



European  
Commission

# Baltic Adriatic



Second Work Plan of the  
European Coordinator

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DECEMBER 2016

*Mobility  
and Transport*

DECEMBER 2016

This report represents the opinion of the European Coordinator and does not prejudice the official position of the European Commission.

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## 1. Towards the second Baltic-Adriatic corridor work plan

The Baltic-Adriatic corridor links major nodes (urban nodes, ports, airports and other transport terminals) through key rail, road, maritime and air transport connections from North to South, i.e. from Poland through the Czech Republic, Slovakia, Austria to Italy and Slovenia. Such a reinforced network in Central Europe significantly strengthens the infrastructural basis for efficient, safe and high-quality multimodal transport chains for freight and passengers. By implementing the Baltic-Adriatic axis, new traffic flows between the Baltic and Adriatic ports and their hinterland are being developed and the ports as entry and exit doors of the corridor being boosted.

In 2014, the European Commission, Member States and a wide number of stakeholders involved in the Corridor Forum jointly paved the way for the development of nine core network corridors. This was the starting point of a challenging, but very appealing exercise which successfully concluded with the approval of a first Baltic-Adriatic corridor work plan by all the six Member States concerned in May 2015.

Since then, we have all together made significant progress along our corridor. Indeed, the corridor process successfully continued in 2015 and 2016, with the organisation of a fifth, sixth, seventh and eighth Corridor Forum in Brussels involving representatives of Member States, railway and road infrastructure managers, the Baltic-Adriatic Rail Freight Corridor (RFC), ports, airports, rail-road terminals, regions and also the four macro-regional strategies crossed by our corridor. In addition, we continued the working group of ports by extending it to the rail-road terminals and organised a working group session for regions which has been extended by the urban nodes and macro-regional strategies. In 2014 and 2015 I also engaged in many dialogues on the spot along the corridor with a high number of stakeholders. I met for instance all Ministers of Transport, the CEOs of the infrastructure managers both for rail and road and visited the core ports. All these activities brought our "corridor family" much closer and I am very proud to be part of this family as European Coordinator. I thank Member States and all other involved parties for the strong and continuous support given to me and the very constructive and harmonious atmosphere during our meetings which comforts me in my conviction that this Baltic-Adriatic Corridor is on a good way and indeed much more than 'hard' infrastructure.

Parallel to this, the corridor consultants around tplan (IT, PL) and their subcontractors JPL Project (PL), Paradigma (AT), NDCON (CZ, SK) and the University of Maribor (SI) have significantly progressed on the corridor analysis. With the development of Key Performance Indicators, we have now a much more detailed insight into the compliance of our corridor infrastructure with the technical requirements laid down in the TEN-T Regulation. Most importantly, we have succeeded in getting a detailed overview of the pipeline of projects and investments that are planned and needed on the corridor in order to achieve the EU targets by 2030. We also know much better where projects stand in terms of maturity and financing. The consultants have worked very hard in setting this common ground for our discussions. I would like to present them my very special thanks for their high-quality work and for the excellent collaboration throughout the past two years.

Apart from this intense consultation and participation process and analysis, significant progress has been made by each Member State with regard to the development of the necessary investments and implementation of infrastructure projects. This strong engagement is for instance reflected in an increased compliance of our corridor infrastructure with a number of the TEN-T requirements that are laid down in Regulation (EU) 1315/2013. A number of the critical issues are already adequately addressed and incorporated in the investment plans.

Besides, we were also very successful with regard to the use of the funds allocated under the Connecting Europe Facility, especially considering the extremely high competition in and oversubscription of the calls. In the first call for proposals of 2014, we managed to get 1.03 billion EUR for our corridor investments and in the second call of 2015 again more than 1 billion EUR. I like to use this opportunity to thank Member States and infrastructure managers for their strong engagement and commitment, not only operationally but also

financially. We have to further build upon these first achievements and I wish to ensure you to continue being a close partner for you in this task.

Last but not least, I like to congratulate the Baltic-Adriatic Rail Freight Corridor which became operational in November 2015. Very useful and interesting results have been presented in the RFC implementation plan upon which we were able to build our analysis and vice-versa. I very much appreciate the very good cooperation between our core network corridor and this Rail Freight Corridor and wish to further build on this.

All these very positive developments are reflected in this first update of the 2014 work plan that I herewith present to you. It represents the basis for continuing the development and implementation of the corridor investments which are needed to develop a fully functional Baltic-Adriatic Corridor.

For me, a fully functional Baltic-Adriatic Corridor is thereby more than a functional hard infrastructure. My vision of the Baltic-Adriatic Corridor is that this corridor turns into a corridor of sustainable and socio-economic growth. I wish that this corridor becomes a key development zone and that it plays an important role as one of the main drivers of economic development in Central Europe. My vision of this corridor is also based on its sustainable dimension, giving clear preference to greener transport modes and fostering a shift from road to rail. Moreover, this corridor needs to be seen far beyond the pure transport links across borders. It needs to be well embedded into national and regional development strategies as to maximize the positive influence of its transport infrastructure on other social and economic sectors. We thus need to come from a regional and national planning perspective to a real corridor perspective.

Our challenge will be to turn this ambition into reality and to turn the Baltic-Adriatic Corridor into a living environment. In order to reach this ambitious goal, a strong cooperation of all relevant stakeholders at all levels of intervention will be needed. I am very pleased that we have with the Baltic-Adriatic axis a corridor with a long history of interregional cooperation on which we can base our activities. This constitutes an important competitive advantage.

I trust that the present work plan in its first update is another important step to enable the corridor to become reality, not only by connecting North and South, but by generating growth along the corridor and its adjacent areas. This second work plan is a concrete plan for the implementation of the core network based on a thorough and further refined analysis of the corridor. It is thereby to be seen as an evolution of the first corridor work plan and not as a revolution. At the same time, it is only an intermediate step. Indeed, a final revision of the corridor work plan is foreseen in 2018. By then, we will detail the corridor study, in particular with regard to our monitoring of the planned projects along the corridor.

In a nutshell, the Baltic-Adriatic corridor activities of the past two and a half years have enabled us to come to a powerful "Acquis Corridor". This is a great momentum and chance to realise what has been worked upon in the past years. I invite you to closely cooperate with me and to assume a vital role in implementing this work plan. The process is not over with the submission of this second work plan; it is instead the continuation of an interesting path that I would like to go together with you. Together we can create the conditions for growth and prosperity, driving competitiveness for everyone in Europe to the benefit of citizens and businesses by setting up a real European transport network with high standards on the Baltic-Adriatic core network corridor that can face the challenges of today's economy and environment. I thus count on your continuous engagement!

## 2. Characteristics of the Baltic-Adriatic Corridor

### *From the Polish to the Adriatic ports – corridor alignment*

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

Figure 1: Alignment of the Baltic-Adriatic core network corridor



Source: Baltic-Adriatic corridor study consortium

The 1,800 km long Baltic-Adriatic Corridor allows for several itineraries between the Baltic and Adriatic basins: from North to South, either starting in the ports of Szczecin and Świnoujście, via Poznań and Wrocław, or in the ports of Gdynia and Gdańsk directly to Katowice or through Warszawa and Łódź, the corridor interconnects the Polish core urban and logistics nodes to the ones located in the Czech Republic, Slovakia and Austria, reaching Wien through Bratislava or Ostrava. The corridor road and rail links continue from Austria towards the Adriatic ports of Koper, Trieste, Venezia and Ravenna via Ljubljana in Slovenia or via Udine, also passing through Venezia and Bologna in Italy.

The corridor encompasses a total of 13 urban nodes and airports, 10 ports and 24 rail road terminals in operation. The backbone of the Baltic-Adriatic axis is based on railway and road routes. Indeed, it is one of the few corridors that do not include inland waterways, even though the corridor interconnects with the inland waterway TEN-T core network at various sections. Its railway network corresponds mostly to the Baltic-Adriatic Rail Freight Corridor 5.

This corridor has intersections with five other corridors. In Poland, the corridor is crossed by the North-Sea Baltic Corridor in West-East direction and in the Czech Republic, Austria and Slovakia by the Orient-East Med and Rhine-Danube Corridors. Further South – in Italy and Slovenia – the corridor runs for large parts parallel to the Mediterranean Corridor. Finally, there is one intersection with the Scandinavian-Mediterranean Corridor between Bologna and Faenza along the Bologna – Ravenna rail itinerary, also including the Bologna urban and logistics nodes.

### **General objectives and KPIs for the development of the Baltic-Adriatic Corridor**

The new TEN-T Regulation (EU) 1315/2013 sets a clear basis for action. General objectives and priorities for the development of the core network corridors are defined in Articles 4 and 10 which include *cohesion development targets* such as ensuring enhanced accessibility, reducing infrastructure quality gaps between Member States, developing interconnection of long-distance, regional and local traffic flows and optimal integration of the transport modes; *efficiency objectives* like bridging missing links and removing bottlenecks, particularly in cross-border sections, promoting interoperability within transport modes; supporting the efficient and sustainable use of the infrastructure and, where necessary, increasing capacity. *Sustainability and users' benefits related targets* are also foreseen to increase the quality of the infrastructure in terms of safety, security, efficiency, climate change and, where appropriate, disaster resilience, environmental performance, social conditions, accessibility for all users (including persons with reduced mobility); as well as to improve the quality of the services and ensure continuity of traffic flows, implement and deploy telematics applications and promotion of innovative technological development.

Furthermore, ambitious transport infrastructure requirements have been defined for the core network which have to be achieved by 2030. With respect to the main required standards, Key Performance Indicators (KPIs) have been defined for the nine core network corridors as part of the activities undertaken in the scope of the 2015-2017 core network corridor studies, in order to measure the status and set the targets for the development of the corridors. The supply side KPIs values for the Baltic-Adriatic Corridor are presented in Table 1 for all transport modes, which include the baseline year at 2013, the updated indicator at 2015 and the target for 2030. Improvements have been made since 2013, in particular with regard to the implementation of ERTMS and train length as well as an upgrade in terms of line speed and axle load along the corridor.

Table 1 Supply-side Key Performance Indicators for the Baltic-Adriatic Corridor

Mode	Objectives	Passenger / Freight	KPI	Unit	2013	2015	Change	2030
Rail network	Cohesion	P/F	Electrification	%	99%	99%	(=)	100%
	Cohesion	P/F	Track gauge 1435mm	%	100%	100%	(=)	100%
	Cohesion/Efficiency	P/F	ERTMS implementation	%	0%	18%	(+)	100%
	Cohesion	F	Line speed (>=100km/h)	%	69%	71%	(+)	100%
	Cohesion	F	Axle load (>=22.5t)	%	89%	92%	(+)	100%
Road network	Cohesion	F	Train length (740m)	%	16%	29%	(+)	100%
	Cohesion	P/F	Express road/ motorway	%	81%	82%	(+)	100%
	Sustainability	P/F	Availability of alternative clean fuels	No.	n.a.			not applicable
Airports	Cohesion/Efficiency	P/F	Connection to rail by 2050 (Warszawa, Wien)	%	100%	100%	(=)	100%

<i>Mode</i>	<i>Objectives</i>	<i>Passenger / Freight</i>	<i>KPI</i>	<i>Unit</i>	<i>2013</i>	<i>2015</i>	<i>Change</i>	<i>2030</i>
	Efficiency	P/F	Open accessibility to at least one terminal *	%	<i>n.a.</i>	100%		100%
	Sustainability	P/F	Availability of alternative clean fuels	%	<i>n.a.</i>	0%		100%
<i>Sea ports</i>	Cohesion/Efficiency	F	Connection to rail	%	100%	100%	(=)	100%
	Cohesion/Efficiency	F	Connection to IWW CEMT IV (5 Seaports connected to IWW)	%	<i>n.a.</i>	100%		100%
	Sustainability	F	Availability of alternative clean fuels	%	0%	0%	(=)	100%
	Efficiency	F	Open accessibility to at least one terminal *	%	<i>n.a.</i>	100%		100%
	Sustainability	P/F	Facilities for ship generated waste	%	<i>n.a.</i>	63%		100%
<i>Inland ports</i>	Cohesion/Efficiency	F	Class IV waterway connection	%	100%	100%	(=)	100%
	Cohesion/Efficiency	F	Connection to rail	%	100%	100%	(=)	100%
	Sustainability	F	Availability of alternative clean fuels	%	<i>n.a.</i>	0%		100%
	Efficiency	F	Open accessibility to at least one terminal *	%	<i>n.a.</i>	100%		100%
<i>Rail Road Terminals (RRT)</i>	Cohesion/Efficiency	F	Capability for Intermodal (unitised) transshipment	%	<i>n.a.</i>	100%		100%
	Cohesion/Efficiency	F	740m train terminal accessibility	%	<i>n.a.</i>	38%		100%
	Cohesion	F	Electrified train terminal accessibility	%	<i>n.a.</i>	75%		100%
	Efficiency	F	Open accessibility to at least one terminal *	%	<i>n.a.</i>	42%		100%

Source: Baltic-Adriatic corridor study consortium; Note: \* Availability of one terminal open to all operators and application of transparent charges



## Compliance with the technical infrastructure parameters of the TEN-T guidelines

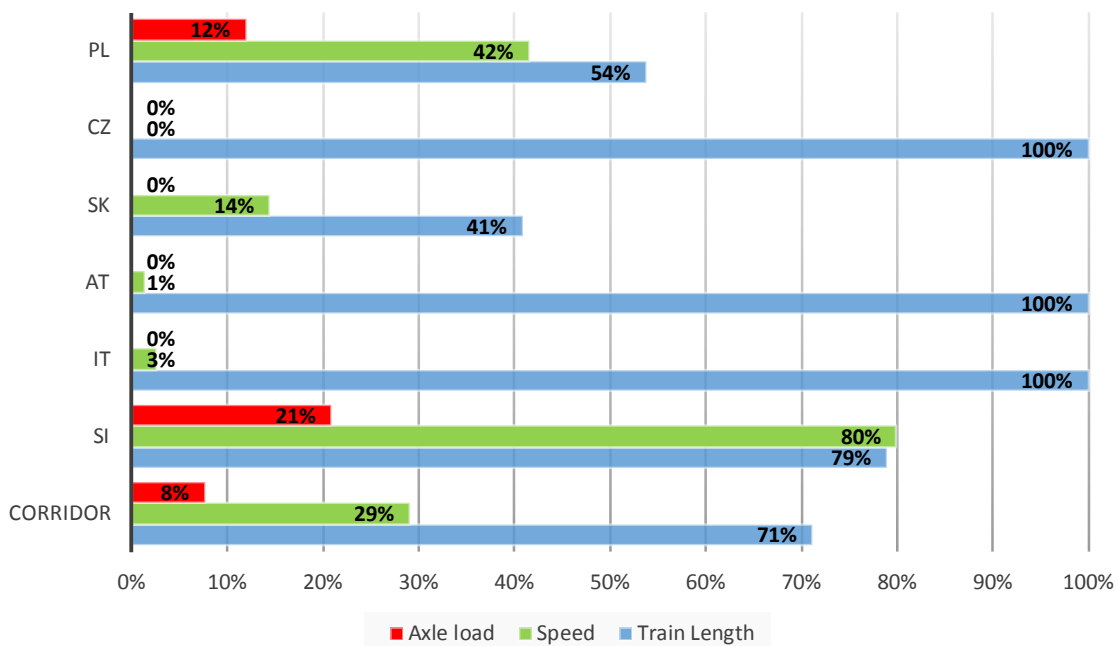
A deviation analysis by comparing the parameters characterising the infrastructure with the target values set in Art. 39 of Regulation (EU) 1315/2013 for the core network infrastructure has been undertaken in the 2014 corridor study. This compliance check was illustrated in eight different maps based on the data encoding (data as of January 2014) in the TENtec database. As part of the on-going 2015-2017 study the above exercise has been updated and complemented by means of a review of the corridor infrastructure and operation with respect to the requirements set in Chapter II of Regulation (EU) 1315/2013. The updated analysis shows the following results which give clear guidance for action on the Baltic-Adriatic Corridor.

### Rail

The Baltic-Adriatic Corridor includes 4,285 km of 1435 mm standard gauge railway infrastructure. With only 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), the corridor railway infrastructure is already continuous and in operation. However, a number of challenges are to be faced in terms of compliance with the different infrastructure requirements as laid down in Regulation (EU) 1315/2013.

Figure 2 summarises the outline in percentage (over the national sections of the corridor) and absolute km values of the non-compliant infrastructure with reference to main compliance parameters related to the rail freight infrastructure of the Baltic-Adriatic Corridor (axle load, line speed and train length).

Figure 2: Extension of the non-compliant rail freight infrastructure in km and % of the total length



Source: Baltic-Adriatic corridor study consortium, elaboration based on TENtec data

As regards *electrification*, with reference to passenger, freight and mixed use lines, the railway infrastructure along the corridor is almost entirely electrified with the exception of diesel passenger sections at the cross-border railway line between Bratislava and Wien. However, three different power systems are in use: AC 15 kV 16.7 Hz (Austria), AC 25 kV 50 Hz (Czech Republic and Slovakia) and DC 3 kV (Poland, Czech Republic, Slovakia, Italy, Slovenia).

Those differences in traction (electrification and power systems) constitute an obstacle for interoperability on the corridor which can only be particularly mitigated by the use of multi-traction locomotives.

With respect to the *axle load*, the corridor is mostly compliant with the Regulation (22.5 t). There are however some corridor sections (8% of the total corridor railway infrastructure) that do not comply with this standard yet, especially in Poland (several sections on the lines Katowice – Czechowice Dziedzice – Zwardoń, Wrocław – Jelcz – Opole, Kędzierzyn Koźle – Chałupki and Kędzierzyn Koźle – Gliwice – Chorzów) and Slovenia (several sections between Zidani Most – Šentilj).

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

When it comes to the maximum permitted *length of trains*, this is on most sections of the corridor shorter than the 740 m required by the Regulation. The prevailing maximum train length along the corridor is around 600 m, but more severe restrictions exist on specific sections.

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

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

Whilst a study is on-going aimed at supporting the definition of the 2016 ERTMS deployment plan for all corridors, based on the preliminary analysis ERTMS instalment is progressing and by end of 2015 the system was available on 18% of the corridor sections. In Poland ETCS level 1 is available on subsections between Grodzisk Mazowiecki and Zawiercie. In Austria ERTMS (ETCS Level 2) is available on the subsections connecting Bernhardsthal to Wien's main station. In Slovakia the Púchov – Trenčianska Teplá and Zlatovce – Bratislava railway line sections are equipped with ERTMS (ETCS Level 1); and ERTMS (ETCS Level 2) is available on the Žilina – Čadca railway line. In Slovenia all sections except Pragersko – Maribor – Šentilj / Spielfeld-Strass (border AT / SI) are equipped with ERTMS (ETCS Level 1).

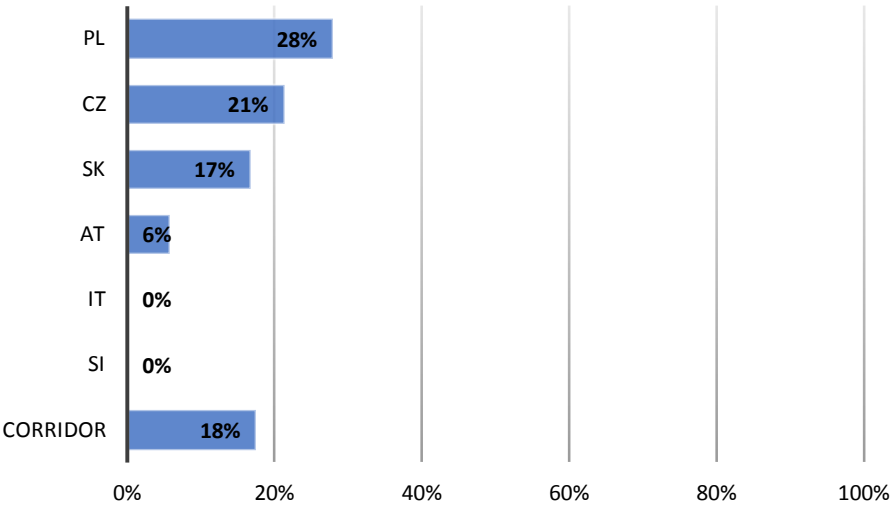
Beyond the above described issues affecting the rail infrastructure and representing an obstacle to interoperability, operational and administrative barriers exist possibly hindering the seamless and continuous flow of passengers and goods, such as lack of harmonisation of procedures for railway vehicles authorisations in different Member States or the lack of coordination between agency-specific and country specific regulatory and operational requirements for international trade and transport. These are rather general issues affecting international transport of freight by railways. However, the Implementation Plan and future initiatives of the Baltic-Adriatic Rail Freight Corridor 5 and more generally the activities of Rail Net Europe are worth mentioning in this regard, which include the development and use of the Path Coordination System (PCS), Train

Information System (TIS) and Charging Information System (CIS). All these tasks aim at simplifying and further supporting the development of international, cross-border train operations in Europe, with a focus on rail freight and multimodal core network corridors.

**Road**

The 3,600 km road infrastructure on the Baltic-Adriatic Corridor is also not entirely compliant with the requirements of the Regulation (EU) 1315/2013, especially with regard to the type of infrastructure. The situation is particularly relevant for the Polish road network, whereas the corridor infrastructure in Italy and Slovenia is fully compliant. Currently, 18% of the road corridor infrastructure is constituted by ordinary roads which do not comply with the requirements.

Figure 3: Extension of the non-compliant road infrastructure in km and % of the total length



Source: Baltic-Adriatic corridor study consortium, elaboration based on TENtec data

Based on the analysis currently under progress, alternative clean fuels are available on the corridor road infrastructure. More in detail electricity is available in the core urban nodes; hydrogen is available in Wien. CNG is available in Poland, Czech Republic, Italy and Slovenia; LPG is available in all Member States. LNG starts to be available in Poland and biofuels are available in the Czech Republic.

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

**Ports**

Ports represent the main gateways for passengers and especially freight transport to core network corridors. There are ten core ports in operation along the Baltic-Adriatic Corridor: five classified as maritime and inland waterway ports (Szczecin and Świnoujście, Trieste, Venezia and Ravenna), three classified as maritime ports (Gdynia, Gdańsk and Koper) and two inland waterway ports (Wien and Bratislava).

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

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

All ports are connected to the road and railway links of the corridor. Last mile connection improvements are however required to improve the standards of the existing dedicated rail links in terms of electrification, axle load, speed and train length at all maritime ports except Venezia and of the road links at Gdynia, Szczecin and Świnoujście. Improvement of the rail infrastructure within the port areas is also required in Gdynia and at all Adriatic ports, whereas the internal road infrastructure require modernisation/upgrading at all Baltic ports as well as in Venezia, Ravenna and Koper. Improvements to respond to capacity expansion needs in view of future traffic increase are foreseen or already ongoing in Gdynia, Gdańsk and at the Adriatic ports for railway transport; and in the Baltic ports, Venezia and Koper for road transport. Due to their location within or in the proximity of urban nodes, measures to reduce/mitigate the impact of rail traffic either at present or in the future are also required in Venezia and Ravenna. In the latter ports as well as in Gdynia, Szczecin, Świnoujście and Koper, solutions to mitigate the impact of road transport on the respective urban areas are also needed.

As of 2015 alternative clean fuels were not available at any of the ten corridor ports. Since 2016 LNG fuel deliveries are possible at the ferry terminal in Świnoujście; LNG fuel is also available at the LNG importing terminal in Świnoujście where it can be loaded onto road tanks.

No corridor or port specific operational and administrative barriers have been identified relating to maritime transport. More general aspects particularly relevant for the development of multimodal freight and combined transport fall within the scope of the implementation of VTMS and e-Maritime services and solutions aimed at promoting Single Window initiatives to access ports, track flows of vessels and transported intermodal vehicles, rolling stock and goods entering and exiting port areas; and/or simplifying administrative procedures associated to custom, safety and security processes. Activities and initiatives in these fields are already operative and under constant development/evolution. These solutions are however found to apply more at the national/local scale and are not integrated and fully interoperable at the Union level. River Information System (RIS) technology is also under implementation at Baltic-Adriatic corridor inland ports and interconnected inland waterways links belonging to other core network corridors or sections of the core network.

### *Airports*

There are 13 core airports along the corridor which are all interconnected to the road network (Szczecin, Gdańsk, Poznań, Wrocław, Łódź, Warszawa, Katowice, Ostrava, Bratislava, Wien, Ljubljana, Venezia, Bologna). The two core airports of Wien and Warszawa (Chopin) are already interconnected to the Baltic-Adriatic corridor railway network, which satisfies the requirements of the Regulation. The second Warszawa airport (Modlin) is developing relatively quickly and should therefore be analysed in future. In addition, a rail connection exists for the Szczecin, Gdańsk and Ostrava airports.

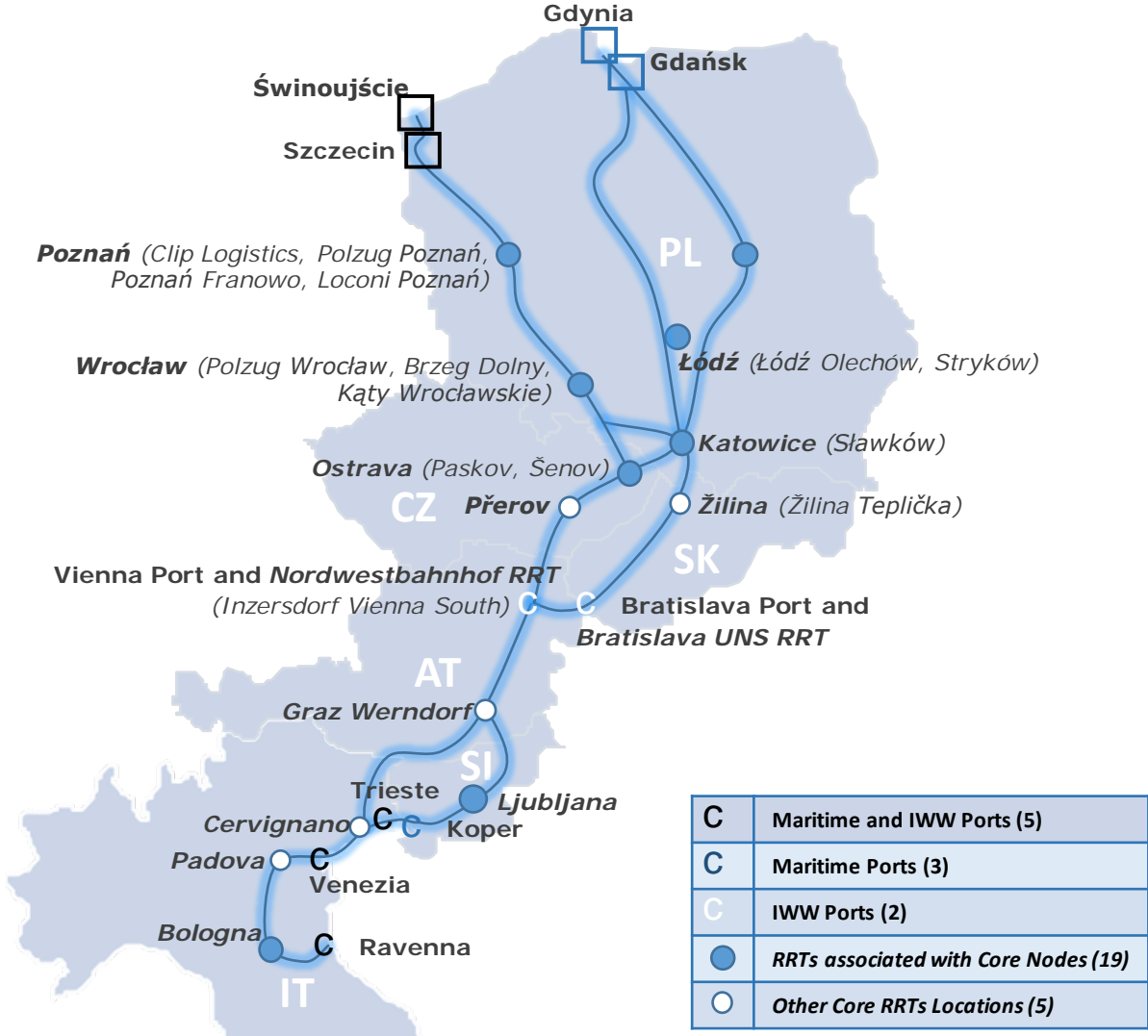
As of 2015, the progressing analysis on the corridor KPIs shows that alternative clean fuels are not available at airports.

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

**Rail Road Terminals**

24 rail road terminals are currently in operation in the areas and vicinity of the Baltic-Adriatic corridor core nodes as defined by Regulation (EU) 1315/2013. These are shown in Figure 4 together with the corridor port infrastructure where additional multimodal terminals are located and in operation. Inzersdorf Wien South (currently under construction) and Žilina Teplička (already completed but not in operation at present) are assumed to replace the Nordwestbahnhof terminal in Wien and the existing terminal in Žilina respectively.

Figure 4: Multimodal Transport Infrastructure



Source: Baltic-Adriatic corridor study consortium

Other rail road terminals also in operation or under development have been indicated as relevant for the development of multimodal and combined transport either on the corridor or on the core network: 3 rail road terminals are under development at present in Warszawa (Brwinów), Poznań (Kórnik) and Přerov; other rail road terminals are in operation in the Łódzkie Voivodship (Kutno, Radomsko), where a new logistic, reloading base and industrial park is also foreseen to be developed to operate the connection Łódź – Chengdu. Additional terminals are present in the Mazowieckie Voivodship (Mława) as well as in the Katowice area (Sosnowiec Południowy, Dąbrowa Górnicza) and in the comprehensive nodes of Gliwice (Gliwice, Śląskie Centrum Logistyki), Bydgoszcz, Brno, Villach-Sud, Rovigo, and Maribor. The dry port at Tczew in Poland, the Interporto Ferneti near the port of Trieste functioning as hinterland terminal for Ro-La traffic and the Interporto Pordenone on the comprehensive railway line between Udine, Treviso and Venezia, part of the Baltic-Adriatic Rail Freight Corridor, are also worth mentioning.

The 24 rail road terminals located at the Baltic-Adriatic Corridor core nodes are all interconnected to their respective national road and rail networks. With respect to the technical compliance of the rail accessibility to terminals, 9 out of 24 rail road terminals have 740 meters train length accessibility and 18 out of 24 have electrified train terminal accessibility. No specific critical issues have been identified so far that would affect the quality of last mile connections, except capacity constraints at the Poznań railway bypass and Bratislava railway node and local urban road accessibility and traffic in Poznań, Warszawa and Wrocław. For the terminals located within seaports and inland waterway ports, similar considerations apply as the ones described for the ports in which they are situated in terms of conditions and issues associated to their accessibility by rail and road.

With regard to the other parameters, all terminals are equipped to handle intermodal units. 5 out of 24 terminals have a maximum length of loading/unloading tracks of minimum 740 meters, 12 terminals do not have electrified rail tracks at terminal. 10 rail road terminals declare they have at least one freight terminal open to all operators in a non-discriminatory way and application of transparent charges, 14 does not have this condition or did not confirm.

Regarding sustainable freight transport/innovation, at least six terminals are active in the field of green/urban logistics for the promotion of low noise and low carbon urban freight delivery, which is becoming of particular relevance due to the increase in e-commerce. Although not required by the Regulation, alternative clean fuels are also available at three rail road terminals whereas other terminals are currently involved in initiatives aimed at supplying and/or distributing LNG.

No corridor or terminal specific operational and administrative barriers have been identified in the analysis. However, initiatives including pilot projects are on-going which relate to safety and security aspects of multimodal transport. Telematics solutions are in place or going to be implemented aimed at simplifying the administrative procedures related to multimodal transport. ICT real time information initiatives are also in place or are being implemented even between nodes to monitor and increase the effectiveness and efficiency of the logistics chain and its basic operations. Still, these seem to be more local or in any case associated to the network of operations of the Multimodal Transport Operators rather than implemented at the European transport system scale.

### *Urban nodes*

Further to the analysis of the compliance and capacity issues on the corridor national roads and railway lines also applying to the sections within core urban nodes, a more detailed analysis with reference to the requirements set in Art. 30 of the Regulation is currently on-going as part of the scope of the 2015-2017 corridor study.

### 3. Results of the transport market study

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

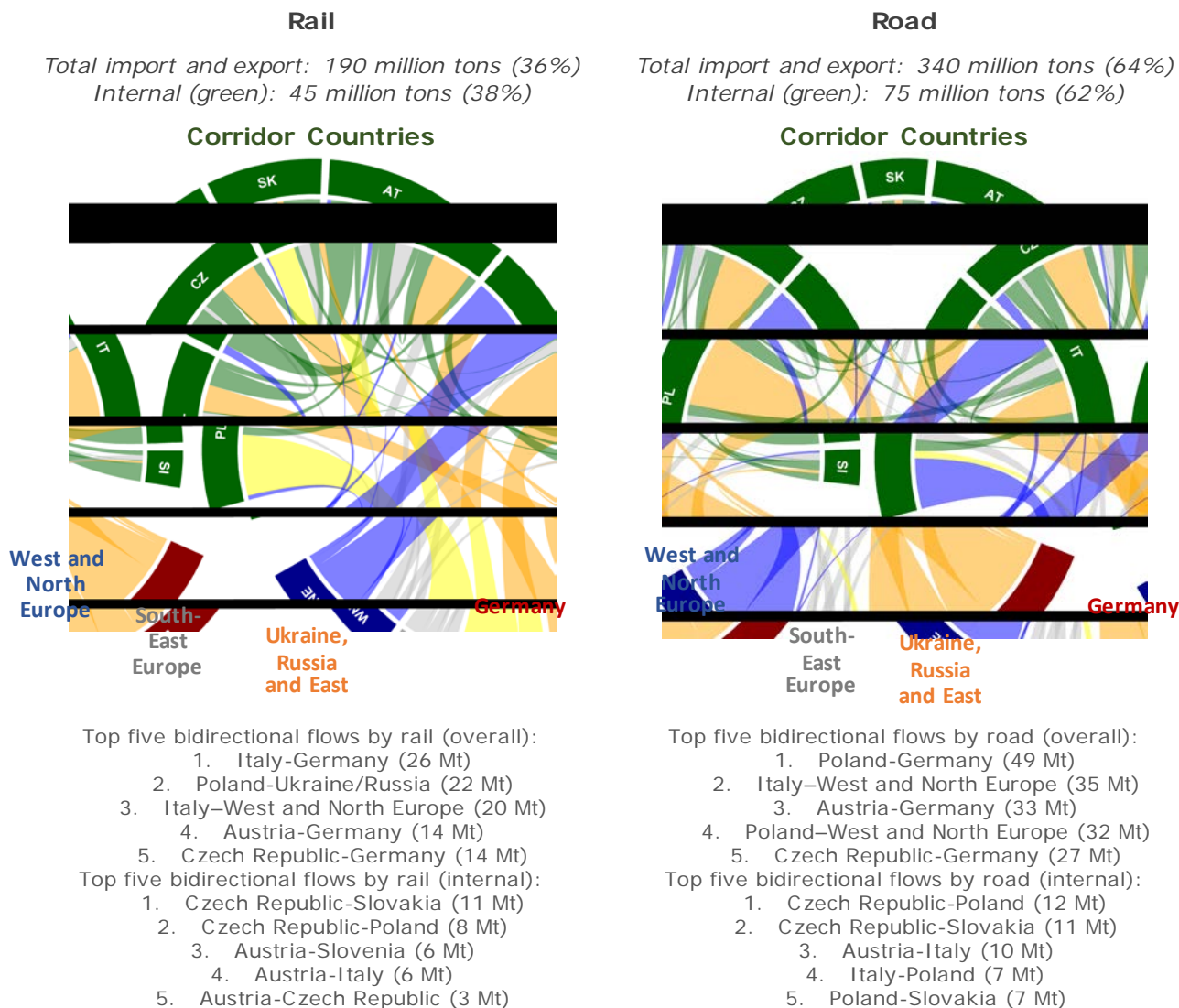
- providing a comprehensive view on the current multimodal transport flows on the rail and road corridor infrastructure and at the main interconnecting nodes (maritime and inland ports, airports);
- measuring the current performance of rail and road transport along the corridor and developing a prognosis of its evolution during the time horizon of the corridor work plan (2014-2030), also including the effects of the investments planned to be implemented for the improvement of the corridor;
- supporting the definition of the critical issues for the development of the corridor, complementing the analysis of the compliance and quality of the infrastructure with a view to identifying the possible issues related to the transport infrastructure capacity on the road and rail networks.

#### *The current transport flows on the corridor*

Indicators concerning the international inland transport flows (road and rail) on the Baltic-Adriatic Corridor, developed on the basis of officially available data (Eurostat), shows that in 2014 more than 530 million tons of freight were moved from/to the corridor countries, with a rail modal share of 36%. Flows between the six countries within the corridor accounted for 120 million tons (38% of rail modal share) – out of which 98.4 million tons along the North-South alignment (excluding the CZ – SK internal flow) (see Figure 5).

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

Figure 5: International freight flows (in tons) by rail and road along the Baltic-Adriatic Corridor



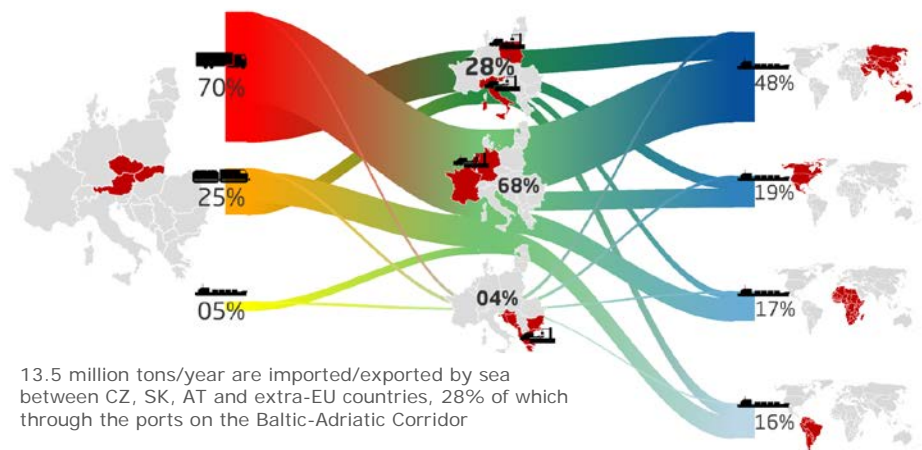
Source: Baltic-Adriatic corridor study consortium based on Eurostat data

Freight transport services along the Baltic-Adriatic Corridor do not only allow for seamless intra-EU flows of goods, contributing to the development of the internal market, but also serve as first or last leg of the multimodal transport chains interconnecting the corridor regions to extra-EU commercial partners, especially through seaports (see Figure 6).

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



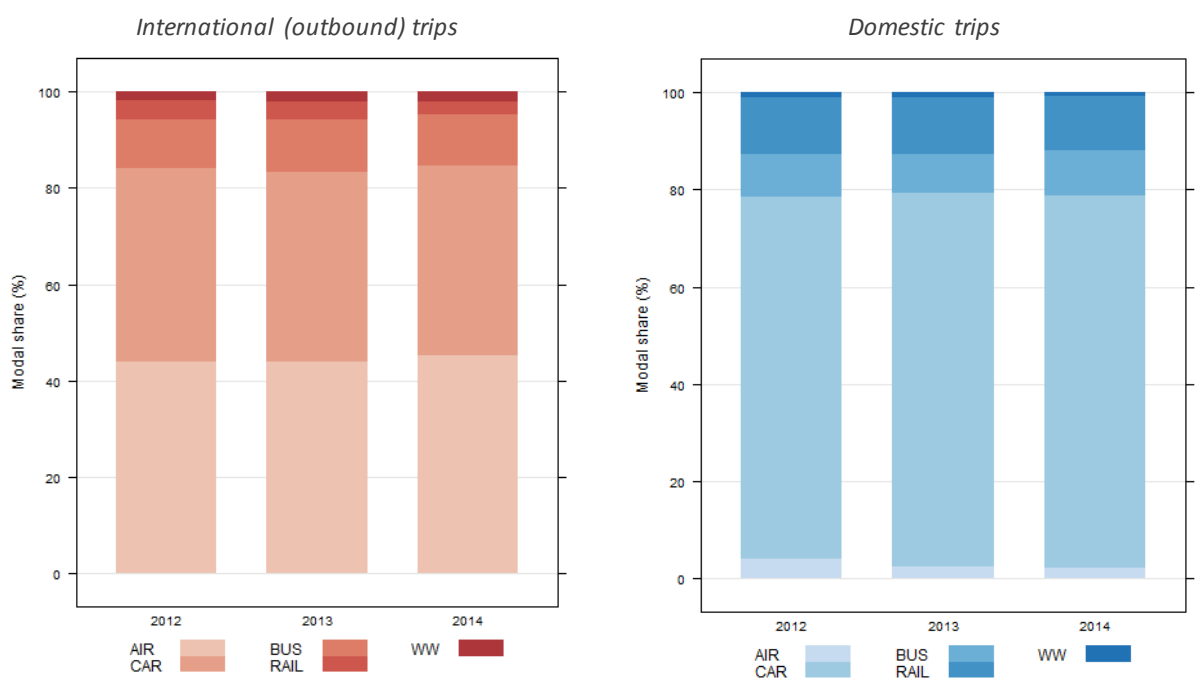
Figure 6: Multimodal freight transport chains between landlocked countries on the Baltic-Adriatic Corridor and extra-EU countries (2010)



Source: Baltic-Adriatic corridor study consortium

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

Figure 7: Modal share indicators for passenger transport on the Baltic-Adriatic Corridor in 2014



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

Source: Baltic-Adriatic corridor study consortium based on Eurostat data

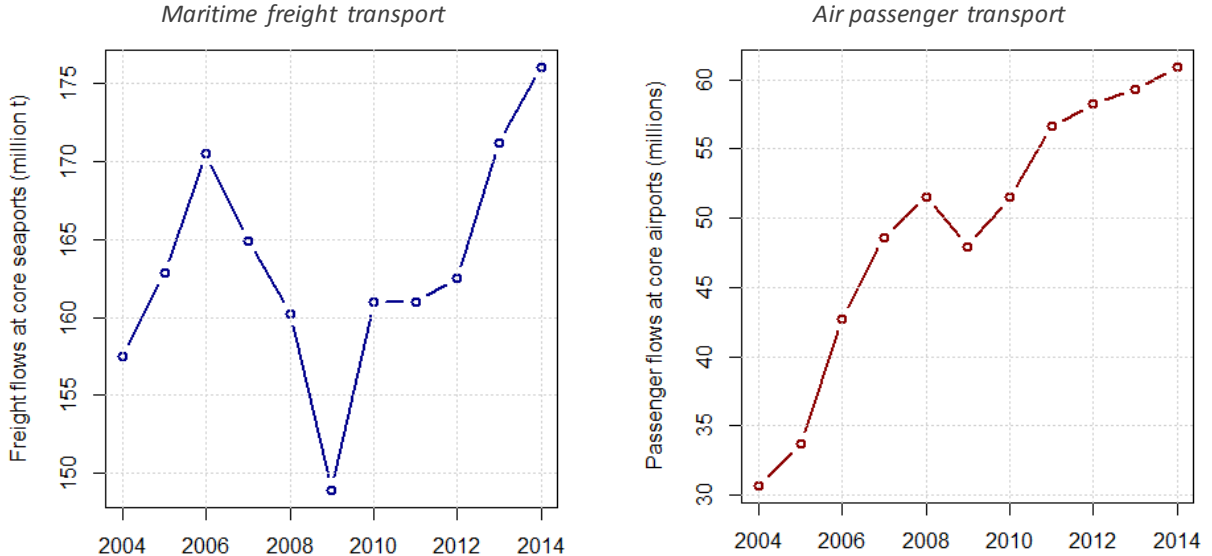
<sup>1</sup> Compared to freight, fewer and less comprehensive data are publicly available in order to elaborate indicators on the passenger modal share. The indicator is based on Eurostat data for the corridor countries concerning annual trips of EU residents, aged 15 or over, for personal or professional/business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

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

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

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

Figure 8: Transport volumes at seaports and airports (2004-2014)



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

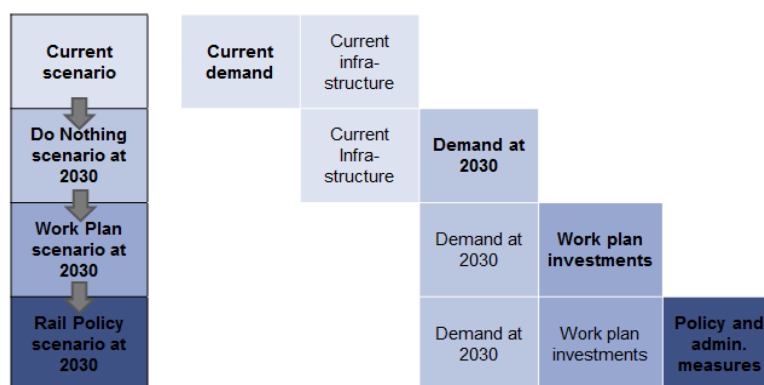
Source: Baltic-Adriatic corridor study consortium based on Eurostat data

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

## Prognosis of the transport market evolution until 2030

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

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



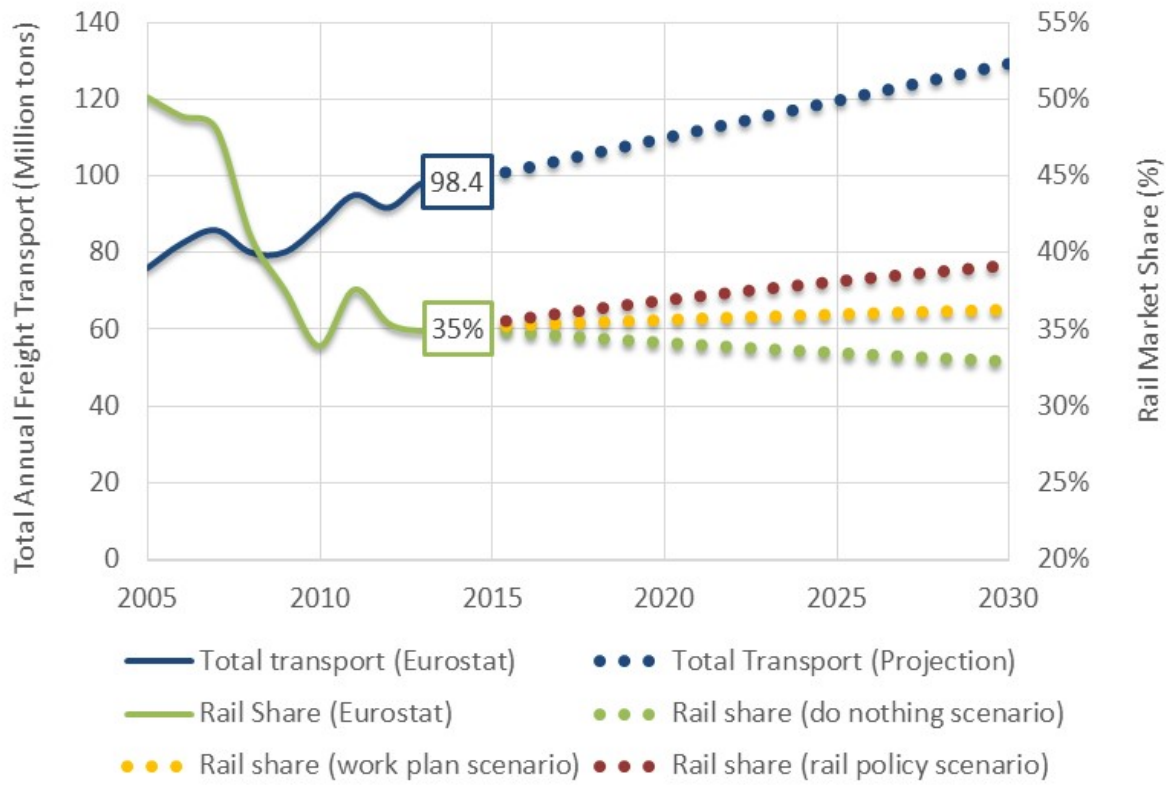
In the interpretation of the results of the transport market study for the corridor, the scope of the study, together with the very large area covered by the analysis and the limitations in the demand and traffic data available, should be kept in mind. Inevitably, significant margins of uncertainty affect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

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

- Notwithstanding the effect of the economic recession in 2008/2009 and 2012, total transport volumes have significantly increased since 2005 (from 75.8 million tons in 2005 to 98.4 in 2014, +30%, +2.9% average year-over-year), mainly driven by the economic growth in the Eastern European countries and their integration in the EU economy. This growth is expected to continue in the future, albeit at a reduced pace reaching 130 million in 2030 (+31%, +1.7% in average year-over-year).
- In the past, the rail modal share has declined progressively, from around 50% of the total transport in 2004 to around 35% in the last two years of analysis (2013 and 2014). This decline has been more rapid in the period 2004-2010. Whilst since then the modal share has stabilized, the decline in rail transport share was driven by the high growth in road transport in the Eastern European Countries, combined with the higher sensitivity to economic recession of rail transport.

- Without significant investments, the rail freight share is expected to further decline (32%). The investments in rail and road infrastructure planned to be implemented for the development of the corridor in addition to improving sustainability and cost efficiency in all transport modes, are expected to have a positive, although limited, effect in counterbalancing this trend, with a rail share slightly exceeding the current position (36%).
- Additional policy and administrative measures (including the implementation of the Baltic-Adriatic Rail Freight Corridor which became operational in autumn 2015) could contribute to a great extent in the promotion of rail transport, with market shares for this mode rising to 39%.

Figure 9: Total volume and rail market share of the international inland freight transport along the Baltic-Adriatic Corridor (millions of tons)



Source: Baltic-Adriatic corridor study consortium based on Eurostat data and Baltic-Adriatic Multimodal Model

The results for passenger transport presented in Figure 9 focus on the rail and road interregional<sup>2</sup>, international and long distance transport demand along the corridor, which are the key target of the EU and TEN-T transport policy, and show that:

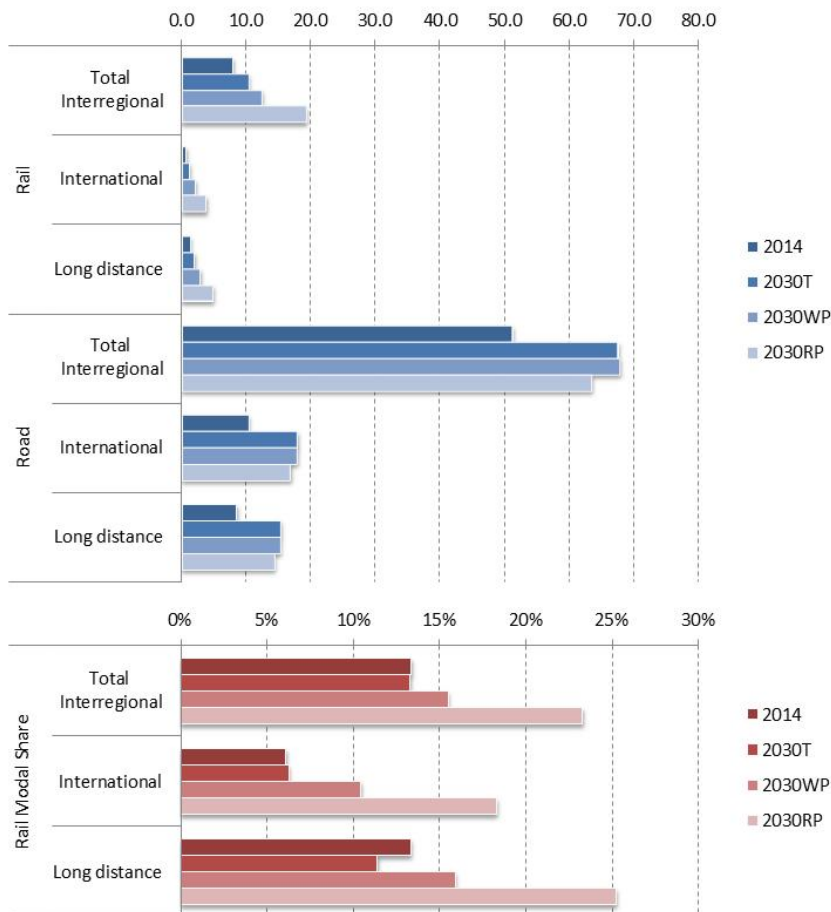
- The current rail modal share in interregional transport is around 13% overall (measured in pax\*km) but much lower for international transport.
- The transport demand is expected to grow significantly by 2030 (+32% for passenger, +1.8% in average year-over-year).
- Without significant investments, the rail share is expected to remain stable (13%). The investments in rail and road infrastructure, in addition to the positive impacts on environments and transport costs, will have a positive, although limited, effect on the

<sup>2</sup> The interregional demands include only trips occurring between two distinct NUTS2 regions both located along the Baltic-Adriatic corridor alignment. The long distance demand includes interregional trips longer than 300 km.

rail modal share (15% in 2030 overall), with major increases in the international and long distance segments.

- Additional policy and administrative measures, also including significant steps in the development of a single EU transport market, could contribute to a great extent in the promotion of rail transport, with market shares for this mode rising to 23% of interregional demand (25% for long distance transport).

Figure 10: Performance and modal share of the Baltic-Adriatic inland surface transport modes (millions of pax\*km/year)



Source: Baltic-Adriatic corridor study consortium

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

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

## 4. Capacity issues on the rail and road networks

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

### *Flows and capacity on the rail network*

Figure 11 shows that current flows on the rail network are generally below the critical level, set in the corridor analysis at 150 trains per day per track for a double track line. Taking into account that rail infrastructure can also operate above this traffic level – especially if specific technological and signalling solutions are implemented – rail capacity is not a generalised short-term issue for the corridor.

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

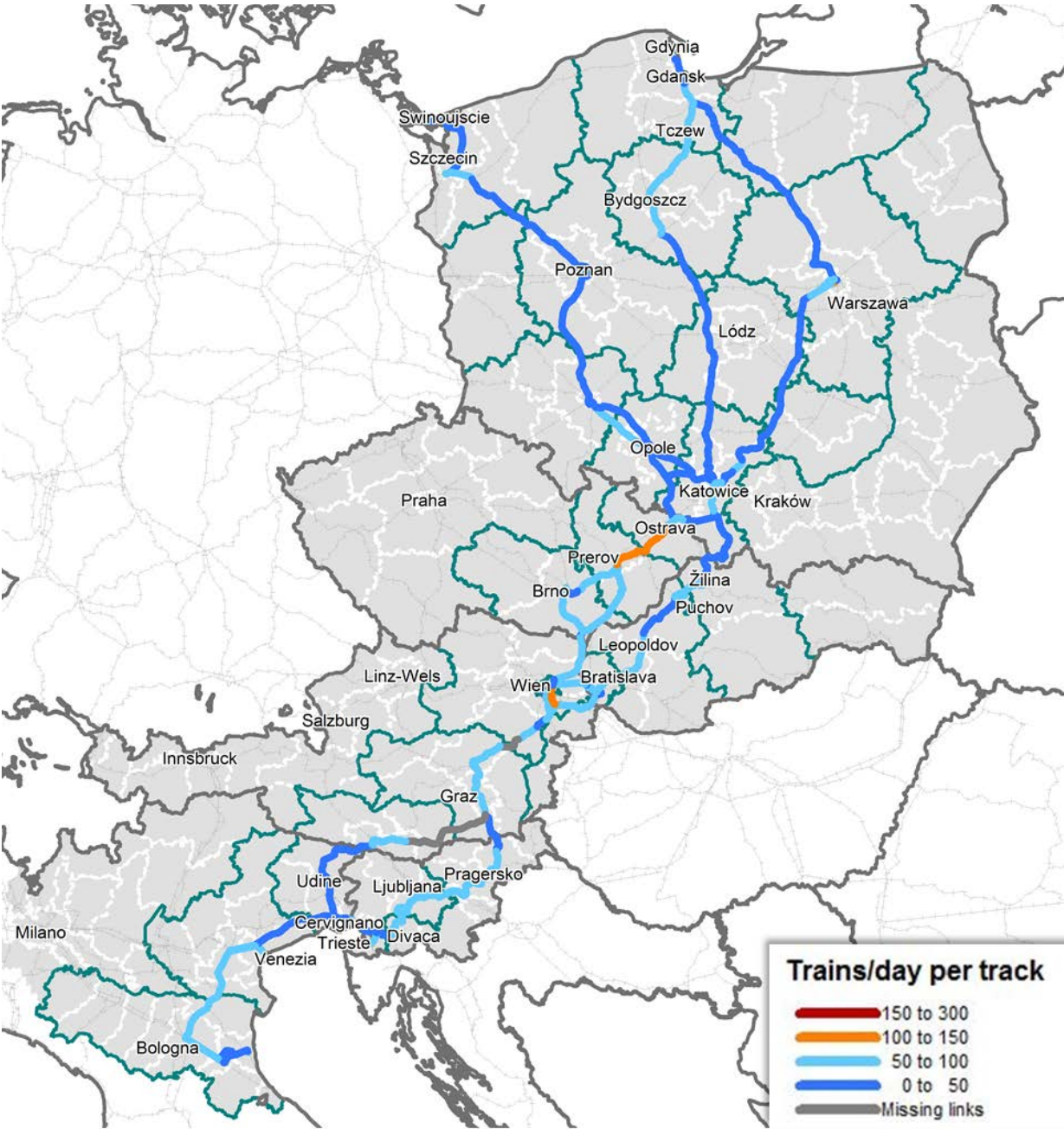
Finally, it is worth noting that in certain sections of the corridor rail infrastructure, specific capacity issues exist due to poor technical parameters of the infrastructure limiting the capacity below the theoretical level allowed by the number of tracks. This is for instance the case in several sections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

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

In this respect, it should be noted that in certain urban and metropolitan areas, new services are going to be implemented, i.e. Bologna node, expected to increase services between Bologna and Castelbolognese, and Gdynia/Gdańsk where the Pendolino high speed trains are already in operation and the Pomerania Metropolitan rail services were recently introduced. These foreseen increases in rail services may lead to capacity issues particularly in view of the increase in freight traffic operations from the ports of Ravenna and Gdynia as well as Gdańsk respectively. Having specified this, it should be also noted that, under the applied approach, the growth in the corridor train traffic is also correlated to re-routing of services from alternative lines to take advantage of the improved infrastructure. This is of course an operational decision that might not be implemented by train operators and/or infrastructure managers, and subject to the availability of train

paths. For this reason, the present assessment is likely to identify an upper limit in the increase in train flows on the corridor.

Figure 11: Intensity of rail transport (2014, trains/day/track)

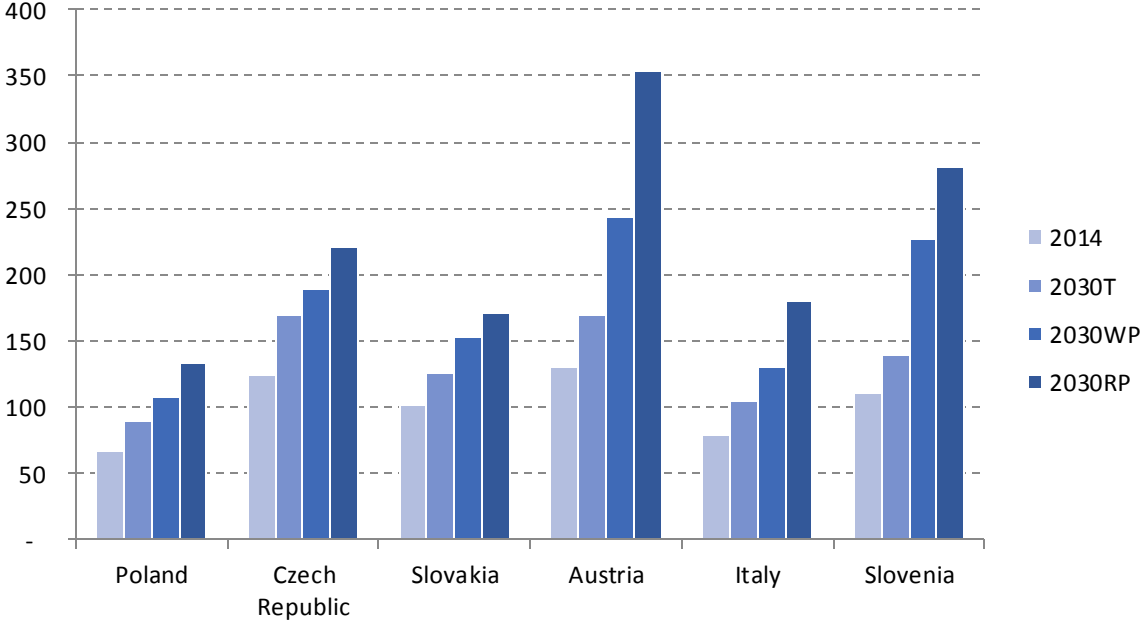


Source: Baltic-Adriatic corridor study consortium, elaboration based on TENtec data and sections

Based on the analysis, the current available track capacity will be sufficient to accommodate train traffic growth along the corridor in the do-nothing scenario (2030T). This is also generally true for the work plan scenario, where the train volumes will further increase compared to the current situation (+60% in average along the corridor, but with growth mainly concentrated on the new or upgraded sections). However, local capacity issues would need to be appropriately managed – both in the detailed definition of the investments or in the management of the available capacity. These issues will be mainly located in urban agglomerations (Warszawa and Katowice in Poland, Brno in the Czech

Republic, Bratislava in Slovakia, Wien in Austria, and Ljubljana in Slovenia) and in specific sections (Ostrava – Přerov in the Czech Republic). In addition, high traffic flows might occur in the Austrian section between Werndorf and Wiener Neustadt, also as a result of traffic induced by the completion of the Alpine crossings (Semmering and Koralm).

Figure 12: Average train flows along the corridor (trains/day)



Source: Baltic-Adriatic corridor study consortium

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

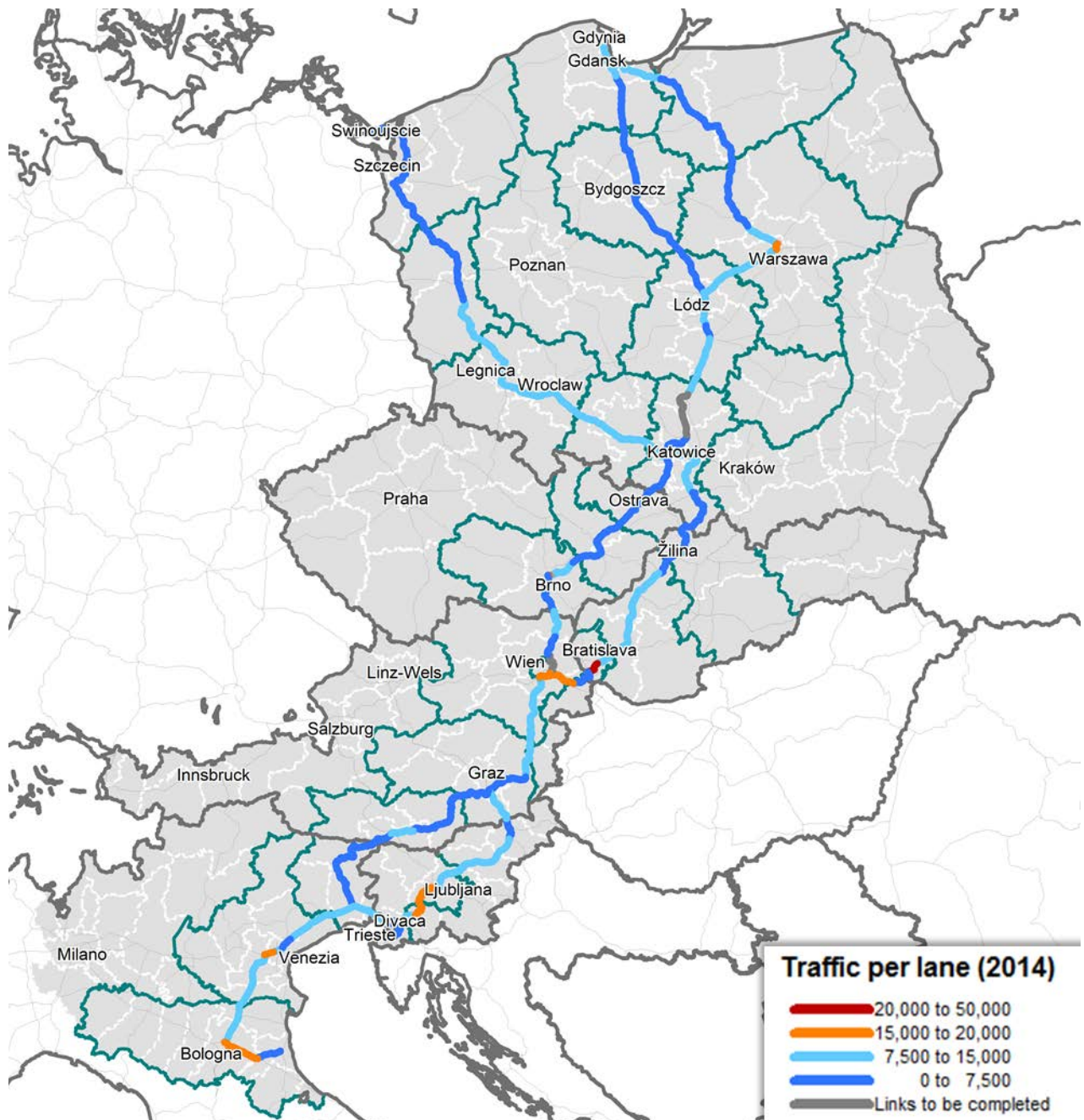


### Flows and capacity on the road network

Figure 13 shows that current road flows are generally below the critical level, set in this analysis at 20,000 vehicles per day per lane.

Taking into account that road infrastructure can also operate above this traffic level (although with reduced efficiency in terms of congestion), capacity is not a general issue for the corridor. The only section currently above the identified critical level is within the urban area in Bratislava, where projects for a new external by-pass are being developed.

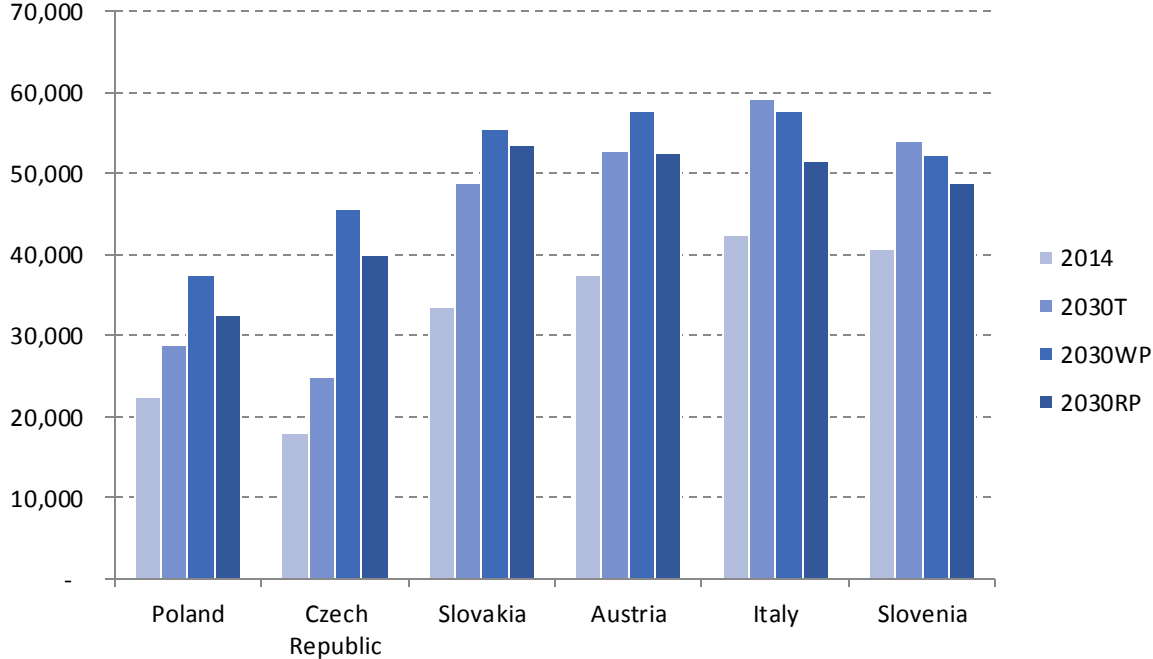
Figure 13: Intensity of road transport (2014, veh/day/lane)



Source: Baltic-Adriatic corridor study consortium, elaboration based on TENtec data and sections

Figure 14 shows that, as a result of the improvement of the infrastructure, the flows on the road infrastructure are expected to grow significantly in the time plan horizon, although this effect might be mitigated by improvements of the rail infrastructure and implementation of modal shift measures.

Figure 14: Intensity of road transport (vehicles/day)



Source: Baltic-Adriatic corridor study consortium

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

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

## 5. The identified planned projects

### Projects for the development of the Baltic-Adriatic Corridor

A bottom-up approach has been adopted for the analysis of the investments required for the development of the corridor infrastructure by 2030. 532 projects have been identified as part of the 2015-2017 Baltic-Adriatic corridor study, aimed to update and integrate the project list developed in support of the elaboration of the first Baltic-Adriatic corridor work plan. Of these, 477 are on-going or planned to be implemented in the future; 55 have been completed since the inception of the new TEN-T policy. Rail, road, port, airport and rail road terminal infrastructure managers as well as Member States and regional authorities have been consulted and their development plans reviewed in order to compile a new list of projects with the ultimate goal to make sure that the corridor will develop by 2030 as a multimodal, interoperable, high quality standard infrastructure, interconnecting European core urban and transport nodes across the concerned Member States.

Table 2 summarises the investments currently on-going or planned for implementation on the corridor with reference to the main categories identified with respect to the relevant articles of the Regulation (EU) 1315/2013 and with respect to the priorities of the 2015 Baltic-Adriatic corridor work plan, specifying the total number of initiatives and budget, as well as the percentage in share of total budget.

Table 2 Projects for the development of the Baltic-Adriatic Corridor

	Project category	Number of projects	Share in % of total budget
Development of the railway infrastructure	Cross-border sections (work plan priority)	24	6.0%
	Missing links (work plan priority)	2	12.0%
	Modernisation and upgrading of national railway lines, including junctions outside core urban nodes	46	26.2%
	Technological upgrading, telematics applications and other horizontal measures (art. 31 to 37 of Reg. 1315/2013)	20	1.5%
	ERTMS including dedicated projects at cross border sections (work plan priority)	10	2.0%
	Other	5	0.01%
Development of the road infrastructure	Cross border sections (work plan priority)	15	3.5%
	Completion and upgrading of national roads outside core urban nodes	46	16.0%
	ITS, ETC and other horizontal measures (art. 31 to 37 of Reg. 1315/2013)	19	2.1%
Development of the port infrastructure	Developing interconnections (work plan priority)	31	2.7%
	Modernization / Expansion of the infrastructure	55	10.6%
	VTMIS and Innovation and other projects	16	0.2%
Development of Inland Waterway Ports		10	0.4%
Development of the airport infrastructure, excluding last mile connections in core urban nodes		84	3.1%
Development of the RRT infrastructure		10	0.8%
Development of the urban node infrastructure excluding last mile connections in core urban nodes (work plan priority)		73	12.6%
Additional horizontal studies and initiatives		10	0.2%
<b>Total n. of projects and cost</b>		<b>477</b>	<b>69.5 (€ billion)</b>

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

The information on the investment costs of the on-going and planned projects is available for 449 initiatives, totalling 69.5 € billion. Most of the projects (304) are planned to be completed by 2020, 137 are foreseen to be completed by 2030 and 5 projects after 2030. For 31 projects the time-schedule is not defined at present. Out of the total budget, almost 40% is allocated to the development of the priorities identified in the first Baltic-Adriatic corridor work plan.

The 55 investments that have been completed since the inception of the new TEN-T policy total 4.9 € billion. These include also works relating to the 2015 Baltic-Adriatic corridor work plan priorities such as a) initial instalment of ERTMS related technology in Poland, Czech Republic, Slovakia, Austria and Slovenia either through dedicated initiatives or as part of modernisation of the national railway lines and junctions; b) studies for the improvement of last mile connections of ports in Poland, road last mile connection works in Gdańsk as well as the reconstruction of the existing track between Koper and Divača providing direct access by railway to the port of Koper and last mile connection works to the new Ro-Ro terminal Fusina at the Venezia port; as well as c) improvement of existing road infrastructure interconnecting to the port of Trieste and completion of the reconstruction of the “old bridge” in Bratislava. Modernisation works of the national road and particularly railway lines are also worth mentioning which improved the standards of the corridor infrastructure.

### *Railway transport*

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

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

### *Road transport*

Works for the modernisation of the corridor network to reach compliance are planned for implementation at the cross-border sections between Poland – Slovakia, Czech Republic – Austria, Italy – Slovenia as well as on the national road networks in Poland, Czech Republic and Slovakia. In Poland, the Czech Republic, Slovakia, Austria, Italy and Slovenia, upgrading works are also foreseen on the corridor sections and junctions to reduce congestion, mitigate the impact of noise, improve safety and the level of services. Studies and works are also on-going and planned to boost development and availability of alternative clean fuels and for the implementation of ITS solutions to improve traffic management and flow orientation. In this respect infrastructure deployments for emerging ITS technologies (especially on connected vehicles) are starting in the Czech Republic, Austria and Slovenia.

### *Ports*

Initiatives aimed at developing port infrastructure and terminals, including dredging works and activities to improve maritime accessibility as well as navigability are on-going and planned for the future to increase port capacity and improve the performance at all ports along the corridor. Such initiatives are backed by the positive market responses to recent developments of the maritime infrastructure at the ports on the Baltic-Adriatic Corridor which have registered a significant positive growing trend in the past years. Opportunities for growth are also related to the development of the Motorways of the Sea between EU Member States and with commercial partner countries in the Mediterranean and Baltic basins and more generally to develop intermodality and new logistics solutions at the EU level.

Initiatives to improve the standards of the existing rail and road links to the ports and to further improve the interconnections between the ports and the other transport modes are also on-going and planned for the future. These investments will be crucial to support the planned port expansions and to enhance multimodality along the corridor. Projects for the development of LNG facilities and technology are also included on the list for Świnoujście, Ravenna and Venezia to promote availability of alternative clean fuels. VTMS and e-Maritime solutions are under implementation for the development of interoperability and simplify/facilitate intermodal transport solutions and improve safe and secure maritime transport.

### *Airports*

Airport terminals and runways expansions and developments as well as technological works to improve safety and security and monitoring/mitigation of environmental impacts are foreseen at most of the 13 airports belonging to the Baltic-Adriatic Corridor. Whilst the majority of the investments relate to passenger transport operations, cargo facilities related improvements are also planned at Gdańsk, Warszawa, Katowice, Bologna and Ljubljana airport.

Regarding interconnections with other modes and particularly with rail, initiatives are planned at Wien airport (the major airport along the Baltic-Adriatic Corridor with already more than 22 million passengers per year) to increase interconnectivity between the Austrian airport and the Czech Republic, Slovakia (as well as Hungary), also in view of future traffic growth at this multimodal cross-border hub, and in consideration of the recent trends in travel patterns, showing an increase in the demand for integrated high-speed railway and aviation services.

Projects of urban nature for the development of rail and transit interconnections are also planned at Katowice, Bratislava and Ljubljana airports as well as at Venezia and Bologna, these latter representing with Warszawa and Wien the largest airports along the corridor. Projects for the improvement of existing road links to the airports are also foreseen by the concerned infrastructure managers at Venezia and Ljubljana as well as at Warszawa and Łódź airports.

SESAR implementation is on-going as part of network initiatives at the EU and multi-country level, also involving the airports located along the Baltic-Adriatic axis. No specific initiatives have been identified at this stage for the promotion of alternative clean fuels.

### *Rail Road Terminals*

The construction of the Žilina Teplička rail road terminal was completed in 2015. The Wien Inzersdorf, Padova and Ljubljana rail road terminals are under development and the Ostrava Paskov, Přerov, Bratislava and Graz Werndorf rail road terminals have plans for their modernisation and/or expansion. Improvements of interconnections are either part of these developments or presented as dedicated projects, as for the Cervignano rail road terminal. ICT and innovation initiatives are also on-going and planned at Padova and Bologna to promote intermodality and support the smooth flow of information along the logistic chain also including the terminals as well as to promote availability of alternative clean fuels.

### *Urban nodes*

Further to the investments planned at the rail nodes along the alignment to improve and reach the standards required by the TEN-T Regulation, other investments are planned in most urban areas along the corridor to solve congestion and capacity issues on the existing corridor alignment by means of construction of rail and road bypasses, improvement of junctions interconnecting the corridor to feeder roads and promote sustainable transport by developing interconnections between road and rail transport infrastructure along the corridor with local urban transit system also by mean of development of park and ride facilities. Projects aimed at mitigating the impact of road

and rail traffic on the urban areas particularly by means of noise barriers are also foreseen. No initiatives are listed which aim at developing green urban logistics solutions or other soft measures to support modal shift on city/corridor users travel behaviour in favour of public transport solutions. The analysis of the urban nodes and their projects is preliminary at present and will be further integrated also by means of consultation of the concerned stakeholders.

#### *Horizontal projects for the promotion of intermodality and sustainable transport solutions*

In addition to projects and investments which are specific to the sections and nodes of the Baltic-Adriatic Corridor, initiatives have also been identified which involve nodes and sections belonging to more corridors and even to comprehensive networks. Usually involving a variety of stakeholders from different transport modes and disciplines, these projects are crucial for solving operational barriers that are affecting the competitiveness of intermodal transport and are relevant to identify, test and deploy at network scale ITS, ICT, alternative clean fuels and innovating vehicles project solutions.

Further to infrastructural works, horizontal initiatives to implement telematics applications are also planned affecting more sections and nodes of the core (and even comprehensive) networks to improve traffic management systems as well as the operational and administrative aspects of international and multimodal transport of passengers and freights along the corridor. The latter initiatives are more generally applicable to the respective transport industries and networks than specific to the corridor.

#### ***Towards a plan for removal of physical, technical, operational and administrative barriers between and within transport modes and for the enhancement of efficient multimodal transport and services***

Although for many investments the scope, budget and time-schedule for implementation may be further refined and confirmed, the identified planned projects for the development of the Baltic-Adriatic Corridor are overall assumed to allow the development of the corridor towards the achievement of the general objectives and priorities of the TEN-T Regulation by 2030. Investments are foreseen on the corridor rail and road infrastructure and transport nodes not only to develop a continuous infrastructure and reach compliance targets, but also to further improve the corridor capacity and performance beyond the requirements set in the Regulation (EU) 1315/2013. Innovation deployment initiatives and projects aimed at mitigating impacts on the environment are also foreseen to be implemented. It should however be noted that provision of adequate funds and financial resources is not secured yet for all projects identified for the development of the Baltic-Adriatic Corridor and may be challenging in a number of cases.

## 6. Financing issues and tools

The development of core network corridors requires, inter alia, a critical mass of investment to take place within a short time-framework. As stated beforehand, the provision of adequate funds and financial resources is however not secured yet for all projects identified for the development of the Baltic-Adriatic Corridor. Therefore a careful analysis of the potential financial sources has to accompany the corridor planning. Some key criteria to be appraised are reported in this section of the work plan.

The projects to be developed can be ranked in three different categories from the point of view of funding and financing needs:

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

The project may look at conventional lending from public and private banks, alternative financing from institutional investors (e.g. bonds) and at financial instruments for instance to cope with the unbalances of cash-flow during its construction and rump-up phase until a sustainable flow of revenues is secured, and to address particular risks and market failures, and to secure lending with long maturity. Financial instruments could be provided in the form of credit enhancing and guarantees (be it a specific legal guarantee or a financial guarantee to ease access to financing).

- b. Hard-infrastructure, greenfield, risky, long-term projects such as the majority of cross-border railway connections as well as inland waterways navigability improvements might require a substantial public support through public funding, even if innovative approaches can apply to project development and/or to specific components of the investment. Public funding can be structured in different ways (also depending on the budgetary constraints of the public authorities) such as lump sum subsidy (grant), fiscal incentives, operational deficit coverage and availability payment schemes.
- c. In a variety of intermediate cases the project will require a more limited funding component in order to reinforce its financial viability – these projects could be supported through a blending of funding (e.g. grants) and financing.

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

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

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

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

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

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

The review of the projects on the Baltic-Adriatic corridor list includes examples and potential new investments for consideration of innovative financial instruments. Many projects have already benefited from adoption of multiple financing options for different stages of their implementation. These do not just include public sources or equivalent sources either from national budgets or infrastructure managers' own funds as well as EU funding which represented the funding as usual pattern for most initiatives. Loans from the European Investment Bank have also been used and are being utilised for a number of projects, including port expansions at Ravenna, Trieste and Koper, widening of the A4 motorway between Mestre and Villesse, the Warszawa Ring-Road, the A1 motorway between Pyrzowice and Częstochowa as well as between Toruń, Stryków and Częstochowa, the D4/R7 Bratislava bypass and the construction of the S3 expressway between Gorzów and Legnica. Also railway projects have benefited from European Investment Bank support, including the Semmering Base Tunnel and Pottendorf Line as well as the new railway station in Wien (recently completed), the Warszawa Railway Node, the E 59 railway line between Rawicz and Czempień and Poznań as well as between Wrocław and the border of the Lower Silesian, the Žilina Teplička rail road terminal and GSM-R digital radio communication system installation on the entire public railway infrastructure network in Slovenia.

Further to the above examples more than half of the projects currently included on the list are potentially revenue generating, which may be also implemented by means of multiple financial sources. Most of these investments relate to infrastructure expansion, which particularly in the case of road, port, airport and rail road terminals – especially if operated under concession regimes – are more suitable for innovative financial instruments.

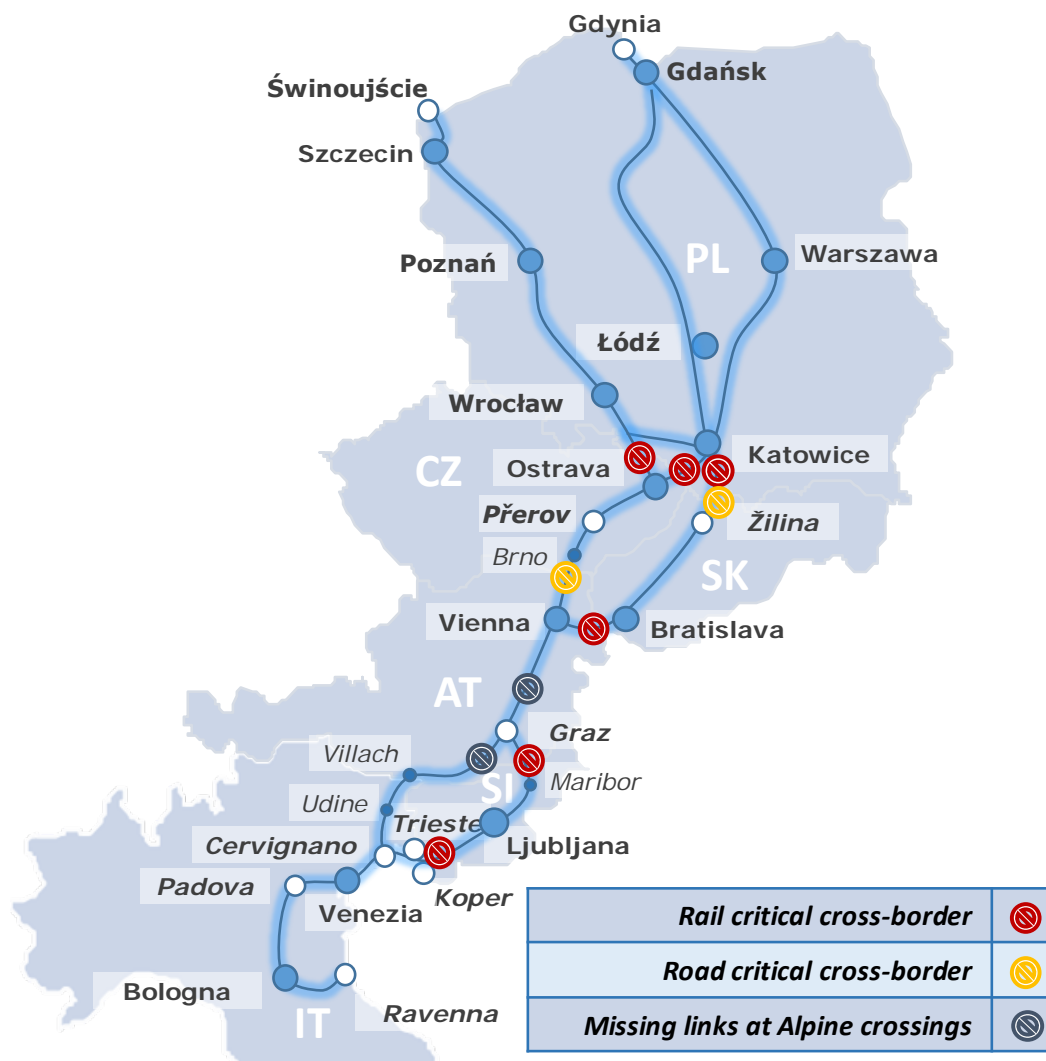


## 7. Critical issues on the Baltic-Adriatic Corridor

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

- Removing the main rail and road bottlenecks to encourage the development of long-distance international traffic flows along the corridor, in particular by improving the most critical cross-border rail and road connections (Poland – Czech Republic / Slovakia, Czech Republic – Austria, Austria – Slovakia, Slovenia – Austria / Italy), also promoting the development of digital cross-border links for the exchange of traffic data and provision of information services.
- Ensuring the timely completion of the on-going projects at the Alpine crossings in Austria in order to remove the two missing links along the corridor.

Figure 15: Critical cross-border sections and missing links on the Baltic-Adriatic Corridor



Source: Baltic-Adriatic corridor study consortium

- Improving the infrastructure quality and standards – completing the modernisation of the national corridor links in the Eastern Member States – with the target to comply with the technical requirements set in the Regulation, in particular concerning transport infrastructure for rail (especially speed, axle load, train length of the core sections and train length and electrification of the rail access to the core freight terminals) and road transport (road class – motorways or expressways).
- Enhancing multimodal transport supporting the optimal integration and interconnection of all transport modes, especially improving the "last mile" connections of ports.
- Improving interconnection in all urban nodes along the corridor between TEN-T and local transport infrastructure, for both passenger and freight traffic.
- Promoting interoperability of national transport networks, in particular through the deployment of existing interoperable telematics applications and their further technological advancement, with a focus on ERTMS.

With reference to these objectives, which have already been identified in the 2014 corridor study, the sections below describe the main existing barriers, the planned investments for their solution and assess the critical issues towards the development of a fully compliant and functional corridor by 2030.

### *Cross-border sections*

#### *Railway cross-border sections*

Further to the analysis of the compliance to the requirements in terms of electrification, axle load, speed and train length, bottlenecks have been identified for six out of nine rail cross-border sections along the corridor. The following box provides a brief overview of the planning and implementation status for each of these cross-border sections.

- **Opole (PL) – Ostrava (CZ)** [Chałupki (PL) – Bohumín (CZ)]: This rail section requires improvement works on the Polish side between Kędzierzyn Koźle and Chałupki (state border) to reach compliance in terms of speed, axle load and train length. Due to limited availability of financial resources the project comprised in the corridor project list to reach the required standards (46.8 € million, expected to be completed by 2020) is included in the reserve list of the National Railway Programme, currently at its final approval stage; and national funds are foreseen to secure only part of the works. Whilst the Polish Authorities assume that the project will be in any case completed by 2030 in line with the requirements set in the TEN-T Regulation, the possibility to implement the works during the current financing period (up to 2023) will be considered in the event additional financial resources will be identified. On the Czech side works were already completed to increase the speed up to 160 km/h, including the improvement of the Bohumín station. This cross-border section is also expected to benefit from the modernisation of the double track railway line E30 between Kędzierzyn Koźle – Opole Groszowice – Opole Zachodnie to increase maximum operational speed by 2021 (150.2 € million) as well as from the modernisation of the Ostrava junction on the Czech side by 2021 (222.2 € million). This cross-border section is currently expected to be at standard by 2030 at the latest, except for train length on the Czech side.
- **Katowice (PL) – Ostrava (CZ)** [Zebrzydowice (PL) – Petrovice u Karviné (CZ)]: Preparatory works are on-going on the Polish side for the modernisation of this rail section requiring major investments on the lines E30 and E65, especially in the area of Katowice, to increase the standards of the existing railway lines and stations (Czechowice Dziedzice, Zebrzydowice). Due to limited availability of financial resources the project comprised in the corridor project list to reach the required standards (979.9 € million, expected to be completed by 2023) is included in the reserve list of the National Railway Programme, currently at its final approval stage; and national funds are foreseen to secure only part of the works. Whilst the Polish Authorities assume that the project will be in any case completed by 2030 in line with the requirements set in the TEN-T Regulation, the possibility to implement the works during the current financing period (up to 2023) will be considered in the event additional financial resources will be identified. On the Czech side, track optimisation works at the Dětmárovice station are planned to be finalised by 2018, which together with the instalment of remote traffic control system

between Petrovice u Karviné and Ostrava by 2017, will further improve the performance of the line. The section from the state border to Petrovice u Karviné and Ostrava was indeed already modernised since 2002, increasing the speed up to 120-160 km/h. Also this cross-border section is expected to benefit from the completion of the modernisation of the Ostrava junction by 2021 (222.2 € million). This cross-border section is currently planned to be at standard by 2030 at the latest except for train length on the Polish section Zebrzydowice – state border as well as on the Czech sections.

- **Katowice (PL) – Žilina (SK)** [Zwardoń (PL) – Skalité (SK)]: On the Polish side works are foreseen to modernise 65 km of the existing predominantly single track electrified railway line between Czechowice Dziedzice and Zwardoń. Due to limited availability of financial resources the project comprised in the corridor project list to reach the required standards (84.1 € million, expected to be completed by 2021) is included in the reserve list of the National Railway Programme, currently at its final approval stage; and national funds are foreseen to secure only part of the works. Whilst the Polish Authorities assume that the project will be in any case completed by 2030 in line with the requirements set in the TEN-T Regulation, the possibility to implement the works during the current EU financing period (up to 2023) will be considered in the event additional financial resources will be identified. On the Slovak side, no works are foreseen on the single track section Zwardoń – Skalité – Čadca. The Skalité – Čadca section was already modernised and electrified with a maximum speed of 100 km/h, axle load of 225 kN and maximum train length of 650 m. The 7.1 km subsection Zwardoń – Skalité is compliant with regard to the axle load, but non-compliant with respect to speed (70 km/h) and has limited train length to 250 m (due to Zwardoń station limitations). The modernisation of the double track Krásno nad Kysucou – Čadca section, also common to the cross-border itinerary between Ostrava and Žilina, is expected to be completed by 2030 (300 € million), although the tunnel layout in the current design solution is still to be approved. This cross-border section is currently expected to be compliant by 2030 except for train length on the Slovak section Čadca – Skalité – Zwardoń and speed limit on the short section Zwardoń – Skalité.
- **Bratislava (SK) – Wien (Stadlau) (AT)** [Devínska Nová Ves (SK) – Marchegg (AT)]: Two cross-border railway lines are in operation between Bratislava and Wien, one passing through Petržalka (SK) – Kittsee (AT) and already compliant in the sections outside the Bratislava railway node, except for train length; another one for passenger transport going via Devínska Nová Ves (SK) and Marchegg (AT). The latter is the only non-electrified section along the Baltic-Adriatic Corridor, also requiring upgrading works. The electrification of the existing single track railway line on the Slovak side is planned to be completed by 2022 (4 € million); feasibility studies are also on-going which relate to the construction of a second track on this line, also including the bridge over the river Morava, which may be subsequently developed. Upgrading of the line Wien Stadlau – Border AT/SK (next to Marchegg) including partial doubling of the section, full line electrification and railroad stations works are planned to be implemented by 2022 (505 € million). The doubling of the line in its entire extension on the Austrian side is foreseen to be subsequently developed, also based on the possibility to upgrade the cross-border section on the Slovak side.
- **Graz (AT) – Maribor (SI)** [Spielfeld-Straß (AT) – Sentilj (SI)]: The section on the Austrian side is already compliant in terms of axle load, speed and electrification. Studies and administrative procedures for the upgrading of the line to two tracks are envisaged to be undertaken between 2022 and 2026 (19.3 € million); the works for doubling the line to be implemented based on market developments. In Austria, train length compliance is also expected to be achieved by 2030. Rehabilitation works of the existing line are planned to be completed on the Slovenian side by 2021-2022 which will allow increasing axle load, train length and speed to reach compliance (191.8 € million). The construction of the second track is also planned for 2030 (170 € million). The whole section is thus currently expected to be fully compliant by 2022 at the latest and doubled on the Slovenian side by 2030.
- **Trieste (IT) – Divača (SI)** [Villa Opicina (IT) – Sežana (SI)]: The studies for this cross-border railway section have been completed reconsidering the previous high speed project solution. The new proposed studies for a conventional railway line are expected to allow reaching compliance on the section by 2030 on both sides, including train length and speed (envisaged total cost on both sides € 102 million).

### Road cross-border sections

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

- **Katowice (PL) – Žilina (Brodno) (SK)** [Zwardoń (PL) – Skalité (SK)]: The tendering process for the upgrading works of the road infrastructure to motorway/express standards is expected to start in 2017 on the Polish side; works are already on-going on the D3 sections on the Slovak side. The development of the S1 between Milówka and Przybędza on the Polish side of this section, namely the Węgierska Górka by-pass, is considered of particular relevance under the functional stand point, for the maximisation of the benefits associated to the implementation of this cross-border itinerary. The works for the upgrading of the road infrastructure to motorway/express road standards are already on-going on the D3 sections on the Slovak side. The whole section is expected to be completed by 2023 (1,634 € million including both the Polish and Slovak sides).
- **Brno (CZ) – Wien (Schwechat) (AT)** [Mikulov (CZ) – Mistelbach (AT)]: On the Austrian side works are on-going for the upgrading of the motorway A5 from Schrick to Poysbrunn, expected to be completed by 2017. Investments are also planned for the completion of the motorway A5 up to the border by 2027 also developing in the last segment of the cross-border a 2x1 lane carriageway project solution till 2018. The completion of the motorway in Austria is however subject to a solution found for the environmental related administrative issues on the Czech side (476.40 € million). On the Czech side, studies including an updated Environmental Impact Assessment have been completed for the D52 Pohořelice – Perná – border CZ/AT section; the revision of the regional land use plan is currently under completion and the preparatory works for this road are under development also supported by the CEF. Works are planned to be completed by 2030 (380 € million).

### Missing links

There are two missing links along the Baltic-Adriatic Corridor. These regard the two Alpine crossings in Austria, the Semmering Base Tunnel and the Koralm railway line and tunnel. Both are under construction and are expected to be completed by 2026 and 2023 respectively (8.3 € billion).

### National bottlenecks

#### National railway lines

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

In *Poland* works are currently under implementation and preparation. These include the modernisation of the major railway axis (E59, E30 and E65/C-E65) aimed at removing line speed bottlenecks, increase train length and axle load standards which will be particularly beneficial for freight transport along the corridor. In greater detail, modernisation works on the Eastern Branch, E65 railway line Gdynia – Warszawa were recently completed which allow reaching the standards required by Regulation (EU) 1315/2013 (1,130 € million), except from very short sections in Tczew (approx. 2 km of 60 km/h), Iława (approx. 4 km of 90 km/h) and near Modlin (approx. 7 km of 60-80 km/h) where due to technical constrains (line geometry) the required standard will not be reached. Furthermore, two actions are planned in the Warszawa node to solve critical issues on the main freight and passenger routes by 2018 and 2024 respectively (319.4 € million). In addition,

two projects to modernise and improve capacity on the section Warszawa – Grodzisk Mazowiecki are expected to be implemented by 2020 (325.2 € million). The line E65 is already compliant on the section from Grodzisk Mazowiecki to Zawiercie, and improvement works are already on-going on the section Zawiercie – Dąbrowa Górnicza (towards Katowice), expected to be completed by 2017 (88.9 € million). Modernisation works on the Central Branch between Gdańsk and Katowice, C-E65 railway line, are envisaged to start in 2017 and are expected to be completed by 2023, aiming at reaching compliance with the TEN-T Regulation (407.9 € million). Further modernisation works are also planned to start in 2018 on the line E65 and E30 – section Chorzów Batory – Gliwice Łabędy – at the interchange between the Central and Western Branches of the corridor (340.9 € million). On the Western Branch, railway axis E59, between Świnoujście and Gliwice, a number of projects have been completed resulting in speed, axle load and train length compliance. These include works between Poznań and Wrocław (415.1 € million), and on the passenger section Błotnica Strzelecka – Opole Groszowice (45.7 € million). Some more works are planned between Szczecin and Wrocław expected to be completed by 2020 (1,085 € million), at the Poznań node, planned to be finalised by 2023 (48 € million), as well as between Wrocław and Katowice, foreseen to be completed by 2023 (477 € million). The investments considered by the Polish Authorities and included in the current plans refer to the 2023 time horizon; no projects are foreseen at present which could be realised afterwards, up until 2030. The implementation of the currently planned investments will contribute to the achievement of the required TEN-T standard on several corridor lines in Poland by 2023; however additional investments will be required to reach compliance by 2030. Based on the analysis of the corridor project list, speed and axle load bottlenecks will remain after 2023 between Szczecin and Świnoujście as well as at the Wrocław node (sections Popowice – Mikołajów – Brochów). Speed limitations will also remain on the rail freight section Opole Groszowice – Rudziniec Gliwicki on the main itinerary Wrocław – Katowice (however the alternative routing Opole Groszowice – Gliwice Łabędy will be compliant, except from a very short non-compliant section in Kędzierzyn Koźle). 740 train length operating bottlenecks will remain between Szczecin and Świnoujście, between Wronki and Słonice along the main itinerary Szczecin – Poznań – Wrocław, at the Wrocław node (sections Popowice – Mikołajów – Brochów), between Tarnowskie Góry and Katowice, on the main section Gdańsk – Tczew – Katowice, and between Opole and Gliwice on the main itinerary Wrocław – Katowice. Depending on limited availability of financial resources the achievement of the speed, axle load and 740 train length standards may be delayed at the Poznań node, and between Wrocław, Jelcz and Opole (the projects relating to the works on these sections are indeed included in the reserve list of the National Railway Programme currently at its final approval stage and no national funds are foreseen to secure their full implementation).

In the *Czech Republic*, capacity and speed bottlenecks exist which affect operations of trains at the junctions in Ostrava and Brno where modernisation works are expected to be completed by 2022 (222.2 € million) and 2030 (759.1 € million) respectively. Upgrading works at the Břeclav node have been completed (except instalment of remote control). The works for the reconstruction of the Přerov station have been divided into different construction phases; the first one has been already completed. The upgrade of the Přerov junction by developing the northern bypass, which represents the second construction phase, is planned to be completed by 2021 (110.7 € million). Except for speed limitations at the above mentioned nodes and train length on the entire corridor, the freight rail network is already compliant. At present it is expected that the network by 2030 will be not compliant only with respect to the 740 meters train length requirement on the mixed passenger and freight sections between Ostrava and Přerov and on the freight sections between Přerov and Břeclav.

In *Slovakia*, bottlenecks are concentrated at major railway junctions in particular Žilina and Bratislava, where maximum speed is respectively of 60 km/h and 40 km/h. Works for the modernisation of the Žilina railway junction, including connection to the Žilina Teplička rail road terminal will be completed by 2020 (308 € million). Studies and works for the modernisation of the Bratislava railway node, including its interconnection to the airport and ERTMS are planned to be completed after 2030, although the Devínska Nová Ves – Bratislava cross-border section and stations are expected to be improved by 2030 (926.3 € million). As part of the modernisation of the node, speed and train length improvements on the cross-border itinerary Petržalka (SK) – Kittsee (AT) on the main route Bratislava – Wien are currently not expected to be undertaken. Except for speed limitations at the above mentioned nodes and on some very short sections between Žilina and Púchov and Žilina and Čadca, as well as train length on most of the corridor sections, the freight rail network is already compliant; at present it is expected that the network by 2030 will be fully compliant between Čadca and Bratislava with respect to all parameters.

In *Austria*, further to the two missing railway links, works for compliance to 740 meters train length operability are required. Some sections of the network are also operating close to capacity limits such as the Graz – Bruck/Mur railway line. Although plans for the implementation of 740

meters train length are currently under development in Austria, it may be assumed that 740 meters train length standard will be achieved on all corridor sections by 2030. As of the other parameters, the national network is already at standard, except for speed in the short section Wien Meidling – Wien Inzersdorf – within the Wien urban node, where speed is in any case not expected to reach 100 km/h for freight trains even after completion of the upgrading of the section by 2023.

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

In *Slovenia*, works are required to improve the standards of the network particularly with respect to speed and train length. Works for the modernisation and improvement of the section Poljčane – Slovenska Bistrica, including railway stations Poljčane and Slovenska Bistrica, as well as works at the Pragersko station and on the section Zidani Most – Celje are either on-going or planned to start by 2018 at the latest which are expected to be completed by 2020 (402.5 € million). Studies are on-going for the improvement and upgrading of the sections Ljubljana – Zidani Most and Ljubljana – Divača, the works expected to be undertaken after 2020 for completion by 2030 at the latest (cost estimate is not available). The modernisation of the existing track between Koper and Divača was recently completed. Works for the elimination of a technical bottleneck at Bivje are on-going and planned to be completed by 2020 (21.4 € million). Studies for the construction of the second track on the line Koper – Divača are on-going; the works are planned for implementation in the period 2016-2022 in support of the planned expansion of the port terminal infrastructure (1,108 € million). Based on current planning activities and studies it can be concluded that the Slovenian Baltic-Adriatic corridor network is expected to be compliant by 2030 with respect to axle load and train length. Whilst the planned projects are at least deemed to improve speed parameters on the corridor sections, studies are currently on-going which are aimed at better defining the scope and technical solution of many of the identified planned investments and possible additional ones to maximise their positive impact on the standards of the infrastructure towards the target set in the TEN-T Regulation.

### *National roads*

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

In *Poland*, part of the road infrastructure belonging to the corridor including section on the A1, S3, S7 and A4 are being upgraded or are planned to be upgraded by 2020 to comply with the Regulation (7,255 € million).

In the *Czech Republic*, the D1 motorway section between Říkovice – Přerov – Lipník, including the Přerov bypass, is planned to be completed by 2022 to reach compliance (453.4 € million).

In *Slovakia*, the section of the D3 between Žilina (Brodno) and Žilina (Strážov), western bypass of Žilina city, is currently under implementation to solve traffic congestion on the existing roads I/11, I/60 and I/61. This D3 road stretch which is directly interconnected with the future Katowice – Žilina cross-border section is expected to be completed by 2017 (254.9 € million). Upgrading works for sections and junctions of the D1 motorway between Trnava and Bratislava are planned to be completed by 2023 (764.5 € million).

### *Improvement of last mile connections of ports*

All the sea and inland ports along the Baltic-Adriatic Corridor are already connected to the rail and road infrastructure. However, last mile railway and/or road port interconnections issues are present and limit the development in all Baltic-Adriatic corridor seaports. The extent and severity of the critical issues at the ports and more specifically the scope of the proposed solutions is in many cases to be further defined. However, most of the problems relate to the need to increase the standards of the existing railway connections in terms of electrification, speed, axle load and train length. Due to their location within urban areas, capacity/congestion and road safety related

problems may also exist in the urban network surrounding the ports partly attributable to the heavy traffic generated by the ports.

- *Port of Gdynia* – Works for the improvement of the standards of the railway lines interconnecting the terminals to the main lines 202 and 201 belonging to the Baltic-Adriatic Corridor are required. Projects for the improvement of the technical parameters are foreseen, covering among others the implementation of Layout Command Control within the port area, electrification of access to the container terminal, instalment of Remote Train Control in view of future ETCS implementation as well as construction of road and railway bridges to improve safety and capacity. Works are planned to start in 2018, expected to be completed by 2020 (191.20 € million). Some other modernisation works are also planned including reconstruction of railway access to the Western port areas of the port of Gdynia, with expected completion of the works by 2020 (approximately 17.7 € million). Works on the comprehensive partially non electrified railway line 201 are also planned; this representing the railway line that will be predominantly used by the traffic generated by the port. Regarding road connections, the S6/S7 express road is already in good condition up to the junction with Morska Street in Gdynia. However, critical issues exist in the road network providing access to the port: the Kwiatkowski Viaduct although recently completed (2008) represents a critical issue in terms of axle load standards and the Kwiatkowski Route registers high traffic levels which may turn into a capacity issue particularly in view of the further development of the traffic at the port. The upgrading of the port's surrounding urban road network is also under consideration which could help solving the existing and future capacity bottlenecks. The following actions addressing the road bottlenecks are envisaged to be implemented by 2030: reconstruction of Kwiatkowski viaduct by 2025, construction of Droga Czerwona by 2022 and upgrading of Polska Street and Janka Wiśniewskiego Street by 2030 (approximately 370 € million).
- *Port of Gdańsk* – Modernisation works on railway line 226 are on-going which include construction of the second track, increase in axle load and operating speed standards, as well as reconstruction of bridges, all activities expected to be completed by 2017 (91 € million). Investments aiming at improving the railway connection to the port (in particular improvement of railway infrastructure within the railway stations Gdańsk Port Północny, Gdańsk Zaspą Towarową and Gdańsk Kanał Kaszubski servicing Port of Gdańsk, construction of a road viaduct and development of Local Control Centre by connecting two stations Gdańsk Port Północny and Gdańsk Kanał Kaszubski, electrifying the railroad no. 965 as well as instalment of Railway Traffic Control devices in view of future ETCS implementation) are foreseen to be implemented with expected completion date by 2020 (141.5 € million). The construction of a road tunnel and a rail bridge to cross the Martwa Wisła River have been recently completed which improved accessibility to the port; the first one allowing direct interconnection to the A1 as an alternative to the existing interconnection with the S7, and the second one increasing capacity on the existing line. The improvement/upgrading of the Nowa Kościuszki street, resulting in the completion of the Gdańsk ring road also represents a critical issue in terms of road accessibility to the port.
- *Świnoujście and Szczecin ports* – Train length and freight speed limitation are currently affecting railway accessibility to the ports. Modernisation works are planned to upgrade the speed up to 160 km and increase axle load to 221 kN/axis for the main existing line tracks and stations and up to 245 kN for the reconstructed and newly constructed sections. The reconstruction of the railway viaduct on line no. 990, the electrification of railway lines no. 990 and no. 996 and the elimination of bottlenecks at Szczecin Port Centralny and Świnoujście stations are also foreseen. All the initiatives are expected to be completed by 2020 (153 € million). Road access to the port of Szczecin is primarily provided through the national road no. 10, Parnica viaduct and local roads. The reconstruction of the local road communication system in the area of Międzyodrze is currently under consideration, the works expected to be completed by 2020 (80 € million). Road access to the port of Świnoujście is provided by the national road no. 3 and lower class roads (Poviat roads). Short segments of both national road no. 3 and Poviat roads require upgrading works.
- *Wien and Bratislava inland waterways ports* – The two inland waterway ports of Freudenuau in Wien and Bratislava are both located on the Danube River. These ports are planned to be expanded aimed at further increasing their capacity and competitiveness to support the further development and growth of intermodal services and transport. Also based on the relevant road and particularly rail services operated by Wiencont, investment plans at the Port of Wien emphasize the expansion of tri-modal facilities, particularly storage of containers and the modernization of the handling equipment, in an endeavour to provide adequate service level

required to encourage modal shift from road to rail and inland waterways. The extension of the port's container handling capacities will emphasize land recovery and the construction of a new quay wall in order to optimize the operational efficiency. Regarding the interconnections of the two ports with the Baltic-Adriatic corridor road and rail networks, the Freudenau port is interconnected with the A4 through national road 14 and motorway A 23. It is also connected with the railway network by a direct link (national code 124) parallel to national road 14. The Bratislava inland waterway port has its own siding network connected with the main railway network through the Bratislava – ÚNS freight station on the Baltic-Adriatic corridor freight branch (section Bratislava – Petržalka). The port has good connections with the motorway D1 on the Baltic-Adriatic Corridor, being only 0.5 km distant from the Bratislava – Prievoz junction on the D1 and R7 under construction (expected to be completed by 2020). No specific problems have been identified which affect last mile connections at present for the two ports; however critical issues exist which affect the navigability of the Danube river between the two cities and particularly in Slovakia, for which works are already on-going or planned to be implemented by 2018-2020. In addition to the need to improve navigability in the section Freudenau – Slovak border, in the National Park Donau-Auen, works are planned between km 1880,260 and km 1862,000 in Slovakia, including dredging of the river bed and removal of obstacles. The reconstruction of the "old bridge" in Bratislava (completed in December 2015) and the possibility to operate simultaneously the two Gabčíkovo locks represent relevant projects to develop inland waterway transport services along the Danube.

- *Port of Trieste* – A direct junction and a flyover (within the port) interconnect the Port of Trieste and its terminals to the main city road network and to the national highway and motorway networks, including the Baltic-Adriatic corridor links. Improvement works on the SS 202, also providing access to the port, have been completed for the stabilisation of the retaining walls (from km 9+850 to km 12+200) and for the structural repair of the viaduct "Molo VII". Concerning accessibility to the port by railway, one double track line is interconnecting the port to the Trieste – Venezia railway line, leaving from Campo Marzio, tunnelling and crossing the city. Furthermore, there is a single track line going from Campo Marzio directly to Villa Opicina, which is however temporary closed and with a steep gradient that prevents operation of heavy trains. Based on the current schedule, increases in the future traffic on the line in operation may lead to congestion. The port's development plans consider this "last mile" issue a critical one to ensure continuity in the operation of freight services. In addition to this, investments are deemed necessary to develop the railway terminal at Campo Marzio (Port Station) in order to improve operations at existing port terminals. Shunting and coupling of trains is indeed currently possible only at port terminals. Due to the limited length of tracks at these terminals more shunting operations and train manoeuvring is required to assemble trains even limited to 550 m length, which impacts on the effectiveness and efficiency of terminal operations. Investments to increase train length operations up to 750 m at Trieste C. Marzio station are planned for implementation as part of a wider initiative aimed at modernising the whole Trieste Campo Marzio station, increasing its capacity and performance in support of the development of intermodal services. The project, which also includes works for the improvement of the so called railway line "Linea di cintura" between Campo Marzio and Trieste Aquilina, is planned to be completed by 2021 (50 € million). Works to improve the railway infrastructure within the port area and terminals as well as the construction of a new railway link in view of the development of the new logistics platform are also planned for implementation between 2016 and 2020 (36 € million).
- *Port of Venezia* – The road and rail infrastructure interconnecting to the port and within the port areas and terminals is overall compliant thanks to recently completed modernisation and upgrading works. Investments are foreseen to further improve accessibility to the port. Road investments are on-going and planned outside and inside the port area on the SR11, SS309 and SP81 up to the bridge located in via Volta, also including new parking areas near the Customs perimeter at the port, expected to be completed by 2017 (5.4 € million). Rail accessibility will be improved by means of upgrading of the rail links between the South Industrial Area of Marghera and Marghera Scalo Station, construction of the second track to the Fusina Ro-Ro terminal, as well as construction of a new rolling stock vehicle maintenance and repair depot, all works expected to be completed by 2020 (12.3 € million). Telematics application investments for road and rail traffic management are also planned on the local roads interconnecting the port to the national motorway network to increase fluidity and safety as well as to reduce congestion. The works are on-going, expected to be completed by 2018 (2.55 € million). In the long term, the existing railway connection is expected to become a possible capacity bottleneck, also causing traffic congestion problems at the Mestre railway node, which will require development of a direct connection to the Venezia – Trieste railway



line bypassing the Mestre node, currently foreseen to be constructed by 2030 (cost estimate is not available).

- *Port of Ravenna* – Works are planned for completion by 2018 to eliminate one level crossing on the line interconnecting the port to the Baltic-Adriatic corridor network as well to upgrade to P/C 80 standard the line between Castelbolognese and Ravenna. Upgrading, electrification and extension of the existing infrastructure providing access to the port and its terminals is also planned for the future (35 € million for all the above rail related projects). Works are also planned for the upgrading of the SS 309Dir and its interconnection to the SS 16, expected to be completed by 2020 (175 € million) as well as for the upgrading of the SS 16 (72 € million).
- *Port of Koper* – The reconstruction of the existing track between Koper and Divača was recently completed. Works for the elimination of the technical bottleneck at Bivje are on-going and planned to be completed by 2020 (21.4 € million). Studies for the construction of the second track on the line Koper and Divača are on-going; the works are planned for implementation in the period 2016-2022 to solve capacity bottlenecks on the existing line expected in the short period and support traffic growth and development of the Port of Koper (1,108 € million). The port capacities will also be upgraded in the period 2016 – 2020 (300 € million – including public and private port infrastructure expansion and equipment). Investments are also planned to start already in 2016 for the development of a direct interconnection between the A1 motorway and the port, which are expected to be completed by 2023 (23.1 € million). Road and rail internal works are also foreseen to be implemented by 2020 to improve accessibility (40 € million), and subsequently by 2030 in view of the expansion of the port infrastructure and operations (30 € million).

### **Urban nodes**

The on-going analysis of the rail infrastructure at urban nodes reveals that the main corridor lines are not at standard within most urban nodes at least in terms of train length and ERTMS. Specifically regarding speed and axle load, non-standard sections have been identified at the following core urban nodes: Gdańsk, Warszawa, Łódź, Katowice, Szczecin, Poznań, Wrocław, (Poland), Ostrava (Czech Republic), Bratislava (Slovakia), Wien (Austria) and Ljubljana (Slovenia). Investments are planned on the corridor lines in urban nodes which are both deemed to improve the performance of the infrastructure and increase capacity. In spite of the implementation of the planned investments for the Baltic-Adriatic Corridor, possible rail capacity issues in the future have been identified for the urban nodes of Warszawa, Katowice, Bratislava, Wien and Ljubljana. As for road, problems exist at present in Szczecin, Warszawa, Poznań, Ostrava, Bratislava, Wien, Bologna, Ljubljana. Problems are here usually related to capacity and need to improve safety and reduce congestion, considering the development of bypassing alternative routes or upgrading of sections and junctions to feeder routes. Particularly regarding the corridor sections, the planned investments are so far deemed to solve capacity issues; which may however remain within or close to the urban agglomerations of Warszawa, Bratislava, Wien and Bologna. Improvements of interconnections between transport modes in order to support modal shift from road to rail are also needed, focussing on the development of urban transit and interchange facilities, as well as ITS and ICT solutions for both passenger and freights. The analysis of the urban nodes is however still preliminary. Problems and solutions are currently under review which affect all 13 urban nodes along the corridor, and which will be described in more detail in subsequent updates of the work plan.

### ***Deployment of ERTMS***

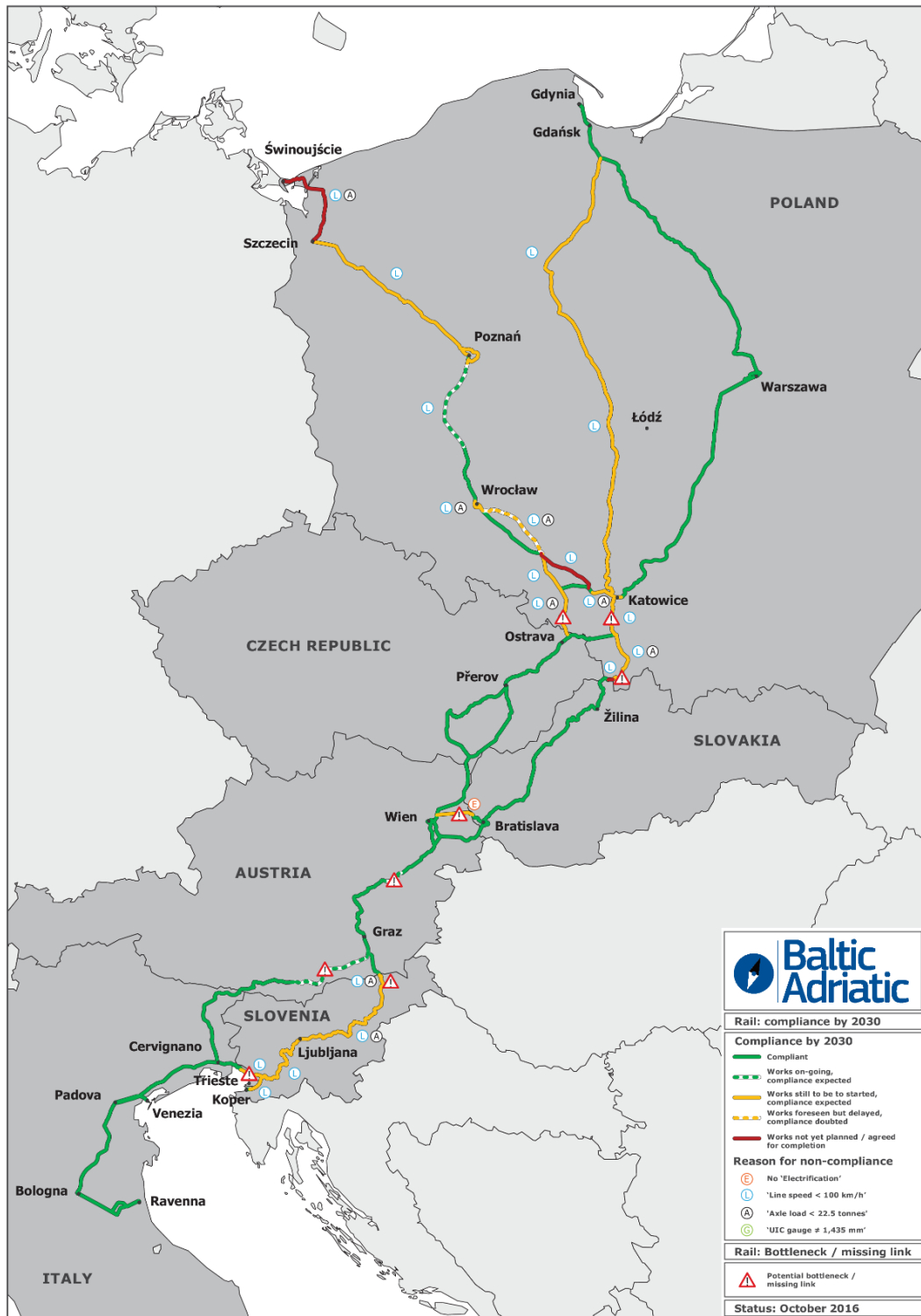
Based on on-going assessment and preliminary analysis of ERTMS deployment along the corridor, this technology is currently only deployed on 18% of the corridor rail infrastructure. As a result, lots of progress is still to be made in the upcoming years to ensure the full deployment of ERTMS along the corridor. The current status for the deployment of ERTMS along the Baltic-Adriatic Corridor and consecutive measures are subject of the ERTMS deployment plan in 2016.

### ***Assessment of the critical issues towards the achievement of the specific objectives of the Baltic-Adriatic Corridor***

With reference to the achievement of the specific objectives of the Baltic-Adriatic Corridor by 2030 the on-going analysis of the investments shows the following at this moment in time:

- A rail compliance map has been elaborated (see Figure 16) reflecting the impact of the investments on the development of the corridor by 2030, according to the projects identified at present in the relevant plans. 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.

Figure 16: Rail infrastructure scenario by 2030 vis-à-vis the planned investments and main bottlenecks



Source: Baltic-Adriatic corridor study consortium; Note: a) The map reflects the review of the Polish National Railway Plan at its final approval stage by October 2016; b) Based on Art. 39, point 3, Slovenia is evaluating the possibility to apply for an exemption to fulfil the requirement relating to speed for freight transport on part of their railway network should such case be justified

The colour of the lines refers to the planned works and their impact on the corridor compliance by 2030, whereas the non-compliance icons show the problems at the time of the analysis (October 2016). This exercise shows that the rail network of the Baltic-Adriatic Corridor, including cross-border sections, is expected to be overall

*modernised and reach the standards set in the TEN-T Regulation for freight transport. However the projects planned for the development of the Opole (PL) – Ostrava (CZ), Katowice (PL) – Ostrava (CZ) and Katowice (PL) – Žilina (SK) cross-border sections on the Polish side are included in the reserve list of the National Railway Programme. Whilst these projects may be either partially or fully implemented in the period after 2023, the required speed and axle load standards on these lines are in any case assumed by the Polish Authorities to be reached by 2030. In addition to this, no works are planned on the Slovak side of the Katowice (PL) – Žilina (SK) cross-border section.*

Furthermore, only the works for the upgrading and electrification of the Bratislava (SK) – Wien (Stadlau) (AT) cross-border section have started (October 2016), whereas none of the projects aimed to modernise and upgrade the other critical cross-border sections have progressed since the inception of the new TEN-T policy in 2014. For these sections either one or all of the three main administrative steps of project implementation are still to be completed, namely: land acquisition, Environmental Impact Assessment (EIA) and final project approval by relevant governmental and administrative authorities.

Finally, whilst ERTMS is currently planned to be deployed by 2030 on the entire corridor lines, investments are still missing on the corridor list which include the Polish central branch of the axis between Tczew and Katowice, the section Wrocław – Jelcz – Opole – Katowice, the Warsaw Railway Node and particularly the Polish and Slovak sides of the Opole – Ostrava, Katowice – Ostrava and Katowice – Žilina sections. At the same cross-border sections 740 meters length compliance is also currently not expected to be either partially or fully achieved except on the Polish side of the Opole-Ostrava and Katowice–Žilina cross-border sections. 740 meters length compliance is also not expected to be achieved between Bratislava and Wien on the Slovak section Bratislava – Petržalka. In Austria both ERTMS and 740 meters train length are assumed to be implemented on all corridor sections, although detailed investments are still to be included in the project list also concerning cross-border sections. *This makes all critical cross-border sections still a potential bottleneck, particularly under the management and administrative stand points of the definition and implementation of the planned solutions (see Figure 16).*

Projects related to the two missing links are on-going and will be developed before 2030.

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

Commission on the exemption from the speed standard is expected before the end of the 2015-2017 corridor studies. In absence of agreement on the results, the current positive assessment will be revised on the basis of the effective impact of the construction works included in the project list, reflecting any possible doubt about the attainment of the standards of the network by 2030.

With respect to speed, infrastructure parameters will also fall short in meeting the KPI targets in some national short sections of the eastern branch of the corridor in Poland between Gdańsk and Warszawa, where modernisation works have been already completed or are under completion (implementation of ETCS). These are located by Tczew and Iława and between Nowy Dwór Mazowiecki and Modlin. According to the list of planned investments, on these lines speed targets will not be further improved. Within core urban nodes speed limitations are currently expected to persist after completion of the planned works at Warszawa, Wrocław, Katowice, Bratislava, Wien, and possibly Ljubljana. Finally, speed limitations currently exist at short subsections of the Ostrava and Brno rail nodes, as well as at the Žilina node and following short sections between Žilina and Púchov and Žilina and Čadca. These are expected to be solved by means of implementation of the planned investments. However, in all the above mentioned cases, the prevailing line speed of the sections is already up to the standard, and speed limitation at urban nodes could be subject of derogations from standard. Hence, these segments are not shown in the above map (see Figure 16).

Due to limited availability of financial resources the achievement of the speed and axle load standards may be delayed in Poland at the Poznań node, and between Wrocław, Jelcz and Opole. The projects relating to the works on these sections are indeed included in the reserve list of the National Railway Programme currently at its final approval stage and no national funds are foreseen to secure their full implementation. Whilst the works on these lines may be implemented in the period after 2023, the possibility to reach the required speed and axle load standards by 2030 remains uncertain at present.

Based on the analysis of the current investments, 740 meters train length compliance along the corridor will remain unachieved in many sections in Poland, Czech Republic and Slovakia, particularly in urban areas, although solutions to reach compliance with respect to this parameter may be considered which could also be implemented by 2030. Though not critical for the overall performance of the corridor, compliance of railway accessibility to rail road terminals in terms of train length and electrification shall also be improved.

- The *road network* is expected to be fully modernised at motorway/expressway standard, including cross-border sections. However, administrative/technical issues exist with respect to the development of the Brno – AT border D52 motorway in the Czech Republic, whose implementation is subject to the timely completion of the elaboration and approval of the South-Moravian region land use plan, adopting the currently identified project solution.
- All *last mile connections to the ports* are planned to be improved to comply with the technical requirements and support port capacity and operation expansions.
- Regarding the development of the *urban nodes*, investments are already planned for the improvement of the rail infrastructure with respect to the standards set in Regulation (EU) 1315/2013. Furthermore, urban transit systems and information and communication solutions for the improvement of the flow of information between transport modes are planned to be implemented as well as road and rail bypasses to solve current and potential future capacity issues. The extent and severity of the problems and more specifically the scope of the proposed solutions are in most cases to be further clarified.

As a result, the 477 projects with a total investment volume of 69.5 € billion are likely to contribute to a significant development of the corridor towards reaching the standards set by the TEN-T Regulation by 2030. The corridor priorities have been well addressed in the investment plans by the stakeholders. Indeed, nearly 40% percent of investments are attributed to the work plan priorities. With specific reference to the corridor objectives, gaps are so far identified with respect to railway transport which mostly refer to 740 meters train length compliance and full ERTMS deployment on many corridor sections. In this regard - although investments are still missing from the list for certain national networks - plans by the concerned infrastructure managers are currently under definition/review which could solve these gaps. Particularly regarding the 740 meters train length compliance, measures could be also considered aimed at improving the operational performance of the corridor lines developing the investments gradually and progressively at specific nodes, stations and junctions, based on traffic and train scheduling.

Regarding railway transport there are also some few sections where no investments are planned yet to comply with the standards, particularly affecting speed. Attention shall be also paid to the standards of the infrastructure at rail road terminals, nodes and junctions where the requirements of the TEN-T regulation are not fully met at present and may not be achieved in the future. Improvements may be considered in these cases and particularly at rail road terminals and sidings, especially where these facilitate open access to multi-modal infrastructure. Finally sections crossing core urban nodes may also fall short in meeting the requirements of the Regulation especially for speed. However, all the above gaps are not of any critical stage for the full functioning of the corridor.

Not strictly related to the specific corridor objectives, but still important to achieve compliance by 2030, alternative clean fuels development shall be monitored closely especially at ports and airports. LNG related projects are included on the corridor project list for Venezia and Ravenna. LNG fuel facilities are also already available at Świnoujście and bio fuel is also possible to be stored at airports (i.e. Wien). Alternative clean fuels are not yet in use except for road transport along the corridor. This is also partially due to the fact that alternative clean fuels are at their inception stage particularly at ports and airports and problems of industrial and market nature may obstacle their deployment at these nodes. Facilities for ship generated waste relating to sewage treatment are also still not available at the Adriatic ports in Italy and no investments are foreseen on the project list at present in this regard.

When it comes to project maturity, most of the investments included in the updated Baltic-Adriatic Corridor project list – 304 – are expected to be completed by 2020; 85 projects are foreseen to be completed between 2021 and 2025. 52 projects will be completed by 2030. Only 5 projects are expected to be completed after 2030 and for only 31 initiatives the time-schedule for completion is not yet defined. These are overall positive figures which however partially contrast with the information available on the three main administrative steps of administrative project implementation identified in the project list for the 398 investments concerning construction works. Referring to these initiatives, land acquisition has been concluded for only 65 projects; the Environmental Impact Assessment has been approved for only 71 initiatives and the project has received final approval by the relevant governmental and administrative authorities only for 57 projects. Although the information on the project maturity included in the project list is partial and may be further refined and integrated, the status of the project administrative implementation shows that efforts are needed to develop a more mature list of projects.

Project costs were provided for 449 projects, i.e. for 94% of the initiatives on the list. However, very partial and uneven information is available on the financial and funding aspects concerning their implementation. Although not incorporating the results of the 2015 CEF call, it is noticed that overall 158 initiatives have at least one source of funding approved, totalling 24.1 € billion of approved funds out of a total of 26.9 € billion potential funds and 36.4 € billion total investment costs. Of the approved funds 18.4 €

billion are state, regional, local or own sources also including IFI loans, 5 € billion are EU funds (including 34 initiatives supported from the first calls of the Connecting Europe facility (CEF) for a total of 2.4 € billion, and 50 co-financed by other EU instruments, including TEN-T, Cohesion Fund (CF) and the European Regional Development Fund (ERDF) for about 2.6 € billion). 125 projects already benefit from total approved funding, for a total of 22.4 € billion. Specifically relating to the priorities of the work plan, initiatives for which funding has been approved either partially or totally include: 1.5 € billion for rail cross-border projects, of which 697 € million for critical sections; the cost for the development of the missing links totalling 8.3 € billion; 640 € million for last mile connection initiatives at the Polish ports on the Baltic Sea and at Trieste and Venezia; 2.2 € billion for technological upgrading including ERTMS dedicated deployment actions in Poland, Czech Republic and Austria; 635 € million for the road cross-border sections between Brno and Wien on the Austrian side and between Katowice and Žilina on the Slovak side. The development of core urban nodes (Warszawa, Łódź, Wien, Venezia and Bologna) amounts to about 3.4 € billion. Approved funding is another key indicator of the maturity of the projects. Albeit preliminary and to be further confirmed also reflecting the recent positive outcomes of the 2015 CEF calls, these figures are not entirely encouraging as the approved budget for the work plan priorities is still only 60% (15.8 € billion) of the total budget associated to the investments so far identified with respect to these priorities (26.9 € billion). Furthermore, whilst the share of approved funds on total costs is above 75% for the projects for technological upgrading and ERTMS, as well as the Alpine crossings, it is less than 40% for the other priorities. Efforts shall be made in this regard towards the development of a mature and stable project pipeline. The fact that an initiative has already its budget approved does not imply that it cannot be entitled to receive funds or grants from EU programmes and institutions. It is actually a condition to increase its attractiveness under the financing and funding stand point.

No problems have been identified at present which relate to procurement and which do not strictly concern the opportunity and need to investigate the possibility to implement conjoint tendering processes for the implementation of cross-border section initiatives. This could indeed also be included in the scope of bilateral agreements particularly between infrastructure managers. Permitting issues other than the one at the road cross-border section Brno-Wien have been not identified at present, which require due attention as the delays or missing approval of the South Moravia region land use plan may also obstacle the implementation of the entire project on both sides of the section by 2030.

## 8. Recommendations and outlook by the European Coordinator

Since the adoption of the first corridor work plan for the Baltic-Adriatic Corridor in May 2015, huge efforts have been made on all sides to bring this corridor to success and to turn it into a competitive development area for growth and jobs in Central Europe. About 250 initiatives and investments to improve the corridor infrastructure and ensure compliance with the technical requirements of the TEN-T Regulation are currently ongoing which total over 35 € billion. Furthermore, 55 projects have been completed since the inception of the new TEN-T policy for a total budget of 4.9 € billion. The progress in the development of the corridor is also reflected in the deepened corridor analysis which has been undertaken by the corridor consultants in very close cooperation and intense consultation with Member States and all stakeholders involved in the Corridor Forum.

This participatory process has enabled us to gain much more detailed insights into where the corridor stands as of today and to project how the corridor may likely perform in 2030. More importantly, it has clearly shown that the five development priorities we jointly agreed upon by the adoption of the first corridor work plan continue to be the most relevant.

Therefore, I confirm by this first update of the corridor work plan that the following five main issues remain highest priority and need to be primarily addressed on the Baltic-Adriatic Corridor:

- the cross-border links both for rail and road, including digital cross-border links for the exchange of traffic data and provision of information services for both modes;
- the timely implementation of the major projects of the Alpine crossings in Austria;
- the 'last mile' connection of the ports building the start and end point of the corridor;
- the interconnection in all urban nodes along the corridor between TEN-T and local transport infrastructure;
- and last but not least the interoperability of the transport network, in particular through the full deployment of ERTMS along the corridor.

We need to continue working with full speed on these priorities in order to get them implemented by 2030 as to convert today's transport patchwork into a real and fully-functioning network and to ensure smooth transport flows along the corridor from the Baltic to the Adriatic Sea.

### *Priorities for the Baltic-Adriatic Corridor*

#### *Removing the bottlenecks at the cross-border sections with high European added value*

A chain is only as strong as its weakest link. In other words, the corridor can only highly perform if the main rail and road bottlenecks at the cross-borders are removed. Only by investing in the cross-border sections can the development of long-distance international traffic flows across the corridor countries be encouraged.

The updated corridor analysis has confirmed that important bottlenecks continue to exist on six railway and two road cross-border sections in terms of their compliance with the requirements of electrification, axle load, speed and train length. These are the following railway cross-border sections which need to be addressed with priority:

#### *Railway cross-border priorities*

- Opole (PL) – Ostrava (CZ), [Chałupki (PL) – Bohumín (CZ)];
- Katowice (PL) – Ostrava (CZ), [Zebrydowice (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)].

In addition, the following two road cross-border sections have been identified as critical in terms of compliance as these two sections are neither motorways nor expressways.

*Road cross-border priorities*

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

As European Coordinator, I pay particular attention to the removal of the bottlenecks at these cross-border sections. Considering the peripheral nature of the cross-border territories, the required investments at these sections are often not in the needed focus of infrastructure managers yet. I will therefore strongly raise attention for the implementation of projects at these sections by engaging in a continuous dialogue with the relevant stakeholders.

Besides the often missing political priority, those cross-border projects often suffer from different processes and procedures affecting both the construction and technical standards of the infrastructure as well as administrative procedures and steps, including permitting, procurement and fiscal aspects on each side of the border. These problems are even amplified by the development of the legislation and policies on market opening and integration of railway transport. In this regard, I already proposed to the European Commission in the framework of the "Christophersen-Bodewig-Secchi report (CBS report)" of 2015 the development of European guidelines for cross-border projects. In addition, I see the need to also reflect on the possibility of joint tendering processes for cross-border projects. These are issues that I will closely follow up in the coming months in the framework of our continuous monitoring of the 12 recommendations of the CBS report.

Further to that, the corridor analysis shows that the development of the Katowice (PL) – Ostrava (CZ), and Katowice (PL) – Žilina (SK) rail cross-border sections to reach speed and axle load compliance is hampered by limited availability of financial resources on the Polish side; at the latter cross-border section speed limit on the short section Zwardoń – Skalité will also not be achieved on the Slovak side. Particularly regarding the Katowice (PL) – Žilina (SK) cross-border section it is noticed that it is located in a mountainous area and the development of the line to reach the required standards would result in high construction costs. Solutions need to be found however for this and more generally all the cross-border sections and the entire corridor network to reach compliance in line with Art. 39 of the Regulation 1315/2013. In line with this and in order to realise our European vision of this corridor, it is also not acceptable that the realisation of some cross-border sections is not even fully supported by identified investments yet, e.g. a) the ERTMS deployment on the Opole – Ostrava, Katowice – Ostrava (Polish side) and the Katowice – Žilina rail cross-border sections (both Polish and Slovak sides); and b) the achievement of the 740 meters train length standard which may be only partially be achieved on the Polish side of the above referred cross-border sections. 740 meters length compliance is also not expected to be achieved between Bratislava and Wien on the Slovak section Bratislava – Petržalka. In Austria both ERTMS and 740 meters train length are assumed to be implemented on all corridor sections, although detailed investments are still to be included in the project list, also concerning cross-border sections.

Technical, political, financial and procedural obstacles which may affect the implementation of cross-border initiatives call for more coordination in the definition of common processes and tools for the harmonised planning, development and implementation, including funding and financing of projects of common interest. Those cross-border initiatives are considered as projects of common interest with highest European added value; as such they should be planned, designed and implemented

conjointly. These projects do not just require the commitment of the Ministries, they also require the direct involvement of the infrastructure managers to align on standards and make sure processes and procedures are implemented timely and consistently.

For this reason, I like to assist Member States in developing and strengthening cooperation between Ministries and infrastructure managers and in finding joint and stable cross-border agreements for the smooth, coordinated and harmonised implementation of those projects on both sides of the border. Indeed, it is of utmost importance that these investments are carried out in a coordinated manner in order to avoid situations when a line section is upgraded up to the national border and then on the other side of the border upgrading is delayed.

In order to achieve this ambitious goal, I have proposed to Member States to organise specific cross-border dialogues and to set-up dedicated working groups for cross-border regions involving all relevant stakeholders wherever diverging interests, implementation plans and timings between Member States exist. Indeed, I understand my role as European Coordinator as a mediator between different (national) interests and as a facilitator for those bilateral exchanges. In the interest of the Baltic-Adriatic Corridor and of creating real network benefits, it will be important to clarify and reconcile potential cross-border conflicts, always aiming at higher quality standards in the interest of both sides of the borders, and at the same time respecting national motivations.

In May 2016, I have invited to the first cross-border dialogue of such kind, between Poland, Czech Republic and Slovakia. Indeed, at this important "triangle", there are three critical rail and one critical road cross-border section that deserve particular attention. In September and October 2016 two more cross-border dialogues have been held for the development of the rail cross-border sections between Austria, Slovakia / Slovenia. The meetings showed that these cross-border dialogues are a very good momentum to bring all relevant stakeholders together, to reflect on the specific local/regional needs and challenges and to encourage closer cooperation between the infrastructure managers. Representatives of Member States, rail, road and rail road terminal infrastructure managers, the relevant border regions, the urban nodes, RFC 5 and also DG REGIO and Jaspers/EIB were present at these meetings.

Based on this positive experience, I wish to continue such dialogues also for the other critical cross-border sections over the years 2016 and 2017 and to encourage infrastructure managers to set-up even more formalised bilateral working groups for concrete projects.

The overall objective is to come to joint and stable agreements for each critical cross-border section (e.g. in form of a Memorandum of Understanding, Letter of Intent or any other appropriate form of bilateral agreement) – both between Member States and between the respective infrastructure managers – by the end of 2016/first quarter of 2017. These agreements shall help aligning the planning and timing of the respective investments efforts on both sides of the border and ultimately lead to the full compliance with the TEN-T standards of each section by 2030. In this regard, significant progress has already been made since the adoption of the first corridor work plan. Indeed, a number of bilateral working groups between Member States and/or infrastructure managers has already been established (see Table 3). Moreover, I am very happy to see that some bilateral agreements have already been signed or are about to be signed between either Member States and/or infrastructure managers (e.g. Katowice-Ostrava rail section – Letter of Intent signed between PKP and SZDC; Katowice-Žilina road section – MoU signed in February 2016 between the National Motorway Company of Slovakia and the General Directorate for national roads and motorways of Poland, Wien-Bratislava and Graz-Maribor – MoUs signed in autumn 2016; see further details in Table 3).

As European Coordinator, I will strive for political commitment at highest level, e.g. by ensuring that agreements are signed between the Ministers of Transport and between the CEOs of the infrastructure managers. For instance, as one result of the first Baltic-

Adriatic cross-border dialogue, a trilateral Letter of Intent between the Polish, Czech and Slovak Ministers of Transport has been signed in October 2016 for the four critical cross-border sections between the three countries.

Apart from that, we also need more technical agreements between the infrastructure managers that will lay down exact planning and timing of the respective cross-border sections. For this purpose, I will assist the infrastructure managers in this task by engaging in a continuous dialogue with them and initiating an exchange of experiences (e.g. by providing templates for possible bilateral agreements based on the good experiences mentioned above).

Finally, the corridor shall not only be an issue of compliance of the infrastructure to the requirements set in the Regulation. Cross-border services should be promoted across the borders of the regions and Member States which require a close cooperation between the railway undertakings and the terminal operators who should also consider the possibility to develop or participate to working groups and conjoint initiatives. Regions should be also interested especially for the promotion of economic growth and passengers flows under a territorial cooperation perspective. The signature in 2015 of the above mentioned Memorandum of Understanding between the motorway operators ASFINAG, Autovie Venete and DARS (also involving partners from Croatia and Hungary) is worth mentioning in this regard for the harmonisation of traffic management measures and the provision of cross-border information services to road users. I am also grateful to be able to build on a fruitful cooperation with the Baltic-Adriatic Rail Freight Corridor 5 and strive to continue this close exchange. I also like to thank for the huge efforts undertaken by the RFC 5 in removing operational barriers along the corridor and their intention to establish a concrete action plan in autumn 2016.

Table 3 Status of the critical cross-border sections on the Baltic-Adriatic Corridor

<b>Railway cross-border priorities</b>	<b>Status of bilateral cooperation</b>	<b>Status of bilateral agreements</b>
Opole (PL) – Ostrava (CZ)	<p>PL-CZ intergovernmental working group for railway transport expected to be established by the end of 2016</p> <p>PL-CZ infrastructural working group between railway infrastructure managers PKP PLK and SZDC established in 2016; sub-group on PL-CZ infrastructure investments' coordination under establishment</p>	<p>Trilateral Letter of Intent between PL, CZ and SK Ministries (signed in October 2016)</p> <p>PL-CZ Intergovernmental Agreement (establishing Intergovernmental Commission) on cross-border cooperation of 1994</p> <p>Agreement on cooperation of railway infrastructure managers PKP PLK and SZDC in cross-border traffic</p>
Katowice (PL) – Ostrava (CZ)	<p>PL-CZ Intergovernmental working group for railway transport expected to be established by the end of 2016</p> <p>PL-CZ infrastructural working group between Railway Infrastructure managers PKP PLK and SZDC established in 2016; sub-group on PL-CZ infrastructure investments coordination under establishment</p>	<p>Trilateral Letter of Intent between PL, CZ and SK Ministries (signed in October 2016)</p> <p>Letter of Intent signed between Railway Infrastructure Managers PKP PLK and SZDC in November 2015</p> <p>PL-CZ Intergovernmental Agreement (establishing Intergovernmental Commission) on cross-border cooperation of 1994</p> <p>Agreement on cooperation of railway infrastructure managers PKP PLK and SZDC in cross-</p>

		border traffic
Bratislava (SK) – Wien (Stadlau) (AT)	Existing bilateral working group SK/AT (active on an ad-hoc basis since 1992)	Memorandum of Understanding signed in October 2016
Katowice (PL) – Žilina (SK)	PL-SK working group for cross-border traffic	Trilateral Letter of Intent between PL, CZ and SK Ministries (signed in October 2016) PL-SK Intergovernmental Agreement (establishing Intergovernmental Commission) on cross-border cooperation of 1994 Agreement on Cooperation of railway infrastructure managers PKP PLK and ŽSR in the field of management of railway infrastructure in cross-border rail traffic
Graz (AT) – Maribor (SI)	Existing bilateral working group SI/AT on rail issues (continuously active since 1995) Established 'Slovenian-Austrian Commission on the development of railway infrastructure and railway transport', based on a cooperation agreement from 1995	Memorandum of understanding signed in October 2016
Trieste (IT) – Divača (SI)	European Economic Interest Group in place since 2013	Statute of EEIG signed in May 2013, activities of the EEIG confirmed in October 2016
<b>Road cross-border priorities</b>	<b>Status of bilateral cooperation</b>	<b>Status of bilateral agreements</b>
Katowice (PL) – Žilina (Brodno) (SK)	Existing cooperation confirmed by Polish GDDKiA and National Motorway Company of Slovakia	Trilateral Letter of Intent between PL, CZ and SK Ministries under preparation (signed in October 2016) MoU signed in February 2016 between the National Motorway Company of Slovakia and GDDKiA Poland PL-SK Intergovernmental Agreement (establishing Intergovernmental Commission) on cross-border cooperation of 1994
Brno (CZ) – Wien (Schwechat) (AT)	Existing bilateral working group (formally set up in 2016; active on ad-hoc basis in varying compositions since about 10 years)	Memorandum of Cooperation signed in November 2005 on preparation and construction of Czech R52 and Austrian A5 motorways between Ministry of Transport of the Czech Republic and Federal Ministry of Transport of Austria Agreement of cooperation signed in January 2009 on interconnection of A5 and R52 between Czech Government and Austrian Federal Government Memorandum signed in December 2009 on the importance of A5/R52 motorway axis between Jihomoravský kraj and Niederösterreich

### *Ensuring the timely completion of the missing links at the Alpine crossings*

The Baltic-Adriatic Corridor is almost continuous, apart from two missing links at the Alpine crossings in Austria (Koralmbahn railway line and Semmering Base Tunnel). During my missions to Austria, I positively noticed that the Austrian stakeholders continue working very hard and make huge investments efforts at national level (8.3 € billion) to realise the projects needed to remove these important bottlenecks. The completion of the Semmering tunnel by 2026 and of the Koralmbahn railway line and tunnel by 2023 will significantly reduce travel times and allow for a big step forward with regard to the Alpine crossing of major traffic flows. Especially the Northern Adriatic Ports will benefit from a better connectivity.

We should grasp all the important network benefits that these two major projects will bring for the whole corridor. As European Coordinator, I will therefore continue closely monitoring the timely implementation of these major projects and assist the Austrian stakeholders in promoting and advancing these crucial investments that are not only of national but of high European added value.

### *Enhancing multimodal transport, in particular by improving the last mile connection of ports*

My visits in 2014 and 2015 to and exchanges with all core ports along the corridor enabled me to get a clear insight into their development challenges and needs. As the corridor analysis confirms, the last mile connection of ports continues to be a predominant issue. The development of appropriate last mile connections to the seaports is therefore a specific target to be continuously monitored along the Baltic-Adriatic Corridor. The planned investments indicate that the improvement of the existing connections aimed at increasing infrastructure standards and performance are planned in the mid-short term with expected completion by 2020 or 2025; additional investments at port "last miles" are also foreseen between 2020 and 2030, to support traffic development.

Regarding intermodality, relevant investments are foreseen up until 2030, totalling over 7.7 € billion for the development of the ports infrastructure and 538 € million for rail road terminals. My working group of ports and rail road terminals has shown that the relevant stakeholders for the promotion of multimodal transport along the corridor share the same concerns. With the overall objective to support the growing trends and meet the potential user's need demand at the ports on the Baltic and Adriatic basins, they aim at improving last mile connections and more generally the interconnection between logistics nodes by means of further improving the conditions and standards of the rail infrastructure.

In order to boost competitiveness of multimodal and combined transport, last mile connections shall be overall considered in the wider context of the conditions and development of the corridor railway infrastructure and capacity and performance of hinterland connections. I therefore call for a close cooperation of rail and road infrastructure managers with the port authorities and rail road terminals. They need to join forces and efforts towards the improvement of the attractiveness of railway transport by freight between the core corridor and network logistics nodes. The analysis of the Motorways of the Sea and MoS implementation plan by Coordinator Brian Simpson will also provide useful insight to further analyse and develop the integration of the port infrastructure with the road and rail link of the corridor and enhance multi-modal hinterland connections. Last but not least, the ports along the Baltic-Adriatic Corridor are all located in urban areas, five of them in core urban nodes, which also require due consideration of the integration and impact of last mile connections in these cities environment.

To facilitate the exchange of good practice and to help ports learning from each other in order to face those common challenges is therefore of high importance. Apart from a continuation of the working group, I see myself as a close partner for ports and like to further assist them in developing their "last miles".

### *Improving the interconnection in all urban nodes*

Not only ports, but also the urban nodes are somehow the "first and last miles" of the corridor since they serve as connecting points, linking transport modes and corridors. They deserve additional attention as their development helps making the benefits of developing a multi-modal trans-European transport network visible to the citizen. As traffic is heavily generated and attracted by urban nodes, high performance connectivity between the urban nodes and the axes of the corridor is vital in addition to the improvement of the corridor infrastructure towards the standards set in the Regulation.

In spite of the implementation of the planned investments for the Baltic-Adriatic Corridor, to modernise and improve the standards and performance of the network (8.8 € billion), possible rail capacity issues in the future have been identified for the urban nodes of Warszawa, Katowice, Bratislava, Wien and Ljubljana. As for road, capacity issues may occur particularly within or close to the urban agglomerations of Warszawa, Bratislava, Wien and Bologna. Investments are planned for road transport which are expected to solve existing and future capacity issues in the core urban nodes of the Baltic-Adriatic Corridor.

In this context, the working group of Regions has been extended to the urban nodes and four macro-regional strategies in order to further consolidate and develop the analysis of the core urban nodes which shall be dedicated to the integration of the core cities in the corridor and wider TEN-T network. I recommend that the definition of project solutions to remove existing and future bottlenecks in urban areas and to promote their integration in the core network should, wherever possible, consider the possible impact of soft policy measures to support the modal shift such as transport demand management and promotion of public transport, cycling and walking, in addition to infrastructure capacity expansion. In this context, it is also worth noting that the EU Regulations provide for flexibility in defining the last mile within urban nodes and thus allow Member States to address the issues occurred within their urban nodes in the best adapted manner.

### *Promoting interoperability, in particular through the full deployment of ERTMS*

Without ensuring an interoperable corridor, a modal shift from road to rail cannot be realised. Investing in ERTMS is therefore a prerequisite to reach the targets of the White Paper on Transport. Even if improvements have already been made along the Baltic-Adriatic corridor since 2014, there is still a lot to do in this respect in order to ensure the full deployment of ERTMS along the corridor by 2030.

In December 2014, the European ERTMS Coordinator, Mr. Karel Vinck, started a consultation with Member States about ERTMS implementation of the core network corridors with the aim to review the current European Deployment Plan (EDP) of 2009. This activity launched a close dialogue in all TEN-T corridors with the Member States. The Coordinator had numerous bilateral discussions with high-level representatives of the Transport Ministries and infrastructure managers. This review process has been closed and the new EDP will be part of the work plan for ERTMS 2016. The reviewed ERTMS deployment plan shall cover all the TEN-T corridor alignments and will be then subject to a Commission adoption procedure to be finalised by the end of 2016.

I will strongly support the European Coordinator for ERTMS in promoting ERTMS along the corridor and encourage the needed investments. In order to grasp the full benefits of ERTMS deployment and to achieve higher added value for our corridor, I will thereby particularly pay attention to the implementation of ERTMS at the cross-border sections.

In view of the above five development priorities, Figure 17 presents the most important milestones and steps to be taken for the Baltic-Adriatic Corridor.

Figure 17: Baltic-Adriatic corridor priorities – different milestones and steps to be taken

Priorities	by 2016	by 2018	by 2020	by 2030
<b>Removing the bottlenecks at the cross-border sections with high European added value</b>	<ul style="list-style-type: none"> <li>Set-up of cross-border dialogues / working groups in order to align national planning and timing of cross-border sections</li> <li>Establishment of cross-border agreements for the six critical rail and two road cross-border sections</li> </ul>	<ul style="list-style-type: none"> <li>Continuation of the cross-border dialogues and bilateral working groups</li> <li>Monitor timely implementation of cross-border projects</li> </ul>	<ul style="list-style-type: none"> <li>Monitor timely implementation of cross-border projects</li> </ul>	<ul style="list-style-type: none"> <li>All cross-border sections fully compliant with TEN-T requirements</li> </ul>
<b>Ensuring the timely completion of the missing links at the Alpine crossings</b>	<ul style="list-style-type: none"> <li>Monitor timely implementation of projects</li> </ul>	<ul style="list-style-type: none"> <li>Monitor timely implementation of projects</li> </ul>	<ul style="list-style-type: none"> <li>Monitor timely implementation of projects</li> </ul>	<ul style="list-style-type: none"> <li>2026: Missing links completed</li> </ul>
<b>Enhancing multimodal transport, in particular by improving the last mile connection of ports</b>	<ul style="list-style-type: none"> <li>Continuation of working group for ports (and RRT)</li> </ul>	<ul style="list-style-type: none"> <li>Monitor the implementation of the last mile connection</li> </ul>	<ul style="list-style-type: none"> <li>Monitor the implementation of the last mile connection</li> </ul>	<ul style="list-style-type: none"> <li>All ports well connected to the corridor</li> </ul>
<b>Improving the interconnection in all urban nodes</b>	<ul style="list-style-type: none"> <li>Continuation of the working group for Regions by integrating the 13 core urban nodes and the four macro-regional strategies</li> </ul>	<ul style="list-style-type: none"> <li>Monitor the implementation of the multimodal development and connection to the wider TEN-T network within urban nodes</li> </ul>	<ul style="list-style-type: none"> <li>Monitor the implementation of the multimodal development and connection to the wider TEN-T network within urban nodes</li> </ul>	<ul style="list-style-type: none"> <li>All core urban nodes along the corridor are well connected to and integrated in the corridor</li> </ul>
<b>Promoting interoperability, in particular through the full deployment of ERTMS</b>	<ul style="list-style-type: none"> <li>Focus on ERTMS deployment at cross-border sections (in line with ERTMS work plan by Coordinator VInck)</li> </ul>	<ul style="list-style-type: none"> <li>Focus on ERTMS deployment at cross-border sections (in line with ERTMS work plan by Coordinator VInck)</li> </ul>	<ul style="list-style-type: none"> <li>Focus on ERTMS deployment at cross-border sections (in line with ERTMS work plan by Coordinator VInck)</li> </ul>	<ul style="list-style-type: none"> <li>ERTMS equipped and in operation on the whole core network corridor</li> </ul>

**High investments required on the corridor**

The corridor study identifies about 477 investments that would be needed for the development of the Baltic-Adriatic Corridor until 2030 which represents an estimated total volume of around 69.5 € billion. Nearly 53% of this total volume of investments is allocated to railways and ERTMS; over 27% to road; around 14% to ports, including their interconnections (2.7%) and MoS projects (0.1%); and about 6% to airports (4.1%), rail road terminals (0.8%), Innovation (0.2%), and transit and multimodal interchange facilities in core urban nodes (1.2%). 9.5% of the total budget is allocated to cross-border sections related initiatives. The cost of the two alpine crossings is equivalent to 12% of the total investment value. Compared to the 2014 study analysis the total budget for the development of the corridor by 2030 augmented by nearly 17% and may further increase upon completion of the analysis of the urban nodes and consolidation of the analysis of the investments for the whole infrastructure. This shows us that there is much to do to realise the Baltic-Adriatic core network corridor.

### *Stable pipeline of mature projects needed*

These financial estimates also clearly illustrate that it is of utmost importance to establish a stable pipeline of mature projects that encourage investors to engage in transport infrastructure. Moreover, a prioritisation of the investments along the corridor is needed. As European Coordinator, I wish to assist the Member States in this challenging task and this work plan shall constitute one tool in this regard.

The project analysis also shows that the current project list falls short in the identification of projects and investments to fully reach the KPI standards by 2030, particularly with respect to rail transport (train length and ERTMS). These targets are as relevant to develop an interoperable corridor as speed, axle load and electrification. I will therefore closely monitor the development of the project pipeline and ensure that all bottlenecks of the corridor are properly addressed in the project and investment plans of the Member States. Availability of alternative clean fuels, particularly at ports and airports, is also a theme which requires further attention and which may become subject of discussion among the stakeholders in order to understand and share views on problems and opportunities related to its development along the corridor.

Furthermore, the detailed analysis of the project pipeline shows that – even though most projects currently included in the updated project list are planned to be completed by 2020 – some key milestones of project implementation have not been concluded yet. This regards in particular aspects such as land acquisition or the Environmental Impact Assessment. In terms of project maturity, we can also notice that funding and financing has not been secured yet for 40% of the projects belonging to the work plan priorities, including critical cross-border sections. As European Coordinator, I will therefore closely follow up on those issues in order to ensure that the necessary efforts are made towards the development of a mature and stable project pipeline.

### *Increasing the budgetary support for transport at European level*

The investment needs on the Baltic-Adriatic Corridor – as well as on all other core network corridors – are extremely high. There is no doubt that the entire budget for transport under the Connecting Europe Facility will be used; indeed the majority of funds has already been committed by mid-2016 within the first two calls for proposals that were both massively oversubscribed. At the same time, high quality projects were submitted which did not even get funding due to the budgetary constraints. In this context, I will do my best to raise my voice during the MFF midterm review and the budgetary negotiations for the next funding period for an increase of the CEF budget in future.

### *Considering innovative financial instruments next to grants*

Considering the extremely high investment needs on the corridor, they cannot be met by grant financing only – even if a future CEF 2 budget was increased. In addition to the European Funds (in particular the European Structural and Investments Funds (ESIF) and the Connecting Europe Facility (CEF)), it will be in the interest of a timely implementation of the Baltic-Adriatic corridor network to look for additional financial means. In this context, we also need to take advantage of the 315 billion investment plan of President Juncker (European Fund for Strategic Investment) and do our utmost to capture its expected growth impulses for our corridor.

This is why I strongly recommend considering alternative ways of financing such as the use of innovative financial instruments. In addition, to secure funding is no longer only an issue for Cohesion countries. Sustainable, forward-looking ways to invest in infrastructure and thus to implement our ideas for the corridor are needed. Together with my fellow colleague Prof. Carlo Secchi, European Coordinator of the Atlantic Corridor, and former Vice-President of the European Commission, Henning Christophersen, I presented in June 2015 a concrete action plan to the Council of the Ministers of Transport and to the European Commission which outlines twelve concrete recommendations of how to



make the best use of new financial schemes. Over the coming months, I will closely follow up on the implementation of those recommendations together with my colleague Prof. Secchi.

### *Setting up of a competitive planning and financing framework and offering a right choice of accompanying measures*

Alongside the development of a stable and mature project pipeline capturing all funding and financing opportunities, the timely and successful implementation of our corridor can only be ensured if the right accompanying measures and planning instruments are set up. Indeed, even in case the financial means for the realisation of the corridor projects are at hand, local, regional and national authorities face problems in realising, in particular major, transport projects. This especially counts for projects that are planned in environmental sensitive areas which often capture the attention of several opponents. Their concerns have to be seriously considered and not neglected as otherwise they can lead to significant delays in the completion of Strategic Environmental Assessments and other planning and development processes as well as during construction. Citizens have to be involved in those planning and development processes in an appropriate and consequent manner by putting in place sound and forward-looking information and participation tools. These have to be adequately integrated in the regional planning procedures as to ensure that planning decisions are legally sound and non-contestable.

Lengthy and complex procedures of the Strategic Environmental Assessment often add on to this problematic. Therefore, acceleration of planning and approval processes need to be considered when and wherever possible.

Similarly, it is needed to streamline, adapt and simplify procurement and permitting procedures in order to accelerate the implementation of projects. Tender procedures as well as plan approval processes, especially for cross-border projects, need to be harmonised. As stated above, one may also think of the possibility to launch joint tendering processes for cross-border projects – a topic that I like to follow-up at European level. In this context, I very much welcome the initiative of DG MOVE of having launched in 2016 a European study about how to better streamline permitting procedures. We should closely follow-up on the results of this study as to make best use of it for the projects and investments along our corridor.

### *Embedding the corridor activities into the wider European Regional Policy*

Regions play a key role in the implementation of the corridor. If we want to achieve a “living” environment along the Baltic-Adriatic axis, their involvement is of crucial importance. A very strong asset of the Baltic-Adriatic Corridor is that its corridor activities can be based on a long tradition of regional cooperation across borders. Apart from the forward-looking Baltic-Sea, Adriatic Ionian, Alpine and Danube macro-regional strategies as well as initiatives such as the Baltic Sea Forum or the Association of Polish Baltic-Adriatic corridor regions, there are numerous cross-border, transnational and interregional cooperation projects (such as BatCo, SoNoRa, TEntacle) which have been financed by the European Territorial Cooperation programmes and which have been and are still very active along the corridor. These cooperation projects and initiatives are of high value in order to come to a joint understanding of cross-border issues and to set-up a joint vision for our corridor. Through regional cooperation, forces within the region can be bundled, innovative ideas can be developed and available resources can be used in a more efficient way. As European Coordinator, I therefore strongly support and encourage those bottom-up initiatives and invite all relevant stakeholders to create synergies with the corridor activities. For this reason, I invited the transport coordinators of the four macro-regional strategies to become formal members of the Baltic-Adriatic Corridor Forum and also involved them in a dedicated working group for the Baltic-Adriatic corridor regions, urban nodes and the four macro-regional strategies. In this context, it is worth noting that there are already six European Groupings of Territorial Cooperation

(EGTC) that have been set up along the corridor. It may thus be interesting to further examine this instrument for the successful implementation of cross-border projects.

Apart from the various cooperation initiatives financed by Structural Funds, further synergies ought to be created between the transport projects implemented through the "mainstream" funds (i.e. European Structural Investments Funds) and the Connecting Europe Facility. For this reason, I also involve DG REGIO very closely in the corridor activities.

#### *From national planning to corridor planning*

There is a growing complexity and interdependency of development processes and an increasing relevance of transport investments for economic growth and social wealth. To meet those challenges, an integrated, cooperative and implementation-oriented development approach is needed which does not stop at the national borders. Therefore, national transport plans should clearly embed the corridor approach and be consistent with the objectives and priorities set out in the TEN-T guidelines. I will do my utmost to reach a common vision of our Baltic-Adriatic Corridor which is shared by all relevant stakeholders and which will guide us in the implementation of transport projects at national, regional and local level. In this context, we should also strive for more coherence between the European policies.

#### *Continuation of the corridor process – outlook*

To reach the overall objective of realising a sustainable and competitive Baltic-Adriatic Corridor, the involvement of the various stakeholders is crucial. My role as European Coordinator is to allow for an open communication and dialogue, to join forces, to listen to the different needs and national constraints and to be – where and whenever needed – an independent mediator.

The Corridor Forum is in this context an important tool which I intend to continue over the next months and years. In addition, working groups for ports / RRT and regions / urban nodes / macro-regions will continue their work in 2017. Other working groups may be set up upon approval of Member States. More importantly, bilateral working groups for the critical cross-border sections will be set up in 2016 and 2017 too, if not already done so by the Member States / infrastructure managers.

Dissemination and communication on activities and results are another important key word that will guide my work in future. Indeed, once this work plan is based on a shared agreement, it is important to spread the word to the "outside world" and to benchmark our Baltic-Adriatic achievements.

#### *Further development of the corridor study*

In parallel, the corridor study as presented by the Baltic-Adriatic corridor study consortium should be further developed with the aim to present a fully-fledged corridor work plan in 2018. There are several issues that were necessarily not touched upon yet, or only marginally so far, which will require due attention in future as to ensure that the Baltic-Adriatic Corridor gets to life and becomes really competitive. This regards for instance the cross-cutting issues of innovation, Intelligent Transport Systems (ITS) and sustainability.

#### *Corridor-wide climate and environmental appraisals*

Work is already on-going to appraise the mutual impact of climate change and the corridor and to characterise its overall contribution of safeguarding the environment from local pollution and noise. I will therefore ensure that due attention will be paid in the further development of the corridor study and the resulting next revision of the work plan, in

- assessing the potential contribution to climate change mitigation (reduction of Greenhouse Gas emissions) of the corridor through a more effective multimodal transport pattern;
- mapping specific needs, opportunities and projects linked to the adaptation to climate change (e.g. extreme events risk increase, variability of water level and flows in river basins);
- identifying the corridor and corridor projects' effects on the local environment (including biodiversity) and noise;
- highlighting best practices along the corridor that have a potential for cross-fertilisation and replicability for
  - climate change mitigation,
  - adaptation to climate change,
  - reduction of environmental negative impacts / enhancement of the quality of the environment and biodiversity,
  - tackling (rail) noise.

In a nutshell, there are various measures that need immediate attention by all relevant stakeholders such as the cross-border agreements and others that should be worked upon continuously as to ensure the completion of our corridor by 2030. More focus is also needed on the process management of infrastructure projects, in particular on the cross-border sections. We need a more integrated and coordinated approach to project development (in particular transport, infrastructure and environmental policies). Indeed, there is the strong need to deliver in the coming years as to build the case for the upcoming negotiation of the next multi-annual financial framework and a potential CEF 2. With our corridor, we have however already a very clear and powerful vision of the Baltic-Adriatic Corridor which gives us a very good starting point for those negotiations.

The challenges of the corridor which are ahead of us are important and its investment needs high. As European Coordinator, I will assist you, Member States, in facing these challenges and in realising the needed investments. I invite you to follow me on this interesting path.

## 9. Contacts



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