



European  
Commission

# North Sea Baltic



Third Work Plan of the  
European Coordinator

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**Table of Contents**

<b>1.</b>	<b>Towards the updated North Sea-Baltic corridor work plan</b>	6
1.1	Introduction	6
1.2	Main Objectives	7
1.3	Main Challenges	8
1.4	Roadmap to setting up the third Work Plan	9
<b>2.</b>	<b>Characteristics of the North Sea-Baltic Core Network Corridor</b>	10
2.1	Alignment including links with other CNCs	10
2.2	Compliance with the technical infrastructure requirements of the TEN-T Regulation	10
<b>3.</b>	<b>Transport market analysis</b>	18
3.1	Freight transport	18
3.2	Passenger transport	21
<b>4.</b>	<b>Capacity issues</b>	23
4.1	Rail	23
4.2	IWW and inland ports including RIS deployment plan	25
4.3	Maritime ports and Motorways of the Sea	26
4.4	Road transport	28
4.5	Airports	30
4.6	Urban nodes	31
4.7	Rail-road Terminals (RRT)	33
4.8	Major cross-border projects	34
<b>5.</b>	<b>Addressing the challenges</b>	35
5.1	Overview of the projects	36
5.2	Project mapping	45
5.3	Success stories	46
5.4	Innovation deployment	47
5.5	ERTMS deployment	49
5.6	Motorways of the Sea	50
<b>6.</b>	<b>Environmental and socio-economic effects of the Corridor</b>	50
6.1	Impacts on jobs and growth	50
6.2	Modal shift and impact on decarbonisation and climate change adaptation	51
<b>7.</b>	<b>Infrastructure funding and innovative financial instruments</b>	53
7.1	Connecting Europe Facility support to the Corridor	53
7.2	Considering financial instruments next to grants	54
7.3	EIB financial support	55
7.4	Blending grants and financial instruments	56
7.5	Increasing the budgetary support for transport at European level	57
<b>8.</b>	<b>Innovative flagship projects</b>	57
8.1	Innovative flagship on Alternative fuel infrastructure	57
8.2	Road safety in the Baltic States and Poland	58
8.3	NSB ITS Corridor	59
<b>9.</b>	<b>Recommendations and future outlook by the European Coordinator</b>	60
9.1	Planned projects and achievement of Corridor technical compliance	65
9.2	Combining grants with innovative financial instruments	66
9.3	Other issues	66
9.4	Next steps	67



## List of Tables and Figures

Figure 1. Screen shot of the northern network of the core network corridors showing the North Sea-Baltic in red with the main interconnection points with the other corridors .....	6
Figure 2. North Sea-Baltic corridor map showing different Urban Nodes and transport interconnections by mode .....	7
Table 1. Compliance with TEN-T requirements (2014): Railways .....	11
Figure 3. Rail compliance by 2015 .....	13
Table 2. Compliance with TEN-T requirements (2014): Roads .....	14
Table 3. Compliance with TEN-T requirements (2014): Inland waterways (IWW).....	15
Table 4. Compliance with TEN-T requirements (2014): Inland Ports.....	16
Table 5. Compliance with TEN-T requirements (2014): Seaports and maritime infrastructure .	16
Table 6. Compliance with TEN-T requirements (2014): Airports .....	18
Table 7. Modal split of corridor-related international freight transport flows by country in 201018	
Figure 7. Origins of international freight transport flows within the corridor catchment area by transport mode .....	20
Figure 8. Destinations of international freight transport flows within the corridor catchment area by transport mode.....	21
Figure 9. Passenger-kilometres in billions from 1995 to 2013 across five means of transport and in total.....	22
Figure 10. Total passenger modal share per Corridor Member State .....	22
Figure 11. Number of projects per category.....	36
Figure 12. Investments per category [M EUR] .....	37
Figure 13. Inland Waterways compliance by 2030 .....	38
Figure 14. Number of projects per country .....	39
Figure 15. Investments per country [M EUR] .....	40
Figure 16. Number of projects to be finished .....	40
Figure 17. Main scope of work per corridor project .....	41
Figure 18. Contribution of NSB projects to the KPIs by category.....	43
Figure 19. Rail compliance by 2030 .....	43
Figure 20. Number of projects per investment class (M EUR) .....	44
Table 12. General ranking of number of projects per cluster .....	45
The table below presents clustering results by transport mode based on the project list. More than 50 % of the overall investments needed fall under cluster 1. ....	45
Table 13. Amount of clustered projects in million euros.....	45
Figure 21. Impacts of the innovative projects on the NSB corridor, multiple impacts per project are possible. ....	48
Table 14. Multipliers used for the growth and jobs analysis derived from the study of Cost of non-completion of the TEN-T (2015).....	50



## Acronyms and Abbreviations

BE	Belgium	SESAR	Single European Sky ATM Research Joint Undertaking
CEF	Connecting Europe Facility	TEN-T	Transeuropean Transport Network
CNC	Core Network Corridor	TENtec	Information system of the European Commission to coordinate and support the TEN-T Policy
CNG	Compressed Natural Gas	UIC	International Union of Railways
DE	Germany		
DEK	Dortmund-Ems-Canal		
DIP	Detailed Implementation Plan for Motorways of the Sea		
EC	European Commission		
EDP	European Deployment Plan		
EE	Estonia		
EIB	European Investment Bank		
EFSI	European Fund for Strategic Investments		
ERTMS	European Rail Traffic Management System		
ESIF	European Structural and Investment Funds		
ETCS	European Train Control System		
EU	European Union		
FI	Finland		
GDP	Gross Domestic Product		
GHG	Greenhouse Gas		
INEA	Innovation and Networks Executive Agency		
ITS	Intelligent Transport System		
IWT	Inland Waterway Transport		
IWW	Inland Waterway		
KPI	Key Performance Indicator		
LPG	Liquefied Petroleum Gas		
LNG	Liquefied Natural Gas		
LT	Lithuania		
LV	Latvia		
MFF	Multiannual Financial Framework		
MoS	Motorways of the Sea		
MS	Member State		
NL	The Netherlands		
NPF	National Policy Framework		
NSB	North Sea-Baltic		
NSM	North Sea-Mediterranean Corridor		
NUTS	Nomenclature of territorial units for statistics		
PL	Poland		
PPP	Public Private Partnership		
RFC	Rail Freight Corridor		
RHK	Rhine-Herne-Canal		
RIS	River Information Services		
RRT	Rail-road Terminal		

# 1. Towards the updated North Sea-Baltic corridor work plan

## 1.1 Introduction

### Background

Transport is a vital element of European integration and smooth and effective cross border transport is a key element in the effectiveness of the Single Market and the creation of jobs and growth. Moreover, the construction and operations of new transport infrastructure can provide many new jobs. Similar to the environment, transport is a policy that is easily understood and can find support among the citizens of Europe at a time when the concept of European integration is under heavier criticism than ever before. Transport clearly requires cooperation between the Member States on policies created by the Union to facilitate the smooth transit of goods, services and people throughout the European Union (EU) for the benefit of all its citizens.

In 1994, the EU initiated the trans-European transport network policy. Regulation No 1315/2013 of 11 December 2013 established the core network consisting of 9 core network corridors, involving all the Member States and covering the whole EU. The core network corridors enable the Member States to achieve a coordinated and synchronised approach with regard to investment in infrastructure, so as to manage capacities in the most efficient way. The network is multimodal including all transport modes and their connections, as well as relevant traffic and information management systems. The concept of core network corridors also serves as basis for the Multiannual Financial Framework negotiations, thus identifying the financial needs for the development of the infrastructure to the required standards.

Figure 1. Screen shot of the northern network of the core network corridors showing the North Sea-Baltic in red with the main interconnection points with the other corridors





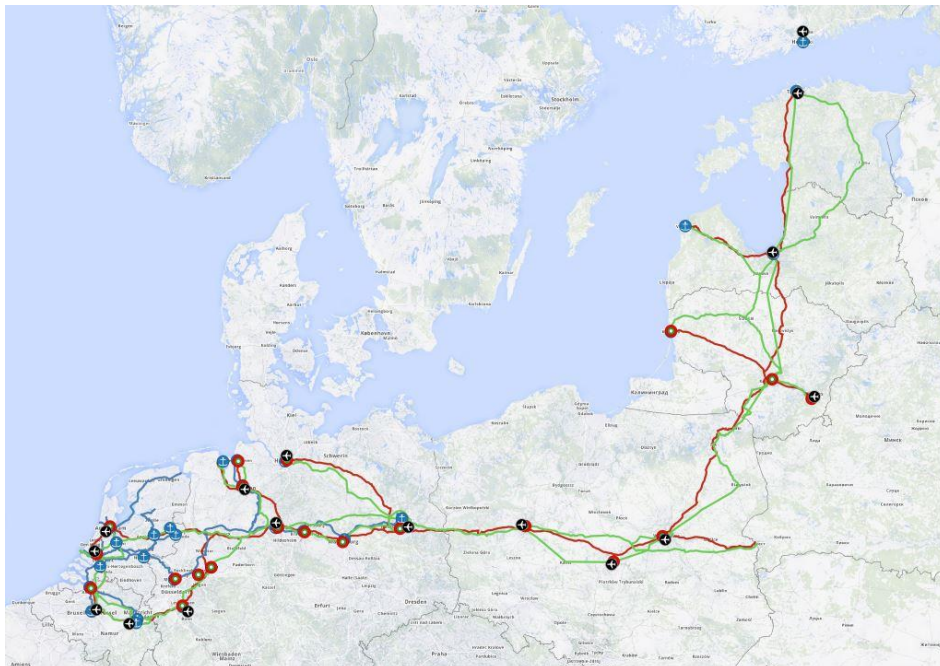
The new core network corridor concept offers opportunities for stakeholders to contribute to the objectives of the new policy. It also provides a strong means of realising the respective potential of stakeholders and of promoting cooperation between them and of strengthening complementarity with actions by the Member States.

## North Sea-Baltic Corridor

The North Sea-Baltic Corridor (hereafter: “the Corridor”) comprises 5,986 km of railways, 4,092 km of roads and 2,186 km of inland waterways. It is one of nine core network corridors and the only one to be situated exclusively in the North of Europe. The Corridor is a clear example of a principal objective of the new TEN-T policy by connecting east with west and improving the accessibility of the eastern Member States. It is the northern-most Corridor connecting the Western and the Eastern markets. It joins the Baltic Sea Region with the low countries of the North Sea Region by way of Helsinki, the Baltic States, Poland and Germany.

The figure below presents the North Sea Baltic corridor map including urban nodes and transport interconnections. The main transport modes covered by the Corridor and Work Plan are rail, road, inland waterways, seaports and airports.

Figure 2. North Sea-Baltic corridor map showing different Urban Nodes and transport interconnections by mode



## 1.2 Main Objectives

One of the main Corridor objectives is to use untapped economic potential in the northern and eastern parts of the Corridor. The Corridor can provide a way to develop global transport routes and a platform for dialogue with industrial stakeholders, by taking into account interests of the 40 regions along the North Sea-Baltic corridor as well as civil society affected by the projects of common interest.





The Corridor provides a direct connection from Western and Central Europe to Belorussia and Russia, furthermore Finland and the Baltic States serve as a hub for the terrestrial connections to the eastern and northern markets in China, Asia and beyond.

The North Sea-Baltic corridor is linking some of the most important ports in Europe and the objective is to link these ports not only by sea, but by all available transport modes including rail, roads, inland waterways and air, ensuring multi-modal links including relevant traffic and information management systems. The North Sea ports also provide maritime access to the Americas and the rest of the global trading network and possibilities for enhanced competitiveness and better connections with the Member States in the Eastern part of the Corridor.

There is also the possibility of connecting in the North to the developing ideas of the Northern Dimension Policy and to the Arctic area, the growing potential of which has been recognised by the recent joint Communication of the High Representative of the Union for Foreign Affairs and Security Policy and the European Commission on "An integrated European Union policy for the Arctic".

A core objective of the Corridor is to achieve compliance of the transport infrastructure for all transport modes with the technical requirements by 2030 set in the TEN-T Regulation<sup>1</sup>.

The North Sea-Baltic corridor should also provide the basis for the large scale deployment of new technologies and innovation which can help to enhance the overall efficiency of the European transport sector and help to reduce its carbon footprint, for instance, well developed ITS in different parts of the Corridor.

### **1.3 Main Challenges**

The North Sea-Baltic corridor links four older Member States with four newer Member States, however there remain substantial divergences, in terms of transport infrastructure as well as economic and social, between the Eastern and Western parts of the EU. Those divergences need to be tackled in order to achieve a fully integrated European transport infrastructure network.

While there is a strong traffic in the western end of the Corridor from the four largest ports in Europe (Rotterdam, Antwerp, Hamburg and Amsterdam) to the hinterland of the low countries and Germany up to Berlin, the flow then lessens from Berlin to Warsaw and, for rail at least, the connection with the Baltic States to the North from Poland is underdeveloped, although, the maritime connection between Helsinki and Tallinn works efficiently.

Another challenge is to create new traffic flows in a North/South direction on the eastern shore of the Baltic Sea and connect them to the well-established West/East flows between the North Sea ports, Berlin and Warsaw. The Rail Baltica project is a missing

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<sup>1</sup> Regulation (EU) No 1315/2013 of the European Parliament and of the Council of 11 December 2013 on Union guidelines for the development of the trans-European transport network and repealing Decision No 661/2010/EU, OJ L 348, 20.12.2013, p.1





link to ensure that there is no gauge break between different Member States, and that these flows can be captured in a sustainable way.

Developing the transport interconnectivity of the key urban nodes is another challenge for the efficiency of the Corridor because these nodes of high economic importance are recognised as having a crucial importance not only to this Corridor, but also to the rest of the network. Actions taken at the crossing-points of the corridors for improving interoperability, multimodality, decarbonisation and interconnections are of crucial importance due to the complications found in them.

## **1.4 Roadmap to setting up the third Work Plan**

The Third Work Plan has been prepared based on the work done for the First Work Plan<sup>2</sup> (May, 2015) and the Second Work Plan<sup>3</sup> (December, 2016), several studies tendered by the European Commission since 2014, which included not only study reports but also intense interactions with different Corridor stakeholders during eleven Corridor fora, joint activities with the dedicated group of stakeholders during eight Working Group meetings and most importantly continuous work on the project list dedicated to the Corridor further development.

The first Corridor study developed in 2014 and 2015 was led by designated consultancy *Proximare* and included initial situation analysis and contribution to the First Work Plan. The next Corridor Study started in September 2015 and led by the Consortium involving EY, Hacon, Stratec and Panteia.

The Study reports included analysis of compliance with technical requirements set in the TEN-T Regulation for all transport modes, definition and assessment of KPIs used to assess the progress made in the Corridor's further development, analysis of the Corridor project list and financing needs, Corridor's potential in innovation deployment, Corridor's possible impact on climate change, possible impact of the Corridor deployment on the greenhouse gas emissions and analysis of the potential market uptake.

The Third Work Plan is also based on the work done during the Corridor Fora that included participants not only from the eight Member States, but from the infrastructure managers, regions and other stakeholders. The Corridor Fora proved to be important and constructive gatherings of stakeholders whose support is vital in the policy's successful implementation.

An important part of the Third Work Plan preparation was the update of the Corridor project list developed jointly with different stakeholders and consulted with Member States representatives during April – May, 2017. The main information for each project included in the Corridor's project list and used in the preparation of the Third Work Plan is available on the European Commission web page.

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<sup>2</sup> [https://ec.europa.eu/transport/sites/transport/files/themes/infrastructure/news/doc/2015-05-28-coordinator-work-plans/wp\\_nsb\\_final.pdf](https://ec.europa.eu/transport/sites/transport/files/themes/infrastructure/news/doc/2015-05-28-coordinator-work-plans/wp_nsb_final.pdf)

<sup>3</sup> [https://ec.europa.eu/transport/sites/transport/files/2nd\\_workplan\\_nsb.pdf](https://ec.europa.eu/transport/sites/transport/files/2nd_workplan_nsb.pdf)



The Work Plan provides a common vision, based on the compilation of the work of all stakeholders towards a final realisation of the Corridor. The common interest of all the Member States on the Corridor is the crucial driving force behind the Work Plan. It is there to provide a framework for the prioritisation of the various steps needed to realise the Corridor.

The Third Work Plan includes characteristics of the Corridor by presenting information about Corridor alignment with other core network corridors and analysis of the Corridor's infrastructure compliance with Regulation (EU) No 1315/2013 requirements per transport mode, including compliance maps for rail and IWW; information from 2014 Market Study related to freight and passenger transport per transport mode; information about capacity issues and bottlenecks per transport mode and country and in some cases a description of planned activities at country level; an overview of different financing options to finance the projects identified to address different challenges; information about three main pilot initiatives – innovative flagship projects which will help to address some of the most important cross country issues to combine infrastructure policy with wider transport policy objectives, where cooperation is required not only between Corridor countries but in some cases also with other core network corridors. On this basis, the final chapter draws the conclusions and provides my recommendations as the European Coordinator.

## **2. Characteristics of the North Sea-Baltic Core Network Corridor**

### **2.1 Alignment including links with other CNCs**

An important characteristic of the North Sea-Baltic corridor is the connection with other corridors via multi-modal connecting points (hubs). Helsinki connects with the Scandinavian-Mediterranean corridor, Warsaw, Łódź and Poznań connect with the Baltic - Adriatic corridor, while Berlin and Hannover connect with both the Orient-East Mediterranean and the Scandinavian-Mediterranean corridors. Further west, Cologne, Nijmegen, Liège intersect with the Rhine-Alpine corridor and at its western end points, Antwerp, Brussels, Rotterdam and Amsterdam connect with the Rhine-Alpine and the North Sea-Mediterranean corridors.

The North Sea-Baltic corridor needs to cooperate closely and on an equal basis with Rail Freight Corridor North Sea-Baltic (set up under Regulation (EU) No 913/2010) which provides a unified system for organisation and management of a dedicated capacity offer for rail freight and which is operational since November 2015, while the extension to Latvia and Estonia is to follow until 2020 and it is foreseen to apply for an extension to Medyka (Polish-Ukrainian border).

### **2.2 Compliance with the technical infrastructure requirements of the TEN-T Regulation**

The Corridor has to comply with the technical requirements defined in the TEN-T Regulation. The analysis below includes only those transport modes for which technical requirements are determined by Regulation (EU) No 1315/2013.

#### **Rail**



The total railway network of the Corridor is 5,986 km long. The table presents the summary of technical compliance for rail (year 2014) and detailed analysis of each technical requirement is provided below the table.

Table 1. Compliance with TEN-T requirements (2014): Railways

RAILWAYS									
All entries: Share of all sections fulfilling the respective standard									
TEN-T parameters	BE	NL	DE	PL	LT	LV	EE	FI	Corridor
Length of all sections Km	397	477	1 783	1 442	848	594	442	3	<b>5 986</b>
Electrification Electrified	100%	100%	97%	91%	18%	11%	17%	100%	<b>75%</b>
track gauge 1,435mm	100%	100%	100%	100%	13%	0%	0%	0%	<b>76%</b>
line speed (core freight lines) ≥100km/h	80%	100%	100%	9%	25%	0%	0%	N/A	<b>61%</b>
Axle Load (core freight lines) 22.5t	100%	100%	100%	99%	100%	100%	100%	N/A	<b>100%</b>
Train length (core freight lines) min. 740m	100% <sup>4</sup>	100%	100% <sup>5</sup>	38%	100%	100%	100%	N/A	<b>85%</b>
ERTMS/signalling system YES	32%	43%	0%	0%	0%	0%	0%	0%	<b>7%</b>

### Electrification

The whole Corridor is **electrified** in Belgium, the Netherlands, Germany, Finland and Poland, except for an approximate 60 km link between Oldenburg and Wilhelmshaven in Germany (that should be solved by 2022) and, in Poland, a 100 km section between Elk and the Polish Lithuanian border. In Lithuania only the Kaunas – Vilnius line (about 105 km) is electrified, as well as the extension to the Belorussian border (not part of the Corridor). In Latvia and Estonia sub-regional lines for passenger transport around the capitals are electrified. Cross-border traffic between the Baltic States and Poland can currently run only using diesel traction. There are also different voltage systems across Member States, but this will not pose a cross-border problem if a locomotive is equipped with a relevant converter.

### Track gauge

The rail technical compliance assessment for the Corridor is influenced by the exemption related to isolated networks in the Baltic States and Finland (1520 mm and 1524 mm networks).

<sup>4</sup> Operation of 740m long trains is theoretically possible in Belgium and Germany. Restriction e.g. due to capacity bottlenecks during peak hours are likely to occur; however, it is not possible to mathematically measure the impact of these restrictions on the compliance, hence the 100% compliance rate in the table.

<sup>5</sup> See footnote 4.



The Corridor is equipped with three different track **gauges**. The Belgian, Dutch, German and Polish networks are all standard UIC gauge (1435 mm). Estonia, Latvia and Lithuania have the 1520 mm gauge, with the exception of the section in Lithuania between Kaunas and the Polish border (which has 115 km dual gauge/parallel tracking of 1520 mm and 1435 mm). Finland uniquely has the 1524 mm gauge. However, the Baltic States and Finnish networks are isolated networks in the sense of Regulation (EU) 1315/2013, and thus are exempted from the compliance with its technical requirements.

### Line speed

In the Netherlands, the requirement of the **minimum line speed** of 100 km/h for freight lines is fulfilled. Parts of the Belgian network receiving freight traffic are not compliant with line speed requirement; including section from Glons to the German border (39 km), from Angleur to Liège Guillemins (3 km), from Lier to Antwerp (10 km) and locally in the railway nodes of Aarschot (0,5 km) and Hasselt (2 km). In Germany, a small number of sections has been identified which are not compliant, because these sections are mainly separate freight lines, links and bypasses in and around urban areas.

In Poland, the line speed compliance along the Corridor is so far on a low level, caused mostly by very low maximum speed on certain sections (especially Warsaw southern rail bypass and Rail Baltica close to the border with Lithuania) and several sections with mixed speed allowance resulting in lowered average speed level. Several long sections are very close to meet the requirement: from Polish – German border to Warsaw (average speed in range between 80 km/h to 99 km/h depending on the section), from Zielonka to Białystok (average speed above 80 km/h). Upgrading only these sections would raise the compliance level well above 60%. Between Olecko and Białystok the speed limits are between 80 and 120 km/h and from Olecko until the Lithuanian border the speed is inadequate at 30-60 km/h but will be raised following modernisation. The Warsaw freight bypass also has an inadequate speed of 40 – 70 km/h, but plans are foreseen to solve this problem. Intensive and large-scale projects are in progress or foreseen up to 2023 to upgrade the performance of the network.

In the Baltic States not all lines are compliant with line speed requirements, but the Rail Baltica project, once completed, will be compliant. In Lithuania, the completed standard gauge 1435 mm railway along the existing 1520 mm alignment has a speed limit of 120 km/h (80 km/h for freight transport). However, would the line be upgraded, equipped with ERTMS and electrified, the speed of the line would increase. The isolated networks of 1520 mm gauge are exempt from the minimum line speed requirement.

### Axe load

Only very limited sections of the network do not comply with the standard of the minimum 22,5t of **axle load**.

### Train length

Most of the Corridor can accommodate the minimum **train length** of 740 m, except in Belgium due to the existing train length restrictions of 650 m during peak hours and in Germany due to capacity bottlenecks during peak hours. Operational bottlenecks also exist in The Netherlands. The Baltic States 1520 mm network meets the requirements, though the Polish network currently does not comply on the E20 railway from Polish/German state border to Poznań, on the Poznań node, on the Warsaw node (partly)

and on the Rail Baltica corridor (Czyżew-Trakiszki). Such diverging situation in different Member States creates a serious obstacle to seamless international freight traffic flows. In order to enhance operation of the longer trains, a sufficient number of side tracks is a necessary condition and would bring quick wins for enhanced competitiveness of rail freight.

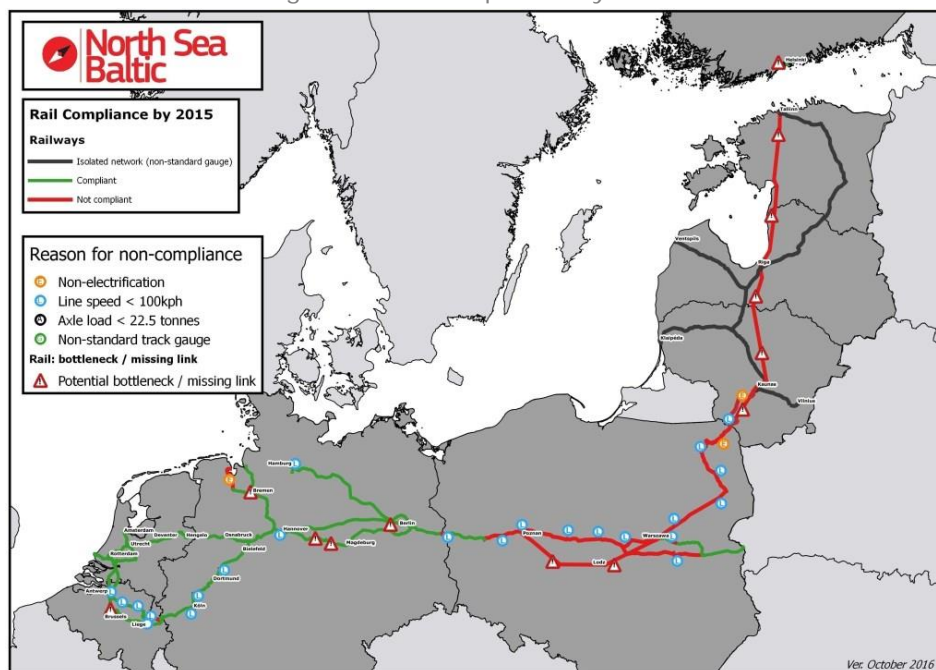
Investments are foreseen in the next years to remove the limitation on the Belgian and on the German parts of the corridor.

## ERTMS

There is no ERTMS deployment in NSB so far except in The Netherlands with the highest level of implementation of **ERTMS** with 43% of the Corridor covered and in Belgium 32% of the Corridor covered. ERTMS implementation in different Member States and the timeline for deployment of ERTMS along the Corridor are described in “ERTMS European Deployment Plan<sup>6</sup>” and national implementation plans. Based on the notification received from the Member States concerned, the European Commission has confirmed that the 1520 mm gauge railway lines of NSB Core Network Corridor are not to be covered by the European Deployment Plan for ERTMS.

The summary of rail compliance with TEN-T requirements is presented in figure below<sup>7</sup>.

Figure 3. Rail compliance by 2015<sup>8</sup>



## Roads

<sup>6</sup> [https://ec.europa.eu/transport/modes/rail/ertms/ertms\\_deployment\\_en](https://ec.europa.eu/transport/modes/rail/ertms/ertms_deployment_en)

<sup>7</sup> The calculation of ERTMS implementation is based on operation of GSM-R and ETCS (all levels) and thus may differ from the ERTMS EDP 2016.

<sup>8</sup> Line speed < 100kph: In Germany, these sections are mainly separate freight lines, links and bypasses in and around urban areas.



The Corridor comprises 4,092 km of roads that connect the capitals of all the Member States on the Corridor. The table below presents the summary of compliance with technical requirements (year 2014).

Table 2. Compliance with TEN-T requirements (2014): Roads

Parameter	Requirement	BE	NL	DE	PL	LT	LV	EE	FI	Corridor
<b>Road class</b>	Roads have to be either an express road or a motorway by 2030	100%	100%	100%	56%	55%	8%	7%	100%	<b>70%</b>
<b>Parking areas along the roads, including their security level</b>	Sufficient parking areas, at least every 100 km, by 2030	100%	100%	100%	56%	N/A	N/A	N/A	N/A	<b>N/A</b>
<b>Availability of alternative fuels</b>	Available by 2025	100%	100%	100%	100%	100%	100%	100%	100%	<b>100%</b>

### Road class

Although the existing road network in Belgium, the Netherlands and Finland meet the requirements of the TEN-T Regulation, there are congestion issues around the main urban nodes.

Almost all road sections on the Corridor in Germany are part of the German motorway system, except a short section of around 10km on the A30 near Bad Oeynhausen where the motorway is missing, however it is under construction with expected opening for traffic before end of 2018.

The Polish road network from the German border to Warsaw is a new four lane motorway, the A2. In Warsaw node the Corridor road alignment is separated in two directions: north-eastern to Baltic States and eastern to Belarus. Warsaw expressway ring road is completed when it comes to traffic towards Lithuania. However, only a first phase of the southern bypass is completed and in order to travel towards Belarus, one has to use the heavily congested internal city road network. The missing section of the ring road is being implemented through design and build contracts (construction should be completed in late 2020). The connection from Warsaw to Lithuania (Via Baltica) is also mainly a two-lane national road. As Via Baltica received recently a high priority, the whole connection is currently either under construction (sections closer to Warsaw and closer to Lithuania) or in a tender stage (central part). Poland will build the A2 motorway until Biała Podlaska, including the missing section between Warsaw and Mińsk Mazowiecki. Poland will also conduct an analysis for completing the A2 section from Biała Podlaska to the Polish-Belorussian border under PPP scheme. Except for completing the connection from Warsaw to Mińsk Mazowiecki further extensions are put on hold due to budget constraints and only preparations for Mińsk Mazowiecki – Siedlce are ongoing.

The Baltic States' roads on the Corridor are not compliant with respect to road class requirements. The Via Baltica highway is the main artery for North-South traffic between Poland and the Baltic States and in many parts it is not compliant with technical requirements as it is not expressway or motorway.

In Lithuania, the Via Baltica road has two lanes, except for sections of 20 km south of Kaunas and 20 km north of Kaunas that has four lanes. Currently construction of 2+1



lanes is carried out in Panevezys bypass on the Via Baltica. The East-West connection from Klaipeda port through Kaunas to Vilnius is a four lane express road soon to be upgraded to motorway road. In Latvia the Via Baltica is a two lane road with capacity problems between the Saulkrasti bypass and Bauska, where some sections require widening the road from two lanes to four (including construction of bypasses). In Estonia compliance is below 10%. Most of the issues identified in the Baltic States relate to bottlenecks and road safety.

### Parking areas along the road

The Netherlands, Belgium and Germany are compliant and in Poland 56% of the motorways fulfil the requirement of available safe and secure parking spaces at least every 100km. For other Member States the technical requirement is not applicable as there are no roads with motorway standard on the Corridor.

### Availability of alternative fuels

Related to the **provision of alternative fuel sources** the Corridor has made significant developments and some implementation projects are ongoing for electricity, LPG, LNG or hydrogen refuelling stations. While the formal requirement of the TEN-T Regulation is already met, there are discrepancies with regard to the type of alternative fuel provided and thus a lack of continuity across borders.

### Inland waterways (IWW)

The Corridor has an effective IWW network stretching from the North Sea ports to Berlin. The table below presents an overview of compliance with technical requirements.

Table 3. Compliance with TEN-T requirements (2014): Inland waterways (IWW)

Parameter	Requirement	BE	NL	DE	PL	LT	LV	EE	FI	Corridor
<b>CEMT Class</b>	Class IV	100%	100%	100%	N/A	N/A	N/A	N/A	N/A	<b>100%</b>
<b>Length of vessels and barges</b>	from 80-85m	100%	100%	100%	N/A	N/A	N/A	N/A	N/A	<b>100%</b>
<b>Maximum beam</b>	from 9.50m	100%	100%	100%	N/A	N/A	N/A	N/A	N/A	<b>100%</b>
<b>Minimum draught</b>	from 2.50m	100%	100%	100%	N/A	N/A	N/A	N/A	N/A	<b>100%</b>
<b>Tonnage</b>	from 1,000-1,500t	100%	100%	100%	N/A	N/A	N/A	N/A	N/A	<b>100%</b>
<b>Minimum height under bridges</b>	from 5.25m	100%	100%	70%	N/A	N/A	N/A	N/A	N/A	<b>86%</b>
<b>Availability of alternative fuels</b>	Indication of availability by 2030	100%	N/A	N/A	N/A	N/A	N/A	N/A	N/A	<b>N/A</b>

IWW network is almost compliant with all technical requirements in all Member States, except one parameter in Germany: the minimum height under bridges has not yet been reached on some sections of the Rhein-Herne-Kanal (RHK), the Dortmund-Ems-Kanal (DEK) and the river Weser. This leads to a score of 70% compliance for Germany and a 86% score for the whole corridor.

In addition to the TEN-T requirements, an updated target for the CEMT class has been calculated specifically for this Corridor. There is full compliance of the network with respect to class IV (as of 2014), therefore a higher target has been chosen: class Vb. For this target, 55% of the network was compliant in 2014.





## Inland Ports

The Corridor has 20 inland ports mainly situated in Belgium, the Netherlands and Germany. The table below presents an overview of compliance with technical requirements.

Table 4. Compliance with TEN-T requirements (2014): Inland Ports

Parameter	Requirement	BE	NL	DE	PL	LT	LV	EE	FI	Corridor
<b>CEMT class</b>	Class IV connection	100%	100%	100%	N/A	N/A	N/A	N/A	N/A	<b>100%</b>
<b>Connection to rail</b>	Core ports to be connected to rail by 2030	100%	100%	100%	N/A	N/A	N/A	N/A	N/A	<b>100%</b>
<b>Availability of clean fuels</b>	Available by 2025	33%	33%	0%	N/A	N/A	N/A	N/A	N/A	<b>15%</b>
<b>Availability of at least one freight terminal open to all operators</b>	in a non-discriminatory way and application of transparent charges	100%	100%	100%	N/A	N/A	N/A	N/A	N/A	<b>100%</b>

All inland ports are compliant with IWT class IV access, besides Berlin and Hamm which have a CEMT class IV connection, all inland ports have class V and above waterway connection. They are also compliant with the availability of at least one freight terminal open to all operators but still have to implement alternative fuels accessibility.

## Seaports and maritime infrastructure

The Corridor has 12 core maritime ports and the table below presents an overview of Corridor's seaports and maritime infrastructure compliance with technical requirements. All core seaports on the corridor are connected to rail and road, however in some cases capacity of those connections are insufficient, as described in the following chapter on capacity issues.

Table 5. Compliance with TEN-T requirements (2014): Seaports and maritime infrastructure

Parameter	Requirement	BE	NL	DE	PL	LT	LV	EE	FI	Corridor
<b>Connection to rail network, inland waterways and road network</b>	Core ports to be connected to rail by 2030	100%	100%	100%	N/A	100%	100%	100%	100%	<b>100%</b>
<b>Availability of alternative fuels</b>	Available by 2025	100%	100%	100% <sup>9</sup>	N/A	100%	0%	0%	0%	<b>42%</b>

### Connection to rail network

Helsinki has three ports that form the combined Port of Helsinki. West Harbour and South Harbour are located in the city centre, serve mainly the passenger and *ropax* ferries, and have home freight capacity. They have tram connection for passengers but no connection to heavy rail. The third port is the new Vuosaari cargo port to the East of the city, serving mainly cargo traffic. Vuosaari is connected to rail.

<sup>9</sup> LNG in German ports is provided by fuelling vehicles/vessels.



Estonia has two ports, which form the combined Port of Tallinn. One of them is the Tallinn Old Port (Vanasadam), which serves mainly the passenger traffic and *ropax* ferries, and has also some freight capacity. The Old Port does not have any rail or tram connection at the moment but the NSB project list includes a project for tram connection to the Old Port. The other port is the Muuga freight port, located to the East of the city. Muuga is currently connected to the 1520 mm rail network and in the future shall also be connected to the 1435 mm Rail Baltica network.

The Freeport of Riga in Latvia is the largest port in the Baltic States and is connected to the rail network. Another Latvian port on the Corridor is the ice-free Freeport of Ventspils, which has convenient road and rail access.

In Lithuania, the ice-free Klaipeda State Port is the biggest Lithuanian transport node with well-developed hinterland connections on rail.

Germany has four core seaports on the Corridor: Hamburg, Bremerhaven, Bremen and Wilhelmshaven and all ports have rail connections.

Ports in Belgium and The Netherlands: Amsterdam, Rotterdam and Antwerp have direct rail access.

### **Availability of alternative fuels**

The ports of Antwerp, Amsterdam and Rotterdam offer LNG as an **alternative fuel source** and LNG supplies in Antwerp are under construction. The implementation of other alternative fuels like methanol, hybrid fuels and electric propulsion is developing rapidly.

In Germany, LNG is available in the seaports of the Corridor and is provided by fuelling vehicles. In addition, there are plans to install a LNG terminal in Brunsbüttel or Wilhelmshaven. A first LNG-powered vessel is bound to start operating between the ports of Bremerhaven and Bremen during the course of this year.

A floating LNG terminal anchored in Klaipeda port opened in November 2014 and an LNG reloading station (ships and shore-to-ship) came into operation in October 2017. The reloading station services LNG bunkering activities directly to LNG driven vessels and distributes LNG with trucks to off grid consumers. At the end of 2018 the first refuelling station for LNG vehicles will start operating on the Polish-Lithuanian border on the Via Baltica road near Kalvarija.. It is also planned to provide alternative fuel source in Latvian ports, expected to be realized as private initiative. In Tallinn, no alternative fuel solutions are provided yet, though LNG and LPG terminals are planned in the Muuga cargo port. LNG bunkering infrastructure and accessibility improvements (but not an LNG terminal) are also planned in the Helsinki's Vuosaari cargo port. Currently the only LNG-fuelled passenger ship Megastar (owned by Tallink) sailing between Helsinki and Tallinn is being refuelled in the West Port of Helsinki via trucks.

### **Airports**

There are 16 core network airports on the Corridor. Regulation (EU) 1315/2013 sets an obligation that certain **core network airports need to be connected by rail** (preferably high-speed) by 2050 and in the Corridor there are 8 airports which need to



comply with this requirement. The table below presents the summary of technical compliance assessment (year 2014).

Table 6. Compliance with TEN-T requirements (2014): Airports

Parameter	Requirement	BE	NL	DE	PL	LT	LV	EE	FI	Corridor
<b>Capacity to make available alternative clean fuels</b>	Available (2014)	0%	0%	0%	0%	0%	0%	0%	0%	<b>0%</b>
<b>Connection to transport network</b>	heavy rail or urban rail system and road network, certain airports have to be connected to heavy rail by 2050	100%	100%	100%	100%	100%	0%	100%	100%	<b>94%</b>

### Capacity to make available alternative clean fuels

None of the airports of the Corridor is making **clean fuels available** for airplanes.

### Connection to transport network

There are 8 core network airports along the Corridor with obligation to connect to rail including Helsinki, Riga, Warsaw, Berlin-Brandenburg, Hamburg, Cologne, Brussels and Amsterdam. All airports meet the requirement, except Riga, but there are plans to connect the airport to the railway system as part of the development of the standard gauge Rail Baltica project thus ensuring the rail link to the airport before 2030.

To be noted that several Corridor countries are currently evaluating the construction of new airports (Poland, Lithuania) or expansion of existing airports (The Netherlands) close to the respective capital cities.

## 3. Transport market analysis

During the 2014 Study a transport market study was carried out for the whole Corridor. It assessed transport demand and the resulting traffic flows as well as the capacity of the infrastructure. The 2014 Study was focused on both freight transport and passenger transport and the main observations are presented below.

### 3.1 Freight transport

The current situation for North Sea-Baltic corridor and the forecast for 2030 were estimated for all the countries and transport modes – rail, road, inland waterways and short sea shipping and the main results are presented in the table below.

Table 7. Modal split of corridor-related international freight transport flows by country in 2010

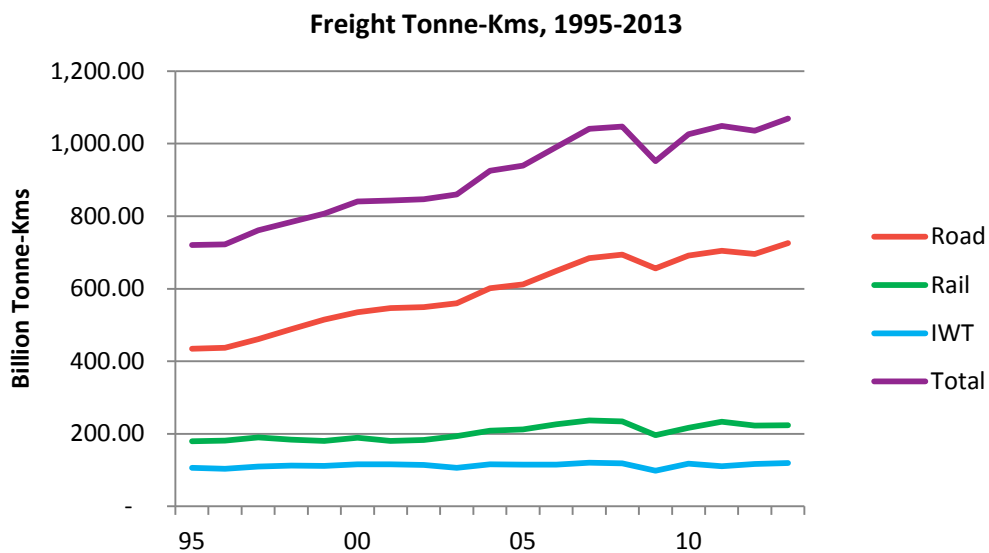
Loading Country	Transport Mode				
	Total	Rail	Road	Inland Waterways	Short Sea Shipping
<b>Finland</b>	100%	0%	2%	0%	98%
<b>Estonia</b>	100%	4%	10%	0%	86%
<b>Latvia</b>	100%	6%	11%	0%	84%



Lithuania	100%	24%	19%	0%	57%
Poland	100%	11%	89%	0%	0%
Germany	100%	6%	50%	30%	15%
The Netherlands	100%	4%	29%	58%	8%
Belgium	100%	4%	39%	49%	8%
Corridor area	100%	6%	34%	38%	22%

At the national level, there is a very **high dominance of road transport** (69%) in the countries along the Corridor. For the Corridor related freight traffic, the picture is more balanced - expressed in freight tonnage; inland waterways accounts for large volumes, whereas rail traffic is only very limited. The freight tonnage per transport mode – road, rail and IWW is presented in figure below and presents data for the time period 1995 - 2013.

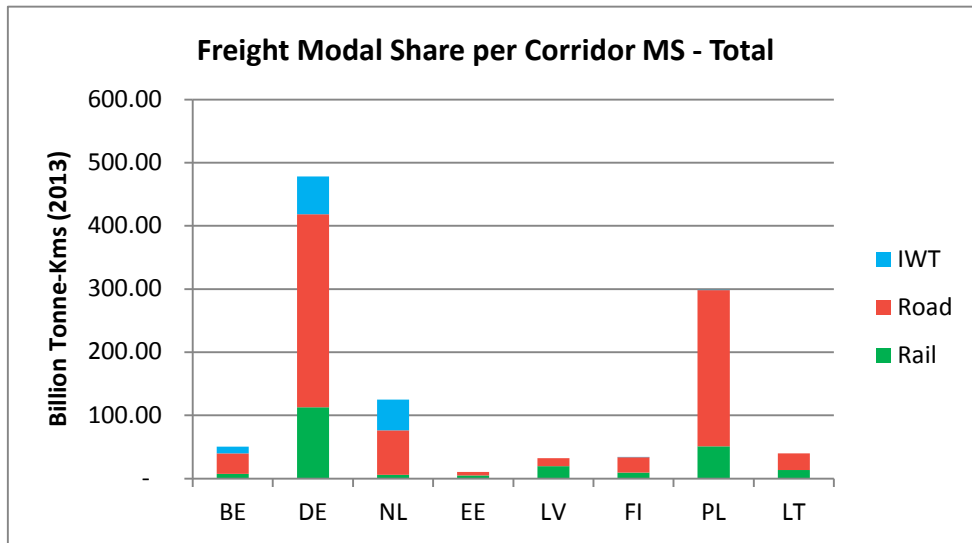
Figure 5. Freight tonnage in billion tonne-kilometres across three transport modes in the NSB CNC and in total



At the national level, rail transport takes the biggest share in the Baltic States and short-sea-shipping is important for Finland, the Baltic States, Belgium and the Netherlands. In Poland, there is the dominance of road in international traffic and rail has a bit bigger share in domestic freight, but also here the dependence on road is very high. Germany has the most balanced modal split for international traffic.

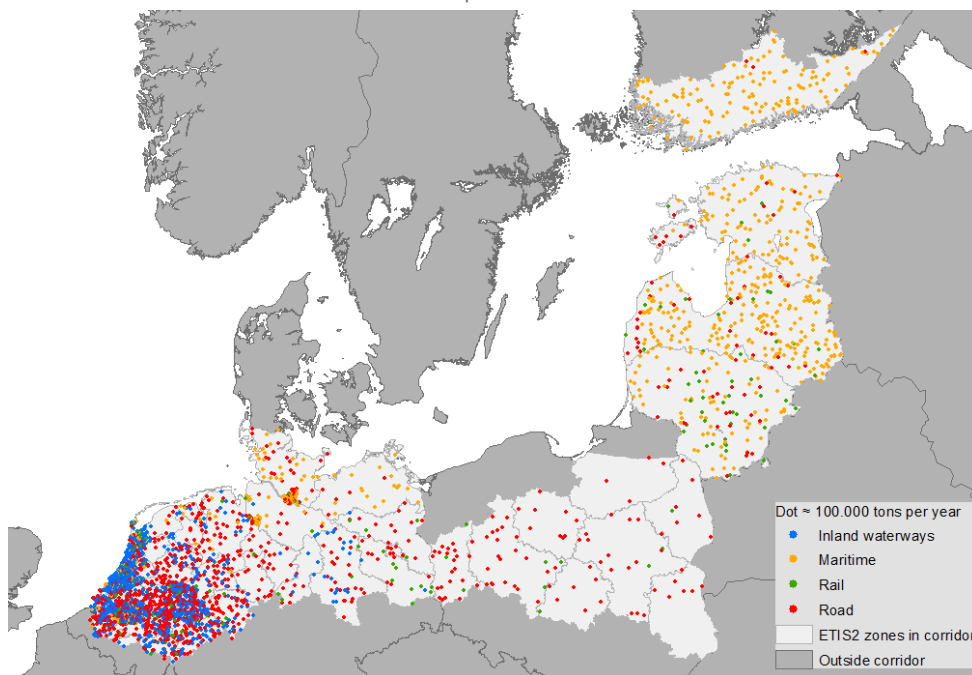
Inland waterways are only relevant in the western part of the Corridor, whereas in the Baltic States and Finland **short-sea-shipping** is by far most important mode of transport. The total freight modal share per Corridor Member States at 2013 is presented in figure below.

Figure 6. Total freight modal share per Corridor Member State



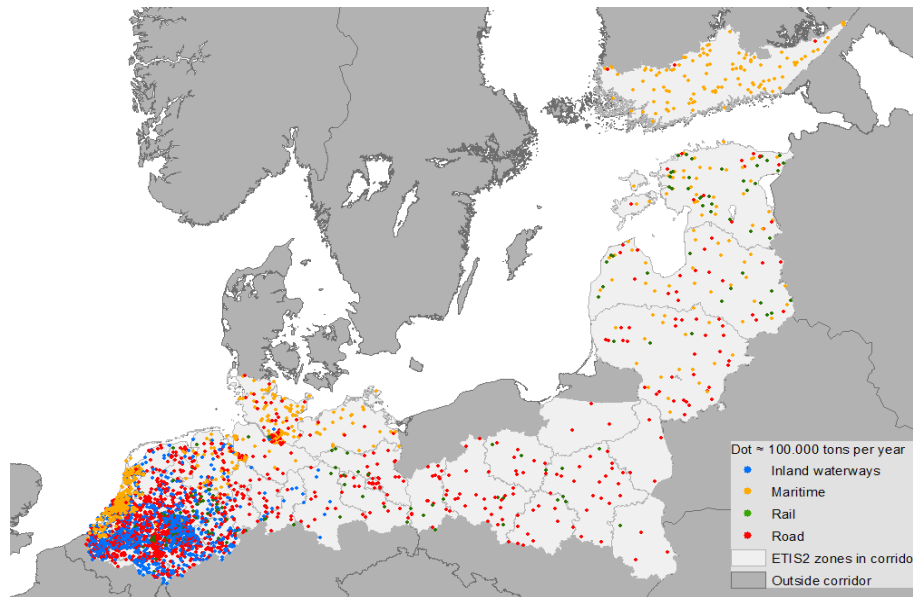
As shown on the map below, the most substantial freight flows (origins) on the Corridor are in the western section between Germany, Belgium and the Netherlands with high level activity in the Baltic States and Finland.

Figure 7. Origins of international freight transport flows within the corridor catchment area by transport mode



Destinations for international freight transport flows on the Corridor are in the western section between Germany, Belgium and the Netherlands as indicated in the map below.

Figure 8. Destinations of international freight transport flows within the corridor catchment area by transport mode



The future anticipated requirements for freight traffic in 2030 show substantial variations between the countries and the transport modes. For the Corridor as a whole, the highest growth rates are expected to be in road haulage (+42%). This is especially the case in the central and eastern parts of the Corridor. As a result, the modal share balance would be further tilted in favour of road transport if no remediating action would be taken. The 2014 Study also indicates that already today the capacity of the road infrastructure in the western end of the Corridor is limited as congestion is a daily phenomenon.

Rail freight is expected to grow substantially in Lithuania, the Netherlands and Belgium. For the Baltic States and Poland rail freight traffic will be positively influenced by modernisation and reconstruction of railway lines and the completion of the Rail Baltica project.

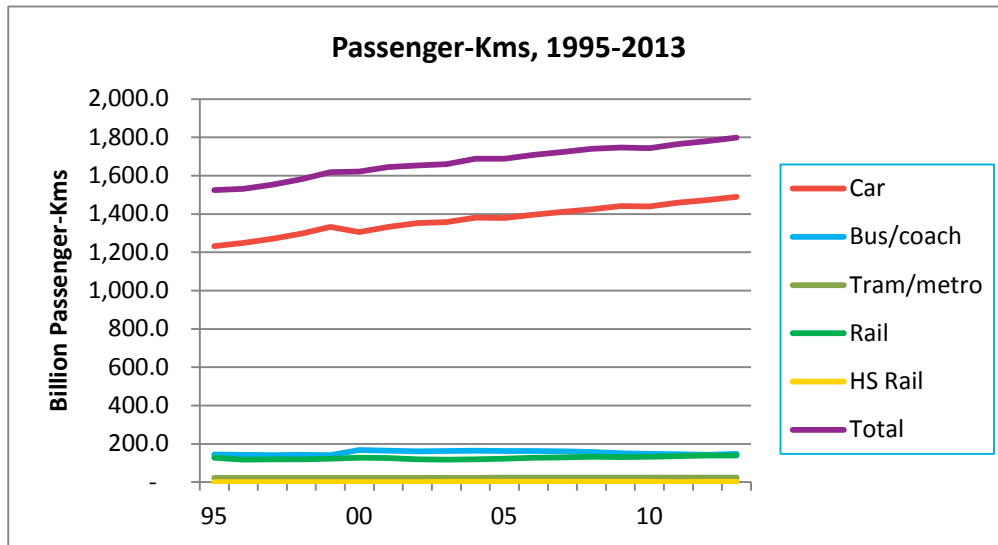
Inland waterways have the lowest expected growth rate (+22%) but based on the projection the inland waterways vessels and the freight volumes are expected to rise, therefore capacity issues may evolve in terms of lock capacity and bridge height.

### 3.2 Passenger transport

At the national level, road transport is by far the most dominant mode for passenger transport. For all the countries along the Corridor, the share of road transport in 2012 was on average between 77-91% (respective examples being Latvia and Lithuania). Estonia and Latvia have a relatively high share of bus transport and the highest share of rail transport (9%) is in Germany and the Netherlands. The total number of international passengers within the Corridor catchment area in 2010 was estimated at over 49 million passengers. The figure below presents passenger kilometres per transport mode for the time period 1995 – 2013.

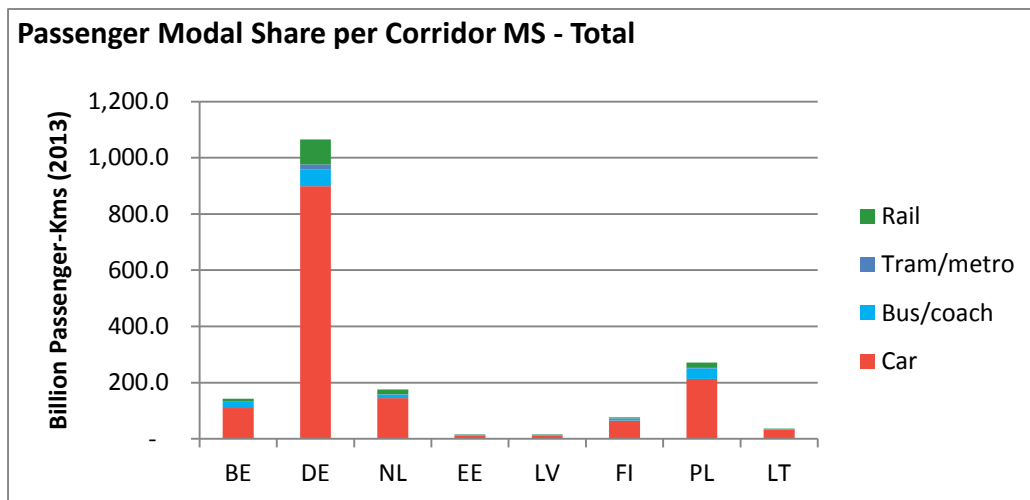


Figure 9. Passenger-kilometres in billions from 1995 to 2013 across five means of transport and in total



In line with data at national level, road transport represents the highest share of the corridor-related cross-border passenger transport. Road transport is very high (86-90%) in Germany, Belgium and the Netherlands. In Germany, 8% of flows are on rail and this is the highest share out of all the countries. Bus transport has a high share in the Baltic States (28-36%). The corridor-related passenger volumes are highest between Germany, Belgium and the Netherlands. The figure below presents the passenger modal share between transport modes and Corridor Member States.

Figure 10. Total passenger modal share per Corridor Member State



Airports are important entry and exit points to the Corridor and therefore important feeders for other modes of transport, such as rail and road. They offer an important alternative for intra-EU links, especially for the eastern and northern parts of the Corridor.

For the Corridor as a whole, the forecast for 2030 shows a higher growth rate for rail passenger transport than for road. Road growth rates are higher in the eastern and





central parts of the Corridor. In the western part of the Corridor the growth rates for rail transport are substantially higher.

The market study has shown that there will be quite a substantial growth in both freight and passenger transport along the Corridor, however, rail transport has a very limited share in the cross-border traffic that is not in line with the overall EU policy objectives.

There is a need for greening transport through initiating the modal shift from roads to rail, inland waterways and short-sea-shipping. In this respect, the 2014 Study shows that there is a clear need for actions related to improving the quality and capacity of the railways, roads and the inland waterways to accommodate a future growth in demand. Further actions will need to be considered to make inland waterways and rail more attractive.

In addition, strengthening the development of alternative fuels infrastructure for road transport will help further greening of transport along the corridor. In particular, countries and areas with heavy current and future road traffic should benefit the most from cleaner alternatives. It is important to foster cross-border cooperation in this field as well.

## **4. Capacity issues**

There are many capacity issues along NSB corridor and it should be noted that there can be a shifting of bottlenecks when it comes to capacity because a problem which is solved locally can then shift to a nearby section. This makes capacity issues a very fluid subject; therefore, it needs a comprehensive view in order to provide long-lasting solutions.

### **4.1 Rail**

In addition to good freight connections, smooth, comfortable and efficient rail, connections for passengers are important for the functioning of the Corridor.

From the West until Poland-Belarus border rail connections for international passenger transport is in operation and the train, whether high speed or conventional, provides an acceptable service for travellers and often is more attractive than the air alternative particularly for shorter distances. However, from Warsaw eastwards, the international long distance passenger service does not provide the service to attract many rail passengers. The Corridor could provide an excellent service for long-distance international passenger travel by rail if improvements were carried out. To achieve this more efficient, faster and fully functioning passenger Corridor, all Member States should aspire to further raise the speed of the passenger trains not only on the whole Baltic States – Poland - Germany axis, but also on the Hannover – Amsterdam section. The Rail Baltica project could inspire also other Member States on the Western part of the Corridor.

Currently there are capacity issues for rail on the Corridor, both for short sections near busy nodes and long stretches. With the general tendency for rail transport to grow, capacity issues would also increase. One of the complexities for rail capacity projects is the gradual implementation of capacity in short time periods. Rail transport is expected



to grow in the period up to 2030, but gradually, therefore potentially leading to unused capacity in the period 2020-2025. Countries along the corridor should therefore strive for a more efficient usage of the current capacity in order to avoid such capacity underuse. For example, current Rail Baltica lines in the Baltic States and Poland should be used to build up traffic flows which can be further extended on the future Rail Baltica fast conventional line.

Belgium is working to secure capacity for the port of Antwerp's hinterland connections. Freight transport main issues are the Brussels-Antwerp axis and the rail capacity to access the seaport. In passenger transport, the main issue is the lack of capacity on the North-South junction in Brussels, which, although not strictly in the Corridor alignment hampers the international, national and regional traffic flows on the Corridor.

In the Netherlands, capacity issues occur at the Rotterdam-Utrecht/Amersfoort link and near the rail nodes of Amersfoort, Amsterdam and Rotterdam. The rail link between Amsterdam and Schiphol airport is becoming one of the most congested rail corridors in the Netherlands. Until 2030 works will be done at station Amsterdam South, Schiphol Plaza and the connection to Amsterdam.

Antwerp port hinterland connections need improvement. The large quantities of freight between Antwerp and Leuven influence the Mechelen node where traffic should be diverted from the urban area. On top of that, in its actual configuration the route through the city of Mechelen leads to a system break affecting the continuity of long-distance and cross-border high speed rail services. The rail by-pass of Mechelen is necessary to allow an increase in the speed, punctuality and capacity of this section.

In Germany, the Federal infrastructure plan 2030 indicates in the forecast that there will be less capacity issues in 2030 because of the projects being implemented. However, from the national traffic perspective the section Hannover-Magdeburg will retain its capacity issues and a new critical capacity section is expected to occur west of Berlin.

In Bremen, a freight bypass rail link is needed to divert the freight traffic from Bremerhaven passing through Bremen central station which is reaching saturation. The last section of the rail line from Oldenburg to Wilhelmshaven port currently has no electrification. Improvement of this hinterland connection with CEF support is underway and could greatly contribute to better freight connections and an increase in traffic. The foreseen implementation of the 740 m-package will increase capacity, too.

Improved freight connections from the Belgian and Dutch North Sea ports to Germany would be an aspiration for the future. For example the Iron-Rhine axis, even though not part of the technical alignment of the Corridor could provide an alternative route for freight traffic to the Ruhr area. A study co-funded from CEF has been finalised in December 2017 and identified the 3RX alternative as a technically feasible option for rail freight capacity improvement on this route, and compared it to revitalisation of the historical Iron Rhine route and previously studied A52 route. Taking into account the CBA results, the study provides a basis for political decision-making. Meanwhile the German Federal Infrastructure Plan 2030 has identified a possible upgrade of the Line Venlo - Kaldenkirchen – Viersen – Mönchengladbach / Krefeld as a viable solution.



Poland is developing new capacity in the form of modernisation (and re-construction) of railway lines, in order to alleviate capacity bottlenecks and attract new rail demand. Both Warsaw and Poznań have an internal dedicated city bypass foreseen to separate freight and passenger traffic with an overall goal to increase line capacity for both. It allows better connections for passengers within the urban nodes. However, railway sections close to nodes will still be likely to suffer from rail congestion in peak hours (mixed international, national, regional, and metropolitan and cargo traffic). This refers mainly to suburban mainlines around Warsaw metropolitan area (especially western and south-western). Rail congestion in peak hours would be mitigated by the considered high speed line connecting Warsaw, Łódź and Poznań as well as modernisation of Warsaw's southern rail bypass (C-E-20 mainline, sections Łowicz-Skierniewice-Pilawa-Łuków).

In the Baltic States capacity improvement projects are underway, including the Rail Baltica project.

Finland has plans to address the congestion in the centre of Helsinki and to build a new underground Rail Loop in the centre as well as new long-distance rail connections to the airport. However, these Finnish capacity projects have high costs and their implementation in the near future is uncertain.

Railway capacity for cross-border traffic is often problematic due to technical barriers like a limited deployment of ERTMS or the lack of harmonisation of the infrastructure when it comes to train length. Coordination is also needed in order to be able to use diversionary routes on the NSB Corridor but also on other Corridors during periods of works and when incidents occur.

## **4.2 IWW and inland ports including RIS deployment plan**

Capacity issues for inland waterways are present on the Corridor. Given the nature of IWW transport, there are generally less capacity issues compared to other modes of transport, but some existing and future issues should be noted.

Capacity problems in inland waterways occur mainly at locks, as these can create waiting time if the amount of traffic exceeds the lock capacity. Furthermore, vessels are generally loaded according to waterway depth and under bridge clearance. When less water depth is available, the cargo hold of a vessel cannot be used to its fullest extent. The result is that more ships are needed to transport the same cargo in low water situations, which leads to higher traffic.

The most important capacity bottlenecks for the inland waterways network are the Amsterdam Sea Locks (IJmuiden locks), the Beatrix Locks and the Eefde Locks in The Netherlands. The future accessibility to Amsterdam port depends on the extension of the IJmuiden locks, planned to be completed in early 2019. The capacity of the lock is no longer sufficient to accommodate the new generation of seagoing vessels and cannot deal with future traffic demands. The Beatrix Locks capacity needs to be increased to accommodate larger vessels and to enable them to continue further into the Dutch hinterland, especially to support the policy goal of cargo modal shift from roads to inland waterways. The Beatrix locks are the guarantee for good IWW connections between the



ports of Antwerp, Rotterdam and Amsterdam. Also for the extension of the Beatrix Locks and the Eefde Locks projects are ongoing.

In addition to these three specific issues, some inland waterways sections in Belgium and several in Germany need to be improved in order to facilitate continuous transport of containers with two layers without restrictions, the height of the bridges needs to be increased.

The capacity of the Albert Canal (part of the alignment of the North Sea-Mediterranean and North Sea-Baltic Corridors) is important. The Albert Canal has a limited under bridge clearance of several bridges and there is a limited width of the waterway between Wijnegem and Antwerp, which leads to capacity issues. The CEF projects tackling these issues will be completed by 2022. Compliance analysis on Kiel Canal was not covered as a part of technical compliance assessment, as it is not part of the alignment, but should be mentioned as bottleneck.

Bottlenecks exist in the form of accommodating larger vessels at the Twente Canals and securing sufficient mooring places for vessels and capacity of locks at IJmuiden, Volkerak and Beatrix locks. The projects to tackle these bottlenecks are ongoing. For all those sections, there are projects either already underway or in the planning stage.

The German national infrastructure plan mentions the section Bremen-Hannover as a qualitative bottleneck. This means the section is not compliant for fairway dimensions. A project is foreseen to solve the bottleneck. In addition a section southwest of Berlin (length of 10 km) is mentioned as a capacity bottleneck. The plan envisages reducing the bottleneck in the coming years.

It could be acknowledged that problems are bound to arise taking into account future goals. Vessel size is increasing noticeably, setting the bar higher for the technical compliance of the infrastructure for depth, width and bridge height. Wider rivers allow more and longer vessels on a section. Sections of the inland waterways and locks cannot accommodate the size of the new barges and therefore some sections of the network are becoming not compliant when the bar is set higher. This bar can be set higher by European standards, or by the daily users of the infrastructure of this sustainable transport mode.

The availability of alternative fuels for inland waterway barges is starting to become available, but additional action is needed to diversify choices and provide access to the fuel at more diverse locations. Mobile refuelling equipment is also an important element in this regard.

### **4.3 Maritime ports and Motorways of the Sea**

The Corridor has a heavy concentration of maritime ports. For the development of this Corridor, ports have a particular strategic relevance as these are the main gateways between the EU market and its commercial partners in the globalised world beyond. The bottlenecks for the seaports are determined by the non-existence or the lack of capacity of rail connections, the connections to IWW CEMT IV, lack of capacity of last-mile road connections, as well as non-availability of clean fuels.



At some ports, there is a capacity issue in terms of future container terminal handling, which may lead to future congestion. The port of Antwerp is aiming for capacity increasing measures of their direct hinterland connections at the Albert Canal and their connection with the rail network. Projects are being carried to alleviate bottlenecks and ease transportation between the Port and Germany.

Amsterdam and Rotterdam ports both have direct road and rail access, though capacity issues do exist. The Brabant route, which crosses the Dutch-German border at Venlo, can provide a diversionary route for the Betuwe route for rail freight between the port of Rotterdam and the Ruhr area. Projects have been planned in both ports to deal with the problem in the future. Access by road to Rotterdam port is a major concern due to congestion.

In Bremen rail capacity issues affect the port freight traffic from the ports of Bremerhaven, Bremen and Wilhelmshaven to the hinterland. The situation is expected to improve according to the German national forecast, but not enough to relieve that capacity bottleneck in total.

In Lithuania, the ice-free Klaipeda State Port is the biggest Lithuanian transport node with well-developed hinterland connections on road and rail. Klaipėda seaport currently has a maximum available depth for container vessels of 13.2 m, which is considered insufficient. Several development projects are in the pipeline to address those constraints.

Currently, cargo traffic to Riga port mainly uses local roads which are closely located to the centre of Riga and have limited capacity. The future plans foresee connecting Riga port directly into the TEN-T road network via the Riga Northern Transport Corridor, for which implementation has already started. Similarly, rail access improvement projects are also planned for Riga port. Port of Riga will be connected by road and 1520mm rail to a future intermodal freight terminal near Salaspils, developed along with the Rail Baltica project.

Ventspils port has developed its infrastructure to serve the largest vessels that can enter the Baltic Sea, deepening the port up to 17.5 meters. Ferry connections, Ro-Ro cargo amount and number of ferry passengers are increasing, leading to capacity issues on the access roads.

The Old Port in Tallinn has road connection, but there is no rail connection for passengers or cargo. While it is not intended to enable rail connection for cargo traffic to the Old Port, Estonia plans to construct a tram connection from the Old Port to the centre of Tallinn and to the Ülemiste railway terminal, which is to become the final rail-road passenger terminal of Rail Baltica. The road access for cargo traffic to the Old Port currently faces the issue of having to travel through the centre of Tallinn, but this issue is planned to be solved by constructing a new seaside road that bypasses the city centre.

The other port in Tallinn is the Muuga cargo terminal. Muuga has both rail (1520 mm) and road connections, and it will serve as the final cargo port of the Rail Baltica (1435 mm). There is a need to improve navigation safety in Muuga and to expand the capacity of both Muuga and the Tallinn Old Port to solve current or expected future bottlenecks.



Vuosaari port in Helsinki has both road and rail connections to the national networks, while the West and South Harbour passenger ports have tram connections. West and South Harbours can be accessed by road only through the city centre, which is somewhat problematic for cargo, but the only economically feasible solution is seen in better traffic management systems. Vuosaari cargo port's fairway needs to be improved and deepened from 11m to 13m.

The ice-breaking capacity in Helsinki port is to be considered as a bottleneck. The project list of Finland does not include an additional ice-breaker because the Port of Helsinki expects to rent it instead of owning it. The ice-breaker included in the project list of Estonia could be used for Tallinn, Helsinki and potentially also Stockholm (which is in the Scandinavian-Mediterranean Corridor), Riga and Ventspils.

New technologies are especially important in the context of ports, Motorways of the Sea and logistics. In particular, given the large water transport component in the Corridor, the provision and use of LNG fuel for seagoing and inland vessels should be highlighted. Digitalisation of the overall logistics chain is a key driver for a modern and efficient transport system. The Corridor already has best practice examples for information technology solutions in the freight sector at both ends of the Corridor e.g. in the Helsinki-Tallinn twin-port and in the Dutch ports. Several ports (such as Helsinki and Tallinn) have also started cooperating in using the ICT solutions for providing better and more efficient services and streamlining the services across the border. This also requires much more attention, cooperation and further action.

The availability of clean fuels is problematic in the ports in Finland, Estonia, Latvia and Germany. Helsinki and Tallinn ports currently do not have specific infrastructures for alternative fuels although alternative fuels can be provided with trucks and one LNG fuelled passenger ship is operating between Helsinki and Tallinn. Nevertheless, Paldiski cargo port in Estonia (not on the NSB corridor) is participating in a small-scale LNG terminal development project and Vuosaari cargo port in Finland intends to improve the LNG-related infrastructure. The same relates to Riga and Ventspils ports where both ports do not have alternative fuels available. More alternative fuel terminals are needed within the Motorways of the Sea (MoS) concept and the accompanying problem is a low take-up of vessels being modified to have bi-fuel engines which require cooperative actions by both, the ports and the operators.

#### **4.4 Road transport**

Capacity issues for roads could be identified in all countries. At the western side of the Corridor the problems mainly relate to the densely populated and economically dynamic regions. The problems are especially noticeable in and around urban nodes, where city bypasses and ring roads are often very congested.

Road congestion is mainly an issue around the urban nodes and does not relate too much to cross-border sections. In the western part of the Corridor technological improvements in vehicle technology are expected to improve the capacity situation by 2030 and road pricing is being discussed within the Member States.

Road congestion in the Netherlands is expected to grow moderately in the national scenarios and the capacity improvement projects in place cover the period roughly until



2030. The Netherlands motorway network on the Corridor has four lanes on most sections and plans exist to widen some more congested sections. The motorways on the most used sections between Amsterdam and Rotterdam are six or eight lanes, however, despite the high capacity of the motorway network, congestion is still a major concern. The government of the Netherlands gives a high priority to using more Intelligent Transport Systems.

Road congestion occurs frequently in Belgium especially around Antwerp, Brussels and Liège, and similarly as in the Netherlands planned improvements are expected to have an impact by 2030.

In Germany, an assessment is made of the future 2030 capacity bottlenecks. Compared to the 2010 situation, the location of the bottlenecks is similar. Available capacity improvements are planned for the nodes of Hannover, Hamburg, Bremen and Berlin. The most significant improvement is expected in the Ruhr-Area where there is a comprehensive improvement of capacity visible. Improvements are also visible at the section Köln -Dortmund – Münster- Osnabrück.

One particular bottleneck is around Bad Oeynhausen on the German motorway network where almost 10 km of the A30 motorway, which is the main road artery of the Corridor, is missing. However the 10 km Bad Oeynhausen bypass is under construction; expected opening for traffic is by end of 2018.

Another bottleneck on the German motorway system is the Berlin ring with only four lanes, due to temporary capacity problems. These restrictions will be removed with the completion of the ongoing and scheduled construction works: extension to 8 lines between Potsdam and Nuthetal, as well as the completion of the Berlin Northern Ring (6 lines).

The Cologne ring has a minimum of six lanes. In addition to the already completed eight lanes on the section Cologne-Heumar-Cologne-Mühlheim construction works have begun on the north site section (Cologne-Mühlheim-Leverkusen-Center) which will be done by end of 2030.

Congestion in Poland concerns mainly the urban nodes of Poznań and Warsaw. The southern bypass of Poznań, a dedicated section of A2 motorway is planned to be widened by the concessionaire of the implemented PPP scheme. Warsaw expects its southern bypass to be completed in 2020. However, in peak hours heavy congestion caused by local and regional traffic will remain a problem, especially along the bridges crossing Vistula River. The northern Warsaw expressway bypass (project completed in 2012), leading towards Via Baltica, experiences daily congestion in peak hours.

As there is limited possibility for expanding existing infrastructure, solving this problem in the long term will require new, comprehensive initiatives aimed at modal shift and, possibly, establishment of a new, outer Warsaw metropolitan bypass.

Sections of the Corridor in north-eastern and eastern Poland which were not upgraded to motorway or expressway status cause problems due to road safety issues and pollution





in smaller cities along the corridor (e.g. Łomża, Suwałki). This issue will be solved after completion of Via Baltica (S61 expressway).

An important road connection between Poland and the Baltic States is the Via Baltica highway. The capacity of Via Baltica highway is also to be considered as bottleneck for the main city bypasses. A noticeable problem on the Via Baltica road is the safety question due to heavy road use and it is to be highly encouraged that road safety improvements should be undertaken.

In Lithuania, road congestion is around the nodes of Vilnius and Kaunas, which is expected to grow with transit traffic development on Via Baltica and increased demand on Kaunas – Vilnius axis. In Lithuania, the Via Baltica road has two lanes, except for sections of 20 km south and 20 km north of Kaunas that has four lanes.

Due to deficiencies of Riga traffic system including lack of capacity, and a highly fragmented character, new traffic infrastructure would be needed in order to have a reliable TEN-T last mile link and extend the TEN-T network to Riga port. Except for Riga ring road, the road to Ventspils port has also two lanes.

In Helsinki the 3<sup>rd</sup> and largest ring road around Helsinki (Kehä III), which connects both the Vuosaari cargo port and the airport, has two plus two lanes but needs improvements in creating better connections with several roads, including accessibility to the airport and to the Vuosaari port.

Deployment of Intelligent Transport Systems (ITS) along the Corridor can alleviate capacity issues, as available real time information on congested road sections can help the users to better plan their movements. At the same time, it would also contribute to increased road safety.

## 4.5 Airports

Due to capacity and connectivity issues related to rail and road, airports have a very important role for many Corridor countries.

The Schiphol airport has a passenger terminal capacity project on the project list to prevent future capacity issues.

The Brussels airport is directly connected to the railway network. Regular rail services are operated from the airport to the city centre of Brussels, the European quarter (via the new Schuman-Josaphat tunnel) and many other Belgian cities.

Of the five core airports in Germany which are part of the Corridor, four are connected by rail (Berlin, Hamburg, Hannover and Cologne) and one by light rail (Bremen). Due to the capacity issues at the existing airports in Berlin, a new airport is under construction. There are ongoing studies for capacity improvement of the airport Hannover, and the airport of Hamburg is studying an additional rail link.



Warsaw Chopin Airport intends to improve its internal road network in order to separate air-traffic-related vehicle flows from common urban traffic congestion. Łódź and Poznań airports are currently served only by road access, sufficient for the time being. Road access to Poznań airport might become a problem once traffic volumes increase. A feasibility study for a tram or rail link to Poznań airport has been completed, but due to unsatisfactory results of the feasibility study the project has been put on hold.

Poland is currently preparing the construction of a new Central Transport Hub 40 km west of Warsaw, at the intersection of Baltic-Adriatic and North Sea Baltic core network corridors. Besides the construction of the airport, connections to the railway network (including new high-speed lines) and to the road network (including motorway A2 and Warsaw bypass) are foreseen to be completed until 2027.

Vilnius airport currently is connected to 1520 rail network, but there are plans through development of the 1435 mm Rail Baltica section "Kaunas – Vilnius" to connect Vilnius airport and main train station.

Riga airport has a requirement to be connected to the rail network by 2050. The solution is foreseen in the context of the Rail Baltica project, whereby the new fast conventional European-gauge rail line shall pass directly through Riga airport with a new rail passenger station to be constructed at the airport.

Tallinn airport is connected to the rail network and the future Rail Baltica passenger terminal by tram connection since September 2017. Due to rapid passenger growth in 2016 (2.5%) and 2017 (18.1%), an extension of the airport passenger terminal is foreseen to be implemented in the coming years.

Helsinki airport's passenger railway connection to the centre of Helsinki was opened in 2015, but further connections are planned for cargo traffic and for long-distance passenger trains.

## **4.6 Urban nodes**

Developing the transport interconnectivity of the urban nodes is a vital objective for the efficiency of the Corridor. These nodes of high economic importance are recognised as having a crucial importance not only to this Corridor, but also to the rest of the network. Actions taken at the crossing-points of the corridors for improving interoperability, multimodality, decarbonisation and interconnections are of crucial importance due to the complications found in them. Connectivity within these nodes requires special emphasis due to a very high level of congestion. Deployment of new info-technology solutions is also highly relevant here. One of the main ways to achieve the goals set will be further promotion of ITS not only covering interoperability but contributing to many everyday aspects of big cities, including improved road safety, general security in cities, better utilisation of environmental resources and better planning, provision and usage of electricity. ITS also contributes to seamless transport flows in cities, thus ensuring better working and living conditions for many citizens.

Similarly, urban nodes – not only the ones that are mentioned in the TEN-T Regulation - are laboratories for the deployment of alternative fuelling infrastructure and vehicles. Several urban nodes along the Corridor are frontrunners in this field.



Urban nodes bottlenecks on the Corridor mostly relate to last-mile issues and road congestion. Cities are addressing those issues with projects already under implementation or at the planning stage, often by means of construction of rail and road bypasses, improvement of interconnections of the corridor with feeder roads and the local urban transit system, and facilitating interchanges between modes. 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 Amsterdam the highest congestion is present at the south of the city which will be addressed by the two passenger rail station upgrades: the Central station and the south station Amsterdam-Zuid including the link with Schiphol airport. Road congestion is present all around the city, and multiple road projects are ongoing to increase capacity. These projects range from local solutions (junction based) to pan-regional solutions, e.g. the project A1/A6/A9 Schiphol-Amsterdam-Almere that costs around 5 billion EUR.

In Rotterdam there are two road projects to improve the last-mile access that is hindered by congestion, the Blankenburg tunnel and A13/A16 bypass.

In Antwerp, several rail projects improving the last-mile connections and the capacity of the shunting yard are expected to be enhanced by 2023. The *Oude Landen* site has been targeted to remove cross-overs. It should noticeably increase the port's access capacity, while the construction of a second access to the port of Antwerp is still envisaged as long-term solution to support the development of the port. The Antwerp ring road is also planned to get a capacity upgrade by 2025.

In Brussels rail and road congestion reduce the quality of the last-mile connections. The rail congestion, especially in the North-South junction, reduces the possibilities for rail passenger transfers and corridor transfers.

Berlin regional and long-distance rail passenger traffic faces congestion at the Spandau station and on the west-east connection (Stadtbahn, part of the North Sea Baltic corridor). There are four road capacity projects at a total cost of around 1 billion EUR. For Berlin urban node the completion of the airport project and related transport links is an important issue.

In Hamburg, road projects are planned to improve the situation on the east motorway. There are rail capacity issues for passengers and freight, as well.

There are a number of projects in Poland related to urban nodes of which the most important refer to railways. Poznań and Warsaw shall receive upgrades of existing infrastructure, aimed at capacity increase and improving the mode transfer for passengers in Poznań. In Łódź, the construction of an underground rail tunnel under the city centre will change the city's railway node, offering new ways for metropolitan, regional and national connections.

There are two major road projects along the Corridor situated in the nodes in Poland, including the continuation of Warsaw's southern expressway bypass and the southern bypass of Poznań along the A2 motorway to address growing capacity issues. In Warsaw there are also four projects aimed at improving the local ring roads inside the urban area. All airports plan investments, but the most significant are planned at Warsaw



Chopin Airport, including an air freight terminal and access for passengers by road and by public transport.

In Vilnius, there is a project to upgrade the air passenger terminal by 2019. Construction of Vilnius western bypass was completed in 2017, while the southern part of a ring road around the city is expected to be completed by 2025. Kaunas western and northern ring road is heavily used by transiting traffic, 1435 mm rail gauge construction projects in Kaunas urban node are ongoing, with a view to connecting the reloading infrastructure that could be used when the North Sea - Baltic Rail Freight Corridor is extended to Latvia and Estonia by 2020.

Similarly as for other cities, in Riga, there are projects to improve the ring road and the urban road network. In addition, there are two projects for Riga rail junction and the port railway line to the northern port area Kundzinsala.

Tallinn is characterized by improvements needed for the last mile links. To avoid heavy trucks in the centre of Tallinn, the Tallinn Ring road project (expansion from 2-lane to 4-lane) and the new road connection to the Old Port in the centre of Tallinn are planned to be built on sea-side. Rail-wise, there are tram connection to the Old Port, as well as a railway bypass project (around Tallinn) to avoid dangerous cargo passing right through Tallinn on its route to the Paldiski Port.

As for Helsinki, the current last mile rail connections to the ports, the airport and the urban area are not sufficient. The ring road is lacking capacity and improvements are also needed here. Extra facilities to provide multimodal transport are needed for the maritime port terminals (Port of Helsinki West, South and Vuosaari). The quality of the railway lines within the node can be improved for the Helsinki shunting yard.

#### **4.7 Rail-road Terminals (RRT)**

There are both rail-road and tri-modal terminals in the port areas in the Netherlands. For Amsterdam and Rotterdam, there is at least one terminal that is compliant to the tri-modal terminal requirements.

In Belgium, RRTs and tri-modal terminals are located at the port of Antwerp. In the port area, several terminals have rail access on top of truck access. One of these terminals has open access to all operators.

Besides rail-road terminals, barge terminals enhance the capacity for freight transport to the main seaports in The Netherlands and Belgium.

In Germany, there are tri-modal terminals in several ports (Hamburg, Hannover, Berlin, Bremen, Bremerhaven, Dortmund and Cologne), as well as a well-developed network of rail-road terminals, owned either by the railway infrastructure manager or privately. All ports have at least one terminal which provides open access to all operators.

The network of the RRTs in Poland is under development, supported by EU Cohesion Funds. Three core areas designated for the RRT localisation are the urban nodes of Poznań, Łódź and Warsaw. All are conveniently located at the crossroads of two TEN-T



corridors (Baltic-Adriatic corridor and NSB). The highest number of RRTs is located in Poznań which capitalizes on its location as gateway to Poland from Germany.

There were two stand-alone RRTs completed in Lithuania – Vilnius and Kaunas intermodal terminals, others are developed in Klaipeda seaport.

There are no RRTs in Latvia, but they are planned to be constructed jointly with Rail Baltic project.

In Estonia, rail-road terminals (RRTs) exist in ports, but not on a stand-alone basis without the port, except a project idea to develop a dry port (RRT) at the outskirts of Tallinn. Rail Baltica project includes a new multi-modal Ülemiste RRT in Tallinn.

In Finland, the Corridor features a trimodal terminal in the port of Helsinki.

Further development of RRTs along the NSB Corridor is especially important in locations with cross-border impact and potential for modal shift.

#### **4.8 Major cross-border projects**

The most critical cross-border issue on the Corridor is the missing 1435 mm UIC standard gauge railway line from Tallinn to the Polish border through the Baltic States that needs to be addressed via the implementation of the **Rail Baltica project**. The standard gauge is completely lacking across two national borders from Estonia to Latvia and Latvia to Lithuania. Even though Lithuania has completed a dual gauge/parallel 1435/1520 mm track from the Polish border to Kaunas, this line has restricted speed limits of 80 km/h for freight and 120 km/h for passenger. The line is also currently without electrification or ERTMS.

It is planned that construction works for the Rail Baltica project in the different countries will start until 2020 and to be completed and tested in the three Baltic States by 2026 and the connection with Warsaw to be fully functional in a similar timeframe, in respect of the timeline to be agreed by the partners, as stated in the Rotterdam Joint Declaration of June 2016.

Without the full implementation of the Rail Baltica line, the flow of goods and services from the rest of the Single Market cannot pass easily by rail into the Baltic States and on to Finland or vice versa. The Corridor cannot operate at its full potential if the situation of two different gauges would remain in place. The freight and passenger rail traffic is currently low because the infrastructure in the North/South direction is not adequately connected or interoperable, and traffic is dominated by trucks and cars. The Baltic States can highly benefit from the symbiosis of the new Rail Baltica railway and the currently dominant East/West trade flow. The Baltic States also need to become better connected to the rest of the EU for strategic reasons in the current geopolitical realm.

Cooperation has already been engaged between the Baltic States in order to prepare for the project implementation, supported by the European Coordinator whenever required and with substantial financial support from the CEF (85% co-funding rate). To support the Member States holding shares in it, the Joint Venture RB Rail AS is fully responsible for coordination, implementation and facilitation of the Rail Baltica project.



Poland has completed upgrading works on the section Warsaw-Sadowne, is currently carrying out works on the section Sadowne-Czyżew and plans for Czyżew-Białystok-Ełk are being prepared. Analysis of options is ongoing in the framework of feasibility studies for the remaining cross-border section between Ełk and the Polish/Lithuanian state border. This should allow determining how the section north of Ełk can be developed in conformity with the TEN-T and CEF Regulations, taking into consideration the environmental issues as well as economic justification for each alternative. The results of the feasibility study shall be fully taken into account by the Member States involved in order to obtain a fully functional Rail Baltica and open the possibility to apply for co-funding from CEF for the detailed design and works in Poland from Ełk to the Polish-Lithuanian state border.

As regards the coherent development of the cross-border section between Lithuania and Poland, an action plan based on a step-wise approach will be deployed following the above mentioned feasibility study in order to ensure that the requirements of the Regulations are fulfilled as well as in line with the Intergovernmental Agreement of the Baltic States on the development of Rail Baltica and other key Rail Baltica implementation documents. Such close cross-border cooperation is crucial for the interoperability of the line, in particular when it comes to technical parameters of design speed, the deployment of ERTMS and the timeline of their implementation, as well as its future commercial viability.

Furthermore, within the framework of the Corridor, Vilnius is of course one of the capitals to be connected. In that perspective, a joint agreement has been reached that Vilnius will be connected by a 1435 mm line to the Rail Baltica north/south axis at Kaunas, ensuring that all Baltic States capitals and Warsaw are connected in the same network, in line with the Intergovernmental Agreement of the Baltic States on the development of Rail Baltica. The Baltic States have agreed that Kaunas-Vilnius connection would be phased so that the entire Project would not be delayed or stopped and to deploy joint efforts to achieve the eligibility of the Vilnius-Kaunas connection for European Union support under the Connecting Europe Facility or equivalent financing instrument.

In the longer term future, Helsinki and Tallinn reflect on the possibility to be connected with a submerged railway tunnel (the FinEst link). However, the project is in early stages and its economic feasibility is considered to be conditional on the success of Rail Baltica. Currently it is not anticipated that any significant investments relating to the FinEst link will be made before 2030, except for certain feasibility studies.

## **5. Addressing the challenges**

This chapter presents the overview of planned projects on the North Sea-Baltic Corridor by transport mode. During the 2014 Study, numerous projects have been identified mainly by the Member States and the involved stakeholders. Since completion of the 2014 Study many projects have changed significantly, therefore the project list has been updated and new information collected in 2016 and 2017. Furthermore, the project list was enriched by the input from the Connecting Europe Facility (CEF) transport call results, the new national infrastructure plans and the Rail Freight Corridor (RFC) implementation plan. Extensive consultations with the European Commission, Member



States and the Corridor Forum stakeholders have been conducted, in order to harmonise the project list and to ensure the completeness and accuracy of the information gathered.

The information presented about projects is preliminary and is based on the situation in July 2017. The projects identified will address both technical compliance and capacity issues described in the previous chapters.

## 5.1 Overview of the projects

### Number of projects and planned investments

The North Sea – Baltic project list of July 2017 contains **530 projects** with a **total value of 96.1 billion EUR**.

Figure 11. Number of projects per category

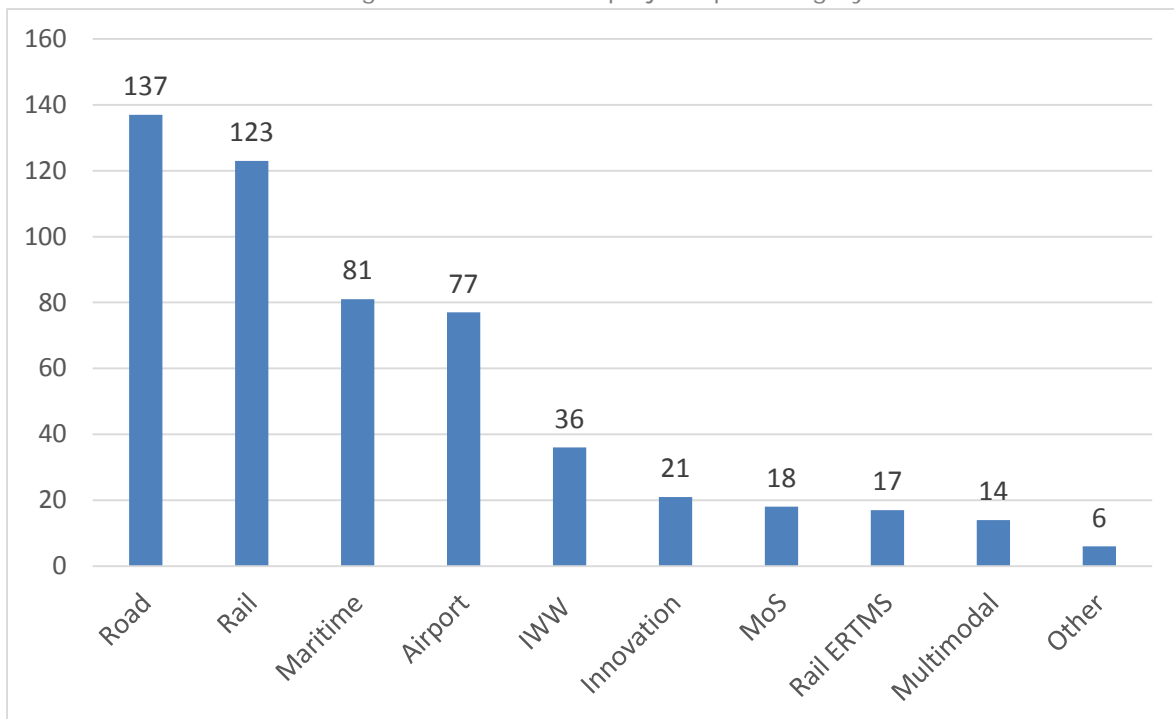
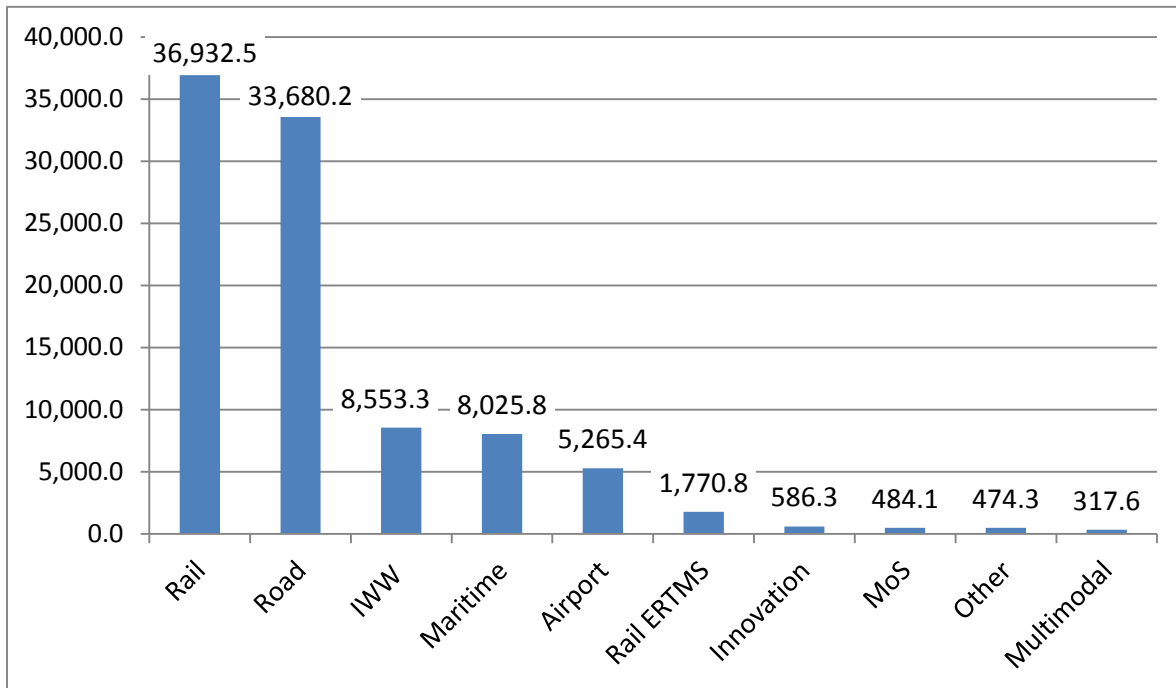


Figure 12 shows the investments per category. More detailed analysis about investments per major investment categories is provided below.



Figure 12. Investments per category [M EUR]



### Investments in rail

The planned investments per transport mode highlight the importance of the railway development on the NSB corridor. **Rail** demands for the highest share: **36.9 billion EUR** (+ 1.8 billion EUR for Rail ERTMS projects) out of in **total 96.1 billion EUR** or 38% are assigned to develop new rail connections and to eliminate bottlenecks.

The need for such a significant investment is highlighted in the technical compliance for certain requirements of the TEN-T Regulation. Investments relate to the Rail Baltica project (5.9 billion EUR), electrification of lines in the Baltic States (outside Rail Baltica project, close to 1 billion in LV and LT), new and upgraded lines in Poland (11 billion EUR), electrification, speed and capacity issues in Germany (11.6 billion EUR), speed, interoperability and capacity issues in Belgium (1.7 billion EUR), connection to airport and other projects in Helsinki (1.7 billion EUR).

### Investments in road

**Road** covers for **33.7 billion EUR** or 35% of the total investments due to the fact that most road projects deal with upgrading of already existing infrastructure, such as adding additional lanes or renewing bridges, which require significant investments. However, the required financing is an intermediate observation as there is missing information on the investments for 34 projects or 6%.

The planned investments will help solving congestion problems in Germany (9 billion EUR), The Netherlands (8 billion EUR) and Belgium (5.5 billion EUR). The project list covers the existing gaps in the east of Poland, enabling a connection to the Baltic States via motorway. Significant improvements are also planned in Latvia amounting to 3 billion EUR focusing on the Riga urban node and improvement of Via Baltica in some parts, as well as in Lithuania amounting to 1.4 billion EUR. The works do not coincide time-wise:

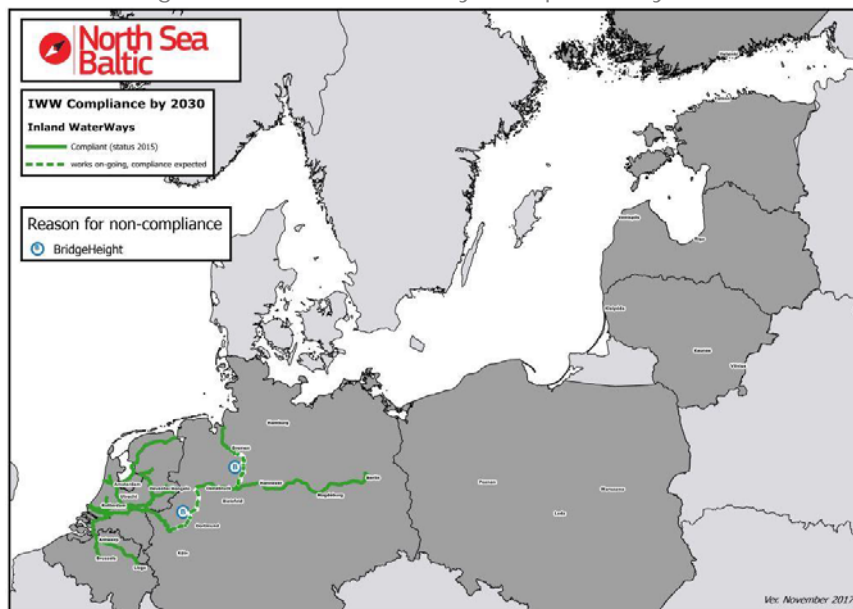
the Polish sections are expected to be completed by 2020. Lithuanian sections are expected to be completed by 2022 whereas the remaining Baltic States' sections are expected to be completed by possibly 2030. Additional investments would be needed in the Baltic States to reach compliance with the TEN-T standards for expressways by 2030.

## Investments in IWW

The largest investments in IWW will be made in Germany (6 billion EUR) mostly addressing compliance issues and in The Netherlands (2 billion EUR). IWW projects for Belgium are included within the North Sea-Mediterranean Corridor Work plan.

With the projects already started in Germany to reach compliance in terms of bridge height, the IWW network is projected to be fully compliant with the TEN-T Regulation requirements by 2030 as demonstrated in the map below.

Figure 13. Inland Waterways compliance by 2030



Going beyond compliance, there are eight projects covering a CEMT V upgrade; two of them are Zaandam and the Twente Canal. These are access or egress points of the Corridor. Assuming that the CEMT IV projects are finished by 2022-2024 and taking into consideration the time required to complete the rest of the CEMT Va projects, the soonest the corridor is foreseen - based on the existing project list- to be CEMT Va compliant is 2026-2028. The last project to finish is the IJssel section.

## Investments in Maritime

The investments in the maritime sector mostly relate to investments in ports in Estonia (1 billion EUR, port of Tallinn), ports in Latvia (2 billion, ports of Riga and Ventspils), and ports in Germany (3 billion EUR).

## Investments in Airports

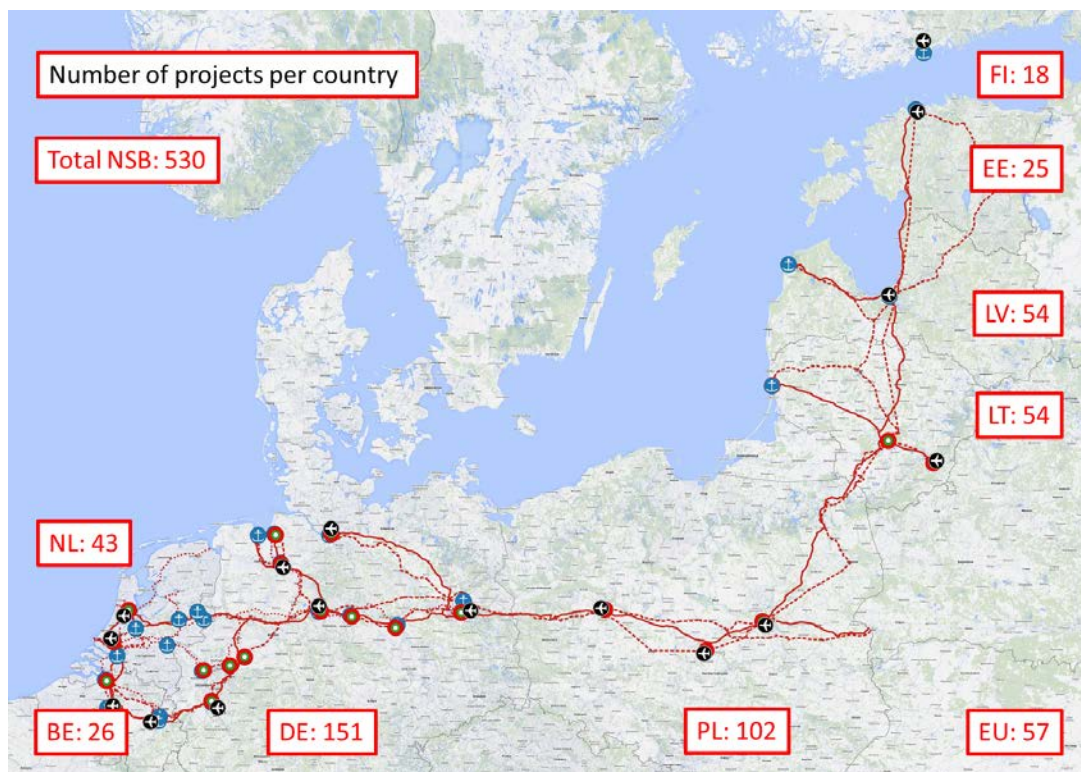


The investments in airports mostly relate to investments in airports in Finland (3.1 billion EUR<sup>10</sup>) and Germany (0.66 billion) and Poland (0.37 billion).

### Project distribution across NSB corridor countries

As shown in the figure below, the distribution of projects across the countries located on the Corridor is unbalanced. Germany (28%) and Poland (19%) contribute together already almost 50% of the total number of projects.

Figure 14. Number of projects per country



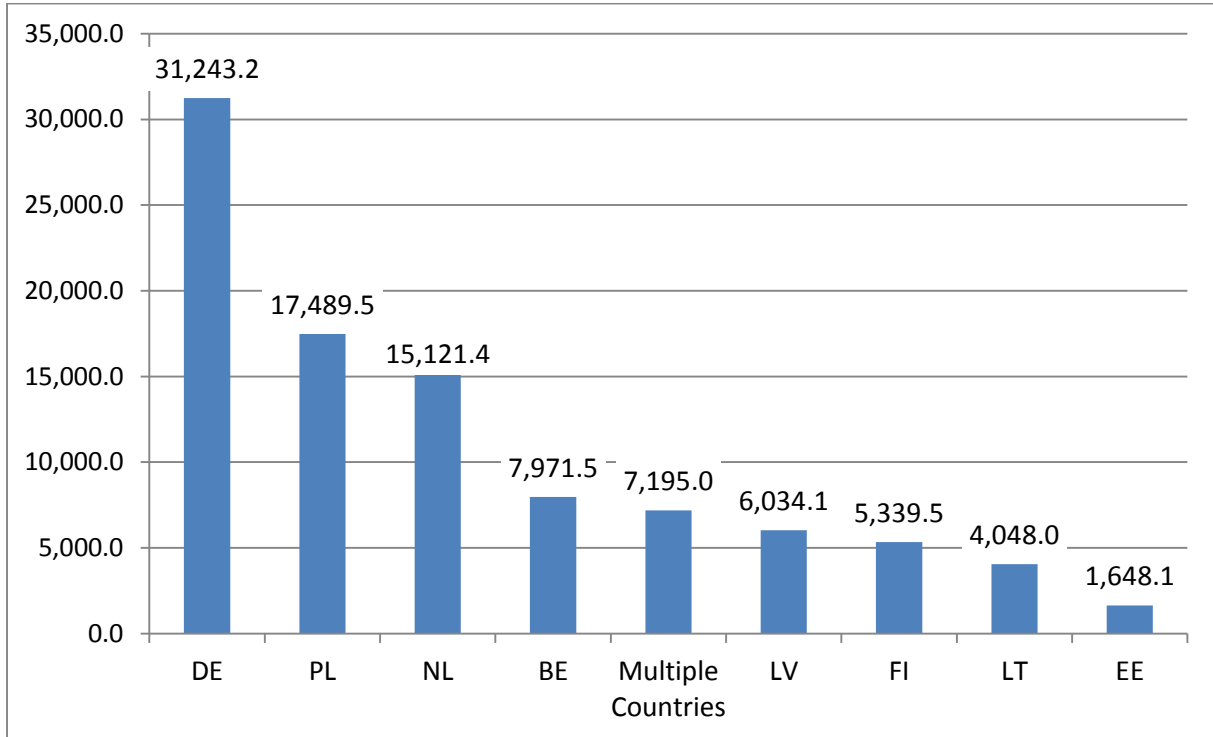
The number of Multiple Country projects is significant and amounts to 57 projects, many of which have received support via the 2015-CEF Transport Call for Proposals. The midfield is formed by Latvia (54 projects or 10%), Lithuania (54 projects or 10%) and the Netherlands (43 projects or 8%). Last but not least there is Belgium (26 projects or 5%), Estonia (25 projects or 5%) and Finland (18 projects or 3%).

The figure below presents the investments planned per country across the NSB Corridor.

<sup>10</sup> 773 M EUR from the project have already been completed.



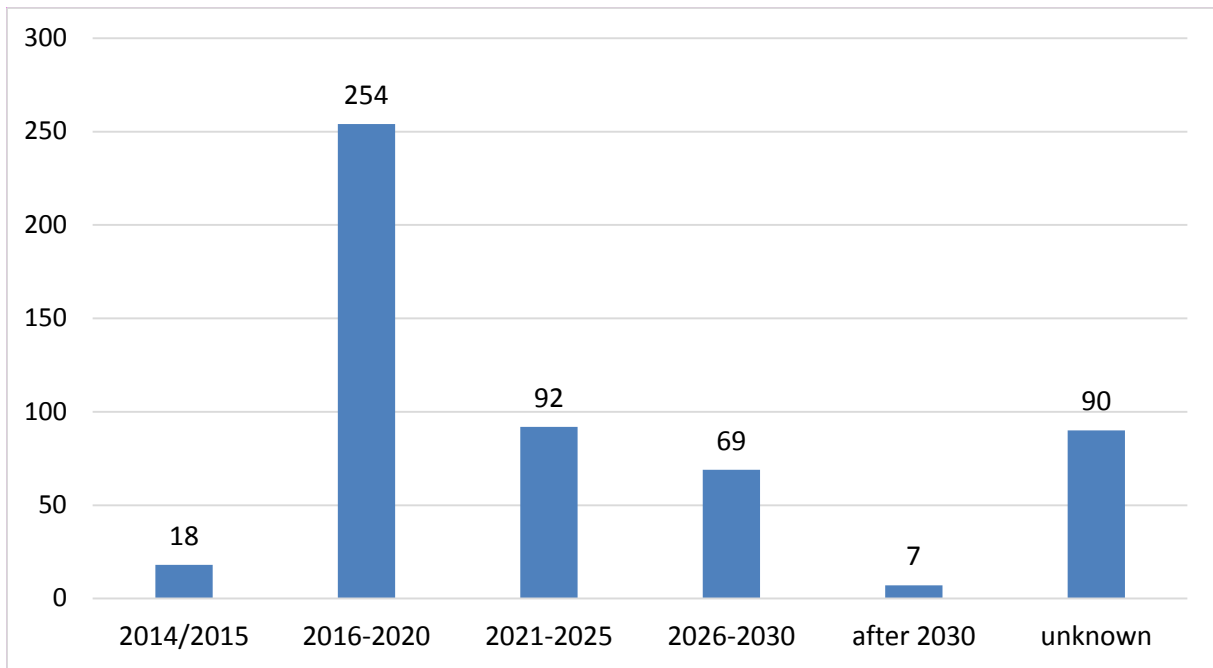
Figure 15. Investments per country [M EUR]



### The timeline of planned investments

As shown in the figure below, more than half of the total number of projects in the project list will be implemented by the end of 2020 (51%). This clearly shows that the realisation of a large number of projects is already ongoing. Another 30% will be finished by 2030, which is just in time for the fulfilment of the TEN-T technical compliance requirements.

Figure 16. Number of projects to be finished



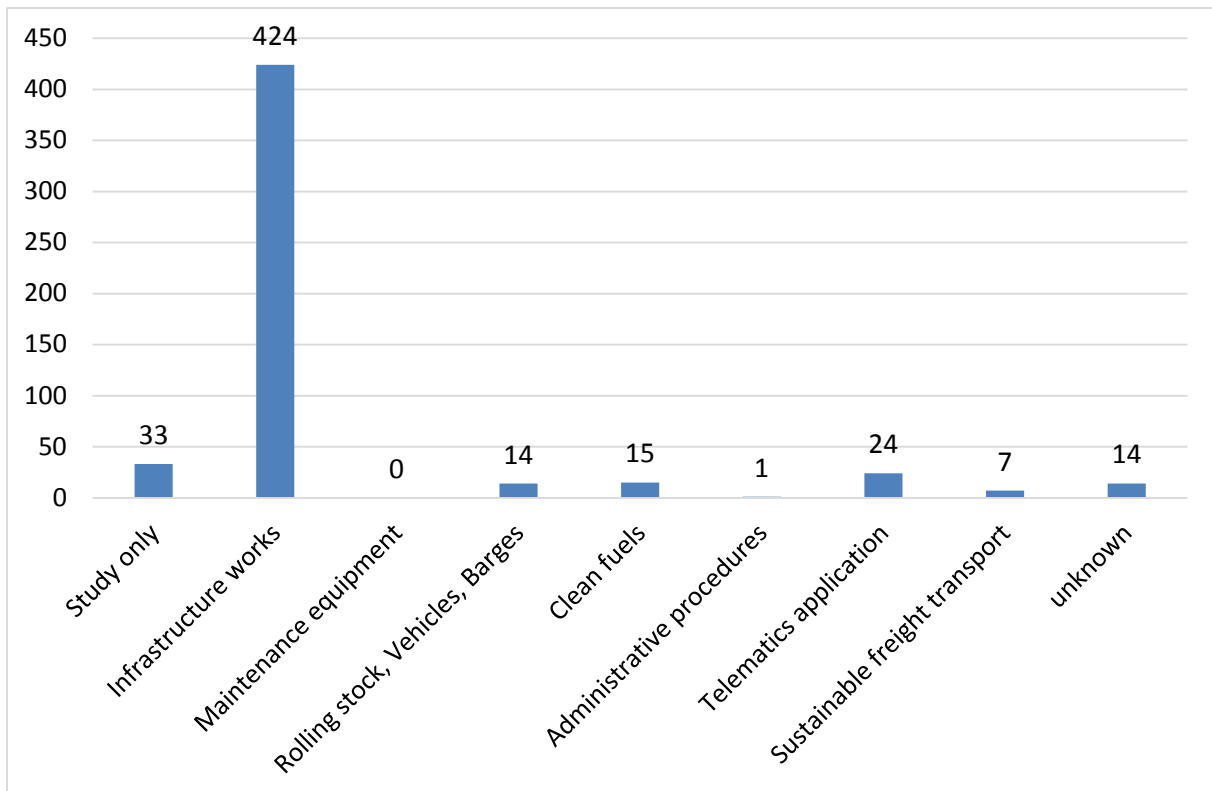
Only five road projects in Latvia and two maritime projects in Germany will not be finished by 2030. However, the road projects would improve the KPI Express road/motorway and therefore should be speeded up in order to finish them by 2030 at the latest. The two maritime projects do not influence achieving the TEN-T Regulation requirements for the NSB corridor, since all projects improve sections which already fulfil the requirements.

Furthermore, there are 90 projects (17%) where the end-date of the project is not yet known. This missing information is partially due to actual uncertainty about the end date (“open”) and partially due to unavailability of data.

### Project allocation by scope of work

According to expectations the vast majority of **424 projects** (80%) deals with **infrastructure works** (rehabilitation and/or upgrade and/or new construction, partially combined with other scopes of work). Pure Telematics projects mostly deal with ERTMS, ITS applications, RIS or SESAR, depending on the respective category. Rolling Stock projects predominantly refer to the equipment of locomotives with ETCS components. Next to these “work oriented” activities, 33 (6%) of the NSB projects focus on providing a study. For an overall overview, the scope of work for the NSB projects is displayed in the figure below.

Figure 17. Main scope of work per corridor project



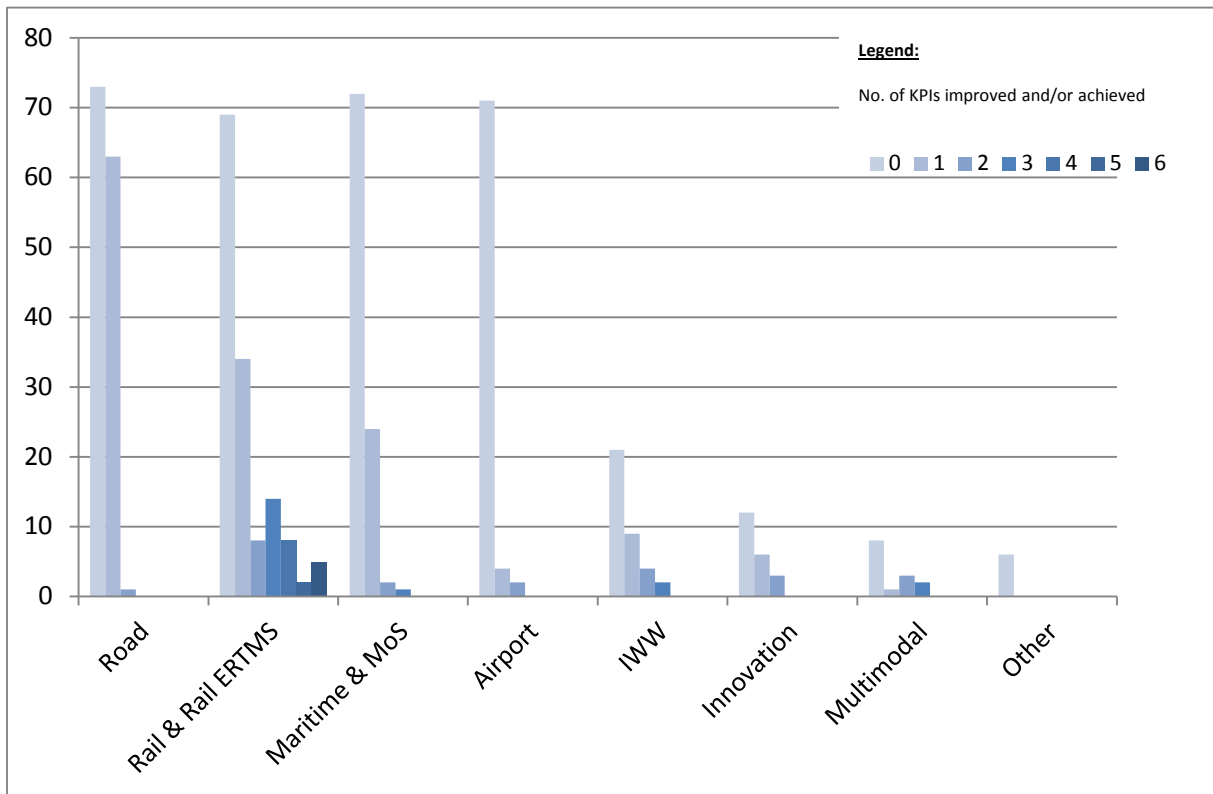
### Project contribution to Corridor's compliance with technical criteria defined in TEN-T Regulation

Many of the projects contribute to compliance of technical infrastructure with the requirements of the TEN-T Regulation and KPIs defined to measure the development of all core network corridors. **198** of overall 530 projects (37%) **contributed to at least one KPI** (achieved and/or improved). As the figure below visualises, particularly Rail projects feature a high contribution rate with up to six KPI contributions. In this context, four or more KPIs mostly are an indicator for (totally or partially) new built rail lines.

In contrast, only a few airport projects improved or achieved the KPIs targets. This is due to the fact that the majority of the airport infrastructure did not need any additional projects in order to fulfil most TEN-T requirements, thus the respective projects provided no progress with respect to achievement of these target values.



Figure 18. Contribution of NSB projects to the KPIs by category

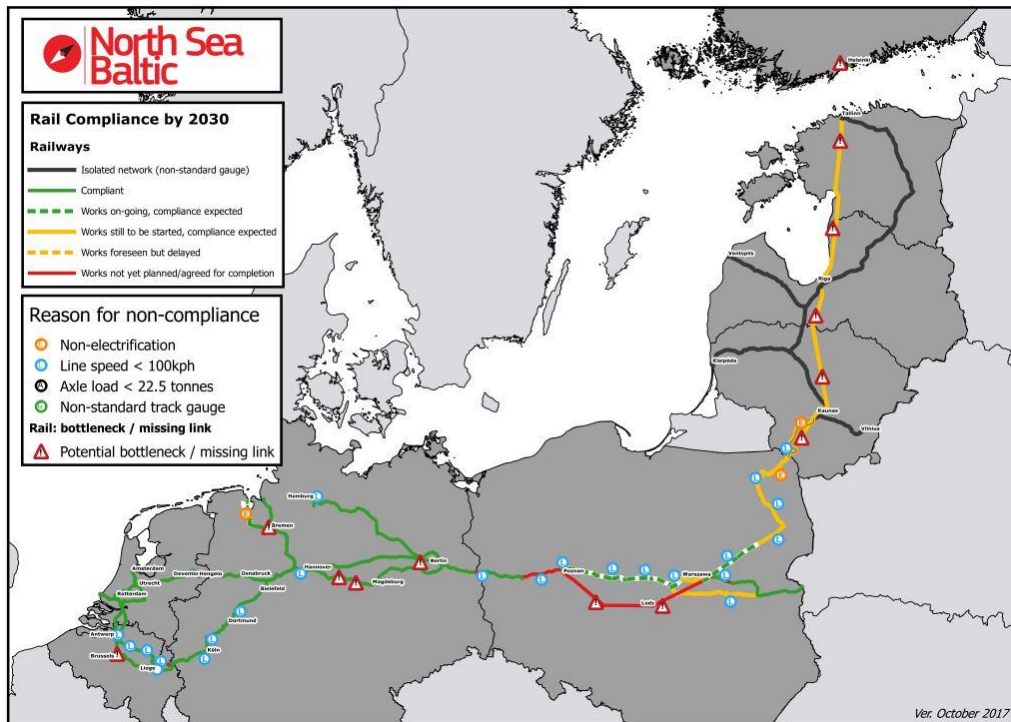


The fact that about 63% of all NSB projects showed no KPI contribution does not mean that these projects have no relevance for the Corridor development. They do not match the selected KPIs but instead, they provide impact on other criteria, particularly on capacity, safety, high-speed rail connections or noise reduction.

Almost 100 projects requiring 30 billion EUR of investments will contribute significantly to the improvement of technical compliance issues as it is demonstrated in the map below on the projected compliance situation in 2030, based on the current project list.

Figure 19. Rail compliance by 2030

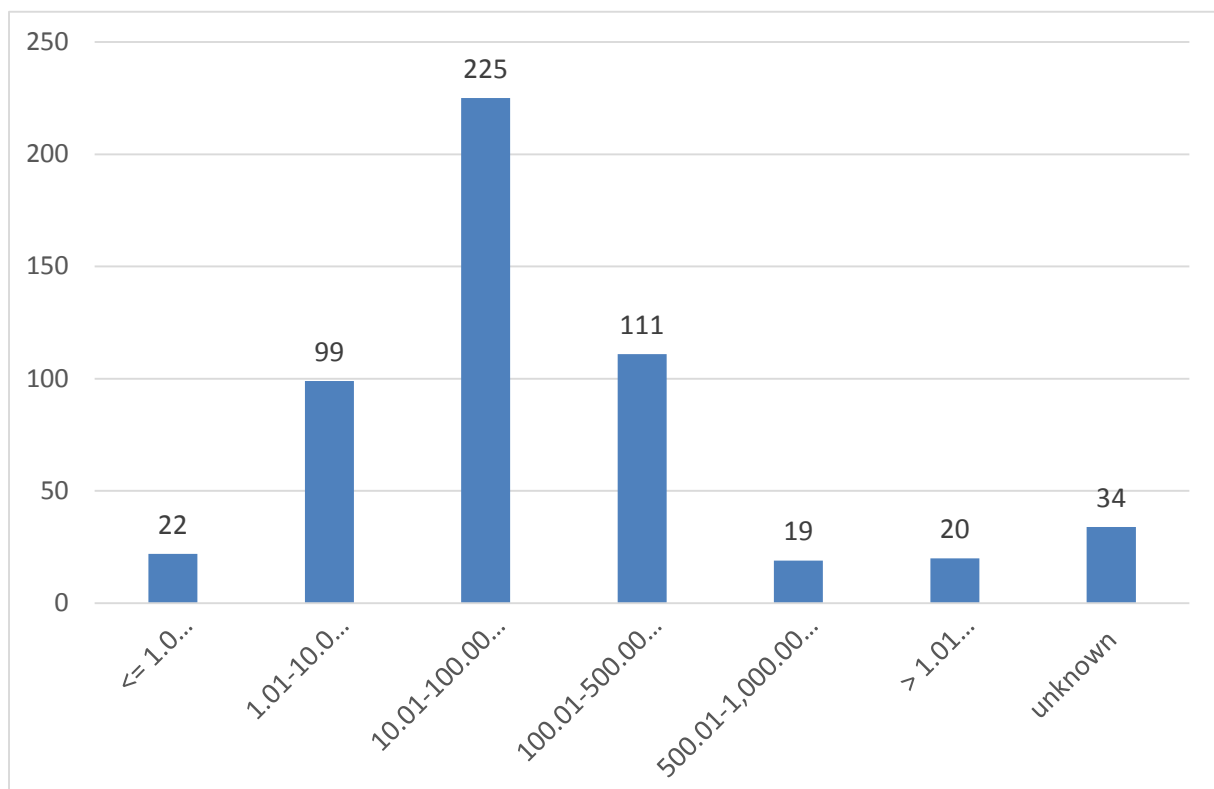




## Projects per investment class

The project specific costs show a large variety, reaching from 10,000 EUR for a small study up to 5.8 billion EUR for the Rail Baltica new construction project (this figure does not include upgrades in Poland and specifies the investment in the Baltic States only). As the figure below points out, most of the projects are attributed to the classes "10-100 M EUR" (42%), "100-500 M EUR" (21%) and "1-10 M EUR" (19%).

Figure 20. Number of projects per investment class (M EUR)





## 5.2 Project mapping

In order to assess the financing needs and project maturity the identified projects have been categorized based on the common methodology applied by all Core Network Corridors that uses two groups of criteria:

1. **Project relevance:** related to the purpose of the intervention and its capacity to meet TEN-T and EU priorities, as set by Regulations 1315/2013 and 1316/2013 (reflected by the technical parameter and bottlenecks tackled by the intervention). Weighting factor 0.6.
2. **Project maturity:** derived by the assessment of the project's technical and institutional readiness, financial/economic maturity and social/environmental maturity. Weighting factor 0.4

The project prioritization was applied to all 530 projects, out of which 118 projects were marked as innovation projects and 422 projects are transport mode related projects. Based on the above criteria, projects were assigned to four clusters, where cluster 1 represents the projects ranking the highest.

### General ranking

When considering the general ranking, transport modes with the highest average rank are IWW (0,8) and Rail (0,7), followed by Road (0,55), Maritime (0,54), Multimodal (0,52), while the lowest average rank is reached by Airport investments (0,40). The table below presents clustering results by number of projects per transport mode.

Table 12. General ranking of number of projects per cluster

Average rank		Number of projects					
		Cluster 1 [1,00- 0,75[	Cluster 2 [0,75- 0,50[	Cluster 3 [0,50- 0,25[	Cluster 4 [0,25- 0,00[	Clustering not applicable	TOTAL
Airport	0,39		9	31	8		48
Innovation	0,61	20	53	16	10		99
IWW	0,79	13	6	3			22
Maritime	0,54	11	16	17	10		54
Multimodal	0,52	1	4	5	1		11
Rail	0,76	63	33	7	9		112
Road	0,55	27	18	50	15		110
Clustering not applicable						74	74
<b>TOTAL</b>	<b>0,60</b>	<b>135</b>	<b>139</b>	<b>129</b>	<b>53</b>	<b>74</b>	<b>530</b>

The table below presents clustering results by transport mode based on the project list. More than 50 % of the overall investments needed fall under cluster 1.

Table 13. Amount of clustered projects in million euros



	Amount in million euros					
	Cluster 1 [1,00- 0,75[	Cluster 2 [0,75- 0,50[	Cluster 3 [0,50- 0,25[	Cluster 4 [0,25- 0,00[	Clustering not applicable	TOTAL
Airport		347,38	1.156,68	13,23		1.517,29
Innovation	1.893,94	5.863,17	6.825,17	103,55		14.685,82
IWW	6.339,39	695,23	200,17			7.234,79
Maritime	676,52	2.540,43	2.426,57	744,85		6.388,37
Multimodal	43,50	146,00	115,00	2,00		306,50
Rail	27.822,11	7.377,51	713,75	262,45		36.175,82
Road	12.638,38	2.896,97	8.401,55	829,33		24.766,23
Clustering not applicable					5.015,48	5.015,48
<b>TOTAL</b>	<b>49.413,84</b>	<b>19.866,69</b>	<b>19.838,89</b>	<b>1.955,40</b>	<b>5.015,48</b>	<b>96.090,30</b>

Rail has the largest number of high-priority projects (i.e. score comprised between 1,00 and 0,75) compared to the other transport modes. Indeed, 66 projects out of the 142 which fall into the cluster 1 belong to the rail transport mode. Rail is followed by Road and IWW in the cluster 1.

Rail also has the largest number (34) of projects in the second highest priority rank (cluster 2; [0,75-0,50]), while Road is the transport mode with the highest number of projects in the lowest categories, which can explain the relatively low average rank for this mode. Almost all the IWW projects are assigned to cluster 1 (15 out of 24 projects) and cluster 2.

### 5.3 Success stories

Progress in the implementation of the Corridor since it was established in 2013 can be illustrated by several examples of projects accomplished over the past years.

The project of “Twin port” is a joint project of both Helsinki in Finland and Tallinn in Estonia implemented by Port of Helsinki and Port of Tallinn with support from the TEN-T programme. The project was started in 2012 and was finished in 2015. The overall project total value was 44,25M EUR. On the Finnish side of the project contributed to improve street traffic arrangements and port signposts, increase parking space, develop automation, and build new berths, as well as improve the overall seaways, while on the Estonian side of the project it contributed an investment into traffic improvements and port logistics in Tallinn old harbour.

The project “S8 Marki expressway bypass” just outside Warsaw was completed in December 2017. Marki bypass will resolve one of the most severe bottlenecks along the North Sea – Baltic CNC roads, just at the beginning of Via Baltica. The new 6-lane



expressway, which was supported from the Cohesion Fund, will reduce travel time, relieve urban traffic congestion, and improve the safety of road users.

The German Federal Ministry of Transport and Digital Infrastructure promoted an IWW project part of which was the new construction of an additional lock in Minden. In addition the project covers the upgrade of the Middle Weser in respect to deepening the fairway and raising the height underneath bridges, which was supported by the TEN-T programme. Both measures ensure the achievement of the respective corridor objectives: CEMT class  $\geq$  IV and Draught  $\geq$  2.5m. The work on the lock started in 2010 and lasted until August 2017. The lock offers sufficient capacity for the operation of modern efficient motor barges and thus greatly improves the hinterland connection of the seaports in Bremerhaven and Bremen. The total project costs were 206M EUR, of which 80 MEUR are allocated to the lock.

Important rail and road connections like Hamburg-Berlin or Hannover-Berlin have also been significantly improved.

Also in Germany, the A30 bypass of Bad Oeynhausen closes a gap on a major international transport route. Completing the East-West axis from the Netherlands via Hannover/Berlin/Warsaw to the Baltic States means a significant improvement for transport business. Furthermore the citizens of Bad Oeynhausen will benefit from mitigation of air and noise pollution caused by approximately 50.000 vehicles per day.

A success story in The Netherlands is the project of Utrecht Centraal. The goal of the project was to increase capacity of passenger handling at Utrecht Central Station and at the same time not to hinder freight traffic. The passenger traffic at this railway hub is high and will continue to grow. The contribution to the TEN-T network of this project by facilitating passenger transfer on the rail section Amsterdam – Utrecht – Frankfurt on the Rhine-Alpine Corridor without hindering freight and passenger traffic from Rotterdam to Germany on the NSB Corridor. The stakeholders of this project are The Ministry of Infrastructure and the Water Management and Infrastructure Manager Prorail. It was performed in the period 2009-2016 at a budget of 346M EUR.

Vilnius western part of ring road, financed by structural funds, and accomplished in 2017, is also a success story.

## 5.4 Innovation deployment

Innovation deployment on the Corridor is measured based on a categorisation of projects that has been agreed among all 9 Core Network Corridors.

In order for a project to be defined as "innovative" (i.e. contributing to the development or deployment of innovative solutions), it has to contribute to at least one of the following elements:

- Telematics (including ERTMS level 3);
- Data sharing and real-time predictive analysis;
- Efficient management and governance structures;
- Innovative transport services;
- Significant safety and security improvements;
- Low carbon and decarbonisation;



- Innovation dissemination;
- Cybersecurity and data protection;
- Climate change resilience and transport greening;
- Other externalities reduction, e.g. rail noise.

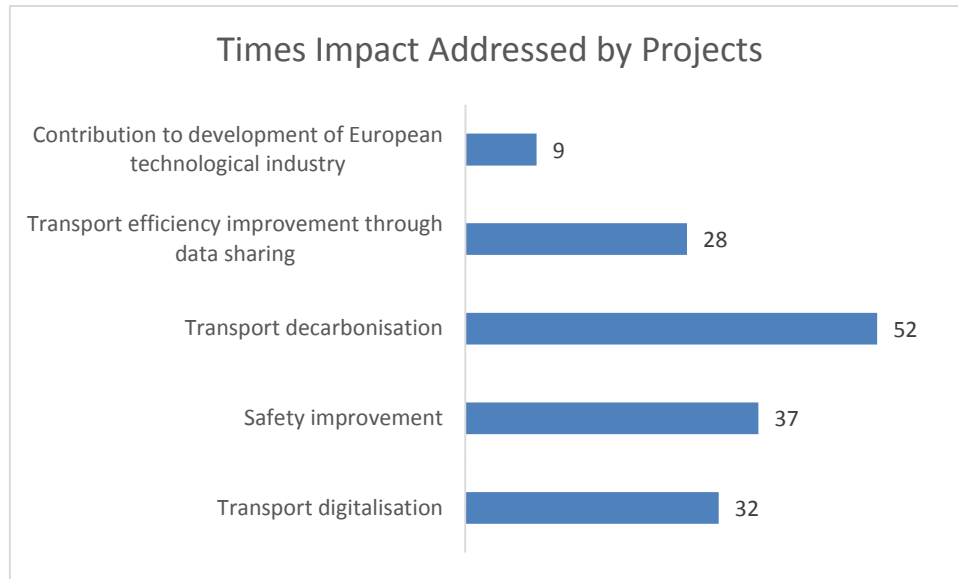
Out of 530 projects of the North Sea Baltic corridor, 113 (or 21%) have been identified as innovative. The cost of these innovation projects is 19% of the total planned investments. 19% of the costs for 21% of the total projects makes the innovations projects moderately financially significant. The moderate costs are due to a number of road projects which have innovative elements, but also infrastructure construction.

Of the 113 innovative projects, 22% are categorised as "Radical" or "Incremental" innovation, or state-of-the-art. 78% represent Catch-up innovation, these are known as projects related to innovation which is transferable innovation across the EU. The Catch-up innovation typically has already been successfully implemented in one region or country. In total 87% of the projects are transferable. Almost half of the projects (41%) are scalable projects, meaning that they apply a solution in a new field, or that the project has multiplier effects.

In terms of modes of transport, road has the most innovation projects, followed by maritime, airport, IWW, MoS and Rail projects. Of the road category, most of the innovation projects are on alternative fuels and safe and secure parking. On ERTMS there are no projects confirming that baseline 3 will be used in the deployment phase. ERTMS Baseline 3 is defined as the most innovative form of telematics in rail.

The impacts of the innovative projects are counted and presented in the figure below. Counting does not show the magnitude of the impact, however counting does indicate how often one impact is felt on different sections of the Corridor. The fact that transport decarbonisation is the most counted impact (52 times) implies that innovation in this field is taking place on several locations. Those projects strengthen for example the alternative fuel infrastructure of the Corridor. The impact of contributing to the European technology industry is counted least, 9 times. This implies that there is a room for improvement in the next CEF calls on this topic.

Figure 21. Impacts of the innovative projects on the NSB corridor, multiple impacts per project are possible.



## 5.5 ERTMS deployment

On 5 January 2017 the European Commission adopted the Implementing Regulation (EU) 2017/6 on European Rail Traffic Management System **European Deployment Plan** (ERTMS EDP) that replaces the old deployment plan of 2009. The reviewed ERTMS EDP adapts the geographical scope of deployment to the TEN-T Regulation, and sets new targets for ERTMS deployment on CNC's until 2023. These target dates are firm commitments made by Member States and Infrastructure Managers during the consultation and negotiations, led by Mr. Vinck, European ERTMS Coordinator, between 2014 and 2016.

In 2023, the ERTMS European Deployment Plan will be updated again setting out the precise implementation dates for the remaining part of the Corridors between 2024 and 2030. The European Coordinator for ERTMS proposed this two-step approach for defining the consistent deployment of CNC's by 2030 which was appreciated by all affected stakeholders. This approach ensures that the reviewed EDP sets out more realistic dates and therefore it can serve as the basis for business planning of railway undertakings.

The deployment of an interoperable Single European Rail Area has faced numerous barriers until now. An important step is the adoption by the Commission of the **ERTMS Deployment Action Plan**<sup>11</sup>, which defines the actions to remove all identified obstacles with the responsible parties in the frame of well-defined timelines. This Action Plan is the last step in a thorough analysis of the ERTMS deployment in the European Union, followed by detailed negotiations with the Member States and the Rail Sector, including their commitment in terms of actions and execution times.

<sup>11</sup> Commission Staff Working Document SWD(2017) 375 final " Delivering an effective and interoperable European Rail Traffic Management System (ERTMS) – the way ahead", adopted on 14 November 2017



## 5.6 Motorways of the Sea

In parallel to my work programme, Brian Simpson, the European Coordinator for Motorways of the Sea, delivered on the second version of the Motorways of the Sea (MoS) Detailed Implementation Plan (DIP).

The document, following extensive consultations with stakeholders and Member States, presents a number of recommendations to shape the MoS programme of tomorrow in close coordination with other European Coordinators.

The DIP singles out the key three future development priorities:

- Environment
- Integration of maritime transport in the logistic chain
- Safety, Traffic Management and Human Element.

The MoS work programme is instrumental in identifying future TEN-T policy maritime objectives and it clarifies the main areas that would require EU financial contribution in order to help the maritime industry to improve its environmental and safety performance.

It also includes a number of suggestions with the objective to contribute to the increased efficiency of the logistic chain within the 9 Core Network Corridors by pointing out to gaps in terms of maritime links.

Brian Simpson's work programme comprises also a set of recommendations defining possible future funding objectives with regard to maritime dimension of the TEN-T policy paying particular attention to future trends in Short Sea Shipping in Europe and the crucial MoS contribution to better connectivity with peripheral and outermost regions.

The document makes an effort to characterize the main bottlenecks and investment needs in the Comprehensive Network of ports as well as point out the main inadequacies when it comes to current network of MoS links.

## 6. Environmental and socio-economic effects of the Corridor

### 6.1 Impacts on jobs and growth

The impact analysis of the Corridor's investments on growth and jobs is based on the projects to be developed and has been calculated by applying a multiplier methodology. For impact assessment all projects were classified into three categories: Cross-border projects; Innovation projects; and "Average" for all types of projects. For each category, a specific multiplier - based on the 2015 study on the cost of non-completion of the TEN-T - was used.

Table 14. Multipliers used for the growth and jobs analysis derived from the study of Cost of non-completion of the TEN-T (2015)

Categories	Average	Type of investment		Unit of
		Cross-border	Innovation	





				measurement
<b>GDP-Multiplier</b>	<b>4,35</b>	<b>16,8</b>	<b>17,7</b>	bn€-GDP / bn€-INV
<b>JOB-Multiplier</b>	<b>16.300</b>	<b>37.000</b>	<b>38.700</b>	FTE-JobY / bn€-INV

The projects for which cost estimates are available and that are planned to be implemented over the period 2016 until 2030 amount to an investment of 96 billion EUR. The implementation of these projects will lead to an increase of GDP over the period 2016 until 2030 of 715 billion EUR in total. Further benefits will occur also after the year 2030.

The investments will also stimulate additional employment. The direct, indirect and induced job effects of these projects will amount to 2,061,000 additional job-years created over the period 2016 to 2030. It can be expected that also after 2030 further job-years will be created by the projects.

## 6.2 Modal shift and impact on decarbonisation and climate change adaptation

### The Corridor and climate resilience

The North-Sea Baltic corridor stretches from a temperate oceanic climate in the west to a gradually more (temperate) continental climate in the east. Belgium, Germany, and Poland will experience a relatively high (but not extreme) increased vulnerability of road pavement to heat stress in the period up to 2100. The Netherlands and the Baltic States are less affected due to the tempering effect of the sea. Southern Germany will experience an average increase in rail buckling vulnerability. However, for the whole Corridor, there is no large increase of the vulnerability expected.

Bridges in the Baltic States (in particular Estonia and Latvia) are expected to encounter significantly increased scour risk. Up to 2050, the Corridor area will become wetter. After this period Belgium, the Netherlands, and Western Germany will contain more areas affected by drought due to climate change. The sea level of the North Sea will likely increase more than the Baltic Sea's sea level.

The North-Sea Baltic project list has four identified projects related to climate change resilience. Two projects are linked with RIS. A fully operational RIS system helps shippers deal with the effects of climate change on short term. For example, changing water levels known in advance for shippers so that they can adjust their load (and therefore ship depth) to make an economically viable and safe journey. The outcome of the system is information, not physical constructions to deal with climate change on the inland waterways. Long term measures against climate change are not included in RIS.

To a lesser degree ITS for road also provides information that helps users resilience to climate change on short term.



Two other climate resilience projects are related to airports, Łódź Airport and Poznań Airport have projects on pre-treatment of the rainwater distribution system. This helps the airports independence when it comes to urban storm water.

## **Modal shift and decarbonisation**

In order to measure the Corridors' impact on modal shift and decarbonisation, a set of reference forecasts for the NSB corridor have been constructed, based upon the results of the European Commission's Reference forecasts published in 2016. These are reference forecasts for traffic growth and impacts for the Corridor, however, the forecasts do not specifically include changes or shifts assumed to arise directly from the Work Plan measures.

Corridor traffic has been defined in these forecasts as the total passenger-km and the total tonne-km performed on the sections of the Corridor, including all geographical categories; cross-border, inter-regional, and intra-regional. To date, no equivalent feasible methodology for including maritime traffic has been identified, and certain smaller categories such as air-freight and passenger/recreational inland waterway traffic are also excluded from the results. However, data for key short-sea maritime sectors is included in the market analysis.

The EU Reference forecast essentially predicts a gradual growth in demographic, economic and transport activity, but with decoupling of energy consumption and CO<sub>2</sub> emission factors. Overall, the Corridor is estimated to experience a 7% growth of passenger-km, and 19% of freight-km, with around 10% of energy demand (for transport), and 10% of CO<sub>2</sub> emissions (from transport).

Passenger traffic, as anticipated in the market analysis, is dominated by road and aviation, whereas freight has a more equal balance for inland waterway and rail. Passenger traffic is forecasted to increase from 129 billion passengers-km today to 153 billion passengers-km by 2030 (road, rail and aviation). Road and aviation account for about 86% of the total, and the fastest growing sector is forecast to be aviation (at 2.0% per annum).

The shares for rail and especially inland waterway transport are quite variable across different regions of the corridor (not only due to the IWW focus on the western part of the corridor). Freight traffic is forecasted to increase from 213 billion tonne-km today to 271 billion tonne-km by 2030 (road, rail, and inland waterway). Rail is forecast to grow at the fastest rate (3.2% per annum), overtaking road tonne-km in the period 2030-2050.

Energy efficiency is forecasted to increase over the 2015-2030 time period, and emission factors are estimated to fall. Total GHG emissions are expected to fall from 30.3 million tonnes of CO<sub>2</sub> equivalent to 29.7 million tonnes across the selected traffic flows, by 2030, although they are expected to increase back again to 30.3 million tonnes by 2050 due to further traffic growth. Most of the 2030 decrease in CO<sub>2</sub> is attributable to greater efficiency in the passenger road sector, where relatively low expected growth is outweighed by increases in efficiency. In the freight sectors and in aviation, traffic growth outweighs efficiency gains.



In 2015, it is estimated that for the Corridor, 60% of GHG emissions arise from road (30% from passenger and 30% from freight), 19% from passenger air and 20% attributable to rail and inland navigation. By 2050, the three highest emission sectors still account for 95%, but the shares are expected to change so that passenger aviation accounts for 22%, passenger road for 23% and road freight for 30%.

## **7. Infrastructure funding and innovative financial instruments**

Out of 530 projects on the Corridor project list accounting for 96.1 billion EUR, a total of 309 projects, or 58% present complete financial information amounting to 64.5 billion EUR which is divided into the financial sources sustaining each one of the analysed projects' cost:

- Member State financing or public grants - 50.8 billion EUR
- EU Funds - 8.5 billion EUR
- Private or own resources - 3.1 billion EUR
- EIB, bank loans- 2.1 billion EUR.

The EU grants share of the total is then further divided into subcategories related to their origin: CEF - 4.1 billion EUR; Cohesion Fund - 3.3 billion EUR, other - 1.1 billion EUR.

### **7.1 Connecting Europe Facility support to the Corridor**

The current portfolio of Actions in the North Sea Baltic corridor comprises 76 grant agreements allocating 3.1 billion EUR in CEF funding for a total investment of 4.8 billion EUR. Among these, 67 grant agreements have been signed following the 2014-2016 CEF Transport calls for proposals, 1 is under preparation following the 2016 call and 8 are under preparation following the 2017 Blending-1 Call. The majority of this funding relates to the Cohesion ring-fenced financing amounting to 2.74 billion EUR, while projects supported from the general CEF received 335.84 M EUR. Around one quarter of the granted CEF support relates to multinational projects involving partners from several Member States.

The largest share of funding is allocated to rail projects amounting to 2.4 billion EUR followed by road projects with 496.6 M EUR. The Corridor projects by type include works amounting to approximately 2.1 billion EUR, while studies account for 65.7 M EUR and mixed projects for 900.8 M EUR.

The largest CEF funding recipient is Poland with total amount of 1.9 billion EUR, followed by Lithuania with 367.6 M EUR, Latvia with 263.3 M EUR and Estonia with 202.8 M EUR. Other Corridor countries received significantly smaller financing. Such an allocation of funding is mostly due to the fact that majority of funding is based on Cohesion fund ring-fenced financing and mostly relates to Cohesion Fund countries and also due to large and strategic projects such as Rail Baltica.



These projects are fully in line with the priorities of the Corridor Work Plan, but far from sufficient to achieve the objectives set for the realisation of the Corridor.

## 7.2 Considering 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 (European Structural and Investments Funds (ESIF), Connecting Europe Facility (CEF), it will be in the interest of a timely implementation of the North Sea-Baltic corridor network to look for additional financial means. This is why I strongly recommend considering alternative ways of financing such as the use of innovative financial instruments. A careful examination of the potential financial sources has to accompany the Corridor planning.

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

- **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 ramp-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).

- **Hard-infrastructure, greenfield, risky, long-term projects** might require a substantial public support through public funding, even if innovative approaches can apply to project development and/or to specific components of the investment. Public funding can be structured in different ways (also depending on the budgetary constraints of the public authorities) such as lump sum subsidy (grant), fiscal incentives, operational deficit coverage and availability payment schemes.
- 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 centrally 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 Investments (EFSI).

For these 3 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 the 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. 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.

Within the North Sea-Baltic Corridor, a screening exercise on the projects' list has highlighted the following projects for their future potential development through Innovative Financial Instruments:

- Alternative fuels infrastructure;
- Rail connections to airports and airport capacity expansions;
- Port development projects;
- City ring roads.

### **7.3 EIB financial support**

During the last years EIB as part of European Funds for Structural Investment (EFSI) management has made significant contribution to NSB Corridor development by providing financing to large and strategically important projects. The financing was



provided to different NSB countries including the Netherlands, Germany, and the Baltic States.

For example, the EIB is going to provide financing amounting to 284 M EUR via EFSI to Germany for the A10/A24 motorway section near Berlin.

The EFSI investments in the Baltic States include a foreseen possibility of financial support of 30 M EUR to for the rehabilitation and modernisation of infrastructure in Vilnius Airport, approved financing to the PPP project on E67/A7 main road south of Riga, and a signed EFSI loan amounting to 30 M EUR for the upgrade of Tallinn Airport to enhance environmental and safety performance, alleviate congestion and accommodate future traffic growth.

In the Netherlands EFSI financing has been provided for A16 Rotterdam motorway reconstruction, to increase capacity and improve road safety, a PPP project with a total cost of 1 billion EUR.

In addition to EFSI, EIB and other financial institutions have been supporting Member States and private infrastructure developers by providing project financing based on a standard lending procedures. EIB loans signed in 2016 and 2017 include for instance the capacity expansion of Helsinki and Amsterdam Schiphol airports, the E75 railway section between Sadowne and Białystok, as well as the S8 expressway connection between Warsaw and Via Baltica in Poland, as well as infrastructure funds in the Baltic States (Baltcap) and for the modernisation of the Polish railway network. Other projects supported by EIB loans in 2016 and 2017 include urban infrastructure and rolling stock in Helsinki, Riga, Warsaw, Łódź, Poznań and Rotterdam.

## **7.4 Blending grants and financial instruments**

The first CEF blending call opened in February 2017 with cut-off dates in July 2017 and April 2018. It was focused on the projects of common interest in the transport sector aiming at maximising the leverage of private investment and capital in the delivery of CEF transport projects. There was a high interest between different potential beneficiaries and it was evidenced by 68 applications submitted out of which 65 were eligible with required financing 2.17 billion EUR in comparison to 1 billion EUR allocated to CEF blending call. The majority of projects or 24 out of 65 related to Core Network Corridors providing further evidence of the importance of the Corridor concept, the second largest project group or 15 out of 65 projects related to innovations as being one of the main future transport efficiency and effectiveness increase drivers.

The North Sea Baltic Corridor was well represented with 16 project applications for the first call cut-off date in July 2017. Out of the projects selected in this first wave of applications, 13 relate to the NSB Corridor infrastructure. 8 projects were selected with recommended CEF funding of 35.1 M EUR and are to be signed in April 2018. Examples of successful projects include the lifting of bridges on the Albert Canal in Belgium, upgrade of the Twente Canal and related inland ports, investments in ERTMS and digitalisation of railways in Germany and The Netherlands, rollout of fast-charging infrastructure for electric vehicles in all corridor countries, deployment of LNG refuelling infrastructure in Germany for inland navigation and road users, improvement of the



maritime access to the Vuosaari harbour in Helsinki, and investment in the multimodal travel centre at the airport of Helsinki.

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

The investment needs on the North Sea-Baltic 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 Multiannual Financial Framework (MFF) midterm review and the budgetary negotiations for the next funding period for an increase of the CEF budget in future.

## **8. Innovative flagship projects**

With the "Issues Papers" European Coordinators started, in addition to their geographically-based corridor work, also an action aiming to advance newer components of TEN-T development and to strengthen corresponding cross-corridor synergies. This initiative opened up a process to ensure that rapidly changing transport and mobility patterns go along with appropriate infrastructure development. The future of the European transport system requires close interaction between infrastructure and transport policy, therefore through innovative pilot initiatives across different TEN-T corridors and Member States the innovative and needed projects are started in close cooperation between transport policy and infrastructure stakeholders from different countries.

### **8.1 Innovative flagship on Alternative fuel infrastructure**

Directive 2014/94 on alternative fuels infrastructure clearly sets out minimum requirements for alternative fuels infrastructure development in Member States, to be implemented through mandatory National Policy Frameworks (NPF). However, there is a variety of approaches taken. Levels of ambition differ and in case of no additional action infrastructure gaps will remain in parts of the EU. The Corridor can contribute to achieve continuity of provision of alternative fuels across borders.

The Alternative Fuel (AF) pilot initiative is an initiative to ensure uninterrupted, smooth travel by using alternative fuels vehicles from Helsinki to Lisbon. Due to the wide geographic coverage the pilot initiative requires a coordination of four Core Network Corridors, NSB, NSM, ScanMed and ATL.

#### **Objective and scope of the flagship project**

The aim of the pilot initiative is to facilitate coherent deployment of alternative fuel infrastructure covering electricity, CNG, LNG and hydrogen. The geographical scope is road trips from Helsinki to Lisbon, for both passenger and freight transport. The deployment approach will include an analysis of fuel demand by fuel type, influence of vehicles technology on the deployment strategy, assessment of financing needed,





possibilities to develop private and public infrastructures or joint infrastructures by applying PPP models and other implementation related topics.

### **Pilot initiative development**

The current situation analysis includes a review of the existing EU and national regulatory framework and data regarding existing infrastructure and near-future existing infrastructure. The review also includes an assessment of potential benefits and needs for financial support for each fuel type, anticipating a stronger vehicle demand in the future. Stakeholders information gathering is an essential last step to elevate the research on the pilot initiative towards a specific project that facilitates the rollout of alternative fuel on the Helsinki – Lisbon route.

### **Current Situation**

Based on the current situation analysis, including information available at EU and national level and CEF projects of the 2016 call, initial needs and benefits for financial support have been identified per alternative fuel type:

- **Electric charging** (public fast charging station near the highway) is fuel type with a high level of deployment. The pilot initiative focus would be on adding missing regions to the route Lisbon – Helsinki to ensure uninterrupted journey. This could involve, for instance, adding electric charging points in Poland, Latvia and Lithuania (where projects are being prepared) or in the cross border sections of Portugal – Spain. It would also help prepare the route for a potentially quick increase in demand for AF infrastructure.
- **CNG** is fuel type with a high level of deployment, similar to Electricity. The focus for this fuel type will be on the gaps around the peripheral areas, these are the areas furthest away from the Corridor urban nodes. In most cases there is CNG infrastructure at urban nodes, therefore no specific actions are planned at urban node level.
- The usage of **LNG** could be more explored in the regions that have this fuel type available. For example, France could strengthen the Lisbon – Helsinki route with LNG road fuelling points.
- **Hydrogen** as fuel type is in its earliest stage of development. The region of Benelux and Northern Germany is the most mature when it comes to H<sub>2</sub>, therefore other regions would benefit from more H<sub>2</sub> fuelling points in the scope of this pilot initiative.

Although there is a variety of alternative fuel infrastructures and networks, there is no centralized or unified paying system, which makes cross border travel with alternative fuel vehicles problematic.

A very wide range of stakeholders has been identified related to clean fuels pilot initiative, including CEF project beneficiaries, car manufacturers, alternative fuel providers, local authorities, port authorities and others as the list of contacts is evolving all the time.

## **8.2 Road safety in the Baltic States and Poland**



The flagship project for **road safety in Baltic States and Poland** was developed based on the needs to reduce the number of road accidents and to provide safer car journey on Via Baltica and in Poland. The proposed solution took into account different tools available developed by international non-profit organisations to increase road safety and good practice examples in different Member States.

Based on the current situation analysis the possibility to develop a joint project by all four Member States – Poland, Lithuania, Latvia and Estonia will be explored. In the common project Member States would assess the current situation on Core Network Corridor roads by using internationally recognised road safety classification, identify the main road sectors where improvements are needed and will quantify investment needs by this allowing better and targeted planning not only at national budget level but also in the framework of the new EU Multiannual Financial Framework.

### **8.3 NSB ITS Corridor**

In Member States along the corridor ITS-related investments are already ongoing.

The NSB ITS flagship project aims to support continuity and interoperability of road safety applications, real time traffic information services and freight management services accordingly to priority areas for the development and use of specifications and standards foreseen in Article 2 of the 2010/40/UE Directive, along the TEN-T Corridors including urban nodes.

The enhancement of road operations and traffic management services is required along this very important connection from Western and Central Europe to Belorussia and Russia, in which road transport is the dominant mode, in the countries along the Corridor. This initiative will help to promote continuous ITS solutions, notably by enhancing traffic flows and safety, by linking and extending the existing coverage of interoperable services across the NSB Corridor and by establishing common understanding and operating principles with the neighbouring ITS corridors.

Special attention will be paid to road safety, including information on road works, hazards, travel times and real-time traffic information services as well as for intelligent truck parking, helping the professional drivers to better comply with their resting times. Cross border improved interaction will be achieved by implementing traffic management plans to ensure smooth operations and continuity of service.

The project will use synergies with other relevant projects, such as the EU EIP East–West Corridor project and national programmes such as the CEF-supported National Traffic Management System (NTMS) project in Poland. It will assess the existing solutions, will identify gaps and most importantly will suggest solutions how to overcome them. When looking forward into deploying C-ITS services and applications the corridor will consider the C-ROADS Platform specifications and the ongoing National initiatives, within that framework, to support the link between the vehicle and the transport infrastructure, in particular in the Western part of the Corridor where traditional ITS services are already well developed.

As a practical result of the innovative flagship project, there will be a clear vision and plans for NSB ITS which will help to implement common standards for interoperable data exchange and relevant services focussing on cross-border traffic problems. Furthermore,



the availability and accessibility of static and dynamic data necessary to the provision of road safety-related and real-time traffic, will make use of any complementary initiatives regarding the setting up of the National Access Points.

The flagship project will be implemented in close cooperation with the innovative flagship project on road safety with a focus on Poland and the Baltic States as those countries will be one of the main actors of the development of a fully interoperable NSB ITS Corridor.

Also, there is a clear synergy with the flagship project on AF development, since the actual use of AF is directly influenced by the static (geographical location) and dynamic (real-time use of recharging point, for example) information. Sharing of information related to the AF refuelling and recharging points is also required by the Directive 2014/94.

In order to foster the uptake of the Alternative Fuels infrastructure and corresponding e-mobility services, the Commission is currently setting up a dedicated Programme Support Action under the CEF Programme. It will aim at collecting data on the charging and fuelling infrastructure and making it accessible to the users via adapted tools and databases. This Programme Support Action will also address the collection of unique Identification Codes of the Charging Points Operators and of the e-mobility service providers, so as to ensure harmonized development of e-mobility across Europe. The Member States of the Corridor are invited to cooperate on this Programme Support Action.

## **9. Recommendations and future outlook by the European Coordinator**

This Work Plan intends to set a framework for the implementation of the North Sea-Baltic Corridor and I expect that it will continue to guide many discussions which I will have in the future with each of the eight Member States and their Ministers. This Work Plan shall allow every Member State to see how they are concerned by a particular issue. But there are some critical projects which need to be implemented. When prioritising the investments, it is important to think beyond the purely national concept towards true Corridor planning.

The functioning of the EU internal market is fully interdependent with the transport systems due to increased cross-border traffic flows. Therefore, the challenges of the infrastructure do not end at the border. The same is true for the necessary efforts for decarbonisation of transport, where the Corridor perspective can provide useful tools, as highlighted in the different issue papers that we have presented as Coordinators and now followed up in the form of innovative flagship projects. Cooperation and coordination between the Member States are needed for a timely and parallel implementation of this new European Transport Policy. The work in the framework of the Corridor should steer this process, both in terms of hard infrastructure development and "softer" elements.

For the countries with only one corridor passing through their territory, the efficient functioning of the Corridor is even more important because it is the only connection to the rest of the core network and to the EU internal market. The corridor infrastructure



will form the main structure for the rest of the connections with which it is linked. For example, for Finland and the Baltic States, efficient Motorways of the Sea connections and port capacity play a crucial role in the connection with the network.

The Member States and other stakeholders have indicated a total of **530 projects** which are intended to contribute to the realisation of the Corridor. The total cost of realising all the projects presented would be **€96 billion** at current prices. By far the biggest investment portfolio is foreseen for the rail sector with more than 36 billion EUR. Nevertheless, it should be kept in mind that several large railway projects are overlapping with other corridors. As this proposed project portfolio far exceeds the finance available there is a clear need for prioritisation of the investments in favour of those that are not only quickly realisable but also those which will have the most EU added value and benefit the Corridor concept the most for the reasons I have already explained. It is important to indicate which are the most important bottlenecks and critical aspects to be dealt with for the timely implementation of the Corridor in its full length and capacity.

**The top priority issues to be addressed for the functioning of the Corridor are in my view, the following:**

- **Timely implementation of the missing cross-border link from Tallinn to Warsaw – the Rail Baltica project;**
- **The hinterland connection – rail, road and inland waterways – of the main ports;**
- **The interoperability of the railway network in close cooperation with the "North Sea – Baltic" Rail Freight Corridor;**
- **Implementation of innovative solutions by using the Corridor approach (ITS, alternative fuels, digitalisation, etc.)**
- **The efficiency of the main urban nodes, particularly the multi-corridor nodes.**

The most crucial issue which needs action is removing the missing rail link in the Baltic States and realising a proper interoperable railway from Tallinn to Warsaw. All the Member States concerned by the line need to work together with the same vision and timetable so that this major infrastructure project can be realised by the mid-2020s. Currently the main share of the international freight traffic between Tallinn and Warsaw is by road. **Rail Baltica** will create a backbone of the multimodal transport system in the Baltic States, will have a very positive effect on modal shift from road to rail, and generate considerable socio-economic benefits and secondary economic effects, as demonstrated by the updated CBA for the project in the Baltic States.

The Rail Baltica line should be seen as a skeleton for further connections. The Motorways of the Sea link between Helsinki and Tallinn, together with good multimodal solutions and an operating Rail Baltica line will open many more possibilities to connect the freight and passenger traffic of that region with the rest of the European network and other Corridors.



It will also contribute to improve connections from Western and Central Europe to the markets of the neighbouring countries. The Rail Baltica will complete a loop in the Baltic transport chain along with the Scandinavian-Mediterranean Corridor, which can now consist of a rail and maritime connection between the Nordic countries, the Baltic States, Poland and Germany. I expressed my support to the so-called Bothnian extension of the North Sea-Baltic Corridor which would make the Corridor reach the border between Finland and Sweden and help in tapping the potential of the Northern Dimension in transport and logistics. The dialogue with future users of the Rail Baltica line which is taking place through the joint venture commercialization efforts, as well as within the "Rail Baltica Business Network" helps in promoting the modal shift potential and gathering feedback on customers' needs already at an early implementation stage of the project.

The dominant transport flow by rail in the Baltic States is for the moment still very much the East/West freight traffic to the ports of the Baltic Sea. The East/West flows exist also in Finland and Poland. The North-South Rail Baltica connection will be insurance for the Baltic States that they will be truly integrated into the European network and traffic flows. The wider connections to the North and to the East can provide substantial feeding for the foreseen North-South Rail Baltica connection between the Baltic States and Poland. These countries can then be seen as a gateway to the European market in the West and in Central Europe. Despite the current geo-political situation, the Eastern and Northern emerging markets have a huge potential for the Corridor. The One Belt One Road initiative by China is aiming at reinforcing the economic corridors linking the country to Europe by land and by sea. The cooperation within the EU-China Connectivity platform has shown the particular interest of China in the North Sea-Baltic Corridor. The dialogue with the Eastern partnership countries is equally relevant for the NSB Corridor, being one of the three Core Network Corridors with a connection to the Eastern neighbourhood countries. Already a strong increase in the number of trains coming from China to the corridor countries and vice versa can be observed.

As European Coordinator, I will therefore pay particular attention to the development and implementation of the Rail Baltica project and would like to assist all the Member States concerned and the Joint Venture based in Riga to ensure a coordinated and timely implementation of this project from Tallinn to Warsaw. This will in particular concern the interconnection of the nodes to the new Rail Baltica line. A Letter of Intent of Rail Baltica cities has recently been launched in this sense.

Secondly, this Corridor is hugely dependent on the **ports** at both ends and along the corridor. Efficient connections with the rest of the network, both for passengers and freight, are crucial. The catchment of international traffic is the key factor for the success of the Corridor and the economies of the respective Member States. The major ports at both ends of the Corridor can support an increase of traffic of the whole Corridor, but also its hinterland if they are well connected. The "last-mile" connections to all the ports are therefore of major importance.

More efficient logistics solutions for transferring cargo to the hinterland connections are needed both in the Baltic and the North Sea ports. The aim of an efficient modal shift



from road to rail and inland waterways can only then be fully achieved. The issue paper on multimodality brings forward key recommendations in order to achieve these goals.

The **Motorways of the Sea** policy has particular importance for this Corridor. There is a need to encourage the ports to cooperate more closely to improve their interconnectivity and upgrade the relevant infrastructures in order to promote the development of Motorways of the Sea connections. Mobility has been facilitated greatly by the ICT solutions. The Helsinki-Tallinn twin ports have created an efficient cross-border economic connection. This cooperation should serve as a benchmark for other ports as further e-links between ports are encouraged.

When it comes to the ports of this Corridor, an important current physical bottleneck is the access to the European network from the North Sea through the **Amsterdam Sea locks** which is one of the most important doorways to the European network. The capacity of the lock currently hinders the biggest vessels from accessing the port of Amsterdam and therefore limits the possibilities to further increase the cargo flows of the Corridor along the inland waterways and the railway network towards the heart of the Single Market. The project is in the construction phase and has received co-funding from the first CEF call of 2014. It is foreseen to be completed in 2019.

An important element in relation to ports and Motorways of the Sea is the **Kiel Canal**. Even though it is not part of the Corridor, as stated before, it remains a crucial connection in the Motorways of the Sea link on the Corridor. The Kiel Canal should be seen as a common interest to several countries and Corridors and Germany asked for its inclusion in the North Sea-Baltic Corridor. My opinion as European Coordinator for the North Sea-Baltic Corridor is that it crucially helps to facilitate the maritime connections of the Corridor - being the most direct connection between the North and Baltic Seas.

As part of the priority to improve hinterland connections of ports, **inland waterways** need to be brought up to the standards when it comes to locks, bridge clearance and canal draught. Actions are needed for example on the Beatrix locks, Twente Canal and on the German canal system, and now in many cases ongoing. Some of these projects have received co-funding from CEF during the first call of 2014. Poland is currently evaluating the possibilities to enhance the navigability of its inland waterways, and expressed strong political commitment on the issue.

Thirdly, the **interoperability of the railway network** is a key priority for the functioning of the Corridor. It strongly relies on cross-border cooperation of the infrastructure managers as well as coordination of national transport plans. The cooperation within the framework of the Rail Freight Corridor can also help in making sure that works are coordinated in a way as to minimize impact on traffic flows. I intend to deepen the cooperation with the North Sea-Baltic Rail Freight Corridor in order to have a joint analysis of technical, operational and administrative obstacles in cross-border railway transport on the Corridor.

The Core Network Corridors strive for an optimal balance and seamless connection between the different transport modes that need to be equally efficient and open to continuous technical developments in order to enhance mobility. The modal share of rail remains below expectations. Therefore a necessary prerequisite for balance between



transport modes is a competitive railway sector. Its competitiveness can be significantly improved over the period 2018 – 2023 through the execution of short-term, operational or administrative actions, requiring lower levels of investments – through so called 'rail breakthroughs'. I will seek to facilitate the CNC/RFC cooperation in that sense. In order to enhance this approach, future EU investments could be conditionally linked to the operational implementation of these breakthroughs.

Significant and measurable performance results of interoperability can be expected from the Rail Freight Corridors that have an integrated governance structure gathering all stakeholders: the railway undertakings, the terminals, the infrastructure managers and the Ministries of Transport. They are therefore in a unique position to identify the most urgent and efficient rail breakthroughs and to ensure that the entire corridor is able to allow interoperable operations. The European Union Agency for Railways has a key role to play to support this approach, for eliminating national rules which hinder interoperability and in the further development of technical specifications of interoperability (especially on operations, to support common operational procedures).

My fourth priority relates to the **deployment of innovative solutions**, such as ITS, alternative fuels infrastructure and digitalisation. As Member States, Regions and cities are stepping up their efforts for the transition to a more sustainable, low-emission transport system, the TEN-T Corridors can be a tool to advance in a more coherent and collaborative manner. The innovative flagship projects are meant to give examples on how to boost wider transport policy objectives by using the Corridor approach and governance tools. For example, now that we are in the implementation phase of the Alternative Fuels Directive and have gathered experience through so many pilot projects for the deployment of both charging infrastructure and clean vehicles, it is time to take a wider perspective and move from a patchwork approach to a network approach also in this domain. This is exactly the philosophy of the TEN-T policy. The ultimate goal of the TEN-T Corridor approach is to facilitate the coordinated realisation of the most strategic parts of the European Transport Network, defined as the core network. The Corridors bring together public and private resources and concentrate EU support from the Connecting Europe Facility (CEF), particularly to remove bottlenecks, build missing cross-border connections and promote modal integration and interoperability. Promoting innovative transport solutions is also clearly part of the aims of this policy, as we aim to pro-actively shape future transport.

The digital revolution in transport that has started to materialise, is opening up new challenges and opportunities for the development of our common European transport network. There is a need to ensure continued, hassle-free, smart and low-emission mobility in the EU. And there are lots of good ideas - many companies are looking into these future-oriented solutions and they need to experiment, demonstrate and scale them. This can partly be addressed by making more active use of the TEN-T network. It is time to break up the silos to reap synergies of transport infrastructure development with energy, IT, digitalisation and innovation, and to ensure real continuity and interoperability of these new mobility solutions across borders.

Last but not least, as a former mayor of the City of Strasbourg I pay particular attention to the **urban nodes** on the Corridor since they serve as connecting points linking different transport modes. As also expressed in the Urban node Issue paper, there needs





to be an excellent connectivity between the network infrastructure and the urban nodes, including the secondary urban nodes not listed in the Annex II.1 of the TEN-T Regulation, for the Corridor to be fully functional. The multi-corridor urban nodes allow special coordination to achieve greater efficiency and synchronization between the different Corridors. Such effective integration of urban nodes in the Corridors needs strong multilevel governance.

There is a need to address the capacity issues in and around the urban nodes. It often requires solutions to separate freight and passenger traffic on urban railways and also to better manage the capacity limits on the city road bypasses. Sometimes major ports or rail-road terminals are in the very heart of the urban areas. In these cases important attention needs to be given to the "last-mile" connections to these facilities to make sure freight traffic will not cause congestion in city centres and bypasses.

Well-functioning multimodal platforms are crucial for the smooth transfer of freight and passengers. The freight villages in Germany and The Netherlands are best-practice examples. The further establishment of the freight villages, especially in border areas, will serve as a good base for cooperation between smaller rail-road terminals. But as a speciality of this Corridor, we should not forget the importance of integrating the inland waterway ports fully into the rail-road terminals network. In the Baltic States the development of rail-road terminals and dry-ports is encouraged in parallel to the Rail Baltica project.

International cross-border traffic is the basis of the Corridor approach. This Corridor is already highly technological due to the Motorways of the Sea policy which has encouraged technological solutions for port interconnections. But much more emphasis should be put on the deployment of the new ICT solutions also for other modes of transport to achieve a more efficient use of the infrastructure and good cross-border performance of the Corridor. In this context, security and cybersecurity issues are important to be considered. Additional analysis shall be made on administrative and technical issues which hamper the good functioning of the Corridor. The **ITS** issue paper put forward ideas on how the Corridors can boost the deployment of ITS by serving as a test bed and giving continuity that is needed for interoperability and scaling up of new solutions, such as it could be set up in the NSB ITS flagship project.

The development of traffic management systems should be pushed forward wherever possible. One of the key issues here is the still limited deployment of the **ERTMS signalling system**. The new and upgraded infrastructure needs to be automatically deployed with the ERTMS and the existing infrastructure needs to be brought up to date. A common timetable needs to be respected to avoid future bottlenecks in the system. ERTMS as a European project needs to be a priority for all Member States and the Corridor approach of the European Deployment Plan and the ERTMS Deployment Action Plan are vital steps forward.

## **9.1 Planned projects and achievement of Corridor technical compliance**

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 North Sea-Baltic 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 North Sea-Baltic corridor and may be challenging in a number of cases.

## 9.2 Combining grants with innovative financial instruments

The investment needs on the Corridor are huge and cannot be met by public funding alone, be it state or European. It is strongly recommended to look into alternative financing through innovative financial instruments and to take advantage of the European Fund for Strategic Investments. Grants are most relevant for projects where only limited revenues are to be expected. Also I believe that we must have a good pipeline of projects that can as far as possible complement each other as construction work progresses. What I mean is that projects should not be developed in isolation but as part of a comprehensive "whole Corridor" concept.

On the North Sea-Baltic corridor, projects identified so far for potential use of financial instruments concern mainly the areas of alternative fuels infrastructure, rail connections to airports and airport capacity expansions, port development projects and city ring roads. In times of scarce public resources, I encourage all project promoters to study the possible options to diversify the funding and financing sources for investments. The results of the use of EFSI for projects on the Corridor and the take-up of the blending call are encouraging in this respect.

## 9.3 Other issues

Realisation of the TEN-T Corridor infrastructure is a strategy for economic growth, and it is estimated that the implementation of the NSB Corridor projects would **create 2,061,000 additional job years and contribute to an increase of GDP by 715 billion EUR over the period 2016 until 2030**. It is especially important to tap the potential of the cross-border job opportunities as the potential for cross-border economic development is much higher than for the rest of the economy. In this context, the cross-border "last-mile" issues are very relevant. I will continue to have regular meetings with industry stakeholders as well as logistics operators in order to exchange on the benefits of the Corridor and expectations towards it.

In the context of the further development of the Defence Union, considering aspects of military mobility and civilian/military synergies will also gain importance, as indicated by the Joint Communication of the European Commission and the High Representative of the Union for Foreign Affairs and Security Policy on "Improving Military Mobility in the European Union" of November 2017 [and the Action Plan on Military Mobility of March 2018].

Other **multi-governance frameworks for cross-border development** like macro-regional strategies (The EU Strategy for the Baltic Sea Region), cross-border,



transnational and interregional cooperation projects (such as CoRe<sup>12</sup>) funded by the European Territorial Cooperation programmes, or the EUREGIO cooperation should continue to be closely integrated into the implementation of the Corridor. The existing EUREGIO cooperation could be seen as a benchmark for other cross-border projects for the regions. A bottom-up approach is needed for organising the participation of the regions and the cities to come to a joint understanding of cross-border issues and to set-up a joint vision for our corridor. We should continue to cooperate with regional cooperation mechanisms along the whole Corridor to synchronize the actions for the realisation of the Corridor and for integrating the infrastructure into the regions and cities.

For the good governance and the realisation of the Corridor, there is a need for cooperation and consensus between different partners, within and between the Member States. The responsibility for the management of the Corridor project needs to be taken at all administrative levels. The process for this has started in the right way and there is a good base for the next steps to come.

## 9.4 Next steps

With this third edition of the North Sea-Baltic Corridor Work plan, we made some important steps forward in deepening the analysis and joint understanding on what is needed to achieve the Corridor's compliance and realisation of its full potential.

The third Work Plan has brought new insight in the area of innovation and deployment of alternative fuels, where I believe that the North Sea-Baltic Corridor has the potential to become a frontrunner, be it in terms of scaling up deployment of infrastructure for electromobility or the use of LNG, that has been given a boost through the support of a number of projects along the Corridor via the CEF calls. With the input from the issue papers and inspiration from the innovative flagship projects under development, I hope that even more projects will exploit the possibilities offered by the TEN-T policy for large-scale demonstration and deployment. In view of the objectives set to fight against climate change, further concerted efforts and concrete measures will be needed in the framework of the core network corridors to achieve modal shift and decarbonisation of the EU transport system.

Now it is important to continue implementing the projects to solve the most critical issues on the Corridor. The actions need to be planned on a coherent cross-border timetable and with the mobilisation of all available resources. **As the European Coordinator I take it as my task to act as a facilitator** and to ensure that we maintain the inclusive approach to such an operation that I personally believe is essential to ensure ultimate success.

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<sup>12</sup> <https://www.uudenmaanliitto.fi/nsbcore>



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**More detailed information can be found at:**

[https://ec.europa.eu/transport/themes/infrastructure/downloads\\_en](https://ec.europa.eu/transport/themes/infrastructure/downloads_en)



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