railway connection to Maritime Ports in Szczecin and Świnoujście	PL	2019	2020	not started	concluded	in progress	0%	Land acquisition: Not completed // EIA: EIA approved // Final Approval: approved // CBA: Performed // Other: NA
1247	Functional and environmentally friendly access to Świnoujście Port infrastructure, phase I	PL	2016	2019		in progress	in progress	31%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1248	Functional and environmentally friendly access to Świnoujście Port infrastructure, phase II	PL	2016	2021		in progress	in progress	20%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR)		
					TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1151	Modernisation of road access to Szczecin Port: reconstruction of communication network in the area of Międzyodrze	PL	1	69.1	0		
1052	Improvement of railway connection to Maritime Ports in Szczecin and Świnoujście	PL	1	143.7	143.7	21.6 122.1	national funds CEF - Cohesion Call
1247	Functional and environmentally friendly access to Świnoujście Port infrastructure, phase I	PL	1	22.9	0		
1248	Functional and environmentally friendly access to Świnoujście Port infrastructure, phase II	PL	1	12.9	0		
	TOTAL			248.6	143.70		

Source: Corridor Project List

C. Gap Analysis and Implementation Risks

C.1. Remaining technical and operational barriers of the infrastructure and implementation risks:

Although the Port of Szczecin and Świnoujście are already interconnected to the rail and road core network corridor, implementation of the above initiatives will allow for removal of existing bottlenecks and attainment of improved technical parameters related to rail speed, axle load as well as train length, especially on railway lines no. 401 and 351 as well as within the port area. With respect to the road access, reconstruction of local road communication system in the area of Międzyodrze will contribute to elimination of this last mile connection bottleneck.

All the schemes are foreseen to be implemented by 2021.

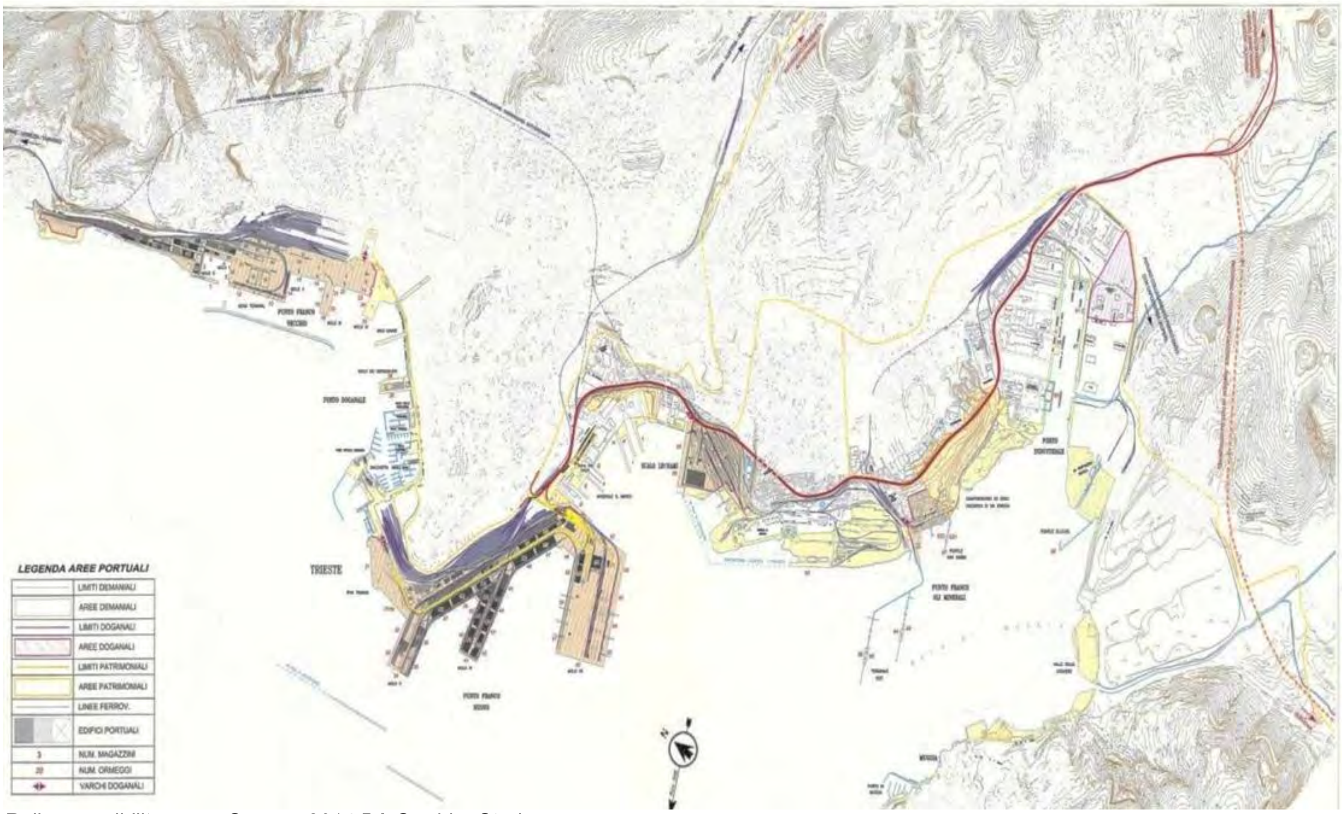
Source: Own assessment based on available information

A. DESCRIPTION OF THE ACTION:

A.1. Action Title:

3.1.04 - Development of interconnections: Port of Trieste

A.2. Location of the action:



Rail accessibility map - Source: 2014 BA Corridor Study

Source: Project fiches

A.3. Description of the action:

Member States involved:	**Section or Node:**	**Estimated total cost [Mio €]:**
-	-	*113.0 EUR million*
Other CNC involved: -	**Implementation schedule:** *Start year: 2016* *End year: 2026*	**Project Promoter:** *Triest Port Authority, RFI S.p.A.*

Concerning accessibility to the port by rail, a double track line is interconnecting the port to the Trieste – Venezia railway line, leaving from Campo Marzio, tunnelling and crossing the city. Furthermore, there is a single track line going from Campo Marzio directly to Villa Opicina, which is however temporary closed and with a steep gradient that prevents operation of heavy trains. Based on the current schedule, increases in the future traffic on the line in operation may lead to congestion. The port's development plans consider this "last mile" issue a critical one to ensure continuity in the operation of freight services. In addition to this, investments are deemed necessary to develop the railway terminal at Campo Marzio (Port Station) to improve operations at existing port terminals. Shunting and coupling of trains is indeed currently possible only at port terminals. Due to the limited length of tracks at these terminals more shunting operations and train manoeuvring is required to assemble trains even limited to 550 m length, which impacts on the effectiveness and efficiency of terminal operations. Investments to increase train length operations up to 750 m at Trieste C. Marzio station are planned for implementation as part of a wider initiative aimed at modernising the whole Trieste Campo Marzio station, increasing its capacity and performance in support of the development of intermodal services. The project, which also includes works for the improvement of the so called railway line "Linea di cintura" between Campo Marzio and Trieste Aquilinia, is planned to be completed by 2026 (77 € million). Works to improve the railway infrastructure within the port area and terminals as well as the construction of a new railway link in view of the development of the new logistics platform are also planned for implementation between 2016 and 2020 (36 € million).

About road last mile connections, a direct junction and a flyover (within the port) interconnect the Port of Trieste and its terminals to the main city road network and to the national highway and motorway networks, including the Baltic-Adriatic corridor links. Improvement works on the SS 202, also providing access to the port, have been completed for the stabilisation of the retaining walls (from km 9+850 to km 12+200) and for the structural repair of the viaduct "Molo VII".

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
Current or potential future capacity bottleneck

Source: Corridor Project List

B. PROJECT IMPLEMENTATION

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1851	Upgrading of the port railway system to operate longer trains coherently with the on-going upgrading action of the marshalling yard in Campo Marzio	IT	Triest Port Authority	Port of Triest	Study, Infrastructure (Upgrade), Admin procedures, OTHER	20.0	
1852	Construction of a new rail connection from the Logistic Platform, the Timber terminal and the steel plant in Servola with the existing national rail system	IT	Triest Port Authority	Port of Triest	Study, Infrastructure (Upgrade),	16.0	
3299	Railway works inside and outside the port area of Trieste	IT	RFI S.p.A.	Trieste Port	Study, Infrastructure (Upgrade), Infrastructure (New construction),	77.0	
	TOTAL					113.0	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1851	Upgrading of the port railway system to operate longer trains coherently with the on-going upgrading action of the marshalling yard in Campo Marzio	IT	2016	2020	concluded	concluded		23%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1852	Construction of a new rail connection from the Logistic Platform, the Timber terminal and the steel plant in Servola with the existing national rail system	IT	2017	2020	concluded	concluded		6%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
3299	Railway works inside and outside the port area of Trieste	IT	2017	2026	concluded	concluded	in progress	0%	Land acquisition: NA // EIA: NA // Final Approval: submitted, decision pending // CBA: Performed // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR) TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1851	Upgrading of the port railway system to operate longer trains coherently with the on-going upgrading action of the marshalling yard in Campo Marzio	IT	1	20.0	0.0		
1852	Construction of a new rail connection from the Logistic Platform, the Timber terminal and the steel plant in Servola with the existing national rail system	IT	1	16.0	0.0		
3299	Railway works inside and outside the port area of Trieste	IT	1	77.0	77.0	77.0	CDP+FSC
	TOTAL			113.0	77.0		

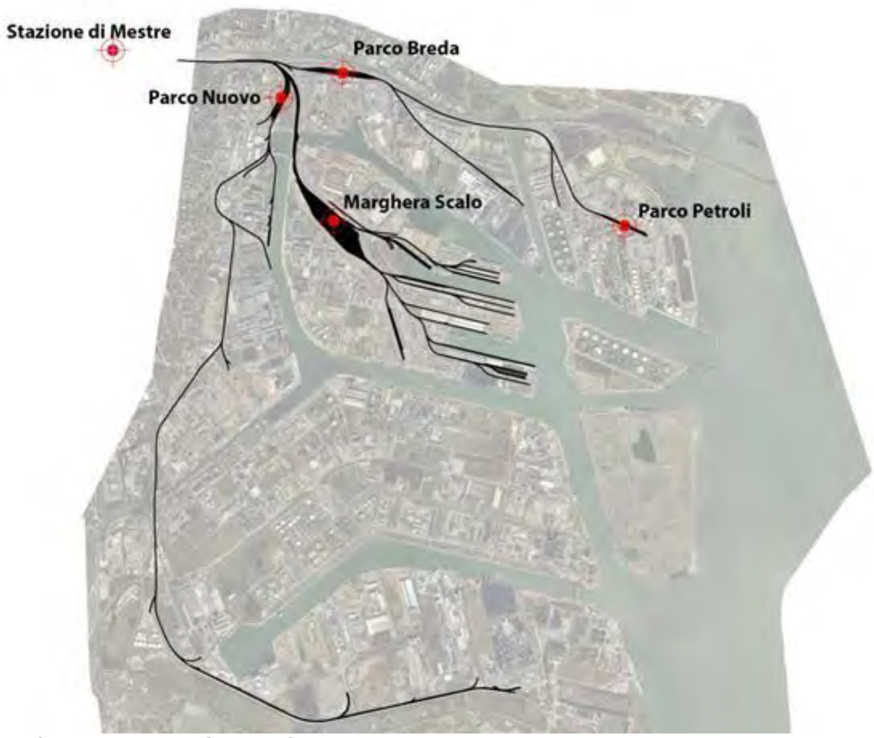
Source: Corridor Project List

A. Description of the Action:

A.1. Action Title:

3.1.05 - Development of interconnections: Port of Venice

A.2. Location of the action:



Rail accessibility map - Source: 2014 BA Corridor Study

Source: Project fiches

A.3. Description of the action:

Member States involved:	**Section or Node:**	**Estimated total cost [Mio €]:**
-	-	*217.5 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
-	*Start year: 2018* *End year: 2030*	*RFI S.p.A. and Venice Port Authority, Venice Port Authority , Venice Port Authority (Venezia Municipality)*

The Port of Venezia lies 5 km from the main national road network. The port is interconnected with the motorway A4 mainly through Via dell'Elettricità and Via della Pila, serving most of the traffic to and from the terminals. A dedicated lane is available to each terminal, with automated traffic management system in place. Regarding rail transport, the Port of Venezia is served by an internal railroad network of 30 km, not including individual branch lines. Such infrastructure consists of essentially the following elements:

- Venezia Mestre railway station;
- Venezia Marghera Scalo rail freight yard;
- Venezia Mestre − Venezia Marghera Scalo railway line;
- Rail sidings of the Parco Breda yard;
- Rail sidings of the Parco Nuovo yard;
- Rail sidings of the Parco Petroli yard;
- Main branch line, branching off from Venezia Marghera Scalo;
- Individual branch lines and sidings/yards inside single port areas.

The Port of Venezia is directly linked to the main international railroad corridors thanks to the Marghera Scalo station, and can operate trains up to 740m. Marghera Scalo station comprises essentially three yards: 2 reception/delivery yards with 17 non-electrified tracks, and, in between, an arrival and departure yard with 12 tracks managed by a central signal box, of which 10 are completely electrified and 2 only partially. The reception/delivery yards constitute an interface between primary and secondary manoeuvres for the port terminal operators.

The rail and road infrastructure interconnecting to the port and within the port areas and terminals is overall compliant thanks to recently completed modernisation and upgrading works. Rail accessibility will be improved by means of upgrading of the rail links between the South Industrial Area of Marghera and Marghera Scalo Station, construction of the second track to the Fusina Ro-Ro terminal as well as construction of a new rolling stock vehicle maintenance and repair depot, all works expected to be completed by 2025 (42.5 € million). A first phase of telematic application works for rail traffic have been developed (Railway telematics systems for shunting operations – SIMA); additional improvements of SIMA and its integration with PCS and additional information systems relating to rail operations are ongoing, expected to be completed by 2018 (1.55 € million). In the long term, the existing railway connection is expected to become a possible capacity bottleneck, also causing traffic congestion problems at the Mestre railway node, which will require the development of a direct connection to the main railway line (following the railway section of the Baltic-Adriatic and Mediterranean core network corridors and the respective Rail Freight Corridors 5 and 6). Road investments have also been recently completed outside and inside the port area on the SR11, SS309 and SP81 up to the bridge located in via Volta; new parking areas near the Customs perimeter at the port have also been completed. Telematic application investments for road on the local roads interconnecting the port to the national motorway network have been completed in 2017 to increase fluidity and safety as well as to reduce congestion.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
Current or potential future capacity bottleneck

Source: Corridor Project List

B. Project Implementation

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
3620	Direct Connection to Venice Port	IT	RFI S.p.A. and Venice Port Authority	Venice Port	Study, Infrastructure (New construction),	175.0	
1268	Upgrading to 2 tracks railway line in order to support growth in traffic flows due also to the realisation of Fusina Ro-Ro terminal (Adriamos EU project)	IT	Venice Port Authority	Port of Venice	Study, Infrastructure (Upgrade),	7.0	
1270	Upgrade of rail links between the South Industrial Area of Marghera and Marghera Scalo Station and redesign of road infrastructure	IT	Venice Port Authority (Venezia Municipality)	Port of Venice	Study, Infrastructure (Upgrade),	32.0	NAPA studies
1271	New rolling stock vehicle maintenance and repair depot in response to increasing demand for this kind of services by port's railway operators	IT	Venice Port Authority	Port of Venice	Infrastructure (New construction),	3.5	
	TOTAL					217.5	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
3620	Direct Connection to Venice Port	IT	2022	2030	in progress			0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1268	Upgrading to 2 tracks railway line in order to support growth in traffic flows due also to the realisation of Fusina Ro-Ro terminal (Adriamos EU project)	IT	2019	2020	in progress			0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1270	Upgrade of rail links between the South Industrial Area of Marghera and Marghera Scalo Station and redesign of road infrastructure	IT	2017	2018	concluded	concluded	in progress	0%	Land acquisition: Completed // EIA: NA // Final Approval: NA // CBA: NA // Other: yes
1271	New rolling stock vehicle maintenance and repair depot in response to increasing demand for this kind of services by port's railway operators	IT	2017	2018	concluded	concluded	concluded	11%	Land acquisition: Completed // EIA: NA // Final Approval: approved // CBA: NA // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR) TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
3620	Direct Connection to Venice Port	IT	1	175.0	0.0		
1268	Upgrading to 2 tracks railway line in order to support growth in traffic flows due also to the realisation of Fusina Ro-Ro terminal (Adriamos EU project)	IT	1	7.0	0.0		
1270	Upgrade of rail links between the South Industrial Area of Marghera and Marghera Scalo Station and redesign of road infrastructure	IT	1	32.0	12.0	12.0	Public Funding MISE agreement
1271	New rolling stock vehicle maintenance and repair depot in response to increasing demand for this kind of services by port's railway operators	IT	1	3.5	0.0		
	TOTAL			217.5	12.0		

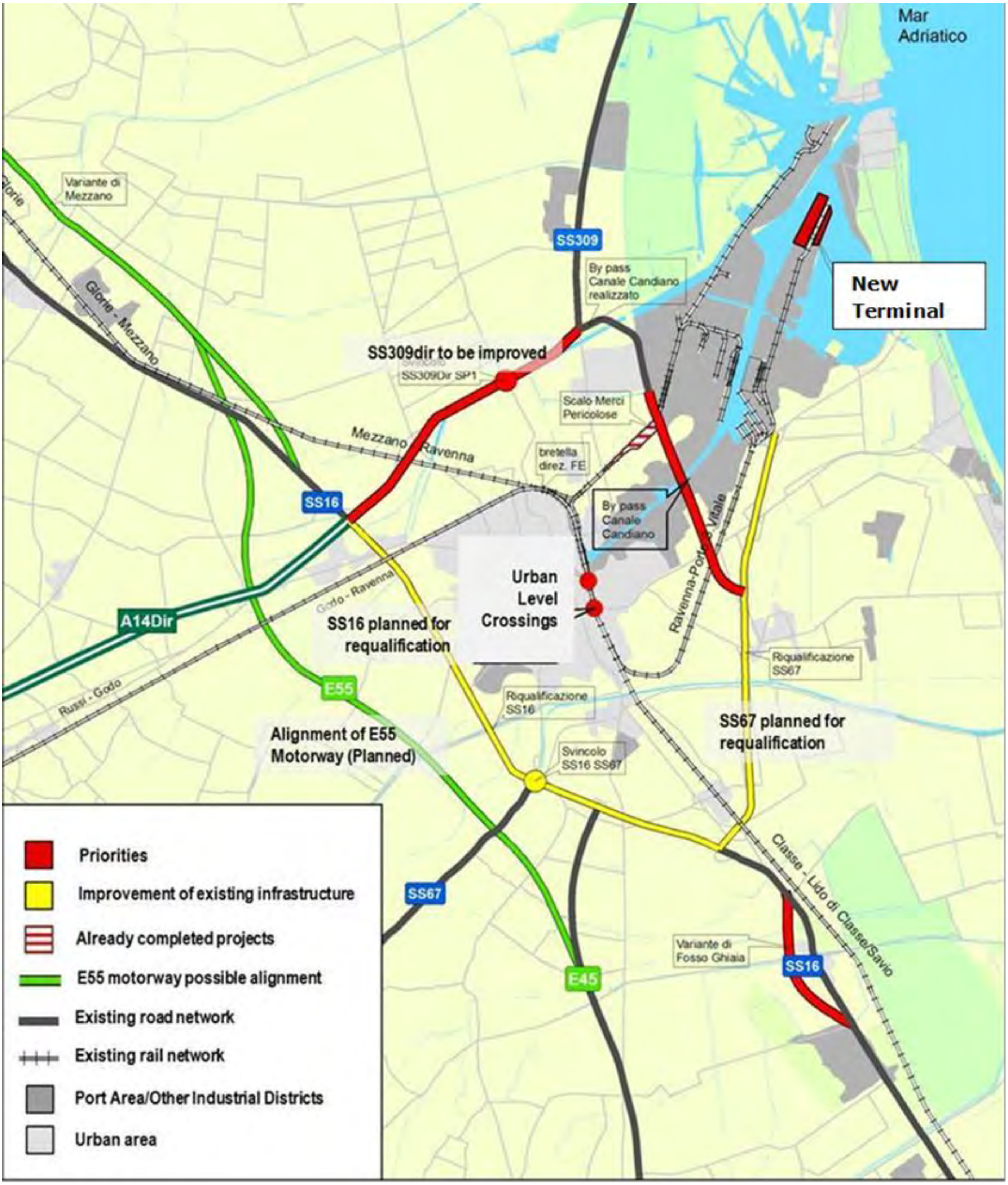
Source: Corridor Project List

A. Description of the Action:

A.1. Action Title:

3.1.06 - Development of interconnections: Port of Ravenna

A.2. Location of the action:



Rail and road accessibility map

A.3. Description of the action:

Member States involved:	Section or Node:	Estimated total cost [Mio €]:
-	-	*317.0 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
-	*Start year: NA* *End year: NA*	*RFI S.p.A., ANAS*

The Port of Ravenna is interconnected with the main national road and railway network. Both road and rail accessibility and internal infrastructure have been and are still the subject of planned improvements.

Regarding rail transport, works are planned to eliminate one level crossing on the line interconnecting the port to the Baltic-Adriatic corridor network as well to upgrade to P/C 80 standard the line between Castelbolognese and Ravenna and extend the existing infrastructure on the right side of the port canal by 2021. Additional upgrading and improvements of the existing infrastructure is also planned for implementation by 2026 (70 € million for all the above rail related projects).

Works for the improvement of road accessibility to the port are also planned for the upgrading of the SS 309Dir and its interconnection to the SS 16, expected to be completed by 2020 (175 € million) as well as for the upgrading of the SS 16 (72 € million).

Another relevant infrastructure development project for the Port of Ravenna as well as for the Port of Venezia is the improvement of the Cesena-Ravenna-Mestre highway interconnecting Venezia to Ravenna, to Rome. This project is currently under consideration, assumed to be possibly developed under a PPP scheme.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
Current or potential future capacity bottleneck

Source: Corridor Project List

B. Project Implementation

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
3208	Upgrading of the railway link to the port of Ravenna	IT	RFI S.p.A.	Ravenna Port	Study, Infrastructure (Upgrade),	70.0	
1207	SS 309DIR: upgrading works by doubling the width of the existing road	IT	ANAS	Ravenna Port	Study, Infrastructure (Upgrade),	150.0	
3671	SS 16 Upgrading	IT	ANAS	Ravenna Port	Study, Infrastructure (Upgrade),	72.0	
3676	Upgrading of the road connection between SS 16 and SS 309Dir	IT	ANAS	Ravenna Port	Study, Infrastructure (Upgrade),	25.0	
	TOTAL					317.0	

Source: Corridor Project List

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL				ADMINISTRATIVE ISSUES
					L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	
3208	Upgrading of the railway link to the port of Ravenna	IT	2017	2026	concluded	concluded	in progress	0%	Land acquisition: NA // EIA: NA // Final Approval: not submitted yet // CBA: Performed // Other: NA
1207	SS 309DIR: upgrading works by doubling the width of the existing road	IT	2019	2020		in progress	not started	0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
3671	SS 16 Upgrading	IT				not started		NA%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
3676	Upgrading of the road connection between SS 16 and SS 309Dir	IT	2019	2020		in progress		0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR)		
					TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
3208	Upgrading of the railway link to the port of Ravenna	IT	1	70.0	0.0		
1207	SS 309DIR: upgrading works by doubling the width of the existing road	IT	1	150.0	0.0		
3671	SS 16 Upgrading	IT	1	72.0	0.0		
3676	Upgrading of the road connection between SS 16 and SS 309Dir	IT	1	25.0	0.0		
	TOTAL			317.0	0.0		

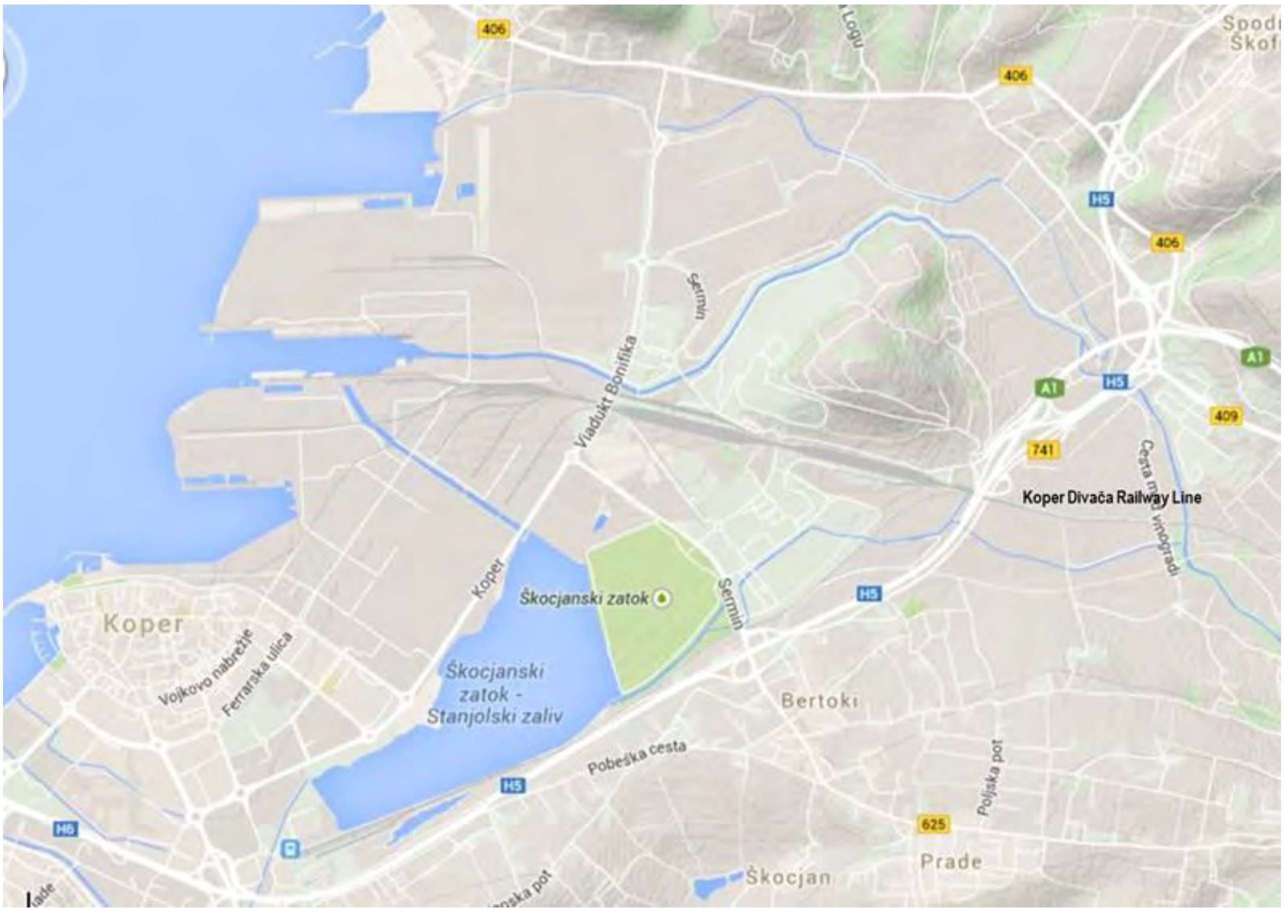
Source: Corridor Project List

A. Description of the Action:

A.1. Action Title:

3.1.07 - Development of interconnections: Port of Koper

A.2. Location of the action:



Rail and road accessibility map – Source: 2014 BA Corridor Study; Map data ©2016 Google GeoBasis-DE/BKG (©2009), Google

Source: Project fiches

A.3. Description of the action:

Member States involved:	Section or Node:	Estimated total cost [Mio €]:
-	-	*93.1 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
-	*Start year: 2015* *End year: 2030*	*Luka Koper d.d., DARS*

The Port of Koper is connected with the main national railway network through the Koper-Divača railway line, belonging to the BA Corridor. It is connected with the national motorway network through national roads 741 and 406 interlinked with the A1 motorway.

About rail last mile connections, the reconstruction of the existing track between Koper and Divača was recently completed. Works for the elimination of the technical bottleneck at Bivje are ongoing and planned to be completed by 2019 (21.4 € million). Studies for the construction of the second track on the line Koper and Divača have been recently completed; the works are planned for implementation in the period 2017-2025 to solve capacity bottlenecks on the existing line expected in the short period and support traffic growth and development of the Port of Koper (960 € million). The port capacities will also be upgraded in the period 2016 – 2020 (300 € million – including public and private port infrastructure expansion and equipment). As of road accessibility, investments are also planned to start already in 2016 for the development of a direct interconnection between the A1 motorway and the port, which are expected to be completed by 2023 (23.1 € million). In addition to last mile connections, works for the improvement of the road and rail internal infrastructure are also foreseen to be implemented by 2020 to improve accessibility (40 € million), and subsequently by 2030 in view of the expansion of the port infrastructure and operations (30 € million).

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
-

Source: Corridor Project List

B. PROJECT IMPLEMENTATION

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1289	Port of Koper - New port entry and supporting road infrastructure	SI	Luka Koper d.d.	Port of Koper	Infrastructure (New construction),	20.0	
1290	Port of Koper -Construction of additional rail connecting infrastructure network within the port	SI	Luka Koper d.d.	Port of Koper	Infrastructure (New construction),	20.0	
1297	Port of Koper - New port entry and supporting road infrastructure	SI	Luka Koper d.d.	Port of Koper	Infrastructure (New construction),	10.0	
1298	Port of Koper -Construction of additional rail connecting infrastructure network within the port	SI	Luka Koper d.d.	Port of Koper	Infrastructure (New construction),	20.0	
1930	Connection of Port of Koper to motorway	SI	DARS	Port of Koper - MW (Koper-Ljubljana)	Study, Infrastructure (New construction),	23.1	
	TOTAL					93.1	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL				ADMINISTRATIVE ISSUES
					L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	
1289	Port of Koper - New port entry and supporting road infrastructure	SI	2015	2020				37%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1290	Port of Koper -Construction of additional rail connecting infrastructure network within the port	SI	2015	2018				56%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1297	Port of Koper - New port entry and supporting road infrastructure	SI	2021	2030				0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1298	Port of Koper -Construction of additional rail connecting infrastructure network within the port	SI	2021	2030				0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1930	Connection of Port of Koper to motorway	SI	2016	2023	concluded	in progress	in progress	11%	Land acquisition: Not completed // EIA: NA // Final Approval: NA // CBA: NA // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR)		
					TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1289	Port of Koper - New port entry and supporting road infrastructure	SI	1	20.0	0		
1290	Port of Koper -Construction of additional rail connecting infrastructure network within the port	SI	1	20.0	0		
1297	Port of Koper - New port entry and supporting road infrastructure	SI	1	10.0	0		
1298	Port of Koper -Construction of additional rail connecting infrastructure network within the port	SI	1	20.0	0		
1930	Connection of Port of Koper to motorway	SI	1	23.1	0		
	TOTAL			93.1	0		

Source: Corridor Project List

A. Description of the Action:

A.1. Action Title:

3.2.01 - Infrastructure development: Port of Gdynia

A.2. Location of the action:

Source: Project fiches

A.3. Description of the action:

Member States involved:	**Section or Node:**	**Estimated total cost [Mio €]:**
-	-	*2,200.9 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
-	*Start year: 2018* *End year: 2027*	*Zarząd Morskiego Portu Gdynia, Urząd Morski Gdynia, Zarząd Morskiego Portu Gdynia/ Urząd Morski Gdynia, Under evaluation / Zarząd Morskiego Portu Gdynia, Urząd Morski w Gdyni*

The Port of Gdynia belongs to the Baltic Adriatic Corridor, it is located in the Pomeranian Voivodship on the western coast of Gdańsk Bay (Baltic Sea). The port is a universal modern port specializing in handling general, mainly unitized cargo transported in containers and also using a Ro-Ro system, based on the well-developed network of multimodal connections. The latter include hinterland, regular Short Sea Shipping Lines as well as ferry connections (ferry terminal). Handling of the containerized cargo at the Port of Gdynia is the domain of two modern container terminals located in the Western Port, Gdynia Container Terminal S.A. and Gdynia's Baltic Container Terminal – BCT. The Port supports transport from Europe and around the world and is connected with Sweden through Motorway of the Sea [2009-EU-21010-P Baltic Link Gdynia-Karlskrona]. The port is interconnected to the rail and road links of the corridor. The TEN-T regulation requirement concerning connection to IWW CEMT IV is not applicable as the port is not interconnected with inland waterway. Other TEN-T regulation requirement, availability of one terminal open to all operators and application of transparent charges is satisfied. Clean fuels are not available/in use at the port. Facilities for ship generated waste are present.

Regarding the main critical issues which are currently affecting the port and the planned investments; rail and road investments are planned for the improvement of the last mile connections which have been described in a separate dedicated action sheet (3.1.01). Investments are also planned which relate to the further expansion of the existing port infrastructure, including reconstruction of quays, deepening of the fairway approach, construction of ferry terminal, new infrastructure on extended port areas. Implementation of telematics applications is also planned including integrated system of navigation marking including e-Navigation as well as implementation of PCS and integration of IT systems in the port, increasing efficiency of serving heavy loads and trucks in the Port of Gdynia, including implementation of Central Parking system and port traffic IT platform. These have been described in a separate corridor wide dedicated action sheet for port infrastructure (3.3.01). Further to this deployment of alternative fuels facility infrastructure (LNG bunkering and vessel's electric power supply) is also planned, as described in a separate corridor wide dedicated action sheet for ports infrastructure (3.3.02). In terms of development of facilities for the treatment of ship generated waste, infrastructure for sewerage collection is also foreseen.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
Connection to rail; Facilities for ship generated waste

Source: Corridor Project List

B. Project Implementation

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1213	Construction of public ferry terminal in Gdynia Port	PL	Zarząd Morskiego Portu Gdynia	Port of Gdynia	Infrastructure (Upgrade), Infrastructure (New construction),	37.0	
1214	Deepening the approach fairway and internal waters of Gdynia Port, phase II	PL	Urząd Morski Gdynia	Port of Gdynia	Infrastructure (Upgrade), Infrastructure (New construction),	108.8	
1215	Deepening the approach fairway and internal waters of Gdynia Port Phase I and III. Reconstruction of Quay areas in Gdynia Port, phase II and III	PL	Zarząd Morskiego Portu Gdynia	Port of Gdynia	Infrastructure (Upgrade), Infrastructure (New construction),	133.8	
1219	Construction of port infrastructure for sanitary sewerage collection	PL	Zarząd Morskiego Portu Gdynia	Port of Gdynia	Infrastructure (New construction),	5.2	
1221	Creating new infrastructure on the extended port areas (including the construction of the Outer Port)	PL	Zarząd Morskiego Portu Gdynia	Port of Gdynia	Study, Infrastructure (New construction),	1,157.7	
1222	Reconstruction of Quay areas in Gdynia Port, phase IV	PL	Zarząd Morskiego Portu Gdynia	Port of Gdynia	Infrastructure (Upgrade), Infrastructure (New construction),	52.6	
1223	Further adaptation of the maritime access infrastructure to new infrastructure created on the extended port areas	PL	Zarząd Morskiego Portu Gdynia/ Urząd Morski Gdynia	Port of Gdynia	Study, Infrastructure (Upgrade), Infrastructure (New construction),	359.2	
1225	Integration of port with its hinterland, especially through intermodal terminals	PL	Under evaluation / Zarząd Morskiego Portu Gdynia	Port of Gdynia	Study, Infrastructure (Upgrade), Infrastructure (New construction), Sustainable Freight, OTHER	70.5	
1227	Development of Multimodal Platform „Logistics Valley"	PL	Zarząd Morskiego Portu Gdynia	Port of Gdynia	Study, Infrastructure (Upgrade), Infrastructure (New construction), Administrativ e procedures	103.97	
1231	Reconstruction of southern access to Gdynia Port	PL	Urząd Morski w Gdyni	Port of Gdynia	Infrastructure (Upgrade), Infrastructure (New construction),	172.1	
	TOTAL					**2,200.9**	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1213	Construction of public ferry terminal in Gdynia Port	PL	2018	2020	concluded	concluded	in progress	0%	Land acquisition: Completed // EIA: EIA approved // Final Approval: NA // CBA: NA // Other: NA
1214	Deepening the approach fairway and internal waters of Gdynia Port, phase II	PL	2018	2019	concluded	not started	concluded	0%	Land acquisition: Completed // EIA: EIA approved // Final Approval: not submitted yet // CBA: Performed // Other: NA
1215	Deepening the approach fairway and internal waters of Gdynia Port Phase I and III. Reconstruction of Quay areas in Gdynia Port, phase II and III	PL	2018	2020	concluded	not started	in progress	0%	Land acquisition: NA // EIA: NA // Final Approval: not submitted yet // CBA: Not performed // Other: NA
1219	Construction of port infrastructure for sanitary sewerage collection	PL	2018	2019	concluded	not started	in progress	0%	Land acquisition: NA // EIA: NA // Final Approval: not submitted yet // CBA: Not performed // Other: NA
1221	Creating new infrastructure on the extended port areas (including the construction of the Outer Port)	PL	2021	2027	in progress	not started	not started	0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1222	Reconstruction of Quay areas in Gdynia Port, phase IV	PL	2023	2027	not started	not started	not started	0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1223	Further adaptation of the maritime access infrastructure to new infrastructure created on the extended port areas	PL	2020	2027	not started	not started	not started	0%	Land acquisition: Not completed // EIA: NA // Final Approval: not submitted yet // CBA: Not performed // Other: NA
1225	Integration of port with its hinterland, especially through intermodal terminals	PL	2021	2027	not started	not started	not started	0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1227	Development of Multimodal Platform „Logistics Valley"	PL	After 2021	2027	in progress	not started	not started	0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1231	Reconstruction of southern access to Gdynia Port	PL	2022	2024	not started	not started	not started	0%	Land acquisition: Completed // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: Not performed // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR) TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1213	Construction of public ferry terminal in Gdynia Port	PL	1	37.0	0		
1214	Deepening the approach fairway and internal waters of Gdynia Port, phase II	PL	1	108.8	23.9	3.6 20.3	State budget OPIE
1215	Deepening the approach fairway and internal waters of Gdynia Port Phase I and III. Reconstruction of Quay areas in Gdynia Port, phase II and III	PL	1	133.8	0		
1219	Construction of port infrastructure for sanitary sewerage collection	PL	1	5.2	0		
1221	Creating new infrastructure on the extended port areas (including the construction of the Outer Port)	PL	1	1,157.7	0		
1222	Reconstruction of Quay areas in Gdynia Port, phase IV	PL	1	52.6	0		
1223	Further adaptation of the maritime access infrastructure to new infrastructure created on the extended port areas	PL	1	359.2	0		
1225	Integration of port with its hinterland, especially through intermodal terminals	PL	1	70.5	0		
1227	Development of Multimodal Platform „Logistics Valley"	PL	1	103.97	0		
1231	Reconstruction of southern access to Gdynia Port	PL	1	172.1	0		
	TOTAL			**2,200.9**	**23.0**		

Source: Corridor Project List

A. Description of the Action:

A.1. Action Title:

3.2.02 - Infrastructure development: Port of Gdańsk

A.2. Location of the action:

Source: Project fiches

A.3. Description of the action:

Member States involved:	Section or Node:	Estimated total cost [Mio €]:
-	-	*832.8 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
-	*Start year: 2016* *End year: 2030*	*Zarząd Morskiego Portu Gdańsk, Urząd Morski w Gdyni, DCT Gdansk S.A.*

The Port of Gdańsk belongs to the Baltic Adriatic Corridor, it is located in the Pomeranian Voivodeship on the coast of Gdańsk Bay (Baltic Sea). The Port of Gdańsk is a major international transportation hub situated in the central part of the southern Baltic coast, which ranks among Europe's fastest growing regions. The Port of Gdańsk comprises two principal sections with naturally diverse operational parameters: the inner port stretched along the Martwa Wisła River and the port canal, and the outer port affording direct access to the Gulf of Gdańsk. The inner port offers a comprehensive range of terminals and facilities designed to handle containerised cargo, passenger ferries and Ro-Ro vessels, passenger cars and citrus fruit, sulphur, phosphorites and other bulk. The other quays are fitted with versatile equipment and infrastructure and are universal in use and enable the handling of conventional general as well as bulk cargo such as rolled steel products, oversize and heavy lifts, grain, artificial fertilizers, ore and coal. The outer port performs its operations on piers, quays and cargo handling jetties situated immediately on the waters of the Gulf of Gdańsk. This section of the port offers state-of-the-art facilities suited to handling energy raw materials such as liquid fuels, coal and liquefied gas. The outer port also accommodates a modern Deepwater Container Terminal which is the only one in the northern part of the BAC that handles direct calls of container ships. The port is interconnected to the rail and road links of the corridor. The TEN-T regulation requirement concerning connection to IWW CEMT IV is not applicable as the port is not interconnected with inland waterway. Other TEN-T regulation requirement, availability of one terminal open to all operators and application of transparent charges is satisfied. Clean fuels are not available/in use at the port. Facilities for ship generated waste are present.

Regarding the main critical issues which are currently affecting the port and the planned investments; rail and road investments are planned for the improvement of the last mile connections which have been described in a separate dedicated action sheet (3.1.02). Investments are also planned which relate to the further expansion of the existing port infrastructure, including construction and extension of quays, modernisation of seaways, modernisation of protective breakwaters system, expansion of Deepwater Container Terminal as well as construction of refuge for ships in distress. Implementation of telematics applications is not planned as well as deployment of alternative fuels facility infrastructure. The port is prepared for providing bunkering of ships with LNG services, which are currently under formal arrangements. Regular services are to be offered upon approval of the specific guidelines by the Maritime Office in Gdynia.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
Facilities for ship generated waste

Source: Corridor Project List

B. Project Implementation

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1567	Construction of the quay in the external port	PL	Zarząd Morskiego Portu Gdańsk	Port of Gdańsk	Infrastructure (New construction),	50.0	CEF / POIiŚ
1233	Modernisation of fairway, expansion of the quays and improvement of navigation in the Internal Port in Gdańsk	PL	Zarząd Morskiego Portu Gdańsk	Port of Gdańsk	Infrastructure (Rehabilitatio n), Infrastructure (Upgrade), Infrastructure (New construction),	110.3	CEF Cohesion Call
1235	Modernisation of entrance to Inner port (in Gdańsk), phase IIIa	PL	Urząd Morski w Gdyni	Port of Gdańsk	Infrastructure (Upgrade), Infrastructure (New construction),	40.6	
1235 a	Modernisation of entrance to Inner port (in Gdańsk), phase IIIb	PL	Urząd Morski w Gdyni	Port of Gdańsk	Infrastructure (Upgrade), Infrastructure (New construction),	17.5	
1235 b	Modernisation of entrance to Inner port (in Gdańsk), phase IV	PL	Urząd Morski w Gdyni	Port of Gdańsk	Infrastructure (Upgrade), Infrastructure (New construction),	35.9	
1236	Modernisation of protective breakwaters system in Northern Port in Gdańsk	PL	Urząd Morski w Gdyni	Port of Gdańsk	Infrastructure (Upgrade), Infrastructure (New construction),	179.3	
1237	Modernisation of seaway into Northern Port in Gdańsk	PL	Urząd Morski w Gdyni	Port of Gdańsk	Infrastructure (Upgrade), Infrastructure (New construction),	28.7	
1238	Gdańsk Northern Port - construction of port of refuge for ships in distress and threatening ecological disaster along with breakwater infrastructure and anti-flood barrage	PL	Urząd Morski w Gdyni	Port of Gdańsk	Infrastructure (New construction),	179.3	
1568	Breakwaters of development areas in the Northern Port of Gdańsk	PL	Urząd Morski w Gdyni	Port of Gdańsk	Infrastructure (New construction),	191.2	
1304	Deepwater Container Terminal Gdańsk - Construction of new part of the terminal	PL	DCT Gdansk S.A.	Gdańsk RRT	Infrastructure (New construction),	To be defined	
	TOTAL					**832.8**	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1567	Construction of the quay in the external port	PL	2020	2022	concluded	concluded	concluded	0%	Land acquisition: NA // EIA: EIA approved // Final Approval: approved // CBA: Performed // Other: NA
1233	Modernisation of fairway, expansion of the quays and improvement of navigation in the Internal Port in Gdańsk	PL	2016	2020	concluded	concluded	concluded	13%	Land acquisition: NA // EIA: EIA approved // Final Approval: approved // CBA: Performed // Other: NA

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1235	Modernisation of entrance to Inner port (in Gdańsk), phase IIIa	PL	2017	2020	in progress	concluded	in progress	0%	Land acquisition: Not completed // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: Performed // Other: NA
1235 a	Modernisation of entrance to Inner port (in Gdańsk), phase IIIb	PL	2020	2023	not started	not started	not started	0%	Land acquisition: Not completed // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: Not performed // Other: NA
1235 b	Modernisation of entrance to Inner port (in Gdańsk), phase IV	PL	2022	2030	not started	not started	not started	0%	Land acquisition: Not completed // EIA: NA // Final Approval: not submitted yet // CBA: Not performed // Other: NA
1236	Modernisation of protective breakwaters system in Northern Port in Gdańsk	PL	2017	2020	in progress	concluded	in progress	0%	Land acquisition: Completed // EIA: EIA approved // Final Approval: not submitted yet // CBA: Performed // Other: NA
1237	Modernisation of seaway into Northern Port in Gdańsk	PL	2017	2019	in progress	concluded	in progress	0%	Land acquisition: Completed // EIA: EIA approved // Final Approval: not submitted yet // CBA: Performed // Other: NA
1238	Gdańsk Northern Port - construction of port of refuge for ships in distress and threatening ecological disaster along with breakwater infrastructure and anti-flood barrage	PL	2020	2023	not started	not started	not started	0%	Land acquisition: Completed // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: Not performed // Other: NA
1568	Breakwaters of development areas in the Northern Port of Gdańsk	PL	2022	2030	not started	not started	not started	0%	Land acquisition: Not completed // EIA: NA // Final Approval: not submitted yet // CBA: Not performed // Other: NA
1304	Deepwater Container Terminal Gdańsk - Construction of new part of the terminal	PL	2016	2019				31%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR) TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1567	Construction of the quay in the external port	PL	1	50.0	0		
1233	Modernisation of fairway, expansion of the quays and improvement of navigation in the Internal Port in Gdansk	PL	1	110.3	110.3	16.6 93.7	own contribution TEN-T/CEF - 2nd call - CEF 2015 call
1235	Modernisation of entrance to Inner port (in Gdańsk), phase IIIa	PL	1	40.6	40.6	6.1 34.5	State budget OPIE
1235a	Modernisation of entrance to Inner port (in Gdańsk), phase IIIb	PL	1	17.5	0		
1235b	Modernisation of entrance to Inner port (in Gdańsk), phase IV	PL	1	35.9	0		
1236	Modernisation of protective breakwaters system in Northern Port in Gdańsk	PL	1	179.3	179.3	26.9 152.4	State budget OPIE
1237	Modernisation of seaway into Northern Port in Gdańsk	PL	1	28.7	28.7	4.3 24.4	State budget OPIE
1238	Gdańsk Northern Port - construction of port of refuge for ships in distress and threatening ecological disaster along with breakwater infrastructure and anti-flood barrage	PL	1	179.3	0		
1568	Breakwaters of development areas in the Northern Port of Gdańsk	PL	1	191.2	0		
1304	Deepwater Container Terminal Gdańsk - Construction of new part of the terminal	PL	1	To be defined	0		
	TOTAL			**832.8**	**358.9**		

Source: Corridor Project List

A. Description of the Action:

A.1. Action Title:

3.2.03 - Infrastructure development: Ports of Szczecin and Świnoujście

A.2. Location of the action:

Source: Project fiches

A.3. Description of the action:

Member States involved:	**Section or Node:**	**Estimated total cost [Mio €]:**
-	-	*584.3 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
-	*Start year: NA* *End year: NA*	*Zarząd Morskiego Portu Szczecin i Świnoujście , Urząd Morski w Szczecinie, PHŚ*

The ports of Szczecin and Świnoujście are the closest seaports for the areas of western and south-western Poland, which contain most important industrial areas such as Upper Silesia, the region of Wrocław and Poznań. Port of Szczecin is an inland waterway port as well. The proximity of eastern Germany is also significant, especially the region of Berlin, situated only 140 km from Szczecin, Brandenburg and Saxony. Furthermore, for many years now, both ports have been important bridge sea ports for the Czech Republic and Slovakia. The ports in Szczecin and Świnoujście are situated on the shortest path connecting Scandinavia with Central and Southern Europe. They also lie on the shortest Seaway connecting the Baltic Finland, Russia, Lithuania, Latvia and Estonia with Germany and Western Europe.

The port of Szczecin is located about 68 km from the sea. The trip by the waterway from Szczecin to Świnoujście takes about 4 hours. The port can handle vessels of draught up to 9.15 m and a length of up to 215 m. Port of Szczecin is universal and handles both general cargo and bulk cargo goods. It specializes in handling and storage of containers, steel products, oversized cargo, paper and cellulose. Port of Szczecin is the largest transhipment centre for granite blocks in Poland. It also handles dry bulk cargo - such as coal, coke, aggregates, grain, fertilizers and liquid cargo, including those requiring special storage conditions and handling, such as tar. The port is interconnected to the rail and road links of the corridor. The TEN-T regulation requirements concerning connection to *IWW CEMT IV* and *availability of one terminal open to all operators and application of transparent charges* are both satisfied. Clean fuels are not available/in use at the port. Facilities for ship generated waste are present.

The port of Świnoujście is situated directly by the sea, whereas the port in Szczecin is 65 km inland. Passage through the seaway from Świnoujście to Szczecin takes 4 hours. An undeniable advantage of the port of Świnoujście is its interconnectivity with both sea and inland waterway. It is also the only Polish sea port for inland waterway transport. The Port of Świnoujście can handle vessels of draught up to 13.2 m and a length of up to 270 m. One of the main elements of this port is the large terminal for handling dry bulk cargo, mainly coal - both exports and imports, and imported iron ore for the Polish, Czech and Slovak steel companies. Another feature of the port in Świnoujście is the ferry terminal equipped with five stations to handle passenger-car ferries and car-railway ferries on the route to/from Sweden. In Świnoujście there is also a new terminal specialised in handling agro-food products, equipped with a flat storage warehouses. The port is interconnected to the rail and road links of the corridor. The TEN-T regulation requirements concerning connection to IWW CEMT IV and availability of one terminal open to all operators and application of transparent charges are both satisfied. Since 2016 LNG fuel deliveries are possible at the ferry terminal in Świnoujście; LNG fuel is also available at the LNG importing terminal in Świnoujście where it can be loaded onto road tanks. Facilities for ship generated waste are present.

Regarding the main critical issues which are currently affecting the two ports and the planned investments; rail and road investments are planned for the improvement of the last mile connections which have been described in a separate dedicated action sheet (3.1.03). Investments are also planned which relate to the further expansion of the existing port infrastructure, including modernisation of fairway Szczecin – Świnoujście, extension and modernisation of technical infrastructure, construction of port infrastructure on development areas. Implementation of telematics applications is not planned at present. Investments are instead foreseen for the promotion of clean fuels availability (LNG), also described in a separate corridor wide dedicated action sheet for ports infrastructure (3.3.02).

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
-

Source: Corridor Project List

B. Project Implementation

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1242	Improvement of Szczecin Port access in the area of Kaszubski Basin	PL	Zarząd Morskiego Portu Szczecin i Świnoujście	Port of Szczecin	Infrastructure (Upgrade), Infrastructure (New construction),	58.8	To be confirmed
1240	Modernisation of the fairway Świnoujście-Szczecin to a depth of 12.5m	PL	Urząd Morski w Szczecinie	Port of Szczecin / Świnoujście	Infrastructure (Upgrade), Infrastructure (New construction),	331.8	
1246	Extension and modernisation of technical infrastructure in Szczecin and Świnoujście Ports	PL	Zarząd Morskiego Portu Szczecin i Świnoujście	Port of Szczecin / Świnoujście	Infrastructure (Upgrade), Infrastructure (New construction),	28.2	To be confirmed
1249	Construction of deep sea berth at the outer port in Świnoujście Construction of deep-water quays in the ports of Szczecin and Świnoujście	PL	Zarząd Morskiego Portu Szczecin i Świnoujście	Port of Szczecin / Świnoujście	Infrastructure (Upgrade), Infrastructure (New construction),	69.8	To be confirmed
1252	Construction of port infrastructure on development areas of Ostrow Grabowski Peninsula	PL	Zarząd Morskiego Portu Szczecin i Świnoujście	Port of Szczecin / Świnoujście	Infrastructure (New construction),	To be defined	
1243	Improvement of Port Szczecin access in the area of Dębicki Basin	PL	Zarząd Morskiego Portu Szczecin i Świnoujście	Port of Szczecin	Infrastructure (Upgrade), Infrastructure (New construction),	83.8	To be confirmed
1303	Development of multimodal infrastructure and facilities at the Container Terminal Świnoujscie	PL	PHŚ	Świnoujście RRT	Infrastructure (New construction),	11.9	To be confirmed
	TOTAL					**584.3**	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1242	Improvement of Szczecin Port access in the area of Kaszubski Basin	PL	2019	2022	concluded	not started	in progress	0%	Land acquisition: Completed // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: NA // Other: NA
1240	Modernisation of the fairway Świnoujście-Szczecin to a depth of 12.5m	PL	2018	2022		concluded	in progress	0%	Land acquisition: Not completed // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: NA // Other: in progress
1246	Extension and modernisation of technical infrastructure in Szczecin and Świnoujście Ports	PL	2019	2022	concluded	not started	in progress	0%	Land acquisition: Completed // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: NA // Other: NA
1249	Construction of deep sea berth at the outer port in Świnoujście Construction of deep-water quays in the ports of Szczecin and Świnoujście	PL	2019	2021	concluded	not started	in progress	0%	Land acquisition: Completed // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: NA // Other: NA
1252	Construction of port infrastructure on development areas of Ostrow Grabowski Peninsula	PL	2020	2027	concluded	not started	in progress	0%	Land acquisition: Completed // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: NA // Other: NA
1243	Improvement of Port Szczecin access in the area of Dębicki Basin	PL	2019	2021	concluded	not started	in progress	0%	Land acquisition: Completed // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: NA // Other: NA
1303	Development of multimodal infrastructure and facilities at the Container Terminal Świnoujscie	PL						NA%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR) TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1242	Improvement of Szczecin Port access in the area of Kaszubski Basin	PL	1	58.8	0		
1240	Modernisation of the fairway Świnoujście-Szczecin to a depth of 12.5m	PL	1	331.8	0		
1246	Extension and modernisation of technical infrastructure in Szczecin and Świnoujście Ports	PL	1	28.2	0		
1249	Construction of deep sea berth at the outer port in Świnoujście Construction of deep-water quays in the ports of Szczecin and Świnoujście	PL	1	69.8	0		
1252	Construction of port infrastructure on development areas of Ostrow Grabowski Peninsula	PL	1	To be defined	0		
1243	Improvement of Port Szczecin access in the area of Dębicki Basin	PL	1	83.8	0		
1303	Development of multimodal infrastructure and facilities at the Container Terminal Świnoujscie	PL	1	11.9	0		
	TOTAL			**584.3**	**0**		

Source: Corridor Project List

A. Description of the Action:

A.1. Action Title:

3.2.04 - Infrastructure development: Port of Trieste

A.2. Location of the action:

Source: Project fiches

A.3. Description of the action:

Member States involved:	Section or Node:	Estimated total cost [Mio €]:
-	-	*707.4 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
-	*Start year: 2015* *End year: 2020*	*Triest Port Authority*

The Port of Trieste is located in the Friuli Venezia-Giulia region – in the North-East of Italy. The Port is at the intersection between the Baltic-Adriatic and Mediterranean TEN-T core network corridors, the Motorways of the Sea, with ferry services to and from Albania, Greece, Turkey and other countries bordering the Mediterranean; as well as international shipping routes interconnecting Europe with Northern Africa and the Far East. The port operates passenger and cargo services with a primarily role and specialisation in oil operations. In addition to oil and chemical products, traffic within the port involves raw materials and finished goods from the ceramics district, metallurgical products, timber and agri-food production. Also significant is the growing share of containerised traffic handled within the port's two terminals as well as the Ro-Ro segment. The port is interconnected to the rail and road links of the corridor. The TEN-T regulation requirements concerning connection to IWW CEMT IV and availability of one terminal open to all operators and application of transparent charges are both satisfied. Clean fuels are not available/in use at the port. Facilities for ship generated waste are also not present.

Regarding the main critical issues which are currently affecting the node and the planned investments; rail and road investments are planned for the improvement of the last mile connections which have been described in a separate dedicated action sheet (3.1.04). Investments are also planned and ongoing which relate to the further expansion of the existing port infrastructure, including development of a new multimodal platform, the development of the existing container terminal and the construction of a new Ro-Ro terminal. Implementation of telematics applications is also planned which has been described in a separate corridor wide dedicated action sheet for port infrastructure (3.3.01). No investments are foreseen at present for the development of facilities for the treatment of ship generated waste.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
-

Source: Corridor Project List

B. Project Implementation

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1258	First phase: construction of a new quay called "Logistic Platform"	IT	Triest Port Authority	Port of Triest	Study, Infrastructure (New construction),	132.4	
1259	Second phase: construction of a new quay called "Logistic Platform", with a wharf of about 600 meters in length and a depth of 12-14 meters	IT	Triest Port Authority	Port of Triest	Study, Infrastructure (New construction),	206.5	
1260	Enlargement of the container terminal at quay VII increasing the potential up to a maximum of 1,200,000 TEU (dimension 200m, 18m depth)	IT	Triest Port Authority	Port of Triest	Study, Infrastructure (Upgrade),	187.0	
1261	Realization of a new Ro-Ro terminal in the Noghere valley area with a "working" draught of no less than 12 meters for berthing RO-RO vessels and a total surface of 430.000 sqm (first phase)	IT	Triest Port Authority	Port of Triest	Study, Infrastructure (New construction),	27.0	
1262	Realization of a new Ro-Ro terminal in the Noghere valley area with a "working" draught of no less than 12 meters for berthing RO-RO vessels and a total surface of 430.000 sqm (second phase)	IT	Triest Port Authority	Port of Triest	Study, Infrastructure (New construction),	126.0	
1263	Second phase of passengers terminal upgrade encompassing the enlargement of the related quay	IT	Triest Port Authority	Port of Triest	Study, Infrastructure (Upgrade),	14.0	
1850	Functional and technical restructuring of Pier VI in the Port of Trieste	IT	Triest Port Authority	Port of Triest	Other Telematic Applications	6.5	
1853	Capital dredging of the port in the area of Noghere Muggia	IT	Triest Port Authority	Port of Triest	Study, Infrastructure (Upgrade),	8.0	
	TOTAL					**707.4**	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1258	First phase: construction of a new quay called "Logistic Platform"	IT	2015	2018	concluded	concluded	concluded	47%	Land acquisition: NA // EIA: NA // Final Approval: approved // CBA: Performed // Other: NA
1259	Second phase: construction of a new quay called "Logistic Platform", with a wharf of about 600 meters in length and a depth of 12-14 meters	IT	2017	2020	concluded	concluded	concluded	0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1260	Enlargement of the container terminal at quay VII increasing the potential up to a maximum of 1,200,000 TEU (dimension 200m, 18m depth)	IT	2017	2020	concluded	concluded	concluded	0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1261	Realization of a new Ro-Ro terminal in the Noghere valley area with a "working" draught of no less than 12 meters for berthing RO-RO vessels and a total surface of 430.000 sqm (first phase)	IT	2017	2020	concluded	concluded		0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1262	Realization of a new Ro-Ro terminal in the Noghere valley area with a "working" draught of no less than 12 meters for berthing RO-RO vessels and a total surface of 430.000 sqm (second phase)	IT	2017	2020	concluded	concluded		0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1263	Second phase of passengers terminal upgrade encompassing the enlargement of the related quay	IT	2017	2020	concluded			0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1850	Functional and technical restructuring of Pier VI in the Port of Trieste	IT	2016	2018	concluded	concluded	concluded	39%	Land acquisition: NA // EIA: NA // Final Approval: approved // CBA: Performed // Other: NA

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL				ADMINISTRATIVE ISSUES
					L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	
1853	Capital dredging of the port in the area of Noghere Muggia	IT	2018	2020	concluded	in progress		0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR)		
					TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1258	First phase: construction of a new quay called “Logistic Platform”	IT	1	132.4	132.4	15.8 116.6	CEF NA
1259	Second phase: construction of a new quay called “Logistic Platform”, with a wharf of about 600 meters in length and a depth of 12-14 meters	IT	1	206.5	0.0		
1260	Enlargement of the container terminal at quay VII increasing the potential up to a maximum of 1,200,000 TEU (dimension 200m, 18m depth)	IT	1	187.0	0.0		
1261	Realization of a new Ro-Ro terminal in the Noghere valley area with a “working” draught of no less than 12 meters for berthing RO-RO vessels and a total surface of 430.000 sqm (first phase)	IT	1	27.0	0.0		
1262	Realization of a new Ro-Ro terminal in the Noghere valley area with a “working” draught of no less than 12 meters for berthing RO-RO vessels and a total surface of 430.000 sqm (second phase)	IT	1	126.0	0.0		
1263	Second phase of passengers’ terminal upgrade encompassing the enlargement of the related quay	IT	2	14.0	0.0		
1850	Functional and technical restructuring of Pier VI in the Port of Trieste	IT	1	6.5	6.5	4.5 2.0	Own sources CEF
1853	Capital dredging of the port in the area of Noghere Muggia	IT	1	8.0	0.0		
	TOTAL			**707.4**	**138.9**		

Source: Corridor Project List

A. Description of the Action:

A.1. Action Title:

3.2.05 - Infrastructure development: Port of Venice

A.2. Location of the action:

Source: Project fiches

A.3. Description of the action:

Member States involved:	Section or Node:	Estimated total cost [Mio €]:
-	-	*3,118.3 EUR million*
Other CNC involved: -	**Implementation schedule:** *Start year: 2016* *End year: 2022*	**Project Promoter:** *Venice Port Authority*

Strategically located at the intersection of the main European Mediterranean and Baltic Core Network Corridors and interlinked with the Motorways of the Sea (MoS), the Port of Venezia is the main port in the Veneto region and one of the largest ports in the Adriatic Sea operating as a European gateway for trade flows to and from Asia. The Port of Venezia is one of the major European ports for project and general cargo, and one of the main ports in the Adriatic for the number of containers handled. In addition, it ranks as the first cruise homeport in the Mediterranean hosting 2 million passengers yearly. It is furthermore the only port in Italy to benefit from a river port providing freight transport by barge along the Po River. The port is interconnected to the rail and road links of the corridor. The TEN-T regulation requirements concerning connection to IWW CEMT IV and availability of one terminal open to all operators and application of transparent charges are both satisfied. Clean fuels are not available/in use at the port. Facilities for ship generated waste are also not present.

Regarding the main investments planned at the port of Venezia; rail and road investments are planned for the further improvement of the accessibility by road rail to the port's terminals and for the optimisation of rail operations, which are described in a separate dedicated action sheet (3.1.05). Investments are also planned which relate to the further expansion of the existing port infrastructure, including the development of the Venice Onshore Offshore Port System for large ships, further development of the new Ro-Ro and Ro-Pax terminal of Fusina. Implementation of telematics applications is also planned which has been described in a separate corridor wide dedicated action sheet for port infrastructure (3.3.01). Investments are finally planned for the promotion of clean fuels availability (LNG), also described in a dedicated corridor wide dedicated action sheet for ports infrastructure (3.3.02). No investments are foreseen at present for the development of facilities for the treatment of ship generated waste.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
-

Source: Corridor Project List

B. Project Implementation

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1277	Definitive design of the Venice Onshore Offshore Port System for large ships	IT	Venice Port Authority	Port of Venice	Study, Infrastructure (New construction),	2,965.0	TEN - T Call PPP project
1278	West Industrial Canal Dredging	IT	Venice Port Authority	Port of Venice	Study, Infrastructure (Upgrade),	5.3	
1856	New access to Passengers Terminal of Marittima	IT	Venice Port Authority	Port of Venice	Infrastructure (New construction),	139.0	
1022	Improving Motorways of the sea Venice Patras (MoS Venice-Patras)	IT	Venice Port Authority	Port of Venice, Port of Patras	Infrastructure (New construction),	9.0	CEF-Multi Annual Call funding objective 3
	TOTAL					3,118.3	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1277	Construction of the Venice Onshore Offshore Port System for large ships (first phase for the onshore is ongoing)	IT	2018	2022	concluded	concluded	in progress	0%	Land acquisition: Completed // EIA: EIA approved // Final Approval: submitted, decision pending // CBA: Performed // Other: NA
1278	West Industrial Canal Dredging	IT	2016	2018				39%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1856	New access to Passengers Terminal of Marittima	IT	2016	2018	concluded	concluded		39%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1022	Improving Motorways of the sea Venice Patras (MoS Venice-Patras)	IT	2016	2018	concluded	concluded	concluded	39%	Land acquisition: Completed // EIA: EIA approved // Final Approval: approved // CBA: Performed // Other: No

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR) TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1277	Construction of the Venice Onshore Offshore Port System for large ships (first phase for the onshore is ongoing)	IT	1	2,965.0	61.2	60.4 0.8	Public Funding including 55.40 € million MISE Agreement TEN-T PPP
1278	West Industrial Canal Dredging	IT	1	5.3	1.7	1.7	NAPADRAG
1856	New access to Passengers Terminal of Marittima	IT	1	139.0	0.0		
1022	Improving Motorways of the sea Venice Patras (MoS Venice-Patras)	IT	1	9.0	9.0	6.5 2.5	Terminal operator CEF
	TOTAL			3,118.3	71.9		

Source: Corridor Project List

A. Description of the Action:

A.1. Action Title:

3.2.06 - Infrastructure development: Port of Ravenna

A.2. Location of the action:

Source: Project fiches

A.3. Description of the action:

Member States involved:	**Section or Node:**	**Estimated total cost [Mio €]:**
-	-	*415.0 EUR million*
Other CNC involved: -	**Implementation schedule:** *Start year: 2019* *End year: 2027*	**Project Promoter:** *Ravenna Port Authority*

The core port of Ravenna is located on two core network corridors: Baltic-Adriatic and Mediterranean. The port operates passenger and cargo services with a primarily role and specialisation in dry bulk operations. In addition to oil and chemical products, traffic within the port involves raw materials and finished goods from the ceramics district, metallurgical products, timber and agri-food production. Also significant is the growing share of containerised traffic handled within the port's two terminals as well as the Ro-Ro segment. The port is interconnected to the rail and road links of the corridor. The TEN-T regulation requirements concerning connection to IWW CEMT IV and availability of one terminal open to all operators and application of transparent charges are both satisfied. Clean fuels are not available/in use at the port. Facilities for ship generated waste are also not present.

Regarding the main critical issues which are currently affecting the node and the planned investments; rail and road investments are planned for the improvement of the last mile connections which have been described in a separate dedicated action sheet (3.1.06). Investments are also planned which relate to the further expansion of the existing port infrastructure, including development of new quays for a multimodal platform, a container terminal and the upgrading of the existing Ro-Ro and Ro-Pax terminal. Implementation of telematics applications is also planned including advanced PCS ICT based services as well as e-Maritime applications. These have been described in a separate corridor wide dedicated action sheet for port infrastructure (3.3.01). Investments are finally planned for the promotion of clean fuels availability (LNG), also described in a dedicated corridor wide dedicated action sheet for ports infrastructure (3.3.02). No investments are foreseen at present for the development of facilities for the treatment of ship generated waste.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
-

Source: Corridor Project List

B. Project Implementation

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1281	Ravenna Port Hub - 1st phase	IT	Ravenna Port Authority	Port of Ravenna	Infrastructure (Upgrade), Infrastructure (New construction),	235.0	
1282	Ravenna Port Hub - 2nd phase	IT	Ravenna Port Authority	Port of Ravenna	Infrastructure (Upgrade), Infrastructure (New construction),	129.0	
1283	Ro-Ro terminal upgrading	IT	Ravenna Port Authority	Port of Ravenna	Infrastructure (Upgrade), Infrastructure (New construction),	31.0	
1858	Dredged material treatment plant	IT	Ravenna Port Authority	Port of Ravenna	Infrastructure (New construction),	20.0	
	TOTAL					404.4	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1281	Ravenna Port Hub - 1st phase	IT	2019	2023	concluded	concluded	concluded	0%	Land acquisition: Not completed // EIA: EIA approved // Final Approval: submitted, decision pending // CBA: Performed // Other: NA
1282	Ravenna Port Hub - 2nd phase	IT	2020	2025	concluded	concluded	in progress	0%	Land acquisition: Not completed // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: Performed // Other: NA
1283	Ro-Ro terminal upgrading	IT	2019	2023	concluded	concluded	in progress	0%	Land acquisition: Completed // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: NA // Other: NA
1858	Dredged material treatment plant	IT	2019	2020	concluded	concluded	in progress	0%	Land acquisition: Not completed // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: Not performed // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR) TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1281	Ravenna Port Hub - 1st phase	IT	1	235.0	121.7	120.0 1.7	CIPE - Italian Government EIB loan TEN-T 2012
1282	Ravenna Port Hub - 2nd phase	IT	1	129.0	0		
1283	Ro-Ro terminal upgrading	IT	1	31.0	6.0	6.0	Port of Ravenna Authority
1858	Dredged material treatment plant	IT	1	20.0	4.0	4.0	Port of Ravenna Authority
	TOTAL			415.0	131.7		

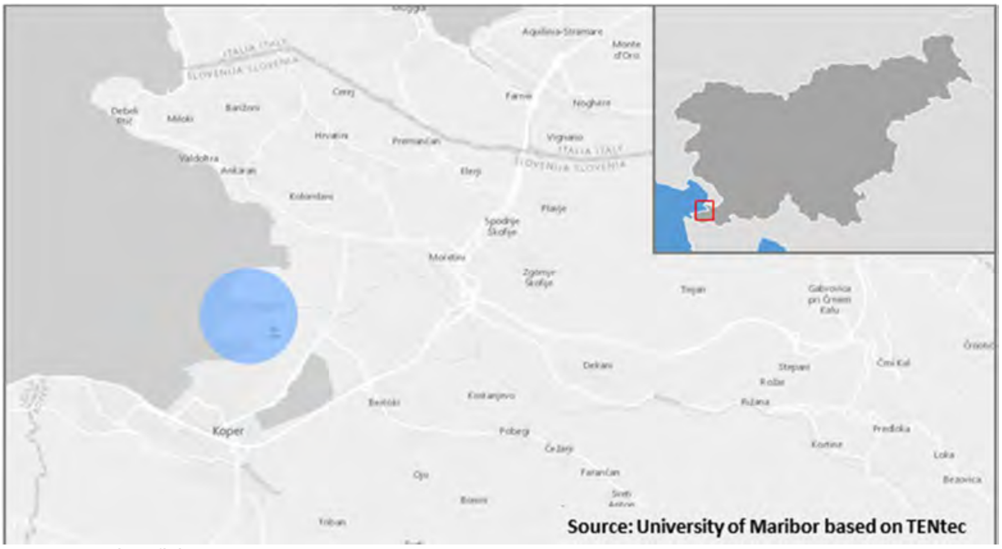
Source: Corridor Project List

A. Description of the Action:

A.1. Action Title:

3.2.07 - Infrastructure development: Port of Koper

A.2. Location of the action:



Source: Project fiches

A.3. Description of the action:

Member States involved:	**Section or Node:**	**Estimated total cost [Mio €]:**
-	-	*410.0 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
-	*Start year: 2015* *End year: 2030*	*Luka Koper d.d., Ministry of Infrastructure*

Port of Koper is located on two core network corridors: Baltic-Adriatic and Mediterranean corridor. The Port of Koper is a multi-purpose port and it operates cargo (11 specialized terminals) and passenger services (1 terminal). Cargo terminals operated in port manifest its multi-purpose with its variety: container terminal, car and Ro-Ro terminal, general cargo terminal, reefer terminal, timber terminal, dry bulk terminal, liquid cargos terminal, iron ore and coal terminal, alumina terminal, silo terminal and livestock terminal. Main groups of throughput in the port are containers and break bulk cargoes, followed by liquid cargoes, general cargoes and cars. The port is directly connected to the rail network and road network of the corridor. The TEN-T regulation requirements concerning availability of one terminal open to all operators and application of transparent charges is fulfilled. Clean fuels are not available/in use at the port, facilities for ship generated waste are present.

Regarding the main critical issues which are currently affecting the port and the planned investments: rail and road investments are planned for the improvement of the last mile connections which have been described in a separate dedicated action sheet (3.1.06). The port's development plan to the year 2020 foresees the following investments in port's infrastructure reported in the corridor project list:

- Upgrade of the container terminal with the significant extension of the south part of the first pier,
- Construction of the new berth, extension of the storage areas and establishment of the infrastructure for the car throughput in the third basin,
- New closed warehouses for liquid, dry bulk and general cargoes on the second pier,
- Construction of new port entrance and supporting road infrastructure,
- Upgrade of berths in the second basin.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
-

Source: Corridor Project List

B. Project Implementation

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1287	Port of Koper - Extension of Pier I Southern side and capacity upgrading in order to support the growing volumes of container business	SI	Luka Koper d.d.	Port of Koper	Study, Infrastructure (Upgrade),	80.0	
1288	Port of Koper - New berthing facilities in Basin I, II and III	SI	Luka Koper d.d.	Port of Koper	Infrastructure (New construction),	40.0	
1291	Port of Koper - Passenger terminal infrastructure	SI	Luka Koper d.d.	Port of Koper	Infrastructure (New construction),	3.0	
1292	Port of Koper - Deepening of the navigational channel in basin II (outside the concession area)	SI	Ministry of Infrastructure	Port of Koper	Infrastructure (Upgrade),	15.0	
1293	Port of Koper - Arrangement of ports back areas	SI	Luka Koper d.d.	Port of Koper	Infrastructure (New construction),	12.0	
1294	Port of Koper - Dredging works in port's basins according needs (within the concession area of the port)	SI	Luka Koper d.d.	Port of Koper	Infrastructure (Upgrade),	10.0	
1295	Port of Koper -Extension of Pier I -Northern side	SI	Luka Koper d.d.	Port of Koper	Infrastructure (New construction),	60.0	
1296	Port of Koper - New berthing facilities in Basin I, II and III	SI	Luka Koper d.d.	Port of Koper	Infrastructure (New construction),	20.0	
1299	Port of Koper - Arrangement of ports back areas	SI	Luka Koper d.d.	Port of Koper	Infrastructure (Upgrade),	10.0	
1300	Port of Koper - Dredging works in port's basins according needs (within the concession area of the port)	SI	Luka Koper d.d.	Port of Koper	Infrastructure (Upgrade),	10.0	
1301	Port of Koper - Extension of Pier II	SI	Luka Koper d.d.	Port of Koper	Infrastructure (New construction),	100.0	
1302	Port of Koper - Construction of Pier III	SI	Luka Koper d.d.	Port of Koper	Infrastructure (New construction),	50.0	
	TOTAL					410.0	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL				ADMINISTRATIVE ISSUES
					L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	
1287	Port of Koper - Extension of Pier I Southern side and capacity upgrading in order to support the growing volumes of container business	SI	2015	2020				37%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1288	Port of Koper - New berthing facilities in Basin I, II and III	SI	2015	2020				37%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1291	Port of Koper - Passenger terminal infrastructure	SI	2015	2018				56%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1292	Port of Koper - Deepening of the navigational channel in basin II (outside the concession area)	SI	2015	2020				37%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1293	Port of Koper - Arrangement of ports back areas	SI	2015	2020				37%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1294	Port of Koper - Dredging works in port's basins according needs (within the concession area of the port)	SI	2015	2020				37%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1295	Port of Koper -Extension of Pier I -Northern side	SI	2021	2025				0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1296	Port of Koper - New berthing facilities in Basin I, II and III	SI	2021	2030				0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1299	Port of Koper - Arrangement of ports back areas	SI	2021	2030				0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1300	Port of Koper - Dredging works in port's basins according needs (within the concession area of the port)	SI	2021	2030				0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1301	Port of Koper - Extension of Pier II	SI	2020	2030				0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1302	Port of Koper - Construction of Pier III	SI	2020	2030				0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR) TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1287	Port of Koper - Extension of Pier I Southern side and capacity upgrading in order to support the growing volumes of container business	SI	1	80.0	0		
1288	Port of Koper - New berthing facilities in Basin I, II and III	SI	1	40.0	0		
1291	Port of Koper - Passenger terminal infrastructure	SI	2	3.0	0		
1292	Port of Koper - Deepening of the navigational channel in basin II (outside the concession area)	SI	1	15.0	0		
1293	Port of Koper - Arrangement of ports back areas	SI	1	12.0	0		
1294	Port of Koper - Dredging works in port's basins according needs (within the concession area of the port)	SI	1	10.0	0		
1295	Port of Koper -Extension of Pier I -Northern side	SI	1	60.0	0		
1296	Port of Koper - New berthing facilities in Basin I, II and III	SI	1	20.0	0		
1299	Port of Koper - Arrangement of ports back areas	SI	1	10.0	0		
1300	Port of Koper - Dredging works in port's basins according needs (within the concession area of the port)	SI	1	10.0	0		
1301	Port of Koper - Extension of Pier II	SI	1	100.0	0		
1302	Port of Koper - Construction of Pier III	SI	1	50.0	0		
	TOTAL			**410.0**	**0**		

Source: Corridor Project List

A. Description of the Action:

A.1. Action Title:

3.3.01 - Telematics appications in the corridor seaports (including VTMIS)

A.2. Description of the action:

Member States involved:	Section or Node:	Estimated total cost [Mio €]:
-	-	*34.4 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
-	*Start year: 2015* *End year: 2027*	*Urząd Morski w Gdyni, Under evaluation / National Administration / Zarząd Morskiego Portu Gdynia, Zarząd Morskiego Portu Gdańsk, Venice Port Authority , Ravenna Port Authority, Triest Port Authority*

10 telematics application initiatives, including one project dedicated to the development of VTMIS and other actions about the development of PCS technology and eMaritime solutions at the Baltic and Adriatic ports in Poland and Italy. These total 34.4 € million. Many of them are already ongoing and most of them are expected to be completed before 2020.

Source: Corridor Project List

A.3. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
-

Source: Corridor Project List

B. Project Implementation

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1216	Integrated system of navigation marking including e-Navigation	PL	Urząd Morski w Gdyni	Port of Gdynia	VTMIS	9.6	
1217	Construction of GMDSS system for maritime administration	PL	Urząd Morski w Gdyni	Port of Gdynia	OTHER	3.6	To be confirmed
1226	Implementation of PCS, and integration of IT systems in the port, increasing efficiency of serving heavy loads and trucks in the Port of Gdynia	PL	Under evaluation / National Administration / Zarząd Morskiego Portu Gdynia	Port of Gdynia	ITS	4.8	
1565	Studies for the integrated IT system aiding traffic and environmental management for freight transport	PL	Zarząd Morskiego Portu Gdańsk	Port of Gdańsk	OTHER	1.2	CEF
1566	Integrated IT system aiding traffic and environmental management for freight transport	PL	Zarząd Morskiego Portu Gdańsk	Port of Gdańsk	OTHER	2.9	CEF / POIiŚ
1274	Realisation of an information system in order to real time monitor maritime traffic and forecast the maritime traffic levels in the last maritime mile	IT	Venice Port Authority	Port of Venice	OTHER	0.6	CEF 2014-STM project
1276	Railway telematics systems for shunting operations (SIMA) and its integration with PCS and information systems of other subject involved in developing rail services	IT	Venice Port Authority	Port of Venice	OTHER	1.6	
1855	Broadband connection	IT	Venice Port Authority	Port of Venice	OTHER	6.0	

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1285	ICT services for the port community: interoperability of PCS with the National Maritime Single Window; the National Logistics Platform and the Customs ICT platform	IT	Ravenna Port Authority	Port of Ravenna	OTHER	3.0	
1859	Improvement of Data connection infrastructure for port services	IT	Ravenna Port Authority	Port of Ravenna	OTHER	1.3	
	TOTAL					34.4	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL				ADMINISTRATIVE ISSUES
					L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	
1216	Integrated system of navigation marking including e-Navigation	PL	2017	2019	in progress	concluded	concluded	0%	Land acquisition: Completed // EIA: EIA approved // Final Approval: not submitted yet // CBA: Performed // Other: NA
1217	Construction of GMDSS system for maritime administration	PL	2018	2019	not started	not started	not started	0%	Land acquisition: Not completed // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: Not performed // Other: NA
1226	Implementation of PCS, and integration of IT systems in the port, increasing efficiency of serving heavy loads and trucks in the Port of Gdynia	PL	2021	2027	in progress	not started	not started	0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1565	Studies for the integrated IT system aiding traffic and environmental management for freight transport	PL	2017	2019	in progress	in progress	not started	0%	Land acquisition: NA // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: Not performed // Other: NA
1566	Integrated IT system aiding traffic and environmental management for freight transport	PL	2020	2021	in progress	in progress	not started	0%	Land acquisition: NA // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: Not performed // Other: NA
1274	Realisation of an information system in order to real time monitor maritime traffic and forecast the maritime traffic levels in the last maritime mile	IT	2018	2019	in progress			0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1276	Railway telematics systems for shunting operations (SIMA) and its integration with PCS and information systems of other subject involved in developing rail services	IT	2015	2018	concluded			56%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1855	Broadband connection	IT	2016	2018	concluded	concluded	concluded	39%	Land acquisition: NA // EIA: NA // Final Approval: approved // CBA: NA // Other: NA
1285	ICT services for the port community: interoperability of PCS with the National Maritime Single Window; the National Logistics Platform and the Customs ICT platform	IT	2015	2018	concluded	in progress	in progress	71%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1859	Improvement of Data connection infrastructure for port services	IT	2015	2019	in progress	in progress	in progress	57%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR)		
					TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1216	Integrated system of navigation marking including e-Navigation	PL	2	9.6	9.6	1.4 8.2	state budget OPIE
1217	Construction of GMDSS system for maritime administration	PL	2	3.6	0		
1226	Implementation of PCS, and integration of IT systems in the port, increasing efficiency of serving heavy loads and trucks in the Port of Gdynia	PL	2	4.8	0		
1565	Studies for the integrated IT system aiding traffic and environmental management for freight transport	PL		1.2	0.6	0.6	own contribution
1566	Integrated IT system aiding traffic and environmental management for freight transport	PL	2	2.9	2.0	2.0	own contribution
1274	Realisation of an information system in order to real time monitor maritime traffic and forecast the maritime traffic levels in the last maritime mile	IT	2	0.6	0		
1276	Railway telematics systems for shunting operations (SIMA) and its integration with PCS and information systems of other subject involved in developing rail services	IT	2	1.6	0.39	0.29 0.10	CEF (0.25 cofinanced 50%) CE (0.038 territorial cooperation) TEN-T
1855	Broadband connection	IT	Residual	6.0	0		
1285	ICT services for the port community: interoperability of PCS with the National Maritime Single Window; the National Logistics Platform and the Customs ICT platform	IT	2	3.0	3.0	0.1 0.8 0.7 1.4	Italian government - IPA Adriatic Port of Ravenna Authority private beneficiaries of co-funded TEN-T project TEN-T; IPA Adriatic; Horizon2020
1859	Improvement of Data connection infrastructure for port services	IT	Residual	1.25	1.25	1.227 0.023	Port of Ravenna Authority IPA Adriatic
	TOTAL			**34.4**	**16.8**		

Source: Corridor Project List

A. Description of the Action:

A.1. Action Title:

3.3.02 - Deployment of LNG fuel facilities at the corridor seaports

A.2. Description of the action:

Member States involved:	**Section or Node:**	**Estimated total cost [Mio €]:**
-	-	*203.4 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
-	*Start year: 2017* *End year: 2027*	*Zarząd Morskiego Portu Gdynia, Zarząd Morskiego Portu Szczecin i Świnoujście , Venice Port Authority , Ravenna Port Authority*

Since mid of 2016 LNG fuel deliveries are possible at the LNG importing terminal in Świnoujście, which is a facility to off-take and re-gasify liquified natural gas. 4 LNG related projects, totalling 203.4 € million are included on the corridor project list for Gdynia, Świnoujście, Venezia and Ravenna. The LNG terminals under development at the two latter ports in the Adriatic are currently being implemented by means of the involvement of the private sector; the LNG terminal of 32.000 m^3 storage capacity planned for construction at the port of Venice has been also recently recommended under the 2017 CEF Blending call with a funding of 6.5 million euro. LNG projects seem indeed particularly suitable for implementation by means of utilization of innovative financial instrument, with a significant involvement of private investors/operators.

Source: Corridor Project List

A.3. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
Availability of clean fuels

Source: Corridor Project List

B. Project Implementation

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1505	Deployment of alternative fuels facility infrastructure - LNG bunkering and vessel's electric power supply	PL	Zarząd Morskiego Portu Gdynia	Port of Gdynia	Clean Fuels,	9.6	
1245	Construction of vessel's stand for LNG export in External Port of Świnoujście	PL	Zarząd Morskiego Portu Szczecin i Świnoujście	Port of Szczecin / Świnoujście	Clean Fuels,	16.3	To be confirmed
1279	LNG supply facilities implementation at the Port of Venezia	IT	Venice Port Authority	Port of Venice	Study, Clean Fuels,	100.0	
1286	LNG supply facilities implementation at the Port of Ravenna	IT	Ravenna Port Authority	Port of Ravenna	Study, Clean Fuels,	77.5	
	TOTAL					203.4	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1505	Deployment of alternative fuels facility infrastructure - LNG bunkering and vessel's electric power supply	PL	2021	2027	not started	in progress	not started	0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1245	Construction of vessel's stand for LNG export in External Port of Świnoujście	PL	2020	2022	not started	not started	not started	0%	Land acquisition: Completed // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: NA // Other: NA
1279	LNG supply facilities implementation at the Port of Venezia	IT	2018	2020	concluded	in progress		0%	Land acquisition: Completed // EIA: NA // Final Approval: NA // CBA: Performed // Other: NA
1286	LNG supply facilities implementation at the Port of Ravenna	IT	2017	2020	in progress	in progress	in progress	22%	Land acquisition: NA // EIA: EIA under preparation or updating //

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
									Final Approval: not submitted yet // CBA: Not performed // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR) TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1505	Deployment of alternative fuels facility infrastructure - LNG bunkering and vessel's electric power supply	PL	1	9.6	0		
1245	Construction of vessel's stand for LNG export in External Port of Świnoujście	PL	1	16.3	0		
1279	LNG supply facilities implementation at the Port of Venezia	IT	1	100.0	0		
1286	LNG supply facilities implementation at the Port of Ravenna	IT	1	77.5	77.5	4.5 3.0 70.0	Port of Ravenna Authority (CEF) CEF private investment
	TOTAL			203.4	77.5		

Source: Corridor Project List

Action sheets for the development of inland waterway ports

A. Description of the Action:

A.1. Action Title:

4.1.01 - Development of the port of Bratislava

A.2. Location of the action:

Source: Project fiches

A.3. Description of the action:

Member States involved: *Slovakia*	**Section or Node:** *Bratislava-*	**Estimated total cost [Mio €]:** *178.7 EUR million*
Other CNC involved: *Orient/East - Med Rhine - Danube-*	**Implementation schedule:** *Start year: 2013 End year: 2024*	**Project Promoter:** *Verejné prístavy, a.s. (Public ports, jsc)*

The inland core ports of Bratislava consisting of separated freight and passenger ports and anchorages for passenger vessels across all city is located on three core network corridors: Baltic-Adriatic, Orient-East Med and Rhine-Danube. Freight port Bratislava fulfils the functions of a universal cargo port. It is used for the transhipment of goods between rail, road and waterborne transport directly or using temporary storage. Oversized freight till 1000 tons can be also loaded or unloaded and Ro-Ro installation is available for the trailers till 60 tons. The locations Winter port with old stores and reloading spaces, pool Pálenisko with transhipment and service berths including mineral oil transhipment facilities and trimodal terminal Bratislava Pálenisko and Lodenica with vessel repair facilities are available in freight port with direct railway access from BA Corridor and with direct connection to the D1 motorway. Bratislava passenger terminal is located in the open channel of the Danube near the historical centre with good pedestrian accessibility and connection to municipal public transport and to D1 motorway. The TEN-T regulation requirements concerning connection to IWW CEMT IV and availability of one terminal open to all operators and application of transparent charges are both satisfied. Clean fuels are not available/in use at the port. Facilities for ship generated waste are also not present.

Regarding the main critical issues which are currently affecting the node and the planned investments; rail investments are planned for the improvement of the railway node infrastructure which could affect also the last mile connection. Investments are also planned which relate to the modernisation of the existing port infrastructure, including binding elements, perpendicular edges, stairs, coastal trails, berths for waiting position, warning signs in the Cargo port and completion port infrastructure in the passenger port. Particularly regarding accessibility and last mile connections, the rail and road infrastructure within the port areas are deemed to be improved. Modernisation and completions of port quays and paved areas in the freight port and expansion of the existing port infrastructure of passenger port to Eurovea waterfront is planned. Landing positions for the purposes of passenger shipping - Winter port in Port of Bratislava are also planned to be constructed and safety radar navigation is to be implemented at the port. The project list also includes an investment for the promotion of alternative clean fuels at the port of Bratislava. No investments are currently envisaged to be development relating to facilities for the treatment of ship generated waste.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
Availability of clean fuels

Source: Corridor Project List

B. Project Implementation

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
9735	Feasibility study for the Modernization of public port of Bratislava	SK	Verejné prístavy, a.s. (Public ports, jsc)	Bratislava (port)	Study,	2.5	
9235	Modernization of infrastructure in cargo port BA and completion of bollards in cargo port	SK	Verejné prístavy, a.s. (Public ports, jsc)	Bratislava (port)	Infrastructure (Upgrade),	63.2	
9236	Modernization and completion of the port quays and hard standings	SK	Verejné prístavy, a.s. (Public ports, jsc)	Bratislava (port)	Infrastructure (Upgrade), Infrastructure (New construction),	40.4	
9237	Passenger port - waterfront Eurovea in Port of Bratislava	SK	Verejné prístavy, a.s. (Public ports, jsc)	Bratislava (port)	Study, Infrastructure (New construction),	7.0	To be confirmed
9736	Port Safety Protection	SK	Verejné prístavy, a.s. (Public ports, jsc)	Bratislava (port)	Study, Infrastructure (New construction),	22.6	
9737	Waterway public transport - feasibility study	SK	Verejné prístavy, a.s. (Public ports, jsc)	Bratislava (port)	Study, Clean Fuels,	0.4	
9738	Waterway public transport - works	SK	Verejné prístavy, a.s. (Public ports, jsc)	Bratislava (port)	Infrastructure (New construction), Clean Fuels,	15.0	
9739	Construction of the LNG Terminal in public port of Bratislava	SK	Verejné prístavy, a.s. (Public ports, jsc)	Bratislava (port)	Study, Clean Fuels,	12.0	
	TOTAL					**178.7**	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL				ADMINISTRATIVE ISSUES
					L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	
9735	Feasibility study for the Modernization of public port of Bratislava	SK	2019	2020	in progress	not started	not started	0%	Land acquisition: Not completed // EIA: EIA under preparation or updating // Final Approval: approved // CBA: Not performed // Other: Under preparation
9235	Modernization of infrastructure in cargo port BA and completion of bollards in cargo port	SK	2021	2024	in progress	not started	not started	0%	Land acquisition: Not completed // EIA: EIA under preparation or updating // Final Approval: approved // CBA: Not performed // Other: Under preparation
9236	Modernization and completion of the port quays and hard standings	SK	2021	2024	in progress	not started	not started	0%	Land acquisition: Not completed // EIA: EIA under preparation or updating // Final Approval: approved // CBA: Not performed // Other: Under preparation
9237	Passenger port - waterfront Eurovea in Port of Bratislava	SK	2013	2023	in progress	in progress	not started	37%	Land acquisition: Not completed // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: Not performed // Other: Under preparation
9736	Port Safety Protection	SK	2018	2021	in progress	not started	not started	0%	Land acquisition: Not completed // EIA: EIA under preparation or updating // Final Approval: approved // CBA: Not performed // Other: Under preparation
9737	Waterway public transport - feasibility study	SK	2018	2019	in progress	in progress	not started	0%	Land acquisition: Completed // EIA: EIA under preparation or updating //

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
									Final Approval: not submitted yet // CBA: Not performed // Other: Under preparation
9738	Waterway public transport - works	SK	2018	2020	in progress	in progress	not started	0%	Land acquisition: Completed // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: Not performed // Other: Under preparation
9739	Construction of the LNG Terminal in public port of Bratislava	SK	2020	2023	in progress	not started	not started	0%	Land acquisition: Not completed // EIA: EIA under preparation or updating // Final Approval: approved // CBA: Not performed // Other: Under preparation

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR) TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
9735	Feasibility study for the Modernization of public port of Bratislava	SK		2.5	0		
9235	Modernization of infrastructure in cargo port BA and completion of bollards in cargo port	SK	1	63.2	0		
9236	Modernization and completion of the port quays and hard standings	SK	1	40.4	0		
9237	Passenger port - waterfront Eurovea in Port of Bratislava	SK	1	7.0	0		
9736	Port Safety Protection	SK	3	22.6	0		
9737	Waterway public transport - feasibility study	SK	3	1.0	0		
9738	Waterway public transport - works	SK	1	30.0	0		
9739	Construction of the LNG Terminal in public port of Bratislava	SK	1	12.0	0		
	TOTAL			**178.7**	**0**		

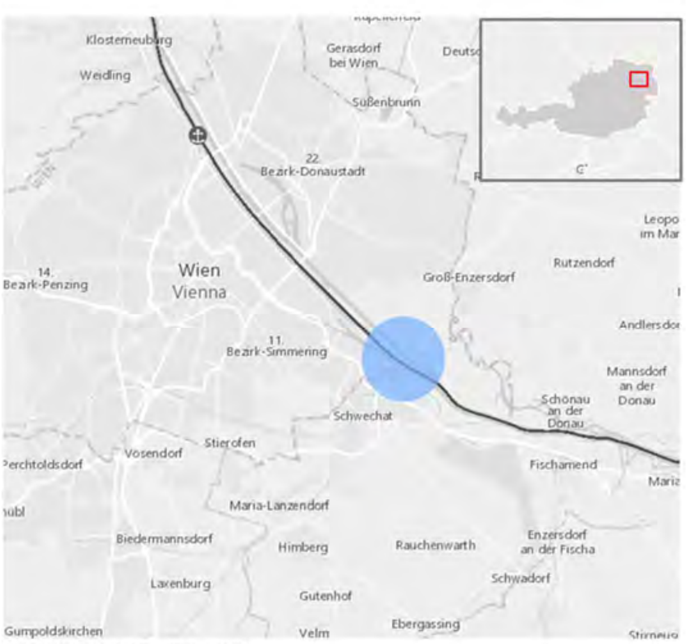
Source: Corridor Project List

A. Description of the Action:

A.1. Action Title:

4.1.02 - Development of the port of Vienna

A.2. Location of the action:



Source: Project fiches

A.3. Description of the action:

Member States involved:	Section or Node:	Estimated total cost [Mio €]:
-	-	*71.1 EUR million*
Other CNC involved: -	**Implementation schedule:** *Start year: NA* *End year: NA*	**Project Promoter:** *Wiener Hafen, Gmbh & Co KG*

Port Wien/Freudenau Port of Wiener Hafen, Gmbh & Co KG, located at a crossroad for international flows, offers transhipment opportunities between inland waterway, rail and road transport. Is the only tri-modal logistics location in the Greater Vienna area and therefore offers key advantages for the intermodal transport of goods. The port is interconnected to the A4 motorway on the BA Corridor through national road 14 and motorway A 23.

The tri-modal terminal is interconnected to the BA Corridor railway network by a direct link (national code 124) parallel to national road 14. Although the referred to electrified section is single track only, its capacity is considered sufficient by the authorities as well as by the terminal operator WIENCONT. The Wien/Freudenau port, which is currently not used to operate waterway services due to the lack of demand from shippers and freight-forwarders is mainly serving rail (120 trains per week) and road traffic.

In recent years, the increase in container transhipments at the Port of Wien/Freudenau has caused bottlenecks in terms of cargo handling space. Compared to 2010, container transhipments alone increased by 38% to nearly 442,000 container units (TEU) in 2011. Thus several venues are tried and studies performed to address these capacity constraints: extension of the container handling capacities including handling yards and waterside infrastructure; improving operational efficiency by deploying optimization systems using location-based conditions; identification of cargo types with waterway transport affinity to strengthen inland waterway transports. Investments are included in the BA Corridor project list, which are already on-going and planned to solve this issues.

The port Wien/Freudenau currently neither offers shore site electrical power supply nor LNG fuel facilities. However, plans are in place to provide both predicated upon demand from operators and/or carriers. Access to terminals is open to all operators, in compliance with article 15 (2) of 1315/2013.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
-

Source: Corridor Project List

B. Project Implementation

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
9161	Planning and construction of the expansion of the trimodal Port of Freudenau/Vienna	AT	Wiener Hafen, Gmbh & Co KG	Wien (port)	Infrastructure (Upgrade), Infrastructure (New construction),	57.0	valorised costs (2,5%)
9162	Improving of the multimodal interconnections at Port of Freudenau/Vienna	AT	Wiener Hafen, Gmbh & Co KG	Wien (port)	Infrastructure (Upgrade), Infrastructure (New construction),	9.0	valorised costs (2,5%)
9725	Expansion of the container terminal - construction Stage 1	AT	Wiener Hafen, Gmbh & Co KG	Wien (port)	Infrastructure (Upgrade), Infrastructure (New construction),	5.1	
	TOTAL					**71.1**	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
9161	Planning and construction of the expansion of the trimodal Port of Freudenau/Vienna	AT	2015	2025				20%	Land acquisition: NA // EIA: NA // Final Approval: not submitted yet // CBA: NA // Other: NA
9162	Improving of the multimodal interconnections at Port of Freudenau/Vienna	AT						NA%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
9725	Expansion of the container terminal - construction Stage 1	AT	2013	2017	in progress	in progress	in progress	85%	Land acquisition: Completed // EIA: NA // Final Approval: not submitted yet // CBA: NA // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR) TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
9161	Planning and construction of the expansion of the trimodal Port of Freudenau/Vienna	AT	1	57.0	0		
9162	Improving of the multimodal interconnections at Port of Freudenau/Vienna	AT	1	9.0	7.2	7.2	National/regional/local
9725	Expansion of the container terminal - construction Stage 1	AT	1	5.1	0		
	TOTAL			**71.1**	**7.2**		

Source: Corridor Project List

Action sheets for the development of airports

A. Description of the Action:

A.1. Action Title:

5.1.01 - Modernization / expansion of the airport of Gdańsk

A.2. Location of the action:

Source: Project fiches

A.3. Description of the action:

Member States involved: -	**Section or Node:** -	**Estimated total cost [Mio €]:** *34.8 EUR million*
Other CNC involved: -	**Implementation schedule:** *Start year: 2017* *End year: 2023*	**Project Promoter:** *Gdansk Airport*

The core airport of Gdańsk is located on Baltic-Adriatic core network corridor. The airport operates both passenger and cargo services (approximately 5% of all air cargo in Poland).

Over the past years intensive investment programme was implemented in Polish airports, in particular in Gdańsk airport including construction of a new passenger terminal and apron, adaptation of the port to CAT II, modernisation of taxiway, construction of drainage system, construction of de-icing stand, modernisation of energy supply system, technical and patrol road, purchase of fire protection vehicle, luggage system, Flying Information System. The actions covered also analysis of adjustment of Gdańsk airport to long term development perspectives. At present the airport has satisfactory capacity to handle the continuously growing number of passengers (over 3.6 million in 2015 and almost 14% growth compared to 2014).

The Gdańsk airport is interconnected to the rail network by Pomorska Kolej Metropolitalna since 2015. Buses are in operation, including dedicated services to the airports. The core airport is interconnected to the A1 motorway via express road S7. Clean fuels are not available/in use at present at the airport for air operations. The TEN-T regulation requirement concerning Availability of one terminal open to all operators and application of transparent charges is satisfied.

Regarding the main critical issues which are currently affecting the node and the planned investments; further development of airport infrastructure is envisaged by means of equipment for safety and security system including purchasing winter maintenance equipment and testing of the taxiway's roughness car as well as special fire and rescue vehicle, airside infrastructure including taxiways, aprons and de-icing aprons, extension of cargo and passenger terminals as well as airplane hangar for airplane's maintenance. Moreover, construction of water supply system for emergency purposes is also foreseen. No investments are currently planned for the promotion of clean fuels availability for air services at the Gdańsk airport. With reference to the deployment of telematics application including SESAR two investments are included in the project list; extension of registered and hand luggage and passenger control system to be implemented by 2020 and extension of navigation light system is included to be implemented by 2023.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
-

Source: Corridor Project List

B. Project Implementation

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1508	Gdansk Airport - airside infrastructure including taxiways, aprons and de-icing aprons	PL	Gdansk Airport	Gdańsk Airport	Infrastructure (Upgrade), Infrastructure (New construction),	10.1	To be confirmed
1509	Gdansk Airport - extension of cargo and passenger terminals	PL	Gdansk Airport	Gdańsk Airport	Infrastructure (Upgrade), Infrastructure (New construction),	24.7	To be confirmed
	TOTAL					**34.8**	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL				ADMINISTRATIVE ISSUES
					L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	
1508	Gdansk Airport - airside infrastructure including taxiways, aprons and de-icing aprons	PL	2017	2023		in progress		3%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1509	Gdansk Airport - extension of cargo and passenger terminals	PL	2017	2023		in progress		3%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR)		
					TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1508	Gdansk Airport - airside infrastructure including taxiways, aprons and de-icing aprons	PL	Residual	10.1	0		
1509	Gdansk Airport - extension of cargo and passenger terminals	PL	3	24.7	0		
	TOTAL			**34.8**	**0**		

Source: Corridor Project List

A. Description of the Action:

A.1. Action Title:

5.1.02 - Modernization / expansion of the airport of Warsaw

A.2. Location of the action:

Source: Project fiches

A.3. Description of the action:

Member States involved:	**Section or Node:**	**Estimated total cost [Mio €]:**
-	-	*274 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
-	*Start year: 2006* *End year: 2019*	*LS Airport Services S.A. & DHL Express Poland, Port Lotniczy Warszawa-Okęcie*

The core airport of Warszawa is located on two core network corridors: Baltic-Adriatic and North Sea-Baltic. The airport operates both passenger and cargo services (approximately 70% of all air cargo in Poland).

Over the past years intensive investment programme was implemented in Polish airports, in particular in Warszawa Chopin Okęcie airport including construction, extension and reconstruction of airport infrastructure, construction of airside and road surface, purchase of equipment for winter maintenance of Warszawa airport as well as elaboration of studies for long term airport development. At present the airport has satisfactory capacity to handle the continuously growing number of passengers (almost 13 million in 2016 and 14.5% growth compared to 2015).

There is direct rail interconnection between the airport and the rail stations within the core urban node of Warszawa. Dedicated bus services are in operation at present between the core airport and the Warszawa urban node main station. The core airport is directly interconnected to the Warszawa ring road and very close to the A2 motorway. Clean fuels are not available/in use at present at the airport for air operations. The TEN-T regulation requirement concerning Availability of one terminal open to all operators and application of transparent charges is satisfied.

In addition to the core Warszawa Chopin airport, also the Warszawa Modlin airport is worth mentioning as other important node located in the proximity of the Warszawa core urban node. The Modlin airport is also interconnected to the rail network and to the main station with dedicated buses serving transport to/from the airport also in operation. Modlin airport started operation in 2012 and serving the low cost airlines records substantial growth in operations with nearly 3 million passengers in 2016 (12% higher than in 2015).

Regarding the main critical issues which are currently affecting the node and the planned investments; modernization of airport infrastructure including adjustment of safety and security parameters to the changes in international law, increasing of quality of passenger care, increasing of operating capacity, increasing the accessibility of Warszawa Chopin Airport to a wider variety of planes and diversification of delivery and distribution of fuel is currently under completion. Another actions are foreseen to be completed by 2020 covering reconstruction of road system in front of the passenger terminal, extension of the north pier of the passenger terminal and alternation of safety and documents check points and increase of capacity of Terminal A. Moreover, construction of a new cargo terminal is also planned to be completed by 2019. No investments are currently planned for the promotion of clean fuels availability for air services at the Warszawa airport. No investments are also included on the list at present which relate to the deployment of telematics application including SESAR.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
-

Source: Corridor Project List

B. Project Implementation

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
2601	Construction of new cargo handling terminal at the Warsaw Chopin Airport (works)	PL	LS Airport Services S.A. & DHL Express Poland	Warsaw node	Infrastructure (New construction),	15.1	Based on the data provided by stakeholder
2602	Modernization of airport infrastructure	PL	Port Lotniczy Warszawa-Okęcie	Warsaw Airport	Infrastructure (Upgrade), Infrastructure (New construction),	172.7	Based on the data provided by stakeholder
2604	Extension of the north pier of the passenger terminal of Warsaw Chopin Airport	PL	Port Lotniczy Warszawa-Okęcie	Warsaw Airport	Study, Infrastructure (Upgrade), Infrastructure (New construction),	62.8	Based on the data provided by stakeholder
2605	Alternation of safety and documents check points and increase of capacity of Terminal A at the Warsaw Chopin Airport	PL	Port Lotniczy Warszawa-Okęcie	Warsaw Airport	Study, Infrastructure (Upgrade),	8.0	Based on the data provided by stakeholder
2609	Construction of a new cargo terminal at the Warsaw Chopin Airport	PL	Port Lotniczy Warszawa-Okęcie	Warsaw Airport	Study, Infrastructure (Upgrade), Infrastructure (New construction),	15.6	Based on the data provided by stakeholder
	TOTAL					**274.2**	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
2601	Construction of new cargo handling terminal at the Warsaw Chopin Airport (works)	PL	2015	2017	concluded	concluded	concluded	69%	Land acquisition: Completed // EIA: EIA approved // Final Approval: approved // CBA: Performed // Other: NA
2602	Modernization of airport infrastructure	PL	2006	2016	concluded	concluded	concluded	NA%	Land acquisition: Completed // EIA: EIA approved // Final Approval: approved // CBA: Performed // Other: NA
2604	Extension of the north pier of the passenger terminal of Warsaw Chopin Airport	PL	2016	2019				31%	Land acquisition: Not completed // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: Not performed // Other: NA
2605	Alternation of safety and documents check points and increase of capacity of Terminal A at the Warsaw Chopin Airport	PL	2016	2017				61%	Land acquisition: Not completed // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: Not performed // Other: NA
2609	Construction of a new cargo terminal at the Warsaw Chopin Airport	PL	2016	2019				31%	Land acquisition: Not completed // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: Not performed // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR)		
					TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
2601	Construction of new cargo handling terminal at the Warsaw Chopin Airport (works)	PL	3	15.1	0		
2602	Modernization of airport infrastructure	PL	Residual	172.7	1732.7	138.6 34.1	own sources Cohesion Fund
2604	Extension of the north pier of the passenger terminal of Warsaw Chopin Airport	PL	3	62.8	0		
2605	Alternation of safety and documents check points and increase of capacity of Terminal A at the Warsaw Chopin Airport	PL	3	8.0	0		
2609	Construction of a new cargo terminal at the Warsaw Chopin Airport	PL	3	15.6	0		
	TOTAL			**274**	**0**		

Source: Corridor Project List

A. Description of the Action:

A.1. Action Title:

5.1.03 - Modernization / expansion of the airport of Katowice

A.2. Location of the action:

Source: Project fiches

A.3. Description of the action:

Member States involved:	**Section or Node:**	**Estimated total cost [Mio €]:**
-	-	*235.2 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
-	*Start year: NA* *End year: NA*	*Port Lotniczy Katowice, PAŻP*

The core airport of Katowice is located on Baltic-Adriatic core network corridor. The airport operates both passenger and cargo services (approximately 20% of all air cargo in Poland).

Over the past years intensive investment programme was implemented in Polish airports, in particular in Katowice Pyrzowice airport including modernisation and extension of airport infrastructure (apron, taxiway and runway), extension of infrastructure including hangars, water and wastewater as well as drainage system, construction of new cargo base and arrival terminal. The actions covered also transport safety and security as well as study for long term airport development. At present the airport has satisfactory capacity to handle the continuously growing number of passengers (over 3 million in 2016 and 6% growth compared to 2015).

The Katowice Pyrzowice airport is not interconnected to the rail network but investment aimed at its interconnection is foreseen. Buses are in operation, including dedicated services to the airports. Local and regional road interconnection is ensured by A1 motorway and S1 express road, with the latter constituting Katowice node by-pass planned for upgrade. The core airport is directly interconnected to both roads and very close to the A1 motorway as well as S1 express road. Clean fuels are not available/in use at present at the airport for air operations. The TEN-T regulation requirement concerning Availability of one terminal open to all operators and application of transparent charges is satisfied.

Regarding the main critical issues which are currently affecting the node and the planned investments; investments on the eastern Katowice ring road – S1 express road connecting the core Katowice Pyrzowice airport (Pyrzowice – Podwarpie – Dąbrowa Górnicza) are planned for implementation. Reconstruction of partially closed railway line no. 182 Tarnowskie Góry – Zawiercie constituting the railway connection to Katowice Pyrzowice airport is planned to be implemented by 2021. Moreover, further development of airport infrastructure is envisaged by means of redevelopment of the runway into the taxiway, redevelopment of passenger terminals A and B, construction of the fire watchtower, construction of the new air traffic control tower, Heliport, adaptation of the movement area to CAT II, construction of the base of the technical support, Base General Aviation, installation for storing the aviation fuel, expansion of Cargo apron and terminal, adaptation of parts of the runway to the function of the GA apron, multi-stage parking extension, construction of the second, parallel runway, extension of aprons, construction of the position of the insulated plane with the de/anti-icing stand as well as construction of the new passenger terminal. No investments are currently planned for the promotion of clean fuels availability for air services at the Katowice airport. No investments are also included on the list at present which relate to the deployment of telematics application including SESAR.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
-

Source: Corridor Project List

B. Project Implementation

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1332	Katowice Airport -Redevelopment of the runway into the taxiway	PL	Port Lotniczy Katowice	Katowice Airport	, OTHER	8.0	
1334	Katowice Airport - Redevelopment of passenger terminals A and B	PL	Port Lotniczy Katowice	Katowice Airport	,	6.2	
1336	Katowice Airport - Construction of the new air traffic control tower	PL	PAŻP	Katowice Airport	,	To be defined	
1338	Katowice Airport - Adaptation of the movement area to CAT II	PL	Port Lotniczy Katowice	Katowice Airport	, OTHER	2.6	
1339	Katowice Airport - Construction of the base of the technical support	PL	Port Lotniczy Katowice	Katowice Airport	,	4.5	
1341	Katowice Airport - Installation for storing the aviation fuel	PL	Port Lotniczy Katowice	Katowice Airport	,	0.6	
1518	Katowice Airport - expansion of Cargo apron - stage IIa and IIb	PL	Port Lotniczy Katowice	Katowice Airport	,	9.6	
1519	Katowice Airport - extension of Terminal Cargo	PL	Port Lotniczy Katowice	Katowice Airport	,	11.6	
1521	Katowice Airport - Multi-stage parking extension	PL	Port Lotniczy Katowice	Katowice Airport	,	8.1	
1523	Katowice Airport - Construction of the second, parallel runway	PL	Port Lotniczy Katowice	Katowice Airport	,	65.7	
1524	Katowice Airport - Extension of aprons	PL	Port Lotniczy Katowice	Katowice Airport	,	23.9	
1525	Katowice Airport - Construction of the position of the insulated plane with the de/anti-icing stand.	PL	Port Lotniczy Katowice	Katowice Airport	,	7.2	
1526	Katowice Airport - Construction of the new passenger terminal D	PL	Port Lotniczy Katowice	Katowice Airport	,	87.2	
	TOTAL					**235.2**	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1332	Katowice Airport - Redevelopment of the runway into the taxiway	PL	2015	2018	concluded		concluded	63%	Land acquisition: NA // EIA: EIA approved // Final Approval: approved // CBA: NA // Other: NA
1334	Katowice Airport - Redevelopment of passenger terminals A and B	PL	2015	2018				54%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1336	Katowice Airport - Construction of the new air traffic control tower	PL						NA%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1338	Katowice Airport - Adaptation of the movement area to CAT II	PL	2015	2018	concluded		concluded	63%	Land acquisition: NA // EIA: EIA approved // Final Approval: approved // CBA: NA // Other: NA
1339	Katowice Airport - Construction of the base of the technical support	PL	2018	2020				0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1341	Katowice Airport - Installation for storing the aviation fuel	PL	2019	2019				0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1518	Katowice Airport - expansion of Cargo apron - stage IIa and IIb	PL		2020				NA%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1519	Katowice Airport - extension of Terminal Cargo	PL	2027	2027				0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1521	Katowice Airport - Multi-stage parking extension	PL	2018	2020				0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL				ADMINISTRATIVE ISSUES
					L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	
1523	Katowice Airport - Construction of the second, parallel runway	PL	2032	2033				0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1524	Katowice Airport - Extension of aprons	PL	2028	2029				0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1525	Katowice Airport - Construction of the position of the insulated plane with the de/anti-icing stand.	PL	2025	2025				0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1526	Katowice Airport - Construction of the new passenger terminal D	PL	2025	2027				0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR)		
					TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1332	Katowice Airport -Redevelopment of the runway into the taxiway	PL	Residual	8.0	0		
1334	Katowice Airport - Redevelopment of passenger terminals A and B	PL	3	6.2	0		
1336	Katowice Airport - Construction of the new air traffic control tower	PL	Residual	To be defined	0		
1338	Katowice Airport - Adaptation of the movement area to CAT II	PL	Residual	2.6	0		
1339	Katowice Airport - Construction of the base of the technical support	PL	Residual	4.5	0		
1341	Katowice Airport - Installation for storing the aviation fuel	PL	Residual	0.6	0		
1518	Katowice Airport - expansion of Cargo apron - stage IIa and IIb	PL	Residual	9.6	0		
1519	Katowice Airport - extension of Terminal Cargo	PL	3	11.6	0		
1521	Katowice Airport - Multi-stage parking extension	PL	Residual	8.1	0		
1523	Katowice Airport - Construction of the second, parallel runway	PL	3	65.7	0		
1524	Katowice Airport - Extension of aprons	PL	Residual	23.9	0		
1525	Katowice Airport - Construction of the position of the insulated plane with the de/anti-icing stand.	PL	Residual	7.2	0		
1526	Katowice Airport - Construction of the new passenger terminal D	PL	3	87.2	0		
	TOTAL			**235.2**	**0**		

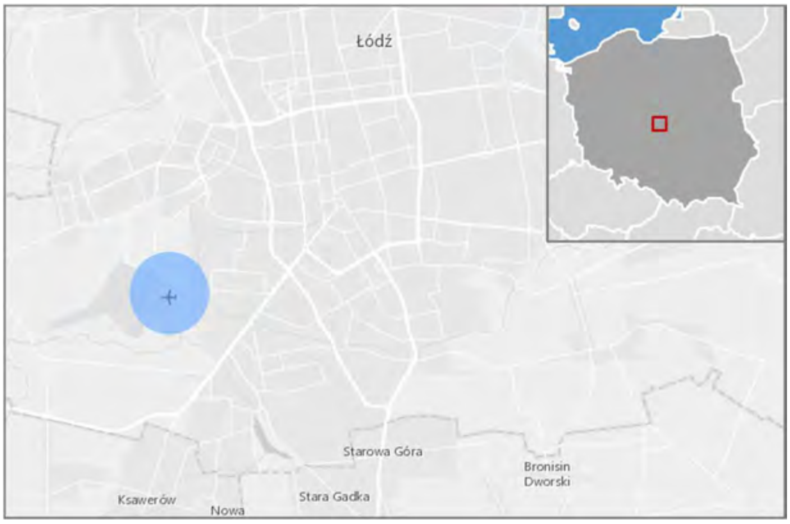
Source: Corridor Project List

A. Description of the Action:

A.1. Action Title:

5.1.04 - Modernization / expansion of the airport of Łódź

A.2. Location of the action:



Source: Project fiches

A.3. Description of the action:

Member States involved:	Section or Node:	Estimated total cost [Mio €]:
-	-	*0 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
-	*Start year: NA* *End year: NA*	*Port Lotniczy Łódź*

The core airport of Łódź is located on two core network corridors: Baltic-Adriatic and North Sea-Baltic. The airport operates only passenger services.

Over the past years intensive investment programme was implemented in Polish airports, in particular in Łódź airport including construction of new passenger terminal, completion of patrol and fire-protection network; adjustment of airport with regard to fire protection standards including purchase of necessary equipment and vehicles and finally, increase of airport operational safety and security by winter airport maintenance. At present the airport has satisfactory capacity to handle the continuously growing number of passengers (over 240 thousand in 2016 and over 16% decrease compared to 2015).

The Łódź airport is not interconnected to the rail network. Buses are in operation, including dedicated services to the airports. Local and regional road interconnection is primarily ensured by S14 express road interconnected with A1 motorway. Clean fuels are not available/in use at present at the airport for air operations. The TEN-T regulation requirement concerning Availability of one terminal open to all operators and application of transparent charges is satisfied.

Regarding the main critical issues which are currently affecting the node and the planned investments; further development of airport infrastructure is envisaged by means of extension of apron as well as extension of parallel taxiway with RET. No investments are currently planned for the promotion of clean fuels availability for air services at the Łódź airport. With reference to the deployment of telematics application including SESAR two investments are planned, implementation of Constant Noise Monitoring System as well as extension of radar - camera security system, first one under implementation and planned for completion by 2017 and the latter with not defined implementation date yet.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
-

Source: Corridor Project List

B. Project Implementation

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1308	Łódź Airport - Extension of parallel taxiway with RET	PL	Port Lotniczy Łódź	Łodź Airport	Study,	To be defined	under consideration
	TOTAL					0	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL				ADMINISTRATIVE ISSUES
					L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	
1308	Łódź Airport - Extension of parallel taxiway with RET	PL						NA%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR)		
					TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1308	Łódź Airport - Extension of parallel taxiway with RET	PL	Residual	To be defined	0		
	TOTAL			0	0		

Source: Corridor Project List

A. Description of the Action:

A.1. Action Title:

5.1.05 - Modernization / expansion of the airport of Szczecin

A.2. Location of the action:

Source: Project fiches

A.3. Description of the action:

Member States involved:	**Section or Node:**	**Estimated total cost [Mio €]:**
-	-	*19.3 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
-	*Start year: 2014* *End year: 2020*	*Port Lotniczy Szczecin - Goleniów Sp. z o.o.*

The core airport of Szczecin is located on Baltic-Adriatic core network corridor. The airport operates both passenger and cargo services (0.1% of all air cargo in Poland).

Over the past years intensive investment programme was implemented in Polish airports, in particular in Szczecin airport including construction of arrival terminal, extension and modernisation of airside infrastructure (taxiways, aprons), modernisation of luggage control system and belt conveyers and development of safety and security systems of fire protection and airport operations. At present the airport has satisfactory capacity to handle the continuously growing number of passengers (over 460 thousand in 2016 and over 13% growth compared to 2015).

The Szczecin Goleniów airport is interconnected to the rail network and to the main station. Buses are also in operation, including dedicated services to the airports. The core airport is interconnected to the S3 express road via road no. 6. Clean fuels are not available/in use at present at the airport for air operations. The TEN-T regulation requirement concerning Availability of one terminal open to all operators and application of transparent charges is satisfied.

Regarding the main critical issues which are currently affecting the node and the planned investments; further development of airport infrastructure is envisaged by means of works on airport's infrastructure on airside / landside (extensions on passenger terminal, extension of runway, extension of apron at 2 parking positions for plane, repairs of airside surface taxiways), replacement security control units at passenger security control zone, building a new entrance to airport airside zone, purchase of new units for winter maintenance at airport surface and building a new airport lighting approach system cat.II. No investments are currently planned for the promotion of clean fuels availability for air services at the Szczecin airport. With reference to the deployment of telematics application including SESAR, rebuilding of CCTV system at airport is ongoing and foreseen to be completed by 2017.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
-

Source: Corridor Project List

B. Project Implementation

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1322	Szczecin Airport - Works on airport's infrastructure on airside / landside	PL	Port Lotniczy Szczecin - Goleniów Sp. z o.o.	Szczecin Airport	,	9.9	To be confirmed
1323	Szczecin Airport - Replacement security control units at passenger security control zone	PL	Port Lotniczy Szczecin - Goleniów Sp. z o.o.	Szczecin Airport	,	0.9	To be confirmed
1325	Szczecin Airport - Building a new entrance to airport airside zone	PL	Port Lotniczy Szczecin - Goleniów Sp. z o.o.	Szczecin Airport	,	1.2	To be confirmed
1327	Szczecin Airport - Building a new airport lighting approach system cat.II	PL	Port Lotniczy Szczecin - Goleniów Sp. z o.o.	Szczecin Airport	, OTHER	7.3	To be confirmed
	TOTAL					**19.3**	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL				ADMINISTRATIVE ISSUES
					L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	
1322	Szczecin Airport - Works on airport's infrastructure on airside / landside	PL	2017	2020				6%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1323	Szczecin Airport - Replacement security control units at passenger security control zone	PL	2014	2016				NA%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1325	Szczecin Airport - Building a new entrance to airport airside zone	PL	2016	2018				41%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1327	Szczecin Airport - Building a new airport lighting approach system cat.II	PL	2016	2020				25%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR)		
					TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1322	Szczecin Airport - Works on airport's infrastructure on airside / landside	PL	Residual	9.9	0		
1323	Szczecin Airport - Replacement security control units at passenger security control zone	PL	Residual	0.9	0		
1325	Szczecin Airport - Building a new entrance to airport airside zone	PL	Residual	1.2	0		
1327	Szczecin Airport - Building a new airport lighting approach system cat.II	PL	Residual	7.3	0		
	TOTAL			**19**	**0**		

Source: Corridor Project List

A. DESCRIPTION OF THE ACTION:

A.1. Action Title:

5.1.06 - Modernisation / expansion of the airport of Poznań

A.2. Location of the action:

Source: Project fiches

A.3. Description of the action:

Member States involved:	Section or Node:	Estimated total cost [Mio €]:
-	-	*37.8 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
-	*Start year: 2015* *End year: 2019*	*Port Lotniczy Poznań-Ławica*

The core airport of Poznań is located on two core network corridors: Baltic-Adriatic and North Sea-Baltic. The airport operates both passenger and cargo services (0.3% of all air cargo in Poland).

Over the past years intensive investment programme was implemented in Polish airports, in particular in Poznań airport including extension and modernisation of passenger terminal with associated infrastructure including specifically construction of arrival terminal, check-in section, modernisation of departure terminal, design and build of airside infrastructure including taxiways and apron as well as construction of de-icing stand. Other relevant implemented investments referred to improvement of air operation and passenger's safety and security as well as airport area security and finally fire protection. At present the airport has satisfactory capacity to handle the continuously growing number of passengers (over 1.7 million in 2016 and almost 14% growth compared to 2015).

The Poznań airport is not interconnected to the rail network. Buses are in operation, including dedicated services to the airports. The core airport is directly interconnected to road no. 92 and S11 express road linking it with A2 motorway. Clean fuels are not available/in use at present at the airport for air operations. The TEN-T regulation requirement concerning Availability of one terminal open to all operators and application of transparent charges is satisfied.

Regarding the main critical issues which are currently affecting the node and the planned investments; further development of airport infrastructure is envisaged by means of modernisation of taxiways, terminal building modernisation (renovation), Modernisation of aircraft parking aprons military part of the airport, energy infrastructure Modernisation, expansion of existing parking spaces as well as the Modernisation of the transport system, Modernisation of aircraft parking aprons, Modernisation of buildings and structures, Photovoltaic Power Plant, rainwater pre-treatment plant and finally extension of technical base. No investments are currently planned for the promotion of clean fuels availability for air services at the Poznań airport. With reference to the deployment of telematics application including SESAR two investments are included in the project list; security - the scope of this task includes both investment tasks purchase of specialized equipment used to ensure the safety of flight operations; and network informatics elements - modernisation and broader utilization of the existing IT network at the airport, including software for managing, both initiatives expected to be implemented by 2019.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
-

Source: Corridor Project List

B. Project Implementation

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1347	Poznań Airport - Modernisation Road taxiing	PL	Port Lotniczy Poznań-Ławica	Poznań Airport	Infrastructure (Upgrade), Infrastructure (New construction),	1.0	To be confirmed
1348	Poznań Airport - Terminal Modernisation	PL	Port Lotniczy Poznań-Ławica	Poznań Airport	Infrastructure (Upgrade), Infrastructure (New construction),	1.7	To be confirmed
1352	Poznań Airport - Construction of parking with the communication system	PL	Port Lotniczy Poznań-Ławica	Poznań Airport	Infrastructure (Upgrade), Infrastructure (New construction),	0.7	To be confirmed
1353	Poznań Airport - Modernisation of aircraft parking aprons	PL	Port Lotniczy Poznań-Ławica	Poznań Airport	Infrastructure (Upgrade), Infrastructure (New construction),	0.2	To be confirmed
1354	Poznań Airport - Modernisation of Buildings and Structures	PL	Port Lotniczy Poznań-Ławica	Poznań Airport	Infrastructure (Upgrade), Infrastructure (New construction),	0.4	To be confirmed
1357	Poznań Airport - Station pre-treatment with rainwater distribution system	PL	Port Lotniczy Poznań-Ławica	Poznań Airport	Infrastructure (Upgrade), Infrastructure (New construction),	7.1	To be confirmed
1358	Poznań Airport - Modernisation and extension of Runway	PL	Port Lotniczy Poznań-Ławica	Poznań Airport	Infrastructure (Upgrade), Infrastructure (New construction),	21.9	To be confirmed
1359	Poznań Airport - Technical Base	PL	Port Lotniczy Poznań-Ławica	Poznań Airport	Maintenance (IWW),	4.8	To be confirmed
	TOTAL					**37.8**	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL: L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1347	Poznań Airport - Modernisation Road taxiing	PL	2019	2019				0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1348	Poznań Airport - Terminal Modernisation	PL	2017	2019				7%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1352	Poznań Airport - Construction of parking with the communication system	PL	2015	2018				56%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1353	Poznań Airport - Modernisation of aircraft parking aprons	PL	2016	2016				NA%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1354	Poznań Airport - Modernisation of Buildings and Structures	PL	2015	2019				45%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1357	Poznań Airport - Station pre-treatment with rainwater distribution system	PL	2015	2019				45%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1358	Poznań Airport - Modernisation and extension of Runway	PL	2015	2019				45%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1359	Poznań Airport - Technical Base	PL	2015	2019				45%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR) TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1347	Poznań Airport - Modernisation Road taxiing	PL	Residual	1.0	0		
1348	Poznań Airport - Terminal Modernisation	PL	Residual	1.7	0		
1352	Poznań Airport - Construction of parking with the communication system	PL	Residual	0.7	0		
1353	Poznań Airport - Modernisation of aircraft parking aprons	PL	Residual	0.2	0		
1354	Poznań Airport - Modernisation of Buildings and Structures	PL	Residual	0.4	0		
1357	Poznań Airport - Station pre-treatment with rainwater distribution system	PL	Residual	7.1	0		
1358	Poznań Airport - Modernisation and extension of Runway	PL	Residual	21.9	0		
1359	Poznań Airport - Technical Base	PL	Residual	4.8	0		
	TOTAL			**37.8**	**0**		

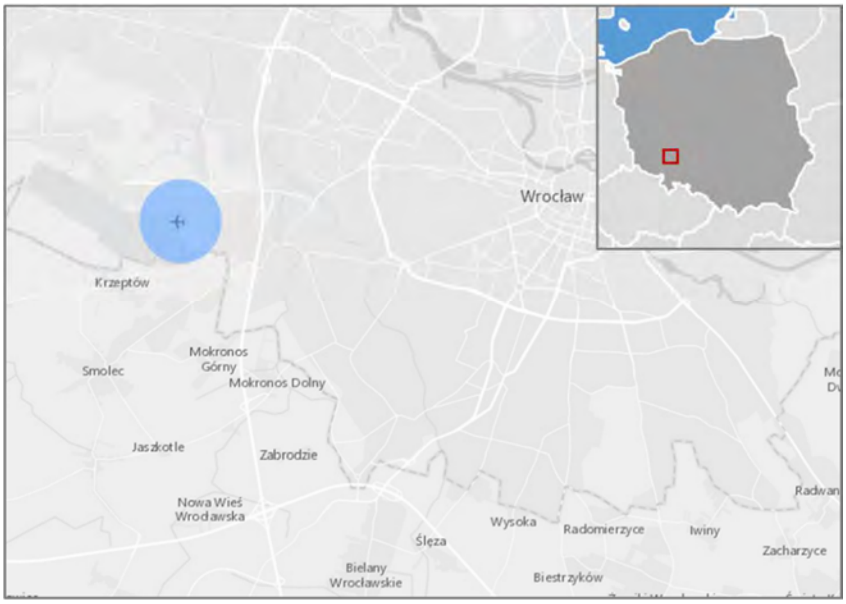
Source: Corridor Project List

A. DESCRIPTION OF THE ACTION:

A.1. Action Title:

5.1.07 - Modernization / expansion of the airport of Wrocław

A.2. Location of the action:



Source: Project fiches

A.3. Description of the action:

Member States involved:	**Section or Node:**	**Estimated total cost [Mio €]:**
-	-	*65.6 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
-	*Start year: 2015* *End year: 2020*	*Port Lotniczy Wrocław*

The core airport of Wrocław is located on Baltic-Adriatic core network corridor. The airport operates both passenger and cargo services (0.1% of all air cargo in Poland).

Over the past years intensive investment programme was implemented in Polish airports, in particular in Wrocław airport including construction of new passenger terminal together with associated infrastructure, purchase of equipment necessary for safe and secure passenger boarding, construction and extension of infrastructure buildings aiming at servicing increased number of planes associated by purchase of appropriate equipment, complex study and technical documentation for airport development, action aiming at birds protection nearby passenger terminal. At present the airport has satisfactory capacity to handle the continuously growing number of passengers (over 2.4 million in 2016 and 4.5% growth compared to 2015).

The Wrocław airport is not interconnected to the rail network. Buses are in operation, including dedicated services to the airports. Local and regional road interconnection is primarily ensured by the Wrocław motorway ring road (A8). This is interconnected to the main urban and metropolitan/regional roads. The core airport is directly interconnected to the ring road and very close to the A8 motorway ring road as well as A4 motorway. Clean fuels are not available/in use at present at the airport for air operations. The TEN-T regulation requirement concerning Availability of one terminal open to all operators and application of transparent charges is satisfied.

Regarding the main critical issues which are currently affecting the node and the planned investments; further airport infrastructure development is foreseen by means of construction of the fuel storage, remediation of former military sites belonging to the airport, modernisation of the airport fire protection location, reconstruction of internal roads and airports taxiways, extension of parking and kerb as well as construction expressway for fast exit the aircraft out of the runway. Finally, construction of the plane de-icing aircraft with a possible extension of an existing one is also planned. No investments are currently planned for the promotion of clean fuels availability for air services at the Wrocław airport. No investments are also included on the list at present which relate to the deployment of telematics application including SESAR.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
-

Source: Corridor Project List

B. PROJECT IMPLEMENTATION

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1314	Wrocław Airport - preparation of documentation and construction of the plane de-icing aircraft with a possible extension of an existing one	PL	Port Lotniczy Wrocław	Wrocław Airport	Study, Infrastructure (Upgrade), Infrastructure (New construction),	18.1	
1315	Wrocław Airport - Construction of the fuel storage	PL	Port Lotniczy Wrocław	Wrocław Airport	Infrastructure (New construction),	3.5	own sources
1319	Wrocław Airport - development of internal infrastructure	PL	Port Lotniczy Wrocław	Wrocław Airport	Infrastructure (Upgrade), Infrastructure (New construction),	16.0	To be confirmed
1320	Wrocław Airport - Extension of parking and kerb	PL	Port Lotniczy Wrocław	Wrocław Airport	Infrastructure (Upgrade), Infrastructure (New construction),	1.0	own sources
1529	Wrocław Airport - Expressway	PL	Port Lotniczy Wrocław	Wrocław Airport	Infrastructure (Upgrade), Infrastructure (New construction),	20.0	To be confirmed
1569	Wrocław Airport - decarbonization	PL	Port Lotniczy Wrocław	Wrocław Airport	Infrastructure (Upgrade), Maintenance (IWW),	5.0	To be confirmed
1570	Wrocław Airport - adapt to climate change	PL	Port Lotniczy Wrocław	Wrocław Airport	Infrastructure (Upgrade), Infrastructure (New construction), Maintenance (IWW),	2.0	To be confirmed
	TOTAL					**65.6**	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1314	Wrocław Airport - preparation of documentation and construction of the plane de-icing aircraft with a possible extension of an existing one	PL	2015	2020	concluded	concluded	in progress	33%	Land acquisition: NA // EIA: EIA approved // Final Approval: submitted, decision pending // CBA: NA // Other: NA
1315	Wrocław Airport - Construction of the fuel storage	PL	2015	2018	concluded	concluded	concluded	53%	Land acquisition: NA // EIA: EIA approved // Final Approval: approved // CBA: Performed // Other: NA
1319	Wrocław Airport - development of internal infrastructure	PL	2018	2020		not started	in progress	0%	Land acquisition: NA // EIA: NA // Final Approval: not submitted yet // CBA: Not performed // Other: NA
1320	Wrocław Airport - Extension of parking and kerb	PL	2018	2020	concluded	not started	not started	0%	Land acquisition: NA // EIA: NA // Final Approval: not submitted yet // CBA: Not performed // Other: NA
1529	Wrocław Airport - Expressway	PL	2018	2020	concluded	concluded	in progress	0%	Land acquisition: NA // EIA: EIA approved // Final Approval: submitted, decision pending // CBA: Performed // Other: NA

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL				ADMINISTRATIVE ISSUES
					L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	
1569	Wrocław Airport - decarbonization	PL	2018	2020	in progress	not started	not started	0%	Land acquisition: NA // EIA: NA // Final Approval: not submitted yet // CBA: Not performed // Other: NA
1570	Wrocław Airport - adapt to climate change	PL	2018	2020	in progress	not started	not started	0%	Land acquisition: NA // EIA: NA // Final Approval: not submitted yet // CBA: Performed // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR)		
					TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1314	Wrocław Airport - preparation of documentation and construction of the plane de-icing aircraft with a possible extension of an existing one	PL	Residual	18.1	0.14	0.072 0.072	own sources OPIE
1315	Wrocław Airport - Construction of the fuel storage	PL	Residual	3.5	3.5	3.5	own sources
1319	Wrocław Airport - development of internal infrastructure	PL	Residual	16.0	0		
1320	Wrocław Airport - Extension of parking and kerb	PL	Residual	1.0	0		
1529	Wrocław Airport - Expressway	PL	Residual	20.0	0		
1569	Wrocław Airport - decarbonization	PL	Residual	5.0	0		
1570	Wrocław Airport - adapt to climate change	PL	Residual	2.0	0		
	TOTAL			**65.6**	**3.6**		

Source: Corridor Project List

A. Description of the Action:

A.1. Action Title:

5.1.08 - Modernization / expansion of the airport of Ostrava

A.2. Location of the action:

Source: Map data ©2016 Google

A.3. Description of the action:

Member States involved:	Section or Node:	Estimated total cost [Mio €]:
-	-	*- EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
-	*Start year: -* *End year: -*	-

The core Leoš Janáček Ostrava Aiport (Letiště Leoše Janáčka Ostrava) is located on two core network corridors: Baltic-Adriatic and Rhine-Danube. Moravian-Silesian regional airport operates both passenger and cargo services. With about 0.26 million passengers in 2015, the airport is currently operating below its maximum capacity (2 million passengers). The demand and services on the of regional airport are limited, suffering from competition from the near larger Katowice and Kraków airports. Praha and Wien airports are also easy to be reached by train within 3 hours. Most of the flights are operated by low cost carriers, and about one third of the traffic volume is operated by charter flights. Cargo operation registered about 4.1 thousand tonnes in 2016. The airport was upgraded in 2006 when a new terminal was built. Plans are under discussion to increase the traffic volumes to 1,5 mil. passengers, build hotel, parking house and new freight terminal facilities. No particular project is however in preparation or planning till 2030.

A direct rail link interconnection between the Ostrava Airport and the railway stations within the core urban node of Ostrava is in operation since April 2015. Regional bus services are also in operation connecting Ostrava Airport to Ostrava ÚAN coach station and the towns of Vsetín and Nový Jičín. The core airport is well connected to the close motorways D1 and D48. Clean fuels are not available/in use at present at the airport for air operations. The TEN-T regulation requirement concerning *Availability of one terminal open to all operators and application of transparent charges* is satisfied.
No investments are currently planned for the promotion of clean fuels availability for air services at the Ostrava airport. No airport specific investments seem to be under implementation at present which relate to the deployment of telematics application including SESAR.

Source: BA Corridor study consortium

A. Description of the Action:

A.1. Action Title:

5.1.09 - Modernization / expansion of the airport of Bratislava

A.2. Location of the action:

Source: Map data ©2016 Google; GeoBasis DE/BKG (2009), Google

A.3. Description of the action:

Member States involved:	Section or Node:	Estimated total cost [Mio €]:
-	-	*- EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
-	*Start year: -* *End year: -*	-

The core Airport Bratislava (Letisko M.R. Štefánika) is located on three core network corridors: Baltic-Adriatic, Orient-East Med and Rhine-Danube and is the largest airport in Slovakia. The airport operates both passenger and cargo services. With nearly 1,8 million passengers in 2016, the airport registered an increase in the number of passengers by 12.3% compared to 2015, but it is far beyond highest number from 2008 (2,2 million) and far beyond its capacity (5 million passengers). The airport suffers from the competition of the nearby Vienna International Airport. Most of the flights are operated by low cost carriers, one third of the traffic volume is operated by charter flights. Cargo operation is about 23 thousand tonnes, 9% more than in 2015.

The airport was upgraded in 2004 – 2012 to fulfil the requirements of Schengen agreement and to increase airport capacity and improve service quality. In spite of the limited usage of its capacity there are plans to increase the capacity to 10 – 12 millions of passengers and to construct a railway connection with an underground station. These plans have no definitive time frame and no approved financing and it is not likely that these developments will be realised before 2030. There is a need to upgrade the runway 13-31, reconstruct taxiway F and extend the apron, all these works amounting to an estimated cost of 170 € million.

No direct rail or other fixed link interconnection between the airport and the rail stations within the core urban node of Bratislava exist at present. A Municipal bus service is in operation at present between the core airport and the Bratislava urban node main station. There is also a direct bus service to the Wien Schwechat International Airport. The core airport is directly interconnected to the motorway D1 and it is planned to construct a new connection to the D4 outer bypass by relocating road II/572. Clean fuels are not available/in use at present at the airport for air operations. The TEN-T regulation requirement concerning *Availability of one terminal open to all operators and application of transparent charges* is satisfied.

Regarding the main critical issues which are currently affecting the node and the planned investments; the necessity of reconstruction of runway 13-31 is crucial. The National Transport Strategy till 2020 foresees the modernisation and extension of the runway by 2020 at the cost of 96 € million. Measures for the monitoring and decrease of environmental impacts are also planned. The railway connection to the airport is is under consideration as part of the feasibility study of Bratislava railway node. The connection may not be realised before 2030. An earlier development of the link is challenged by low economical effectiveness due to the current low demand. Plans have been elaborated to upgrade the airport for larger aircrafts, and to increase its capacity. There is however no sufficient demand supporting the development of these plans.

No investments are currently planned for the promotion of clean fuels availability for air services at the Bratislava airport. No specific airport investments seem also to be included in the list at present which relate to the deployment of telematics application including SESAR.

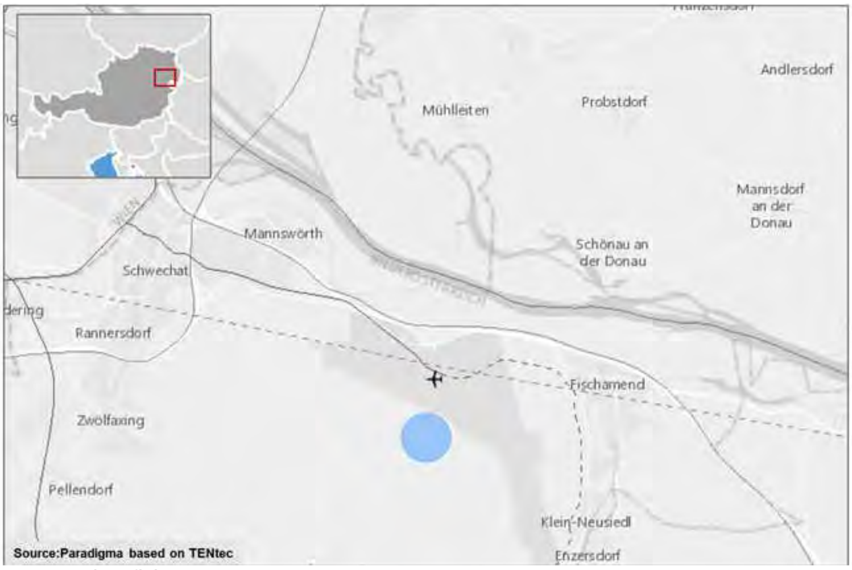
Source: BA Corridor study consortium

A. Description of the Action:

A.1. Action Title:

5.1.10 - Modernization / expansion of the airport of Vienna

A.2. Location of the action:



Source: Project fiches

A.3. Description of the action:

Member States involved:	Section or Node:	Estimated total cost [Mio €]:
-	-	*880.0 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
-	*Start year: 2012* *End year: 2028*	*Vienna Airport PLC, Flughafen Wien AG*

The Vienna airport (international airport Wien/Schwechat) is located on the Baltic-Adriatic corridor, 20km from the urban node Wien. It has direct access to the A4 motorway on the BA Corridor and is connected to the national and BA Corridor railway network. Train services provided encompass suburban railways, conventional rail as well as rail shuttle (CAT). Several international trains on the West-East corridors have their terminal station at the airport, allowing combined rail/air services for passengers from Linz, Salzburg and St. Pölten.

The airport operates both passenger and air-cargo services. With over 22 million passengers in 2015, the airport remains on its projected growth path. It is considered an international hub for destinations in Eastern Europe, the Near East and the Middle East. Its catchment area – defined by the managing authority to cover an area with a radius of 2 hours distance from the airport - includes regions in neighbouring member states Hungary, Slovakia and the Czech Republic. About 11.8 Million people living in this area have access from the airport to connections in 75 countries. Extending this area from two hours to a radius of 3 hours will increase the accessibility to 23.4 Million people. Sustained investment in the infrastructure and concomitant rising income levels in this region are expected to increase the propensity for air travel demand as well as air- freight.

In the medium term, ecological considerations as well as capacity constraints at airports are expected to see the partial substitution of short distance flights by adequate train services. Consequently, the Vienna airport has to develop into a multimodal hub, specifically by expanding its rail connectivity towards Bratislava and Budapest.

Results of feasibility studies performed in 2015 for High Speed train services (“Neue Ostbahn”), connecting Wien, Bratislava and Budapest show that such services would lead to an increase from 4,400 passengers/day (without such a new connection) to 6,300 passengers/day in 2035. This amount to a tripling of passengers compared to today’s numbers and a concomitant increase of the modal rail split from 5.5% to 12%. (See also the BAC projects 9060, 9061).

Connection between the international airport Wien/Schwechat and Bratislava will thus be available either by the new high speed line „Neue Ostbahn“ via Bruck and der Leitha , Kittsee and Petržalka/Bratislava or alternatively via the new Marchegg line (See also the BAC project 1093). As a result of the latter project, passenger volumes are expected to increase from 4.000/day in 2012 to 9.000/day in 2025. The combined result will be a substitution of current bus by rail services.

The resulting increases in the number of air passengers as well as the anticipated long-term developments in international aviation cannot be effectively handled with the current system of two intersecting runways nor would it be acceptable for the local population. Thus plans have been in place for several years to build an additional take-off and landing runway, which is expected to reduce delays, fuel consumption and noise by eliminating holding patterns and queued aircraft during busy periods.

This third runway - 11R/29L - will be 2,400 metres south of the existing 11L/29R runway, with an effective runway length of 3,680 metres. The location of the planned third runway was determined following detailed mediated discussions. After in-depth consideration of the various development scenarios, the groups involved, including neighbouring communities and action groups, recognised that the planned location was the most environmentally sensible solution. (BAC project 1360).

Environmental concerns not only include greenhouse gas emissions and their eventual reduction by means of the airlines using more fuel efficient aircraft and using alternative fuels, but also extend towards mitigating the impact of noise. Thus as a result of the above mentioned mediation process voluntary restrictions of the amount of air traffic during night hours have been agreed to and are being observed. Concerning efforts to reduce CO^2 emissions, facilities to provide bio fuels (Bio Kerosene) are in place, however not in operation due to lack of demand from carriers. Recharging facilities for electrical cars are available on parking areas at the airport.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
Availability of clean fuels

Source: Corridor Project List

B. PROJECT IMPLEMENTATION

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1360	Third runway for the Vienna International Airport	AT	Vienna Airport PLC	Airport Vienna	Study, Infrastructure (Upgrade),	800.0	valorised costs (2,5%)
9906	Sustainable airport area - CO2 neutral Airport	AT	Flughafen Wien AG	Vienna Airport	Study, Clean Fuels, Sustainable Freight,	80.0	Estimation of total coasts for the measures in the project
	TOTAL					**880.0**	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONST R.	ADMINISTRATIVE ISSUES
1360	Third runway for the Vienna International Airport	AT	2019	2028				0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
9906	Sustainable airport area - CO2 neutral Airport	AT	2012	2025				37%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR) TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1360	Third runway for the Vienna International Airport	AT	3	800.0	0		
9906	Sustainable airport area - CO2 neutral Airport	AT	Residual	80.0	0		
	TOTAL			**880.0**	**0**		

Source: Corridor Project List

A. DESCRIPTION OF THE ACTION:

A.1. Action Title:

5.1.11 - Modernization / expansion of the airport of Venice

A.2. Location of the action:

Source: Project fiches

A.3. Description of the action:

Member States involved:	Section or Node:	Estimated total cost [Mio €]:
-	-	*505.0 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
-	*Start year: 2013* *End year: 2025*	*ENAC S.p.A. / SAVE S.p.A.*

The core airport of Venezia is located on two core network corridors: Baltic-Adriatic and Mediterranean. The airport operates both passenger and cargo services. In 2016, the airport recorded nearly 9.6 million passengers, with a growth of 10.0% compared to the previous year.

No direct rail or other fixed link interconnection between the airport and the rail stations within the core urban node of Venezia exist at present; a dedicated bus service is in operation at present. Water transport services are also available from the airport boathouse, connecting to Venice and the main Venetian islands (Murano, Burano, Lido). A direct expressway link interconnects the airport to the motorway ring road (*Tangenziale di Mestre*) and the external bypass (*Passante di Mestre*). Clean fuels are not available/in use at present at the airport for air operations. The TEN-T regulation requirement concerning availability of one terminal open to all operators and application of transparent charges is satisfied.

Regarding the main critical issues which are currently affecting the node and the planned investments, there are plans for the further expansion of the passenger terminal in successive lots, to meet the needs of expected air traffic growth and to keep satisfactory levels of service to passengers, as well as initiatives for the improvement of green and open spaces, underground utilities, hydraulic works and a new rigeneration plant. The construction of an automated pedestrian transport system for passengers is foreseen to improve internal node connections between the passenger terminal, parking garage and water terminal.

Additional investments are planned to improve ground accessibility and develop a multilevel car park system in the immediate vicinity of the passenger terminal, also including a bus terminal for public transport services. Furthermore, a new railway link to the Venezia Marco Polo Airport is currently under study, in order to provide direct connection to the conventional Venice - Trieste railway line and the regional railway transport services (*Servizio Ferroviario Metropolitano Regionale*). This last investment is included in the action sheet for the Venice urban core node.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
Connection to rail

Source: Corridor Project List

B. Project Implementation

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
3604	Venice Airport: new Parking and Bus terminal	IT	ENAC S.p.A. / SAVE S.p.A.	Venice Tessera Airport	Study, Infrastructure (New construction),	75.0	
3605	Venice Airport: new connection between the Underground railway station, the passenger terminal, public transport and car parkings	IT	ENAC S.p.A. / SAVE S.p.A.	Venice Tessera Airport	Study, Infrastructure (New construction),	50.0	
3603	Venice airport: external areas and internal ways (Aree scoperte e viabilità interna)	IT	ENAC S.p.A. / SAVE S.p.A.	Venice Tessera Airport	Study, Infrastructure (Rehabilitation),	80.0	
3601	Venice Airport: expansion of the passenger terminal	IT	ENAC S.p.A. / SAVE S.p.A.	Venice Tessera Airport	Study, Infrastructure (Upgrade),	300.0	Terminal expansion costs: infrastructural works, civil works, technical components
	TOTAL					505.0	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
3604	Venice Airport: new Parking and Bus terminal	IT	2013	2025	concluded	in progress	in progress	33%	Land acquisition: Completed // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
3605	Venice Airport: new connection between the Underground railway station, the passenger terminal, public transport and car parkings	IT	2020	2022	concluded	not started	not started	0%	Land acquisition: Completed // EIA: NA // Final Approval: NA // CBA: NA // Other: "Protocollo RFI/SAVE per la condivisone della progetazione del tracciato ferroviario all'interno del sedime aeroportuale"
3603	Venice airport: external areas and internal ways (Aree scoperte e viabilità interna)	IT	2013	2025	concluded	in progress	in progress	33%	Land acquisition: Completed // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
3601	Venice Airport: expansion of the passenger terminal	IT	2013	2025	concluded	concluded	in progress	33%	Land acquisition: Completed // EIA: EIA approved // Final Approval: submitted, decision pending // CBA: NA // Other: "Contratto di programma con ENAC" being updated

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR)		
					TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
3604	Venice Airport: new Parking and Bus terminal	IT	3	75.0	0.0		
3605	Venice Airport: new connection between the Underground railway station, the passenger terminal, public transport and car parkings	IT	Residual	50.0	0.0		
3603	Venice airport: external areas and internal ways (Aree scoperte e viabilità interna)	IT	Residual	80.0	0.0		
3601	Venice Airport: expansion of the passenger terminal	IT	3	300.0	0.0		
	TOTAL			**505.00**	**0.0**		

Source: Corridor Project List

A. Description of the Action:

A.1. Action Title:

5.1.12 - Modernization / expansion of the airport of Bologna

A.2. Location of the action:

Source: Project fiches

A.3. Description of the action:

Member States involved:	**Section or Node:**	**Estimated total cost [Mio €]:**
-	-	*100.3 EUR million*
Other CNC involved: -	**Implementation schedule:** *Start year: 2008* *End year: 2020*	**Project Promoter:** *Bologna Airport*

The core airport of Bologna is located on three core network corridors: Baltic-Adriatic, Mediterranean and Scandinavian-Mediterranean. The airport operates both passenger and cargo services. With over 7.5 million passengers in 2016, the airport is reaching its current capacity limit. The 40 year concession agreement signed between the operator (SAB) and the national civil aviation agency (ENAC) started in 2006. In line with the investments included in the Master Plan at the basis of the concession agreement and the growing traffic trends, land-side infrastructure is being improved to increase the capacity of the terminal. No direct rail or other fixed link interconnection between the airport and the rail stations within the core urban node of Bologna exist at present. A dedicated bus service is in operation at present between the core airport and the Bologna urban node main station. The core airport is directly interconnected to the Bologna ring road (tangenziale) and very close to the A1-A14 motorways. Clean fuels are not available/in use at present at the airport for air operations. The TEN-T regulation requirement concerning availability of one terminal open to all operators and application of transparent charges is satisfied.

Regarding the main critical issues which are currently affecting the node and the planned investments; an automated people mover connecting the Core Airport and the Bologna Central Rail Station is currently under development to replace the existing dedicated bus service. The investments related to this new infrastructure and services have been considered in the action sheet for the Bologna core urban node (7.1.12). A number of investments are also planned for the future expansion of the airport as foreseen in the airport Master Plan which particularly relate to land side infrastructure and accessibility. Expansion of the cargo related infrastructure is also planned. No investments are currently planned for the promotion of clean fuels availability for air services at the Bologna airport.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
Connection to rail

Source: Corridor Project List

B. Project Implementation

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
3274	Bologna airport: People Mover Footbridge	IT	Bologna Airport	Bologna Airport	Study, Infrastructure (New construction),	1.7	Project costs include costs for People Mover footbridge's studies and for People Mover footbridge's construction
3617	Construction of Turn Pad and taxiway B expansion	IT	Bologna Airport	Bologna Airport	Study, Infrastructure (New construction),	4.0	Project costs include costs for Turn pad and taxiway B expansion study and construction
3618	Investment to meet regulatory requirements (ex. New EASA, ICAO)	IT	Bologna Airport	Bologna Airport	Study, Infrastructure (New construction),	0.3	Project costs include costs to meet regulatory requirements
3619	Express car park expansion	IT	Bologna Airport	Bologna Airport	Study, Infrastructure (New construction),	2.0	Project costs include costs for Express car park expansion
3616	Construction of new boarding piers in Bologna Airport	IT	Bologna Airport	Bologna Airport	Study, Infrastructure (New construction),	2.6	Project costs include costs for New boarding pier studies and construction
3610	Bologna airport: III site apron	IT	Bologna Airport	Bologna Airport	Study, Infrastructure (New construction),	15.2	Project costs include costs for New pier's studies and for the New pier's construction
3609	Bologna airport: realisation of a new East multistory parking	IT	Bologna Airport	Bologna Airport	Study, Infrastructure (New construction),	15.4	Project costs include costs for New East multistory parking pier studies and construction
3607	Bologna airport: realisation of a new departure lounge and a new pier	IT	Bologna Airport	Bologna Airport	Study, Infrastructure (New construction),	50.6	Project costs include costs for New departure lounge's studies and for the New departure lounge's construction
3615	Bologna airport: I site apron extension	IT	Bologna Airport	Bologna Airport	Study, Infrastructure (New construction),	2.8	Project costs include costs for I site apron extension studies and construction
3611	Bologna airport: de-icing apron and structure	IT	Bologna Airport	Bologna Airport	Study, Infrastructure (New construction),	5.8	Project costs include costs for III site apron studies and construction
	TOTAL					**100.3**	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
3274	Bologna airport: People Mover Footbridge	IT	2008	2018	concluded	concluded	concluded	84%	Land acquisition: Completed // EIA: EIA approved // Final Approval: approved // CBA: NA // Other: NA
3617	Construction of Turn Pad and taxiway B expansion	IT	2016	2019	in progress	concluded	in progress	31%	Land acquisition: Completed // EIA: EIA approved // Final Approval: not submitted yet // CBA: NA // Other: NA
3618	Investment to meet regulatory requirements (ex. New EASA, ICAO)	IT	2016	2020	in progress	concluded	in progress	18%	Land acquisition: NA // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: NA // Other: NA
3619	Express car park expansion	IT	2016	2017	concluded	concluded	concluded	29%	Land acquisition: NA // EIA: EIA approved // Final Approval: approved // CBA: NA // Other: NA
3616	Construction of new boarding piers in Bologna Airport	IT	2009	2018	concluded	concluded	concluded	82%	Land acquisition: Completed // EIA: EIA approved // Final Approval: approved // CBA: NA // Other: NA
3610	Bologna airport: III site apron	IT	2016	2019	concluded	concluded	concluded	31%	Land acquisition: Completed // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: NA // Other: NA
3609	Bologna airport: realisation of a new East multistory parking	IT	2015	2020	concluded	concluded		37%	Land acquisition: Completed // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: NA // Other: NA
3607	Bologna airport: realisation of a new departure lounge and a new pier	IT	2015	2020	in progress	concluded		37%	Land acquisition: NA // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: NA // Other: NA
3615	Bologna airport: I site apron extension	IT	2011	2018	concluded	concluded	concluded	78%	Land acquisition: NA // EIA: EIA approved // Final Approval: approved // CBA: NA // Other: NA
3611	Bologna airport: de-icing apron and structure	IT	2010	2018	concluded	concluded	concluded	80%	Land acquisition: NA // EIA: EIA approved // Final Approval: approved // CBA: NA // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR) TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
3274	Bologna airport: People Mover Footbridge	IT	Residual	1.7	1.7	1.6	NA
3617	Construction of Turn Pad and taxiway B expansion	IT	Residual	4.0	0.0		
3618	Investment to meet regulatory requirements (ex. New EASA, ICAO)	IT	Residual	0.3	0.0		
3619	Express car park expansion	IT	3	2.0	0.0		
3616	Construction of new boarding piers in Bologna Airport	IT	3	2.6	0.0		
3610	Bologna airport: III site apron	IT	3	15.2	0.0		
3609	Bologna airport: realisation of a new East multistory parking	IT	3	15.4	0.0		
3607	Bologna airport: realisation of a new departure lounge and a new pier	IT	3	50.6	0.0		
3615	Bologna airport: I site apron extension	IT	3	2.8	0.0		
3611	Bologna airport: de-icing apron and structure	IT	3	5.8	0.0		
	TOTAL			**100.3**	**1.7**		

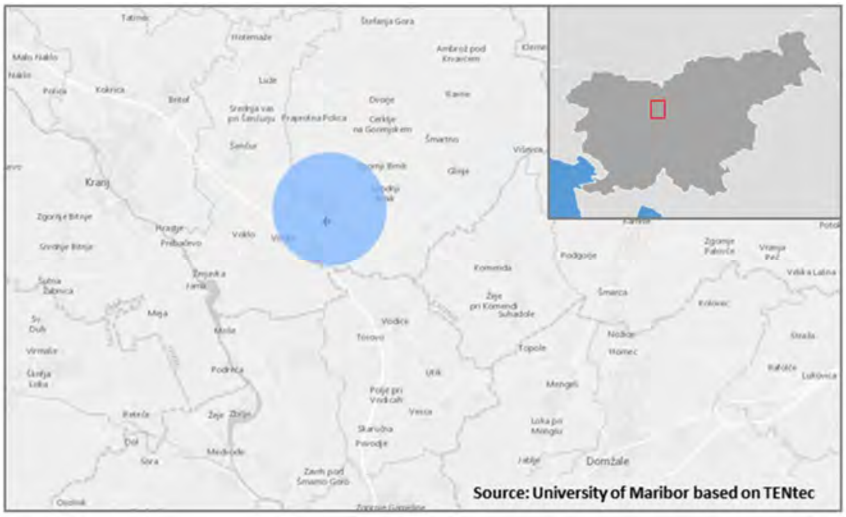
Source: Corridor Project List

A. Description of the Action:

A.1. Action Title:

5.1.13 - Modernization / expansion of the airport of Ljubljana

A.2. Location of the action:



Source: Project fiches

A.3. Description of the action:

Member States involved:	Section or Node:	Estimated total cost [Mio €]:
-	-	*58.6 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
-	*Start year: 2013* *End year: 2025*	*Ministry of Infrastructure, Slovenian infrastructure agency (DRSI), Aerodrom Ljubljana, Občina Cerklje na Gorenjskem, Infrastructure manager, Aerodrom Ljubljana, d.o.o., Aerodrom Ljubljana, Aerodrom Ljubljana, d.o.o.*

The core airport of Ljubljana Jože Pučnik, situated 26 km north of Ljubljana urban node, is located on two core network corridors: Baltic-Adriatic and Mediterranean. The airport operates both passenger and cargo services. The airport is connected to highway but has no connection to railway network. The interconnection of the airport to the national railway network is currently under evaluation as part of the feasibility study for the upgrading of the Ljubljana-Jesenice railway line. The TEN-T regulation requirements concerning availability of one terminal open to all operators and application of transparent charges is fulfilled. Clean fuels are not available/in use at the airport.

With 1,4 million passengers on average in last 4 years the airport is operating under capacity limits with regard to airside operations. However the existing passenger terminal is working at its capacity limits and cannot accommodate future passenger handling processes due to space and unit constraints. In its Master Plan plans for future development of a new terminal next to the existing terminal are made. The airside areas of the existing terminal will be extended in the new terminal use. The plans for the construction of the new terminal are well advanced and have been considered as given in the Master Plan.

For the future enlargement of the airport, planned investments include reallocation of the regional road, airport enlargement on the Northern side of the runway, renovation and modernization of air navigation services as well as investments into air navigation services infrastructure.

Renovation and modernization of airport infrastructure will be implemented in accordance with the development documents and strategies of the Republic of Slovenia and the business plan of the airport operator.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
-

Source: Corridor Project List

B. Project Implementation

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1921	Airport Ljubljana - Development of airport infrastructure (In the context of the National Spatial Plan will set area for the location of the airport and other infrastructure)	SI	Ministry of Infrastructure	Ljubljana Airport	Study,	1.4	
1922	Reallocation of the main road	SI	Slovenian infrastructure agency (DRSI), Aerodrom Ljubljana, Občina Cerklje na Gorenjskem	Ljubljana Airport	Study, Infrastructure (Rehabilitation), Infrastructure (New construction),	5.3	
1927	Logistic centre (optimization of logistic processes)	SI	Infrastructure manager, Aerodrom Ljubljana, d.o.o.	Ljubljana Airport	Infrastructure (Upgrade),	9.2	
1934	Renovation and modernization of airport infrastructure	SI	Aerodrom Ljubljana	Ljubljana Airport	Infrastructure (Upgrade),	41.8	
1943	Initial airport operation plan	SI	Aerodrom Ljubljana, d.o.o.	Ljubljana Airport	Study, OTHER	0.9	CEF total eligible recommended
	TOTAL					58.6	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1921	Airport Ljubljana - Development of airport infrastructure (In the context of the National Spatial Plan will set area for the location of the airport and other infrastructure)	SI	2013	2021				45%	Land acquisition: NA // EIA: EIA under preparation or updating // Final Approval: submitted, decision pending // CBA: NA // Other: NA
1922	Reallocation of the main road	SI	2016	2017	concluded	concluded	concluded	51%	Land acquisition: Completed // EIA: EIA approved // Final Approval: approved // CBA: Performed // Other: tripartite agreement /financing agreement
1927	Logistic centre (optimization of logistic processes)	SI	2016	2022	in progress			8%	Land acquisition: Completed // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1934	Renovation and modernization of airport infrastructure	SI	2016	2025	in progress			12%	Land acquisition: Completed // EIA: NA // Final Approval: NA // CBA: NA // Other: Contract on the building right.
1943	Initial airport operation plan	SI	2016	2017				84%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR) TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1921	Airport Ljubljana - Development of airport infrastructure (In the context of the National Spatial Plan will set area for the location of the airport and other infrastructure)	SI	3	1.4	1.4	1.4	MZI
1922	Reallocation of the main road	SI	Residual	5.3	5.3	3.11 0.19 2.00	state budged Municipality budget (Cerklje na Gorenjskem) Company budget (CAPEX)
1927	Logistic centre (optimization of logistic processes)	SI	1	9.2	0		
1934	Renovation and modernization of airport infrastructure	SI	Residual	41.8	0		
1943	Initial airport operation plan	SI		0.9	0.9	0.45 0.45	NA CEF
	TOTAL			58.6	7.6		

Source: Corridor Project List

A. Description of the Action:

A.1. Action Title:

5.2.01 - Telematics applications (including SESAR) at coorridor airports

A.2. Location of the action:

Source: Project fiches

A.3. Description of the action:

Member States involved:	**Section or Node:**	**Estimated total cost [Mio €]:**
-	-	*63.9 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
-	*Start year: NA* *End year: NA*	*Gdansk Airport, Polska Agencja Żeglugi Powietrznej, Port Lotniczy Łódź, Port Lotniczy Szczecin - Goleniów Sp. z o.o., Port Lotniczy Poznań-Ławica, Air Traffic Control, Ministry of Infrastructure, Air Traffic Control, Air Traffic Control*

14 projects have been identified that are specific to the BA Corridor nodes and Member States, totalling 64 € million, relating to the implementation of telematics applications (including SESAR), sustainable freight services, innovation (Art. 31, 32, 33 of Regulation 1315/2013) and specific security, safety and accessibility measures (Art. 34, 35, 37 of Regulation 1315/2013). Most of these initiatives are ongoing and planned to be completed before 2020.

Further to these projects, and specifically regarding the deployment of SESAR, the BA Corridor project list includes 18 cross-corridor and multi-country initiatives, totalling 2.7 € billion (grouped in a different action 5.2.02 for classification purposes, as these are not specific to the BA Corridor). Thanks to the support from the CEF, these projects are aimed at implementing the SESAR technology in the BA Corridor Member States by 2020.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
-

Source: Corridor Project List

B. Project Implementation

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1506	Gdansk Airport - extension of registered and hand luggage and passenger control system	PL	Gdansk Airport	Gdańsk Airport	, OTHER	15.7	To be confirmed
1511	Gdansk Airport - extension of navigation light system on auxiliary direction no 1.1	PL	Gdansk Airport	Gdańsk Airport	, OTHER	3.4	To be confirmed
2616	Development of national infrastructure of air traffic management	PL	Polska Agencja Żeglugi Powietrznej	Whole country (horizontal project)	, SESAR	34.6	Investment plans
1309	Łódź Airport - Implementation of Constant Noise Monitoring System	PL	Port Lotniczy Łódź	Łodź Airport	, OTHER	0.1	instead of building a constant noise monitoring system there is four-year service of constant noise monitoring system
1310	Łódź Airport - Extension of radar - camera security system	PL	Port Lotniczy Łódź	Łodź Airport	, OTHER	0.3	under consideration
1324	Szczecin Airport - Rebuild CCTV system at airport	PL	Port Lotniczy Szczecin - Goleniów Sp. z o.o.	Szczecin Airport	, OTHER	0.5	To be confirmed
1351	Poznań Airport - Security	PL	Port Lotniczy Poznań-Ławica	Poznań Airport	, OTHER	2.1	To be confirmed
1355	Poznań Airport - Network Elements Informatics	PL	Port Lotniczy Poznań-Ławica	Poznań Airport	, OTHER	1.9	To be confirmed
1923	Renovation and modernization of air navigation services at the airport - "New pens"	SI	Air Traffic Control, Ministry of Infrastructure	Ljubljana Airport	, SESAR	0.1	
1924	Renovation and modernization of the infrastructure of air navigation services	SI	Air Traffic Control	Ljubljana Airport	, SESAR	1.1	
1928	FAB CE - Free Route Airspace from the Black Forest to the Black Sea (Partnership Project)	SI	Air Traffic Control	Ljubljana Airport	, SESAR	0.3	
1929	Air Traffic Management, Partnership Project	SI	Air Traffic Control	Ljubljana Airport	, SESAR	1.7	
1939	FAB CE - DAM and STAM (Partnership Project)	SI	Air Traffic Control	Ljubljana Airport	, SESAR	0.4	
1940	Gate One - Free Route Airspace project (Partnership Project)	SI	Air Traffic Control	Ljubljana Airport	, SESAR	1.7	
	TOTAL					**63.9**	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1506	Gdansk Airport - extension of registered and hand luggage and passenger control system	PL	2017	2020		in progress		6%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1511	Gdansk Airport - extension of navigation light system on auxiliary direction no 1.1	PL	2017	2023		in progress		3%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
2616	Development of national infrastructure of air traffic management	PL	2014	2020	in progress	in progress	in progress	51%	Land acquisition: Not completed // EIA: EIA under preparation or updating // Final Approval: submitted, decision pending // CBA: Performed // Other: in progress
1309	Łódź Airport - Implementation of Constant Noise Monitoring System	PL	2014	2017				86%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1310	Łódź Airport - Extension of radar - camera security system	PL						NA%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1324	Szczecin Airport - Rebuild CCTV system at airport	PL	2014	2017				81%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1351	Poznań Airport - Security	PL	2015	2019				45%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1355	Poznań Airport - Network Elements Informatics	PL	2015	2019				45%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1923	Renovation and modernization of air navigation services at the airport - "New pens"	SI	2016	2020	concluded	in progress		23%	Land acquisition: NA // EIA: NA // Final Approval: approved // CBA: Not performed // Other: NA
1924	Renovation and modernization of the infrastructure of air navigation services	SI	2017	2018	concluded	in progress		11%	Land acquisition: NA // EIA: NA // Final Approval: submitted, decision pending // CBA: Not performed // Other: NA
1928	FAB CE - Free Route Airspace from the Black Forest to the Black Sea (Partnership Project)	SI	2015	2017	concluded	in progress		90%	Land acquisition: NA // EIA: NA // Final Approval: approved // CBA: Not performed // Other: FAB CE agreement (international agreement between 7 countries: Bosnia and Herzegovina, Czech Republic, Slovakia, Austria, Hungary, Croatia and Slovenia)
1929	Air Traffic Management, Partnership Project	SI	2015	2017	concluded	in progress		72%	Land acquisition: NA // EIA: NA // Final Approval: approved // CBA: Not performed // Other: NA
1939	FAB CE - DAM and STAM (Partnership Project)	SI	2017	2018	concluded	in progress		7%	Land acquisition: NA // EIA: NA // Final Approval: submitted, decision pending // CBA: Not performed // Other: NA
1940	Gate One - Free Route Airspace project (Partnership Project)	SI	2017	2019	concluded	in progress		0%	Land acquisition: NA // EIA: NA // Final Approval: submitted, decision pending // CBA: Not performed // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR)		
					TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1506	Gdansk Airport - extension of registered and hand luggage and passenger control system	PL	Residual	15.7	0		
1511	Gdansk Airport - extension of navigation light system on auxiliary direction no 1.1	PL	Residual	3.4	0		
2616	Development of national infrastructure of air traffic management	PL		34.6	34.6	7.2 27.4	own sources Cohesion Fund
1309	Łódź Airport - Implementation of Constant Noise Monitoring System	PL	Residual	0.1	0.06	0.06	own bonds
1310	Łódź Airport - Extension of radar - camera security system	PL	Residual	0.3	0		
1324	Szczecin Airport - Rebuild CCTV system at airport	PL	Residual	0.5	0		
1351	Poznań Airport - Security	PL	Residual	2.1	0		
1355	Poznań Airport - Network Elements Informatics	PL	Residual	1.9	0		
1923	Renovation and modernization of air navigation services at the airport - "New pens"	SI	1	0.08	0.08	0.02 0.06	KZPS CEF 2015
1924	Renovation and modernization of the infrastructure of air navigation services	SI	1	1.1	0		
1928	FAB CE - Free Route Airspace from the Black Forest to the Black Sea (Partnership Project)	SI	1	0.31	0.31	0.15 0.16	KZPS CEF 2014
1929	Air Traffic Management, Partnership Project	SI	1	1.7	1.7	0.85 0.16 0.69	KZPS CEF 2014 NA
1939	FAB CE - DAM and STAM (Partnership Project)	SI	1	0.4	0.4	0.2 0.2	KZPS CEF 2014
1940	Gate One - Free Route Airspace project (Partnership Project)	SI	1	1.7	1.7	0.1 0.2 1.44	KZPS CEF 2014 NA
	TOTAL			**63.9**	**38.9**		

Source: Corridor Project List

Action sheets for the development of rail-road terminals

A. DESCRIPTION OF THE ACTION:

A.1. Action Title:

6.1.01 - Development of the terminal infrastructure, last mile connections and telematics applications

A.2. Description of the action:

Member States involved:	**Section or Node:**	**Estimated total cost [Mio €]:**
-	-	*569.3 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
-	*Start year: NA* *End year: NA*	*Urząd m.st. Warszawy, Urząd Miasta Łodzi, Schavemaker Invest Sp. z o.o., Advanced World Transport a.s., Rail Cargo Operator - CSKD s.r.o., To be specified, Slovak railways (ZSR), ÖBB-Infrastruktur AG, Steiermärkische Landesbahnen / Cargo-Center-Graz, RFI S.p.A., Interporto di Padova S.p.A. , Interporto di Bologna S.p.A., Slovenian railways*

14 projects are ongoing and planned for the development of rail-road terminals, totalling 569.3 € million. These relate to the development and expansion of infrastructure for multimodal transport at Wrocław (Kąty Wrocławskie), Ostrava Paskov, Přerov, Freight Centre Wien South (Inzersdorf), Graz Süd (planned to be expanded by 2024, also in view of the completion of the Koralm railway line and tunnel, see Action 1.2.01), Padova and Ljubljana. Improvement of interconnections are either part of these developments or presented as dedicated projects, as for the Warszawa, Łódź and Cervignano rail-road terminals. ICT and innovation initiatives are also ongoing and planned to promote intermodality and support the smooth flow of information along the logistic chain also including the terminals.

Source: Corridor Project List

A.3. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
Current or potential future capacity bottleneck; Capability of handling intermodal units; 740m train terminal accessibility; Electrified train terminal accessibility

Source: Corridor Project List

B. PROJECT IMPLEMENTATION

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
2613	Modernisation of Marywilska, Czołowa, Polnych Kwiatów streets, section Trasa Toruńska - Mehoffera st, stage I	PL	Urząd m.st. Warszawy	Warsaw	Infrastructure (Upgrade),	30.5	Based on the municipal budget
1549	Link to the junction "Romanów" on the A1 motorway - 3rd phase of the "Trasa Górna"	PL	Urząd Miasta Łodzi	Łódź	Study, Infrastructure (New construction),	19.1	
1574	Expansion of Intermodal Terminal in Katy Wrocławskie	PL	Schavemaker Invest Sp. z o.o.	Wrocław (Katy Wrocławskie RRT)	Infrastructure (New construction), Rolling Stock,	3.0	
1395	Multimodal container terminal Ostrava - Paskov, phase III (acc. to CEF)	CZ	Advanced World Transport a.s.	Ostrava	Study, Infrastructure (Rehabilitation), Infrastructure (Upgrade),	8.9	
1394	Rail road terminal Přerov	CZ	Rail Cargo Operator - CSKD s.r.o.	Prerov	Infrastructure (Upgrade),	To be defined	
1701	Open multi modal rail road terminal Přerov	CZ	To be specified	Prerov	Infrastructure (New construction),	To be defined	
9040	ZSR Intermodal Terminal Bratislava - 1st construction phase	SK	Slovak railways (ZSR)	Bratislava Node	Infrastructure (New construction),	50.0	
9066	Cargo Center Vienna South (Inzersdorf)	AT	ÖBB-Infrastruktur AG	Wien Inzersdorf	Infrastructure (New construction),	245.5	valorised costs (2,5%)

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1832	Terminal Graz Süd Expansion	AT	Steiermärkische Landesbahnen / Cargo-Center-Graz	Graz Werndorf Rail Road Terminal	Infrastructure (New construction),	39.8	land acquisition (10), phase 1 (12.05), phase 2 (17.75)
3209	Improvement of the accessibility by railway to the Cervignano Core RRT	IT	RFI S.p.A.	Cervignano RRT	Study, Infrastructure (Upgrade),	To be defined	Evaluation on-going
1004	Enhancing the efficiency of the new container terminal of Interporto di Padova	IT	Interporto di Padova S.p.A.	Padova Rail-Road Terminal	Infrastructure (Upgrade), Infrastructure (New construction), Rolling Stock,	16.2	CEF - Recommended total eligible costs [CEF Brochure]
1861	Enhancing Interporto di Padova - Step 2: ancillary measures and ICT solutions for optimising terminal operations, accessibility and interconnections	IT	Interporto di Padova S.p.A.	Padova Rail-Road Terminal	Study, Infrastructure (Upgrade), Infrastructure (New construction), Rolling Stock, OTHER	5.9	CEF - Recommended total eligible costs
1390	ICT system application in RRT on the Italian part of the corridor, for operations synchronization and management efficiency with other nodes	IT	Interporto di Bologna S.p.A.	Bologna Rail-Road Terminal	Study, OTHER	0.4	Costs for the preparation of the ICT tool at the basis of the initiative
1391	Upgrading and modernization of Ljubljana container terminal infrastructure for improvement of intermodal transport services and logistics centre	SI	Slovenian railways	Ljubljana Rail Road Terminal	Study, Infrastructure (Upgrade), Infrastructure (New construction), Sustainable Freight,	150.0	
	TOTAL					**569.3**	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
2613	Modernisation of Marywilska, Czołowa, Polnych Kwiatów streets, section Trasa Toruńska - Mehoffera st, stage I	PL	2020	2023	concluded	concluded	in progress	0%	Land acquisition: Not completed // EIA: EIA approved // Final Approval: not submitted yet // CBA: Not performed // Other: EIA and other design & administrative documents will need to be updated (competed & issued in 2010/2011).
1549	Link to the junction "Romanów" on the A1 motorway - 3rd phase of the "Trasa Górna"	PL	2017	2020				0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1574	Expansion of Intermodal Terminal in Katy Wrocławskie	PL	2018	2020	concluded	concluded	in progress	0%	Land acquisition: Not completed // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: Not performed // Other: NA
1395	Multimodal container terminal Ostrava - Paskov, phase III (acc. to CEF)	CZ	2016	2020				22%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1394	Rail road terminal Přerov	CZ						NA%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1701	Open multi modal rail road terminal Přerov	CZ	2023	2030				0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
9040	ZSR Intermodal Terminal Bratislava - 1st construction phase	SK	2018	2020				0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
9066	Cargo Center Vienna South (Inzersdorf)	AT	2009	2017	not required	not required	concluded	91%	Land acquisition: Not completed // EIA: EIA approved // Final Approval: approved // CBA: Performed // Other: not required
1832	Terminal Graz Süd Expansion	AT			in progress	in progress	in progress	NA%	Land acquisition: Not completed // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
3209	Improvement of the accessibility by railway to the Cervignano Core RRT	IT	2022	2030				0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1004	Enhancing the efficiency of the new container terminal of Interporto di Padova	IT	2014	2019				54%	Land acquisition: NA // EIA: NA // Final Approval: approved // CBA: Performed // Other: NA
1861	Enhancing Interporto di Padova - Step 2: ancillary measures and ICT solutions for optimising terminal operations, accessibility and interconnections	IT	2016	2020				22%	Land acquisition: NA // EIA: NA // Final Approval: approved // CBA: Performed // Other: NA
1390	ICT system application in RRT on the Italian part of the corridor, for operations synchronization and management efficiency with other nodes	IT	2017	2020				0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1391	Upgrading and modernization of Ljubljana container terminal infrastructure for improvement of intermodal transport services and logistics centre	SI	2015	2030				14%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR) TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
2613	Modernisation of Marywilska, Czołowa, Polnych Kwiatów streets, section Trasa Toruńska - Mehoffera st, stage I	PL	2	30.5	30.5	8.9 21.6	City of Warsaw budget Cohesion Fund
1549	Link to the junction "Romanów" on the A1 motorway - 3rd phase of the "Trasa Górna"	PL	2	19.1	0		
1574	Expansion of Intermodal Terminal in Katy Wrocławskie	PL	1	3.0	1.6	1.6	-
1395	Multimodal container terminal Ostrava - Paskov, phase III (acc. to CEF)	CZ	1	8.9	8.9	5.9 3.0	CEF NA
1394	Rail road terminal Přerov	CZ	1	To be defined	0		
1701	Open multi modal rail road terminal Přerov	CZ	1	To be defined	0		
9040	ZSR Intermodal Terminal Bratislava - 1st construction phase	SK	1	50.0	0		
9066	Cargo Center Vienna South (Inzersdorf)	AT	1	245.5	272.0	269.9 2.1	State guaranteed loans TEN-T-Annual Programme
1832	Terminal Graz Süd Expansion	AT	1	39.8	0		
3209	Improvement of the accessibility by railway to the Cervignano Core RRT	IT	1	To be defined	0		
1004	Enhancing the efficiency of the new container terminal of Interporto di Padova	IT	1	16.2	16.2	13.0 3.2	Own sources and loans CEF - Multi Annual Call, funding objective 3
1861	Enhancing Interporto di Padova - Step 2: ancillary measures and ICT solutions for optimising terminal operations, accessibility and interconnections	IT	1	5.9	5.9	4.6 1.3	Own sources and loans CEF
1390	ICT system application in RRT on the Italian part of the corridor, for operations synchronization and management efficiency with other nodes	IT	1	0.4	0.4	0.4	HORIZON 2020
1391	Upgrading and modernization of Ljubljana container terminal infrastructure for improvement of intermodal transport services and logistics centre	SI	1	150.0	0		
	TOTAL			**569.3**	**335.5**		

Source: Corridor Project List

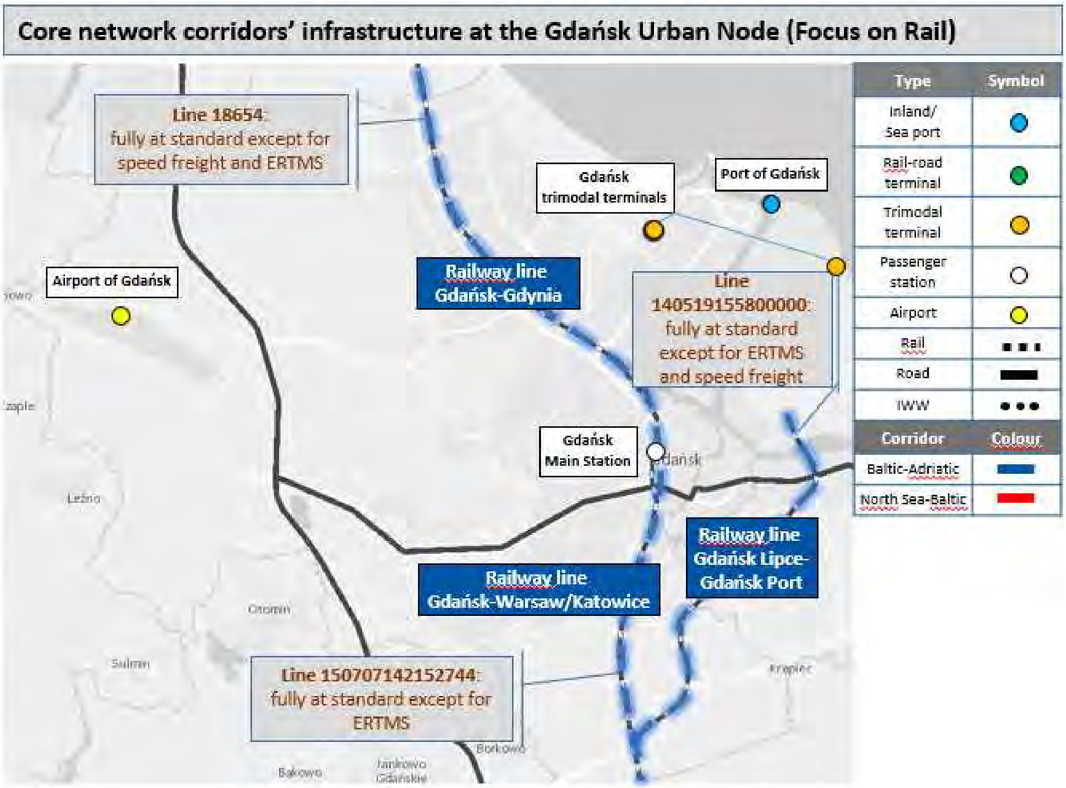
Action sheets for the interconnection of urban nodes

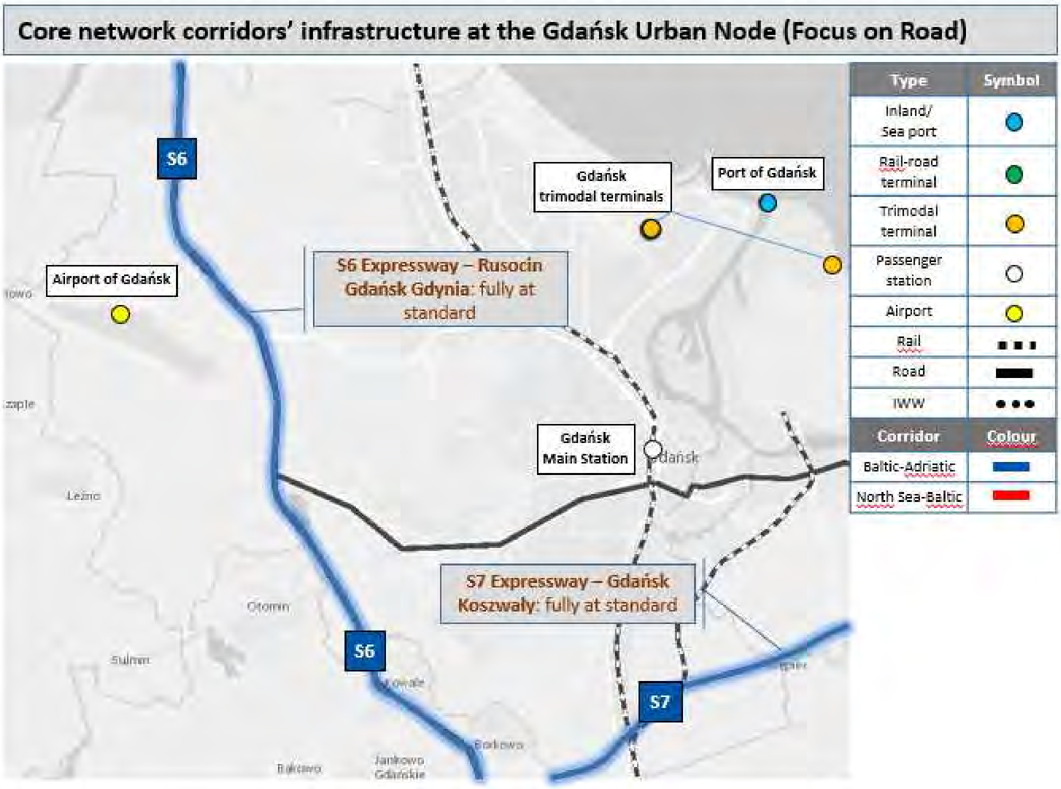
A. Description of the Action:

A.1. Action Title:

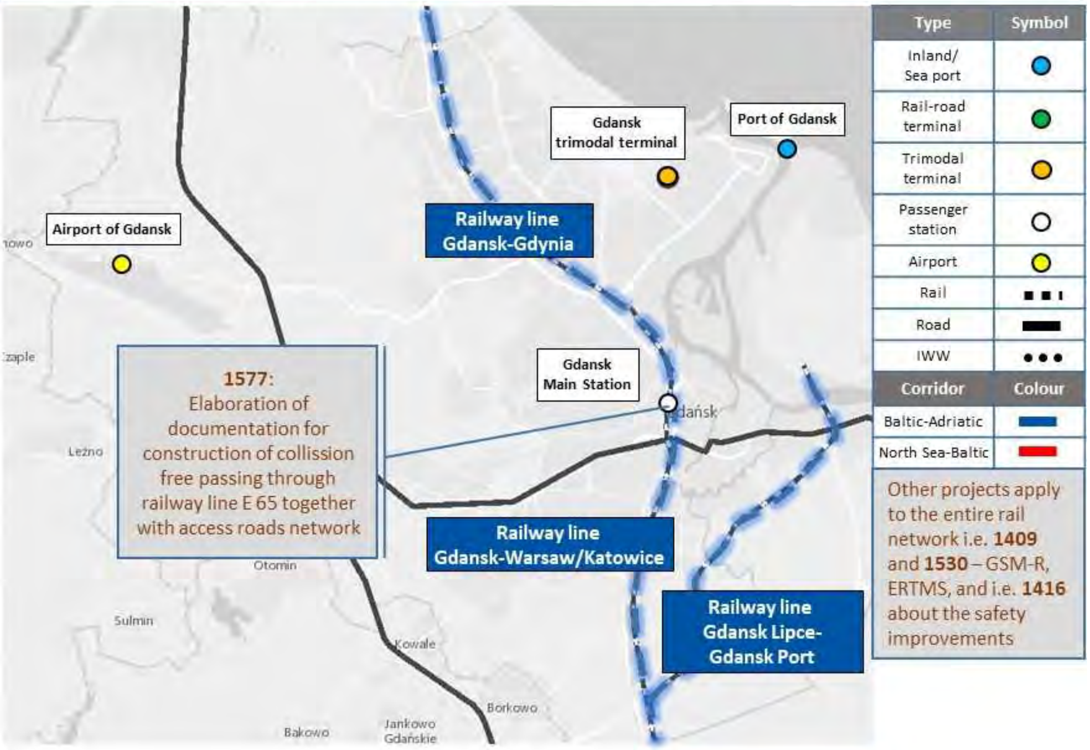
7.1.01 - Urban node: Gdańsk

A.2. Location of the action:



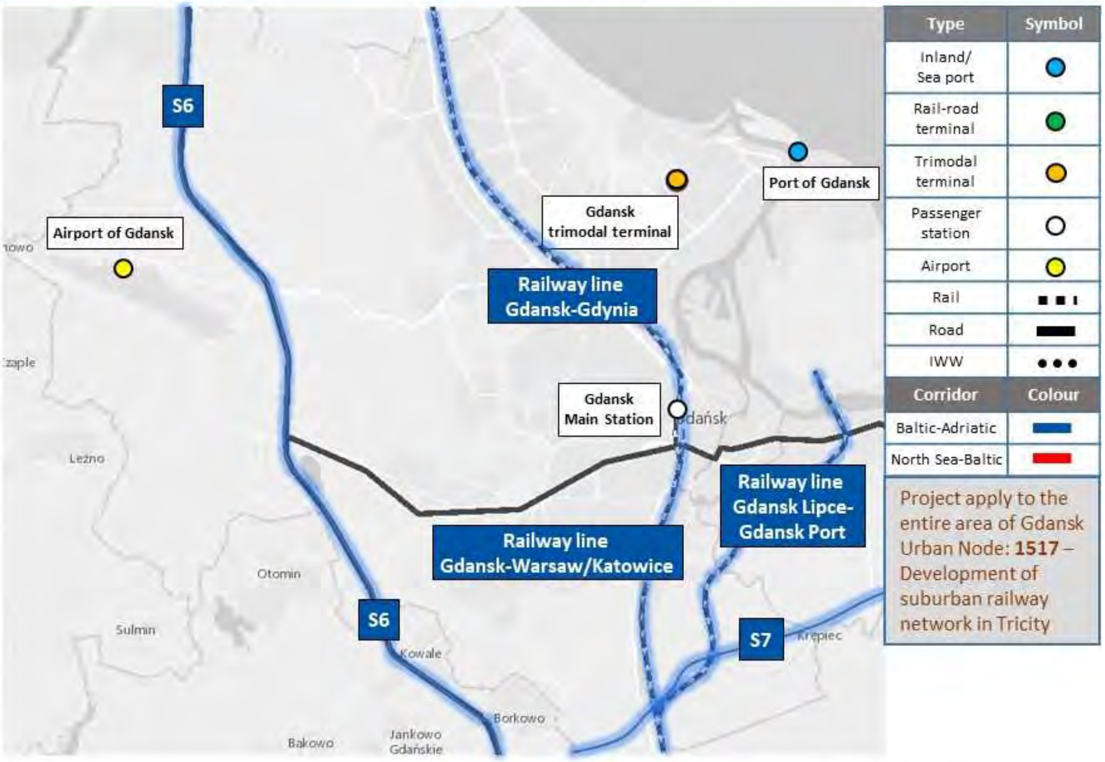


Investments on BAC Project List at the Gdansk Urban Node (Focus on Rail)



Investments on BAC Project List at the Gdańsk Urban Node (Focus on Road)

Investments at the Gdansk Urban Node (Core nodes and main interconnections to CNC)



Source: Project fiches

A.3. Description of the action:

Member States involved:	**Section or Node:**	**Estimated total cost [Mio €]:**
-	-	*104.7 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
-	*Start year: 2015* *End year: 2023*	*Urząd Marszałkowski Województwa Pomorskiego (Pomorska Kolej Metropolitalna S.A.), Municipality of Gdansk, Municipality of Gdansk Municipality of Pruszcz Gdański Minicipality of Kolbudy*

The core urban node of Gdańsk is located on the Baltic-Adriatic core network corridor. The rail infrastructure crossing the node (sections Gdańsk Lipce – Gdańsk Główny) is at standard with respect to electrification, train length, speed and axle load. The network is not yet at standard in terms of ERTMS. The road infrastructure crossing the node is fully at standard. The main city station is Gdańsk Główny. The station operates services to other core network urban nodes. Next to the Gdańsk Główny railway station coach station (Dworzec Główny PKS) is also present operating services to other urban nodes of the core network. The Gdańsk core urban node includes Port of Gdańsk (described in detail in a dedicated action sheet), the Gdańsk core airport (operating passenger services) and two rail-road terminals: Gdańsk Container Terminal (GCT) and Deepwater Container Terminal (DCT), both located in the port area. Suburban and regional services are operated from the main station towards the main destinations located within the Gdańsk / Tri-city Metropolitan Area and Pomorskie Region. Tramway/light rail system is also in operation, which ensure local interconnection to the railway and coach stations. The Gdańsk airport is interconnected to the rail network and to the main station via Pomorska Kolej Metropolitalna completed in 2015. Buses are also in operation, including dedicated services to the airports. Local and regional road interconnection is primarily ensured by the road no. 7 as well as A1 motorway. This is interconnected to the main urban and metropolitan/regional roads. The core airport is interconnected to the A1 motorway via express road S7; the rail-road terminal is located in the area of port and is directly interconnected to the corridor rail and road network.

Park and ride facilities are available. The integrated ticketing at urban as well as metropolitan/regional level for buses and rail services are available too. ICT real time information for public transport services and parking and ITS systems for road traffic management are also in operation. Clean fuels are available which include electricity and LPG. LNG for road transport, CNG, hydrogen and biofuels are not available at present. Car sharing and bike sharing are also not yet available in the Gdańsk core urban node. A Sustainable Urban Mobility Plan is available. A green urban/ city logistics programme is not in operation at present.

Regarding the main critical issues which are currently affecting the node and the planned investments; deployment of ERTMS is expected to be completed by the end of 2016 by means of modernisation of railway line E65/C-E65 on section Warszawa - Gdynia in the scope of supreme layer of LCC, ETRMS/ETCS/GSM-R, DSAT and traction power supply. In terms of removal of capacity bottlenecks relevant road investment is worth mentioning, which is opening for traffic recently constructed tunnel under Martwa Wistula River aiming at streamlining the connection to the port especially for heavy traffic. Seven Park&Ride facilities already exist and further are under development.

Prognosis by 2030: the corridor node rail and road infrastructure will be at standard with respect to ERTMS. Port last mile connections are expected to be improved by means of a number of planned initiatives as described in detail in a dedicated port action summary sheet (3.1.02).

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
-

Source: Corridor Project List

B. Project Implementation

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1517	Development of suburban railway network in Tricity	PL	Urząd Marszałkowski Województwa Pomorskiego (Pomorska Kolej Metropolitalna S.A.)	Gdańsk Urban Node	Infrastructure (Upgrade),	11.7	
1577	Elaboration of documentation for construction of collission free passing through railway line E 65 together with access roads network	PL	Municipality of Gdansk	Gdańsk Urban Node	Study,	1.0	
1578	Extension of Szadółki junction within national road S6 together with construction of Nowa Jabłoniowa Street	PL	Municipality of Gdansk	Gdańsk Urban Node	Study, Infrastructure (Rehabilitation), Infrastructure (Upgrade), Infrastructure (New construction),	92.0	
1579	Extension of Kowale junction within the national road S6 together with connecting roads	PL	Municipality of Gdansk Municipality of Pruszcz Gdański Minicipality of Kolbudy	Gdańsk Urban Node	Study, Infrastructure (Rehabilitation), Infrastructure (Upgrade), Infrastructure (New construction),	To be defined	
	TOTAL					**104.7**	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1517	Development of suburban railway network in Tricity	PL	2016	2017				nearly completed	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1577	Elaboration of documentation for construction of collission free passing through railway line E 65 together with access roads network	PL	2017	2020	in progress	in progress	in progress	0%	Land acquisition: Not completed // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: Not performed // Other: NA
1578	Extension of Szadółki junction within national road S6 together with construction of Nowa Jabłoniowa Street	PL	2015	2023	in progress	in progress	in progress	24%	Land acquisition: Not completed // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: Not performed // Other: Agreement between Gdańsk city anf GDDK&A

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1579	Extension of Kowale junction within the national road S6 together with connecting roads	PL	2016	2023	in progress	in progress	not started	5%	Land acquisition: Not completed // EIA: NA // Final Approval: not submitted yet // CBA: Not performed // Other: Letter of Intent sogned by Voivodship Marshall, representatives of Kolbudy, Pruszcz Gdański and Gdańsk on 14 November 2016.

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR) TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1517	Development of suburban railway network in Tricity	PL	Residual	11.7	11.7	4.0 7.7	NA OPIE2014-2020
1577	Elaboration of documentation for construction of collission free passing through railway line E 65 together with access roads network	PL		1.0	0.51	0.51	own contribution, municipality budget
1578	Extension of Szadółki junction within national road S6 together with construction of Nowa Jabłoniowa Street	PL	Residual	92.0	0		
1579	Extension of Kowale junction within the national road S6 together with connecting roads	PL	Residual	To be defined	0		
	TOTAL			**104.7**	**12.2**		

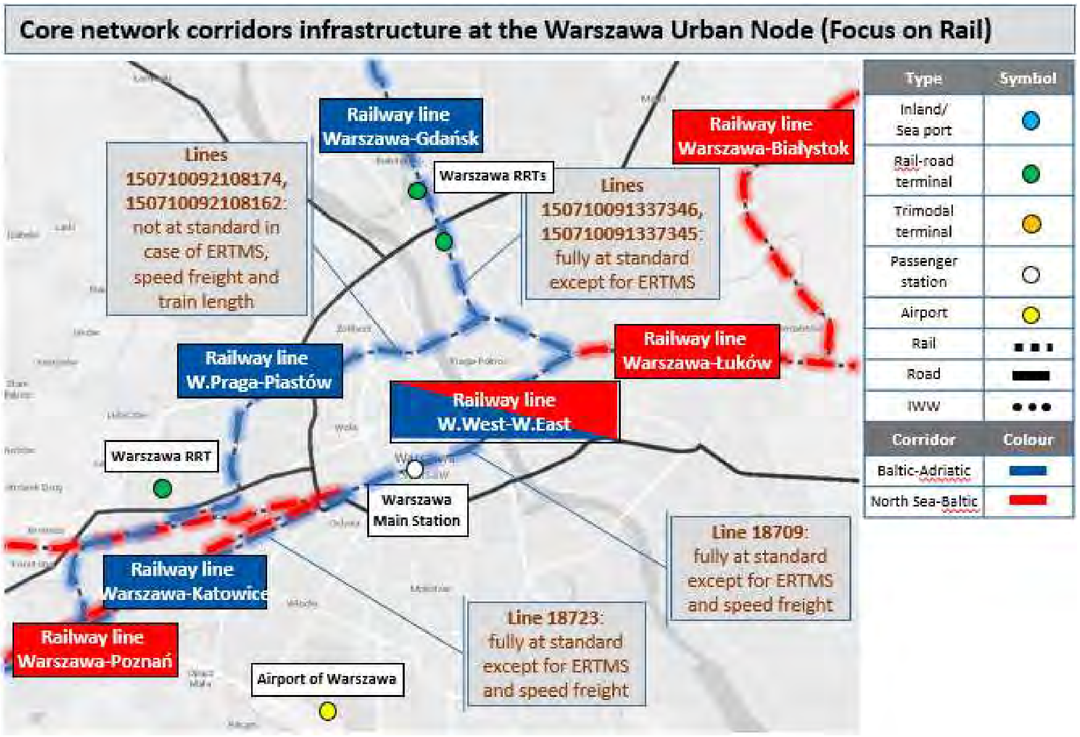
Source: Corridor Project List

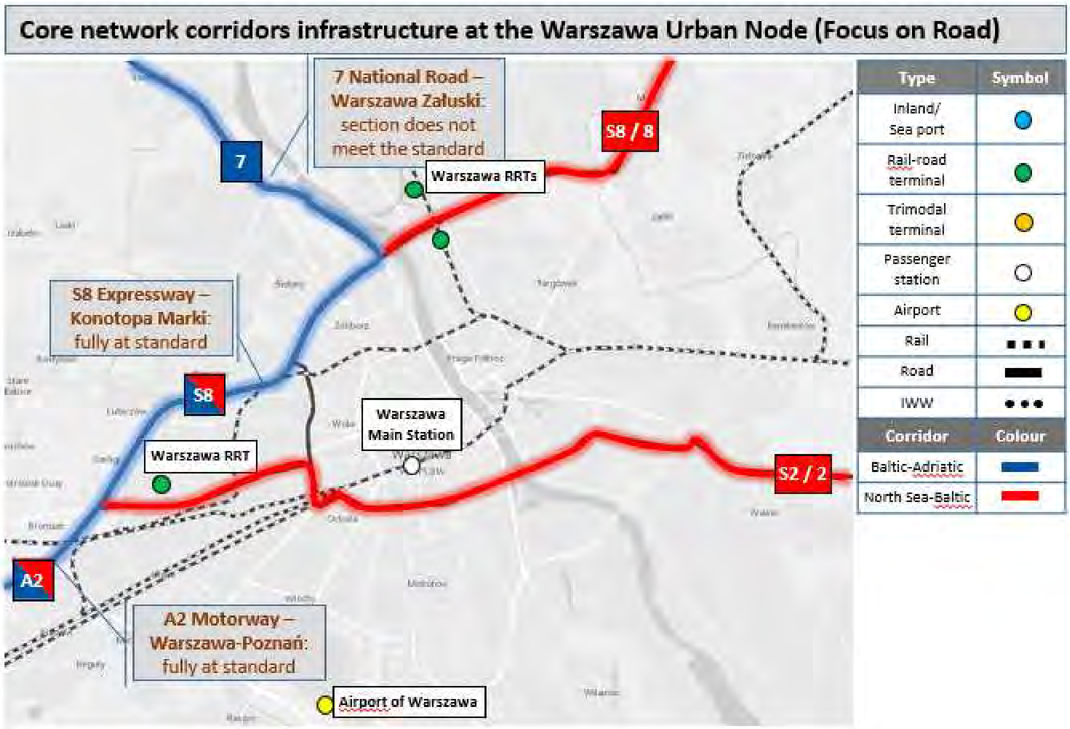
A. Description of the Action:

A.1. Action Title:

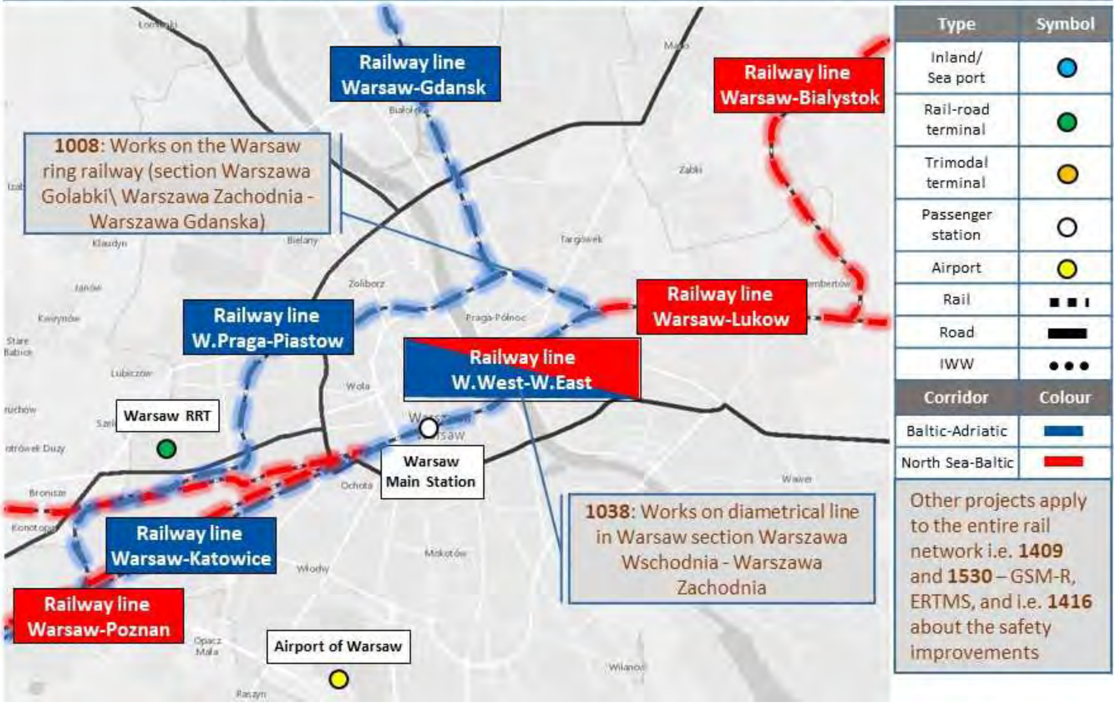
7.1.02 - Urban node: Warsaw

A.2. Location of the action:

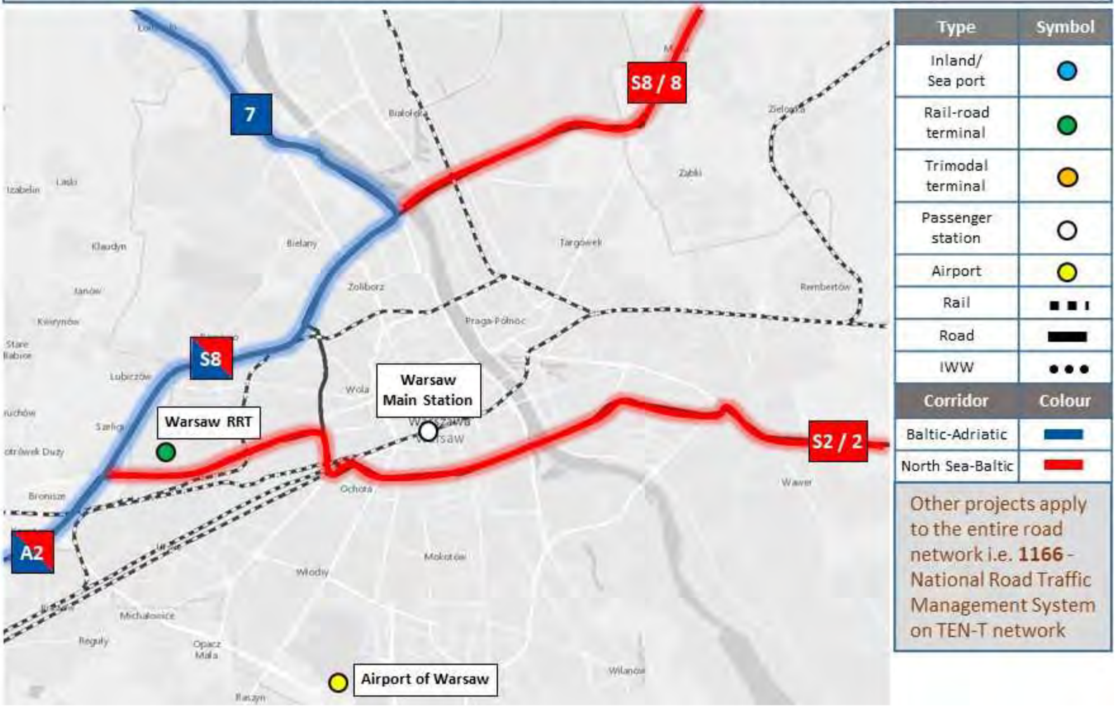




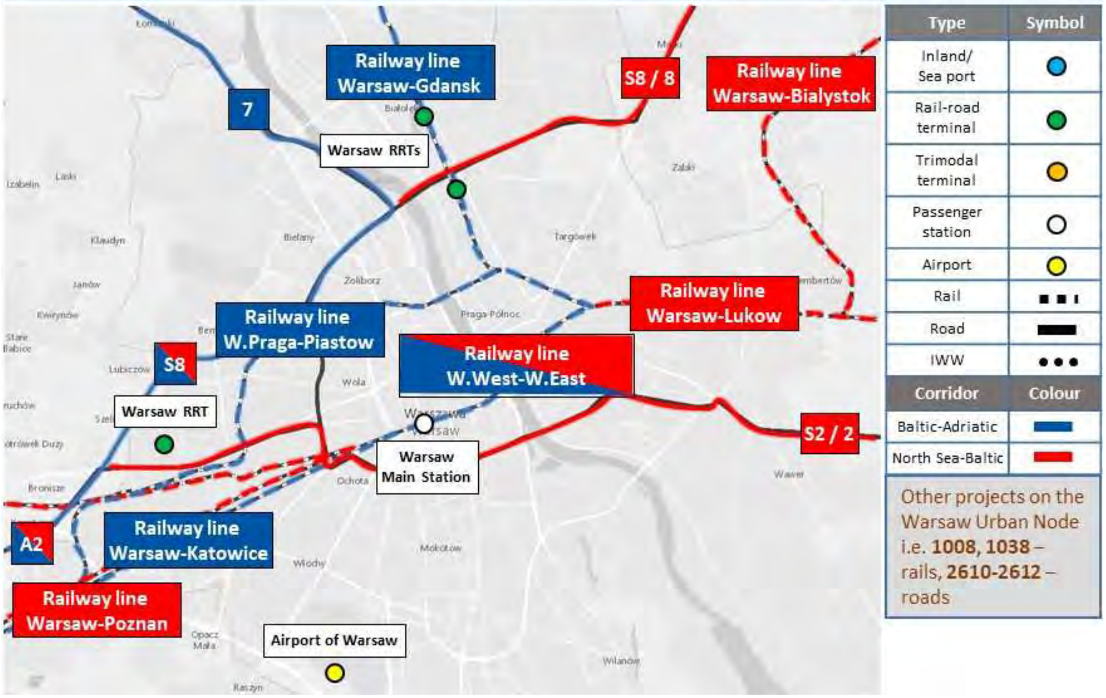
Investments on BAC Project List at the Warsaw Urban Node (Focus on Rail)



Investments on BAC Project List at the Warsaw Urban Node (Focus on Road)



Investments at the Warsaw Urban Node (Core nodes and main interconnections to CNC)



Source: Project fiches

A.3. Description of the action:

Member States involved:	**Section or Node:**	**Estimated total cost [Mio €]:**
-	-	*407.3 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
-	*Start year: 2015* *End year: 2024*	*PKP Polskie Linie Kolejowe S.A. , PKP Polskie Linie Kolejowe S.A., Port Lotniczy Warszawa-Okęcie, Urząd m.st. Warszawy*

The core urban node of Warszawa is located on two core network corridors: Baltic-Adriatic and North-Sea Baltic. The rail infrastructure crossing the node (sections Dzialdowo – Warszawa Wschodnia, Warszawa Zachodnia – Warszawa Wschodnia, Warszawa Praga – Warszawa Piastów and Warszawa Zachodnia – Grodzisk Mazowiecki) is overall at standard with respect to electrification, axle load, train length, and speed, thanks to modernisation works which are at their finalisation stage. The network is still not at standard in terms of ERTMS. The road infrastructure crossing the node is fully at standard. The main city station is Warszawa Centralna, although other two stations are present on the alignment of the Baltic-Adriatic Corridor: Warszawa Wschodnia and Warszawa Zachodnia. All three stations operate services to other core network urban nodes. Next to the Warszawa Centralna and Warszawa Zachodnia railway stations coach stations (with the same name) are also present operating services to other urban nodes of the core network. The Warszawa core urban node includes the Okęcie Chopin core airport (operating both passenger and cargo services) and three rail-road terminals: Główna Towarowa, Warszawa Praga, and Pruszków. The Warszawa Modlin airport and the HHLA Intermodal Polska Sp. z o.o. in Brwinów are other important nodes within or in the proximity of the Warszawa core urban node, which are deemed relevant under the operational stand point for the Baltic-Adriatic Corridor. Suburban and regional services are operated from the stations towards the main destinations located within the Warszawa Metropolitan Area and Mazovia Region. Underground heavy metro and tramway/light rail systems are also in operation, which ensure local interconnection to the railway and coach stations. Approximately 500 km of bike routes are also available in the city. The Okęcie Chopin and Modlin airports are both interconnected to the rail network and to the main station. Buses are also in operation, including dedicated services to the airports. Local and regional road interconnection is primarily ensured by the Warszawa ring road. This is interconnected to the main urban and metropolitan/regional roads. The core airport is directly interconnected to the ring road and very close to the A2 motorway; the rail-road terminals are directly interconnected to the corridor rail network and are also close to the corridor A2 motorway link.

Park and ride facilities, and integrated ticketing at urban as well as metropolitan/regional level for buses and rail services are available. Further development of park&ride facilities is worth mentioning including stands for electric cars loading and photovoltaic panels for serving these parkings are planned in the future. ICT real time information for public transport services and parking and ITS systems for road traffic management are also in operation. Clean fuels are available which include electricity, CNG, LNG for road transport and LPG (hydrogen and biofuels are not available). Car sharing is not available yet, although under implementation, whereas bike sharing is in operation in the Warszawa core urban node. A Sustainable Urban Mobility Plan is available. A green urban/ city logistics programme is not in operation at present.

Regarding the main critical issues which are currently affecting the node and the planned investments; ERTMS is assumed to be deployed by investments to be undertaken at the network level by the national infrastructure manager. The performance of the railway network and services at the local/regional scale is going to be improved by the modernisation of passenger section Warszawa Wschodnia – Warszawa Zachodnia (diametrical line) as well as freight route Warszawa Gołąbki – Warszawa Gdańska, both expected to be completed by 2024. Investments on the ring road/feeder roads are also planned for the improvement of the route Żołnierska – Marsa (for the traffic on the south-east direction). The underground heavy metro is also going to be expanded by means of extension of the second line.

Prognosis by 2030: the corridor node rail and road infrastructure will be overall at standard with respect to all main parameters including ERTMS, although the section Warszawa Zachodnia – Warszawa Wschodnia will remain below the TEN-T required speed standard (up to 80 km/h). Capacity issues may still affect the road corridor sections based on current planned investments.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
Freight lines: speed (100 km/h); Freight lines: Axle.load (22.5 t); Freight lines: train length (740m); Current or potential future capacity bottleneck

Source: Corridor Project List

B. PROJECT IMPLEMENTATION

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1008	Works on the Warsaw ring railway (section Warszawa Golabki\ Warszawa Zachodnia -Warszawa Gdanska)	PL	PKP Polskie Linie Kolejowe S.A.	Warsaw Urban Node	Study, Infrastructure (Rehabilitation), Infrastructure (Upgrade),	82.2	Total value in the National Railway Programme [PLN]
1038	Works on diametrical line in Warsaw section Warszawa Wschodnia - Warszawa Zachodnia	PL	PKP Polskie Linie Kolejowe S.A.	Warsaw Urban Node	Infrastructure (Upgrade),	239.0	Total value in the National Railway Programme [PLN]
2603	Reconstruction of road system in front of the passenger terminal of the Warsaw Chopin Airport	PL	Port Lotniczy Warszawa-Okęcie	Warsaw Airport	Study, Infrastructure (Upgrade), Infrastructure (New construction),	19.5	Based on the data provided by stakeholder
2610	Modernisation of Marynarska street, section Taśmowa st - Rzymowskiego st	PL	Urząd m.st. Warszawy	Warsaw Airport	Infrastructure (Upgrade),	11.5	Based on the results of tender offers
2611	Modernisation of Marsa & Żołnierska streets, section Marsa junction - city limits, phase II	PL	Urząd m.st. Warszawy	Warsaw Urban Node	Infrastructure (Upgrade),	36.0	Based on the results of tender offers
2612	Modernisation of Wał Miedzeszyński street, section Trakt Lubelski st - junction with planned S2 expressway	PL	Urząd m.st. Warszawy	Warsaw Urban Node	Infrastructure (Upgrade),	19.1	Based on the municipal budget
	TOTAL					**407.3**	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1008	Works on the Warsaw ring railway (section Warszawa Golabki\ Warszawa Zachodnia -Warszawa Gdanska)	PL	2015	2018	concluded	concluded	concluded	50%	Land acquisition: Not completed // EIA: EIA approved // Final Approval: approved // CBA: Performed // Other: NA
1038	Works on diametrical line in Warsaw section Warszawa Wschodnia - Warszawa Zachodnia	PL	2019	2024	in progress	concluded	in progress	0%	Land acquisition: Not completed // EIA: EIA approved // Final Approval: submitted, decision pending // CBA: Performed // Other: NA
2603	Reconstruction of road system in front of the passenger terminal of the Warsaw Chopin Airport	PL	2016	2020				25%	Land acquisition: Not completed // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: Not performed // Other: NA
2610	Modernisation of Marynarska street, section Taśmowa st - Rzymowskiego st	PL	2015	2017	concluded	concluded	not started	74%	Land acquisition: Completed // EIA: EIA approved // Final Approval: approved // CBA: Not performed // Other: NA
2611	Modernisation of Marsa & Żołnierska streets, section Marsa junction - city limits, phase II	PL	2015	2017	concluded	concluded	concluded	74%	Land acquisition: Completed // EIA: EIA approved // Final Approval: approved // CBA: Not performed // Other: NA
2612	Modernisation of Wał Miedzeszyński street, section Trakt Lubelski st - junction with planned S2 expressway	PL	2016	2019	concluded	in progress	in progress	31%	Land acquisition: Not completed // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: Not performed // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR) TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1008	Works on the Warsaw ring railway (section Warszawa Golabki\ Warszawa Zachodnia -Warszawa Gdanska)	PL	1	82.2	82.2	12.9 69.3	national funds CEF - Cohesion Call
1038	Works on diametrical line in Warsaw section Warszawa Wschodnia - Warszawa Zachodnia	PL	1	239.0	55.7	55.7	national funds
2603	Reconstruction of road system in front of the passenger terminal of the Warsaw Chopin Airport	PL	Residual	19.5	0		
2610	Modernisation of Marynarska street, section Taśmowa st - Rzymowskiego st	PL	2	11.5	11.5	1.8 9.7	City of Warsaw budget Cohesion Fund
2611	Modernisation of Marsa & Żołnierska streets, section Marsa junction - city limits, phase II	PL	3	36.0	36.0	6.7 29.3	City of Warsaw budget Cohesion Fund
2612	Modernisation of Wał Miedzeszyński street, section Trakt Lubelski st - junction with planned S2 expressway	PL	3	19.1	19.1	8.2 10.9	City of Warsaw budget Cohesion Fund
	TOTAL			**407.3**	**0**		

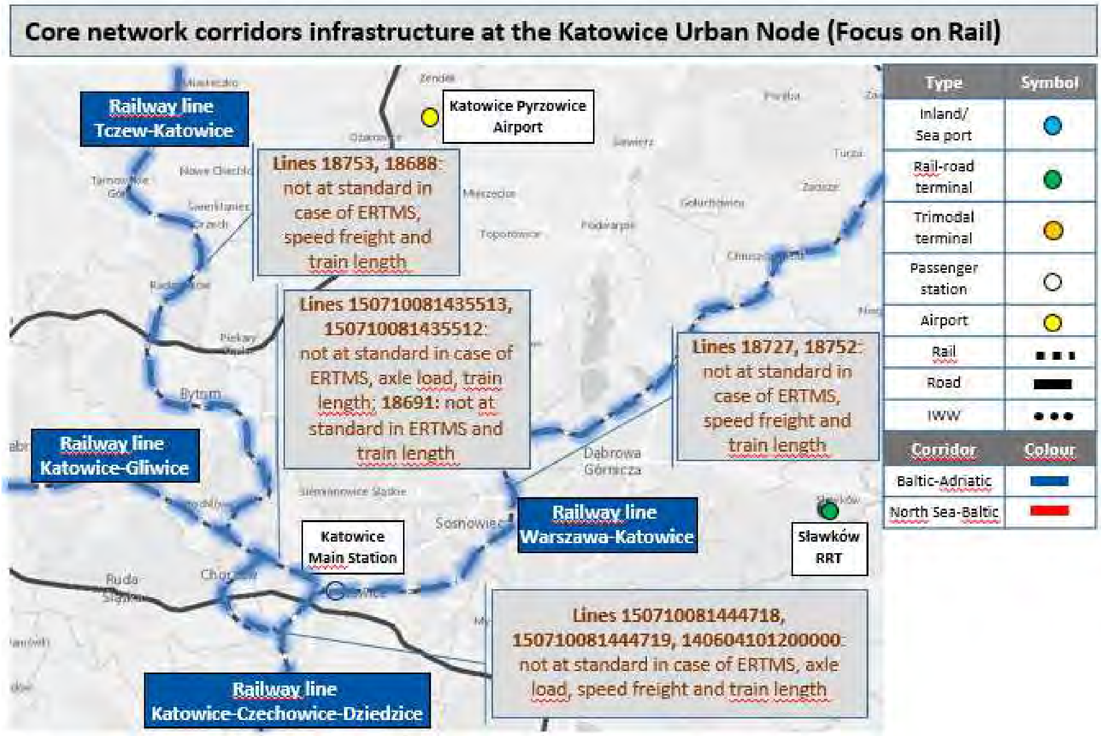
Source: Corridor Project List

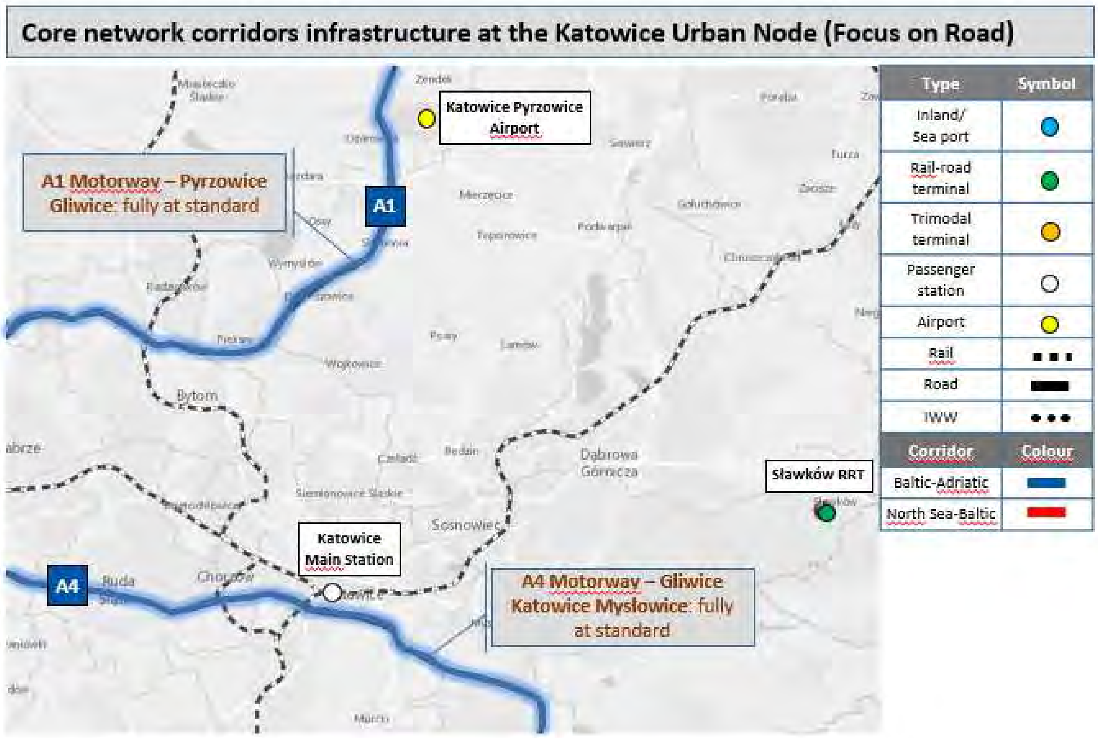
A. Description of the Action:

A.1. Action Title:

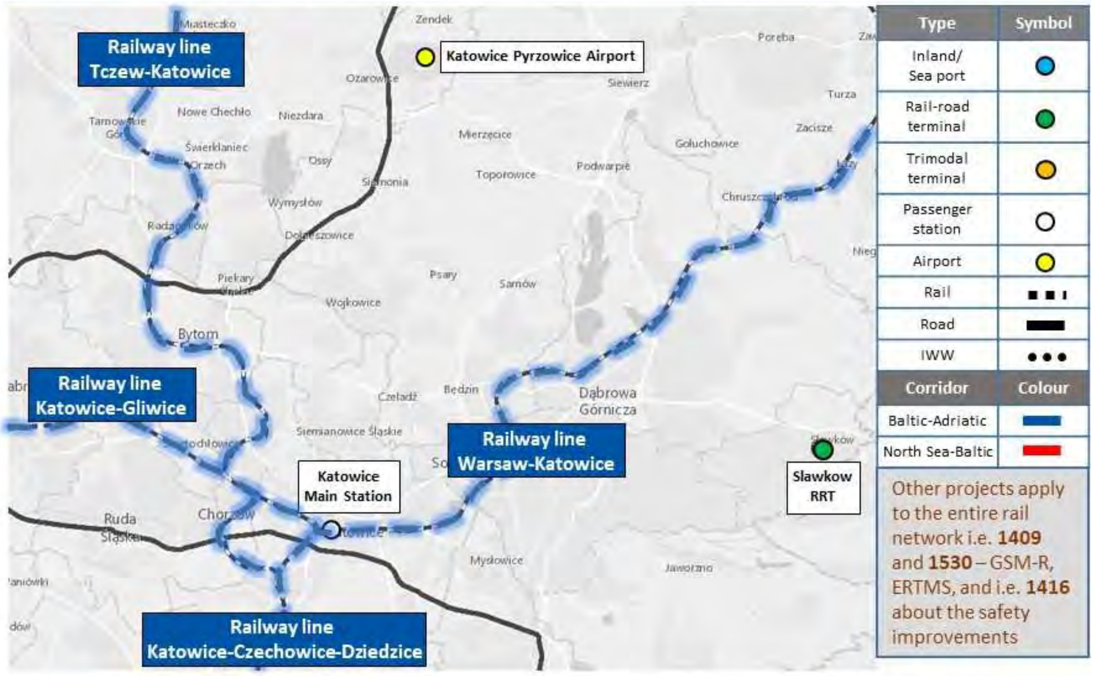
7.1.03 - Urban node: Katowice

A.2. Location of the action:



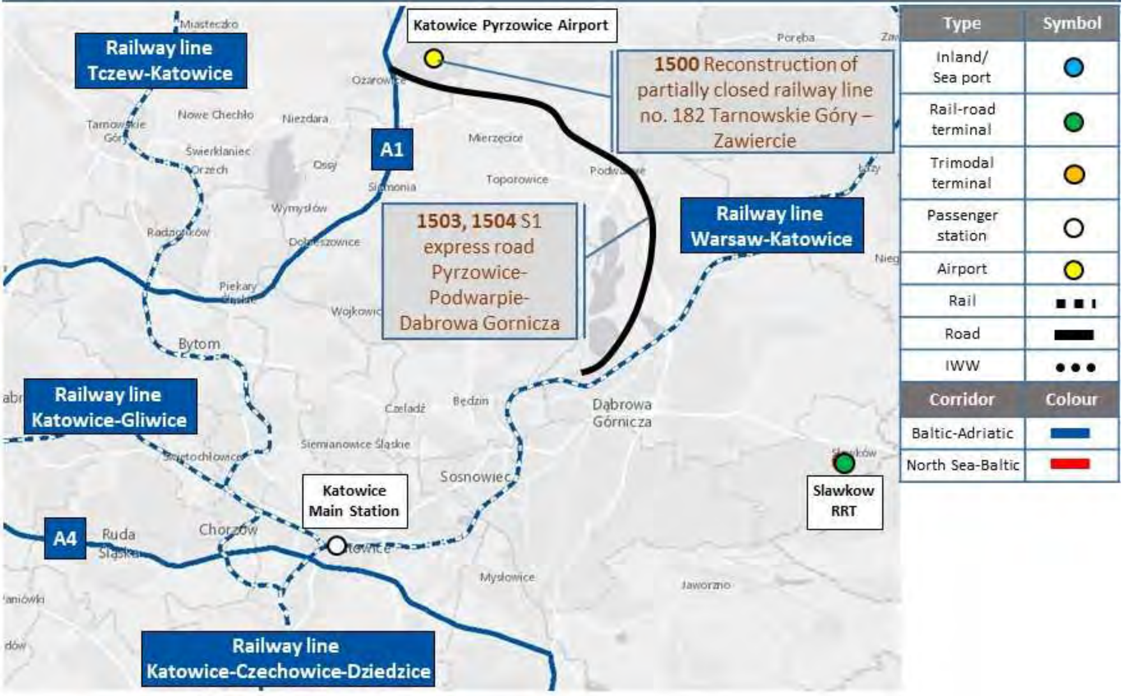


Investments on BAC Project List at the Katowice Urban Node (Focus on Rail)



Investments on BAC Project List at the Katowice Urban Node (Focus on Road)

Investments at the Katowice Urban Node (Core nodes and main interconnections to CNC)



Source: Project fiches

A.3. Description of the action:

Member States involved: -	**Section or Node:** -	**Estimated total cost [Mio €]:** *228.9 EUR million*
Other CNC involved: -	**Implementation schedule:** *Start year: 2017* *End year: 2021*	**Project Promoter:** *Generalna Dyrekcja Dróg Krajowych i Autostrad, PKP Polskie Linie Kolejowe S.A.*

The core urban node of Katowice is located on the Baltic-Adriatic core network corridor. The rail infrastructure crossing the node (section Katowice – Katowice Szopienice Południowe) is already at standard with respect to electrification and axle load. It is not at standard with regard to train length, and speed. The network is also still not at standard in terms of ERTMS. The road infrastructure crossing the node is fully at standard. The main city station is Katowice Główny which operates services to other core network urban nodes. Next to the Katowice Główny railway stations coach station (Dworzec Autobusowy) is also present operating services to other urban nodes of the core network. The Katowice core urban node includes the Katowice Pyrzowice core airport (operating both passenger and cargo services) and core rail – road terminal – Euroterminal Sławków, constituting the further towards west located terminal operating on wide gauge as well as standard one. Apart from Sławków terminal, other terminals located nearby Katowice urban node and relevant from the operational stand point of the Baltic-Adriatic corridor are also worth mentioning: Polzug Terminal Dąbrowa Górnicza, Container Terminal Sosnowiec Południowy, Container Terminal Gliwice, Terminal PCC Gliwice located in the area of Śląskie Centrum Logistyki and HHLA Terminal Dąbrowa Górnicza. Suburban and regional services are operated from the station towards the main destinations located within the Metropolitan area and Upper Silesia Region. Tramway/light rail system is also in operation, which ensures local interconnection to the railway and coach stations. The Katowice Pyrzowice airport is not interconnected to the rail network but investment aimed at its interconnection is foreseen. Buses are in operation, including dedicated services to the airports. Local and regional road interconnection is ensured by A1 motorway and S1 express road, with the latter constituting Katowice node by-pass planned for upgrade. The core airport is directly interconnected to both roads and very close to the A1 motorway as well as S1 express road; the rail-road terminals are directly interconnected to the corridor rail network and are also relatively close to the corridor road links, although some bottlenecks with regard to the last mile road connections to terminals are noted.
Park and ride facilities are not present yes, however under planning stage and foreseen for construction in 2018. Integrated ticketing at urban and metropolitan level is available for buses and under development for rail. The system will cover 49 municipalities belonging to the Communication Municipal Association of Upper Silesia Industrial Area. ICT real time information for public transport services and ITS systems for road traffic management are also in operation, although under development for parking. Clean fuels are available which include electricity, CNG and LPG. LNG for road transport as well as hydrogen and biofuels are not available. Car sharing and bike sharing are available in the Katowice core urban node. A Sustainable Urban Mobility Plan is available. A green urban/ city logistics programme is not in operation at present.

Regarding the main critical issues which are currently affecting the node and the planned investments; investment aiming at solving the capacity issue in Katowice Railway Node, namely train length and speed, is at preparatory phase. It will cover section Będzin – Sosnowiec – Katowice – Katowice Ligota and exit from Katowice towards Gliwice (centre of agglomeration) and will allow for reaching compliance with TEN-T technical standards as well as distinguishing of long distance and agglomeration traffic by 2023.

Reconstruction of partially closed railway line no. 182 Tarnowskie Góry – Zawiercie constituting the railway connection to Katowice Pyrzowice airport is planned to be implemented by 2021. Investments on the eastern Katowice ring road – S1 express road connecting the core Katowice Pyrzowice airport (Pyrzowice – Podwarpie – Dąbrowa Górnicza) are also planned for implementation. Implementation of park&ride system in this core urban node is also under development.

Prognosis by 2030: the corridor node rail and road infrastructure will be at standard with respect to all main parameters including ERTMS.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
Freight lines: speed (100 km/h); Freight lines: Axle.load (22.5 t); Freight lines: train length (740m); Express road or motorway standard; Connection to rail

Source: Corridor Project List

B. Project Implementation

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1503	S1 express road section Pyrzowice-Podwarpie	PL	Generalna Dyrekcja Dróg Krajowych i Autostrad	Katowice Airport	Infrastructure (Upgrade), Infrastructure (New construction),	41.3	
1504	S1 express road section Podwarpie - Dąbrowa Górnicza	PL	Generalna Dyrekcja Dróg Krajowych i Autostrad	Katowice Airport	Infrastructure (Upgrade), Infrastructure (New construction),	56.6	
1500	Reconstruction of partially closed railway line no. 182 Tarnowskie Góry – Zawiercie	PL	PKP Polskie Linie Kolejowe S.A.	Katowice Airport	Infrastructure (Upgrade), Infrastructure (New construction),	131.0	Value from the FS
	TOTAL					228.9	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL				ADMINISTRATIVE ISSUES
					L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	
1503	S1 express road section Pyrzowice-Podwarpie	PL	2017	2020	concluded	concluded	concluded	0%	Land acquisition: NA // EIA: EIA approved // Final Approval: NA // CBA: NA // Other: NA
1504	S1 express road section Podwarpie - Dąbrowa Górnicza	PL	2019	2021	concluded	concluded	concluded	0%	Land acquisition: NA // EIA: EIA approved // Final Approval: NA // CBA: NA // Other: NA
1500	Reconstruction of partially closed railway line no. 182 Tarnowskie Góry – Zawiercie	PL	2020	2021	not started	in progress	in progress	0%	Land acquisition: Not completed // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: Performed // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR)		
					TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1503	S1 express road section Pyrzowice-Podwarpie	PL	2	41.3	0		
1504	S1 express road section Podwarpie - Dąbrowa Górnicza	PL	2	56.6	0		
1500	Reconstruction of partially closed railway line no. 182 Tarnowskie Góry – Zawiercie	PL	2	131.0	0		
	TOTAL			**229**	**0**		

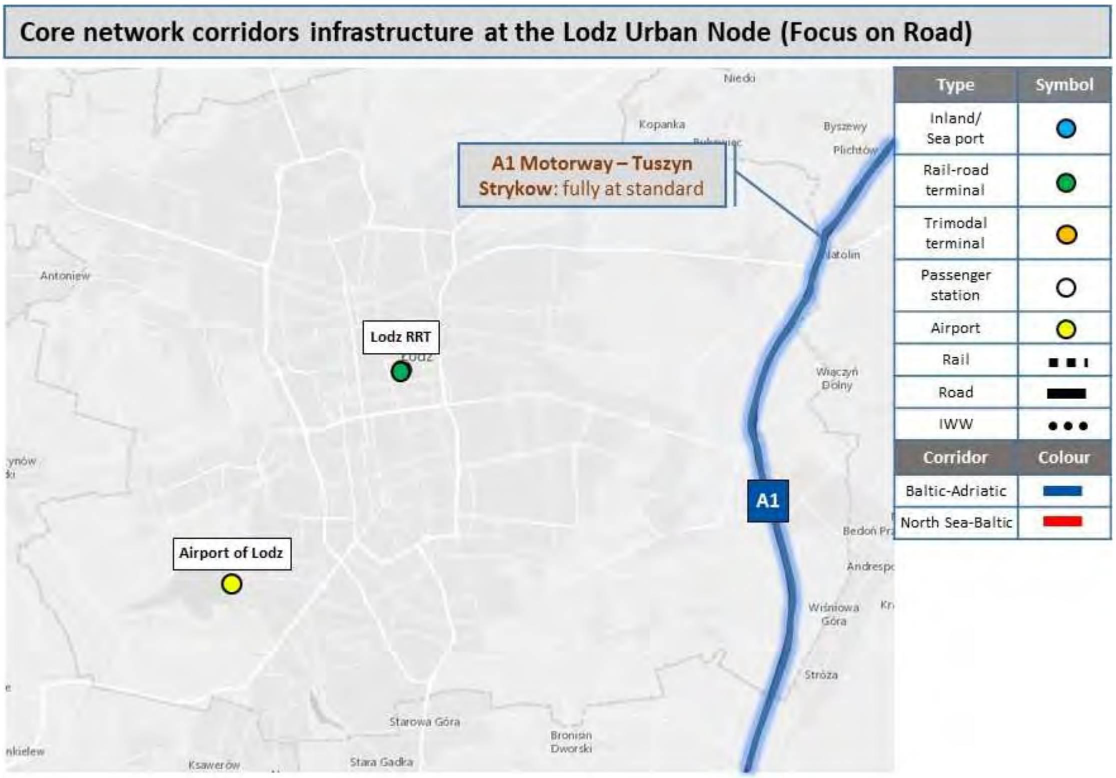
Source: Corridor Project List

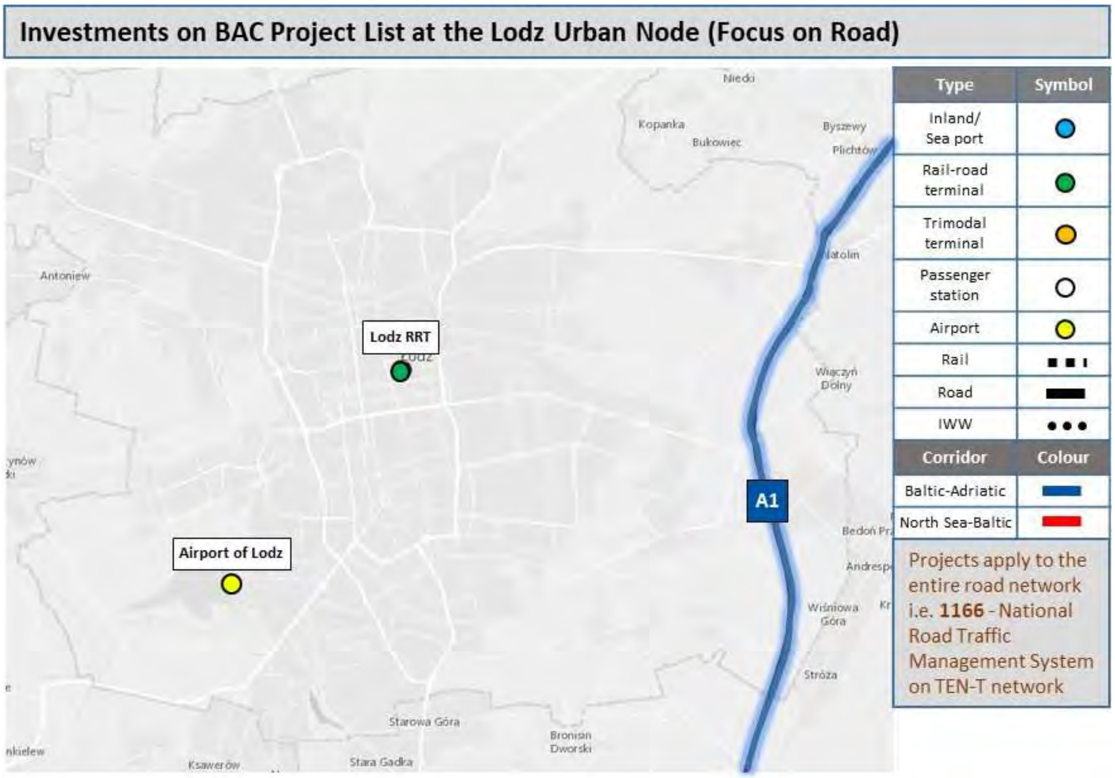
A. Description of the Action:

A.1. Action Title:

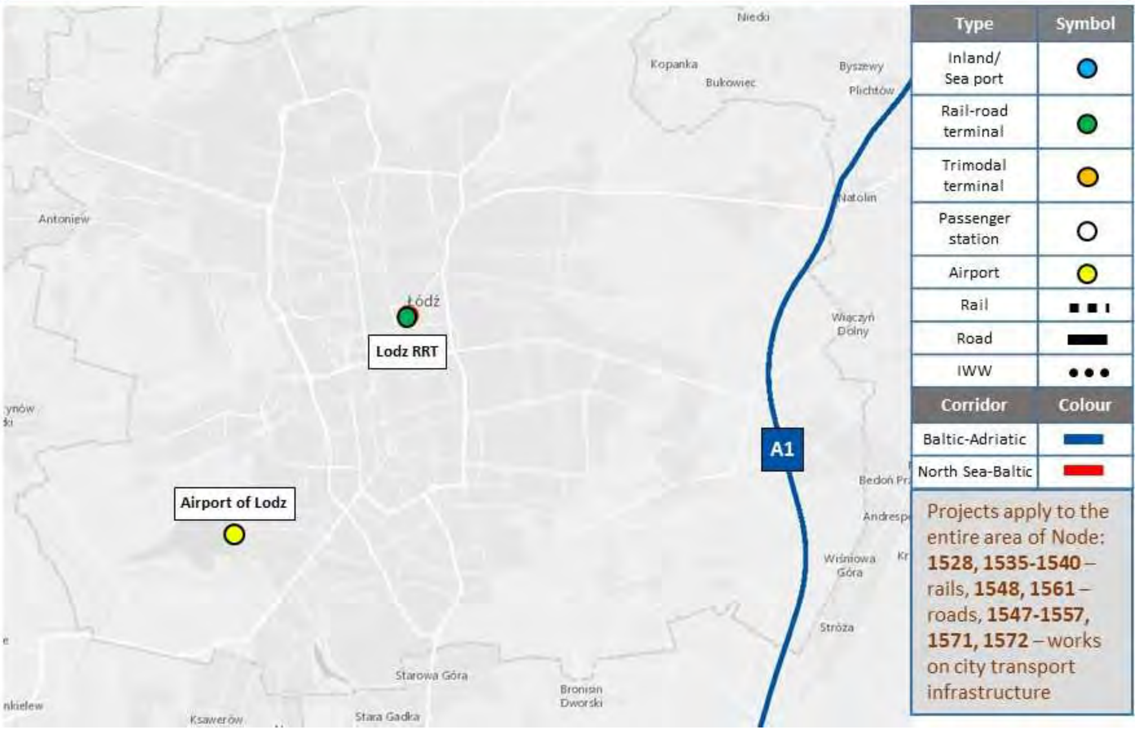
7.1.04 - Urban node: Łódź

A.2. Location of the action:





Investments at the Lodz Urban Node (Core nodes and main interconnections to CNC)



Source: Project fiches

A.3. Description of the action:

Member States involved:	Section or Node:	Estimated total cost [Mio €]:
-	-	*1,594.9 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
-	*Start year: 2011* *End year: 2021*	*PKP Polskie Linie Kolejowe S.A., PKP Polskie Linie Kolejowe S.A. , Urząd Miasta Łodzi*

The core urban node of Łódź is located on two core network corridors: Baltic-Adriatic and North-Sea Baltic. It is not directly crossed by core railway corridor network, but interconnected with the Central Branch by railway line no. 14 (Łódź Kaliska - Zduńska Wola). The rail infrastructure in the urban node (section Łódź Fabryczna – Łódź Kaliska) is at standard only with regard to electrification. It is not at standard with respect to axle load, train length, speed and ERTMS. The road infrastructure crossing Łódź node is fully at standard. The main city station is Łódź Kaliska, which operates services to other core network urban nodes. Second most relevant is terminus railway station Łódź Fabryczna currently undergoing intensive modernisation programme aiming at completing as multimodal and multilevel station with underground part serving the high speed rail in the future. Next to the Łódź Kaliska railway station, the coach station (with the same name) is also present operating services to other urban nodes of the core network. The Łódź core urban node includes the Łódź core airport (operating passenger services) and two rail-road terminals: Container Terminal Łódź Olechów and Erontrans Terminal Stryków. Suburban and regional services are operated from the stations towards the main destinations located within the Łódź Metropolitan Area and Łódzkie Region. Underground heavy metro is not in place, however tramway/light rail system is in operation, which ensure local interconnection to the railway and coach stations. The Łódź airport is not interconnected to the rail network. Buses are in operation, including dedicated services to the airports. Local and regional road interconnection is primarily ensured by S14 express road interconnected with A1 motorway. This is interconnected to the main urban and metropolitan/regional roads. The rail-road terminals are directly interconnected to the corridor rail network and whereas Euroterminal Stryków is located near to the junction of the A1 (the Baltic Adriatic Corridor core road) and A2 (east-west) motorways, Olechów is located 10 km away from A1 motorway.

Park and ride facilities, integrated ticketing at urban as well as metropolitan/regional level for buses and rail services are available. ICT real time information for public transport services and parking and ITS systems for road traffic management are also in operation. Clean fuels are available which include electricity, CNG, LPG as well as LNG for road transport (hydrogen and biofuels are not available). Car sharing and bike sharing are not available at present in the Łódź core urban node. A Sustainable Urban Mobility Plan is available. A green urban/ city logistics programme is not in operation at present.
Regarding the main critical issues which are currently affecting the node and the planned investments the Łódź railway node is expected to be compliant with regard to required standards by implementation of project concerning streamlining of Łódź railway node assuming construction of tunnel connecting Łódź Fabryczna and Łódź Kaliska / Łódź Żabieniec stations as well as other modernisation works planned on lines no. 15, 16 and 25. ERTMS is also expected to be implemented. The performance of the railway network and services at the local and regional scale is going to be improved due the abovementioned modernisation of

Łódź railway node planned to be completed by 2023. Investments on the ring road/feeder roads are also planned for the improvement, including construction of western by-pass being part of S14 express road as well as construction of access roads to A1 and A2 motorways and reconstruction of section of S14 express road constituting connection to the airport. Actions aiming at extension and development of tramway routes connecting core stations and multimodal junctions as well as development of park&ride infrastructure are also worth mentioning.

Prognosis by 2030: the corridor node rail and road infrastructure will be at standard with respect to all main parameters including ERTMS.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
ERTMS; Freight lines: speed (100 km/h); Freight lines: Axle.load (22.5 t); Freight lines: train length (740m); Current or potential future capacity bottleneck

Source: Corridor Project List

B. PROJECT IMPLEMENTATION

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1528	Works on railway lines no. 14 and 811 on the section Łódź Kaliska-Zduńska Wola-Ostrów Wielkopolski, stage I: Łódź Kaliska-Zduńska Wola	PL	PKP Polskie Linie Kolejowe S.A.	Łódź Urban Node	Study, Infrastructure (Upgrade),	113.1	Total value in the National Railway Programme [PLN]
1535	Streamlining of Łódź Railway Node (TEN-T), phase I, section Łódź Widzew - Łódź Fabryczna	PL	PKP Polskie Linie Kolejowe S.A.	Łódź Urban Node	Infrastructure (Upgrade), Infrastructure (New construction),	352.6	Total value in the National Railway Programme [PLN]
1536	Streamlining the Łódź Railway Node (TEN-T), phase II, section Łódź Fabryczna – Łódź Kaliska/Łódź Żabieniec	PL	PKP Polskie Linie Kolejowe S.A.	Łódź Urban Node	Infrastructure (Upgrade), Infrastructure (New construction),	459.2	Total value in the National Railway Programme [PLN]
1537	Works on railway lines no. 15, 16 on section Łódź Kaliska – Zgierz – Kutno	PL	PKP Polskie Linie Kolejowe S.A.	Łódź Urban Node	Study, Infrastructure (Rehabilitation),	66.9	
1538	Construction of multimodal integrated nodes together with construction and reconstruction of railway stops in the area of Łódzkie Voivodship	PL	PKP Polskie Linie Kolejowe S.A.	Łódź Urban Node	Infrastructure (Upgrade), Infrastructure (New construction),	9.6	Total value in the National Railway Programme [PLN]
1539	Completion of construction of the eastern viaduct on Łódź Kaliska station	PL	PKP Polskie Linie Kolejowe S.A.	Łódź Urban Node	Infrastructure (Upgrade), Infrastructure (New construction),	9.6	
1540	Revitalisation of railway line no. 16 Łódź Widzew – Kutno on section Zgierz – Ozorków	PL	PKP Polskie Linie Kolejowe S.A.	Łódź Urban Node	Infrastructure (Rehabilitation),	32.3	
1547	Multimodal node by Łódź Fabryczna Station	PL	Urząd Miasta Łodzi	Łódź Urban Node	Study, Infrastructure (Upgrade), Infrastructure (New construction),	100.4	
1548	Extention of Rokicinska Street in Lodz from Malownicza street to the city border	PL	Urząd Miasta Łodzi	Łodź Airport	Study, Infrastructure (Upgrade),	9.7	
1561	Construction of Nowoweglowa street in Lodz between Wierzbowa and Kopcinskiego streets with the expansion of the intersection of Kopcinskiego street	PL	Urząd Miasta Łodzi	Łódź Urban Node	Study, Infrastructure (Upgrade),	8.6	To be confirmed
1552	Comprehensive integration program for the low-emission public transport system in Lodz Metropolitan Area	PL	Urząd Miasta Łodzi	Łódź Urban Node	Study, Infrastructure (Upgrade), Infrastructure (New construction), Rolling Stock,	161.5	
1571	Construction and reconstruction of tram lines in Łódź	PL	Urząd Miasta Łodzi	Łódź Urban Node	Study, Infrastructure (Upgrade), Infrastructure (New construction),	27.0	To be confirmed
1572	Lodz metropolitan tram	PL	Urząd Miasta Łodzi	Łódź Urban Node	Study, Infrastructure (Upgrade), Infrastructure (New construction), Rolling Stock,	244.3	To be confirmed
	TOTAL					**1,594.9**	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1528	Works on railway lines no. 14 and 811 on the section Łódź Kaliska-Zduńska Wola-Ostrów Wielkopolski, stage I: Łódź Kaliska-Zduńska Wola	PL	2018	2020	concluded	concluded	in progress	0%	Land acquisition: Not completed // EIA: EIA approved // Final Approval: approved // CBA: Performed // Other: NA
1535	Streamlining of Łódź Railway Node (TEN-T), phase I, section Łódź Widzew - Łódź Fabryczna	PL	2011	2017	concluded	concluded	concluded	88%	Land acquisition: Completed // EIA: EIA approved // Final Approval: approved // CBA: Performed // Other: NA
1536	Streamlining the Łódź Railway Node (TEN-T), phase II, section Łódź Fabryczna – Łódź Kaliska/Łódź Żabieniec	PL	2019	2021	concluded	concluded	in progress	0%	Land acquisition: Not completed // EIA: EIA approved // Final Approval: submitted, decision pending // CBA: Performed // Other: NA
1537	Works on railway lines no. 15, 16 on section Łódź Kaliska – Zgierz – Kutno	PL	2018	2021	concluded	not started	in progress	0%	Land acquisition: Not completed // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: Not performed // Other: NA
1538	Construction of multimodal integrated nodes together with construction and reconstruction of railway stops in the area of Łódzkie Voivodship	PL	2019	2021	not started	in progress	not started	0%	Land acquisition: Not completed // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: Not performed // Other: NA
1539	Completion of construction of the eastern viaduct on Łódź Kaliska station	PL	2019	2021	not started	in progress	not started	0%	Land acquisition: Not completed // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: Not performed // Other: NA
1540	Revitalisation of railway line no. 16 Łódź Widzew – Kutno on section Zgierz – Ozorków	PL	2020	2021	in progress	not started	in progress	0%	Land acquisition: Not completed // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: Not performed // Other: NA
1547	Multimodal node by Łódź Fabryczna Station	PL	2012	2017				87%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1548	Extention of Rokicinska Street in Lodz from Malownicza street to the city border	PL	2017	2019				7%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1561	Construction of Nowoweglowa street in Lodz between Wierzbowa and Kopcinskiego streets with the expansion of the intersection of Kopcinskiego street	PL	2015	2017				64%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1552	Comprehensive integration program for the low-emission public transport system in Lodz Metropolitan Area	PL	2016	2021				5%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1571	Construction and reconstruction of tram lines in Łódź	PL	2017	2020				4%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1572	Lodz metropolitan tram	PL	2015	2020				32%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR)		
					TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1528	Works on railway lines no. 14 and 811 on the section Łódź Kaliska-Zduńska Wola-Ostrów Wielkopolski, stage I: Łódź Kaliska-Zduńska Wola	PL	1	113.1	113.1	40.0 73.1	national funds CEF - Cohesion Call
1535	Streamlining of Łódź Railway Node (TEN-T), phase I, section Łódź Widzew - Łódź Fabryczna	PL	Residual	352.6	352.6	108.6 244.0	national funds OPIE 2007-2013
1536	Streamlining the Łódź Railway Node (TEN-T), phase II, section Łódź Fabryczna – Łódź Kaliska/Łódź Żabieniec	PL	Residual	459.2	107.2	107.2	national funds
1537	Works on railway lines no. 15, 16 on section Łódź Kaliska – Zgierz – Kutno	PL	Residual	66.9	0		
1538	Construction of multimodal integrated nodes together with construction and reconstruction of railway stops in the area of Łódzkie Voivodship	PL	Residual	9.6	0		
1539	Completion of construction of the eastern viaduct on Łódź Kaliska station	PL	Residual	9.6	0		
1540	Revitalisation of railway line no. 16 Łódź Widzew – Kutno on section Zgierz – Ozorków	PL	Residual	32.3	0		
1547	Multimodal node by Łódź Fabryczna Station	PL	Residual	100.4	100.4	36.2 64.2	NA OPIE2007-2013
1548	Extention of Rokicinska Street in Lodz from Malownicza street to the city border	PL	2	9.7	0		
1561	Construction of Nowoweglowa street in Lodz between Wierzbowa and Kopcinskiego streets with the expansion of the intersection of Kopcinskiego street	PL	Residual	8.6	8.6	5.7 2.9	NA Regional Operational Programme for Łódzkie Voivodship 2014-2020
1552	Comprehensive integration program for the low-emission public transport system in Lodz Metropolitan Area	PL	Residual	161.5	0		
1571	Construction and reconstruction of tram lines in Łódź	PL	Residual	27.0	0		
1572	Lodz metropolitan tram	PL	Residual	244.3	0		
	TOTAL			**1,594.9**	**0**		

Source: Corridor Project List

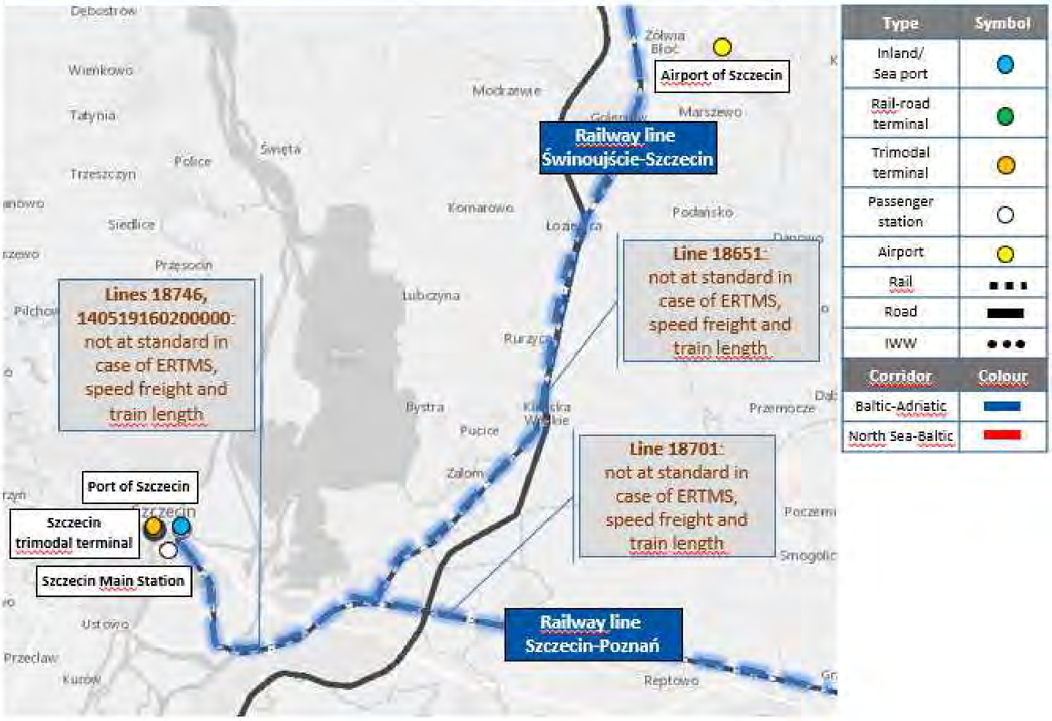
A. Description of the Action:

A.1. Action Title:

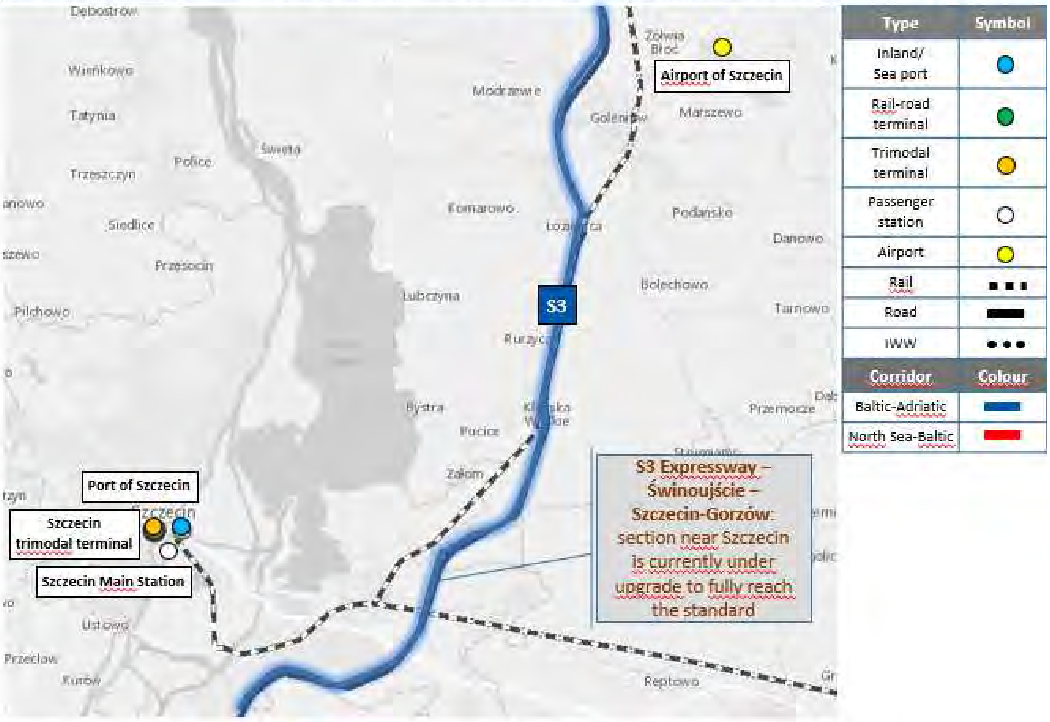
7.1.05 - Urban node: Szczecin

A.2. Location of the action:

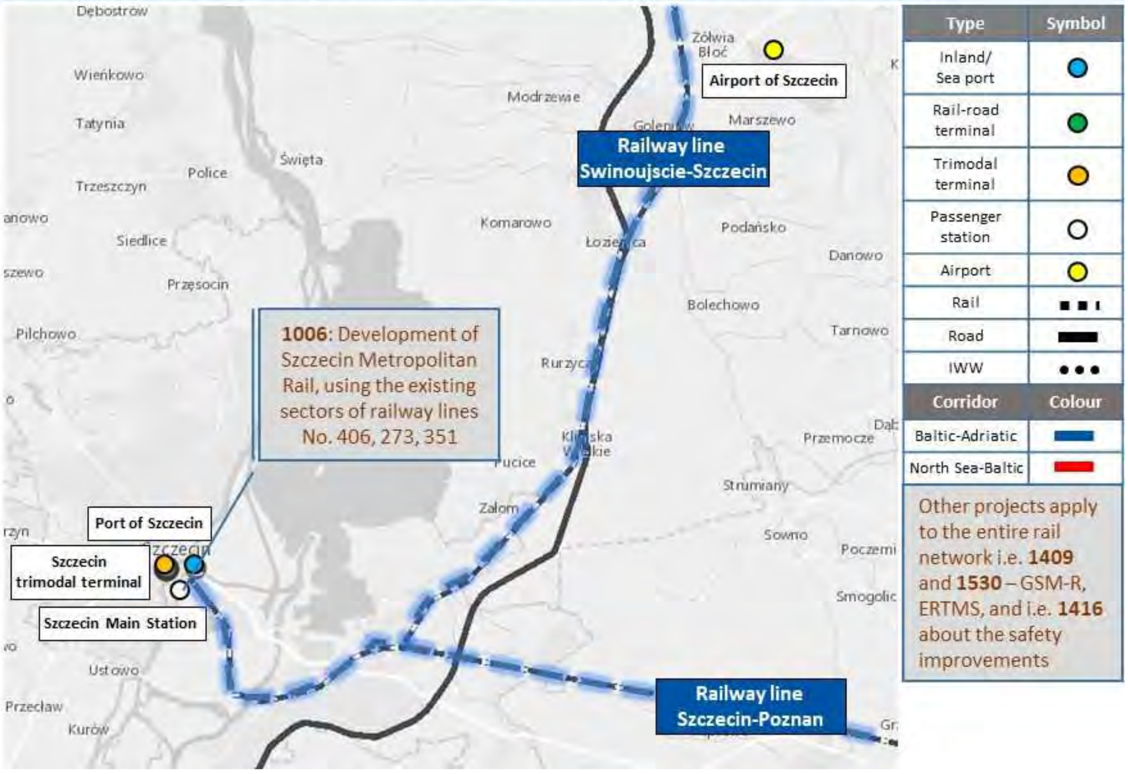
Core network corridors infrastructure at the Szczecin Urban Node (Focus on Rail)



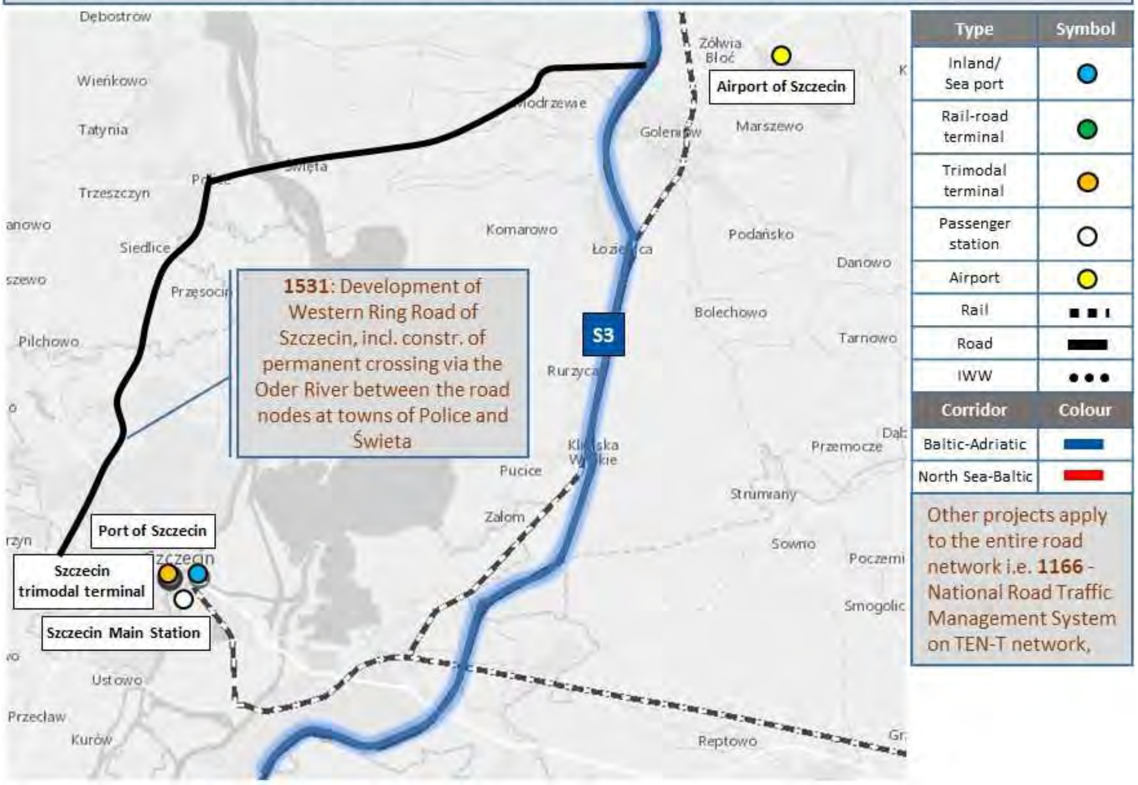
Core network corridors infrastructure at the Szczecin Urban Node (Focus on Road)



Investments on BAC Project List at the Szczecin Urban Node (Focus on Rail)



Investments on BAC Project List at the Szczecin Urban Node (Focus on Road)



Source: Project fiches

A.3. Description of the action:

Member States involved:	Section or Node:	Estimated total cost [Mio €]:
-	-	*317.3 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
-	*Start year: 2017* *End year: 2023*	*Gmina Miasto Szczecin ,* *Stowarzyszenie Szczecińskiego Obszaru Metropolitalnego*

The core urban node of Szczecin is located on the Baltic-Adriatic core network corridor. The rail infrastructure crossing the node (sections Szczecin Dąbie – Szczecin Zdroje – Szczecin Port Centralny) is at standard with respect to electrification. The network is not at standard in terms of axle load, train length, and speed as well as ERTMS. The road infrastructure crossing the node is fully at standard. The main city station is Szczecin Główny. The station operates services to other core network urban nodes. Next to the Szczecin Główny railway station coach station (Dworzec Główny PKS) is also present operating services to other urban nodes of the core network. The railway and coach stations form one interchange node. Other railway stations also operate services to the other core network nodes, namely Szczecin Dąbie and Basen Górniczy. The Szczecin core urban node includes Port of Szczecin / Świnoujście (described in detail in separate dedicated action sheet), the Szczecin Goleniów core airport (operating passenger and cargo services) and DB Port Szczecin Container Terminal. Suburban and regional services are operated from the main station towards the main destinations located within the Szczecin Metropolitan Area and Zachodniopomorskie Region. Tramway/light rail system is also in operation, including Szczecin fast train,
which ensure local interconnection to the railway and coach stations. The Szczecin Goleniów airport is interconnected to the rail network and to the main station. Buses are also in operation, including dedicated services to the airports. Local and regional road interconnection is primarily ensured by the road no. 10 as well as S3 express road. This is interconnected to the main urban and metropolitan/regional roads. The core airport is interconnected to the S3 express road via road no. 6; the rail-road terminal is located in the area of port and is directly interconnected to the corridor rail and road network.
Park and ride facilities were recently constructed and are available. The integrated ticketing at urban level is available, whereas pending for the metropolitan/regional level for buses and rail services. ICT real time information for public transport services and ITS systems for road traffic management are also in operation. ICT real time information system is not available for parking. Clean fuels are available which include electricity and LPG. First LNG terminal was recently open and started operation in Świnoujście. CNG, hydrogen and biofuels are not available, although CNG is under consideration at present. Also hydrogen for buses is under consideration. Car sharing is not available, whereas bike sharing is available and in operation in the Szczecin core urban node. A Sustainable Urban Mobility Plan is available. Regarding the green urban/ city logistics delivery solutions, one hybrid bus is ion operation and further 20 buses are planned for purchase in 2016.

Regarding the main critical issues which are currently affecting the node and the planned investments; axle load is expected to reach compliance with TEN-T standards due to implementation of works on the E 59 railway line, Poznań Główny - Szczecin Dąbie section, ERTMS is also planned to be deployed on section Wronki – Słonice and as part of horizontal action aiming at ERTMS deployment. Train length is not expected to be fully compliant and freight speed is expected to reach 80 km/h. Development of western ring road of Szczecin, including construction of permanent crossing via the Oder River between the road nodes at towns of Police and Święta is also expected aiming at improvement of road traffic conditions in the core urban node. Reduction of noise has also been indicated as relevant issue to solve with regard to the railway and road traffic.

Prognosis by 2030: the corridor node rail and road infrastructure will be at standard with respect to all axel load and ERTMS, section Szczecin Dąbie – Szczecin Zdroje – Szczecin Port Centralny will be almost at standard with regard to train length and below the TEN-T required freight speed standard (up to 80 km/h). Port last mile connections are expected to be improved after implementation of number of actions as described in detail in a dedicated port action sheet (3.1.03).

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
Current or potential future capacity bottleneck; Single track section; Express road or motorway standard

Source: Corridor Project List

B. Project Implementation

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1531	Development of Western Ring Road of Szczecin, including construction of permanent crossing via the Oder River between the road nodes at towns of Police and Święta	PL	Gmina Miasto Szczecin	Szczecin Urban Node	Infrastructure (Upgrade), Infrastructure (New construction),	139.5	
1560	Development of Szczecin Metropolitan Rail, using the existing sectors of railway lines No. 406, 273, 351	PL	Stowarzyszenie Szczecińskiego Obszaru Metropolitalnego	Szczecin Urban Node	Study, Infrastructure (Rehabilitation), Infrastructure (Upgrade), Infrastructure (New construction), OTHER	177.8	OPIE
	TOTAL					**317.3**	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL: L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1531	Development of Western Ring Road of Szczecin, including construction of permanent crossing via the Oder River between the road nodes at towns of Police and Święta	PL	2017	2023	in progress	concluded	in progress	0%	Land acquisition: Not completed // EIA: EIA under preparation or updating // Final Approval: NA // CBA: NA // Other: Partnership agreements between the stakeholders: City of Szczecin, Police Municipality and Policki Poviat was signed in August 2015 W dniu 17 sierpnia 2015 roku w Szczecinie podpisano List Intencyjny pomiędzy Gminą Miasto Szczecin, Gminą Police oraz Powiatem Polickim stanowiący deklarację stron do prowadzenia wspólnych działań, zmierzających do przygotowania kluczowego elementu procesu inwestycyjnego Zachodniego Drogowego Obejścia Szczecina, obejmującego przeprawę pomiędzy węzłami drogowymi Police - Goleniów. W lutym 2016 roku Gmina Miasto Szczecin wraz z Wojewodą Zachodniopomorskim, Marszałkiem Województwa Zachodniopomorskiego, Starostą Powiatu Polickiego oraz Burmistrzem Polic wystąpili z wnioskiem do Ministra Infrastruktury i Budownictwa o wpisanie inwestycji do Programu Budowy Dróg Krajowych 2014 - 2023
1560	Development of Szczecin Metropolitan Rail, using the existing sectors of railway lines No. 406, 273, 351	PL	2018	2022	concluded	concluded	in progress	0%	Land acquisition: Not completed // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: Performed // Other: Partnership Agreement between Szczecin Metropolitan Area Association, Zachodniopomorskie Voivodship, PKP PLK S.A., City of Szczecin, City of Stargard, Goleniów, Gryfino, Kobylanka, Police and Stargard Municipalities, PKP S.A. is under preparation

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR) TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1531	Development of Western Ring Road of Szczecin, including construction of permanent crossing via the Oder River between the road nodes at towns of Police and Święta	PL	3	139.5	0		
1560	Development of Szczecin Metropolitan Rail, using the existing sectors of railway lines No. 406, 273, 351	PL	Residual	177.8	0		
	TOTAL			**317.3**	**0**		

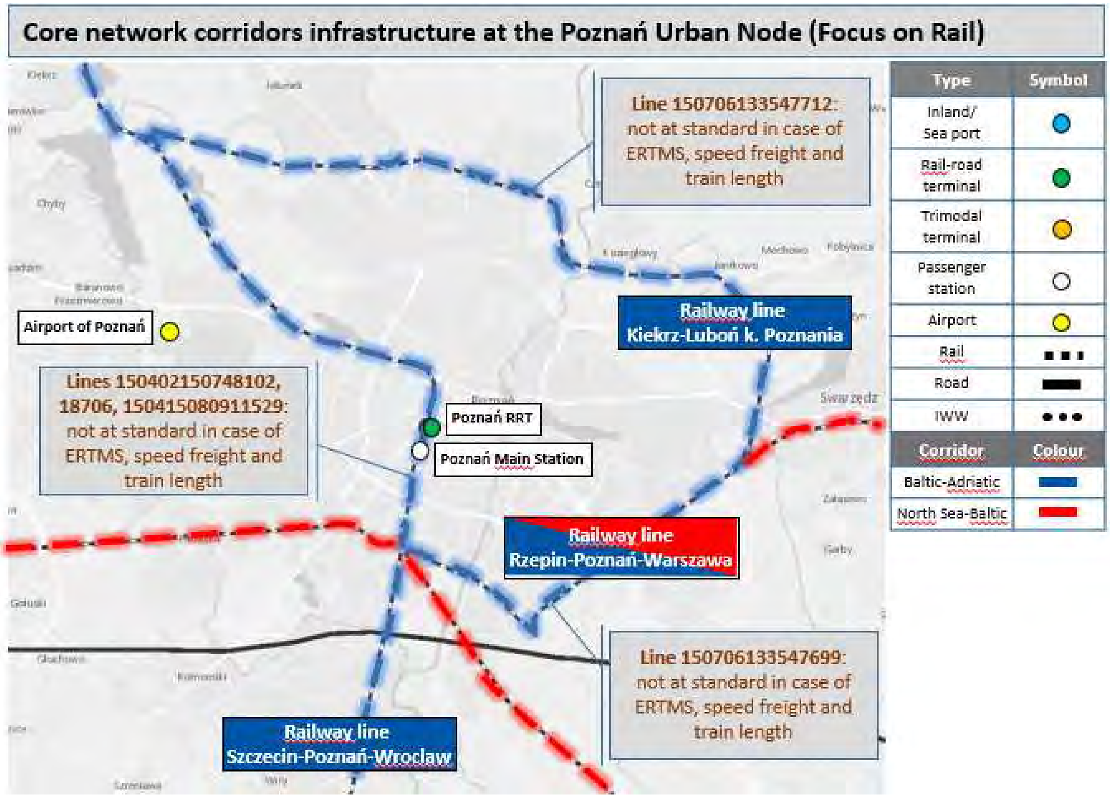
Source: Corridor Project List

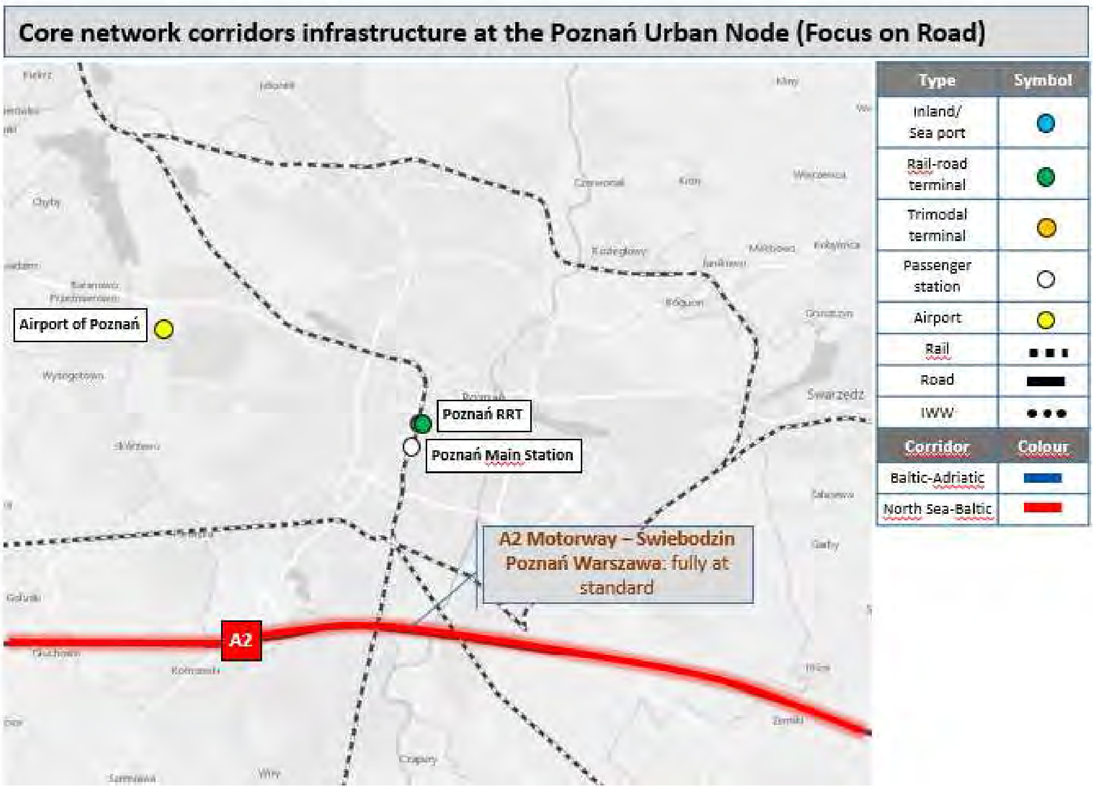
A. Description of the Action:

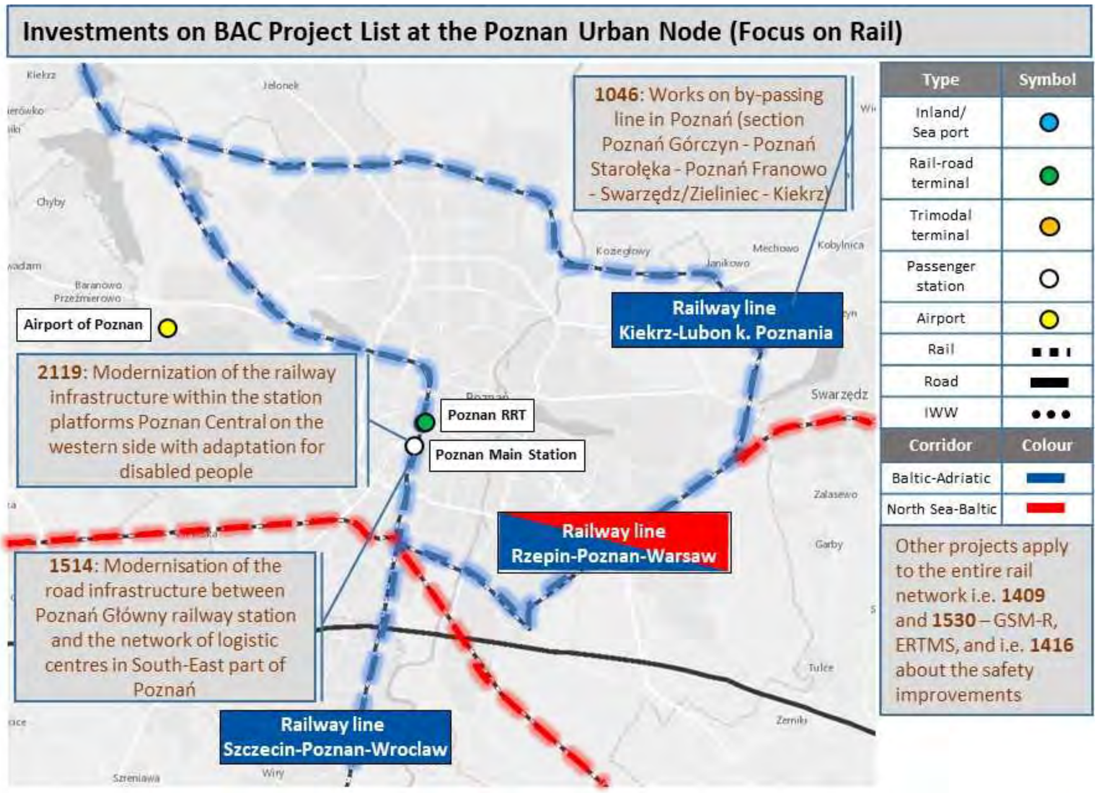
A.1. Action Title:

7.1.06 - Urban node: Poznań

A.2. Location of the action:







Source: Project fiches

A.3. Description of the action:

Member States involved: -	**Section or Node:** -	**Estimated total cost [Mio €]:** *241.8 EUR million*
Other CNC involved: -	**Implementation schedule:** *Start year: NA* *End year: NA*	**Project Promoter:** *PKP Polskie Linie Kolejowe S.A., PKP Polskie Linie Kolejowe S.A. (national rail infrastructure manager in Poland), Miasto Poznań*

The core urban node of Poznań is located on two core network corridors: Baltic-Adriatic and North-Sea Baltic. Under Baltic-Adriatic corridor, it is crossed by railway core network infrastructure only. The rail infrastructure crossing the node (sections Kiekrz – Luboń k. Poznania / Poznań Starołęka – Poznań Dębiec) is at standard with respect to electrification and axle load, but not at standard with respect to train length, speed and ERTMS. The road infrastructure crossing Poznań node is fully at standard. The main city station is Poznań Główny, which operates services to other core network urban nodes. Next to the Poznań Główny railway station coach station (Dworzec Główny PKS) is also present operating services to other urban nodes of the core network. The Poznań core urban node includes the Poznań-Ławica core airport (operating passenger services) and four rail-road terminals: CLIP Intermodal Container Terminal, Container Terminal HUB Poznań, Container Terminal Franowo, Loconi Container Terminal in Poznań. Suburban and regional services are operated from the Poznań Główny station towards the main destinations located within the Poznań Metropolitan Area and Wielkopolskie Region. Underground heavy metro is not in place, however tramway/light rail system is in operation, which ensure local interconnection to the railway and coach stations. The Poznań airport is not interconnected to the rail network. Buses are in operation, including dedicated services to the airport. Local and regional road interconnection is primarily ensured by the A2 motorway (constituting part of North Sea-Baltic corridor), S11 express road and road no. 92. This is interconnected to the main urban and metropolitan/regional roads. The core airport is directly interconnected to road no. 92 and S11 express road linking it with A2 motorway; the rail-road terminals are directly interconnected to the corridor rail network directly by or in a short distance from A2 motorway.

Park and ride facilities are not available at present. Integrated ticketing at urban as well as metropolitan/regional level for buses and rail services are available. ICT real time information for public transport services and parking and ITS systems for road traffic management are also in operation. Clean fuels are available which include electricity, CNG, and LPG as well as LNG for road transport (located in Śrem near Poznań). Hydrogen and biofuels are not available. Car sharing and bike sharing are available and in operation in the Poznań core urban node. A Sustainable Urban Mobility Plan is available. A green urban/ city logistics programme is not in operation at present.

Regarding the main critical issues which are currently affecting the node and the planned investments, the by-passing line of Poznań (Poznań Górczyn - Poznań Starołęka - Poznań Franowo - Swarzędz/Zieliniec - Kiekrz) is expected to be compliant with regard to axle load and train length as well as the passenger section Poznań Główny – Luboń k. Poznania is expected to reach improved parameters after implementation of modernisation of E59 line on section Czempiń – Poznań. The freight speed although improved may still in some cases remain under the required standard (speed may reach 80-100 km/h). ERTMS is assumed to be deployed by investments to be undertaken at the network level by the national infrastructure manager. The performance of the railway network and services at the local and regional scale is expected to be improved due the modernisation of section Poznań Górczyn - Poznań Starołęka - Poznań Franowo - Swarzędz/Zieliniec - Kiekrz, however its implementation in this time horizon depends from limited availability of financial resources, and the project implementation dates are not available at present. Some actions are planned aiming at improvement of the road infrastructure and traffic conditions in the urban node including modernisation of the road infrastructure between Poznań Główny railway station and the network of logistic centres.

Prognosis by 2030: the corridor node rail and road infrastructure is expected to be at standard with respect to all main parameters including ERTMS, although some parts of the section Poznań Starołęka – Kiekrz may partially remain below the TEN-T required speed standard (up to 80 km/h).

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
Freight lines: speed (100 km/h); Freight lines: Axle.load (22.5 t); Freight lines: train length (740m); Current or potential future capacity bottleneck

Source: Corridor Project List

B. PROJECT IMPLEMENTATION

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1046	Works on by-passing line in Poznań (section Poznań Górczyn - Poznań Starołęka - Poznań Franowo - Swarzędz/Zieliniec - Kiekrz)	PL	PKP Polskie Linie Kolejowe S.A.	Poznań - Urban Node	Infrastructure (Upgrade),	10.5	Total value in the National Railway Programme [PLN]
2119	The modernization of the railway infrastructure within the station platforms Poznan Central on the western side with adaptation for disabled people	PL	PKP Polskie Linie Kolejowe S.A. (national rail infrastructure manager in Poland)	Poznań node: Poznań Główny station upgrade	Infrastructure (Upgrade),	11.3	Total value in the National Railway Programme
1514	Modernisation of the road infrastructure between Poznań Główny railway station and the network of logistic centres in South-East part of Poznań	PL	Miasto Poznań	Poznań Urban Node	Infrastructure (Upgrade), Infrastructure (New construction),	220.0	
	TOTAL					241.8	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1046	Works on by-passing line in Poznań (section Poznań Górczyn - Poznań Starołęka - Poznań Franowo - Swarzędz/Zieliniec - Kiekrz)	PL	NA	NA		in progress	not started	NA	Land acquisition: Not completed // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: Not performed // Other: NA
2119	The modernization of the railway infrastructure within the station platforms Poznan Central on the western side with adaptation for disabled people	PL	2015	2017	concluded	concluded	in progress	78%	Land acquisition: Completed // EIA: EIA completed // Final Approval: approved // CBA: performed // Other: NA
1514	Modernisation of the road infrastructure between Poznań Główny railway station and the network of logistic centres in South-East part of Poznań	PL	2019	2022	not started	not started	not started	0%	Land acquisition: Not completed // EIA: EIA under preparation or updating // Final Approval: NA // CBA: Not performed // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR) TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1046	Works on by-passing line in Poznań (section Poznań Górczyn - Poznań Starołęka - Poznań Franowo - Swarzędz/Zieliniec - Kiekrz)	PL	1	10.5	0		
2119	The modernization of the railway infrastructure within the station platforms Poznan Central on the western side with adaptation for disabled people	PL	1	11.3	11.3		National funds
1514	Modernisation of the road infrastructure between Poznań Główny railway station and the network of logistic centres in South-East part of Poznań	PL	Residual	220.0	0		
	TOTAL			**241.8**	**11.3**		

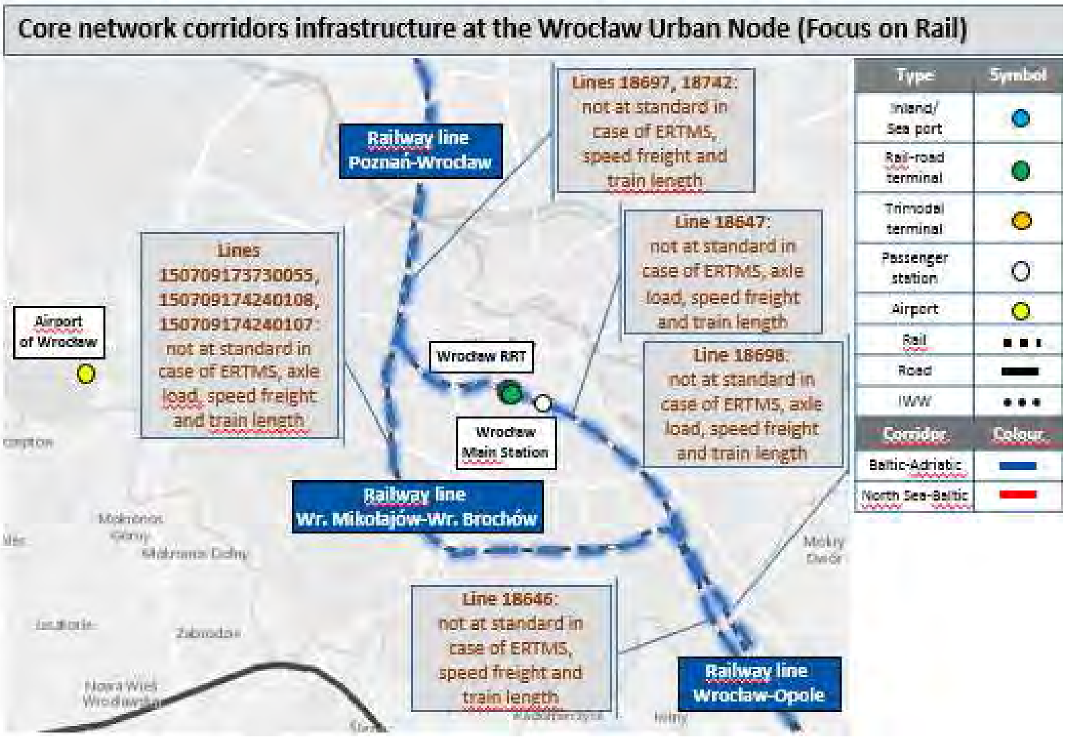
Source: Corridor Project List

A. Description of the Action:

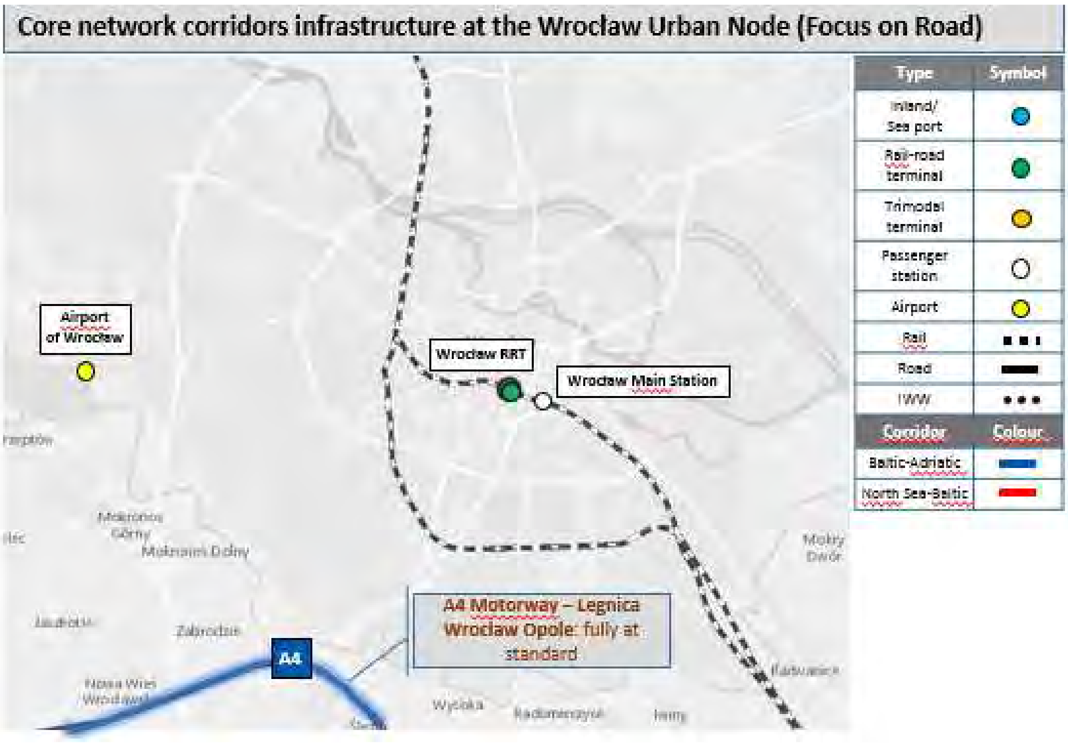
A.1. Action Title:

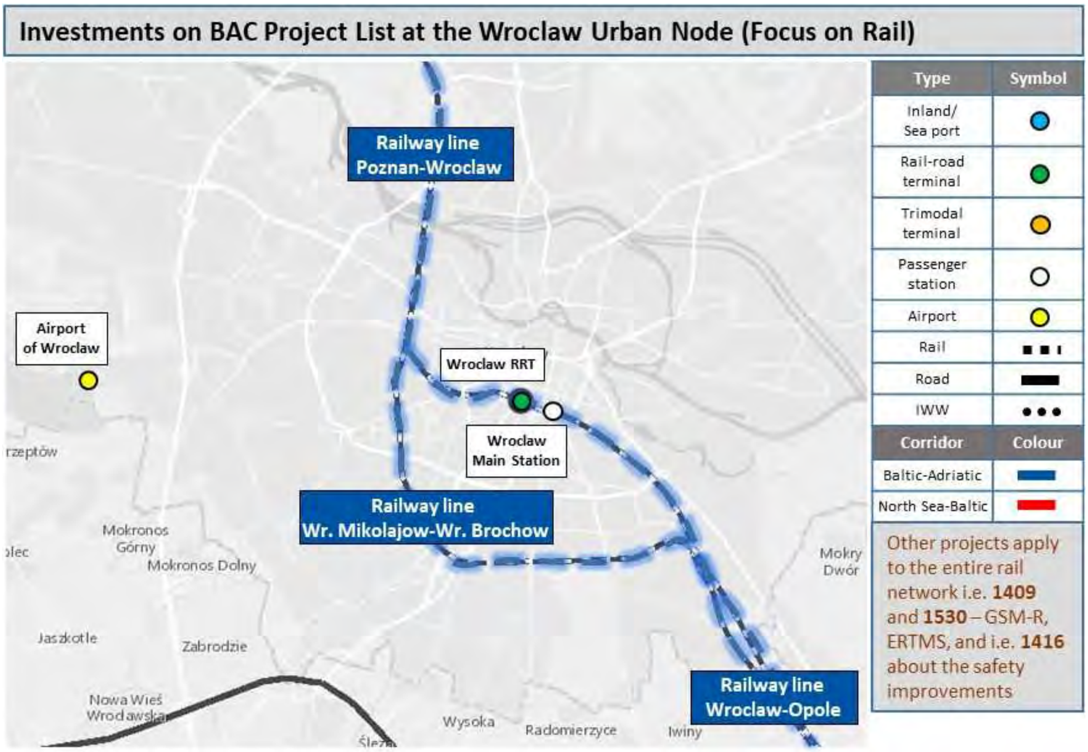
7.1.07 - Urban node: Wrocław

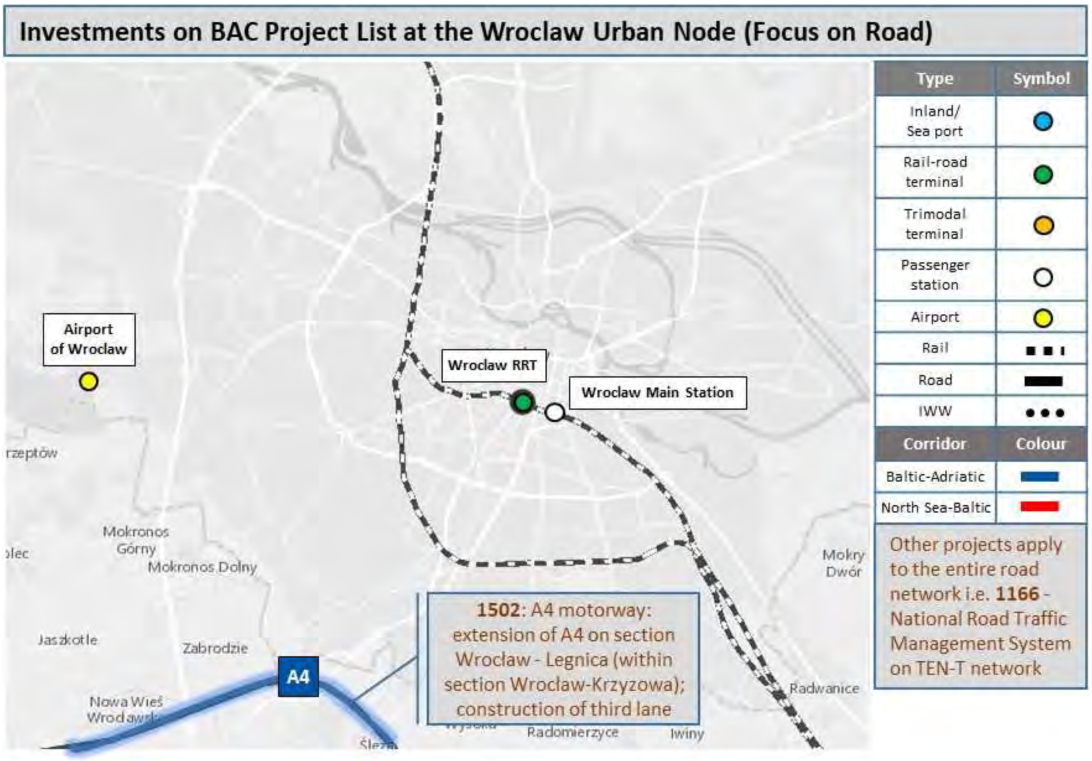
A.2. Descriptive maps of the urban node:



Source: Tplan based on TENtec







Source: Tplan based on TENtec

A.3. Description of the action:

Member States involved:	Section or Node:	Estimated total cost [Mio €]:
-	-	*- EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
-	*Start year: -* *End year: -*	-

The core urban node of Wrocław is located on the Baltic-Adriatic core network corridor. The rail infrastructure crossing the node (sections Wrocław Popowice – Wrocław Mikołajów – Wrocław Brochów) is at standard with respect to electrification, but not at standard with respect to axle load, train length, speed and ERTMS. The road infrastructure crossing the Wrocław node is fully at standard. The main city station is Wrocław Główny, which operates services to other core network urban nodes. Next to the Wrocław Główny railway station coach station (Dworzec Główny PKS) is also present operating services to other urban nodes of the core network. The Wrocław core urban node includes the Wrocław core airport (operating both passenger and cargo services) and three rail-road terminals: Polzug Container Terminal, Container Terminal PCC Brzeg Dolny and Schavemaker Terminal in Kąty Wrocławskie. Suburban and regional services are operated from the station towards the main destinations located within the Wrocław Metropolitan Area and Dolnośląskie Region. Underground heavy metro is not in place, however tramway/light rail system is in operation, which ensure local interconnection to the railway and coach stations. The Wrocław airport is not interconnected to the rail network. Buses are in operation, including dedicated services to the airports. Local and regional road interconnection is primarily ensured by the Wrocław motorway ring road (A8). This is interconnected to the main urban and metropolitan/regional roads. The core airport is directly interconnected to the ring road and very close to the A8 motorway ring road as well as A4 motorway; the rail-road terminals are directly interconnected to the corridor rail network and two out of the three are also close to the corridor A4 motorway link or its direct links.
Park and ride facilities, and integrated ticketing at urban as well as metropolitan/regional level for buses and rail services are available. ICT real time information for public transport services and parking and ITS systems for road traffic management are also in operation. Clean fuels are available which include electricity, CNG, and LPG (LNG for road transport, hydrogen and biofuels are not available). Car sharing and bike sharing are available and in operation in the Wrocław core urban node. A Sustainable Urban Mobility Plan is available. A green urban/ city logistics programme is not in operation at present.
Regarding the main critical issues which are currently affecting the node and the planned investments the freight section of Wrocław Mikołajów – Wrocław Brochów is not expected to be compliant with regard to speed and axle load by 2023 (as part of the currently under finalisation National Railway Programme). Section Wrocław Popowice – Wrocław Mikołajów is already compliant with regard to axle load and in 50% for speed. The train length is not expected to be compliant with the requirements of the regulation. ERTMS was deployed as part of modernisation of railway line E30, phase II including implementation of ERTMS/ETCS and ERTMS/GSM-R in Poland on section Legnica - Wrocław – Opole, completed in 2015. The system is however not yet in operation (therefore noted as not compliant for the moment). The performance of the railway network and services at the local and regional scale is going to be improved due the modernisation of the freight section Wrocław Mikołajów – Wrocław Brochów, expected to be completed (although not as part of BAC) after 2023.

Prognosis by 2030: the corridor node rail and road infrastructure are not expected to be at standard by 2023 with respect to all main parameters including ERTMS, the section Wrocław Popowice – Wrocław Mikołajów will partially remain below the TEN-T required speed standard (up to 80 km/h).

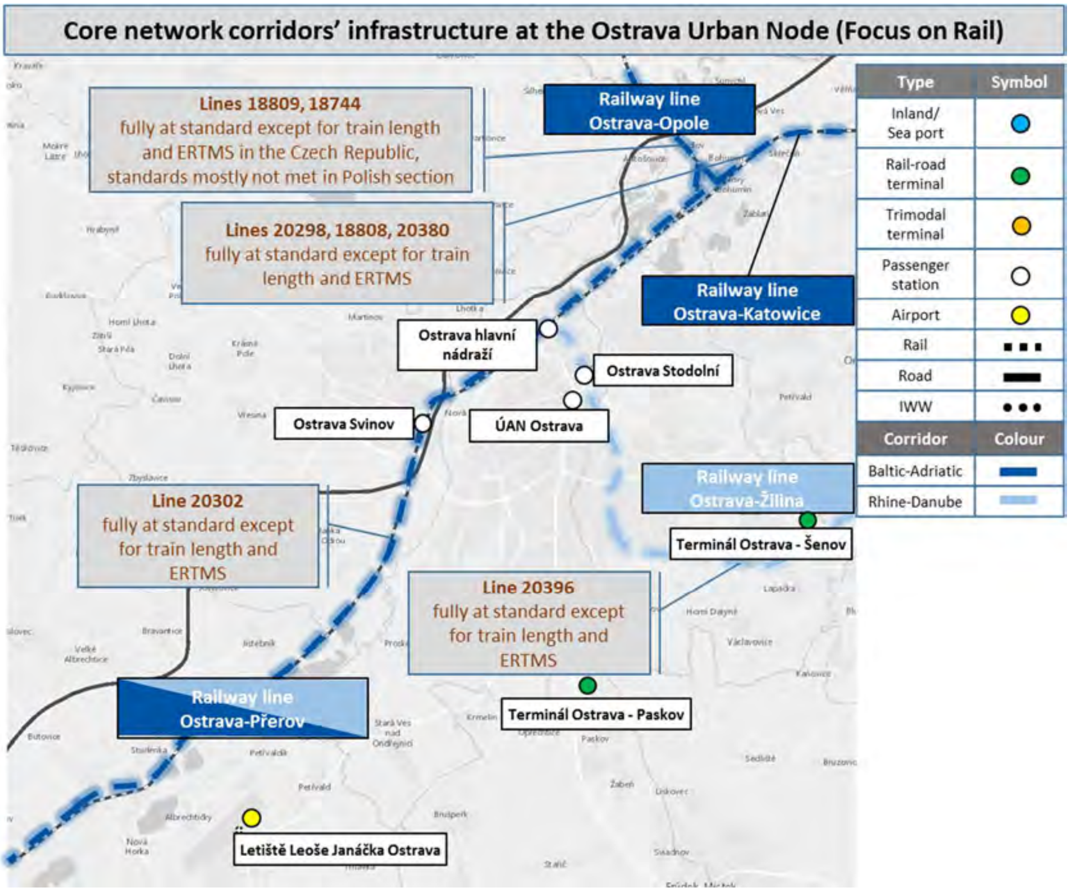
Source: BA Corridor study consortium

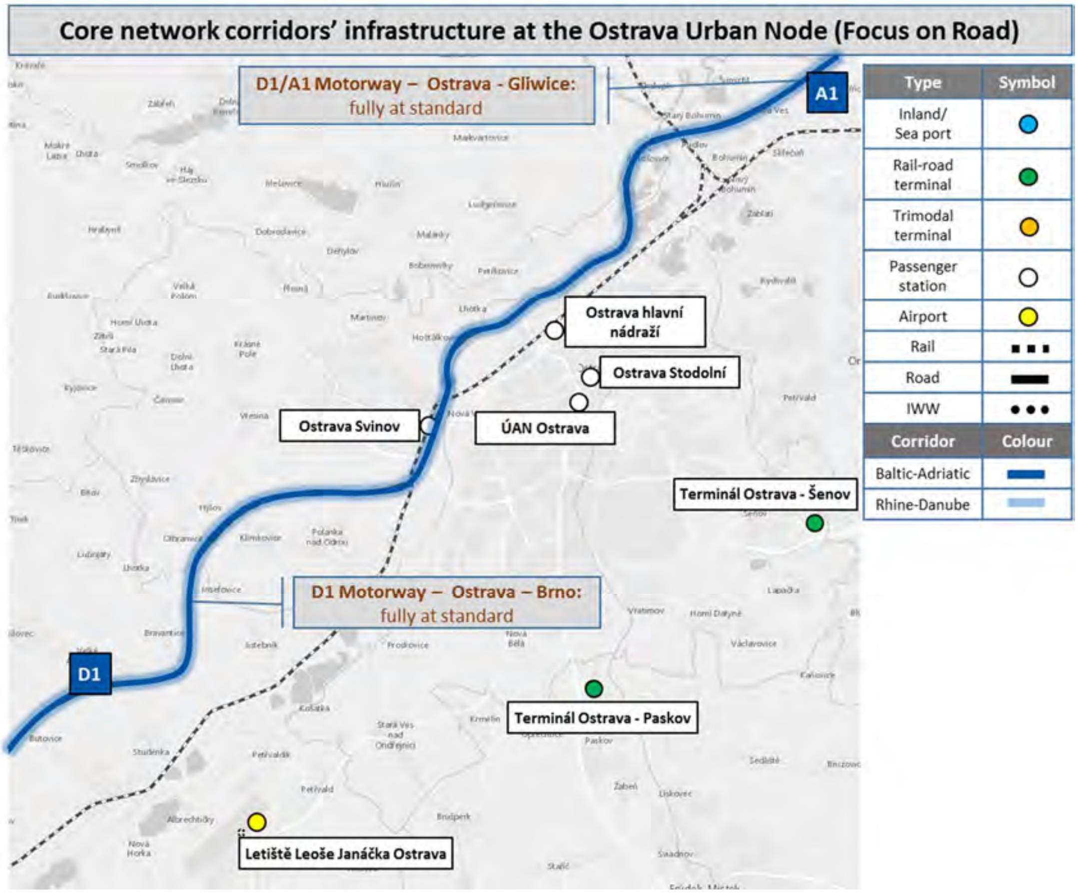
A. Description of the Action:

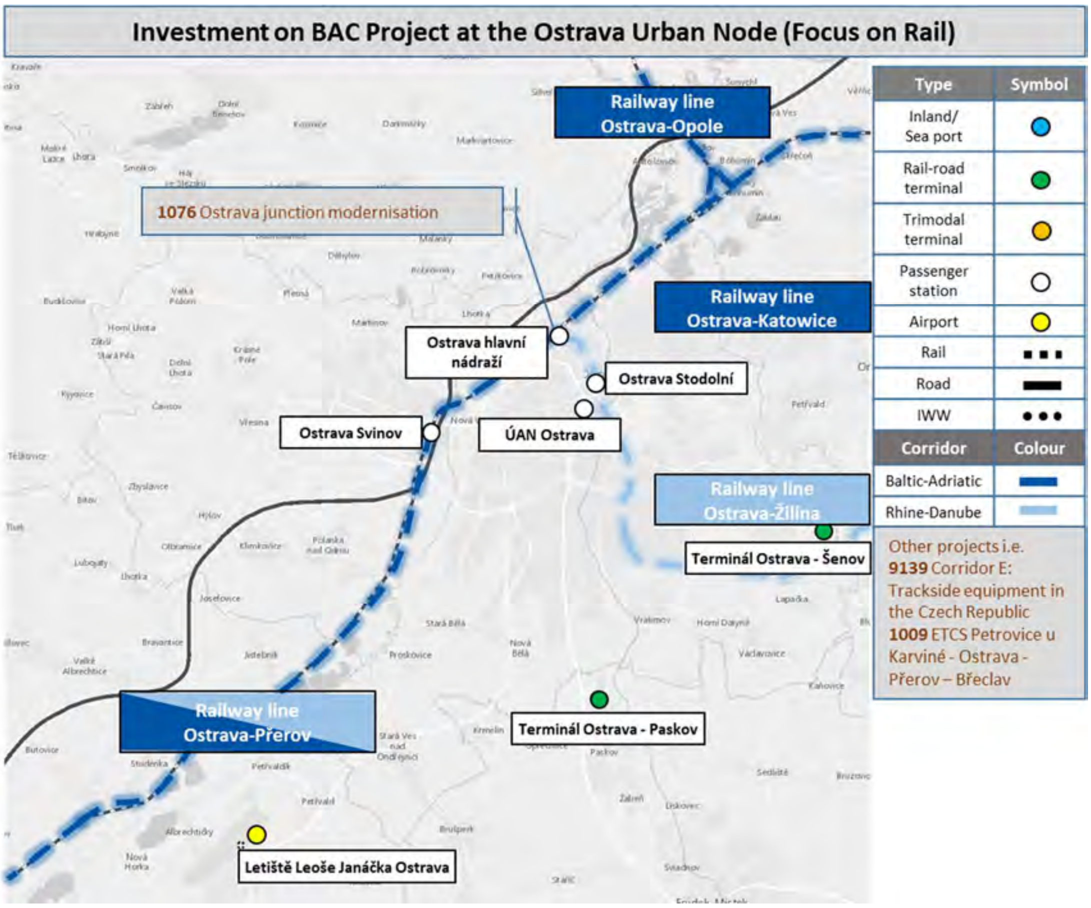
A.1. Action Title:

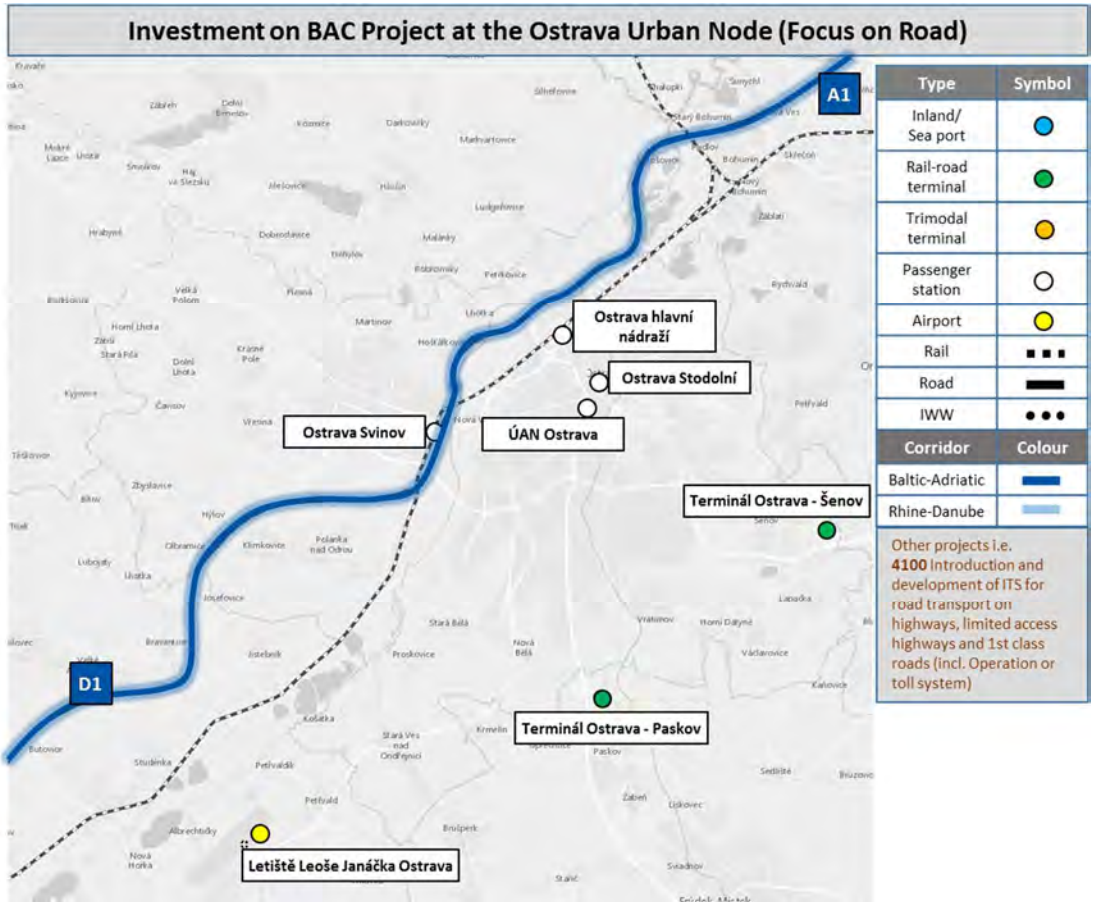
7.1.08 - Urban node: Ostrava

A.2. Location of the action:




Core network corridors' infrastructure at the Ostrava Urban Node (Focus on Road)
D1/A1 Motorway – Ostrava - Gliwice: fully at standard
A1
D1 Motorway – Ostrava – Brno: fully at standard
D1
Ostrava hlavní nádraží
Ostrava Stodolní
Ostrava Svinov
ÚAN Ostrava
Terminál Ostrava - Šenov
Terminál Ostrava - Paskov
Letiště Leoše Janáčka Ostrava
Type
Symbol
Inland/ Sea port
Rail-road terminal
Trimodal terminal
Passenger station
Airport
Rail
Road
IWW
Corridor
Colour
Baltic-Adriatic
Rhine-Danube


Investment on BAC Project at the Ostrava Urban Node (Focus on Rail)
Railway line Ostrava-Opole
1076 Ostrava junction modernisation
Railway line Ostrava-Katowice
Ostrava hlavní nádraží
Ostrava Stodolní
Ostrava Svinov
ÚAN Ostrava
Railway line Ostrava-Žilina
Terminál Ostrava - Šenov
Railway line Ostrava-Přerov
Terminál Ostrava - Paskov
Letiště Leoše Janáčka Ostrava
Type
Symbol
Inland/ Sea port
Rail-road terminal
Trimodal terminal
Passenger station
Airport
Rail
Road
IWW
Corridor
Colour
Baltic-Adriatic
Rhine-Danube
Other projects i.e. 9139 Corridor E: Trackside equipment in the Czech Republic 1009 ETCS Petrovice u Karviné - Ostrava - Přerov – Břeclav



Source: Project fiches

A.3. Description of the action:

Member States involved: *Czech Republic*	**Section or Node:** *Ostrava*	**Estimated total cost [Mio €]:** *222.2 EUR million*
Other CNC involved: *Rhine - Danube-*	**Implementation schedule:** *Start year: 2019* *End year: 2021*	**Project Promoter:** *SŽDC*

The core urban node of Ostrava is located on two core network corridors: Baltic-Adriatic and Rhine-Danube. The rail infrastructure crossing the node (Bohumín / Havířov – Ostrava – Hranice na Moravě) is overall at standard with respect to electrification, axle load and speed (although some limitations are still present at the stations within the node). The network is still not at standard in terms of ERTMS and train length. The road infrastructure crossing the node is fully at standard, although some reconstruction works caused by insufficient quality of construction works are foreseen. The main city station is Ostrava hlavní nádraží, which still waits for modernisation of railside (1076). There is also the plan to improve road access by new roads Porážková and Skladištní, construction of regional buses terminal and bus parking lot by Ostrava municipality till 2021. Another important station of express trains, Ostrava Svinov, is also present on the alignment of the Baltic-Adriatic Corridor and was completely modernised in 2006. Both stations operate services to other core network urban nodes, some express trains connect other urban core network nodes also to modern stop in the very city centre, Ostrava Stodolní on the alignment of Rhine Danube corridor. There is the plan for outlook till 2050 to construct high speed line (Praha – Brno-) Přerov – Ostrava – Katowice, but no detailed planning is being done for the time being. In addition to the railway stations a coach station Ostrava ÚAN is also present operating services to other urban nodes of the core network, main coach station is close to Ostrava střed station with regional trains services (also to three stations with other urban nodes connections). The Ostrava core urban node includes the Letiště Leoše Janáčka Ostrava core airport (8 km off the city limits) and the two rail-road terminals Ostrava Paskov and Ostrava Šenov (less than 2 km off the city limits). There are no other core or comprehensive nodes within or in the proximity of the Ostrava core urban node, closest core urban node is 100 km remote Katowice. Suburban and regional services are operated from 7 stations and 3 stops towards the main destinations located within the Ostrava Metropolitan Area and Moravian-Silesian Region and from close Bohumín railway node also to Silesian voivodeship in Poland. Tramway rail system is also in operation, which in addition to railway, ensure local interconnection to the railway and coach stations. The city does not have any underground heavy metro system, but operated also trolleybus network. The Ostrava core airport is already interconnected to the rail network; it is directly connected by means of regional services to the Ostrava Svinov and Ostrava hlavní nádraží stations (not to Ostrava Stodolní stop). Buses are also in operation, including dedicated services to the airport. Local and regional road interconnection is primarily ensured by the Ostrava highway triangle (D1, I/11, I/56). This is interconnected to the main urban and metropolitan/regional roads. The core airport is directly interconnected to the ring road and very close to the D1 motorway; the Ostrava Šenov rail-road terminals is interconnected with the corridor rail network and via I/11 expressway also to close corridor D1 motorway link. Ostrava Paskov rail-road terminal with open access is also close to the corridor motorway link D1 and interconnected with the corridor rail network, but connected to Paskov station by rather long private siding (4,6 km) which increases the operational costs of the terminal.

Park and ride facilities, and integrated ticketing at urban as well as metropolitan/regional level for buses and rail services are available. ICT real time information for public transport services and parking exists. ITS systems for road traffic management is not in operation. Clean fuels are available which include electricity, CNG, LPG and biofuels (LNG and hydrogen is not available). Car sharing is available, whereas bike sharing is not in operation in the Ostrava core urban node. A Sustainable Urban Mobility Plan is available. A green urban/ city logistics programme is not in operation at present.

Regarding the main critical issues which are currently affecting the node and the planned investments; ERTMS is assumed to be deployed by investments to be undertaken at the network level by the national infrastructure manager. The standard of the speed at the Ostrava node/station is also assumed to be increased upon completion of the planned investments which will also increase the capacity of Ostrava railway node. Noise impact will be also mitigated by means of these investments. No projects are foreseen at present to further increase the train length standard of the lines up to 740 meters. Investments on the ring road/feeder roads (I/56 and I/11) connected to BA corridor D1 motorway are also planned to solve capacity issues at the Ostrava node.

Prognosis by 2030: the corridor node rail and road infrastructure will be at standard with respect to all main parameters including ERTMS, although train length standard may be not achieved. The investments planned for the modernisation of the Ostrava railway node will increase its capacity and speed of operation but there are not deemed to improve accessibility of Ostrava Paskov existing terminal. Its situation could even worsen in connection with foreseen closure of Paskov black coal mine sharing the siding.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
Freight lines: speed (100 km/h); Freight lines: train length (740m); Current or potential future capacity bottleneck

Source: Corridor Project List

B. Project Implementation

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1076	Ostrava junction modernisation	CZ	SŽDC	Ostrava	Study, Infrastructure (Upgrade),	222.2	
	TOTAL					222	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL				ADMINISTRATIVE ISSUES
					L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	
1076	Ostrava junction modernisation	CZ	2019	2021	concluded	in progress	not started	0%	Land acquisition: Not completed // EIA: NA // Final Approval: not submitted yet // CBA: Not performed // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR)		
					TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1076	Ostrava junction modernisation	CZ	1	222.2	0		
	TOTAL			**222.2**	**0**		

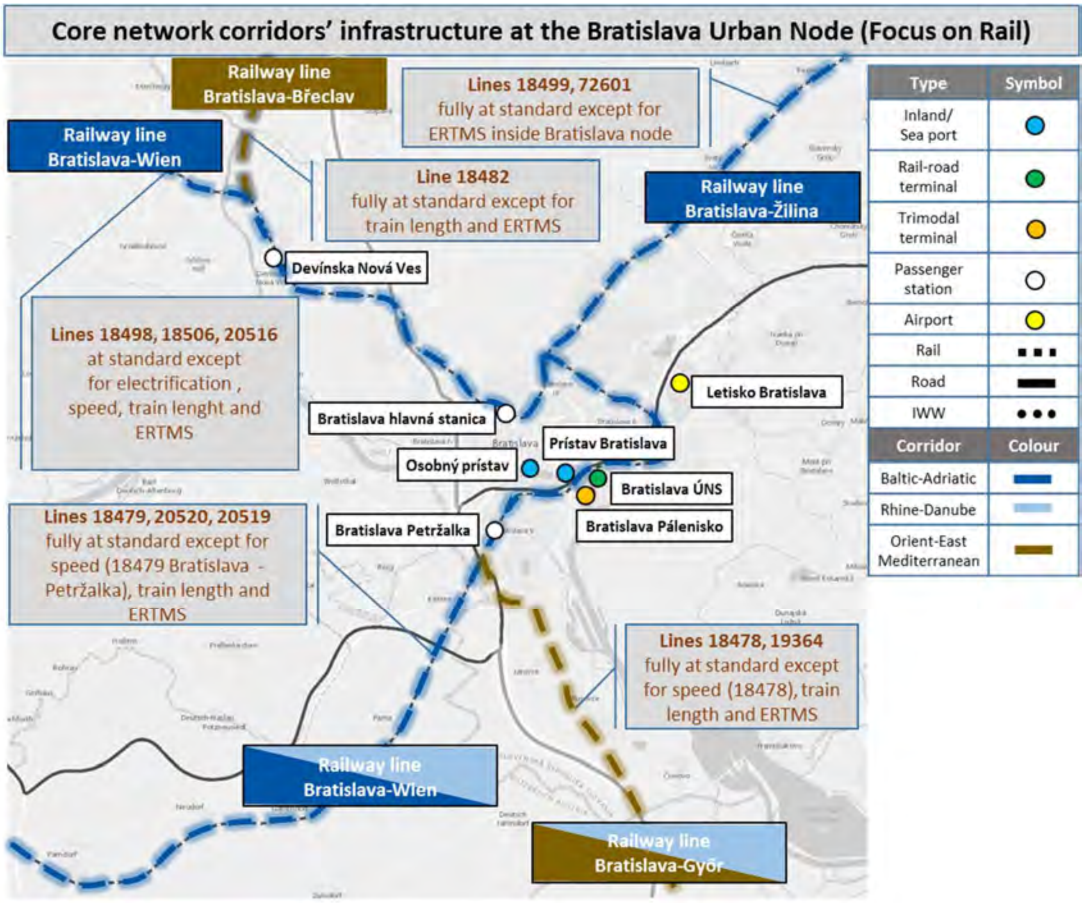
Source: Corridor Project List

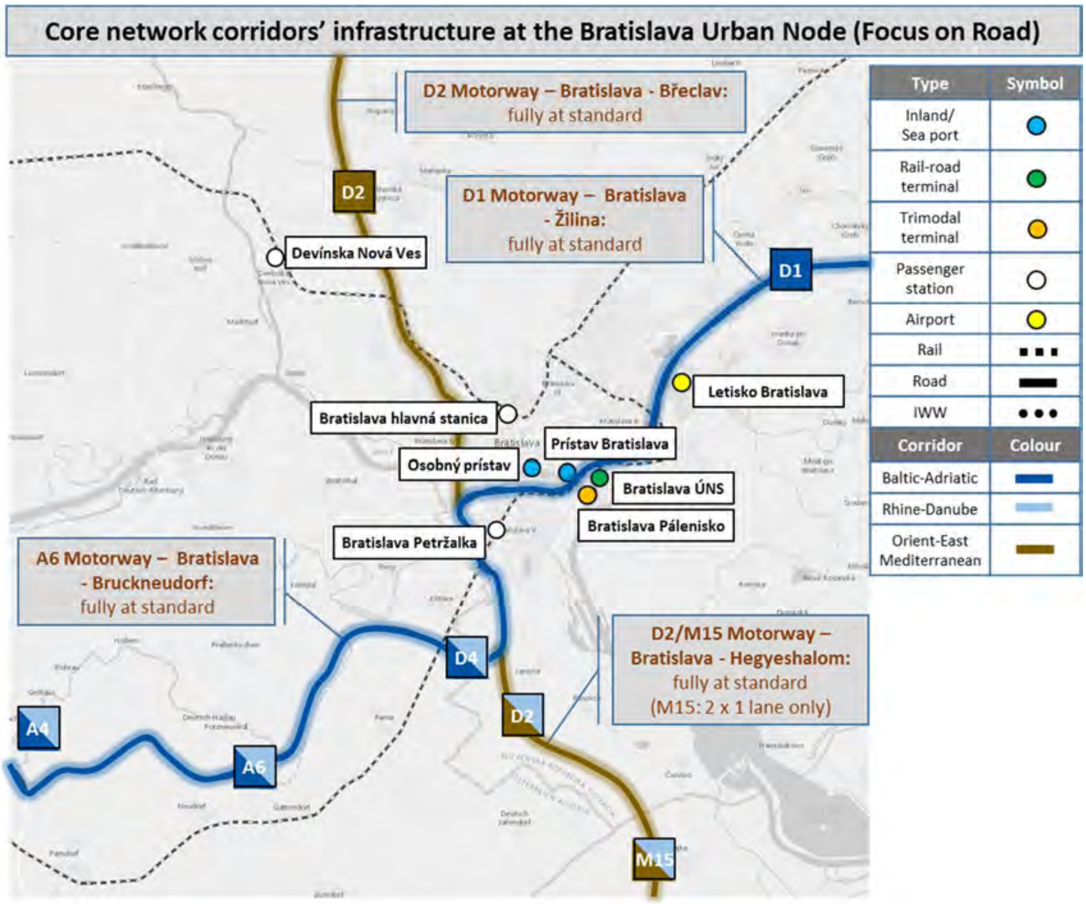
A. Description of the Action:

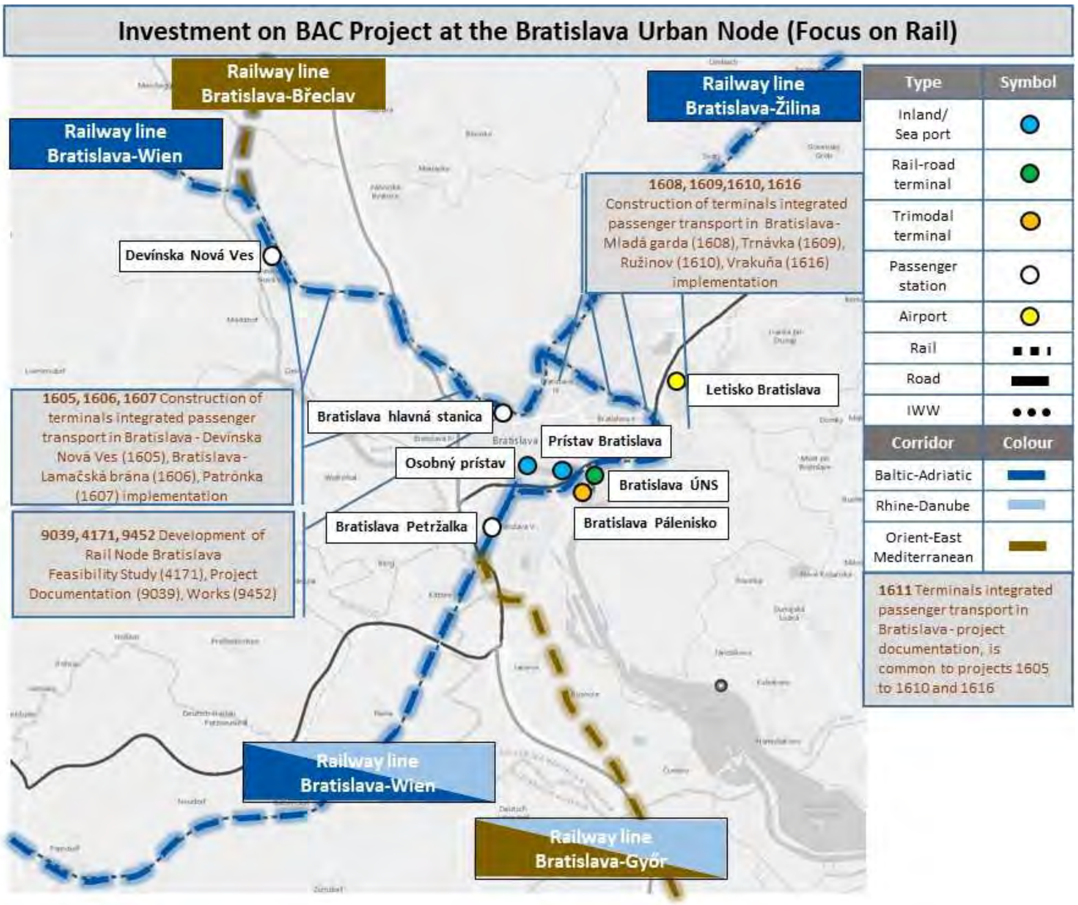
A.1. Action Title:

7.1.09 - Urban node: Bratislava

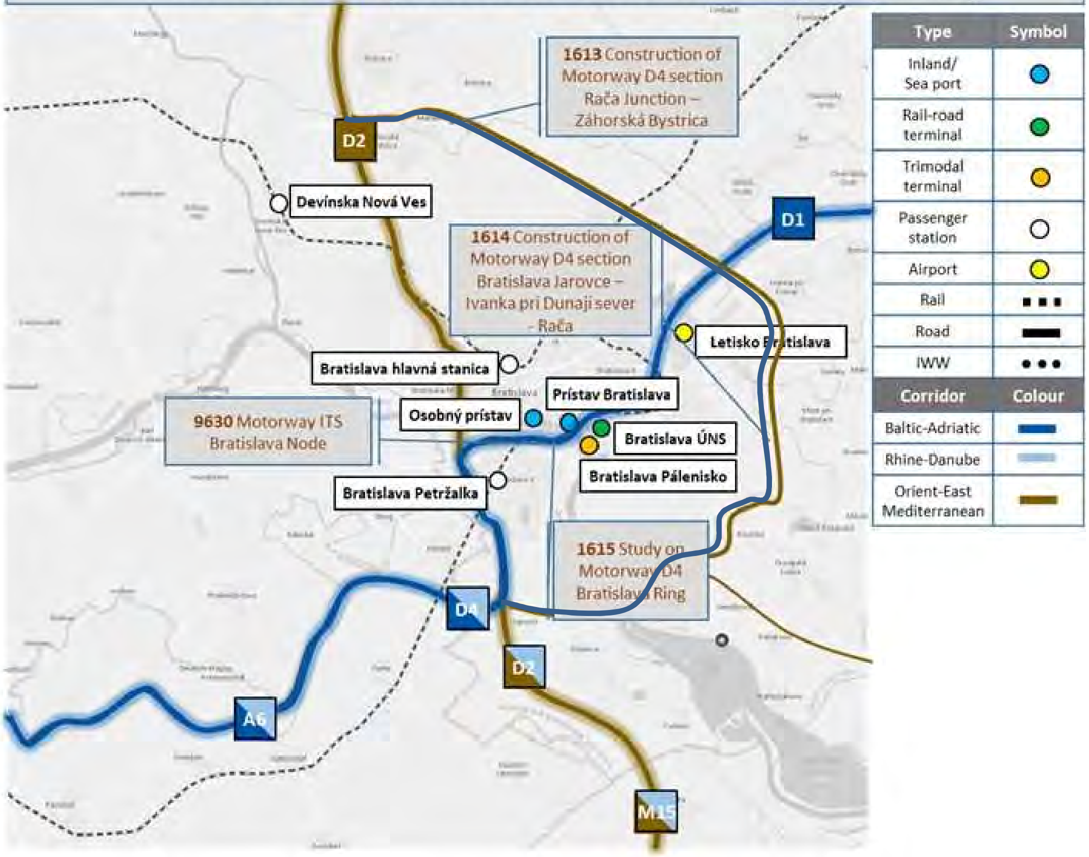
A.2. Location of the action:



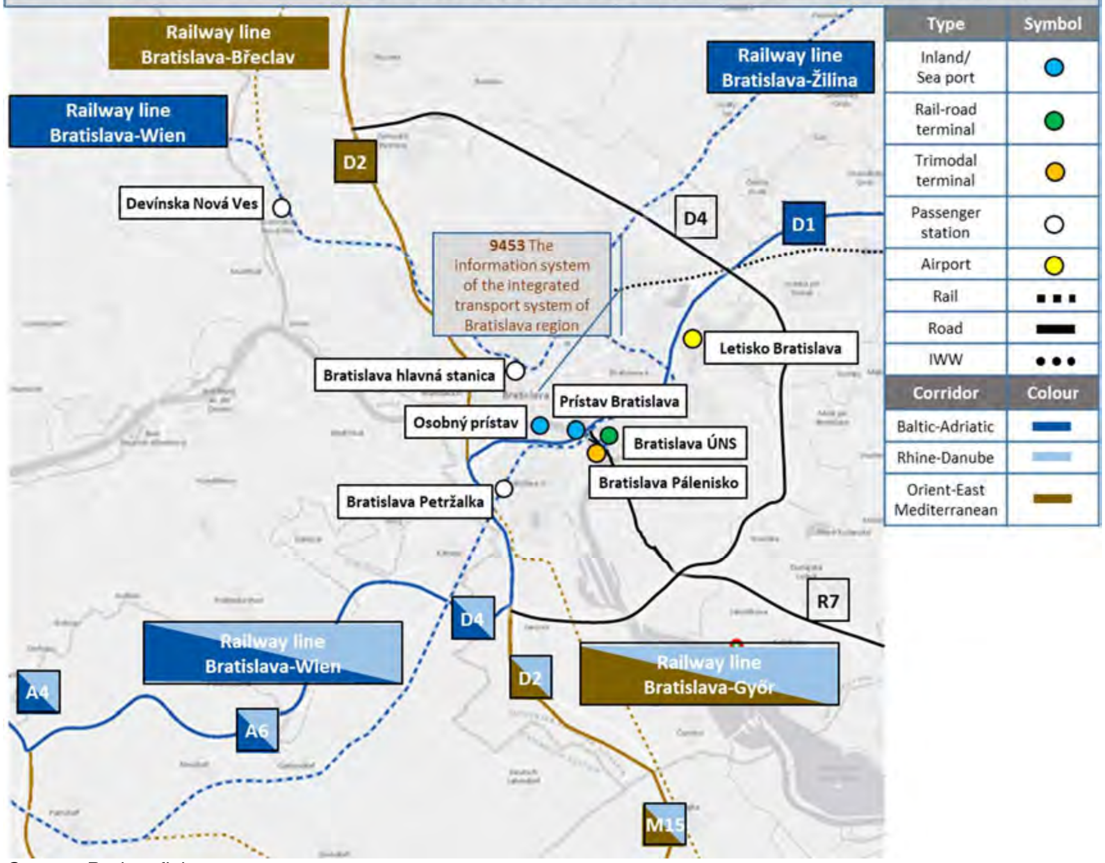

Core network corridors' infrastructure at the Bratislava Urban Node (Focus on Road)
D2 Motorway – Bratislava - Břeclav: fully at standard
D1 Motorway – Bratislava - Žilina: fully at standard
A6 Motorway – Bratislava - Bruckneudorf: fully at standard
D2/M15 Motorway – Bratislava - Hegyeshalom: fully at standard (M15: 2 x 1 lane only)
D2
D1
D4
A4
A6
M15
Devínska Nová Ves
Bratislava hlavná stanica
Letisko Bratislava
Prístav Bratislava
Osobný prístav
Bratislava ÚNS
Bratislava Pálenisko
Bratislava Petržalka
Type
Symbol
Inland/ Sea port
Rail-road terminal
Trimodal terminal
Passenger station
Airport
Rail
Road
IWW
Corridor
Colour
Baltic-Adriatic
Rhine-Danube
Orient-East Mediterranean


Investment on BAC Project at the Bratislava Urban Node (Focus on Rail)
Railway line Bratislava-Břeclav
Railway line Bratislava-Wien
Railway line Bratislava-Žilina
1608, 1609,1610, 1616 Construction of terminals integrated passenger transport in Bratislava-Mladá garda (1608), Trnávka (1609), Ružinov (1610), Vrakuňa (1616) implementation
1605, 1606, 1607 Construction of terminals integrated passenger transport in Bratislava - Devínska Nová Ves (1605), Bratislava - Lamačská brána (1606), Patrónka (1607) implementation
9039, 4171, 9452 Development of Rail Node Bratislava Feasibility Study (4171), Project Documentation (9039), Works (9452)
1611 Terminals integrated passenger transport in Bratislava - project documentation, is common to projects 1605 to 1610 and 1616
Devínska Nová Ves
Bratislava hlavná stanica
Letisko Bratislava
Prístav Bratislava
Osobný prístav
Bratislava ÚNS
Bratislava Pálenisko
Bratislava Petržalka
Railway line Bratislava-Wien
Railway line Bratislava-Győr
Type
Symbol
Inland/ Sea port
Rail-road terminal
Trimodal terminal
Passenger station
Airport
Rail
Road
IWW
Corridor
Colour
Baltic-Adriatic
Rhine-Danube
Orient-East Mediterranean

Investments on BAC Project at the Bratislava Urban Node (Focus on Road)



Investments at the Bratislava Urban Node (Core nodes and main interconnections to CNC)



Source: Project fiches

A.3. Description of the action:

Member States involved:	Section or Node:	Estimated total cost [Mio €]:
Slovakia, Austria-	*Bratislava*	*2,646.3 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
Orient/East – Med *Rhine - Danube*	*Start year: N.A.* *End year: N.A.*	*Slovak railways (ZSR), ŽSR, MDV (MoT), NDS a.s.*

The core urban node of Bratislava is located on three core network corridors: Baltic-Adriatic, Rhine-Danube and Orient-East-Mediterranean and on the border of three countries, Slovakia, Austria and Hungary, so also cross border sections of Baltic Adriatic Corridor (Action summary sheet 1.1.05.) are located on the city limits equal to state border. The rail infrastructure crossing the node and within the node is at standard in respect of electrification (with the exception of cross border passenger core TEN-T link Devínska Nová Ves – Marchegg, formally part of Action 1.1.05.) and axle load, it is partially at standard with respect to speed, it is not at standard with reference to train length and ERTMS. Complex modernisation of Bratislava node is being prepared, the extent will be defined in the feasibility study being currently elaborated (9039, 4159, 9452). ERTMS will be completed as the first action, speed and train lengths compliance will be to better till 2020 with further improvement till 2030. The road infrastructure crossing the node is fully compliant but includes some regularly congested section. The projects to increase the capacity of access motorways D1 and D2 are under construction and preparation, eastern part of motorway bypass D4 and section Bratislava – Holice of R7 feeder expressway from southeast as part of TEN-T comprehensive network (thus not part of any TEN-T corridor) are planned to be constructed till 2023. The main city station is Bratislava hlavná stanica, which needs substantial modernisation both of roadside and railside due to its insufficient capacity, speed and service quality for passengers. Another important stations on alignment of the Baltic-Adriatic Corridor are Bratislava Petržalka and Devínska Nová Ves, both with direct regional express and freight connections to urban hub Wien (Petržalka is directly connected also to Budapest, regional passenger service with transfer in Hegyeshalom and freight transport is operated). Bratislava Petržalka was modernised in 1997 including connection to Austrian electrification system 15 KV AC, 16,7 Hz, it has currently no passenger service to Slovakia, municipal bus connection to Bratislava hlavná stanica is available. Devínska Nová Ves station is used by Wien regional express and freight and regional trains to all directions including Bratislava hlavná stanica. In addition to these railway stations a coach station Bratislava AS is also present operating services to other urban nodes of the core network, main coach station is connected to railway station by municipal trolleybus and bus services. The Bratislava core urban node includes the Bratislava Airport (M.R. Štefánik airport), passenger and freight inland ports, trimodal terminal Bratislava Pálenisko and rail-road terminal Bratislava ÚNS. Wien core node is in proximity of the Bratislava core urban node, 80 km form Bratislava, but Wien airport is only 64 km from Bratislava and is used for most of air journeys from and to the city. Suburban and regional railway services are operated from 10 stations and 2 stops towards the main destinations located within the Bratislava and Trnava region and to Wien and Hegyeshalom, 7 new stops are being prepared for construction to improve the service of regional trains (1605 – 1611). Tramway system is also in operation, new track to left Danube bank to Petržalka is in operation from July 2016 with further prolongation being prepared for construction, new tram track is planned also between Šafárikovo námestie and Trnavské Mýto. The city does not have any underground heavy metro system, but operates also trolleybus network. The Bratislava core airport is connected by municipal and regional buses. Local and regional road interconnection is primarily ensured by the motorways D1, D2 and D4 creating southern city centre bypass, new eastern section of outer bypass D4 is under preparation (which is expected to be supported by the European Investment Bank and developed as a PPP initiative) together with new motorway access R7 form southeast. Major D1 motorway coming from the northeast is being upgraded to eight lanes and equipped by two new junctions enabling better access from suburban area (1173 – 1176). The motorways are interconnected to the main urban and metropolitan/regional roads. The core airport is directly interconnected to D1 motorway. Bratislava inland freight port and Bratislava Pálenisko trimodal terminal and Bratislava ÚNS rail-road terminal are directly interconnected with the corridor rail network and they are very close to D1 motorway. Bratislava passenger port is in the city centre close to D1 motorway with tram and municipal bus services.

Park and ride facilities are not existing in the city, there are being prepared for construction by three suburban railway stations. There is integrated ticketing at urban as well as metropolitan/regional level for buses and rail services are available. ICT real time information for public transport services is not available, parking ICT real time information is disposed close to particular underground parking entrances with no system interconnection. ITS systems for road traffic management is not in operation, but the project to develop ITS infrastructure is planned to be finalised in 2017. Clean fuels are available which include electricity, CNG and LPG (LNG, hydrogen and biofuels are not available). Car sharing and bike sharing are not in operation in the Bratislava core urban node. A Sustainable Urban Mobility Plan is available. A green urban/ city logistics programme is not in operation at present.

Regarding the main critical issues which are currently affecting the node and the planned investments; ERTMS is assumed to be deployed by investments to be undertaken at the network level by the national infrastructure manager till 2020-23. The standards of the speed and train lengths at the Bratislava node stations and sections is also assumed to be increased upon completion of the planned investments which will also increase the capacity of Bratislava railway node (9039, 4171, 9452, 1605 – 1611, 1616). Noise impact will be also mitigated by means of these investments. Investments on the D1 motorway and construction of D4 motorway bypass are planned to solve capacity issues at the Bratislava node.

Prognosis by 2030: the corridor node rail infrastructure will be at standard as for ERTMS, but with other main parameters only on the section Devínska Nová Ves – Bratislava hlavná stanica – Bratislava Rača, the rest of the junctions will be modernised after 2030 (section Devínska Nová Ves – Marchegg will keep the speed limit 80 km/h even after electrification and node modernisation). The road infrastructure will be at standard with respect to all main parameters and ITS installations will be deployed on the motorway network. The investments being planned for the modernisation of the Bratislava railway node will increase its capacity, speed and maximum train lengths, 7 new stops will be built and new railway station for suburban transport is foreseen. Although the plans for Airport Bratislava connection to railway network were prepared in the past, its construction within railway node modernisation is not likely. Railway connection to Wien airport at Schwechat will be available from Bratislava Petržalka once "Neue Ostbahn" railway link is constructed in Austria.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
ERTMS; Freight lines: speed (100 km/h); Freight lines: train length (740m); Current or potential future capacity bottleneck; Connection to rail

Source: Corridor Project List

B. PROJECT IMPLEMENTATION

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
4171	Rail Node Bratislava - Feasibility Study	SK	Slovak railways (ZSR)	Bratislava Node	, ERTMS	1.3	To be confirmed
9039	Rail Node Bratislava - Project Documentation	SK	Slovak railways (ZSR)	Bratislava Node	, ERTMS	25.0	
9452	Rail Node Bratislava - Works	SK	Slovak railways (ZSR)	Bratislava Node	, ERTMS	900.0	
1605	Construction of terminals integrated passenger transport in Bratislava - Devínska Nová Ves, implementation	SK	ŽSR	Bratislava	,	20.6	
1606	Construction of terminals integrated passenger transport in Bratislava - Lamačská brána, implementation	SK	ŽSR	Bratislava	,	16.5	
1607	Construction of terminals integrated passenger transport in Bratislava - Patrónka, implementation	SK	ŽSR	Bratislava	,	10.3	
1608	Construction of terminals integrated passenger transport in Bratislava - Mladá garda, implementation	SK	ŽSR	Bratislava	,	3.0	
1609	Construction of terminals integrated passenger transport in Bratislava - Trnávka, implementation	SK	ŽSR	Bratislava	,	8.6	
1610	Construction of terminals integrated passenger transport in Bratislava - Ružinov, implementation	SK	ŽSR	Bratislava	,	4.5	
1616	Construction of terminals integrated passenger transport in Bratislava - Vrakuňa, implementation	SK	ŽSR	Bratislava	,	3.0	
1611	Terminals integrated passenger transport in Bratislava - project documentation	SK	ŽSR	Bratislava	,	1.0	
1613	Construction of Motorway D4 section Rača Junction – Záhorská Bystrica	SK	MDV (MoT)	Bratislava	,	740.8	To be confirmed
1614	Construction of Motorway D4 section Bratislava Jarovce – Ivanka pri Dunaji sever - Rača	SK	MDV (MoT)	Bratislava	,	860.0	To be confirmed
1615	Study on Motorway D4 Bratislava Ring	SK	MDV (MoT)	Bratislava	,	22.5	To be confirmed
9630	Motorway ITS Bratislava Node	SK	NDS a.s.	Bratislava	, IST	24.5	
9453	The information system of the integrated transport system of Bratislava region	SK	ŽSR	Bratislava	, OTHER	4.7	
	TOTAL					**2,646.3**	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
4171	Rail Node Bratislava - Feasibility Study	SK	2016	2018		in progress	not started	41%	Land acquisition: NA // EIA: NA // Final Approval: approved // CBA: Not performed // Other: NA
9039	Rail Node Bratislava - Project Documentation	SK	2018	2019		not started	not started	0%	Land acquisition: NA // EIA: NA // Final Approval: not submitted yet // CBA: Not performed // Other: NA
9452	Rail Node Bratislava - Works	SK	2020	2030		in progress	not started	0%	Land acquisition: Not completed // EIA: NA // Final Approval: not submitted yet // CBA: Not performed // Other: NA
1605	Construction of terminals integrated passenger transport in Bratislava - Devínska Nová Ves, implementation	SK	2017	2020		concluded	concluded	6%	Land acquisition: Not completed // EIA: EIA completed // Final Approval: not submitted yet // CBA: Performed // Other: NA
1606	Construction of terminals integrated passenger transport in Bratislava - Lamačská brána, implementation	SK	2017	2021		concluded	concluded	5%	Land acquisition: Not completed // EIA: EIA completed // Final Approval: not submitted yet // CBA: Performed // Other: NA
1607	Construction of terminals integrated passenger transport in Bratislava - Patrónka, implementation	SK	2017	2021		concluded	concluded	0%	Land acquisition: Not completed // EIA: EIA completed // Final Approval: not submitted yet // CBA: Performed // Other: NA
1608	Construction of terminals integrated passenger transport in Bratislava - Mladá garda, implementation	SK	2021	2023		concluded	concluded	0%	Land acquisition: Not completed // EIA: EIA completed // Final Approval: not submitted yet // CBA: Performed // Other: NA
1609	Construction of terminals integrated passenger transport in Bratislava - Trnávka, implementation	SK	2020	2021		concluded	concluded	5%	Land acquisition: Not completed // EIA: EIA completed // Final Approval: not submitted yet // CBA: Performed // Other: NA
1610	Construction of terminals integrated passenger transport in Bratislava - Ružinov, implementation	SK	2020	2020		concluded	concluded	6%	Land acquisition: Not completed // EIA: EIA completed // Final Approval: not submitted yet // CBA: Performed // Other: NA
1616	Construction of terminals integrated passenger transport in Bratislava - Vrakuňa, implementation	SK	2018	2020		concluded	concluded	0%	Land acquisition: Not completed // EIA: EIA completed // Final Approval: not submitted yet // CBA: Performed // Other: NA
1611	Terminals integrated passenger transport in Bratislava - project documentation	SK	2014	2020		concluded		54%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1613	Construction of Motorway D4 section Rača Junction – Záhorská Bystrica	SK	2018	2023	concluded	concluded	not started	0%	Land acquisition: Not completed // EIA: EIA approved // Final Approval: not submitted yet // CBA: Performed // Other: NA
1614	Construction of Motorway D4 section Bratislava Jarovce – Ivanka pri Dunaji sever - Rača	SK	2016	2020	concluded	concluded	concluded	24%	Land acquisition: Not completed // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: Not performed // Other: NA
1615	Study on Motorway D4 Bratislava Ring	SK	2014	2020				46%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
9630	Motorway ITS Bratislava Node	SK	2015	2017				74%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
9453	The information system of the integrated transport system of Bratislava region	SK	2018	2020				2%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR)		
					TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
4171	Rail Node Bratislava - Feasibility Study	SK		1.3	0		
9039	Rail Node Bratislava - Project Documentation	SK		25.0	0		
9452	Rail Node Bratislava - Works	SK	1	900.0	0		
1605	Construction of terminals integrated passenger transport in Bratislava - Devínska Nová Ves, implementation	SK	Residual	20.6	0		
1606	Construction of terminals integrated passenger transport in Bratislava - Lamačská brána, implementation	SK	Residual	16.5	0		
1607	Construction of terminals integrated passenger transport in Bratislava - Patrónka, implementation	SK	Residual	10.3	0		
1608	Construction of terminals integrated passenger transport in Bratislava - Mladá garda, implementation	SK	Residual	3.0	0		
1609	Construction of terminals integrated passenger transport in Bratislava - Trnávka, implementation	SK	Residual	8.6	0		
1610	Construction of terminals integrated passenger transport in Bratislava - Ružinov, implementation	SK	Residual	4.5	0		
1616	Construction of terminals integrated passenger transport in Bratislava - Vrakuňa, implementation	SK	Residual	3.0	0		
1611	Terminals integrated passenger transport in Bratislava - project documentation	SK		1.0	0		
1613	Construction of Motorway D4 section Rača Junction – Záhorská Bystrica	SK	3	740.8	0		
1614	Construction of Motorway D4 section Bratislava Jarovce – Ivanka pri Dunaji sever - Rača	SK	3	860.0	0		
1615	Study on Motorway D4 Bratislava Ring	SK		22.5	0		
9630	Motorway ITS Bratislava Node	SK	2	24.5	0		
9453	The information system of the integrated transport system of Bratislava region	SK	2	4.7	0		
	TOTAL			**2,646.3**	**0**		

Source: Corridor Project List

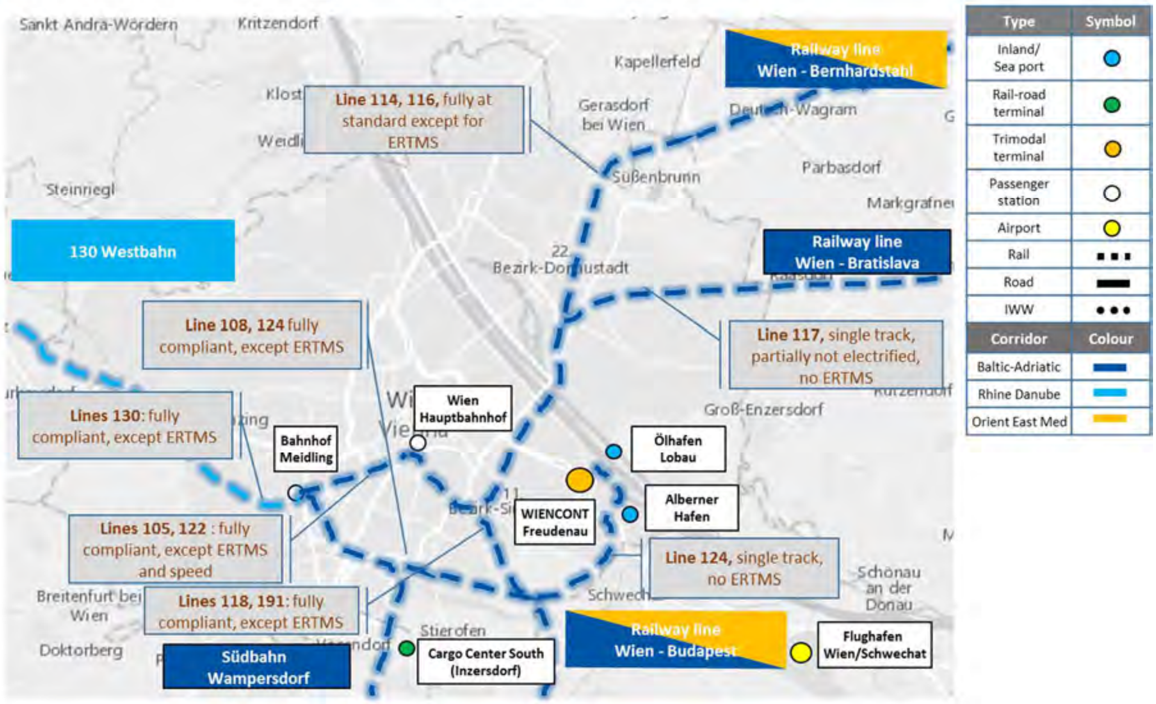
A. Description of the Action:

A.1. Action Title:

7.1.10 - Urban node: Vienna

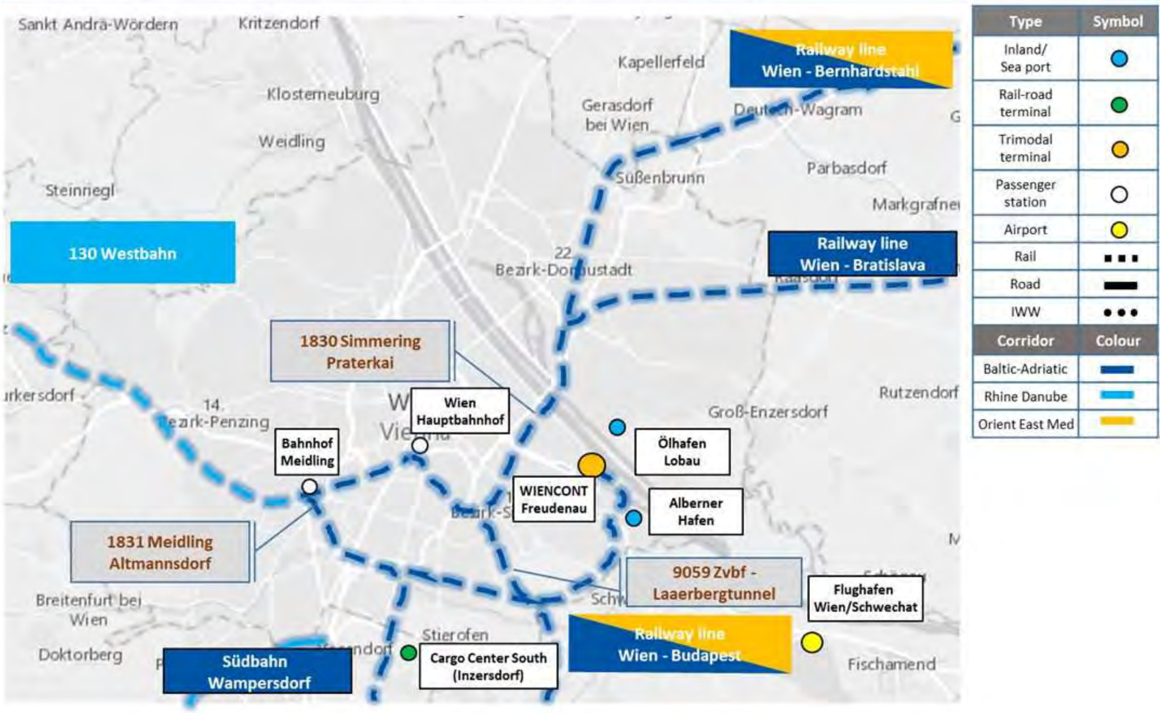
A.2. Location of the action:

Core network corridors' infrastructure at the Wien Urban Node (Focus on Rail)

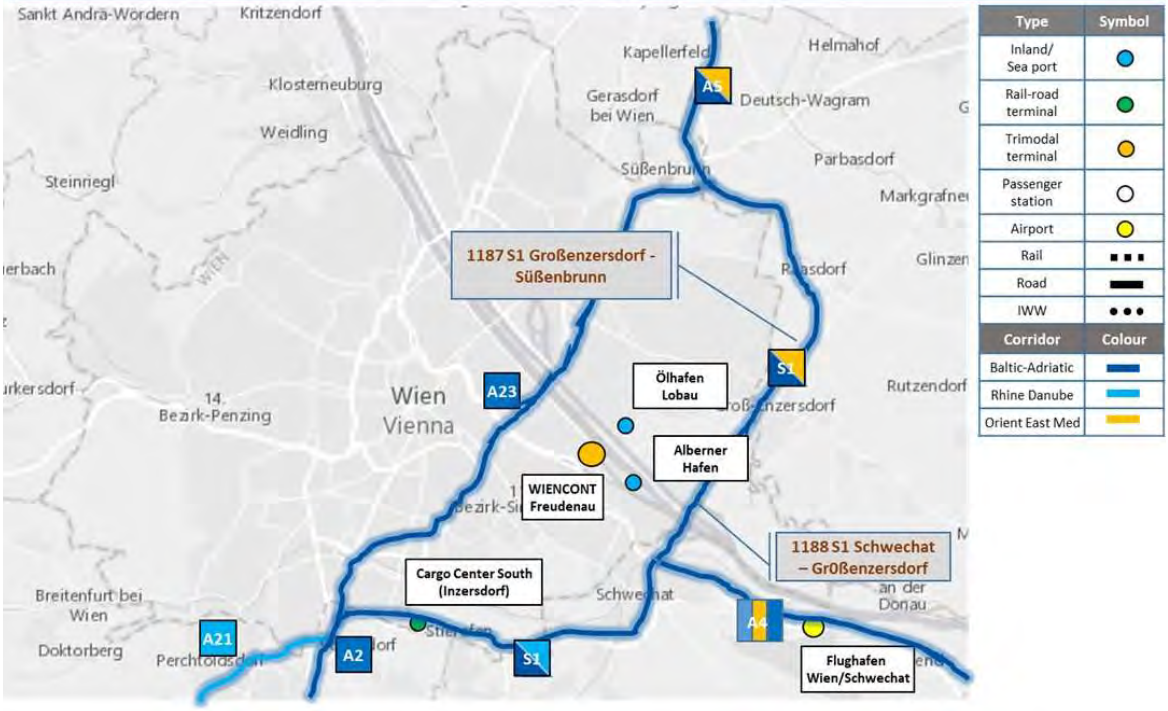


Core network corridors' infrastructure at the Wien Urban Node (Focus on Road)

Investments on BAC Project List at the Wien Urban Node (Focus on Rail)



Investments on BAC Project List at the Wien Urban Node (Focus on Road)



Source: Project fiches

A.3. Description of the action:

Member States involved:	Section or Node:	Estimated total cost [Mio €]:
-	-	*1,927.8 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
-	*Start year: 2003* *End year: 2037*	*ÖBB-Infrastruktur AG, ASFINAG (Austrian Road Infrastructure Manager)*

The core urban node of Vienna is located on three core network corridors: Baltic-Adriatic, Rhine-Danube and Orient-East-Mediterranean.

The rail infrastructure crossing the node and within the node is at standard with respect to electrification and axle load and speed; partially at standard with respect to speed, train length and ERTMS. Efforts are on-going to improve compliance in these areas, investing in upgrading existing lines such as the "Nordbahn" connecting Süßenbrunn to Berhardsthal (1098) and Stadlau to Marchegg (1093). Within the urban node proper, ETCS deployment in the gap between the Westbahn and Ostbahn is foreseen as well as the deployment of ETCS on the section between Wien and Süßenbrunn (1807); measures to integrate existing interlocking, signalling and dispatching centers in support of ERTMS are also relevant in this regard. (1810, 9465)

The recently completed Vienna Central Railway station (Hauptbahnhof Wien) is a high-performance north-south and east-west connection hub. It is accessible to regional, national, and international transport and serves as a main junction within the trans-European rail network. As part of this project not only railway infrastructure – 100km of tracks, 300 switches, several bridges and noise protection installations - has been put in place but also surrounding urban zones (Südtirolerplatz) have been reconstructed. Vienna's Central Railway station is accessible via underground metro, suburban railway, regional railway and streetcars. Urban, regional, national and international bus services provide road connectivity.

Other railroad terminals in the Vienna node include the "Franz-Josefs Bahnhof" and the "Wien Westbahnhof", both terminus type of stations and "Wien/Meidling". Via the latter not only main passenger connections between the western parts of Austria are routed, but also future southbound freight trains towards the Vienna Cargo South railroad terminal (1371) will use this station. To address existing bottlenecks, an upgrade of an existing section connecting "Wien Meidling" with the junction in Altmannsdorf to double track is planned. (1831)

Further improvements in the railroad infrastructure of this urban node include the construction of the Laaerberg tunnel connecting the Vienna Central Marshalling yard (Wien Zvbf) with the Kledering junction and an upgrade of the sections connecting Kledering with Achau. The latter will strengthen the freight rail connection between Vienna's Central Railway ("Hauptbahnhof Wien") station to Wiener Neustadt and Sopron, feeding into the Pottendorfer line.

Regarding connectivity to the corridors road network, the urban node of Vienna has no compliance issues. Considering the unabated increase in traffic in Vienna and its surroundings, capacity issues have to be addressed. In particular congestion on the circular road network, the A23 motorway, is a challenge. Currently the A23 is part of the S1 motorway, connecting the southbound A2 with the northbound A5 motorways. To relieve the congestion in the urban area on the A23, two new projects related to construct an alternative route are planned. The first will extend the existing S1 motorway from Großenzersdorf to Süßenbrunn (1187), the second will connect Süßenbrunn with Schwechat via a tunnel underneath the river Danube. (1188)

Park and ride facilities, integrated ticketing at urban as well as metropolitan/regional level for buses and rail services are available. ICT real time information for public transport services and parking and ITS systems for road traffic management on motorways are in place.

Clean fuels are available which include electricity, LPG and hydrogen for road transport. As of 2015 Vienna offers 21 electric charging stations, one hydrogen and one LPG refuelling station. Car sharing and bike sharing are also operation in the Vienna urban node.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
Current or potential future capacity bottleneck; Single track section

Source: Corridor Project List

B. Project Implementation

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1831	Upgrade Wien Meidling / Altmannsdorf	AT	ÖBB-Infrastruktur AG	Wien Meidling - Wien Inzersdorf	Infrastructure (Upgrade),	44.6	valorised costs (2,5%)
9059	Wien Zvbf Rail Freight Station - Alignment optimization of exit lines	AT	ÖBB-Infrastruktur AG	Wien Node; (Wien ZVB Nord - Kledering)	Infrastructure (Upgrade),	To be defined	
1830	Extension Wien Erdberger Lände Rail Bridge (section Wien Simmering - Wien Praterkai)	AT	ÖBB-Infrastruktur AG	Wien Node	Infrastructure (Upgrade),	To be defined	valorised costs (2,5%)
1187	S1 - Vienna Outer Ring Expressway - Schwechat - Süßenbrunn (1st part: Großenzersdorf - Süßenbrunn)	AT	ASFINAG (Austrian Road Infrastructure Manager)	Schwechat - Eibesbrunn	Study, Infrastructure (New construction),	271.1	valorised costs (2,5%)
1188	S1 - Vienna Outer Ring Expressway - Schwechat - Süßenbrunn (2nd part: Schwechat - Großenzersdorf)	AT	ASFINAG (Austrian Road Infrastructure Manager)	Schwechat - Eibesbrunn	Study, Infrastructure (New construction),	1,612.1	valorised costs (2,5%)
	TOTAL					**1,927.8**	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL: L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1831	Upgrade Wien Meidling / Altmannsdorf	AT	2016	2023		concluded		15%	Land acquisition: Not completed // EIA: NA // Final Approval: NA // CBA: Performed // Other: not required
9059	Wien Zvbf Rail Freight Station - Alignment optimization of exit lines	AT	2029	2037	in progress	in progress	not started	0%	Land acquisition: not required // EIA: not required // Final Approval: not submitted yet // CBA: Performed // Other: not required
1830	Extension Wien Erdberger Lände Rail Bridge (section Wien Simmering - Wien Praterkai)	AT	2030	2034	not started	not started	not started	0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: Performed // Other: not required
1187	S1 - Vienna Outer Ring Expressway - Schwechat - Süßenbrunn (1st part: Großenzersdorf - Süßenbrunn)	AT	2003	2020	concluded	concluded	concluded	79%	Land acquisition: Not completed // EIA: EIA completed // Final Approval: not submitted yet // CBA: Performed // Other: not required
1188	S1 - Vienna Outer Ring Expressway - Schwechat - Süßenbrunn (2nd part: Schwechat - Großenzersdorf)	AT	2003	2025	concluded	concluded	concluded	63%	Land acquisition: Not completed // EIA: EIA completed // Final Approval: not submitted yet // CBA: Performed // Other: not required

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR): TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1831	Upgrade Wien Meidling / Altmannsdorf	AT	1	44.6	44.6	44.6	Rahmenplan 2017-22
9059	Wien Zvbf Rail Freight Station - Alignment optimization of exit lines	AT	1	To be defined	0		
1830	Extension Wien Erdberger Lände Rail Bridge (section Wien Simmering - Wien Praterkai)	AT	1	To be defined	0		
1187	S1 - Vienna Outer Ring Expressway - Schwechat - Süßenbrunn (1st part: Großenzersdorf - Süßenbrunn)	AT	3	271.1	271.1	271.1	cash flow (ASFINAG)
1188	S1 - Vienna Outer Ring Expressway - Schwechat - Süßenbrunn (2nd part: Schwechat - Großenzersdorf)	AT	3	1,612.1	1,612.1	1,612.1	cash flow (ASFINAG)
	TOTAL			**1,927.8**	**1,927.8**		

Source: Corridor Project List

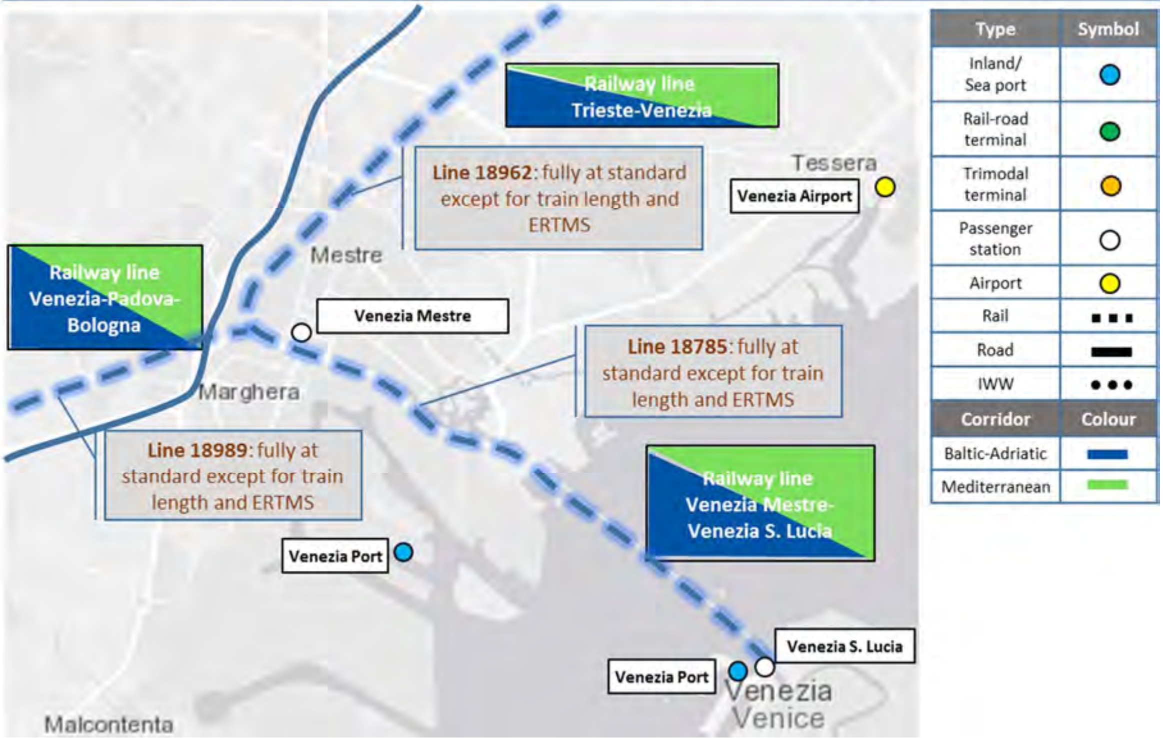
A. Description of the Action:

A.1. Action Title:

7.1.11 - Urban node: Venice

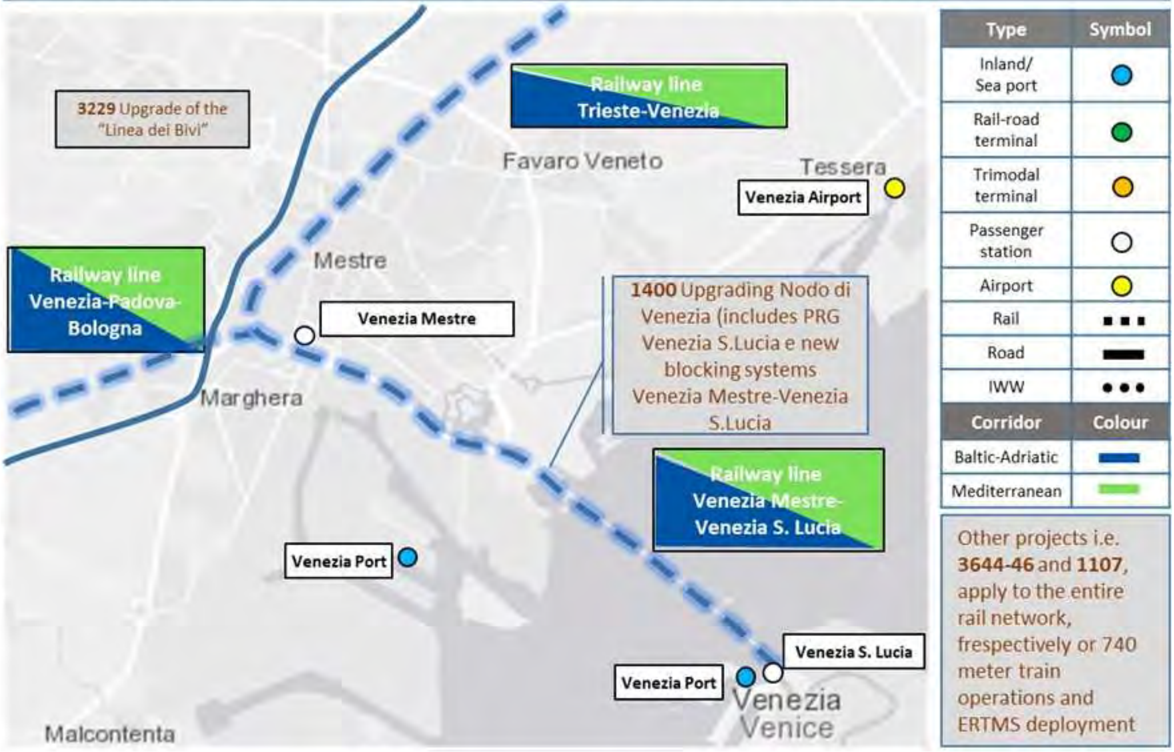
A.2. Location of the action:

Core network corridors' infrastructure at the Venezia Urban Node (Focus on Rail)



Core network corridors' infrastructure at the Venezia Urban Node (Focus on Road)

Investments on BAC Project List at the Venezia Urban Node (Focus on Rail)



Investments on BAC Project List at the Venezia Urban Node (Focus on Road)

Investments at the Venezia Urban Node (Core nodes and main interconnections to CNC)

Source: Project fiches

A.3. Description of the action:

Member States involved: -	**Section or Node:** -	**Estimated total cost [Mio €]:** *720.0 EUR million*
Other CNC involved: -	**Implementation schedule:** *Start year: NA* *End year: NA*	**Project Promoter:** *RFI S.p.A., ANAS S.p.A.*

The core urban node of Venezia is located on two core network corridors: Baltic-Adriatic and Mediterranean. The rail infrastructure crossing the node (TENtec sections Portogruaro – Venezia Mestre, Venezia Mestre – Venezia S. Lucia and Venezia Mestre – Padova) is overall at standard with respect to electrification, axle load and speed. It is not at standard in terms of ERTMS and train length. The road infrastructure crossing the node is fully at standard. The Venezia Mestre (through type) and Venezia S. Lucia (termini type) stations are the main stations in the node operating both conventional and high speed services. There are no other stations in the node operating national and international services to other core network urban nodes. In addition to railway transport, national and international coach services are also operated to and from Mestre and Venezia towards other core network nodes. The Venezia core urban node includes the Marco Polo core airport (operating both passenger and cargo services) and the core port of Venezia. The Venezia-Treviso airport is also worth mentioning in the proximity of the Venezia core urban node. Suburban and regional services are operated from the main stations of Mestre and S. Lucia towards the main destinations located within the Venezia Metropolitan Area and Veneto Region. The city does not have any underground heavy metro system. Buses as well as a light rail system are in operation, which ensure local interconnection to the main railway and coach stations. Dedicated bus services are also operated between the core airport and Venezia Mestre main station. Local and regional road interconnection is primarily ensured by the Venezia ring road (tangenziale di Mestre). The core airport is directly interconnected to the motorway network. A dedicated action sheet has been prepared for the description of the accessibility to the port of Venezia, which is already interconnected to the rail and motorway networks (3.1.05).

Park and ride facilities, and integrated ticketing at the urban as well as metropolitan/regional levels for buses, water and rail services are available. ICT real time information for public transport services and parking and ITS systems for road traffic management are also in operation. Clean fuels are available which include electricity, CNG, LNG for road transport and LPG. Car sharing and bike sharing are also operation in the Venezia core urban node. A Sustainable Urban Mobility Plan for the City of Venice is not currently in place; a long-term urban mobility plan for the metropolitan area was approved in 2010. A systematic green urban/ city logistics programme is also not available at present.

Regarding the main critical issues which are currently affecting the node and the planned investments; ERTMS and train length compliance are assumed to be solved by investments to be undertaken at the network level by the national infrastructure manager. The performance of the railway network and services at the local/regional scale is going to be improved by the completion/development of the Metropolitan Area Railway System (Sistema Ferroviario Metropolitano) both in terms of infrastructure and additional services. Regional/local connections will also be improved by means of further development of the existing light rail system as well as investments planned on the node railway infrastructure including the upgrading of the Linea dei Bivi, and of the stations layouts. The improvements of the accessibility by road and rail, with the construction of a rail link to the Venezia Marco Polo core airport and a multimodal terminal, are also worth mentioning which will improve last mile connections to the airport. The railway investments planned at the node of Venezia will overall improve the performance of the railway system also in favour of the traffic directed to and originated by the port.

Prognosis by 2030: the corridor node rail and road infrastructure is expected to be fully at standard, including ERTMS and train length. No capacity issues are expected to affect the node with respect to railway and road transport.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
Current or potential future capacity bottleneck; Express road or motorway standard; Connection to rail

Source: Corridor Project List

B. Project Implementation

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
3229	Venice node: Upgrade of the “Linea dei Bivi” railway line	IT	RFI S.p.A.	Venice Node	Study, Infrastructure (Rehabilitation), Infrastructure (Upgrade), Infrastructure (New construction),	180.0	
1400	Upgrading of Venezia node	IT	RFI S.p.A.	Venice Node	Study, Infrastructure (Upgrade), OTHER	80.0	
1119	Venezia Marco Polo Airport: Last mile rail connection with conventional Venice - Trieste railway line (SMFR)	IT	RFI S.p.A.	Venice Tessera Airport	Study, Infrastructure (Upgrade), Infrastructure (New construction),	425.0	
3308	SS 14 bypass at Campalto and Tessera	IT	ANAS S.p.A.	Venice Tessera Airport	Study, Infrastructure (New construction),	35.0	
	TOTAL					**720.0**	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
3229	Venice node: Upgrade of the “Linea dei Bivi” railway line	IT	2020	2030				0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: Performed // Other: NA
1400	Upgrading of Venezia node	IT	2017	2021	concluded	concluded	concluded	0%	Land acquisition: NA // EIA: NA // Final Approval: approved // CBA: Performed // Other: NA
1119	Venezia Marco Polo Airport: Last mile rail connection with conventional Venice - Trieste railway line (SMFR)	IT	2019	2026		concluded	in progress	0%	Land acquisition: NA // EIA: NA // Final Approval: not submitted yet // CBA: NA // Other: NA
3308	SS 14 bypass at Campalto and Tessera	IT				not started		NA%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR)		
					TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
3229	Venice node: Upgrade of the “Linea dei Bivi” railway line	IT	1	180.0	120.0	120.0	CDP+FSC
1400	Upgrading of Venezia node	IT	1	80.0	80.0	80.0	CDP
1119	Venezia Marco Polo Airport: Last mile rail connection with conventional Venice - Trieste railway line (SMFR)	IT	2	425.0	18.0	14.0 4.0	CDP CEF
3308	SS 14 bypass at Campalto and Tessera	IT	2	35.0	0.0		
	TOTAL			**720.0**	**218.0**		

Source: Corridor Project List

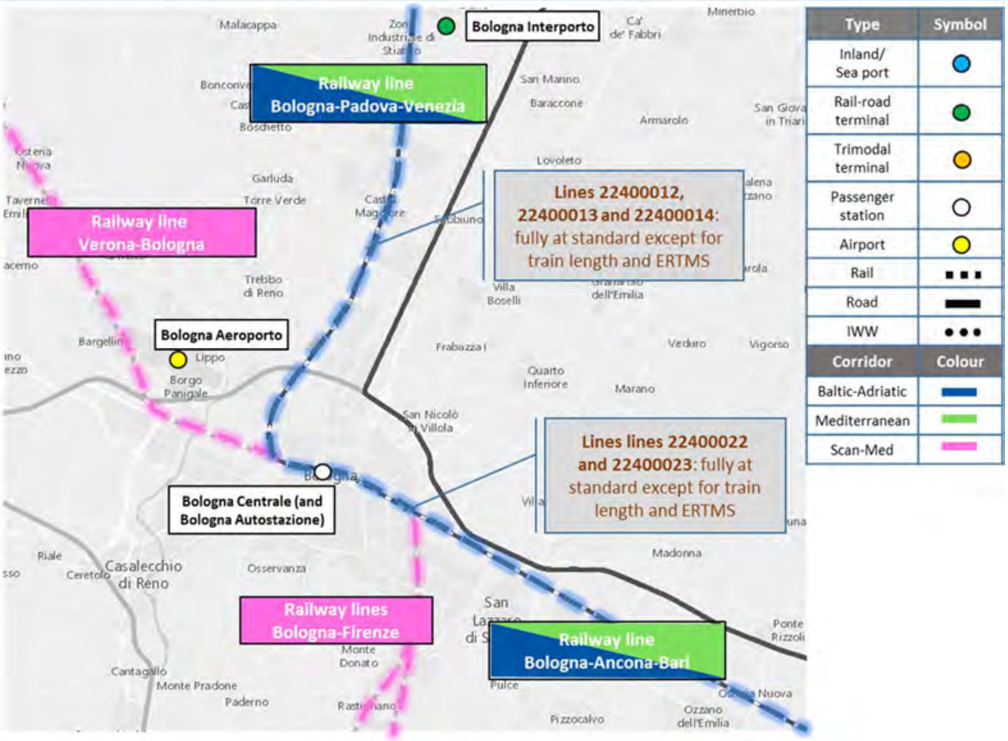
A. Description of the Action:

A.1. Action Title:

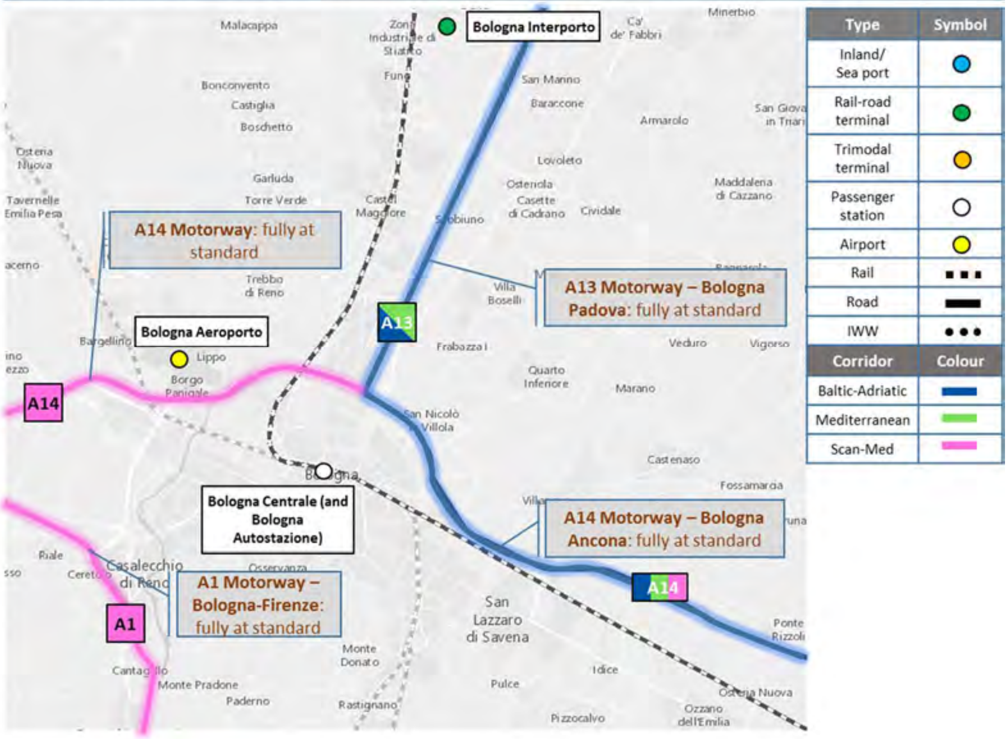
7.1.12 - Urban node: Bologna

A.2. Location of the action:

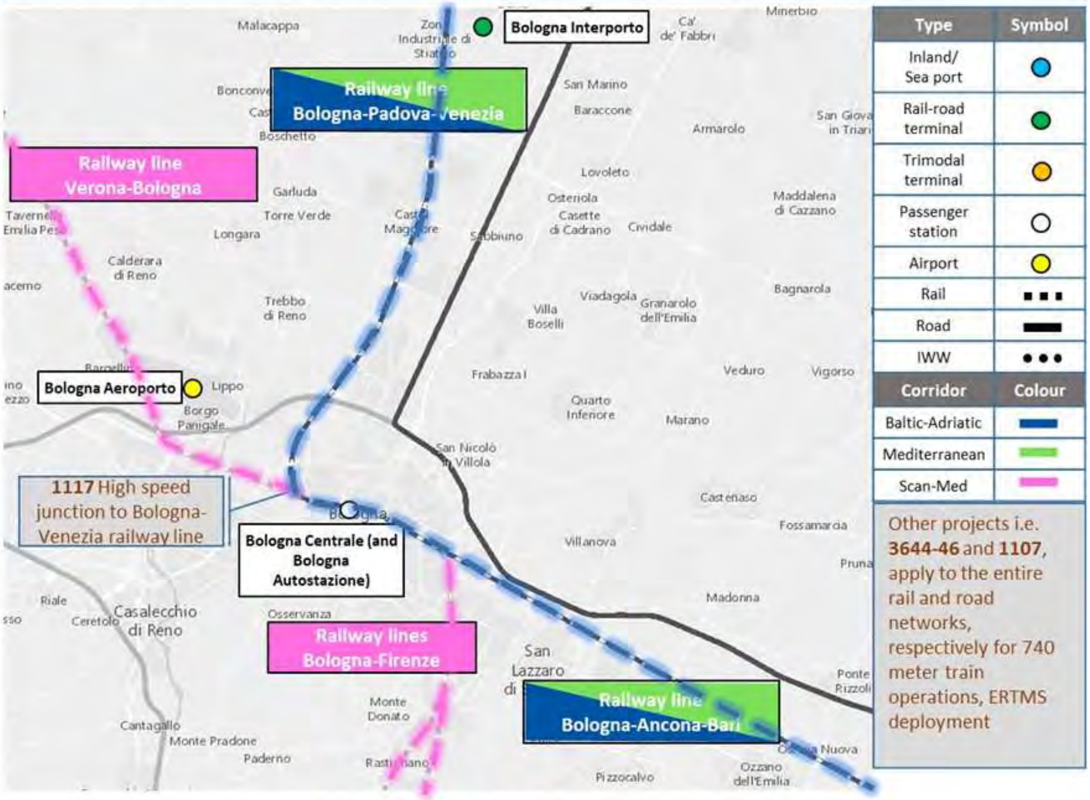
Core network corridors' infrastructure at the Bologna Urban Node (Focus on Rail)



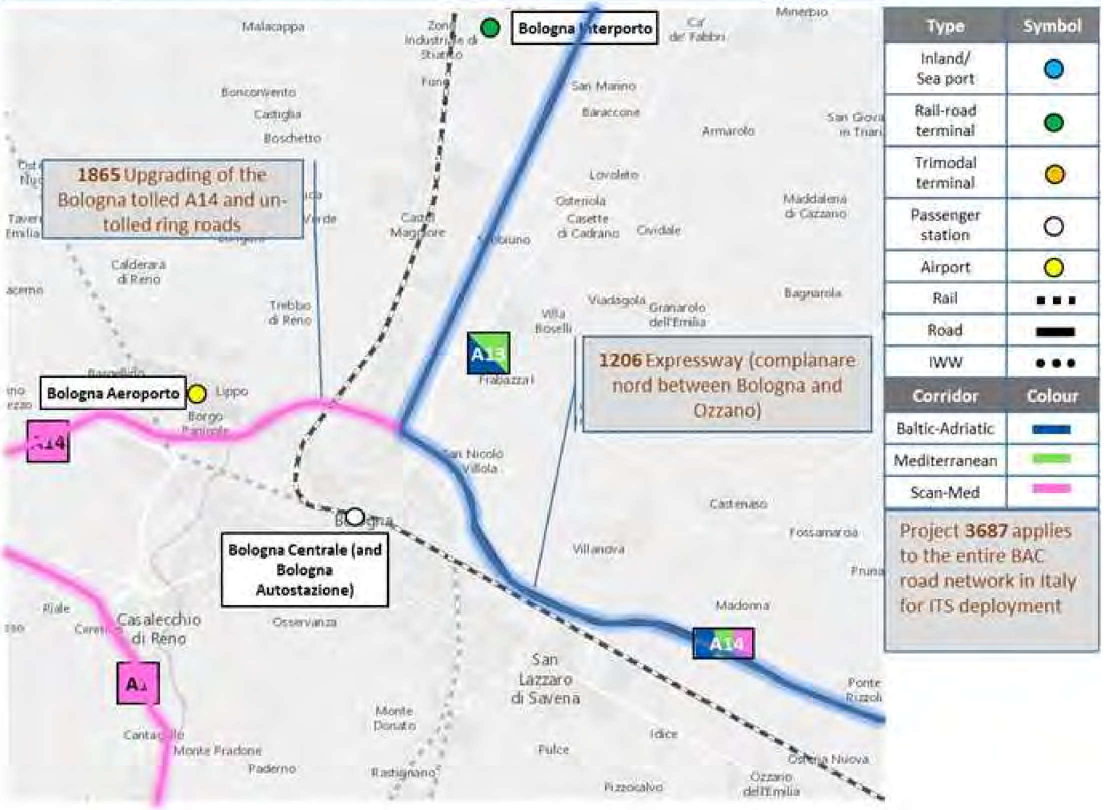
Core network corridors' infrastructure at the Bologna Urban Node (Focus on Road)



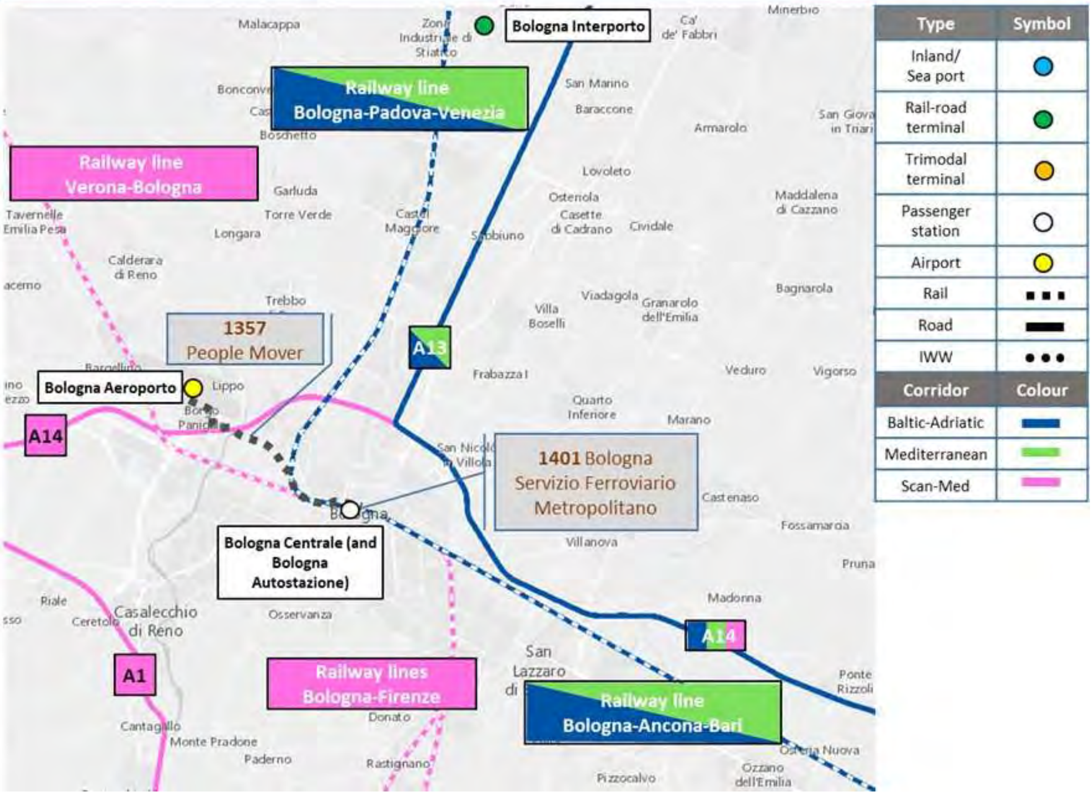
Investments on BAC Project List at the Bologna Urban Node (Focus on Rail)



Investments on BAC Project List at the Bologna Urban Node (Focus on Road)



Investments at the Bologna Urban Node (Core nodes and main interconnections to CNC)



Source: Project fiches

A.3. Description of the action:

Member States involved: -	**Section or Node:** -	**Estimated total cost [Mio €]:** *565.6 EUR million*
Other CNC involved: -	**Implementation schedule:** *Start year: NA* *End year: NA*	**Project Promoter:** *RFI S.p.A., Città Metropolitana di Bologna, Autostrade per l'Italia S.p.A., ANAS S.p.A., Emilia Romagna Region*

The core urban node of Bologna is located on three core network corridors: Baltic-Adriatic, Mediterranean and Scandinavian-Mediterranean. The rail infrastructure crossing the node (sections Castel Maggiore – Bologna Centrale and Bologna Centrale – San Vitale Junction) is overall at standard with respect to electrification, axle load and speed. It is not at standard in terms of ERTMS and train length. The road infrastructure crossing the node is fully compliant. The Bologna Centrale railway station (through type) is the main station in the node operating both conventional and high-speed services. There are no other stations in the node operating national and international services to other core network urban nodes. Next to the railway station a coach station (Bologna Autostazione) is also present operating national and international services to other core network nodes. The Bologna core urban node includes the Guglielmo Marconi core airport (operating both passenger and cargo services) and the Bologna Interporto core rail-road terminal. There are no other core or comprehensive nodes within or in the proximity of the Bologna core urban node. Suburban and regional services are operated from the main station towards the main destinations located within the Bologna Metropolitan Area and Emilia Romagna Region. The city does not have any underground heavy metro system. Buses and trolley buses are in operation, which ensure local interconnection to the main railway and coach stations. These also include a dedicated bus service between the core airport and main station. Local and regional road interconnection is primarily ensured by the Bologna ring road (tangenziale) and feeder roads (complanari) both running parallel to the corridor motorway links. These are interconnected to the main urban and metropolitan roads. The core airport is directly interconnected to the ring road and very close to the A1-A14 motorways; the rail-road terminal is directly interconnected with the corridor rail network and is close to the corridor A13 motorway link.

Park and ride facilities, and integrated ticketing at urban as well as metropolitan/regional levels for buses and rail services are available. ICT real time information for public transport services and parking and ITS systems for road traffic management are also in operation. Clean fuels are available which include electricity, CNG, LNG for road transport and LPG. Car sharing and bike sharing are also in operation in the Bologna core urban node. A Sustainable Urban Mobility Plan is under development at present. A systematic green urban/ city logistics programme is under study / development.

Regarding the main critical issues which are currently affecting the node and the planned investments; ERTMS and train length compliance are assumed to be solved by investments to be undertaken at the network level by the national infrastructure manager. The performance of the railway network and services at the local/regional scale is going to be improved by the completion/development of the Metropolitan Area Railway System (Sistema Ferroviario Metropolitano) both in terms of infrastructure and additional services. Local/regional connections will also be improved by means of upgrading works planned on the corridor lines between Bologna and Castelbolognese/Faenza. Investments and studies on the ring road/feeder roads are under consideration to solve capacity issues. An automated people mover connecting the Core Airport and the Bologna Central Rail Station is also currently under development to replace the existing dedicated bus service. Finally, investments are also on-going which relate to the completion of the high-speed infrastructure in the node.

Prognosis by 2030: the corridor node rail and road infrastructure is expected to be fully at standard including ERTMS and train length. No capacity issues are expected to affect the node with respect to railway transport. Road capacity problems may be present in the event the existing corridor motorway will not be upgraded.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
Current or potential future capacity bottleneck; Express road or motorway standard; Connection to rail

Source: Corridor Project List

B. Project Implementation

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1117	Bologna High Speed Railway Junction: interconnection to Venezia line	IT	RFI S.p.A.	Bologna node	Study, Infrastructure (New construction),	36.2	
1401	Bologna Underground (Servizio Ferroviario Metropolitano di Bologna)	IT	Città Metropolitana di Bologna	Bologna node	Infrastructure (Upgrade),	372.7	
1865	Upgrading of the Bologna tolled A14 and un-tolled ring roads	IT	Autostrade per l'Italia S.p.A.	Bologna node	Study, Infrastructure (Upgrade),	To be defined	Evaluation on-going
1206	Realisation of the metropolitan expressway road north of the A14 between Ozzano and Bologna	IT	ANAS S.p.A.	Bologna node	Study, Infrastructure (New construction),	37.6	
1367	Bologna airport: People Mover	IT	Emilia Romagna Region	Bologna Airport	Infrastructure (New construction),	119.1	110 total (13,60 funded by Bologna Airport operator for line and Airport station). Investment include a share for People Mover infrastructure's construction
	TOTAL					**565.6**	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	ADMINISTRATIVE ISSUES
1117	Bologna High Speed Railway Junction: interconnection to Venezia line	IT	2013	2017		concluded	concluded	81%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: Performed // Other: NA
1401	Bologna Underground (Servizio Ferroviario Metropolitano di Bologna)	IT			concluded	concluded	concluded	NA%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1865	Upgrading of the Bologna tolled A14 and un-tolled ring roads	IT				in progress		NA%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1206	Realisation of the metropolitan expressway road north of the A14 between Ozzano and Bologna	IT	2018	2020		in progress	not started	0%	Land acquisition: Not completed // EIA: not submitted yet // Final Approval: not submitted yet // CBA: Performed // Other: NA

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL				ADMINISTRATIVE ISSUES
					L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	
1367	Bologna airport: People Mover	IT	2008	2018	concluded	concluded	concluded	84%	Land acquisition: NA // EIA: EIA approved // Final Approval: approved // CBA: NA // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR)		
					TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1117	Bologna High Speed Railway Junction: interconnection to Venezia line	IT	1	36.2	36.2	36.2	Cash flows (autofinanziamento)
1401	Bologna Underground (Servizio Ferroviario Metropolitano di Bologna)	IT	Residual	372.7	241.7	241.7	National budget
1865	Upgrading of the Bologna tolled A14 and un-tolled ring roads	IT	3	To be defined	0		
1206	Realisation of the metropolitan expressway road north of the A14 between Ozzano and Bologna	IT	3	37.6	0		
1367	Bologna airport: People Mover	IT	2	119.1	119.1	119.1	NA
	TOTAL			**565.6**	**397.0**		

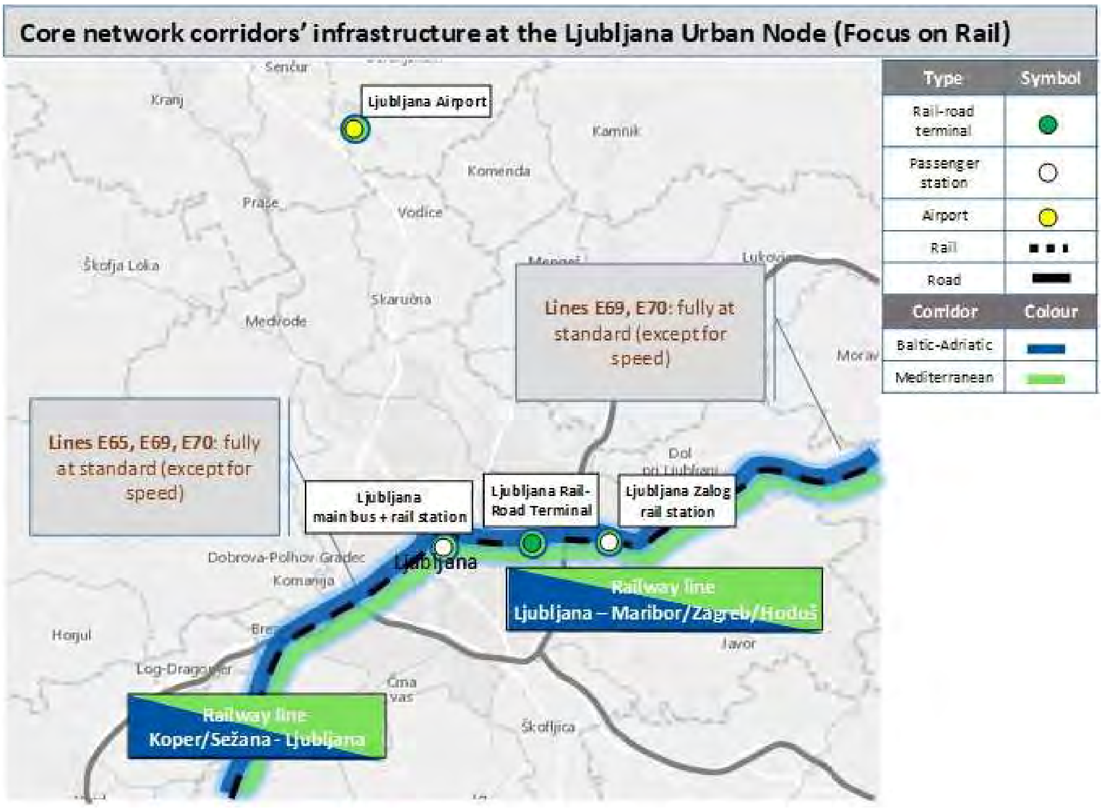
Source: Corridor Project List

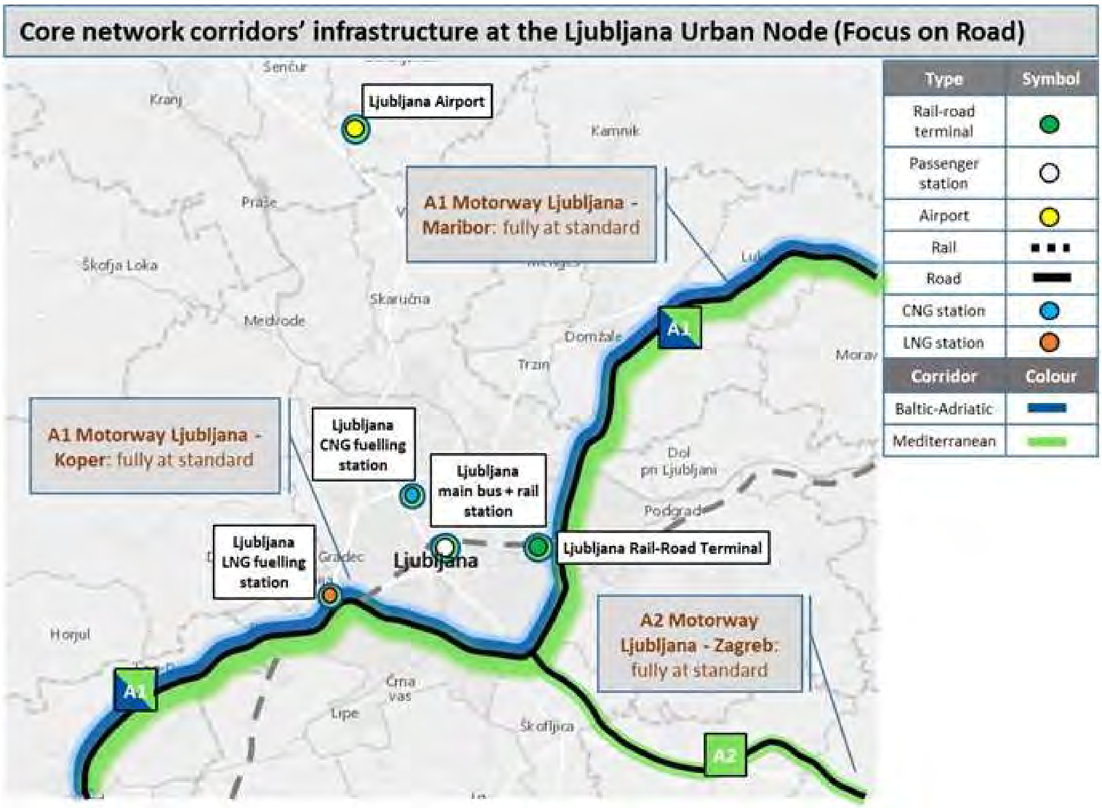
A. Description of the Action:

A.1. Action Title:

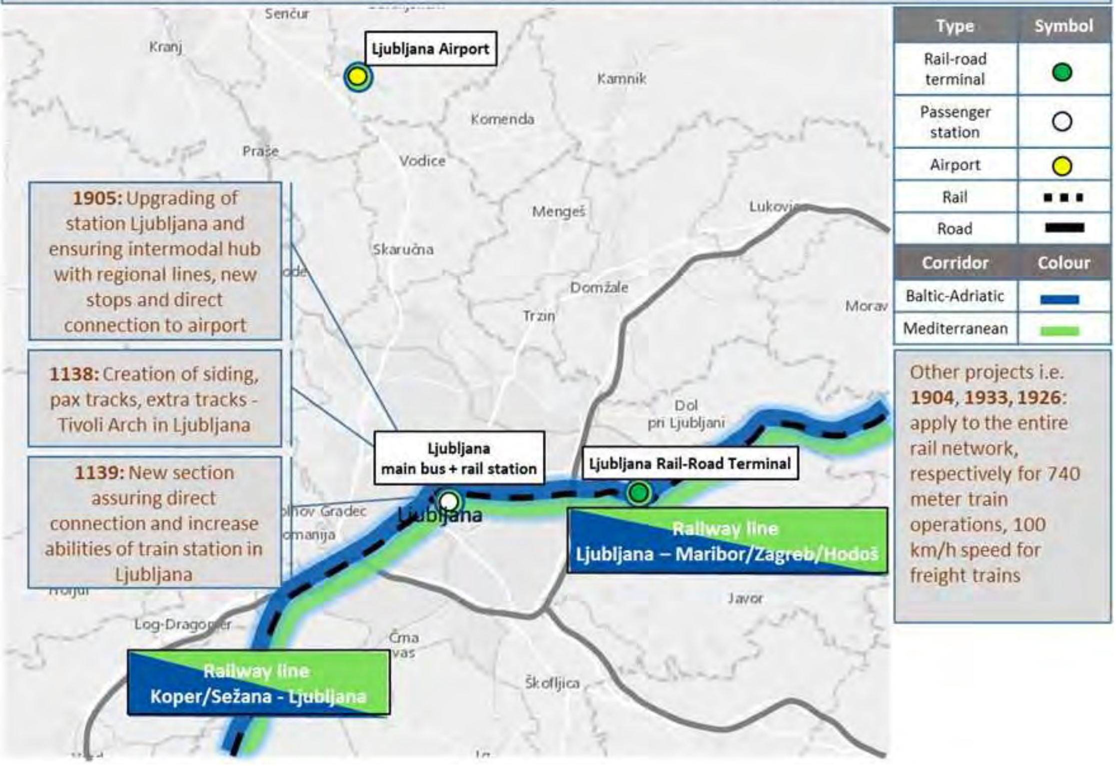
7.1.13 - Urban node: Ljubljana

A.2. Location of the action:

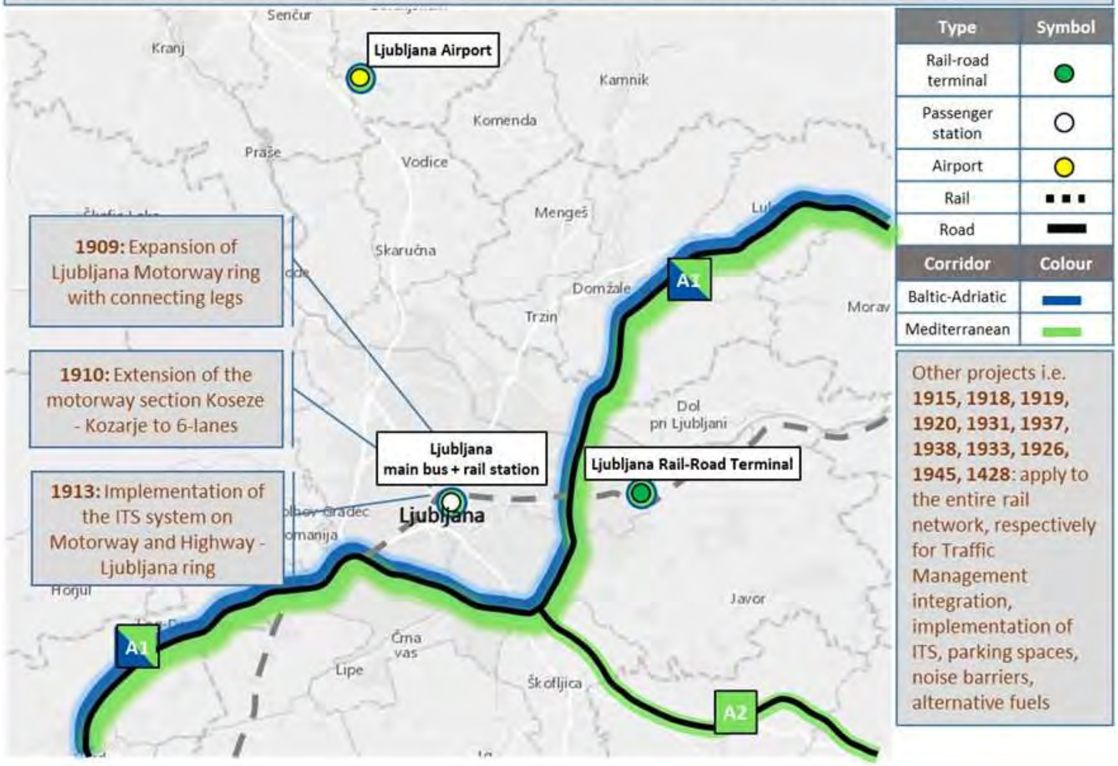




Investments on BAC Project List at the Ljubljana Urban Node (Focus on Rail)



Investments on BAC Project List at the Ljubljana Urban Node (Focus on Road)



Source: Project fiches

A.3. Description of the action:

Member States involved:	Section or Node:	Estimated total cost [Mio €]:
-	-	*309.9 EUR million*
Other CNC involved:	**Implementation schedule:**	**Project Promoter:**
-	*Start year: 2010* *End year: 2030*	*Ministry of infrastructure, DARS*

The core urban node Ljubljana is located on two core network corridors: Baltic-Adriatic and Mediterranean. The rail infrastructure crossing the node is partly at standard with respect to electrification, ERTMS, axle load, and not at standard with respect to speed and train length. Efforts are ongoing to improve standards in these areas, investing in signalling enhancement, creation of siding, pax tracks, extra tracks and new section assuring direct connection and increase abilities of train station in Ljubljana, upgrading of station Ljubljana and ensuring intermodal hub with regional lines and new stops. Direct railway connection to Ljubljana Airport will be considered. The Ljubljana Rail-Road Terminal infrastructure is to be upgraded and modernized in order to improve intermodal transport services and logistics centre.

The Ljubljana Main Station is accessible to regional, national, and international transport via rail, coach and bus services, underground and tramway are not available. The urban node has bus, shuttle and taxi connections to airport. The road infrastructure crossing the node is fully at standard. Considering the increase in traffic in Ljubljana and its surroundings, capacity issues have to be addressed, in particular on northern highway ring H3 passing through urban areas. Emissions and noise generated by traffic, congestions and transiting road transport negatively affect urban areas. Ban for heavy freight vehicles on the northern section of Ljubljana bypass is under investigation.

Park and ride facilities, integrated ticketing at urban level for buses is available but no so on at metropolitan/regional level for buses and rail. ICT real time information for public transport services and parking are in place while ITS systems for road traffic management on motorways are not present.

Clean fuels are available which include electricity, LPG and CNG for road transport, hydrogen is not available yet. Bike sharing is in operation, car sharing was deployed in summer 2016. Electric vehicles Kavalir for passenger transport in pedestrian zone are in operation - use is free of charge. A Sustainable Urban Mobility Plan is available.

Regarding the main critical issues which are currently affecting the node and the planned investments; construction of Tivoli arch railway section to increase the train length standard and to enable bypass of Ljubljana for freight trains, electrification of regional railway tracks within urban area in order to diminish noise and modernisation of passenger rail rolling stock. Development of network of additional charging stations for electric vehicles will increase.

Source: Corridor Project List

A.4. Contribution to KPIs and elimination of bottlenecks:

KPIs IMPROVED OR ACHIEVED
Current or potential future capacity bottleneck; Single track section

Source: Corridor Project List

B. PROJECT IMPLEMENTATION

B.1 Project cost

ID	PROJECT TITLE	MS	PROMOTER	SECTION OR NODE	SCOPE	TOTAL COST (MEUR)	REMARKS ON COST
1138	Creation of siding, pax tracks, extra tracks - Tivoli Arch in Ljubljana	SI	Ministry of infrastructure	Ljubljana Urban Node	,	0.5	
1139	New section assuring direct connection and increase abilities of train station in Ljubljana (project called Tivoli Arch)	SI	Ministry of infrastructure	Ljubljana Urban Node	,	80.0	It will be determined after the completion of the study of variants
1905	Upgrading of station Ljubljana and ensure intermodal hub with regional lines and new stops	SI	Ministry of infrastructure	Ljubljana urban node	,	180.0	It will be determined after the completion of the study
1909	Expansion of Ljubljana Motorway ring with connecting legs	SI	DARS	Ljubljana Urban Node	,	3.3	Making all the necessary studies and technical basis, pending confirmation by the Government variants
1910	Extension of the motorway section Koseze - Kozarje to 6-lanes	SI	DARS	Ljubljana Urban Node	, ITS	34.1	The estimated costs resulting from the pre-investment plan (July 2010, the price level 06/09). The investment includes construction works (including 10 % unexpected works): EUR 24.8887.077, Research and Monitoring: 1.244.354 EUR; project and investment documentation: 1.146.231 EUR; purchases and compensation: 4.800.000 EUR. Total 32.077.661 EUR. Conversion factor is 1.064 to 3/2016O.
1913	Implementation of the ITS system on Motorway and Highway - Ljubljana ring	SI	DARS	Ljubljana Urban Node	, ITS	12.0	
	TOTAL					**309.9**	

Source: Corridor Project List

B.2 Project implementation and maturity

ID	PROJECT TITLE	MS	START	END	MATURITY LEVEL				ADMINISTRATIVE ISSUES
					L1: PLAN	L2: FEAS.	L3: PERMIT	L4: CONSTR.	
1138	Creation of siding, pax tracks, extra tracks - Tivoli Arch in Ljubljana	SI	2010	2018		in progress	in progress	88%	Land acquisition: NA // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: Not performed // Other: NA
1139	New section assuring direct connection and increase abilities of train station in Ljubljana (project called Tivoli Arch)	SI	2020	2022	in progress	in progress	in progress	0%	Land acquisition: Not completed // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: NA // Other: NA
1905	Upgrading of station Ljubljana and ensure intermodal hub with regional lines and new stops	SI	2018	2030	in progress			0%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1909	Expansion of Ljubljana Motorway ring with connecting legs	SI	2016	2020	concluded	in progress	not started	11%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA
1910	Extension of the motorway section Koseze - Kozarje to 6-lanes	SI	2019	2020	concluded	concluded	not started	0%	Land acquisition: Not completed // EIA: EIA under preparation or updating // Final Approval: not submitted yet // CBA: Performed // Other: NA
1913	Implementation of the ITS system on Motorway and Highway - Ljubljana ring	SI	2016	2020	not started	not started	not started	25%	Land acquisition: NA // EIA: NA // Final Approval: NA // CBA: NA // Other: NA

Source: Corridor Project List. Maturity Levels: Level 1: Planning stage / pre-feasibility studies / Strategic Environmental Assessment (SEA); Level 2: Preliminary project analysis / Feasibility studies; Level 3: Environmental Impact Assessment (EIA) / Detailed Design / Detailed Implementation Plan / Administrative Permits and Licences; Level 4: Construction/ implementation (% of completion)

B.3 Project financial information

ID	PROJECT TITLE	MS	CLUSTER	TOTAL COST (MEUR)	APPROVED FUNDS (MEUR)		
					TOTAL FUNDS	FUNDS BY SOURCE	FUNDING SOURCE
1138	Creation of siding, pax tracks, extra tracks - Tivoli Arch in Ljubljana	SI	1	0.5	0.5	0.5	MzI
1139	New section assuring direct connection and increase abilities of train station in Ljubljana (project called Tivoli Arch)	SI	1	20.0	0		
1905	Upgrading of station Ljubljana and ensure intermodal hub with regional lines and new stops	SI	1	180.0	0		
1909	Expansion of Ljubljana Motorway ring with connecting legs	SI	3	3.3	0		
1910	Extension of the motorway section Koseze - Kozarje to 6-lanes	SI	3	34.1	0		
1913	Implementation of the ITS system on Motorway and Highway - Ljubljana ring	SI	2	12.0	0		
	TOTAL			**309.9**	**0.5**		

Source: Corridor Project List