European Commission

Baltic Adriatic

Fourth Work Plan of the European Coordinator

Anne Elisabet Jensen

JUNE 2020

Mobility and Transport

JUNE 2020

Contents

List of figures

List of tables

List of acronyms and abbreviations

AB	Allocation Bodies
Alpine Crossings	Semmering base tunnel and Koralm railway line and tunnel in Austria
Art.	Article
ASFINAG	Autobahnen- und Schnellstraßen-Finanzierungs-Aktiengesellschaft/Motorway and Highway Infrastructure Manager
ASTRA	Assessment of Transport Strategies
AT	Austria
BAC	Baltic-Adriatic Corridor
CBS	Christophersen-Bodewig-Secchi Report
CEF	Connecting Europe Facility
CEMT	Conférence Européenne des Ministres des Transports/ European Conference of Ministries of Transport
CNC	Core Network Corridor
CNG	Compressed Natural Gas
CZ	Czech Republic
DARS	Družba za avtoceste v Republiki Sloveniji/ Motorway Infrastructure Manager
DG MOVE	Directorate-General for Mobility and Transport
DG REGIO	Directorate-General for Regional and Urban Policy
EC	European Commission
EIB	European Investment Bank
EFSI	European Fund for Strategic Investment
ERTMS	European Rail Traffic Management System
ERTMS EDP	European Rail Traffic Management System European Deployment Plan
ETCS	European Train Control System
EU	European Union
EV	Electric Vehicle
ICT	Information Communication Technologies
IM	Infrastructure Manager
INEA	Innovation and Networks Executive Agency
IT	Italy
ITS	Intelligent Transport System
KPI	Key Performance Indicator
LNG	Liquefied Natural Gas
MoS	Motorways of the Sea
MS	Member State
PCS	Path Coordination System
PL	Poland
RFC	Rail Freight Corridor
RFC B-A	Rail Freight Corridor Baltic-Adriatic
RIS	River Information Services
RNE	RailNetEurope
RRT	Rail-Road Terminal
RU	Railway Undertaking
SDM	Sesar Deployment Manager
SESAR	Single European Sky ATM Research
SI	Slovenia
SK	Slovak Republic
TCC	Traffic Control Centres
TCCCom	Traffic Control Centres Communication
TEN-T	Trans-European Transport Network
TENtec	European Commission's Information System to coordinate and support the Trans-European Transport Network Policy
TIS	Train Information System
TRUST	TRansport eUropean Simulation Tool
VTMIS	Vessel Traffic Management and Information System
WP	Work Plan

1. Towards the Fourth Baltic-Adriatic Corridor Work Plan

In September 2018, I took over the role of European Coordinator for the Baltic-Adriatic Corridor from Prof. Kurt Bodewig. It is a pleasure and an honour for me to continue the work begun by my predecessor in 2014, assisting Member States and the Members of the Corridor Forum in the development and implementation of the trans-European transport network (TEN-T). I would like to commend Prof. Bodewig, the Member States and the Forum Members on what has already been achieved under the scope of the first three work plans.

Six priorities have been defined that provide us with a robust road map for the development of a modern, continuous and interoperable infrastructure. The national plans and the investment strategies of the infrastructure managers show an overall coherence with the objectives set in Regulation (EU) 1315/2013, on which basis it was possible to define a sound pipeline of investments. About 340 projects are ongoing and nearly 180 have been already completed. The Corridor has also been very successful with regard to the allocation of funds under the Connecting Europe Facility (CEF), in particular, in view of CEF calls being highly competitive and oversubscribed. In total, 100 actions have been co-funded by the CEF for a total support of € 2.4 billion, corresponding to an overall investment of € 4.9 billion.

Since my first Corridor Forum meeting in November 2018, I have noted the very constructive atmosphere in which the work on the Corridor is carried out. This bears witness to the fact that the Corridor is a common success story. I would like we continue developing the Baltic-Adriatic Corridor in that spirit, with the ambition of completing the Corridor by 2030. Recognising the importance of stability in the long-term planning of TEN-T investments, my first work plan builds on the first three editions. The work plan is cut from the mould of a no-surprises approach that stresses continuity, wherefore readers familiar with preceding work plans will recognise consistency with the priorities set out here. This concerns, in particular, the modernisation of the critical cross-border sections on the Corridor and the completion and modernisation of the rail infrastructure in Member States. Moreover, it concerns the need for strengthening multimodality by improving last mile and hinterland connections to ports and within logistic clusters. Finally, it concerns the improvement of the interconnection of long distance, regional and local transport in urban nodes, as well as the interoperability of telematic applications with a focus on ERTMS deployment.

In pursuing these priorities, I would like to see the Corridor fulfil its potential for contributing to the most pertinent and demanding task at hand for the European transport sector; to bring forward solutions that effectively reduce the climate and environmental impact of how we travel and move goods across the continent. Transport accounts for a quarter of the total greenhouse gas emissions of the EU, and the emissions are still growing. To achieve climate neutrality, a 90% reduction in transport emissions is needed by 2050. The TEN-T, the CEF and the Core Network Corridor approach have long proven the most effective set of policy measures ever devised for building a sustainable trans-European network. Exactly such policy instruments are called for with the European Green Deal, and as the European Coordinator for the Baltic-Adriatic Corridor, I will be determined to see the Corridor play its part in making good on the promises made to the future European generations. With my first work plan, I believe we set out at the turning point of these challenges. I am confident that the strong engagement demonstrated by all parties involved in the Baltic-Adriatic Corridor will help turn this development into new opportunities for us.

Apart from commitment and sheer determination, this will require substantial investments. With the new Multiannual Financial Framework (MFF) of the Union in place before 2021, we will also have a budget for the Connecting Europe Facility 2 (CEF 2). Additional funds will be made available through financial blending instruments to further increase available funds for the completion of the Corridor.

Finally, the process of revising the TEN-T Regulation has been initiated and will be completed by 2023. With the entry into force of the CEF 2 Regulation and the new TEN-T Regulation, the Core Network Corridors will reflect the last decade of developments and will play an even more important role in providing for decarbonisation, climate change mitigation and jobs creation.

This fourth work plan builds on the wealth of corridor analyses and consultation activities performed since 2014. Studies for the development of the Baltic-Adriatic Corridor have been elaborated in 2014 and between 2015 and 2017. A third phase of studies is currently ongoing aimed at updating the results of previous analyses. These studies elaborated by the corridor consultants team around tplan consulting (IT, PL) and their subcontractors Paradigma (AT), NDCON (CZ, SK) and the University of Maribor (SI), represent the technical basis of the work plans.

Fourteen Corridor Forum meetings, four working group meetings of 'Ports and Rail-Road Terminals' and three working group meetings of 'Regions, urban nodes and macroregions' have been organised. On these occasions the results of the Baltic-Adriatic Corridor study and the priorities of the work plan have been discussed and agreed with the Member States, railway and road infrastructure managers, ports, airports, rail-road terminals, the Baltic-Adriatic Rail Freight Corridor (RFC BA), regions, urban nodes and the four macroregional strategies crossed by the Baltic-Adriatic Corridor.

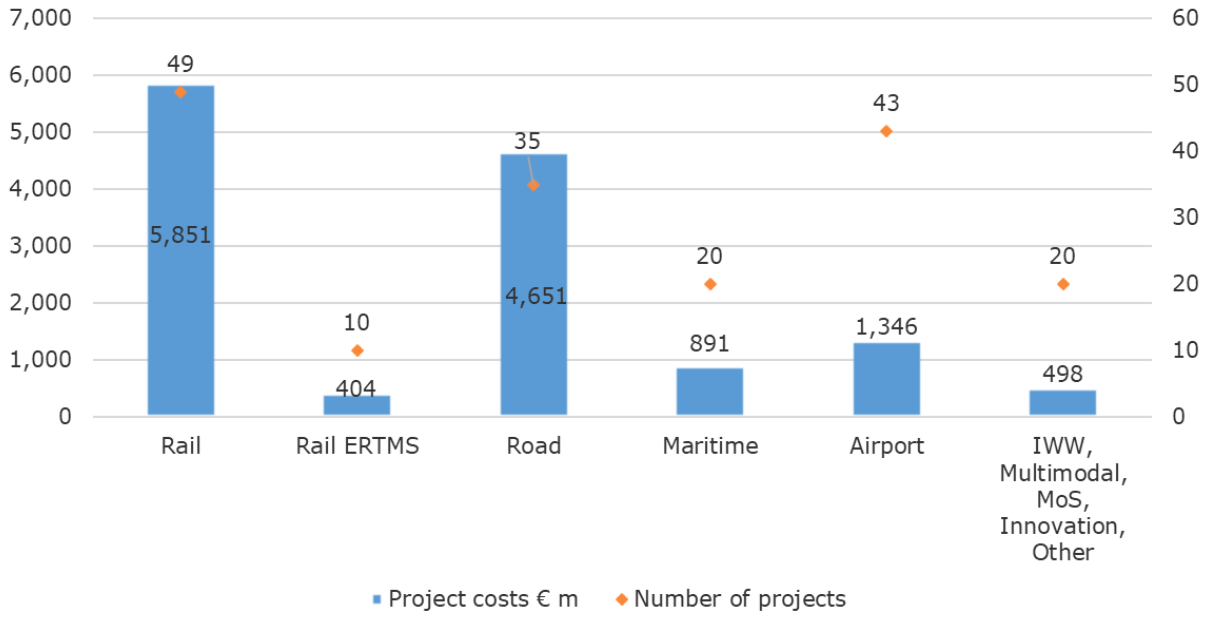
On top of these meetings, several visits to projects and stakeholders have been performed, including the organisation of cross-border dialogues. I already had the pleasure to visit the corridor Member States and it is my intention to visit key projects and as many stakeholders as possible during my mandate, also taking the opportunity of organising our working groups locally and promote conjoint events with my fellow Coordinators. Last but not least I would like to mention the fruitful cooperation in place since 2014 with the Rail Freight Corridor Baltic-Adriatic, that allows us looking at the development of the Corridor under the lenses of its actual operation.

I would like to thank all the institutions that have been involved in the activities for the development of the Baltic-Adriatic Corridor. They made it possible to achieve remarkable progresses in the implementation of the TEN-T Regulation in the wider framework of the European Union policies for mobility and transport. In this respect, I would also like to express my gratitude to my advisory team at the European Commission and to the European Investment Bank for their efforts in making the Corridor implementation happen. We have about ten years ahead to complete the work started in 2014. Let’s continue this work together!

1.1. Achievements along the Corridor since 2014

Since the entry into force of the TEN-T Regulation in 2014 remarkable efforts have been made in the development of the Baltic-Adriatic Corridor. More than 660 projects have been identified by stakeholders, totalling € 85.3 billion of investments. For over 510 investments, worth € 58.7 billion, implementation activities have already started. Out of these, about 180 initiatives were completed at an overall budget of € 13.6 billion. Figure 1 provides the main statistics for the completed projects from the corridor project list by transport mode.

Figure 1: Total number and costs of completed projects by category



Source: Baltic-Adriatic corridor study consortium

The work plan priorities are well addressed by the projects completed by end of 2019. These include the preparatory works for the critical rail cross-border sections between Poland, the Czech Republic and the Slovak Republic, and several modernisation works of the national railway lines in Poland, the Czech Republic and the Slovak Republic, among which the Eastern branch of the Corridor in Poland between Gdynia and Warszawa. Railway works have been also completed at the core urban nodes of Łódź, Poznań, Wien and Bologna. Projects for the improvement of interconnectivity at core urban nodes, including airport connections by railway, have been finalised in Gdańsk, Łódź, Ostrava, Wien and Bologna, where construction works for an Automated People Mover between the central railway station and the airport have been recently completed. Furthermore, ERTMS deployment projects have been completed in Poland, the Czech Republic, the Slovak Republic, Austria and Slovenia.

The list of finalised investments also includes works for the development of the road cross-border sections between Katowice and Žilina and between Brno and Wien; studies for the improvement of the last mile connections of the ports in Poland; road last mile connection works at the port of Gdańsk; road and rail last mile connections to the port of Świnoujście; completion of the reconstruction of the Stary Most Bridge in Bratislava; improvement of the existing road infrastructure interconnecting to the port of Trieste; road last mile connection works and interconnection by railway to the Fusina Terminal at the Venezia port; and reconstruction of the existing track between Koper and Divača, improving accessibility by railway to the port of Koper.

Other relevant concluded projects relate to the completion of the construction of two new rail-road terminals in Žilina Teplička and Wien Inzersdorf, respectively replacing the existing terminals in Žilina and Wien Nordwestbahnhof; enlargement and modernisation of the existing rail-road terminals in Přerov and Padova; and expansion of container terminals at the ports of Gdańsk, Gdynia and Vienna; enlargement of the airports in Warszawa, Łódź, Katowice, Szczecin, Poznań, Wrocław, Venezia, Bologna and Ljubljana; modernisation and upgrading of the corridor road network in Poland, the Czech Republic, the Slovak Republic, Austria and Italy, as well as completion of ITS projects in the Slovak Republic, Austria, and Slovenia. Finally, multi-country and cross-corridor CEF supported initiatives have been also finalised for the promotion of telematic applications and alternative clean fuels.

The analysis of the completed projects is overall encouraging in view of the development of the Baltic-Adriatic Corridor infrastructure and shows high commitment by Member States and infrastructure managers with respect to the objectives of the TEN-T policy and priorities of the work plan. Based on discussions with the stakeholders, as well as INEA and DG REGIO, it appears, however, that ongoing and planned projects are challenged by delays and difficulties with regard to the finalisation of preparatory studies and works as well as permitting and procurement processes. This might result in the postponement of the completion dates of the projects. Whereas no specific issues currently identified are affecting the risk of completing relevant projects by 2030, special attention by all the involved parties should be given to identifying and solving problems that would otherwise result in the Baltic-Adriatic Corridor not being completed and/or reaching compliance by 2030.

2. Characteristics of the Baltic-Adriatic Corridor

2.1. From the Baltic to the Adriatic ports – the Corridor Alignment

The alignment and infrastructure of the Baltic-Adriatic Core Network Corridor are legally defined by Regulations (EU) 1315/2013 and 1316/2013. The Baltic-Adriatic Corridor consists of 4,200 km of rail and 3,600 km of road infrastructure spanning over Poland, the Czech Republic, the Slovak Republic, Austria, Italy and Slovenia, from the Baltic ports of Gdynia/Gdańsk and Szczecin/Świnoujście to the Adriatic ports of Trieste, Venezia, Ravenna and Koper.

Figure 2: Alignment of the Baltic-Adriatic Corridor

Source: Baltic-Adriatic corridor study consortium

The Corridor interconnects the core urban nodes of Szczecin, Gdańsk, Poznań, Wrocław, Łódź, Warszawa, Katowice, Ostrava, Bratislava, Wien, Venezia, Bologna and Ljubljana as well as the airports, ports and rail-road terminals located therein.

A total of 27 regions are crossed by the Baltic-Adriatic Corridor, which are also encompassed in the European Union strategies for the Baltic Sea Region (EUSBSR), the Danube Region (EUSDR), the Alpine Region (EUSALP) and Adriatic and Ionian Region (EUSAIR).

The Corridor involves 9 rail and 7 road cross-border sections as reported in Table 1 below.

Table 1: Cross-border sections of the Baltic-Adriatic 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) – Poysbrunn (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 (Kledering) (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) - Šentilj (SI)]	Graz West (AT) – Maribor Pesnica (SI); [Spielfeld-Straß (AT) - Šentilj (SI)]
IT	SI	Trieste (IT) - Divača (SI); [Villa Opicina (IT) – Sežana (SI)]	Trieste (IT) - Divača (SI); [Fernetti (IT) - Divača (SI)]

Source: Baltic-Adriatic corridor study consortium

Further to the maritime ports in the Baltic and Adriatic basins, the multimodal corridor infrastructure comprises the inland waterway ports of Bratislava and Wien and a total of 24 core classified rail-road terminals. Most of them are located in Poland: three in Warszawa (Główna Towarowa, Warszawa Praga, Pruszków), two by Łódź (Łódź Olechów, Stryków), one near Katowice (Sławków), four around Poznań (Clip Logistics, Metrans Poznań Gądki, Poznań Franowo, Loconi Poznań), three in Wrocław (Metrans Wrocław, Brzeg Dolny, Kąty Wrocławskie). Three additional rail-road terminals are located in the Czech Republic: two in Ostrava (Paskov, Šenov) and one by Přerov. Two more exist in the Slovak Republic, in Žilina and Bratislava. Two rail-road terminals are furthermore located in Austria by Wien (Inzersdorf) and Graz (Graz Werndorf). Three core terminals are finally present in Italy in Cervignano, Padova and Bologna; and one in Slovenia by Ljubljana.

The alignment of the Baltic-Adriatic Corridor does not involve inland waterway links, but intersects with the inland waterway core network in the core ports of Bratislava and Wien as well as in the ports of Szczecin, Świnoujście, Trieste, Venezia, Ravenna, also classified as inland waterway logistic nodes.

Concerning the possible future Corridor alignment and infrastructure, that may reflect an updated configuration of the functioning of the Corridor, it is worth mentioning other rail-road terminals in operation or under development along the Corridor, as indicated by the Forum Members as relevant for the development of multimodal and combined transport on the Corridor. These comprise the new rail-road terminals in Tczew, Warszawa (Loconi), Brwinów, Łódź (Łódź-Chojny, Kutno, Radomsko), Poznań (Kórnik), Přerov. Additional terminals are present in the Masovian 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. Fernetti, Pordenone on the comprehensive railway line between Udine, Treviso and Venezia, part of the Baltic-Adriatic Rail Freight Corridor, are also worth mentioning. A new terminal is finally planned for construction in Ostrava Mošnov, by the airport, that will involve four different transport modes.

Referring to the core logistic and transport nodes of the Baltic-Adriatic Corridor the Italian ports of Monfalcone and Chioggia are finally worth considering that both under the functional and administrative standpoints belong to the Ports of Trieste and Venezia. The airports of Modlin (PL) and Treviso (IT) are also relevant that are part of the system of airports of Warszawa and Venezia. Expected to replace the existing airport in Warszawa the New Central Polish airport is finally worth mentioning that is at its planning stage at present.

2.2. Compliance with infrastructure requirements

In order to ensure the interoperability and the proper functioning of the TEN-T, a number of infrastructure requirements for the Core Network are set out in the TEN-T Regulation to be achieved by 2030. With respect to these standards, key performance indicators (KPIs) have been defined for all nine Core Network Corridors. The infrastructure KPI values for the Baltic-Adriatic Corridor are presented in Table 2 for all transport modes for the baseline year 2013 and for 2019.

Improvements have been made since 2013, in particular with regard to rail transport. ERTMS has been installed on several sections of the Corridor in Poland, the Czech Republic, the Slovak Republic, Austria and Slovenia. Works for the modernisation of the network in Poland, the Czech Republic, the Slovak Republic 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, the Czech Republic, the Slovak Republic and Austria.

Table 2: Infrastructure Key Performance Indicators for the Baltic-Adriatic Corridor

Mode	Key performance indicator	Unit	2013	2019	2019 vs 2013
Rail network	Electrification	%	99%	99%	(=)
	Track gauge 1435mm	%	100%	100%	(=)
	ERTMS implementation	%	0%	22%	(+)
	Line speed (>=100km/h)	%	66%	71%	(+)
	Axle load (>=22.5t)	%	88%	94%	(+)
	Train length (740m)	%	16%	49%	(+)
Road network	Express road/motorway	%	79%	86%	(+)
	Availability of alternative clean fuels	No.	n.a.	n.a.	
Airports	Connection to rail by 2050 (Warsaw, Wien)	%	100%	100%	(=)
	Open accessibility to at least one terminal *	%	100%	100%	(=)
	Availability of alternative clean fuels	%	0%	0%	(=)
Seaports	Connection to rail	%	100%	100%	(=)
	Connection to IWW CEMT IV (5 Seaports connected to IWW)	%	100%	100%	(=)
	Availability of alternative clean fuels	%	0%	0%	(=)
	Open accessibility to at least one terminal *	%	100%	100%	(=)
	Facilities for ship-generated waste	%	63%	63%	(=)
IWW ports	Class IV waterway connection	%	100%	100%	(=)
	Connection to rail	%	100%	100%	(=)
	Availability of alternative clean fuels	%	0%	0%	(=)
	Open accessibility to at least one terminal *	%	100%	100%	(=)
RRTs	Capability for Intermodal (unitised) transhipment	%	100%	100%	(=)
	740m train terminal accessibility	%	33%	33%	(=)
	Electrified train terminal accessibility	%	75%	75%	(=)
	Open accessibility to at least one terminal *	%	42%	83%	(+)

*Source: Baltic-Adriatic corridor study consortium; Notes: 1) KPIs data refer to December 2019; 2) The elaboration of the KPIs of the rail and road networks is based on the sections encoded in the TENtec database as of 2017, corresponding to a total length of the corridor links of the rail network of 4,227 km, of which 3,700 km classified as freight or mixed passengers and freight railway lines; and 3,587 km of roads; 3) ERTMS figures were elaborated by the ERTMS Deployment Management Team. According to the criteria adopted in the ERTMS Deployment Plan (EDP), percentages refer to the length of the sections where ETCS is already in operation, i.e. where an authorisation of the trackside by the national safety authority has been issued; 4) *Availability of one terminal open to all operators and application of transparent charges*

A deviation analysis has been performed by comparing the current infrastructure parameters with the 100% target value set in the Regulation (EU) 1315/2013 for the core network infrastructure for all the KPIs. The outcome of this exercise is commented below for each transport mode.

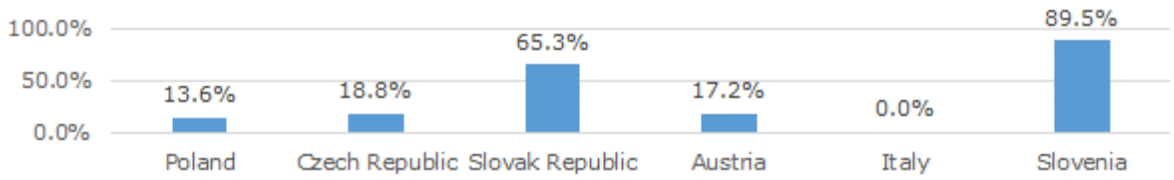
Rail

The Baltic-Adriatic Corridor includes 4,227 km of 1,435 mm standard gauge railway infrastructure. The corridor railway infrastructure is already continuous and in operation with the exception of the two sections in Austria (Koralmbahn line section Wettmannstätten – Grafenstein within the wider section Graz – Klagenfurt and Semmering Base Tunnel Gloggnitz – Mürzzuschlag).

As regards electrification, with reference to passenger, freight and mixed use lines, the railway infrastructure along the Corridor is also almost entirely electrified with the exception of the diesel passenger cross-border section between Bratislava and Wien (Stadlau), via Devínska Nová Ves (SK) – Marchegg (AT).

ERTMS deployment is progressing along the Corridor. Based on the analysis developed as part of the studies for the monitoring of the ERTMS deployment as defined in the current European Rail Traffic Management System European Deployment Plan (ERTMS EDP), by end of 2019 ETCS was in operation on 22% of the Corridor. Figure 3 provides details on ETCS deployment by corridor Member State.

Figure 3: ETCS deployment along the Baltic-Adriatic Corridor (%)



Source: Baltic-Adriatic corridor study consortium based on ERTMS Deployment Management Team; Notes: 1) Data refer to December 2019; 2) Elaboration based on the sections encoded in the TENtec database as of 2017, corresponding to a total length of the corridor links equal to 4,227 km; 3) According to the criteria adopted in the ERTMS Deployment Plan (EDP) percentages refer to the length of the sections where ETCS is already in operation, i.e. where an authorisation of the trackside by the national safety authority has been issued

ERTMS deployment is particularly advanced in the Slovak Republic and Slovenia. In Italy, although planning activities were completed, construction works are still to start which is expected to occur in 2021. Therefore, no section has yet been equipped with ERTMS. Albeit not in operation, by the end of 2019 ETCS Level 2 was installed in the Czech Republic along the 206 km section Petrovice u Karviné – Ostrava – Přerov – Břeclav, which will significantly increase the share of the ERTMS compliant network in the near future in this Member State.

With reference to the implementation schedule set in the ERTMS EDP by 2023, delays exist in the implementation of ERTMS along the corridor lines. In Poland, ERTMS is in operation on the sections Grodzisk Mazowiecki – Zawiercie (albeit the system is temporary unavailable on the subsection Idzikowice – Włoszczowa due to ongoing modernisation works) and Wrocław – Opole. On the sections Gdynia – Warszawa and Warszawa – Grodzisk Mazowiecki, ERTMS deployment has been delayed from 2018 to 2020. The deployment of ERTMS between Opole and Zawiercie and between Opole and the borders with the Czech Republic and the Slovak Republic is not foreseen before 2023. In the Slovak Republic the border sections are planned to be in operation beyond 2023, which may result in a possible discontinuity at least along the itinerary of the cross-border section Bratislava and Wien (Stadlau), via Devínska Nová Ves (SK) – Marchegg (AT), since ERTMS deployment between Wien and Marchegg is planned for 2023. As of the other sections in Austria, ERTMS is in operation between the border with the Czech Republic and Wien (Kleidering). On the Wiener Neustadt - Graz section and at the cross-

border section with Italy, ERTMS will not be in operation by 2023. On the remaining sections of the Corridor in Austria, ERTMS is planned to be deployed by 2023. In Italy, ERTMS deployment should have started on some corridor sections (i.e. Portogruaro – Cervignano – Trieste/Villa Opičina – Slovenian Border and Padova – Venezia). However, even though the technology is not yet installed, these corridor sections are planned to be in operation before 2023. ERTMS at the border section with Austria and along the Venezia – Portogruaro section are currently foreseen to be in operation after 2023.

Table 3 summarises the outline in percentage (over the national sections of the Corridor) and absolute kilometres values of the non-compliant infrastructure with reference to main compliance parameters related to the rail freight infrastructure of the Baltic-Adriatic Corridor:

- ***Axle load*** – The Corridor is mostly compliant with the Regulation (22.5 t). However, some sections, comprising 6% of the total corridor railway infrastructure, are not at standard yet. This concerns Poland (some sections of the odd track of line 139 between Katowice – Czechowice – Dziedzice – Zwardoń, and of line 277 between Wrocław – Jelcz – Opole) and Slovenia (some sections between Pragersko-Maribor-Šentilj-state border, where studies and works are currently ongoing).
- ***Line speed*** – 71% of the Baltic-Adriatic Corridor is at standard, with gaps on the Polish and Slovenian networks in particular. Nearly 750 km of the Polish railway lines (around 20% of the total corridor railway infrastructure for freight transport) and about 270 km of Slovenian railway lines need to be upgraded to meet the requirement of line speed for freight trains (100 km/h).
- ***Train length*** – At several corridor sidings and links, there are limitations which affect the operation of 740 meter long trains.

Table 3: Share in % of the non-compliant rail infrastructure for freight transport

	CORRIDOR	PL	CZ	SK	AT	IT	SI
Axle load (>=22.5t)	**6.1%**	11.6%	0.0%	0.0%	0.0%	0.0%	4.9%
Line speed (>=100km/h)	**29.0%**	41.1%	0.0%	13.2%	1.0%	5.0%	75.5%
Train length (740m)	**51.5%**	53.6%	100.0%	29.0%	0.0%*	100.0%	9.4%*

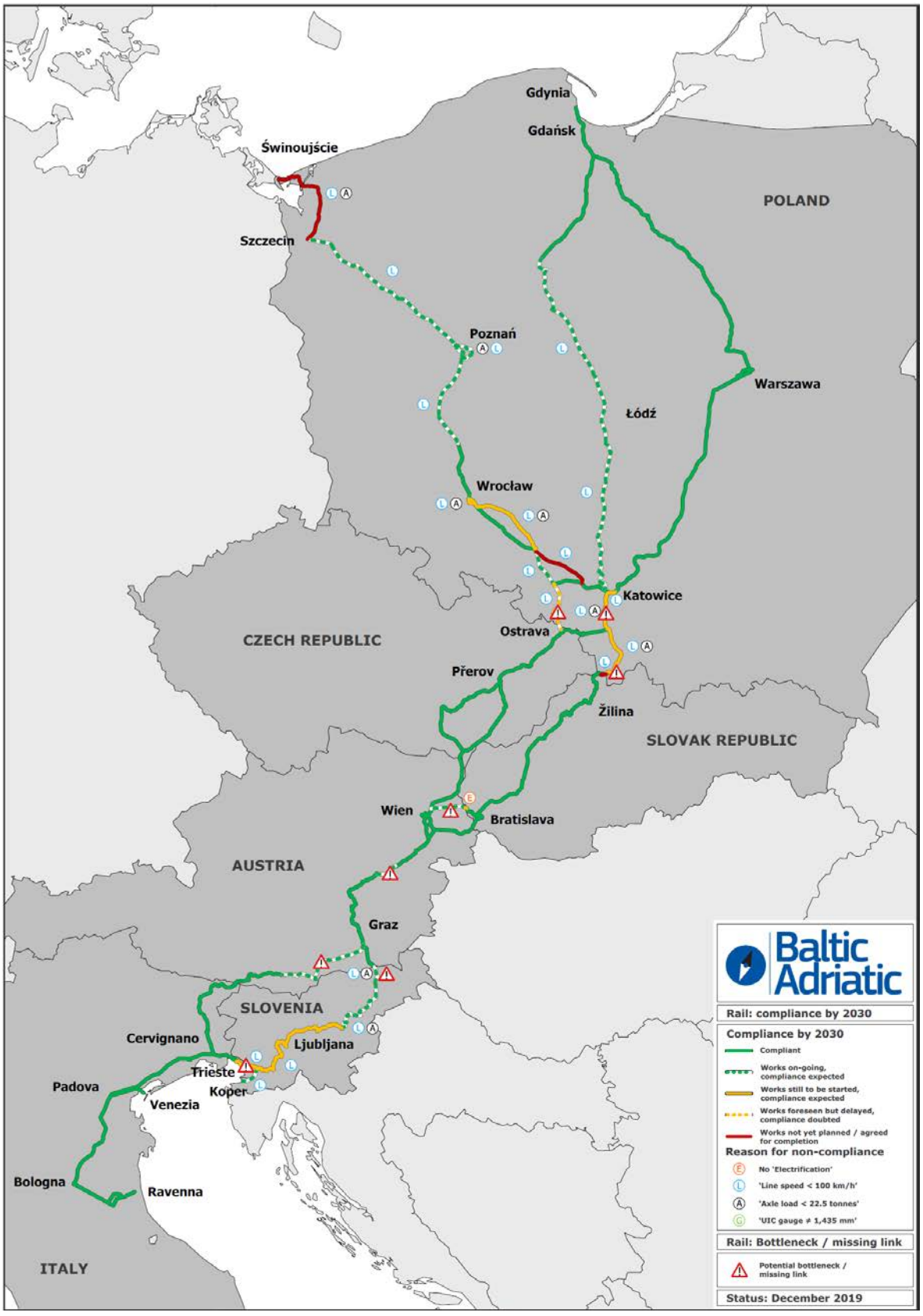
*Source: Baltic-Adriatic corridor study consortium; Notes: 1) Data refers to December 2019; 2) Elaboration based on the sections encoded in the TENtec database as of 2017, corresponding to a total length of the corridor links classified as freight or mixed passengers and freight railway lines, equal to 3,700 km; 3) *According to the Slovenian and the Austrian authorities 740 meters long trains are possible to be operated on the corridor lines depending on traffic conditions and subject to permission*

Along the Corridor, stations and junctions are generally technically adequate in the Czech Republic, the Slovak Republic, Austria and Italy and are gradually undergoing modernisation and upgrading in Poland and Slovenia. However, bottlenecks and limitations are identified in Brno (CZ), Žilina (SK) and Zidani Most (SI), particularly regarding speed. 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. 740 meter train operation is possible across Gdańsk, Szczecin, Wien and Ljubljana urban nodes.

A technical compliance map for the railway infrastructure has been developed (see Figure 4 below) to represent the likely status of the Corridor by 2030, taking into account all the ongoing and planned investments.

The map is based on the TENtec system encoded sections 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 and potential bottleneck/missing link icons show the problems at the time of the analysis (2019).

Figure 4: Rail compliance map by 2030 overview



Source: Baltic-Adriatic corridor study consortium; Notes: 1) For some projects in the list improving but not achieving the speed standard of 100 km/h for freight transport, information on the extent of the remaining gaps has not been provided/is not yet available. Accordingly it has currently been assumed that the gaps will be limited to short subsections that are not graphically represented; 2) Where at least a line crossing a urban node is at standard, the whole network in the same node is represented as such

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. This presumes that, for certain outstanding sections, Member States proceed to identify all necessary investments, define the scope of the projects, their costs and their time-schedule for implementation. While this work has to be carried out with a view to reaching full compliance by 2030, the analysis of the corridor project list vis-à-vis the functioning of the Corridor rather points to the need to turn the plans and project list into a more mature and stable pipeline of projects.

The corridor analysis shows that for some projects required to reach the standards foreseen in the TEN-T Regulation, costs or implementation dates are not defined. Furthermore, based on a gap analysis developed as part of the corridor study assessing the effectiveness of the investments included in the corridor project list in achieving the TEN-T standards by 2030, several rail investments would be required that are not currently defined.

Provided that the plans for ERTMS deployment after 2023 are to be further confirmed, most of the identified gaps do not appear to represent major bottlenecks under the interoperability standpoint, as they are assumed to be related to i. short segments of the Corridor, particularly in urban areas or at stations where the speed target of 100 km/h for freight transport may not be achieved; and/or ii. to the achievement of the 740 meter train length parameter for freight transport on certain sections, that might also be reached by means of operational solutions associated with the gradual implementation of infrastructure investments on other links; or iii. to the improvement of the parameters within the terminals at logistic nodes. Nonetheless doubts exist about the scope of several planned projects, currently under definition/preparation, and their impact on the parameters of the infrastructure by 2030.

According to the review of the corridor project list and consultation with the concerned infrastructure managers and stakeholders, the development of a compliant Corridor by 2030 is challenged by financial constraints, technical difficulties and costs associated with the solutions to be adopted to meet the required standards. In turn, this also has an impact on the economic viability of the projects. This is particularly the case of the infrastructure within urban nodes, but it also affects the modernisation of main corridor lines and cross-border sections. Requests for derogation from the required speed standard in accordance with Art. 39, point 3 of the TEN-T Regulation are under consideration in Member States, particularly in Poland and Slovenia, with a view to achieving compliance. However, no information is currently available on the exact location and extent of the sections for which a possible derogation would be requested. Therefore, the compliance outlook, as depicted in the above map, could not be elaborated with certainty, adding an element of risk to the achievement of a compliant Corridor by 2030.

With reference to the TEN-T requirements represented in the previous map, specific details are provided below for the critical cross-border sections and for the national sections that could still be affected by compliance issues by 2030:

- ***Critical cross-border sections***: Modernisation works of the Katowice (PL) – Ostrava (CZ) cross-border section have recently started on the Polish side. The projects planned for the modernisation of this section are foreseen to be completed by 2026, achieving the required axle load and speed standards. Further to the ongoing works on the current routing of this cross-border section, a 2019 CEF study is under implementation by Centralny Port Komunikacyjny Sp. z o.o. concerning the development of a new railway line interconnecting the Katowice and Ostrava regions. Rehabilitation works are also ongoing on the Opole (PL) – Ostrava (CZ) and Katowice (PL) – Žilina (SK) cross-border sections on the Polish side, that are expected to improve the speed parameter. Additional initiatives aimed at achieving the speed and axle load standards by 2030 for these sections are foreseen for implementation after 2020. Due to financial constraints, the initiatives for the modernisation of the three cross-border sections that are still to start are currently included in the reserve list of

the National Railway Programme and for the ones relating to the Opole (PL) – Ostrava (CZ) and Katowice (PL) – Žilina (SK) cross-border sections investments costs are not yet defined. Whereas no works are required on the Czech side to achieve the parameters represented in the compliance map, the short cross-border section Zwardoń – Skalité on the Slovak side of the Katowice (PL) – Žilina (SK) cross-border section is currently not foreseen to reach the speed standard by 2030.

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 and are expected to be completed by 2023. The full double tracking of the remaining single track sections is under evaluation which might occur after completion of the ongoing works, subject to transport demand. Works for the electrification of the cross-border section on the Slovak side are expected to start in 2021 and be completed by 2023.

Works are ongoing for the modernisation and upgrading of the cross-border section Graz (AT) – Maribor (SI) on the Slovenian side. The axle load and speed standards are expected to be achieved on the existing line already by 2023, whereas the track doubling on the section is foreseen for completion by 2030. Subject to transport demand, studies on the upgrade of the section are planned to be carried out between 2022 and 2026 on the Austrian side.

The modernisation of the cross-border section Trieste (IT) - Divača (SI) is foreseen to be completed by 2030. Based on current investments the speed parameter may not be achieved on this cross-border section.

- ***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 in Poland 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. These are the only non-compliant sections on the Baltic-Adriatic Corridor where no investments are currently planned. Feasibility studies are under development for the definition of the initiatives to modernise the corridor infrastructure between Szczecin and Świnoujście and at the Wrocław node.

  Infrastructure parameters on speed will also fall short in meeting the KPI targets on some short national sections of the Eastern branch of the Corridor in Poland between Gdańsk and Warszawa due to technical constraints (line geometry). These are located by Tczew and between Nowy Dwór Mazowiecki and Modlin. Within core urban nodes, speed limitations are currently expected to persist after the 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 in the Czech Republic, at the Žilina node, and at some short sections between Žilina and Púchov and between Krásno nad Kysucou and Čadca in the Slovak Republic as well as at the Venezia node and on the short section between Granarolo and Faenza in Italy. These issues are generally expected to be resolved by means of ongoing/foreseen initiatives. Furthermore they are limited to short sections and speed limitation particularly at urban nodes could be subject of derogations from standard. Hence, such segments are not shown in the technical compliance map.

  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 Opole and Katowice. Works on these sections are indeed included in the reserve list of the National Railway Programme, with no national funds foreseen to secure their full implementation. While the works on these lines may be implemented in the period after 2020, the possibility of reaching the required speed and axle load standards by 2030 remains uncertain.

According to the review of the impact of the planned projects by 2030 for the other two KPIs not represented in the above compliance map – i.e. ERTMS and 740 meters train length – the Polish National ERTMS Implementation Plan foresees the deployment of this technology on the entire core network by 2030. However, the projects concerning the deployment of ERTMS on several sections of the Polish network, including at the Katowice (PL) – Ostrava (CZ) and Opole (PL) – Ostrava (CZ) cross-border sections, have not yet been defined (except on the subsection Kędzierzyn Koźle – Opole Zachodnie). The projects concerning ERTMS deployment have not been defined on either side of the Katowice (PL) – Žilina (SK) cross-border section. Concerning train length, this standard may not be achieved on both sides of the Opole (PL) – Ostrava (CZ) cross-border section as well as on the Czech side of the Katowice (PL) – Ostrava (CZ) cross-border section and on the Slovak side of the Katowice (PL) – Žilina (SK) cross border section. Train length compliance may also not be achieved between Bratislava and Wien on the Slovak section Bratislava – Petržalka. Implementation dates for ETCS implementation at the Brno node in the Czech Republic are not defined. In Austria, ERTMS is assumed to be implemented on all corridor sections, although the investments in the project list are still to be fully defined also concerning the critical cross-border sections. In Italy, ERTMS deployment and operability of 740 meter long trains will be gradually implemented and fully achieved by 2030, although the implementation dates of the corresponding projects have not been defined completely. It is also unclear whether the train length standard will be achieved on some national sections in Poland, i.e. between Tarnowskie Gory and Chorzow Batory along the Central branch of the Corridor, between Szczecin and Świnoujście, between Opole Groszowice – Rudziniec Gliwicki on the main itinerary Wrocław – Katowice and at the Wrocław node, as well as on most sections between Ostrava and Břeclav in the Czech Republic.

Road

The 3,600 km road infrastructure on the Baltic-Adriatic Corridor is not entirely compliant with the requirements of the Regulation (EU) 1315/2013, especially with regard to the type of infrastructure (expressway/motorway standard). Currently, 13.4 % of the road corridor infrastructure is not compliant with the TEN-T requirements.

Table 4: Share of non-compliant road infrastructure

CORRIDOR	PL	CZ	SK	AT	IT	SI
13.4%	22.9%	14.7%	11.1%	1.1%	0.0%	0.0%

Source: Baltic-Adriatic corridor study consortium, elaboration based on the sections encoded in the TENtec database as of 2017, corresponding to a total length of the road corridor links of 3,587 km; Data refers to December 2019

Whereas the corridor infrastructure in Italy and Slovenia is fully at standard, issues exist in other corridor Member States that also affect certain cross-border sections. This concerns sections between Poland and the Slovak Republic along the itinerary Katowice (PL) – Žilina (Brodno) (SK) and between the Czech Republic and Austria, along the route Brno (CZ) – Wien (Schwechat) (AT). No compliance issues have been identified in core urban nodes where at least one urban motorway/expressway route exists.

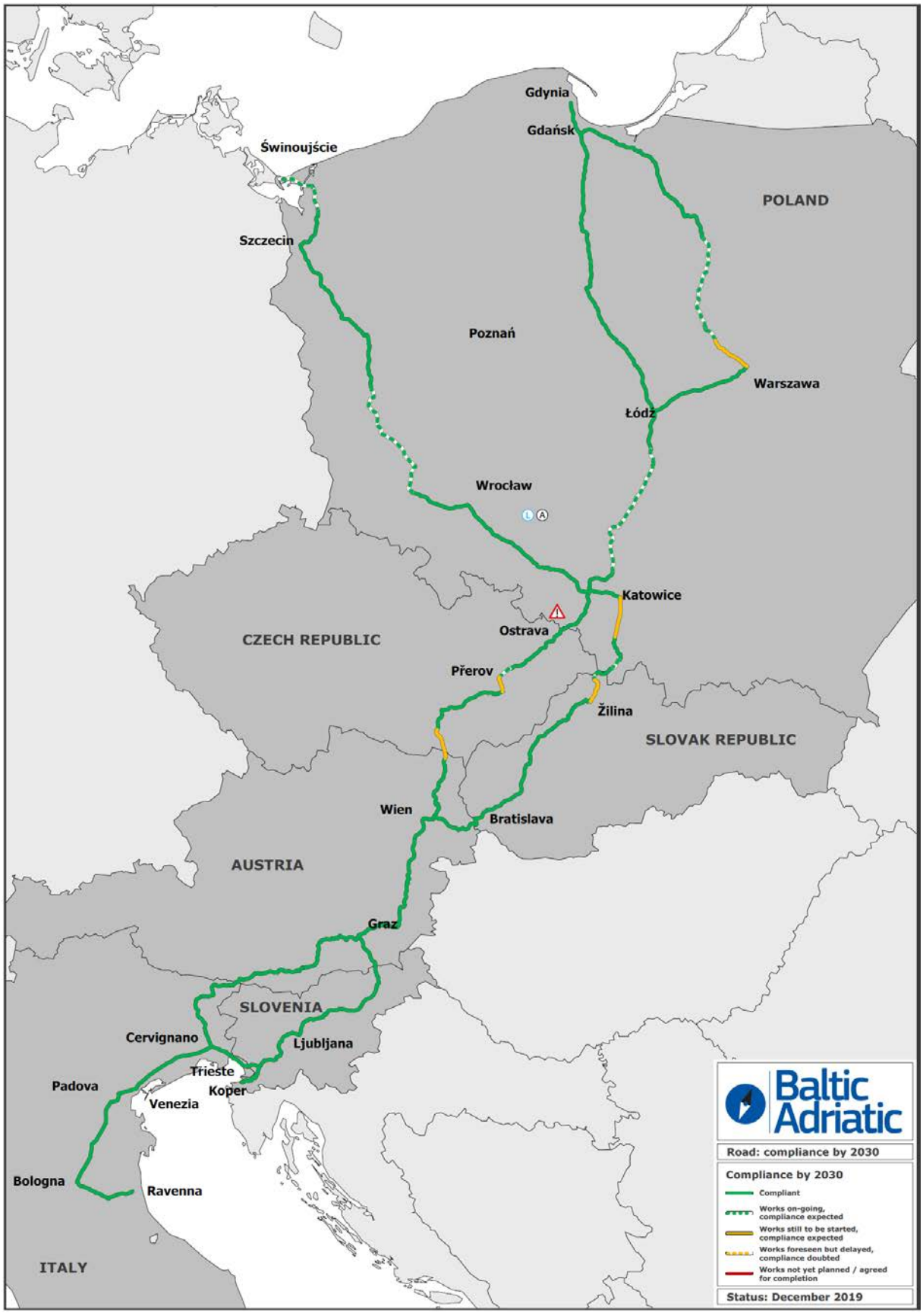
In line with the analysis performed for the railway infrastructure, a technical compliance map for the corridor road network has been developed (see Figure 5 overleaf), which is also based on the TENtec system encoded sections and shows the prevailing standard on the corridor links with reference to the motorway/expressway standard. The colour of the lines refers to the planned works and their impact on the corridor compliance by 2030.

The review of the planned investments shows that the corridor road infrastructure is expected to be fully compliant with motorway/expressway standard by 2030, including cross-border sections.

Intelligent Transport Systems (ITS) activities are ongoing at the international level (i.e. EU ITS platform) and 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. A Memorandum of Understanding between the motorway operators ASFINAG, Autovie Venete and DARS (also involving partners from Croatia and Hungary) is in place since 2015, supporting the exchange of traffic related data and information across the borders. An interoperable toll collection systems along the Corridor in line with Directives 2004/52/EC - 2009/750/EC - 2019/529/EC, is not yet available.

Figure 5: Road compliance map by 2030 overview



Source: Baltic-Adriatic corridor study consortium

Infrastructure for safe and secure parking and alternative clean fuels are available on the corridor road infrastructure, although the quantitative measurement of the status and progresses of the corresponding KPIs is pending the definition of a specific methodology. Concerning alternative clean fuels, it is noticed that electricity is available on several sections of the Corridor and in all core urban nodes, including fast charging stations with a nominal power output of more than 40kW in all Member States. CNG is available in Poland, the Czech Republic, Italy and Slovenia; LPG is available in all Member States. LNG is available in Poland and Slovenia, and hydrogen is starting to become available in Austria and Slovenia. Biofuels are available in the Czech Republic, where LNG and hydrogen are also expected to be available within the next two years.

Ports

Regarding the analysis of the compliance of the port infrastructure, all Baltic-Adriatic corridor ports have at least one terminal open to all operators in a non-discriminatory way and charges are applied transparently. Reception facilities for ship-generated waste and cargo residues in accordance with Directive 2000/59/EC are generally available at all corridor seaports. However, some ports limitations exist for some waste and residues categories. All classified inland waterway ports fulfil the CEMT IV requirement.

All ports are 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 corridor seaports. With regard to 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 the Adriatic ports. Expansion of the existing infrastructure to increase capacity in view of future traffic growth are foreseen or already ongoing in Gdynia, Gdańsk and at the Adriatic ports, which will further improve hinterland connections by rail thereby supporting modal shift. Due to their location within or in proximity of urban nodes, measures to reduce/mitigate the impact of road traffic either at present or in the future are also required in Venezia and Ravenna.

Concerning last mile road connections, works to increase standards are envisaged at the ports in the Baltic Sea and at Koper. Port 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 2019, alternative clean fuels were not available for maritime transport operations at any of the ten corridor ports. Finally, vessel traffic monitoring and information systems (VTMIS) and e-Maritime services are available or under development at the ports, although they are not integrated and fully interoperable at the basin or Union level (RIS deployment is also available/ongoing at the corridor inland waterway Ports).

Airports

In accordance with the TEN-T Regulation requirements, the two core airports of Wien and Warszawa (Chopin) are already connected to the Baltic-Adriatic corridor railway network. In addition, rail connections exist for the Szczecin, Gdańsk, Ostrava and Bologna airports (where construction works for an Automated People Mover between the central railway station and the airport have been recently completed).

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 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. The SESAR Deployment Manager coordinates and monitors the realisation of all implementation projects, with the ultimate goal of providing the Union with a high performing air traffic management infrastructure by 2030. There are currently ongoing and planned initiatives on the development of SESAR in the Member States, including the Baltic-Adriatic Corridor.

The analysis of the corridor KPIs shows that alternative clean fuels are currently not available at any corridor airport.

Rail-road terminals

The 24 rail-road terminals located at the core nodes of the Baltic-Adriatic Corridor are all connected to their respective national road and rail networks. With regard to rail interconnections and with respect to the technical compliance of the rail accessibility to terminals, 8 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 that would affect the quality of last mile connections, except capacity constraints at the Poznań railway bypass and Bratislava railway node. Concerning the infrastructure inside the terminals, 7 out of 24 terminals have a maximum length of loading/unloading tracks of minimum 740 meters, 19 terminals do not have electrified rail tracks at the terminal. As for road last mile connections, there are issues concerning local urban accessibility and traffic in Poznań, Warszawa and Wrocław.

With regard to the other parameters, all terminals are equipped to handle intermodal units. 20 rail-road terminals declare they have at least one freight terminal open to all operators in a non-discriminatory way, while 4 terminals do not meet this criterion or did not confirm.

2.3. Persisting bottlenecks and missing links

Rail infrastructure

A number of bottlenecks on the corridor railway have yet to be resolved In order to achieve compliance with the standards required in Regulation (EU) 1315/2013. Also, there are two missing links, the construction of which is pending completion.

Rail cross-border sections

Among the bottlenecks to be resolved, the modernisation projects of the six cross-border sections, which have been identified as critical since the elaboration of the first work plan, are particularly important:

- Opole (PL) – Ostrava (CZ) [Chałupki (PL) – Bohumín (CZ)];
- Katowice (PL) – Ostrava (CZ) [Zebrzydowice (PL) – Petrovice u Karviné (CZ)];
- Katowice (PL) – Žilina (SK) [Zwardoń (PL) – Skalité (SK)];
- Bratislava (SK) – Wien (Stadlau) (AT) [Devínska Nová Ves (SK) – Marchegg (AT)];
- Graz (AT) – Maribor (SI) [Spielfeld-Straß (AT) – Šentilj (SI)];
- Trieste (IT) – Divača (SI) [Villa Opicina (IT) – Sežana (SI)].

Missing links

The two Alpine crossings in Austria, i.e. Semmering Base Tunnel and the Koralm Railway Line and Tunnel, are under construction and expected to be completed by 2027 and 2025 respectively. Once finalised, the two projects will contribute significantly to improving the functioning of the Corridor.

National railway lines and rail-road terminals

In addition to the need for upgrades at the border sections of the Corridor and the completion of the two Alpine crossings, several bottlenecks located on national networks need to be addressed to ensure the Baltic-Adriatic Corridor will develop as an interoperable infrastructure.

Infrastructure improvements are also required at core urban nodes and other nodes along the corridor railway. Here, the improvement of the interconnection between long distance and regional/local traffic corresponds to the need to modernise the existing infrastructure. Finally, the infrastructure connecting several corridor rail-road terminals does not conform to the standards of the Regulation, including electrified and/or 740 meter long train accessibility.

Road infrastructure

Some corridor sections still require an upgrade to reach the required expressways/motorway standards, including the following two road cross-border sections:

- Katowice (PL) – Žilina (Brodno) (SK) [Zwardoń (PL) – Skalité (SK)];
- Brno (CZ) – Wien (Schwechat) (AT) [Mikulov (CZ) – Poysbrunn (AT)].

Based on the results of the transport market analysis capacity constrains are present and may intensify in the future in urban nodes, where urban bypasses are currently foreseen to be implemented.

Port infrastructure

Further improvement and upgrade of the existing logistic facilities and infrastructure, including road and rail last mile connections inside and outside port areas, are required to support interconnectivity between the ports and their hinterlands and to strengthen the competitiveness of intermodal transport and Motorways of the Sea.

Decarbonisation of transport

In order to reduce emissions, more efforts are needed to support the diffusion of alternative clean fuels and zero emission vehicles. According to the analysis of the corridor KPIs, progress in the availability of alternative clean fuels shall be monitored closely at ports and especially at airports. Facilities for ship-generated waste and cargo residues are also not available for all type of waste and residues at all ports.

2.4. Persisting administrative and operational barriers

To develop the Baltic-Adriatic Corridor as an interoperable multimodal network, the construction 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 gradually be overcome in order for the Corridor to generate the expected benefits for European citizens and businesses.

Railway transport

Long distance transport of freight by railway is particularly affected by administrative and operational bottlenecks, namely issues that relate to cumbersome procedure, organisational inefficiency and/or legal aspects. According to analyses carried out by the

Baltic-Adriatic Rail Freight Corridor, operational bottlenecks concern a) the communication between the Traffic Control Centres (TCCs) of Infrastructure Managers (IMs) or among Railway Undertakings (RUs) or between RUs and IMs at the borders; or b) operational rules between RUs and IMs at the borders. Faulty or untimely intersystem communication of delays and the arrival sequence of freight trains, insufficient communication between railway undertakings in the takeover of trains, technical inspection of rolling stocks and the change of locomotives due to different power systems are all examples of barriers that result in extensive dwelling times at international border crossings, negatively impacting on the commercial speed and competitiveness of rail transport.

In order to resolve communication and operational issues, the rail infrastructure managers under the RailNetEurope umbrella adopted tools and processes to enable a more effective and efficient operation of international rail traffic. These include the following systems: *Path Coordination System (PCS)* - which is an international path request coordination system for Railway Undertakings (RUs), Infrastructure Managers (IMs) and Allocation Bodies (ABs); *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; and *Traffic Control Centres Communication „TCCCom" tool* – that is a multilingual information exchange tool to facilitate the necessary communication between the Traffic Control Centres.

Since the establishment of the Baltic-Adriatic Rail Freight Corridor (RFC), the RFC has undertaken analyses and studies aimed at resolving the above described administrative and operational challenges affecting the operation of international freight transport by railway, improving the management of the capacity of the corridor lines and offering a quality and market oriented service to their customers.

Multimodal transport

Short Sea Shipping and intermodal transport operations at the core ports and rail-road terminals are affected by administrative and operational issues reducing their competitiveness. The implementation of e-Maritime and ICT solutions is required to simplify administrative procedures associated with custom, safety and security processes, implementation of rail and road hinterland traffic management, as well as the promotion of Single Window initiatives and facilitation of access to ports, track flows of vessels and transported intermodal vehicles, rolling stock and goods. The competitiveness of rail and rail combined traffic as well as Short Sea Shipping is furthermore hindered by the higher costs of these operations. In absence of green transport policy measures aimed at reducing the cost of these solutions and/or internalising external costs of road transport, modal shift effects of infrastructure investments may be limited.

Interconnectivity

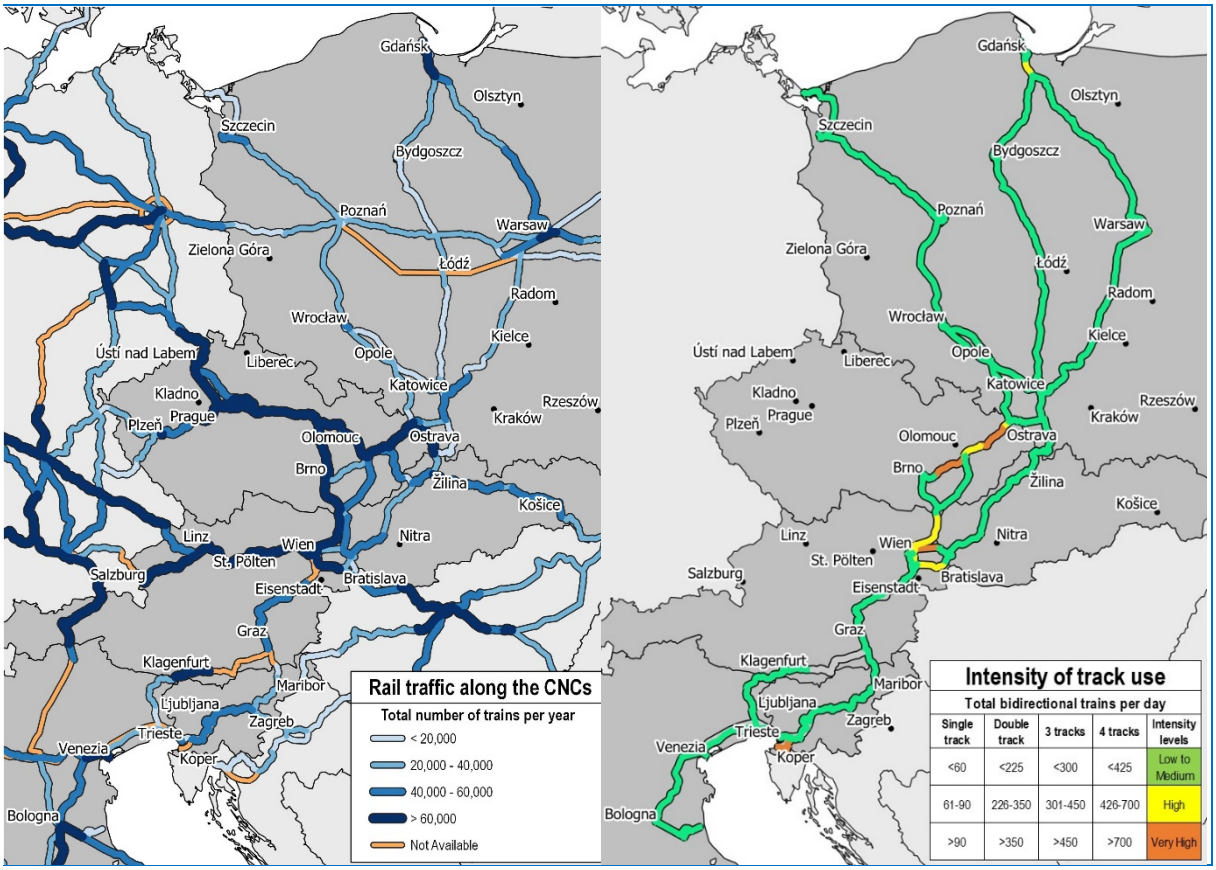
The development of cross-modal and borderless commercial solutions of mobility services within and between the urban nodes along the core network corridors and across the European regions (e.g. provision of real time information and passengers' rights, travel planner multimodal platforms as well as Mobility as a Service solutions) are facing challenges, in particular, 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 thus required in addition to technological solutions to support the development of "open data" platforms in favour of the further digitalisation of mobility services.

3. Transport market analysis

3.1. Current flows along the Corridor

In line with the principles set out in Regulation (EU) 1315/2013 for the development and implementation of the TEN-T policy, an analysis of the current transport flows along the Corridor has been performed as part of the Transport Market Study. The following maps represent the outcome of this analysis.[1]

Figure 6: Rail traffic flows and intensity of track use along the Baltic-Adriatic Corridor



Source: CNC Studies Consultants based on TENtec sections as of 2017 and data provided by the infrastructure managers

Next to the current annual bidirectional traffic flows, the maps also display the intensity of track/lane usage of the corridor infrastructure. Whereas the analysis indicates possible capacity constraints, it does not constitute a complete assessment of the capacity of the infrastructure.[2]

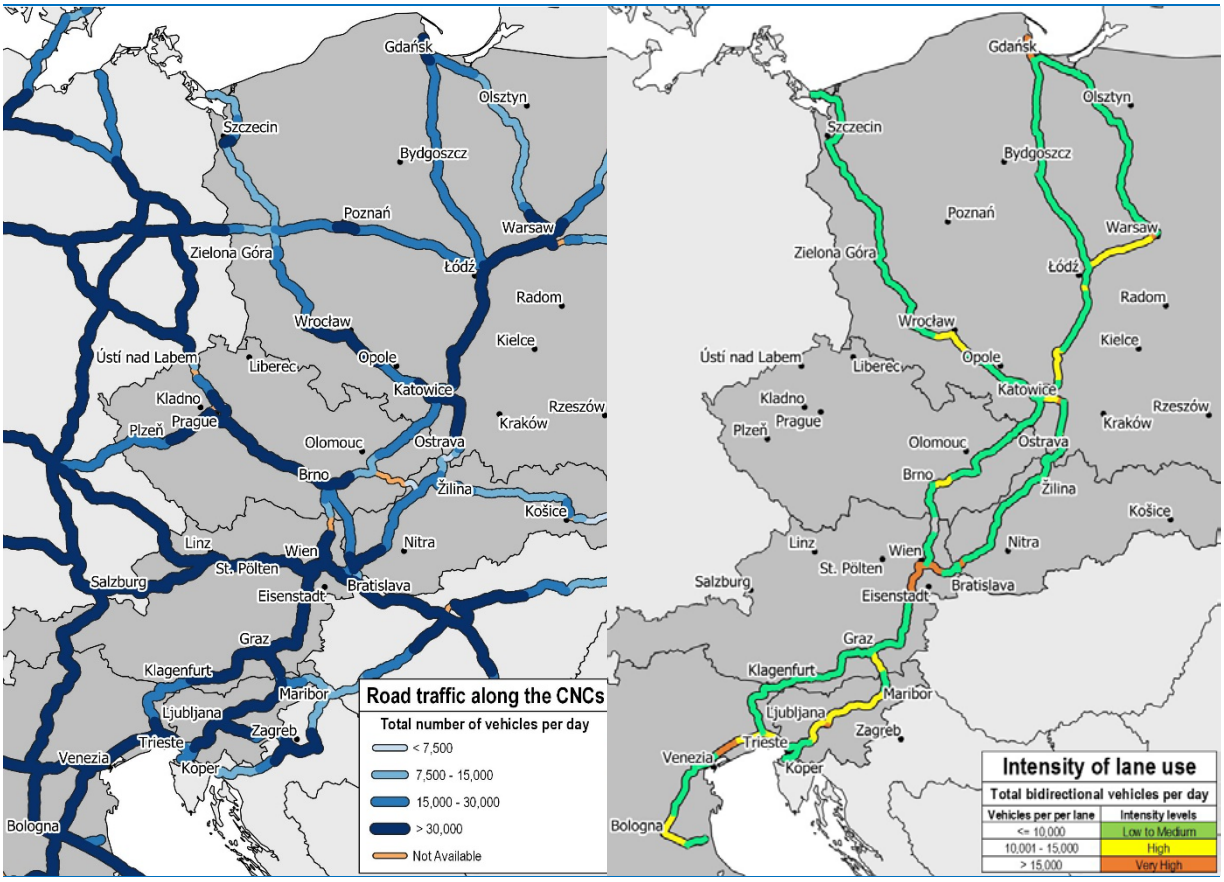
Based on the current corridor traffic flows, very high levels of use of the rail infrastructure are present between Ostrava and Brno in the Czech Republic, between the two twin capital cities of Bratislava and Wien as well as on the railway line towards the port of Koper in Slovenia. Sustained rail track usage also appears between Gdańsk and Tczew in Poland.

[1] Data have been collected from national surveys, Eurostat and infrastructure managers. Data refer to 2016.

[2] This would require a more detailed evaluation (especially for rail, where capacity limitations may refer to any of the rail subsystems and not only to the number of tracks).

For road transport, traffic intensity is particularly high between the ports of Gdynia/Gdańsk and Tczew in Poland, around and within the capital cities of Warszawa, Bratislava, Wien and Ljubljana, as well as between Trieste and Venezia. A High level of road infrastructure usage is seen between Warszawa and Łódź in Poland, around the core urban nodes of Wrocław and Katowice in Poland and Bologna in Italy, as well as along several stretches of the Slovenian network.

Figure 7: Road traffic flows and intensity of lane use along the Baltic-Adriatic Corridor



Source: CNC Studies Consultants based on TENtec sections as of 2017 and data provided by the infrastructure managers

3.2. The Corridor scenario

In addition to the analysis of the current flows and available capacity of the corridor infrastructure, future transport activities, as well as macro-economic impacts for three different corridor development scenarios have been estimated: 1) a **baseline scenario**, assuming that no additional core TEN-T network investments would take place beyond 2016; 2) a **reference scenario** assuming full completion of the core TEN-T, in line with the projects identified through the work of the European Coordinators and 3) a **specific scenario** highlighting specific aspects such as critical projects, special opportunities, specific sets of investments or measures of relevance for the Corridor. For all three scenarios, a combination of the "Assessment of Transport Strategies" (ASTRA) and "TRansport eUropean Simulation Tool" (TRUST) models has been used. For the scenarios relating to full corridor completion, this work plan draws on the results of the study on *The impact of TEN-T completion of growth, jobs and the environment* published in 2019 by the European Commission (Growth and Jobs study). The corridor-specific scenario was elaborated as part of an additional study carried out in view of the elaboration of the core network corridor work plans.

Reference scenario

The impact analyses performed under the Growth and Jobs study allow for capturing the direct effects of the new infrastructure developments in the transport sector and the indirect effects on supply industries. It also allows for including the wider economic impacts induced by mechanisms, such as higher productivity for other economic agents and into future years at regional/national scale. For the Baltic-Adriatic Corridor, the implementation of the entire EU-wide core TEN-T (reference vs. baseline in 2030) will result in a cumulated increase in GDP by 1.7% in the Corridor Member States from 2017 - 2030, corresponding to about € 600 billion and the generation of 2.8 million additional man-years of jobs.

These socioeconomic gains will be accompanied by additional benefits in terms of reduction of external costs and improved environmental protection. The planned investments along the Corridor, as set out in the present work plan, will enhance the environmental performance of the TEN-T, creating favourable conditions for increasing the modal share of green transport, reducing greenhouse gas emissions and other negative environmental impacts.

While the transition to innovative and sustainable transport technologies will generally make possible the decarbonisation of all transport modes, a positive contribution is also expected from the large-scale adoption of alternative clean fuels and zero-emission vehicles. The ongoing and planned projects on the TEN-T are expected to play an important enabling role by supporting the early adoption of such technology.

Corridor specific scenario

In line with the analysis of the critical issues affecting the development of the Baltic-Adriatic Corridor, the specific scenario for this Corridor concerns the assessment of the impact of the non-completion of the projects *for the modernisation of the road and rail cross-border sections between Ostrava-Katowice-Žilina*. These cross-border sections are particularly important for being located in relevant economic and industrial areas of the Corridor, with sustained freight traffic between Poland and the Czech Republic.

The non implementation of these projects would result in a loss of 3.5% and 4.4% of the TEN-T implementation impact on national GDP and employment (corridor vs reference in 2030) in the six Corridor Member States, with higher negative effects in Poland (-7.7% and -7.1% of the TEN-T implementation impact on national GDP and employment) and in the Slovak Republic (-10.4% and -11.7% of the TEN-T implementation impact on national GDP and employment).

The non modernisation of the critical cross-border sections between Ostrava-Katowice-Žilina will furthermore affect the functioning of the Corridor as a continuous and interoperable infrastructure. Such conditions would hamper the development of seamless traffic flows across Poland, the Czech Republic and the Slovak Republic and negatively affect the attractiveness of rail and intermodal transport in one of the most dynamic areas of the European industrial economy.

4. What still has to be realised by 2030

4.1. Overview

A list of projects for the development of the Baltic-Adriatic Corridor by 2030 in line with the requirements set out in the Regulation (EU) 1315/2013 was elaborated in 2014. The list was subsequently updated in view of the elaboration of the second and third work plans. For the present work plan, the project list was updated during August/September 2019.

Table 5 summarises the content of the Baltic-Adriatic corridor project list with reference to the main categories of investments and with respect to the priorities of the Baltic-Adriatic Corridor work plan.

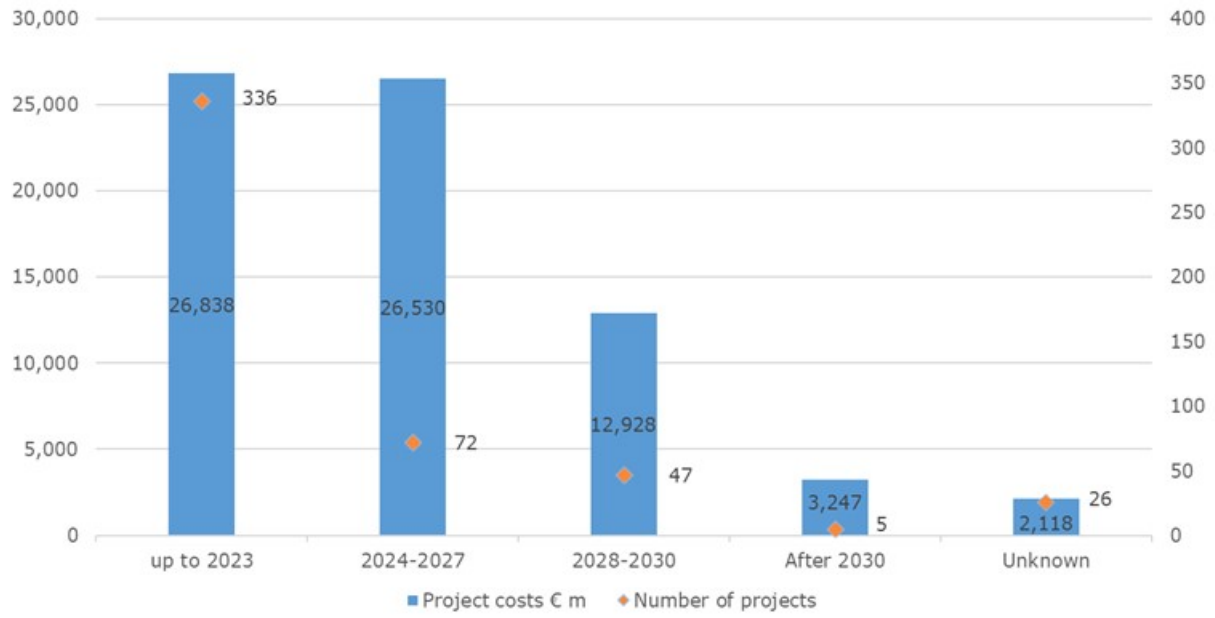
Table 5: Projects for the development of the Baltic-Adriatic Corridor

	Project category	Projects	Budget	Share on total
Development of the railway infrastructure	**Cross-border sections** (WP priority)	**27**	**5,627**	**7.9%**
	Missing links (WP priority)	**2**	**8,534**	**11.9%**
	Modernisation and upgrading of national railway lines, including junctions and nodes outside core urban areas in Cohesion Member States (WP priority)	**27**	**7,493**	**10.5%**
	Other projects for the modernisation and upgrading of national railway lines, including junctions and nodes outside core urban areas	21	4,614	6.4%
	Technological upgrading, telematics applications and other horizontal measures (art. 31 to 37 of Reg. 1315/2013)	9	1,120	1.6%
	ERTMS including dedicated projects at cross border sections (WP priority)	**22**	**1,822**	**2.5%**
	Other railway projects	13	375	0.5%
Development of the road infrastructure	**Cross border sections** (WP priority)	**10**	**2,635**	**3.7%**
	Completion and upgrading of national roads outside core urban nodes	44	8,355	11.7%
	ITS, ETC and other horizontal measures (art. 31 to 37 of Reg. 1315/2013)	55	2,653	3.7%
Development of the port infrastructure	**Developing interconnections** (WP priority)	**30**	**2,300**	**3.2%**
	Modernization / Expansion of the infrastructure	59	10,689	14.9%
	VTMIS and Innovation and other projects	18	534	0.7%
	Cross-corridor projects including MoS	4	74	0.1%
Development of Inland Waterway Ports		9	157	0.2%
Development of the airport infrastructure, excluding last mile connections in core urban nodes		59	3,022	4.2%
Development of the RRT infrastructure		14	355	0.5%
Development of the urban node infrastructure (WP priority)		**57**	**11,181**	**15.6%**
Additional horizontal studies and initiatives		6	122	0.2%
Total costs and approved funds (€ million)		**486**	**71,661**	**100.0%**
Work plan priorities		**163**	**37,042**	**51.7%**

Source: Baltic-Adriatic corridor study consortium; Notes: 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 2018 as provided by the European Central Bank: EUR 1 = PLN 4.2615, EUR 1 = CZK 25.647 – For the projects supported by the CEF instrument or for the projects for which values have been provided in € by the project promoters and Member States, the value reported by these sources has been considered as appropriate; 3) For 22 initiatives in the project list financial information including total project cost is not available

Overall, 486 projects have been identified for the development of the Corridor. These projects are either ongoing or planned for implementation, with a total budget of € 71.7 billion. More than 150 projects, corresponding to nearly half of the total project list value, relate to rail and ERTMS initiatives. Road transport represents the second largest category of projects in terms of budget, with more than 25% of the project list budget and 125 projects. Maritime transport follows with about 19% of the total project list value and 102 initiatives. The work plan priority projects concern 163 investments totalling € 37.2 billion, equivalent to more than 50% of the total project list.

Figure 8: Projects by completion time cluster



Source: Baltic-Adriatic corridor study consortium

Most of the projects are expected to be completed by 2023, with a total cost of € 26.8 billion. 119 initiatives are foreseen to be completed between 2024 and 2030 at an overall budget of € 39.5 billion. 31 projects are planned to be finalised after 2030 or have undefined completion dates, with a total cost of € 5.4 billion.

The project list appears overall adequate to ensure the development of a functional interoperable Corridor by 2030. What might jeopardise the completion of the Corridor rather concerns issues of lack of technical and/or financial maturity of certain initiatives. Some projects need to be fully defined in terms of scope, budget and implementation dates. Some Member States and infrastructure managers are furthermore considering to apply for derogation in line with the provisions set in Art. 39 of the Regulation (EU) 1315/2013, although no procedure was initiated so far and no details were provided on the location and extent of the corridor sections for which a derogation may be requested. While the current list is assumed to provide for a modernised corridor infrastructure by 2030, it might however be the case that the standards set out in the TEN-T Regulation for the rail freight infrastructure might not be fully met on all corridor sections. Specifically, this might be the case concerning speed within some urban areas, at stations and junctions, as well as speed and axle load on relatively short segments of the Corridor. Based on the current plans, ERTMS deployment and the possibility to run 740 meter trains might not be achieved on all sections. The standards required for rail freight infrastructure might not be fully reached within all ports and multimodal terminals. Investments to provide availability of alternative clean fuels at some ports and at all airports still have to be defined. Initiatives to ensure collection of all categories of ship-generated waste and cargo residues are also needed at some ports.

On the basis of the above analysis of the impact of the project list vis-à-vis the requirements set out in the TEN-T Regulation, an exercise was performed as part of the core network corridor studies aimed at roughly estimating the additional costs that would be needed to achieve the full standard corridor scenario by 2030. In addition to the budget of the measures currently not foreseen within the scope of the ongoing and planned initiatives, the costs of those projects included in the project list, as well as the impact on the KPIs but without budget at present, were also estimated. As a result, it appears that the budget needed to fully reach the TEN-T standards would increase by € 7 billion at minimum.

The following sections describe the projects currently included in the Baltic-Adriatic Corridor project list.

4.2. Description per transport mode

Rail transport

The Baltic-Adriatic Corridor list comprises 152 rail infrastructure projects, for a total cost of € 34.0 billion. Modernisation works to reach the TEN-T standards are ongoing and planned at the cross-border sections between Poland, the Czech Republic and the Slovak Republic, between the Slovak Republic and Austria, between Austria and Slovenia and between Slovenia and Italy, as well as on the national network in Poland and Slovenia. In the Czech Republic, the Slovak Republic, Austria and Italy, the upgrade of lines, including junctions and nodes, are needed to increase capacity. This also includes studies and projects for the development of high-speed lines.

Rail-road Terminals

In addition to the rail infrastructure and ERTMS projects, there are 18 initiatives for the development of the Corridor rail-road terminals for a total investment of € 457 million. These concern the development and expansion of infrastructure for multimodal transport at Wrocław (Kąty Wrocławskie, Brzeg Dolny), Ostrava Paskov, Přerov, Graz Süd, Padova and Ljubljana. For the Warszawa, Łódź and Cervignano rail-road terminals, there are projects on the improvement of interconnections. Also, there are ongoing and planned ICT and innovation initiatives that promote intermodality and logistic chain information flow.

Finally, a project dedicated to the development and operation of the Baltic-Adriatic Rail Freight Corridor is ongoing. The project aims at enhancing international and interoperable long distance transport along the Corridor by mitigating and resolving operational and administrative bottlenecks.

ERTMS deployment

26 rail initiatives are ERTMS projects at a total value of € 2.2 billion. Four of the projects concern the instalment of ERTMS on rolling stock. The diagram in Figure 9 below shows the state of play and deadlines for ERTMS deployment along the Baltic-Adriatic Corridor from the studies related to the monitoring of the ERTMS deployment. The diagram is based on the current ERTMS Deployment Plan.

On the Corridor, 45% of the instalments to be realised by 2023 is already in operation. For the remaining sections several Member States need to make substantial progress. Poland will have to equip around 450 kilometres of corridor sections by 2023. In the Czech Republic, 25% of the sections planned for completion by 2023 are in operation. For Austria, nearly 30% of the corridor sections have been equipped, while in Italy about 150 km of corridor sections are planned to be equipped with ERTMS by 2023. The Slovak Republic and Slovenia have deployed 80% and 90% respectively.

Figure 9: State of play and milestones for ERTMS deployment on the Baltic-Adriatic Corridor

Source: Baltic-Adriatic corridor study consortium based on data from the ERTMS Deployment Management Team

Road transport

A total of 125 projects for the development of road transport are ongoing or planned, amounting to € 18.8 billion of investment. At the cross-border sections between Poland and the Slovak Republic, the Czech Republic and Austria, Italy and Slovenia as well as on the national road network in Poland, the Czech Republic and the Slovak Republic, works on the modernisation of the Corridor are planned for implementation. In Austria, Italy and Slovenia, works aimed at upgrading the existing motorway infrastructure are also foreseen. Studies and works are ongoing or planned for the implementation of ITS solutions to improve traffic management, develop areas for safe and secure parking, and increase availability of alternative clean fuels across the Corridor. Nearly half of the projects involve more than one Member State and often cross several core network corridors. Most of the alternative clean fuel projects concern deployment of infrastructure for electric mobility in all Member States. Projects concerning the availability and/or further development of LNG for road transport, including bioLNG, are also under implementation in Poland, the Czech Republic, Austria, Italy, Slovenia, while hydrogen fuel projects are found in Poland, the Czech Republic and Slovenia.

Maritime and inland waterway ports and Motorways of the Sea

119 projects have been identified for the development of maritime ports infrastructure, including terminals, last mile connections, Motorways of the Sea (MoS) operations, alternative clean fuels and Vessel Traffic Monitoring & Information Systems (VTMIS) and e-Maritime initiatives. These projects, which concern both maritime and inland waterway ports, amount to a total investment of € 13.7 billion.

Initiatives aimed at developing port infrastructure and terminals, including dredging works and activities to improve maritime accessibility as well as navigability are ongoing or planned at all ports on the Corridor.

At the maritime ports on the Corridor, projects are ongoing or planned projects aimed at improving last mile and hinterland connections.

Alternative clean fuel projects for maritime transport operations are included in the corridor project list for Gdynia, Świnoujście, Bratislava, Venezia, Ravenna and Koper.

Airports

Airport terminals and runways expansion works as well as technological improvements comprise a total of 67 projects worth € 3.7 billion of total investments. The majority of the investments concern passenger transport operations. Cargo facility expansions are planned at Gdańsk, Warszawa, Katowice and Ljubljana.

Projects for the development of urban rail connections, including last mile sections, are planned for airports at Katowice, Bratislava, Venezia and Ljubljana. For Vienna Airport, studies to interconnect this hub to the international high-speed rail infrastructure towards Bratislava and Budapest are ongoing. Projects on the improvement of existing road connections to the airports at Venezia, Warszawa, Katowice and Łódź are also foreseen.

4.3. Urban nodes

57 projects for a total of € 11.2 billion investment costs have been identified at the core nodes of the Baltic-Adriatic Corridor.[3] These concern actions to improve the capacity of rail corridor sections at the core urban nodes of Gdańsk, Warszawa, Łódź, Katowice, Szczecin, Poznań, Wrocław, Ostrava, Bratislava, Wien and Ljubljana.

In addition, projects are foreseen aimed at increasing capacity, improving safety and reducing congestion on the corridor road infrastructure. These investments are located in Gdańsk (including the project for the development of the S6 Tricity bypass), Warszawa, Łódź, Szczecin, Poznań, Ostrava, Bratislava, Wien, Bologna and Ljubljana.

Finally, initiatives are found aimed at improving multimodal infrastructure to support modal shift from road to rail. Located in Gdańsk, Warszawa, Szczecin, Łódź, Bratislava, Bologna, the projects concern the development of urban transit and interchange facilities as well as ITS and ICT solutions for both passenger and freight transport.

[3] Last mile connections to the core airports have been considered as urban projects due to their relevance at the metropolitan level. Last mile connections to ports and rail-road terminals have by contrast 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 connections in urban areas located outside core urban nodes have been considered under the respective modes (e.g. modernisation of railway nodes, stations and junctions at Brno, Žilina, Udine and Zidani Most; and the development of the D1 Přerov bypass and D52 Mikulov bypass, and the upgrade of the A2 Klagenfurt bypass).

5. Funding and Financing

5.1. The funding needs

Table 6 below provides a summary of the total costs and approved funds of the investments included in the corridor project list, focussing on the work plan priorities. While more than 54% of the budget expenditure is already covered by approved funds, an additional € 17.1 billion would be needed to implement relevant projects. Looking at the complete corridor project list, the gap increases to € 41.5 billion.

Table 6: Projects for the development of the Baltic-Adriatic Corridor – work plan priorities

Work plan priorities	Number of projects	Budget in € m	Approved funds in %
Rail critical cross-border sections	***17***	***3,097***	***34.6%***
Katowice-Ostrava-Žilina Trycity cross-border sections	10	2,013	16.1%
Bratislava-Wien twin city cross-border section	2	551	100.0%
Other critical cross-border sections	5	533	36.6%
Rail missing links	***2***	***8,534***	***100.0%***
Modernisation and upgrading of the national railway networks - improvement of the quality and standards of the lines in Cohesion Member States	***27***	***7,493***	***52.3%***
Deployment of ERTMS	***22***	***1,822***	***45.9%***
Road critical cross-border sections	***8***	***2,616***	***24.0%***
Developing hinterland interconnections inside and outside port areas	***30***	***2,300***	***48.2%***
Rail last mile connections outside port areas	9	1,458	68.6%
Rail last mile connections inside port areas	8	171	12.0%
Rail and road last mile connections inside port areas	2	87	33.2%
Road last mile connections outside port areas	7	532	10.3%
Road last mile connections inside port areas	4	53	9.3%
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	***57***	***11,181***	***31.5%***
Development of the rail infrastructure at core urban node	29	4,384	23.2%
Development of rail connections to core airports	2	566	100.0%
Development of interchange and transit systems at core urban nodes	4	899	0.0%
Development of the road infrastructure at core urban nodes	16	5,173	37.1%
Development of road connections to core airports	6	158	9.0%
Work plan priorities	**163**	**37,042**	**53.9%**
Total project list	**486**	**71,661**	**42.1%**

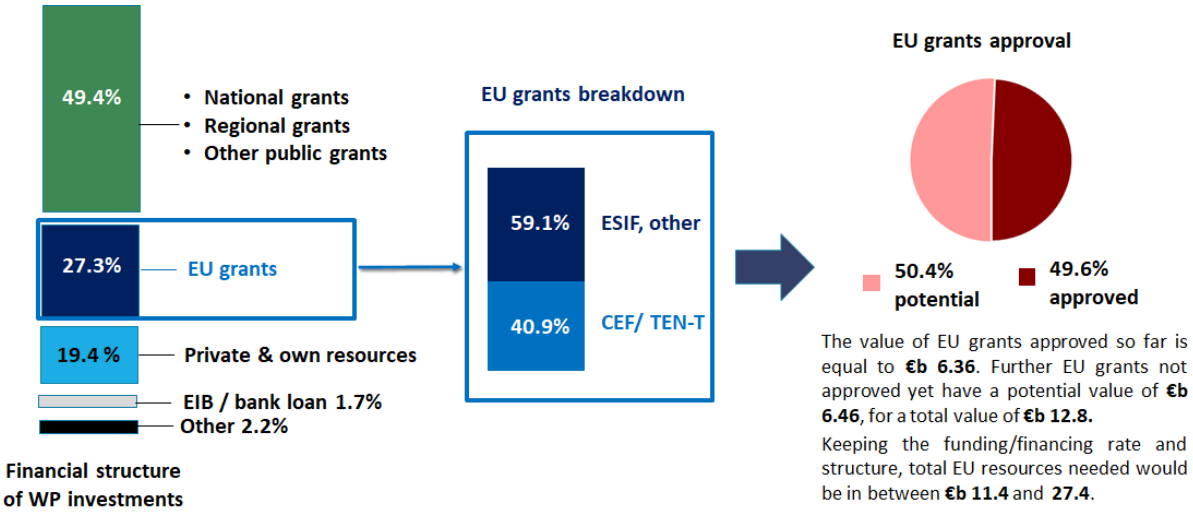
Source: Baltic-Adriatic corridor study consortium; Notes: for 22 initiatives in the project list financial information including total project cost is not available

An analysis of the funding and financing sources of the projects identified for the development of the Baltic-Adriatic Corridor was carried out as part of the core network corridor studies. The analysis aimed at understanding the funding structure of the investments proposed and estimating the potential needs for EU funding. The exercise consisted in the following main steps:

- Identification of the investments for which financial information was available;
- Analysis of the funding sources of the project costs;
- Application of the funding ratios to the overall investment cost of the total project list.

The outcome of the analysis is summarised in Figure 11 below. For 464 out of 486 ongoing and planned projects included in the project list, information on the project costs and financing structure was available.

Figure 10: The financing and funding structure of the Baltic-Adriatic corridor project list

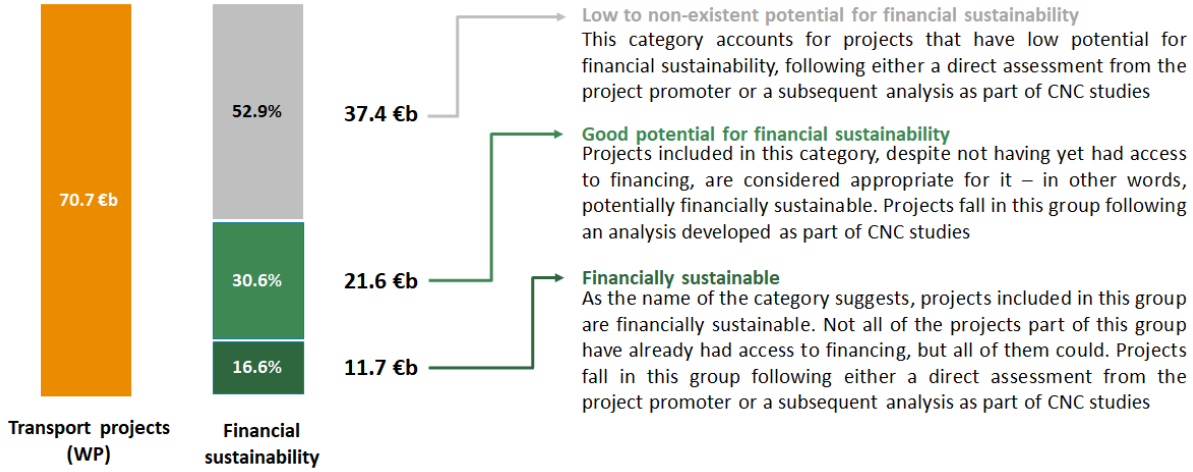


Source: Baltic-Adriatic corridor study consortium based on methodology developed by PwC; Note: the analysis refers to 464 projects for which at least the project cost is available, with a total budget of € 71.7 billion

The total budget of these investments amounts to € 71.7 billion. 27.3% of the total costs, corresponding to about € 12.8 billion, represents approved or potential EU funds. In greater detail, the value of EU grants approved corresponds to € 6.36 billion, whereas the EU funds still to be approved amounts to € 6.46 billion. Considering the minimum and maximum co-financing rates adopted for the financing of the corridor projects, i.e. 20% and 85%, the amount of EU funds required to finance the 464 projects for which total investment cost is available could range between € 11.4 and € 27.4 billion (these values also include the 6.46 billion potential EU funds).

In order to meet the significant demand for funding, all possible sources of funds should be considered as appropriate for each specific project, taking into account the suitability for blended funding and financing. To this end, the investments included in the project list were classified into three categories in order to determine their sustainability for innovative funding and financing, as reported in Figure 12 below.

Figure 11: The financial sustainability of the Baltic-Adriatic Corridor project list



Source: Baltic-Adriatic corridor study consortium based on methodology developed by PwC; Note: the analysis refers to 430 ongoing and planned projects including works in their scope and for which financial information was available, with a total cost of € 70.7 billion

The assessment focussed on a total of 430 ongoing and planned projects, with an overall budget of € 70.7 billion, omitting 26 studies only related initiatives and 30 projects for

which the information available was not sufficient to perform the analysis. The analysis shows that 183 projects appear suitable for innovative financing, corresponding to a total value of € 33.3 billion, which is nearly half of the total value of the projects analysed.

5.2. Innovative financial tools

According to the work plans of the European Coordinators, the aggregate demand for investment on the TEN-T corridors represents a total value of about € 640 billion. To meet this investment demand, a substantial contribution from private financing is required.

Around 20% of the total lending of the European Investment Bank (EIB) goes to the transport sector, representing more than EUR 150 billion of investment since 2014. In the period 2014-2018, about 60% of EIB transport lending went to TEN-T projects. Lending to TEN-T CNC projects represented about a quarter of the overall EIB transport lending during this period. A share of EIB financing is backed by the EU budget, notably in the form of the EU financial instruments and budgetary guarantee, such as the European Fund for Strategic Investment (EFSI). While EFSI financing was successfully applied to road and airport projects as well as mobile assets and rolling stocks, the risk profile of TEN-T projects, in particular rail projects, made these initiatives less suited for this financing instrument.

To improve the quality and bankability of TEN-T projects, in the current Multiannual Financial Framework (MFF), DG MOVE and the EIB piloted a blending approach, setting up the CEF Blending Call and Facility. Under the first CEF Blending Call, 72 projects were supported of which 33 already reached full financial closure, with EUR 1.4 billion of CEF funding mobilising close to EUR 8 billion of overall investments. The Baltic-Adriatic Corridor was particularly successful. According to the results of the 2017 CEF blending Call (available from the INEA website), 21 proposals have been selected that concern either partially or totally the development of the Baltic-Adriatic Corridor for a total investment of more than € 1.8 billion of which about € 365 million were allocated CEF funds.

The following sample of projects funded and financed under the CEF call demonstrates that blending solutions can be considered for a wide spectrum of investments that will contribute significantly to the development of the Corridor:

- Modernisation works on the critical cross-border section between Katowice and Ostrava, where the works concerned the Czech sections between Dětmarovice and Petrovice u Karviné towards the border with Poland;
- Upgrade and electrification on the Austrian side of the critical passenger cross-border section between Wien Stadlau and the border to the Slovak Republic, near Marchegg;
- Modernisation works and ETCS deployment on the Western branch of the Corridor in Poland on the E59 railway line;
- Works for the development of the second track of the Divača-Koper railway line;
- Construction of a LNG facility at the ports of Świnoujście and Venezia;
- Expansion of the port of Gdańsk;
- Dredging activities in and expansion of the Port of Ravenna;
- Upgrade of the railway infrastructure inside the port of Trieste;
- Development of alternative clean fuel projects for road transport, including electric, LNG, CNG and hydrogen solutions;

In the next MFF (2021-2027), the InvestEU initiative will include all available financial instruments. The InvestEU will also offer a higher risk threshold than the EFSI, allowing for both low and higher risk projects to be financed.

The 3rd CBS report of September 2019 by European Coordinators Kurt Bodewig and Carlo Secchi “Enabling the uptake of the TEN-T pipeline by the financial market” gives a more detailed insight into financing issues for the TEN-T networks (available under the download section of TEN-T: https://ec.europa.eu/transport/themes/infrastructure/downloads_en).

6. Recommendations and outlook of the European Coordinator

Priorities of the Work Plan

Since the adoption of the first, second and third corridor work plans for the Baltic-Adriatic Corridor, substantial efforts have been made on all sides, bringing the corridor approach to fruition. The Corridor has emerged as a competitive development area for growth and jobs in Central Europe. Nearly 180 projects have been completed, with a total value of € 13.6 billion, and more than 485 initiatives are either ongoing or planned for implementation, with a total additional expenditure of € 71.7 billion. € 6.4 billion of EU funds have been allocated, of which € 2.4 billion relate to 100 projects financed by the CEF.

My first work plan builds on the first three editions, as elaborated by my predecessor Prof. Kurt Bodewig. Recognising the importance for transport infrastructure planning and development to have certainty and predictability as long-term undertakings, this work plan stresses continuity with the objectives set out in the preceding work plans. This work plan therefore remains consistent with the priorities defined in the third work plan. The overarching purpose of the work plan is to see the corridor infrastructure complete and compliant with the quality and standards defined in Regulation (EU) 1315/2013[4]. To meet this objective, the work plan sets out the following six priorities:

- The modernisation of the critical rail and road cross-border sections, including the deployment of digital cross-border links for the exchange of traffic data and provision of information services;
- The completion of the Alpine crossings in Austria in order to remove the two missing links on the Corridor;
- The completion of the modernisation of the railway infrastructure, in particular, in Cohesion Member States;
- The enhancement of multimodality by improving last mile and hinterland connections to ports and within logistic clusters;
- The interconnection between long distance, regional and local transport in urban nodes;
- The interoperability of telematic applications, with a particular focus on ERTMS deployment.

Operationalisation of the Work Plan Priorities – Coordinator Dialogues

Our Corridor Forum meetings in Brussels and the working groups of 'Ports and Rail-Road Terminals' and 'Regions, urban nodes and macro-regions' are very important occasions for me and the Members of the Forum to monitor the progress of the Corridor and to discuss activities related to the implementation of the TEN-T in the framework of EU policy. However, as indicated by the experience of the successful corridor implementation over the past six years, additional benefits could be had by bringing the corridor activity to a local audience, organising events at important locations on the Corridor. In addition, my visits to Member States, projects and nodes, including urban nodes, rail-road terminals, ports and airports, are invaluable as sources of information for me on how to provide for coordination in the implementation of projects. In order to operationalise these six priorities in our work, I would like to deal with them under three headings, which will form the basis for dialogues organised as local events. The basic idea is that

[4] To be amended as appropriate with the revision of Regulation (EU) 1315/2013.

this should give a new impetus to our work on the Corridor by bringing together a broader multitude of stakeholders to discuss issues of common concern.

Our six priorities give us concrete elements to focus our efforts on. However, in the organisation of events on the Corridor, they may appear of less relevance and interest to a broader group of stakeholders if they are not related to wider-ranging topics. I would therefore propose to organise local events in the form of dialogues on **Interoperability, Interconnectivity and Innovation**. These Coordinator Dialogues will comprise the thematic headings under which we will structure our work as we go forward. In practical terms, the Coordinator Dialogues can have an extended scope compared to the format used for cross-border dialogues, working groups and project or stakeholder visits, as organised in the past. Indeed, the Dialogues might possibly combine these different events, also in the form of joint or side events of different core network corridors as well as local initiatives organised by the stakeholders. The following section relates the six priorities (highlighted in bold) to the broader themes of Interoperability, Interconnectivity and Innovation, providing my recommendations to take concrete action towards their implementation.

Interoperability

The creation of a Single European Transport Area and the development of a homogeneous high quality standard infrastructure is contingent on the interoperability of transport infrastructure and telematic applications. Indeed, interoperability is key to reaching the ultimate goal of the TEN-T Regulation of developing a consistent core network that interconnects the Union Member States. Accordingly, since the inception of the corridor approach in 2014, priority was given to initiatives aimed at achieving the standards for the core network, as set out in the Regulation.

The most important priority, which will be addressed under this heading is the **modernisation of the cross-border sections**. At present, six railway cross-border sections face compliance issues in terms of the requirements for electrification, axle load, speed and train length, whereas the two road cross-border sections identified as critical are neither motorways nor expressways. To summarise the description found in chapter 2.3, this involves the following rail and road cross-border sections, which concern projects of the highest European added value:

Railway cross-border sections

- Opole (PL) – Ostrava (CZ), [Chałupki (PL) – Bohumín (CZ)];
- Katowice (PL) – Ostrava (CZ), [Zebrzydowice (PL) – Petrovice u Karviné (CZ)];
- Bratislava (SK) – Wien (Stadlau) (AT), [Devínska Nová Ves (SK) – Marchegg (AT)];
- Katowice (PL) – Žilina (SK), [Zwardoń (PL) – Skalité (SK)];
- Graz (AT) – Maribor (SI), [Spielfeld-Straß (AT) – Šentilj (SI)];
- Trieste (IT) – Divača (SI), [Villa Opicina (IT) – Sežana (SI)].

Road cross-border sections

- Katowice (PL) – Žilina (Brodno) (SK), [Zwardoń (PL) – Skalité (SK)];
- Brno (CZ) – Wien (Schwechat) (AT), [Mikulov (CZ) – Poysbrunn (AT)].

Lack of interoperability issuing from compliance gaps is not limited to railway cross-border sections. They extend to several parts of the network and are also present at railway nodes. The strengthening of interoperability at the cross-border sections will only pay off if these gaps are bridged on the entire network, and it is thus a priority to complete the **modernisation of the railway infrastructure, in particular, in Cohesion Member States**.

Among the key requirements for interoperability, ERTMS is critical. **ERTMS deployment** has thus remained a priority of the work plan since 2015. Whereas progress has been

made on the Baltic-Adriatic Corridor since 2014, and ERTMS is under implementation in all Member States, we find delays in respect of the schedule foreseen in the ERTMS Deployment Plan. For several sections, including cross-border sections, projects are still to be fully defined. In order to grasp the full benefits of ERTMS, it should be deployed on all corridor links, including at cross-border sections.

Based on discussions with INEA and DG REGIO, delays and difficulties in the finalisation of preparatory studies and works as well as permitting/procurement processes appears to affect several EU supported initiatives. This is likely to result in the postponement of the finalisation of the projects and possible reduction of the allocated funds for those initiatives financed by the CEF. In order to see the completion of a compliant corridor by 2030, the consolidation of the project list as a mature and stable pipeline of projects is thus of paramount importance. We shall work together to overcome the administrative, technical and financial difficulties that may hamper the implementation of the projects required to develop the Corridor.

Finally, albeit not included in the priorities for the Baltic-Adriatic Corridor, I would still emphasise the importance of promoting interoperability of ITS and ICT systems with reference to all transport modes. This should increase the safety and security of transport as well as contribute to the streamlining of administrative procedures involved in transport. The adoption of “open data” solutions should be encouraged in order to maximise the involvement of transport operators and users in providing for more attractive multimodal transport for both freight and passengers, including the development of Mobility as a Service solutions.

Finally yet importantly, our efforts towards building an interoperable Corridor will also need looking into the requirements of Military Mobility, as set out in the “*Action Plan on Military Mobility*” (2018).

Interconnectivity

Interconnectivity represents the key functional value of the core network corridors as they aim at bringing together Member States, regions and urban nodes, by reducing distances and travel times and facilitate transport of passengers and goods The completion of the Semmering tunnel by 2027 and of the Koralm railway line and tunnel by 2025 will significantly reduce travel times and allow for smoother traffic flows between Central European regions and the Northern Adriatic Ports. As European Coordinator, I will therefore continue to monitor **the completion of the Alpine crossings in Austria** and assist the Austrian stakeholders in promoting and advancing these critical projects, which are not only of high added value nationally, but indeed also for the interconnection of Europe.

Interconnectivity also means **the enhancement of multimodality by improving last mile and hinterland connections to ports and within logistic clusters**. The development of appropriate last mile connections to the ports is therefore a specific target to be continuously monitored. Looking at what has been achieved over the past years, important steps have been taken, striking a good balance between the fruitful cooperation between ports and fair competition.

In order to boost the competitiveness of multimodal and combined transport, last mile connections shall be considered in the wider context of the conditions and development of the logistic and corridor railway infrastructure, including the capacity and performance of hinterland connections. In particular, logistic terminals in the wider hinterland of ports will have an increasing role to play. I therefore call for the close cooperation of rail infrastructure managers with port authorities and rail-road terminals. Under the thematic of interconnectivity, they should join forces and efforts for improving the attractiveness of multimodal transport solutions and make the Corridor competitive in the framework of the global trade and transport routes.

I would also like to emphasise the role of logistic clusters, involving core and comprehensive ports as well as rail-road terminals across the network. Here, the

functional dimension of the logistic chain should be appropriately considered to effectively promote multimodal transport and support the modal shift toward green transport solutions. Finally, not only infrastructure projects, but also the promotion of transport digitalisation measures are important in order to streamline administrative procedures and processes of rail and intermodal operations, as well as maritime transport and Short Sea Shipping. In this regard I will also support the activities pursued under the framework of the Rail Freight Corridor Baltic-Adriatic and Motorways of the Sea.

A third very important element of interconnectivity concerns the **interconnection of long distance, regional and local transport in urban nodes**. As hubs on the network that attract and generate traffic and main points of interchange between the Corridor, its regions and macroregions, the proper functioning of transport in urban nodes is essential if we are to maximise the impact of the corridor infrastructure on economic development, growth and territorial cohesion. I therefore recommend that attention is paid to the development and modernisation of the corridor infrastructure in urban nodes to remove existing and future bottlenecks and to promote regional and local integration into the core network. In this respect, it is important to note that urban nodes also encompass airports, rail-road terminals and ports, as all corridor ports are located in urban areas, with five located in core urban nodes. Measures shall be considered to ensure adequate physical and digital interconnection between core transport nodes and facilitate interchange and integration between the Corridor, the regional and the local transport infrastructure and services.

Innovation

In providing for an interoperable infrastructure with increased interconnectivity, the Baltic-Adriatic Corridor will generate substantial economic benefits and promote territorial cohesion and integration. The Corridor, however, has an even greater potential to consider when we look at the most pressing challenge for the transport sector today; to achieve a 90% reduction in emissions by 2050. With the European Green Deal, we are called upon to do our part in achieving this goal, thus contributing to making Europe the first climate neutral continent. While the TEN-T policy has been a ‘green policy’ from its inception, we can certainly contribute even more.

Core network corridors have great potential to support decarbonisation and the reduction of greenhouse gas emissions and air pollutant emissions. Indeed, since their inception, the core network corridors have been conceived as frontrunners and test-beds for the implementation of innovative solutions and approaches, not only related to the TEN-T policy, but also to the wider set of Union policy on mobility and transport. In the first place, I would like all stakeholders to consider the importance of innovative transport digitalisation measures to increase the attractiveness and competitiveness of multimodal transport solutions involving rail, maritime and public transport solutions.

Secondly, in the development of a decarbonised transport system, I would invite all stakeholders to invest more in the diffusion of alternative clean fuels, and the introduction into the market of more efficient means of transport, in particular zero emission vehicles, as well as taking steps in behavioural measures that rationalise the movement of passengers and freight. While the corridor project list includes several Corridor investments that concern electric mobility, LNG, CNG and hydrogen fuels for road transport, as well as to LNG facilities at most corridor ports, strategies and projects that would provide for the availability of alternative clean fuels are missing at some ports and at all airports on the corridor. The KPI target related to the availability of facilities for ship-generated waste is also not fully met at present. It is important that the investment and operational plans by the infrastructure managers appropriately address these requirements of the TEN-T Regulation.

Climate change mitigation is finally an area that should deserve increasing attention. Increased temperature, precipitation and floods are causing potential damage and interruption of operation of services to rail and road transport, whereas maritime

transport is affected by increased and more frequent extreme winds and high amplitude waves. In the mid to long terms, all maritime ports will also be affected by rising sea levels. I therefore encourage Member States and infrastructure managers to undertake the required studies to identify the impacts of climate change, assess vulnerabilities and risks for transport infrastructures, while also defining measures to mitigate the negative consequences.

Interoperability, Interconnectivity and Innovation are in other words part and parcel of building our Corridor. With the Coordinator Dialogues intend to extend our exchanges to the widest possible audience. To do so I would be very much in favour of organising these Dialogues in the urban nodes and particularly in core urban nodes. These encompass core transport and logistic nodes such as airports, rail-road terminals and in most cases ports. Several core urban nodes are furthermore located at the edge of one or more cross-border sections. Finally, urban nodes are capital cities of NUTS 2 regions if not of corridor Member States. As such they define the geographical boundaries wherein most Europeans live, representing the places where the benefits of European intervention should be made visible. I would therefore propose to strengthen our efforts in communicating the value of the Corridor work to the European citizen by organising the Dialogues to take place in the cities of the Corridor urban nodes.

In carrying out the Coordinator Dialogues, it is of paramount importance that we keep a strong focus on the cross-border sections of the Corridor. A number of actions, including cross-border memoranda of understandings, joint declarations and bilateral agreements have been concluded between Member States and infrastructure managers. I would therefore propose to discuss their development at the Coordinator Dialogues as an issue of common concern. Member States and/or infrastructure managers will regularly report on the progresses of these actions at the Corridor Fora.

Let me conclude by stressing that the Corridor has a vast untapped potential. To realise this, we need to continue the fully integrated, cooperative and implementation-oriented development approach, which has defined the work so far. I would like to thank all Members of the Baltic-Adriatic Corridor Forum for their active participation in the development of the Corridor. We would not have achieved such excellent progress and impressive results without your involvement and sheer dedication. However, substantial challenges still lie ahead of us, and investment needs remain high. As European Coordinator, I will make every effort to facilitate this work and assist you, Member States, in facing the challenges and completing the Baltic-Adriatic Corridor.

Afterword on the COVID19 crisis

This Work Plan has been under preparation since November 2019 and was finalised in June 2020. In this period, the world has been affected by the SARS-CoV-2 pandemic. At this stage, we do not have the full picture of the consequences the pandemic will have on our lives and the economy.

The transport sector has been heavily impacted by the containment measures in Europe and worldwide. Continuity of service has been ensured by transport workers under difficult conditions, showing their critical function in serving the basic needs of the population. The transport sector will also be important in supporting the recovery of the European economy.

With the pandemic still ongoing, it would be premature to draw conclusions of the impact in this Work Plan. However, it is my intention to begin an initial analysis involving all Member States and important stakeholders of our Corridor in order to gather insight on the impact of the crisis and the related recovery plans on transport infrastructure investment. The analysis will also collect views on the future possible orientation of the Corridor work and Work Plan priorities.

Without jeopardising the final objective of the realisation of the Baltic-Adriatic Corridor, this approach is intended to further align our activities with the current events, which have considerably changed our social and economic life and will affect our approach to mobility and transport.

7. Contacts

Anne Elisabet Jensen
European Coordinator
anne.jensen@ec.europa.eu

Kristoffer Bang Refberg
Adviser to the European Coordinator
kristoffer.refberg@ec.europa.eu

Corridor website:
https://ec.europa.eu/transport/themes/infrastructure/baltic-adriatic_en

Contact details:
European Commission – Directorate General for Mobility and Transport
Directorate B – Investment, Innovative & Sustainable Transport
Unit B1 – Transport Networks
http://ec.europa.eu/transport/index_en.htm
email: move-info@ec.europa.eu
Offices:
Rue Demot 28
1049 Brussels, Belgium

Design & Layout by TENtec