



Atlantic



Third Work Plan of the
European Coordinator
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*Mobility
and Transport*



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Please note that at the time of printing, this Work Plan has not yet received the final approval of the Ministry of Transport of France.

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Acronyms and Abbreviations

ATL	Atlantic Corridor	NSMED	Nord Sea Mediterranean Corridor
BMVI	German Ministry of Transport	NUTS	Nomenclature of territorial units for statistics
CBA	Cost Benefit Analysis	O/D	Origin / Destination
CEF	Connecting Europe Facility	OPT	Operation Programme of Transport
CF	Corridor Forum	PaP	Pre-arranged path
CNC	Core Network Corridor	PPP	Public Private Partnership
C-ITS	Cooperative Intelligent Transportation Systems	PR	Progress Report
DE	Germany	PT	Portugal
DG-MOVE	Directorate General for Mobility and Transport (European Commission)	PU	Public
EC	European Commission	RALP	Rhine Alpine Corridor
ECA	Emission Control Area	RFC	Rail Freight Corridor
EEIG	European Economic Interest Group	RIS	River Information System
EIB	European Investment Bank	RRT	Rail–Road Terminal
ERTMS	European Rail Traffic Management System	SESAR	Single European Sky ATM Research Programme
ES	Spain	SSS	Short Sea Shipping
ESTAT	Eurostat	TENtec	Information system of the European Commission to coordinate and support the TEN-T Policy
ETCS	European Train Control System	TMS	Traffic Market Study
ETIS	European Transport policy Information System		
EU	European Union		
FR	France		
GDP	Gross Domestic Product		
GHG	Greenhouse Gas		
GIS	Geographic Information Systems		
GPSO	Grand Project du Sud-Ouest		
HAROPA	Le Havre, Rouen and Paris Ports		
HSR or HS	High Speed (rail)		
INEA	Innovation and Networks Executive Agency		
ITS	Intelligent Transportation System		
IWT	Inland Waterway Transport		
IWW	Inland Waterway		
KPI	Key Performance Indicator		
LNG	Liquefied Natural Gas		
MED	Mediterranean Corridor		
MoS	Motorways of the Sea		
MTMS	Multimodal Transport Market Study		
MS	Member State		
Nat	National		

1. Towards the Atlantic Corridor 3rd Work Plan

The Atlantic Corridor has an important maritime dimension with eight Core seaports, as well as a significant potential to increase its modal share of rail especially for freight transport. It also shows important opportunities in the field of Innovation, related to especially alternative fuels, e-maritime/e-freight and C-ITS. This 3rd Work Plan was elaborated on the basis of the Corridor's goals, an intensive consultation and coordination process with the Member States and other relevant stakeholders, technical studies conducted by a consortium of consultants and focus on specific points on top of what was already analysed under the 1st and 2nd Work Plans.

1.1 Introduction

The Atlantic Corridor, as defined in its alignment by EU Regulation 1316/2013, connects Europe's South-Western regions towards the centre of the EU, linking the Iberian Peninsula's ports of Algeciras, Sines, Lisboa, Leixões (Porto) and Bilbao through Western France to Paris and Normandy (up to the port of Le Havre) and further east to Strasbourg and Mannheim. It covers rail, road, airports, ports, rail-road terminals and the River Seine inland waterway. Even though they are not part of the Corridor, the Douro River and its port of Porto are "Core" and represent an important connection to maritime transport via the port of Leixões. Other neighbouring sections and territories are analysed under point 5.5.

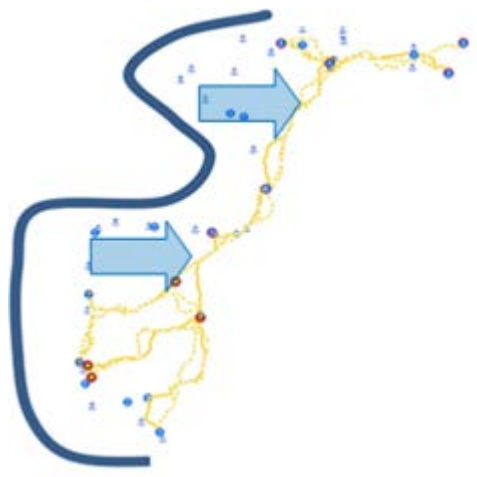
The Corridor has an outstanding maritime dimension given its positioning at the crossroads of global shipping routes.

The inland backbone of the corridor delivering transport efficiency and sustainability is constituted by the Atlantic Rail Freight Corridor, still endowed with large capacity on various sections.

Beyond exploiting mono-modal routes (maritime and rail), the Atlantic Corridor, in line with TEN-T objectives, aims at better interconnecting transport modes. Accordingly, the Atlantic coastline and all its Core ports, as well as the Comprehensive ports and the maritime logistics platforms ought to be seen as feeding / served by the Corridor¹.

The Atlantic Corridor connects and overlaps with four other Corridors, with which coordination is important:

- Mediterranean, with a common section Algeciras – Madrid;
- North Sea Mediterranean, with connections in Paris and a shared section between Metz and Strasbourg;
- Rhine Alpine and Rhine Danube, both with a connection in Mannheim and Strasbourg.



¹ As already acknowledged in the previous workplans, a special attention is given to the core network branches connected to the corridor (additionally to corridor components) such as the core ports in North-West Spain (Gijón/A Coruña), in the South-West (Huelva) and Canarias (Las Palmas/ Tenerife), Nantes-Saint-Nazaire, Douro river and Seine-Sud. Other comprehensive ports delivering a significant ro-ro traffic also make a positive contribution to the corridor performance by alleviating road congestion.

1.2 Roadmap to setting up the WP III

This work plan was elaborated in accordance with the provisions of EU Regulation No 1315/2013 which establishes Union guidelines for the development of the trans-European transport network.

1.2.1 The Atlantic Corridor goals

The main strategic goals of the development of the Atlantic Corridor are enhancing modal integration (thus rebalancing the current modal split, highly dependent of road for the inland component), further exploiting the maritime connectivity, and addressing railway interoperability, including by a gradual track gauge change to UIC standard on the Iberian Peninsula. This will eventually connect seamlessly the ports of Algeciras, Bilbao, Sines, Lisboa and Leixões to France and Germany. Within this framework, the need to solve the current bottlenecks and missing railway links is still critical. Particular attention is devoted to the priorities stated by TEN-T guidelines: cross-border, bottlenecks, missing links, interoperability and multimodality, as well as to financing issues. In addition, the deployment of alternative fuels and of C-ITS have also become important focus points.

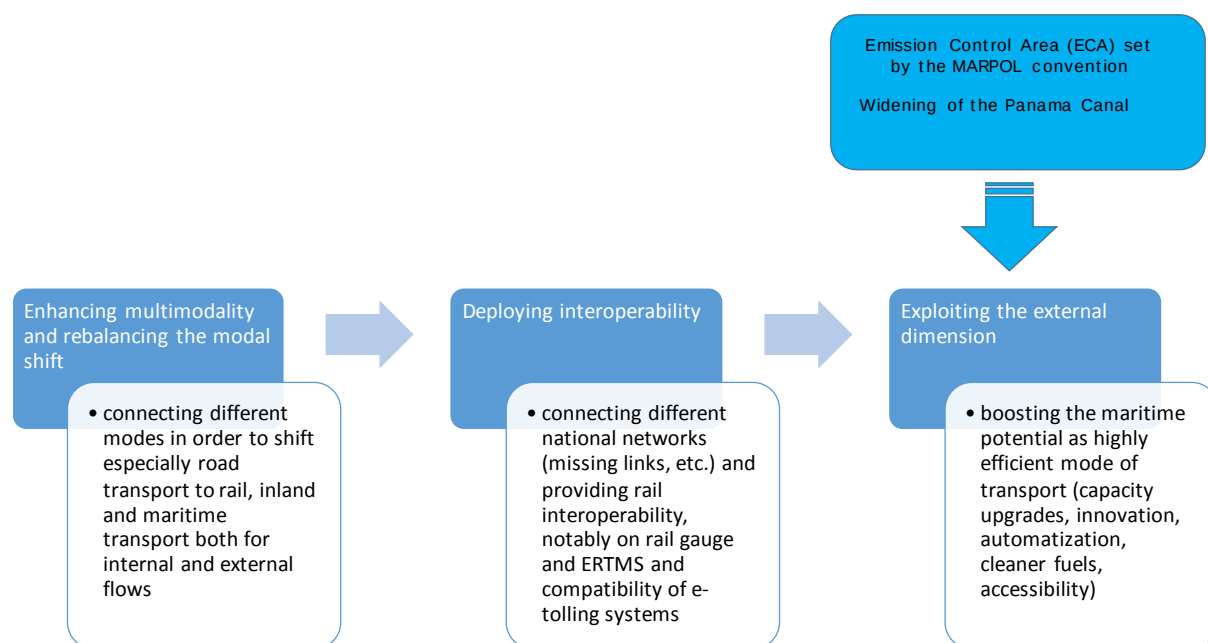


Figure 1 - Atlantic Corridor main goals

1.2.2 Corridor Fora and Working Groups

In 2014, four Corridor Fora have been successfully held.

Restarting activities in September 2015 after the approval of the first Work Plan, seven Corridor Fora and six Working Group meetings took place, as follows:

- a working group dedicated to the cross-border dimension held in Bordeaux in October 2015;
- a working group on ports together with the 5th CF meeting;
- a working group on regions together with the 6th CF meeting
- two joint working group meetings with the Nord Sea Mediterranean Corridor, one focused on ports, inland waterways and logistic facilities held in Paris (March 2016) and one on regions and logistic platforms held in Metz and Strasbourg (September 2016);

- a working group meeting on urban nodes and regions held in Madrid in April 2017;
- a working group meeting on ports, originally scheduled for fall 2017, was held in February 2018 in Algeciras.

As previously, Corridor Forum stakeholders fall into four main categories:

- Member States (MS) – Transport Ministries;
- Infrastructure Managers (IM) – for each mode of transport. Rail-road terminals' stakeholders started to be involved in Forum activities from the 7th meeting onwards;
- Corridor Regions (CR) – equivalent to NUTS2 regions;
- The Atlantic Rail Freight Corridor.

In addition to the Forum members, a wider group of stakeholders is engaged in the corridor activities through the participation in meetings of the working groups. That is the case for Euroregions², specific cross-border projects, innovation projects as well as the municipalities, metropolitan regions and transport consortia in the Corridor's urban nodes.

Several international events, bilaterals with Member States (with missions to Paris, Madrid, Lisboa, Berlin and Oporto) and meetings with key stakeholders also took place. Moreover, a close coordination with the Rail Freight Corridor has been maintained, enriched by the presence of the RFC Managing Director in all the Atlantic Corridor Forum activities.

Last but not least, Member States cross-border working groups such as Spain-Portugal on interoperability and Spain-France on rolling motorways maintained regular meetings and reporting of the progress of their work to the Corridor Forum. Even though there have not been recent meetings with our involvement, we should also mention the Spain-France intergovernmental conference supported by the EEIG for the cross-border connection Vitoria-Dax, as well as the EEIG AVEP for high-speed rail in Spain and Portugal, recently endowed to also cover rail interoperability issues for both passengers and freight.

1.2.3 Technical support and 2015-2017 corridor studies

The European Coordinator and the Member States in the Corridor Fora are supported by a consortium of consultancy companies contracted by the European Commission. In its essence, the contractors for the 2015-2017 studies kept the same composition as for the 2014 studies, with TIS.pt (Portugal) as team leader, INECO (Spain), EGIS (France), endowed with M-FIVE (Germany), BG Ingenieurs (France) and Panteia (Netherlands) also as partners.

The 2015-2017 studies built upon the work carried out in 2014. As before, the process was guided by regular Corridor Forum meetings and Working Group meetings.

The work took stock of the results of the 2014 study, further developing the Project List, and paving the way for an updated Corridor Work Plan addressing all the elements foreseen by Article 47 of EU Regulation 1315/2013. Elements such as economic impacts of individual projects at corridor level, synchronised implementation of projects, notably cross-border ones, environmental impacts (e.g.: noise and greenhouse gas emissions), cohesion, job creation³, innovation and innovative financing were further developed. The

² The Atlantic Corridor runs through two Euroregions i.e. Nouvelle Aquitaine Euskadi Navarra and Euroace (Alentejo, Centro, Estremadura), while the EGTC Galicia Norte de Portugal is in its neighbourhood

³ already object of analysis in the study on "Costs of non-implementation of the TEN-T network"



topics of innovation deployment, impact of climate change on existing infrastructure and impacts of corridor deployment on GHG emissions, noise and other negative environmental impacts of transport were object of specific analysis.

Innovation in the context of the Atlantic corridor is extremely relevant, with three key issues arising as priorities, next to the deployment of the standard (UIC) gauge and ERTMS:

- Concerns that the long-term security of supply and the compliance with the two Emission Control Area (ECAs), set by the MARPOL convention and to which the Atlantic coastline is directly connected, will lead to an enhanced Liquefied Natural Gas (LNG) deployment and, complementarily, to Shore Side Electricity development in ports. Based on the projects and pilot initiatives already present, an adequate planning for LNG deployment should be prepared for the Atlantic Corridor;
- Boosting the maritime potential through innovation and simplification, notably by progressing on the systems and procedures to evolve e-maritime towards e-freight and increasing the efficiency of the logistic chains using maritime transport;
- e-mobility corridors and C-ITS have high innovation content in the Atlantic Corridor.

1.2.4 Content

One of the main novelties of the second Work Plan was the inclusion of a chapter on infrastructure funding and innovative financial instruments. The screening exercise on the Project List highlighted specific types of projects with potential for future development through innovative financial instruments.

Now in the third Work Plan, besides deepening of the topics underlined in the second Work Plan, comprehensive views notably to appraise the impact of climate change in the Corridor, and to characterise its overall contribution to safeguarding the environment from local pollution and noise are being added. New pilot initiatives aimed at achieving an objective defined as a theme and no more restricted to one location or one stretch of road/rail or node have also been worked with Forum members.

2. Characteristics of the Atlantic Corridor

The Atlantic Corridor already has to-date a high level of compliance with several TEN-T requirements. This is the case especially for Road, for certain rail parameters including line speed and axle load, for Inland Waterways and for the most important parameters of Maritime i.e. connection to rail and inland waterways. Remaining gaps expected to be filled by 2030 include electrification of rail, train length, availability of clean fuels at inland ports and along roads and the connection of the airport of Madrid-Barajas to the high-speed rail network. Where compliance will not be fully achieved by 2030 includes track gauge (74% expected in 2030) and ERTMS deployment. The positive development of the Corridor evidences that inter-governmental working groups and agreements as well as regional/local cross-border cooperation are key to progress, next to of course financial support.

2.1 Corridor alignment

The Corridor's alignment is defined by Regulation 1316/2013 in its annex as follows:

- Algeciras – Bobadilla – Madrid
- Sines / Lisboa – Madrid – Valladolid
- Lisboa – Aveiro – Leixões/Porto
- Aveiro – Valladolid – Vitoria – Bergara – Bilbao/ Bordeaux – Paris – Le Havre/Metz – Mannheim / Strasbourg



Figure 2 - The Atlantic corridor and its nodes

The Paris – Rouen - Le Havre branch is three-modal, involving rail, road, and the Seine – IWW; the connection links the North Sea to the Corridor.

The corridor does not have a road component in Germany.

The Atlantic Corridor has 4 cross-border sections:

- DE-FR: Metz – Mannheim (Forbach-Saarbrücken)
- ES-FR: Vitoria-Dax (San Sebastián – Bayonne)
- PT-ES: Évora-Mérida
- PT-ES: Aveiro-Salamanca

2.2 Compliance with the technical infrastructure parameters of the TEN-T guidelines (including KPI's analysis results) in 2017

Key Performance Indicators (KPIs) were used within the 2015-2017 Core Network Corridor (CNC) studies to assess and monitor the evolution of the Corridors and the potential effects of individual projects or groups of projects upon infrastructure interoperability and performance. A common or 'generic' KPI framework was developed for all nine corridors, in order to permit comparability across the whole network.

Next to these generic indicators applying across all Corridors, corridor-specific indicators tailored to individual circumstances were also developed. For the Atlantic Corridor, two corridor-specific KPIs with a subset of measurement methods were defined, which reflect strategic issues at Corridor level:

- the progress in terms of rail interoperability, notably for UIC gauge deployment, and,
- the specificity of the Atlantic maritime dimension, which can be seen as almost a sea corridor parallel to the land corridor.

The assessment of compliance presented below refers to the status of infrastructure as in the 2014 studies, taking into consideration recent developments whenever they affect the results. Core network sections which are not yet operational were not considered in the compliance analysis.

2.2.1 The Atlantic Railways Network

The Core railway network covers an extension of 7616 km, of which 6105 km (79.9%) are in operation. Important stretches of the Corridor have been concluded in 2016 (Remilly – Strasbourg) and 2017 (Tours-Bordeaux). The Y-Basque is under construction with end of works foreseen to 2023 on the Spanish side and works are starting for the missing link Évora-Caia, close to the border PT-ES, notably in the section Elvas to the border.

Due to the withdrawal of the only core network section linking Grândola with the Core Port of Sines, following the outcome of the environmental studies, it shall be acknowledged that the only possible rail access to the Port of Sines takes place through the existing TEN-T rail line Sines-Ermidas do Sado-Grândola belonging to the Comprehensive network. It was therefore necessary to include it in the network analysis for the sake of consistency with the Core Network methodology, and to ensure the achievements of the Corridor's objectives.

High speed passenger lines belonging to the Corridor include the following stretches in Spain: Madrid-Córdoba-Antequera, Madrid-Valladolid-Venta de Baños, and Venta de



Baños-Burgos-Vitoria (under construction), Madrid-Extremadura (under construction), the Y Basque (under construction); in France, the corridor high speed component is represented by Tours-Bordeaux, Tours-Paris-Strasbourg (LGV Est) and Metz (Saarbrücken)-Mannheim. The Y-Basque will ensure gauge continuity for passenger (and freight) flows from Germany towards Spain. Unfortunately, it recently appeared that the GPSO and especially the Bayonne-Dax and later the Dax-Spanish border high speed connections may not to be realised before many years. In that case, an upgrade of the existing line would be a must.

Regulation 1315/2013 established several infrastructure-related parameters: gauge, electrification, train length, axle load and line speed as well as ERTMS in operation. Mixed lines are considered for compliance with the whole set of freight-related parameters. The assessment of compliance for 2014 is performed only for the corridor sections in operation.

Electrification

Core rail network complies with the electrification criteria in 87% of its extension. Sections still not electrified are located in both cross-border connections Spain to Portugal (both with works ongoing), on the non-electrified section of the conventional railway Bobadilla-Algeciras (planned to be ready before 2030) and in France for the Gisors – Serqueux section (the electrification project has received CEF funding and is planned to be ready before 2030)⁴.

Although just 13% of the core network is not electrified, various types of voltage (25 kV AC in Portuguese network and HS lines of Spain and northern France; 3 kV DC in conventional lines in Spain; 1.5 kV DC in conventional lines in the South of France and 15 kV in Germany) coexist, requiring the use of multi-tension rolling stock or changing locomotives at borders, thus reducing transport efficiency. It should however be noted that ongoing electrification of cross-border sections in Spain is at 25 kV, adopting the same standard as in Portugal and high-speed lines in Spain and France.

Track gauge

Harmonised planning for UIC gauge deployment on the Iberian Peninsula represents one of the key actions established in the 2014 Work Plan; the setting-up of an intergovernmental cross-border Working Group on interoperability in 2015 was a major step in the right direction.

Currently, only 56% of Atlantic Core railways dispose of a standard European gauge. Planned interventions will allow extending this coverage to nearly 74% by 2030, connecting all border crossings in UIC gauge.

ERTMS

Overall, ERTMS implementation in the Corridor is very low, with just 12% of the rail network fulfilling the criteria. The Work Plan on ERTMS provides further information on this aspect and targets to be achieved.

Line speed > 100km/h for freight lines

Line speed above 100 km/h for freight lines is accomplished on 96% of the Corridor extension. Currently, non-compliant sections are present in France (Motteville – Montérolier-Buchy and some short links in the Paris and Bordeaux nodes), in Spain (Bilbao - Puerto de Bilbao) and in Portugal (sections connecting the core ports of Leixões and Lisboa). It is expected that interventions planned will ensure a

⁴ Additionally, interoperable catenary isn't available between Bordeaux and Bayonne: catenary renewal is planned at short and medium term.

generalised compliance by 2030 with few exceptions; in any case, a careful assessment of the costs and benefits for the Corridor of their potential upgrade has to be made case-by-case.

Axle load

The Corridor is fully compliant in all its extension (on its freight component) with minimum axle load of 22.5 tonnes.

Train length

The compliance rate with the 740-m train length on rail freight lines equals 57%, therefore representing a clear limiting factor for freight operations in the Iberian Peninsula, notably in Spain. Currently, the maximum freight train length in the Spanish Atlantic Corridor sections is 550 m and it is reduced to 400-420 m in several stretches, e.g. in the Badajoz-Aljucén section. In Portugal, all sections connecting to the Core ports as well as the “Beira Alta” line are non-compliant. Ongoing and planned interventions along the network will ensure full compliance of this criterion by 2030. Despite the fact that all the French and German sections comply with these criteria, timetable related / operational restrictions may have influence on the possible train length.

Other limiting factors

Loading gauges limit the size of wagons and containers that could be conveyed on the railway sections. Along the Corridor, different loading gauges coexist, acting as a constraint towards a harmonised rail network and impacting on rail freight performance. Some tunnels between Paris-Bordeaux-Spain border and Paris - Metz do not meet loading gauge requirements (B+) for rolling motorways and for transport of high cubes containers. Therefore, for the deployment of rolling motorways services, the use of the line through Saintes and Niort is at this time mandatory. In addition, some single track and non-electrified sections on this line constrain operation performances and service level."

Gradient

Although the track gradient is not included in the requirements for core network rail by 2030, sections of the corridor in Portugal⁵ and Spain⁶ present relatively high gradients (maximum values) which might constraint trains weight and length or require multiple traction.

#	Mode	KPI	Definition	2017	Target 2030
1	Rail network	Electrification	Electrified rail network km as a proportion (%) of relevant CNC rail network km.	87%	100%
2		Track gauge 1435mm	Standard (1435mm) track gauge as a proportion (%) of relevant CNC rail network km.	58%	74%
3		ERTMS implementation	Length of Permanent Operation (excluding operational test lines) of both ERTMS and GSM-R on rail network, as a proportion (%) of relevant CNC rail network km.	12%	89%
4		Line speed >=100km/h in accordance with art. 39 para. 2. Item a) (ii) of the Regulation 1315/2013	Length of Freight and combined line with allowing for a maximum operating speed greater than or equal to 100 km/h, as a proportion (%) of relevant CNC rail network km without load restriction.	96%	100%
5		Axle load (>=22.5t)	Length of Freight and combined line with a permitted axle load greater than or equal to 22.5 tonnes, as a proportion (%) of relevant CNC rail network km.	100%	100%
6		Train length (740m)	Length of Freight and combined line with a permitted train length greater than or equal to 740m, as a proportion of relevant CNC rail network km.	57%	100%

The deployment of UIC gauge being a strategic issue for the Corridor, corridor-specific KPI's were defined to closely follow the progress, as presented below:

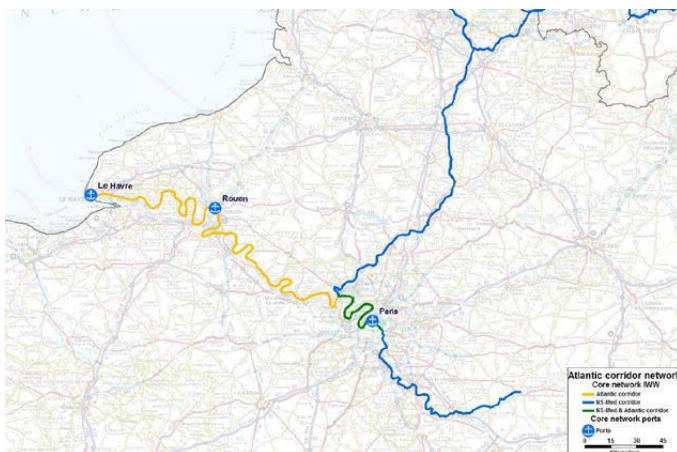
⁵ Pampilhosa-Guarda 20,7‰, Sines-Ermidas Sado 20‰, Contumil-Leixões 15,6‰

⁶ Bobadilla-Algeciras 24‰, Fuentes de Oñoro-Salamanca 18‰, Madrid-Ávila 18‰, Vitoria-Irún (notably Alsasua-San Sebastian) 18‰

Mode	KPI	Unit	2014	2020	2030	2050
Rail network	Core Nodes connected in UIC gauge*					
	Freight	Nr	8	9	17	19
	Passengers		12	13	15	19
	Border crossing points connected in UIC gauge	Nr	1	2	4	4
	Cross border extension connected in UIC gauge					
	Freight	index	100	105,7	166,8	
	Passengers	(km year x) / (km 2014) x 100	100	120,7	181,8	

2.2.2 The Atlantic IWW Network and the Inland Ports

The Seine River, comprising the whole section Le Havre – Paris, is the only inland waterway in the Atlantic Corridor. North of Paris, the Corridor is linked with the planned Canal Seine-Scheldt, included in the North Sea – Mediterranean Corridor.



The Seine river section included in the Atlantic Corridor, already reaches higher standards than the minimum established by Regulation (EU) 1315/2013, with only a partial completion of RIS implementation along all sections to be achieved (ongoing activity). Although the Seine is compliant from Paris to the sea, there is an issue of low bridges in Paris limiting the height of container barges. This issue can't be solved due to the historic value of Paris bridges.

In spite of this, several local bottlenecks were identified, notably on locks and port access, and a set of measures were planned to address those issues. It is worth recalling that the broader TEN-T includes, within the NSMED corridor, the navigable waterway from Paris via the Seine/Oise and Scheldt rivers to connect to the Benelux countries. This is expected to substantially increase waterborne freight traffic related to Paris and the River Seine. Coordination between the Work Plans of the Atlantic and NSMED Corridors was important to identify common projects and synergies.

Although not included in the Corridor but in its connecting sections, and being Core with a Core port (Porto), the Douro River also fulfils the standards for IWW, notably class IV and RIS is being deployed. Actions are however required to improve its navigability and address its functional obsolescence, mainly in terms of geometrical correction and interventions in locks.

The Seine river section in the Atlantic includes three core network ports; Le Havre, Rouen (which are both Sea and IWW ports) and Paris, grouped as 'HaRoPa' ports. Other inland ports in the Atlantic are Bordeaux (both sea and inland port), Strasbourg (which recently signed a partnership agreement with the HaRoPa ports), Metz and Mannheim. In total, the corridor counts seven inland core ports.

With regard to inland waterways, ports are already compliant with the minimum criteria established in the Regulation. All ports are connected to IWW class Vb and to the rail network.

Nevertheless, there are still critical limitations in those inland connections, such as the electrification of the Gisors-Serqueux rail stretch connecting the ports of Le Havre and Rouen, or the IWW connectivity to the new Port XXI in Le Havre, which are being addressed in ongoing and planned projects.

The availability of clean fuels, currently limited to Mannheim, is being object of several studies and works and compliance might be achieved before 2030.

#	Mode	KPI	Definition	2017	Target 2030
7	Inland waterway network	CEMT requirements for class IV IWW	Length of inland waterways classified as at least CEMT class IV, as a proportion (%) of CNC waterway network km.	100%	100%
8		Permissible Draught (min 2.5m)	Inland waterway network km permitting a vessel of 2.5m draught, as a proportion (%) of CNC waterway section km.	100%	100%
9		Permissible Height under bridges (min. 5.25m)	Inland waterway network km with vertical clearance of at least 5.25m under bridges, as a proportion (%) of CNC waterway section km.	100%	100%
10		RIS implementation (% of km on which the minimum requirements set out by the RIS directive are met)	Inland waterway network km on which the minimum technical requirements of the RIS directive are met, as a proportion (%) of CNC waterway section km.	75%	100%

#	Mode	KPI	Definition	2017	Target 2030
21	Inland ports (7)	Class IV waterway connection	Number of inland ports in CNC with an inland waterway connection of at least CEMT IV class, as a proportion (%) of the total number of core inland ports in the CNC.	100%	100%
22		Connection to rail	Number of inland ports in CNC with a rail connection as a proportion (%) of the total number of core inland ports in the CNC.	100%	100%
23		Availability of alternative clean fuels	Number of inland ports offering (at least one of) LPG, LNG, liquid biofuels, synthetic fuels or hydrogen as a proportion (%) of the total number of inland ports in the CNC.	14%	100%
24		Availability of at least one freight terminal open to all operators in a non-discriminatory way and application of transparent charges	Number of inland ports with at least one open access terminal, as a proportion (%) of the total number of core inland ports in the CNC.	100%	100%

2.2.3 The Atlantic Maritime Infrastructure and Motorways of the Sea

The maritime dimension is of utmost importance in the Atlantic Corridor. The joint throughput of the 8 core seaports in the Atlantic (Algeciras, Sines, Lisboa, Leixões, Bilbao, Bordeaux, Le Havre and Rouen) reached more than 300 million tonnes in 2016, with an overall magnitude of more than 420 million tonnes if considering all seaports along the Atlantic front.

The importance of complementarity between the seaports along the coastline (Core and Comprehensive) must be stressed, in synergy with the deployment of maritime links through Motorways of the Sea (e.g. Atlantis MoS project and the existing Atlantica MoS project -Vigo as well as the links from Santander and Bilbao and the efforts being made to relaunch the Gijón-Nantes MoS).

Intra corridor maritime flows (country level) represented, in 2015, nearly 123 million tons, clearly demonstrating the importance of ports in the Atlantic.

The connection of ports with other modes, in particular rail (and inland waterways) is critical to guarantee the capacity for freight traffic to and from the economic regions along the Corridor and to promote port competitiveness and strengthen hinterland connections. The main limiting factors and bottlenecks in the port areas, which need to be overcome for further growth, relate to four main issues: capacity, connectivity/ automatization, multimodality and availability of alternative fuels. Several projects in the Corridor Work Plan address these bottlenecks.

Many ports are operating near capacity, thus facing the need to expand their facilities and upgrade port infrastructure and maritime accesses to cope with the expected growth

in demand. The ports sector is showing fairly consistent growth expectations. This is in line with the necessary upgrade and reinforcement of terminal extensions for logistic and industrial platforms and intermodal terminals. Furthermore, most ports also need to adapt facilities and equipment to the new standards required by the use of bigger ships, a trend that is expected to be continued in the future due to the Panama and Suez Canal widening.

Connection to rail

Although all ports in the Corridor are connected to rail, improvements in land access and last mile connections are needed: both in Portugal and Spain, the upgrade of rail connections and rail freight terminals to allow 740 m trains to access the ports is critical. Similarly, as previously stated, electrification is missing along the railway line connecting to the Core port of Algeciras (the largest seaport by volume in the Corridor), as well as the section Gisor-Serqueux serving the Core port of Le Havre.

Moreover, rail connection to the port of Sines (third port in volume in the Corridor and the first in terms of rail share for container hinterland traffics) is currently done through the Comprehensive section Sines – Ermidas – Grândola, in a single track line, with limited train length and 20 ‰ gradient. Building a new line has been rejected on environmental impact ground. In order to ensure a satisfactory inland connection of the core port of Sines it is therefore critical to enhance the existing line to the performance and interoperability parameters required for a Core section, which is being addressed with ongoing projects.

Connection to IWW

All French ports have an inland waterway connection, class Vb. The port of Leixões also has an indirect connection to the inland waterways of the Douro river (class IV), however, in regards to cargo, these are not exploited to their potential, due to existing navigation bottlenecks along the Douro River (core IWW but not in the Corridor), which are being addressed in ongoing study projects but for which there is not yet funding allocated to the works. Additionally, the port of Lisboa is studying the navigability of the Tagus estuary to Castanheira do Ribatejo.

Availability of clean fuels

LNG deployment is taking place along the Corridor with several projects running (such as *Core LNG Hive* in the Iberian Peninsula), but actual compliance is just 13%. Full compliance is expected by 2025 as foreseen in the MS action plans for deployment of clean fuels. Moreover, a possible pilot initiative for LNG along the Atlantic coast may accelerate this deployment. Viability studies for the availability of ship to shore electricity are also planned in some Core ports. The port of Le Havre already offers shoreside LNG energy limited to cruises.

Availability of at least one open terminal

Article 22.1.b) highlights that ports should ensure that at least one terminal is open and there is no discriminatory access. All ports currently meet this criterion.

Facilities for ship generated waste

All ports have some kind of Port Reception Facilities available and there is no indication of a lack of fulfilment of this requirement (Article 22.2).



#	Mode	KPI	Definition	2017	Target 2030
16	Seaports (8)	Connection to rail	Number of seaports in CNC with a rail connection as a proportion (%) of the number of relevant core seaports in the CNC.	100,0%	100%
17		Connection to IWW CEMT IV	Number of seaports in CNC with a (hinterland) inland waterway connection of at least CEMT IV class, as a proportion (%) of the number of relevant core seaports in the CNC.	100,0%	100%
18		Availability of alternative clean fuels	Number of seaports offering (at least one of) LPG, LNG, liquid biofuels, or synthetic fuels as a proportion (%) of the total number of seaports in the CNC.	13,0%	100%
19		Availability of at least one freight terminal open to all operators in a non-discriminatory way and application of transparent charges	Number of seaports with at least one open access terminal, as a proportion (%) of the total number of core seaports in the CNC.	100,0%	100%
20		Facilities for ship generated waste	Number of seaports offering facilities for accepting PRF mandatory (MARPOL Annexes I, IV, and V) categories of ship-generated waste, as a proportion (%) of the total number of core seaports in the CNC.	100,0%	100%

2.2.4 The Atlantic Road Infrastructure

The Atlantic Corridor is characterised by the high quality of the existing road network, 99.8% of which fulfils the TEN-T class requirements (motorways or express roads). The exception for full compliance is the cross-border stretch ES-PT through Vilar Formoso, to be upgraded in short term on both sides of the border, benefitting from a joint project between Portugal and Spain under CEF 2016.

Actions for road LNG deployment in the Corridor are currently ongoing, and it is expected that the actual compliance rate for LNG (about 12%) and electric charging (about 18%) will increase soon, as deployment is starting in beginning 2018, ensuring the accomplishment of the target by 2025. Availability of electric charging along the corridor is also being planned: nevertheless, electric charging is already available at large scale in urban nodes as well as along the main cities crossed by the Corridor.

Moreover, interoperability of tolling systems is not yet fully achieved at corridor level despite a significant progress since 2014. Technologically there is already a full achievement of interoperable solutions, but commercial services are not yet in place.

#	Mode	KPI	Definition	2017	Target 2030
11	Road network	Express road/ motorway	Road network km classified as motorway or express road, as a proportion (%) of CNC road section km.	99,8%	100%
12		Availability of alternative clean fuels (stations)	Number of fuel stations offering plug-in electricity, hydrogen, liquid biofuels, LNG/CNG, bio-methane or LPG along CNC road sections or within 10km from its junctions.	18,4% 12%	100% 100%

2.2.5 The Atlantic Rail-Road Terminals (RRTs)

The planning of the Atlantic rail-road terminals was one of the important topics addressed in our 7th Corridor Forum meeting. While the present situation is characterised by a very low modal share of rail along most of the Corridor, notably for long distance transport across the Pyrénées, the expected increase of rail traffic (already triggered by the Rail Freight Corridor) leads to a situation where further development of efficient RRTs is needed.

As pointed out in the 1st and 2nd Work Plan, bottlenecks are mainly relevant for intermodal connectivity, of both road and rail, the latter being largely affected in Spain and Portugal by limits on train lengths.

Additional rail-road terminals in the Atlantic Corridor are being defined, in order to take stock of the Corridor development, and to fully exploit the progressive deployment of UIC gauge network in the Iberian Peninsula.

Together with the infrastructure related measures, an emphasis on the deployment of logistic single windows along the Corridor, extending the current port single windows

towards the hinterland and integrating with e-maritime services and information technologies, could have a strong impact.

#	Mode	KPI	Definition	2017	Target 2030
25	Rail Road Terminals (10)	Capability for Intermodal (unitised) transshipment	Number of road rail terminals with the capability of handling intermodal units, as a proportion (%) of the total number of core RRTs in the CNC.	80%	100%
26		740m train terminal accessibility	Number of road rail terminals with the capability of handling 740m trains (without decoupling), as a proportion (%) of the total number of core RRTs in the CNC.	40%	100%
27		Electrified train terminal accessibility	Number of road rail terminals with the capability of handling electrified trains, as a proportion (%) of the total number of core RRTs in the CNC.	70%	100%
28		Availability of at least one freight terminal open to all operators in a non-discriminatory way and application of transparent charges	Number of RRTs with at least one open access terminal, as a proportion (%) of the total number of core RRTs in the CNC.	80%	100%

2.2.6 The Atlantic Air Transport Infrastructure

Airport infrastructure on the Atlantic Corridor is extremely important, with seven Core airports ensuring international and intra-European connectivity. Due to long distances, in particular for Spain and Portugal, the vast majority of intra-EU passenger journeys take place via airplane.

Four of the airports are considered main airports, notably Paris-Charles de Gaulle (the 2nd EU Airport), Madrid-Barajas (6th EU airport), Paris-Orly and Lisboa. As such, they are subject to the provisions of Art 41(3) of Reg. 1315/2013, which require them to have connections to both TEN-T road and rail and, where feasible, to include a high speed rail network, by 2050. Bordeaux, Porto and Bilbao are other Core airports on the corridor.

Among the larger airports – Paris-CDG, Paris-Orly and Madrid-Barajas – only the first is currently connected to high speed rail (as well as with a suburban train connection to Paris - RER B); Paris Orly is connected to Paris with a suburban rail connection: the “Orlyval” links the airport to the RER B; Madrid-Barajas airport is linked through commuter rail (“Cercanías” line C1) and fast metro connections. Lisboa and Porto have metro connections, while no rail connection exists for Bordeaux and Bilbao airports.

Paris, Madrid and Lisboa airports are required to have a connection with Core rail network by 2050, which is already planned in the case of Madrid through the foreseen new high speed UIC access from Chamartin railway station to the airport.

The compliance perspective on the alternative fuel availability in airports by 2030 (air side) is not clearly defined yet, although a feasibility study for the 2030 horizon is under development. Moreover, all corridor airports already have alternative clean fuels available for airport ground services and in airport parking stations.

#	Mode	KPI	Definition	2017	Target 2030
13	Airports (7)	Connection to rail	Number of core airports in CNC with a rail connection as a proportion (%) of the number of relevant core airports in the CNC.	42,9%	100%
			Number of core airports in CNC with a high speed rail connection as a proportion (%) of the number of relevant core airports in the CNC (by 2050) Applicable to Lisboa, Madrid, Paris CDG, Paris Orly	25,0%	75%
14		Availability of at least one terminal open to all operators in a non-discriminatory way and application of transparent charges.	Number of airports with at least one open access terminal, as a proportion (%) of the total number of core airports in the CNC.	100,0%	100%
15		Availability of alternative clean fuels	Number of airports offering liquid biofuels or synthetic fuels for aeroplanes, as a proportion (%) of the total number of core airports in the CNC.	-	-

2.3 Progress of Corridor Development

Important progresses, notably for cross border sections, have been achieved since the 2nd Work Plan.

As major achievements at the corridor level it is highlighted:

- The LGV East (to Strasbourg) entered in operation in September 2016;
- The for Tours-Bordeaux HSL ended – largest PPP on railway in the world (7.8 B EUR) thanks to by EU Guarantee (LGTT) and EIB Loan – and the line entered in operation in July 2017 allowing to travel between Paris and Bordeaux in only 2 hours. This is now sparing capacity on the conventional line for freight;
- The launch of the Port Accessibility fund in Spain, supported by EFSI;
- The launch of investments in most ports (PT, ES, FR).

Relevant on-going projects are expected to be operational on time or with some delays:

- The Y Basque by 2023 on the Spanish side;
- The construction of the missing rail link “Évora-Caia”, with completion foreseen by 2021 (likely to be delayed);
- Electrification works (at 25Kv) on the Spanish border between Fuentes de Oñoro and Medina del Campo by 2019;
- Partial conclusion of works on the Spanish border between Badajoz and Plasencia (UIC gauge), mixed line for passengers and freight.

Unfortunately, it recently appeared that the GPSO and especially the Bayonne-Dax and later the Dax-Spanish border high speed connections may not to be realised before many years. In that case, an upgrade of the existing line would be a must.

Advancements are also visible in terms of governance with the continuous cooperation between Portugal and Spain on interoperability and between France and Spain for rolling motorways. For the later, a joint proposal for studies on the Vitoria-Lille rolling motorway was presented and accepted in the CEF 2016 calls and a call for interested industry parties to submit information (technical specifications, commercial information etc.) on RoRo rolling stock was opened over March-June 2017. Five information files were received which are under examination. A new call for interested services suppliers will be launched shortly (or has been launched at the time of finalisation of this Work Plan).

Stakeholders and political participants in Forum activities clearly reinforced their commitment to Corridor activities and acknowledge that:

- Cooperation on concrete working themes as in the thematic groups is key to succeed in the Corridor;
- Development is facilitated by clear, simple and mandatory parameters for TEN-T;
- EU support, notably through CEF, is important;
- Decarbonisation of transport is a political mission;
- Motorways of the Sea and Port connectivity are of the uttermost importance for the Atlantic Corridor for all the MS;
- Blending of funds will prove crucial to timely develop the ambitious infrastructure needs.

Last, there is a growing acceptance that strong territorial cooperation across borders increases the interest and facilitating cross-border projects. Relevant stakeholders are taking part in different working group meetings, presenting successful projects and studies. The Euskadi-Nouvelle Aquitaine-Navarre Euroregion, the Macro-Region RESOE (Galicia, Asturias, Castilla y León, Norte and Centro), the coordinated services between Portuguese ports and logistic platform in Extremadura or the Quattropole and Grande Region are excellent examples of the territorial cooperation in place in the Atlantic Corridor.

3. Transport market analysis

The Atlantic Corridor has a significant potential to increase its modal share of Rail, though competition with Road is important and low oil prices are a hampering factor. Maritime freight transport is expected to continue growing, calling for an increase of the capacity of ports as well as better connections of ports with rail and inland waterways especially in the first/last miles. As such, the increase of Maritime is expected to lead to an increase of the volume and share of also Rail and Inland waterways, increasing the sustainability of the land-based part of the Corridor. Other remaining capacity issues lie especially in the urban nodes, on the rail network related to an insufficient deployment of ERTMS, restrictions for long trains, limited gauge of tunnels, differences in gauge in the Iberian Peninsula and at cross-border connections with France, lack of electrification and the missing Evora-Merida cross-border link. However, most of these issues are expected to be addressed by 2030.

3.1 Results of the Multimodal Transport Market Study (MTMS)

The transport market study has been developed by consultants in 2014. For methodological information, the reader is referred to the 2nd Work Plan pages 22-23.

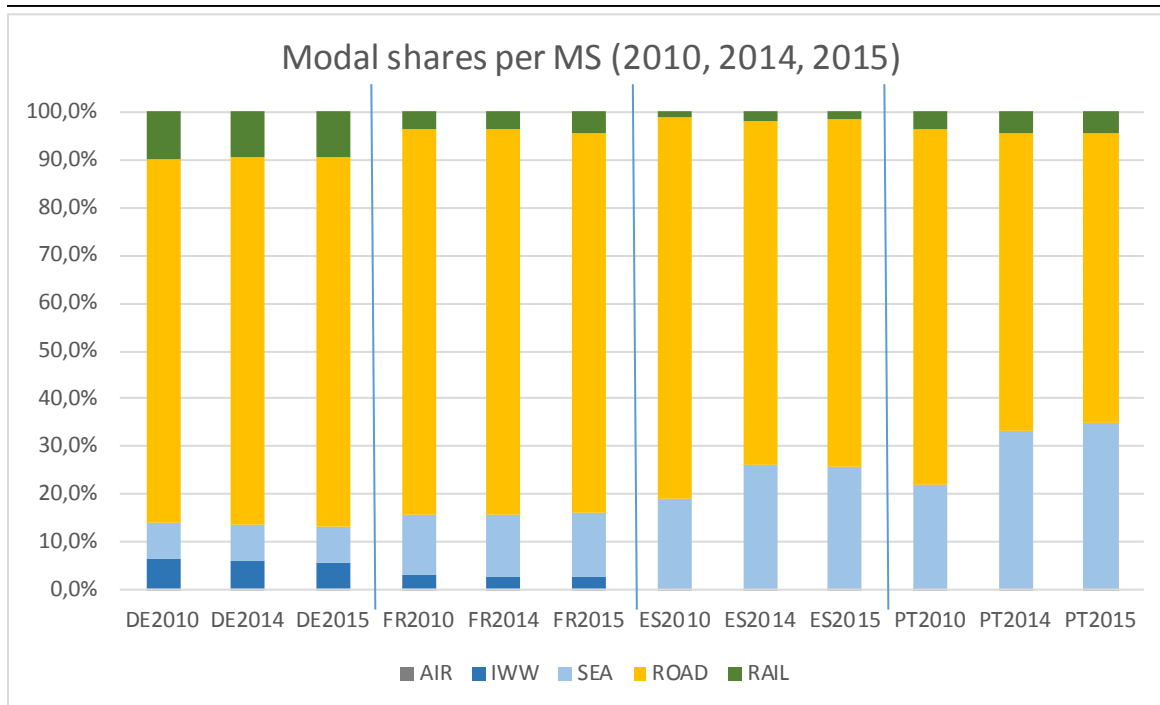
This section is a summary of the data already presented in more detail in the 2nd Work Plan, highlighting notably the main evolutions occurring at the corridor level:

General parameters

From 2010 to 2016, population in the Corridor regions saw a very moderate growth from 54 million to 54.5 million in 2014 and to 55.4 in 2016, with corridor regions representing about 11% of the EU population and nearly 12% of the EU GDP. Employment on the corridor regions shows a global recuperation almost to the values of 2010, after the 5% decrease observed from 2010 to 2014. Also, tourism in the Corridor regions continuously grows with the number of bed-places increasing by around 5% since 2014, with several regions showing rates over 15%, confirming the relevance of the Atlantic as a touristic destination.

Modal share

As in 2010, road remains the preferred mode for the transport of goods, however its share in Iberian countries, and particularly in Portugal, highlights a continuous reduction in favour of more sustainable modes, notably of maritime transport, and in lower rate of rail transport. In France and Germany, the modal shares remain rather stable over the period.

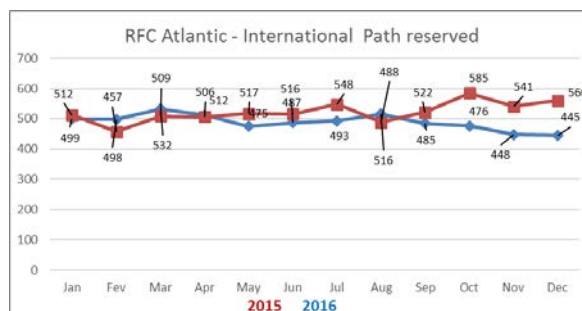


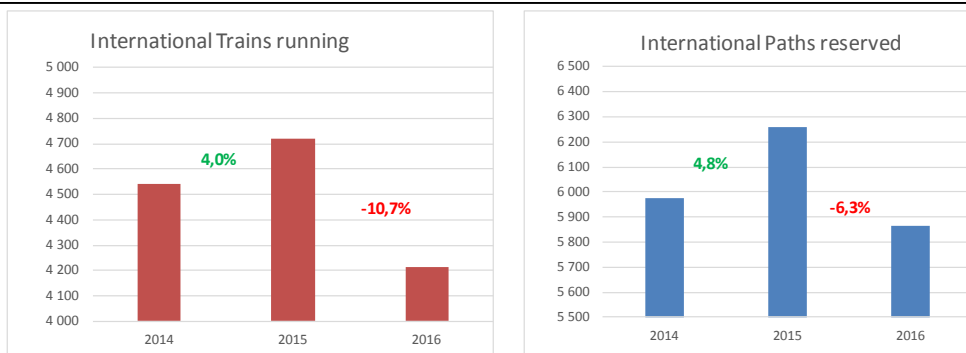
Source: Eurostat, Goods transported, by type of transport (2010, 2014, 2015)

Figure 3 – Freight modal shares per Member State (not limited to Atlantic Corridor)

Market

- Looking at the international *rail freight traffic*, as monitored by the Atlantic Rail Freight Corridor in 2014 and 2015, we observe that the number of international trains running, which showed an increase of 4% in 2015, decreased by nearly 10% in 2016. This is very much related to strikes and urgent works in France which impacted also the competitiveness in Portugal and Spain. For the borders ES-PT and ES-FR, in the first half of 2017 an important decrease of traffic (-20%) is again observed in France, linked to the cancelation of rail-road traffic between Woippy/Valenton and Hendaye (better competitiveness of road traffic for the full trip). On the positive side, a better punctuality is observed for the 3 countries. However, it is worth noting that capacity wishes for 2019 are significantly higher than for 2017/2018 so traffic and probably modal shift are expected to increase.

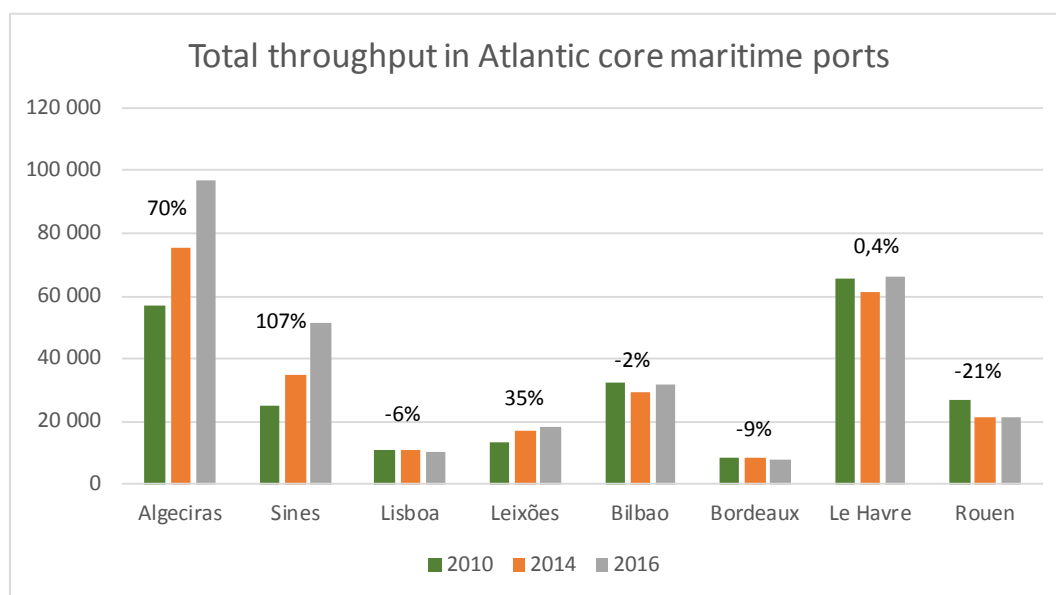




Source: Atlantic Rail Freight Corridor, 2017

Figure 4 - Rail Freight Corridor Indicators

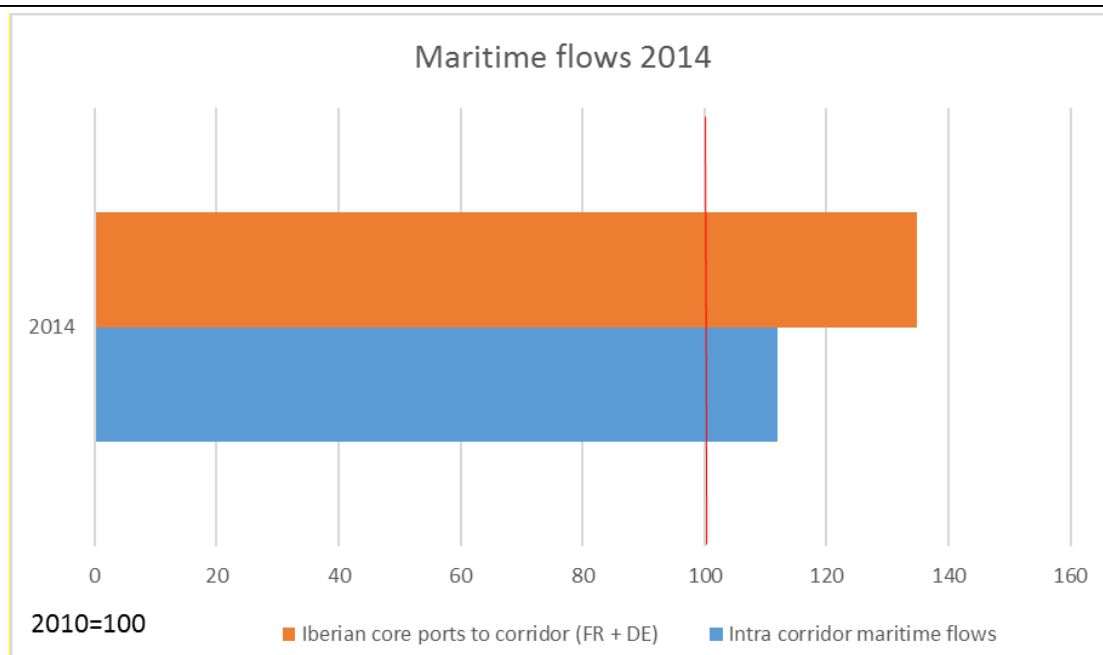
For the *maritime mode*, a sharp increase was observed in 2014 and further reinforced in 2016. The total freight volume passing through the Atlantic Core ports increased by 27% since 2010, reaching in 2016, 303.5 million tons (it was 239 million tons in 2010). The considerable growth of Algeciras (70%), Sines (107%, more than doubling the total volumes in 2010) and Leixões (35%) largely contribute to this result. Considering all core and comprehensive ports of the Atlantic coast, the total freight volume reached 420 million tons in 2015 compared to 291 million tons in 2010. A similar trend is also visible for maritime passengers in the Atlantic ports notably Algeciras and Lisboa but also growing in Bilbao and Leixões, affecting as well as the corridor performance.



Source: Eurostat, Port statistics

Figure 5 - Total throughput evolution in Atlantic core maritime ports

Intra corridor (i.e. all ports along the Atlantic façade, both comprehensive and core) maritime flows had grown at a good pace from 2010 to 2014, this trend being particularly remarkable when looking to the flows from the Iberian core corridor seaports towards France and Germany, as presented in the next figure. Worth noting that intra corridor maritime flows were collected as one of the corridor specific KPI:



Source: Eurostat

- With regards to *inland waterways*, total inland ports throughput on the Atlantic amounts to 46.5 million tons, falling nearly 5% compared to 2014. From 2014 to 2016, Mannheim and Paris ports grow about 1% while all the other inland ports lost traffic with the ports de Moselle (including Metz) showing the highest loss with almost 28%

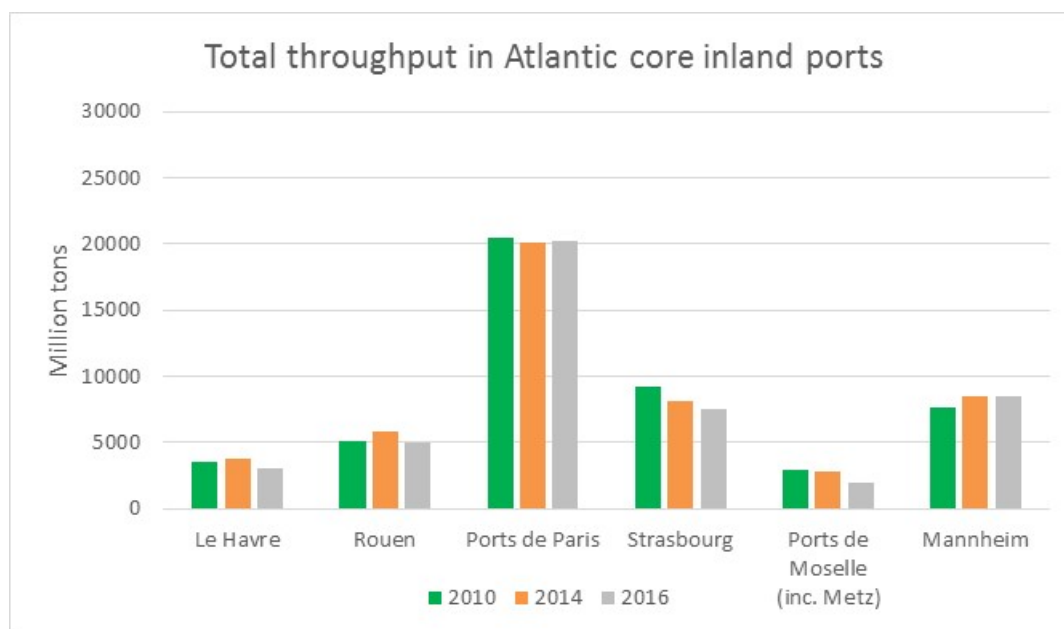


Figure 6 - Total throughput evolution in Atlantic core inland ports

With regards to the Seine River, freight traffic has slightly decreased with an overall volume of 21.2 million tons in 2016 (compared with 21.5 in 2014 and 22.4 in 2010). Despite so, it is worth noting that the River's container activity from the inland ports of Rouen and Le Havre has increased: +11% for Le Havre and +26% for Rouen in 2016 compared to 2015.

3.2 Progressing with the MTMS

A study developed in 2015 for the RFC on the “Impact of Atlantic ports’ development on international rail freight traffic” showed that rail traffic represents a hinterland market share of 12% (13 MT), with the highest share observed in Portugal (19%), Spain (10%), and the weakest in France (8%), and that, on the whole Atlantic Corridor, rail pre post haulages concern mainly dry bulk and container traffic (5 MT each of them) for two thirds of its market. The main container rail services are operated in Sines (2 MT), where the handled volumes permit economies of scale and intermodal services despite the high transshipment rate. Le Havre and Bilbao reach more than 1 MT each and, to a lower extent, Algeciras, Leixões and Lisboa each dispatch 0.5 MT on rail intermodal services.

However, for reasons of flexibility and ability to adapt more quickly to the demand of freight clients, most of the traffic in volume on short distances is captured by the road mode, due also to the barrier existing in cross-border railways. The potential of rail remains significant for mid- or long-distance destinations, where it could benefit from multi-client intermodal services for containers and trailers (Algeciras, Le Havre).

For the Atlantic Corridor, it must be kept in mind that major changes are indeed expected since:

- For the base year, alternative modes do not perform very well against road due to major interoperability problems;
- Part of these problems are expected to be solved with major investment projects for alternative modes, including development of new techniques such as Rail Motorways and MoS services, while others can be overcome with operational arrangements between infrastructure managers and with innovative administrative tools;
- and that the relative importance of very long distance international transport along the Corridor, compared to other Corridors, calls for innovative organisational solutions, with the development of transport hubs and multimodal logistic platforms.

For instance, the Traffic Market Study (TMS), realised by the RFC in 2014/2015 showed a high demand level for new rolling motorway services on the Atlantic Corridor of 2 million tons per year (equivalent to 4000 trains) by 2020 and 5.877 million tons (10.000 trains) by 2030. In this respect, the ongoing study “Feasibility Study of Rolling Motorway Service on the Atlantic Corridor at Short, Medium and Long Term” for the Rail Freight Corridor will bring further insights on its potential, notably for Spain and Portugal.

Another example is the maritime transport of containers. The study for the Atlantic RFC shows that an average moderate growth of 2%/year can be expected, which is much lower than the expected growth for rail traffic (containers 10%/year, dry bulk 5%/year, general cargo 4%/year) but could be higher if ports accessibility is improved.

The Corridor's added-value will also be influenced by its potential to improve the logistics chains to/from the EU in the global framework. When assessing this potential, two additional key elements also need to be considered:

- The deployment in the near future of LNG as maritime fuel in the North Sea-Baltic and North America's East coast, following the establishments of ECAs according to the MARPOL convention (operational since 2015), being noted in particular the effects in terms of competition that might affect the port of Le Havre, the only Atlantic port included in a ECAs;
- The enhanced role of the Atlantic area following the openings of the new Panama lock system and Suez Canal widening and, gradually, the growth of the polar route between the Far East and the North Sea.

While this set of factors call for enhanced capacity on ports, ensuring adequate inland connections for long-range transport, to the rail freight corridor, and to inland waterways, where available, is also critical.

In this respect, it is worth mentioning that in the medium time range (by 2023), Vitoria will be the key interconnecting point Iberian-UIC gauge, while capacity should be developed on the French side (which already consists of a double track electrified line compatible for 740-m long trains). It is therefore crucial to develop a plan to fully exploit its potential, also with reference to branch of the RFC feeding the Atlantic Corridor (e.g.: Zaragoza-Pamplona-Vitoria).

Additionally, the different corridors with inland waterways developed a joint macro analysis for container shift potential study for inland waterways, which objective was to identify individual transport flows that, brought together, could bring enough volume to operate a liner service between two (or more) Inland Terminals. A top-down approach has been used to determine the multimodal market potential. The assessment conducted highlights a low potential for container shift growth along the Seine river basin in the Atlantic corridor. The Douro inland waterway was not considered in the exercise, although it could play an important role in the future by connecting relevant industrial zones to seaport.

3.3 Capacity issues along the Corridor by 2030

The main problems related to capacity and line saturation at corridor level lie particularly in the important volume of works and maintenance periods planned by the rail infrastructure managers, as well as in the rail crossing of the capital cities Paris, Madrid and, to lesser extent, Lisboa. The lack of continuity on high-speed rail networks also affects passenger flows on the Corridor. In that respect, we hope for a positive decision of the French Government regarding the timings for the GPSO or at least the modernisation of the existing line.

3.3.1 Rail capacity issues in urban nodes

- Paris, one of the main urban areas in the Corridor, is also a bottleneck for freight trains, due to heavy passenger traffic of local and national trains; capacity issues are located on access routes to the *Grande Ceinture Ferroviaire*. This is of the utmost importance since three branches of the Corridor meet in Paris, connecting the node to Normandy (Rouen and Le Havre) in the North-West, Mannheim and Strasbourg in the East, Bordeaux and the Iberian Peninsula in the South-West.

On the Paris-Le Havre branch, railway freight traffic suffers from the saturation of the current main line along the Seine. In the future, maintenance works and the increase in passenger traffic will further reduce capacity allotted to freight. The new Serqueux-Gisors routing, in addition to the traditional Le Havre-Paris route, is an essential asset to develop the Port of Le Havre and its access to inland transport, however, the level of performance of this alternative route must be improved. Electrification is needed, as well as a direct rail connection at the Serqueux junction. The projects related to this line are progressing although it is possible that some delays might occur⁷.

- In the case of the Madrid node, as for Paris, freight transport and commuter services share the tracks on several lines, although there are some exclusive stretches for freight or commuter trains ("Cercanías"). The railways system is articulated through

⁷ Project was declared to be of public interest in November 2016, and since January 2017 the project is the subject of proceedings in the courts

the following facilities: two passenger stations (Madrid-Chamartín and Madrid-Puerta de Atocha) and several freight terminals (including Abroñigal, Vicálvaro and Dry Port of Coslada). Several actions aimed at solving technical issues in some of the mentioned lines and multimodal terminals will contribute to the improvement of the functioning of freight traffic through the Madrid node.

Concerning terminals, the outstanding projects impacting on the Corridor are: the planned development of the Madrid-Vicálvaro and Abroñigal Multimodal platforms, and the standard gauge connection of the node conventional network.

Developing works in the line Atocha-Chamartín (new HS tunnel Atocha-Chamartín, UIC gauge, length 8.2 km) will improve the operation model of both stations, as they will evolve from being a terminal to being transit stations. These works are therefore solving a key bottleneck for long-distance passenger traffic.

- In the Lisboa node, freight traffic connects to the *Cintura line*, a highly saturated line where three main suburban lines converge. An overall study planning on the rail infrastructures and services in the node is foreseen.

Studies for the Lisboa multimodal platform including the revamped terminal on the South bank (Barreiro) are ongoing; its results could lead to a potential concentration of main freight services in the south bank of the Tagus River, where rail has enough capacity available to cope with additional flows (but where last mile connections to the port will be necessary).

3.3.2 Other rail capacity issues

- The North line connecting the two urban nodes in Portugal (Lisboa to Porto) is saturated, imposing frequent limitations on services offered, both for passengers and freight. While several projects are targeted at minimising those bottlenecks, an overall planning for this stretch of the Corridor, in the context of the overall interoperability programming, is needed.
- Capacity is limited due also to restrictions to the operation of long freight trains in the rail network, rail-road terminals and port rail access, notably in Spain and Portugal. The need to run shorter freight trains decreases the efficiency of rail and maritime transport. Several projects and works ongoing or planned to allow longer freight trains along the Corridor will contribute to solve some of these capacity bottlenecks.
- Several sections of the Corridor are double track lines without banalisation system and single track lines, limiting the available capacity and hindering timetabling. Improvements should be evaluated on a case by case basis, taking into account the costs and benefits of upgrading.
- Another important constraint is the gauge of tunnels on the Hendaye-Bordeaux-Paris section, not sufficient for Rolling Motorways. A single non-electrified track line linking Bordeaux to Poitiers through Saintes can be used, increasing the operating cost, as long as the works for increasing the gauge of the tunnels are not realised.
- The current cross-border railway infrastructure between Spain and France represents a major bottleneck, leading to the need to adapt the trains from the Iberian and French railway networks (axle change, transfer of the load...). There is also a pressing need to complete the Y Basque and GPSO connection to allow for a direct connection to the line Bordeaux – Tours – Paris, and this would push a qualitative leap for cross-border rail traffic.

- On the Spain-Portugal borders (beyond the missing link of Évora-Caia, on the south connection, expected to be operational by 2021 though there could be delays), limited train lengths and lack of electrification (with both issues being addressed in ongoing projects) can be mentioned.

Notwithstanding these considerations, the Corridor appears to dispose, in the short-to-medium term, of sufficient capacity to cope with the expected growth in rail traffic. In addition, the proposal to the Rail Freight Regulation to allow RFC to manage PaPs for national freight flows from ports (which for the Atlantic are the majority of traffic from ports) would contribute to manage existing capacity in a more efficient way.

3.3.3 Capacity issues for seaports

Seaports are actively developing facilities and programmes to enhance their efficiency (digitalisation, extended gateways, single windows, etc.) and to develop multimodal hinterland connections; however, in several cases, enhancing capacity both for terminals and storage areas is called for to cope with increasing international traffic (i.e. Leixões). Ports' capacity is also conditioned by the necessary adaptation of infrastructure and superstructure to comply with larger ships' requirements: access channels and berths, quay length and strength, yard size, crane height and width are the most relevant limiting factors.

4. The identified projects to be realised by 2030 on the Atlantic Corridor

The analysis of the Project List of the Atlantic Corridor, identifying all ongoing and planned projects, allows confirming that most of the remaining gaps vs. the TEN-T requirements and the remaining capacity issues should be filled/removed by 2030. As stated already, where compliance will not be fully achieved by 2030 includes track gauge (74% expected in 2030) and ERTMS deployment – though all cross-border sections will have ERTMS deployed by 2030. In addition, we can highlight that the navigation on the Seine will be improved, adding value to the ports of Rouen, Le Havre and Paris; that the alternative fuels, interoperability of e-tolling and C-ITS projects will make the road component of the Corridor clean, connected and smart; that there is no clarity yet on the timings for the availability of alternative fuels at airports; and that there is still significant room for improving the first/last miles of travel, both passengers and freight, in the Corridor's urban nodes.

4.1 General Overview

The Atlantic Project List 2017, identified until May 2017, includes 272 projects belonging to the Corridor with an overall investment volume of 43.6 billion euro.

In addition, the Project List includes 63 other projects related to network branches connected to the Corridor with relevant influence on its functioning. Last, 14 horizontal projects affecting the Corridor have also been identified. These other projects and horizontal projects are however not considered in the analysis below.

Modes

The 272 projects are split per category as follows; note some of the projects are global projects still to be divided between several implementation projects (e.g. MoS showing just one global project):

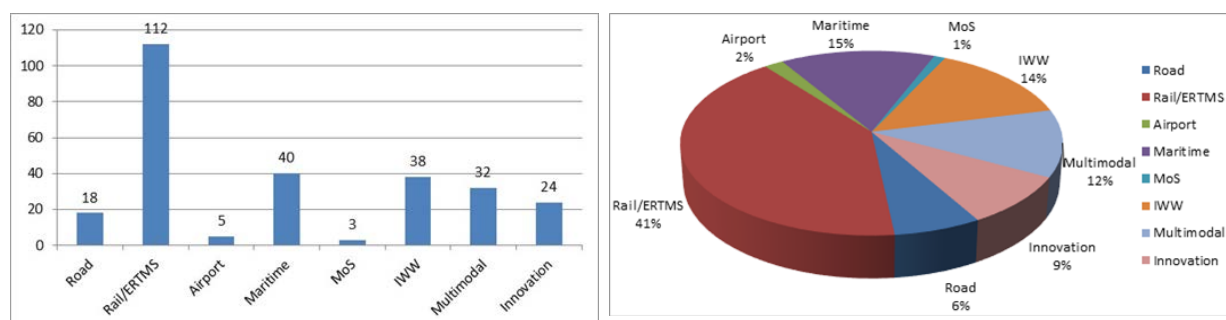


Figure 7 - Overall figures for the Atlantic project list 2017

Costs

Overall, the total cost of the planned projects amounts to 43,664.79 million € (cost data available for 82% of the projects). Rail (including ERTMS) represents 60.5% of the total costs. Nearly 25% are related to inland waterways. About 9% are related to maritime, 4% to MoS and almost 3% to multimodal projects, notably inland connections to ports. Innovation represents only about 0.9% of the costs. This is due to the fact that Innovation projects are predominantly horizontal and not directly attributed to a specific Corridor.

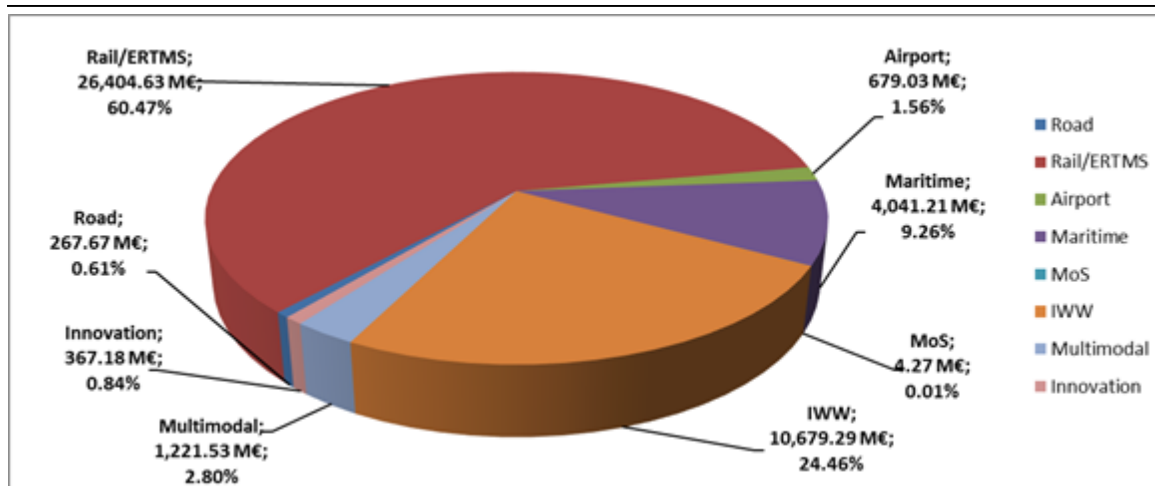


Figure 8 - Cost split per mode in the 2017 project list

Location

40 projects out of the 272 Corridor projects (14.7%) have a cross border dimension. They are divided by affected borders as follows:

Cross Border Projects

Cross-border Projects							
	PT/ES	ES/FR	FR/DE	PT/ES/FR	PT/ES/FR/DE	ATL+OTHER	TOTAL
Number	10	7	13	1	1	8	40
%	25.00%	17.50%	32.50%	2.50%	2.50%	20.00%	100.00%

Progress since the 2nd Work Plan

As acknowledged before, some relevant projects have been concluded since 2016. Of main significance are: the completion of the LGV East from Paris to Strasbourg in September 2016 and of the Tours-Bordeaux HS line in July 2017.

The actions collected in the projects that make up the 2017 Project List represent a step forward towards the fulfilment of the Atlantic Corridor objectives, notably in terms of compliance with the criteria of Regulation 1315/2013. Nevertheless, there are still sections of not full compliance, already identified in 2016 and for which the 2017 Project List still doesn't provide an answer. This is analysed in more details in the rest of this chapter.

4.2 Analysis by mode

4.2.1 Rail & RRT including ERTMS deployment plan

- In the rail network belonging to the Corridor, there is a *missing link* between Évora and Caia in the border Portugal-Spain. The "Évora-Caia Section" project (phases 1 and 2) on the Sines-Elvas line aims at addressing this issue.
- Some cross-border railways sections lack electrification: the "Salamanca – Fuentes de Oñoro Electrification, signalling system" project as well as the "HS line Madrid-Extremadura" project address this problem. In addition, electrification is lacking in strategic sections for freight transport along the Corridor. This constraint is tackled by the following projects: "Bobadilla - Algeciras. Conventional rail line. Electrification 25KV AC"; "Modernisation of Serqueux-Gisors line" and "UIC Gauge - Aveiro line" between Cacía and the Port of Aveiro.

- There are restrictions to the *operation of long trains* (740 m) for freight transport in the rail network, rail-road terminals and port rail accesses in the Iberian Peninsula. The outlook is however positive since several projects are tackling these constraints on both sides of the border (15 in Portugal and 11 in Spain). The most relevant ones in Portugal are along the rail connection Aveiro-Vilar Formoso - Aveiro-Mangualde stretch; on the central line Sines/Elvas on the Évora-Caia section, and related to the road and rail accesses to the new south bank terminal of Lisboa.
- Several projects are addressing bottlenecks in the crossing of and/or access to urban nodes: the Madrid - Algeciras conventional line (San Cristobal - Villaverde bajo - Pitis railway freight track), the Implementation of UIC gauge in the Madrid node to its RRTs and the enhanced Bilbao port land accessibility and rail connectivity.
- A meaningful set of projects mapped along the Atlantic Corridor deal with *Rail-Road Terminals* (6 in Spain, 2 in Portugal and 4 in France), highlighting an effort towards new generation logistic platforms and a shared focus on multimodality.

On *railway development*, in France, the following projects stand out for their added-value to the Corridor: the new mixed HSL line between Bordeaux and Spain (GPSO), the increase of tunnel gauge for RoMo services and the implementation of banalisation system (IPCS) in different sections of the network. Unfortunately, it recently appeared that the GPSO and especially the Bayonne-Dax and later the Dax-Spanish border high speed connections may not to be realised before many years. In that case, an upgrade of the existing line would be a must.

- The historic differences in track gauge between the Iberian Gauge (1668 mm) and the UIC Gauge (1435 mm) are addressed by the “Y Basque High Speed Rail (mixed line). Several other projects of the Project List of the Corridor contribute to the objective of interoperability such as “HS line Madrid-Extremadura” and “Medina del Campo - Fuentes de Oñoro Implementation of UIC”. Interoperable cross-border connections are addressed by several projects including “Rail connection Aveiro-Vilar Formoso” and “Railway connection Sines/Elvas”. With the implementation of these projects, the Iberian branch of the Corridor will increase its interoperability, with the exception case of the North line, as already underlined. Importantly, the cross-border sections will be interoperable or ready to become fully interoperable not only in terms of gauge but also of electrification and train length. Polyvalent sleepers will, finally, be the technical solution to be adopted to prepare the transition of Portuguese network for the UIC track gauge, in consonance with the technical solutions in Spain for cross-border sections. The figure below highlights the sections in Portugal and Spain where polyvalent sleepers are already installed or will be installed for its future upgrade into UIC:

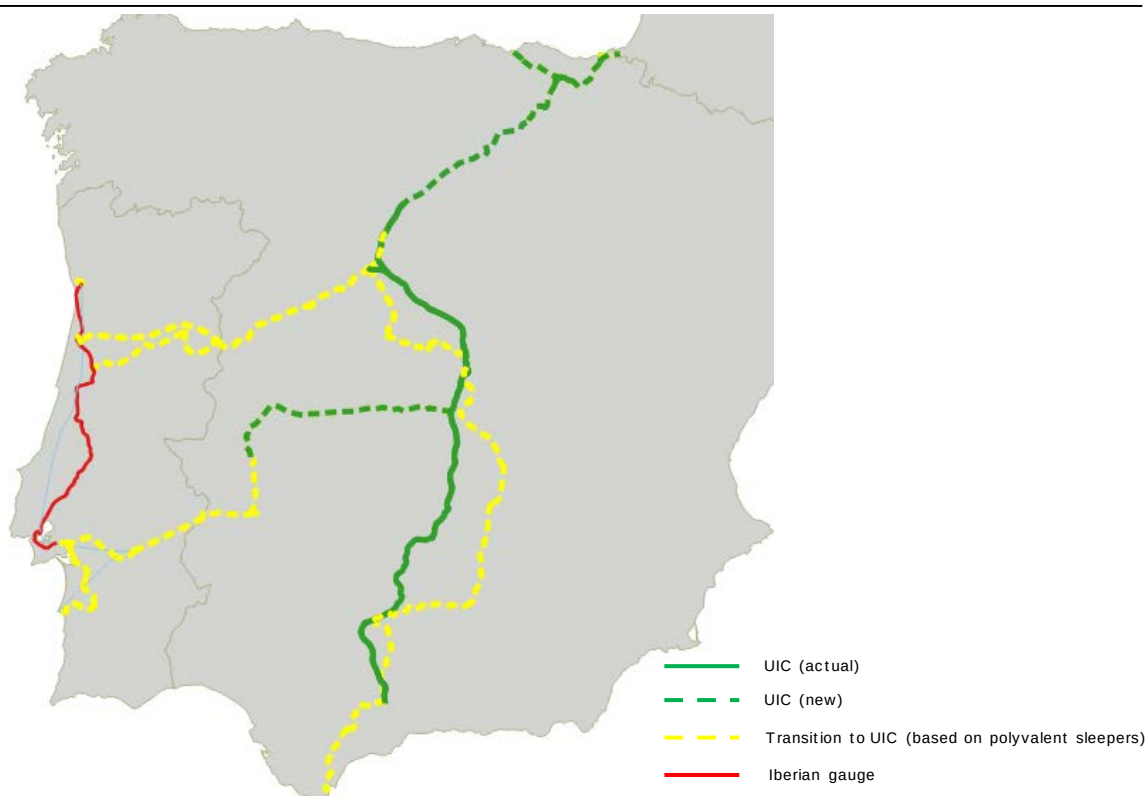


Figure 9 - UIC gauge in the Iberian Peninsula⁸

- As far as *signalling* is concerned, “Full deployment ERTMS/ETCS - Lisboa-Porto”; “Évora-Caia–ERTMS”; “Conventional rail line Madrid-Alcázar-Córdoba-Algeciras. Implementation of ERTMS”; “ERTMS deployment on the Longuyon- Basel line”; “ERTMS deployment on the corridor (Excluding HSL SEA and HSL EE) by 2030 (France)” are some of the projects addressing ERTMS implementation on the Corridor. Several of the ERTMS implementation projects are however planned for a horizon beyond 2030. Nevertheless, it is worth noting that all cross-border sections are included in the set of projects to be implemented until 2030.

Overall, the completion of on-going and planned projects would lead to a substantial improvement of the rail corridor. Notably:

- The missing link in the southern border between Portugal and Spain would be completed and interoperable with UIC gauge (polyvalent sleepers);
- The entire network would be electrified and allowing the operation of 740m trains and 22.5 t of maximum axle load.
- Interoperable gauge – polyvalent sleepers or UIC – would be deployed over 75% of the core network. The “North line” connecting Lisboa to Porto in Portugal remaining in Iberian gauge as an exceptional issue that can’t be tackled with the line in full operation. A planning for the upgrade of this line is still pending.

We add here the perspective from the Coordinator for ERTMS as to the status of his work:

⁸ A discussion is on-going regarding the interpretation of the TEN-T Regulation for the gauge compliance of existing lines. This may lead to changes of the maps and KPIs with a higher compliance for the ATL Corridor than currently displayed.

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. ERTMS Coordinator 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 by implementing ERTMS over the last 10 years. However, an ERTMS Deployment Action Plan, adopted by the Commission as a Commission Staff Working Document on 16 November 2017, has been officially introduced. It 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.

4.2.2 IWW & inland ports including RIS Deployment Plan

- In the *Seine River* some local bottlenecks, notably on locks and port access, were identified. Examples of projects that address those issues are: "Lengthening of the Méricourt lock (Seine-Scheldt inland waterway)"; "Modernisation of the Poses dam (Seine-Scheldt inland waterway)" or the "Upgrade and availability improvement of Tancarville locks".

Tackling these issues will increase the reliability of navigation on the Seine. The doubling of single locks and the lengthening of smaller second locks will offer alternatives to barges in case of incidents, while reducing waiting time at locks under normal conditions. Renovated dams and locks will also decrease the risks of incidents occurring in the first place. Finally, remote control of locks from headquarters will improve efficiency of waterway operations. The sum of those various local improvements will boost traffic fluidity on the basin, at the junction between the Atlantic and the North Sea Mediterranean corridors, improving IWW competitiveness and promoting multimodality.

- On the information systems, a deployment of a river single window connected with ports, IWW ports, and other logistics platforms towards a River Single window (SIF) is planned by HaRoPA.
- Several projects from Strasbourg inland port comprising capacity increase but particularly improvements in the inland connections but also a project for capacity enlargement in the Ludwigshafen IWW port.

4.2.3 Maritime Ports & MoS

- As previously highlighted, many ports on the Corridor are operating near *capacity*, thus facing the need to expand their facilities and upgrade their infrastructure and

maritime accesses to cope with the expected growth in demand. This is in line with the necessary upgrade and reinforcement of terminal extensions for logistic and industrial platforms and intermodal terminals. Furthermore, most ports also need to adapt facilities and equipment to the new standards required by the use of bigger ships, a trend that is expected to be continued in the future due to the Panama and Suez Canal widenings. Based on the Project List, ports and port terminals on the Corridor will substantially increase their capacity, e.g.: the “New Container Terminal of the Port of Leixões”; “Terminal XXI Capacity Expansion Project in the Port of Sines”, “New container terminal in Sines - Vasco da Gama terminal (phase 1)”, “Developing and upgrading port maritime infrastructure in Algeciras Bay Port: La Galera (Passengers), Juan Carlos I, Campamento (keywalls & jetty and breakwater), Isla Verde and Tarifa expansions”, “Developing new port infrastructure and upgrading (Central Breakwater) in Bilbao Port”, the “Third phase of “Port 2000” container terminal” in Port of Le Havre; or the “Improvement of vessel access to the Port of Rouen”, which are critical to meet the expected traffic growth. As an example, without the new container terminal increasing draught from 12m to 14m to accommodate an increase of vessel size, almost 40% of the world fleet cannot be received in the port of Leixões. It is worth noting that these investments are expected to attract private investment, turning them into potential candidates for innovative financial instruments.

- Projects concerning *last mile connections* to ports are highly relevant for the functioning of the Corridor. Several projects mapped for the Atlantic Corridor focus on the improvement of land access and last mile connections, especially related to rail access but also to road connections. Some examples are: “Road and Rail Accessibilities to the new Lisboa South Bank Terminal”; “Algeciras Bay Port land accessibility and connections with the hinterland”; “Bilbao Port land accessibility and connections with the hinterland. Road”; “Upgrade Port of Rouen rail network”; “Increasing capacity at the Port du Rhin station-Upgrading rail access to the port-Rail access to the port from the German network”. A part of these projects will be further speeded up with the new Fund for Port Accessibility in Spain, developed with the contribution of the EFSI. Worth mentioning as well are implementation projects for e-freight solutions in the Atlantic corridor, such as the “e-Impact” project being implemented in the ports of Lisboa and Leixões.
- Additionally, the development of *MoS* is particularly relevant to the Atlantic Corridor, though its potential is not yet fully exploited. Nevertheless, a reasonable number of successful MoS and SSS regular lines from the Atlantic ports are already in operation (including also comprehensive and core ports not belonging to the Corridor but nevertheless contributing to its maritime dimension).
- Cooperation between ports is also an interesting topic. In January 2018, HAROPA, the economic grouping representing the ports of Le Havre, Rouen and Paris, signed a partnership agreement with the port of Strasbourg, by which both partners will put in place a regular rail connection between the two areas, exchange best practices and join forces in amongst others research and development efforts. This is a very good example of cooperation between maritime and hinterlands ports to their joint benefit and that of the Corridor.
- It is also worth underlining the role of the Atlantic Corridor as the main axis *connecting Europe with North Africa*. This role brings important challenges to the Corridor in terms of efficiency and capacity, but also security and safety, amongst other issues, to tackle with the increasingly active role of northern African countries in freight logistics (i.e. new vehicles, ro-ro, components, etc.).
- Finally, many projects are on-going as regards the development of *clean fuel bunkering infrastructure*, particularly related to LNG and electricity, in order to

comply with the environmental regulations and the MS national policy frameworks for clean fuels infrastructure.

We add here the perspective from the Coordinator for MoS as to the status of his work:

In parallel to this Work Plan, Brian Simpson, the European Coordinator for Motorways of the Sea, delivered 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 is supported by a full set of data on ports characteristic, which are an integral part of the TEN-TEC database and in the form of annex it consists of a detailed analysis on ports and shipping operations with regard to all 331 seaports included in the TEN-T core and comprehensive network.

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.

4.2.4 Road transport (including ITS deployment)

As far as roads are concerned, the most remarkable actions included in the Project List of the Corridor address three main issues: continuity of highways, progress on e-tolling compatibility and provision of C-ITS services:

- On the issue of *continuity of highways*, the project “Completion of missing link in cross-border PT/ES (Vilar Formoso) - motorway with a new alignment, bypassing Vilar Formoso village”, on the Portuguese side of this cross-border motorway section, and the “Construction of the motorway A-62. Section: Fuentes de Oñoro - Border ES/PT”, on the Spanish side, will complete the last kilometres that do not comply with the motorway criteria;

- On the issue of *interoperability of e-tolling*, the “Expansion of acceptance of VIA T in France road” project will widen the compatibility of e-tolling systems between Spain and France;
- On the issue of *C-ITS services*, with the three countries actively engaged in the C-Roads platform, there is a good momentum to make the Atlantic Corridor a frontrunner. The ongoing AUTOCITS project addressing a regulation study and pilot deployment for interoperability towards autonomous driving in the Paris, Madrid and Lisboa nodes is also a worth noting.

Together with the ongoing deployment of LNG supply and electric charging along the Corridor, the road component of the Corridor is building up the conditions to become clean, connected and smart.

4.2.5 Airports

- There is a bundle of projects targeting *airport infrastructure and environmental performance*, among which we can mention: “Lisboa airport upgrade” and “Porto airport upgrade”.
- Paris, Madrid and Lisboa airports are required to have a connection with the *core rail network by 2050*, which is already the case for Paris and which is already planned for Madrid, through the project “High Speed Rail Access to Madrid Barajas Airport (Chamartín - Barajas) and renewal of side-tracks in Chamartín Railway Station”. Currently, the Lisboa airport is served by the underground, ensuring a direct connection to the main passenger railway station (Orient) which is less than 5 km from the airport. However, the current Project List doesn't include any measure to ensure its access to the rail network by 2050.
- The compliance on *alternative fuel availability by 2030* is also not clearly defined yet. The current Project List only contains studies, evidencing a low technological maturity of the issue. This may however evolve following the recent agreement to involve the air sector in the implementation of the Paris process on curbing GHG emissions.

4.3 Urban nodes

According to Regulation EU N° 1315/2013, urban node means “an urban area where the transport infrastructure of the trans-European transport network, such as ports including passenger terminals, airports, railway stations, logistic platforms and freight terminals located in and around an urban area, is connected with other parts of that infrastructure and with the infrastructure for regional and local traffic”. Requirements applicable to urban nodes are those established in the Articles 30 (Urban nodes) and Article 41 (Nodes of the core network) i.e.:

- Modal interconnections for freight and passenger transport in cities;
- Adequate connections between airports and railway stations;
- Seamless connections between local and national networks at logistics centres;
- Mitigation of negative externalities.

Our seven core urban nodes include the three capital cities (Paris, Madrid and Lisboa) and four other main agglomerations: Mannheim (Germany), Bordeaux (France), Bilbao (Spain) and Porto (Portugal).

Country	Urban Node	Other CNC	Connection with modes
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			Rail	Road	IWW
Germany	Mannheim	RDAN RALP	X	X ⁹	X ⁸
France	Paris	NSMED	X	X	X
	Bordeaux	-	X	X	X
Spain	Madrid	MED	X	X	
	Bilbao	-	X	X	
Portugal	Lisboa	-	X	X	
	Porto	-	X	X	X

4.3.1 Madrid

- A major ongoing project in Madrid is the finalisation of the new Atocha - Chamartín standard gauge tunnel. The UIC tunnel will allow direct connection between the north (Madrid - Chamartín) and the south (Madrid - Puerta de Atocha) HS rail stations, providing a unified HS national network, enabling direct HS services connecting the regions in the north-west/north with those in the north-east/east/south.

This tunnel will also represent an upgrade on rail operations, an increase of functional possibilities for new services and a significant increase of the capacity of the Puerta de Atocha and Chamartín HS stations. Several studies are planned to upgrade these stations to meet future needs:

- Putting into value the new standard gauge tunnel Atocha-Chamartín
- Transfer of new high speed traffic between stations (mainly to Chamartín)
- Upgrade the functional capacity of commuter traffic that share station with HS traffic.



Figure 10 - Atocha-Chamartin connection

- Moreover, the enhancement of the existing infrastructure in Vicalvaro RRT to international standards for freight trains would allow this terminal to become a state-of-the-art logistic node, integrated in the TEN-T.

4.3.2 Paris

The Paris node is at the junction of the ATL Corridor, with branches heading from Paris to the Iberian Peninsula, Mannheim and Le Havre, and the NSMED Corridor linking the Paris area with North of France, the UK and the Benelux. For freight, rail infrastructures on the Corridor include conventional lines to Strasbourg in the East, Bordeaux in the South, Rouen and Le Havre in the North-West through Mantes-la-Jolie or through Serqueux for freight trains (opening in 2020). Additionally, the ATL Corridor includes the Grande Ceinture Ferroviaire (Large Rail Belt) bypassing Paris and connecting all 4 aforementioned branches. Passenger rail lines include the East HSL to Metz and

⁹ There are no IWW and Road networks components in Germany for the Atlantic corridor

Strasbourg, the Paris-Bordeaux HSL and the high speed interconnection line linking the East HSL to the Paris-Lyon HSL (not in the ATL corridor).

- Still missing on the HSL network at the Paris node are the Interconnection Sud project, joining the Paris-Tours-Bordeaux line to the Paris-Lyon, Paris-Strasbourg and Paris-Lille lines, as well as the Paris-Normandy line.
- Several projects aim at increasing capacity on rail links in the Paris area or upgrading the alternative route between Paris and the seaports of Normandy through Serqueux. These projects will reduce delays for freight trains crossing the node and improve the competitiveness of rail on the overall Corridor.
- The works planned on the Seine in the frame of the Seine-Scheldt project will improve infrastructures and navigation on the Seine axis both on the downstream Seine (ATL corridor) and on the upstream Seine (not ATL corridor). Several projects by Ports de Paris will develop the network of platforms on the Seine (Paris Seine Métropole, Triel-sur-Seine, extension of Limay) or improve multimodal access to existing platforms (in particular RN406 to the port of Bonneuil-sur-Marne), thus enhancing multimodality at the Paris node. In addition, enhancements of existing RRT and implementation of additional capacities (especially RoMo terminals) are needed.
- Moreover, two metro projects conducted by Société du Grand Paris aim at improving access to Paris core network airports.

4.3.3 Lisboa

- In the Lisboa node, the main issues relate to last mile connections: the terminals belonging to the maritime port of Lisboa are located on both sides of the Tagus, with different modal connections: the north shore focuses on containerized cargo, Roll-on / Roll-off and other general cargo and cruises. The different specialised terminals in liquid and solid bulk are positioned on the south shore. Of these terminals on the south shore, only the terminal of Barreiro has railway connections. Container facilities include three terminals located on the north bank of the river. These terminals have railway connections, but there are severe bottlenecks for the terminal of Alcântara, the most critical ones being the urban level crossing (with several conflict points) of major roads and the converging of freight traffic into the *Cintura line*, a highly saturated line where three main suburban lines converge. An overall study planning on the rail infrastructures and services in the Lisboa node is foreseen. Studies for the Lisboa multimodal platform including a revamped terminal on the South bank (Barreiro) are ongoing; its results could lead to a potential concentration of main freight services in the south bank of the Tagus in a revamped container terminal at Barreiro, where rail has enough capacity to cope with additional flows (but where last mile connections to the port will be necessary) thus reducing the pressure of freight transport in the urban node.
- As mentioned above, the Lisboa airport is currently served by the underground. However by 2050, the airport should be connected to the core railway network, if possible with high speed line. The current Project List doesn't plan any measure to address this requirement.
- On the other hand, important ongoing projects with relevant impact on the functionality of the urban node as a smart, clean, inclusive and connected city, which go beyond infrastructure deployment, include the development of a Municipal Integrated Operational Centre Municipal (COI) which will integrate with the National Single Access Point. Moreover, a C-ITS pilot case in the Lisboa Urban node will deploy a relevant set of C-ITS day 1 and day 1,5 services.

- The conclusion of the Port Cruises Terminal in summer 2017 and its connection with other modes (metro, light rail, buses and railways, both long distance and suburban lines) reinforces the relevance of the Lisboa node from the tourism perspective (523 thousand passengers/ 311 ships in 2016).
- In terms of alternative fuels, the Electric Mobility program foresees a wide coverage of charging points in the Lisboa urban node. New fast charging points on major motorways connecting Lisboa to the north and the south are foreseen under the "CIRVE_PT" and "Deployment of Autogas refuelling stations in metropolitan areas in Spain and Portugal" projects.

4.3.4 Mannheim

Mannheim is the third-largest city in the German federal state of Baden-Württemberg and it is one of the twenty largest cities in Germany. Two corridors run through the urban node of Mannheim, the Rhine-Alpine and Rhine-Danube Corridors, the Atlantic is ending there. The motorway A6, passing next to the node, as well as many corridor rail lines are part of the Rhine-Danube network while the Rhine and the Neckar, that flow together in Mannheim, belong to the Rhine-Alpine core network. Two rail-road terminals (M. Handelshafen (DUSS) and Ludwigshafen KTL) and three trimodal terminals (M. Handelshafen (Contargo), Ludwigshafen Kaiserwörthhafen and Mannheim MCT) characterise the urban node area of Mannheim.

The corridor core network in Mannheim is totally compliant. Moreover, a project for the "Node extension Frankfurt, Hamburg, Köln, Mannheim, München, Hannover, Bremen", partly affecting the Atlantic Corridor, has been foreseen in the Federal Transport Infrastructure Plan 2030 to eliminate current or potential capacity bottlenecks within the whole node.

4.3.5 Bordeaux

The Bordeaux urban node, located along the Atlantic coast halfway between Paris and Madrid, hosts a population of 1.1 million inhabitants in its urban area (source INSEE 2012). It is connected to Paris by the A10 motorway and to Spain by the A63 motorway, both part of the core network. Bordeaux is positioned on the Paris-Orléans-Tours-Bordeaux-Dax-Hendaye core network conventional rail line and connected to Paris by high speed line after the opening of the LGV SEA line between Tours and Bordeaux in July 2017. The Bordeaux node is characterised by the following issues: important congestion on the Bordeaux bypass, notably in the Eastern part connecting Merignac airport and in the South on the part from A63 to the Garonne belonging to the ATL corridor; public transport access to Merignac airport which is currently not connected by any rail mode; limited capacity of rail infrastructure to allow for expected passenger and freight traffic increase due to the development of the high speed network (Tours-Bordeaux, Bordeaux-Toulouse expected for 2024 and Bordeaux-Spain planned for 2032 – based on the agenda from 2013) and upgrades of the conventional network in Spain and France. Furthermore, waterway access to terminals furthest from the ocean is limited to some time-windows due to a natural draught of 8.80 meters and a decreasing natural dredging by the river.

Notable improvements are foreseen for the Bordeaux node: several projects aim at increasing capacity in or near Bordeaux on the Paris-Spain rail line. These projects will allow trains induced by coming network developments such as the GPSO HSL and the deployment of the UIC gauge on the Iberian Peninsula. The Gironde XL project by the port of Bordeaux aims at dredging and promoting innovative solutions to allow larger vessels at terminals furthest from the ocean. A public transport project by Bordeaux Métropole aims at connecting by light rail the Merignac airport to the city centre.

4.3.6 Bilbao

The urban node of Bilbao is constrained by several issues, the main ones being:

- the rail line between Bilbao and Bilbao Port suffers from an overlap of commuters' trains and freight trains. Consequently, the current RRTs linked to the activity of the Bilbao Port cannot cover all the expected needs;
- due to the high heterogeneity of rail traffics in the access to Bilbao city, linked to overlapping of metropolitan, regional, long distance and freight traffic, the node performance for freight traffic is rather low, especially during periods of higher commuter train frequencies.

However, with the projects currently foreseen in the Project List, most of the issues in the node will be addressed. Notable projects include the creation of a new direct connection to the Bilbao Port through the existing Serantes tunnel in UIC gauge (South rail bypass) which will contribute to enhance intermodal transport between Bilbao Port and the centre of the Iberian Peninsula and the rest of Europe, allowing avoiding the circulation of freight traffic through Bilbao's urban area. Also the creation of the new HS access to Bilbao within Y Basque in UIC gauge, independent from the current Iberian gauge network, will grant direct rail access to the city of Bilbao. Intermodality will be implemented at the Bilbao-Abando underground station for commuters, regional and long-distance trains.

4.3.7 Porto

Finally, the Porto node is characterised by several bottlenecks:

- The *rail connection to the port of Leixões* presents several limitations as previously acknowledged. The studies for the improvement of the rail connections to the port and the logistic platform have been concluded, but the project implementation is delayed due lack of financial resources. The port of Leixões is located in a very densely populated and industrialised area, which severely limits its growth potential. Moreover, this also raises issues related to the sustainability of the operations, notably in terms of noise and emissions, even more so as the port operates on a 24/7/365 basis.
- The *port of Leixões* also has *inland connection* (class IV), however it is not exploited to its full potential due to bottlenecks along the Douro River (core IWW).
- The *airport* is connected to urban transport (bus/metro) but not to *rail*.
- The *lack of high speed rail connection from Porto to Lisboa and to Spain*, for which projects are delayed for decision after 2030, affects the long distance connections from Porto. Moreover, besides the connections to Spain through Salamanca for which improvements are ongoing, the connection to Northern Spain (Galicia) is even more critical due to strong economic relations. Some ongoing projects co-funded by the structural funds are addressing this issue, notably the electrification of the Minho line.

On the *innovation side*, with the ongoing CEF projects CIRVE-PT and Autogas, the continuity from the urban node (already with a good coverage level of electric charging points) to the Corridor is being put in place. We also note the deployment of an automated and connected vehicle pilot on the A28 connecting Porto to Galiza (cross-border) in the framework of the CEF "Scoop" project, as well as relevant progress in terms of freight digitalisation with the continuous widening of the port single window deployed also to the Douro inland waterway and to the Viana do Castelo pole.

Last but not least, Porto is showing a constant pressure in terms of tourism growth, both air and cruises, therefore better and smooth *intermodal connections for passengers* (in addition to freight) need to be planned.



5. Future Challenges for the Atlantic Corridor

As stated already, where compliance will not be fully achieved by 2030 includes track gauge (74% expected in 2030) and ERTMS deployment, though all cross-border sections will have ERTMS deployed by 2030. Regarding track gauges, the gaps will be only in Portugal on the North line connecting Lisboa and Porto. Other challenges are identified in relation to the respect of timings of certain projects (though nothing critical which would be postponed beyond 2030); the need to convince the private sectors to invest in alternative fuels recharging/refuelling/refilling and in C-ITS; the need to better connect the maritime ports to the inland logistics chains; the need to relieve the pressure of port activities on the urban environment; the general need to make procedures and permitting much more simple and faster; and the need to take care of efficient connection to neighbouring (Core and Comprehensive) branches and territories. Sufficient commitment at Member States level to ensure seamless high speed passenger flows at cross-border rail connections recently appeared as a bigger challenge than earlier anticipated.

5.1 How do we identify the critical issues

From the preceding chapters, we naturally come to identify the key challenges for the completion of the Corridor, versus the requirements of the TEN-T Regulation and versus the specific goals we set forth for the Corridor. Chapter 2 on the characteristics of the Corridor allowed identifying especially the gaps in terms of technical requirements while Chapter 4 on the Project List helped evidencing where the remaining gaps are expected to be, beyond what is already planned to meet these requirements. Chapter 3 on the transport market analysis gave a good reading of current and projected traffic flows, highlighting both watch-outs and opportunities. Last but not least, the wide consultation and coordination process described under Chapter 1 produced numerous valuable insights guiding us further in documenting the main challenges.

In this chapter, we go deeper into the critical issues by first showing the compliance maps, then recapping the remaining bottlenecks and identifying the persisting administrative and operational barriers. The last part of the chapter look furthers into sections and territories which are not part of our Corridor but have important impacts on it and should therefore be in the scope of our activities.

5.2 Technical compliance maps by 2030

At corridor level, the aggregation of the information provided by stakeholders in the Project List exercise allows the drawing of geographical-based compliance maps for 2030 for rail and for IWW, considering the following stages of implementation:

- Green: compliant (status of 2017)
- Green dotted: works ongoing, compliance expected
- Yellow: works still to start, compliance expected
- Yellow dotted: works foreseen but delayed, compliance doubted
- Red: works not yet planned / agreed for completion

The map for rail refers to an aggregate result considering four compliance criteria: track gauge, electrification, axle load and speed. An aggregate result in this context means that if one of the criteria is not accomplished, then the section is non-compliant. Given the specificity of different track gauges in the Corridor, a map for gauge compliance is also presented. Beware, figure 11 does not yet reflect the likely postponement of the GPSO.

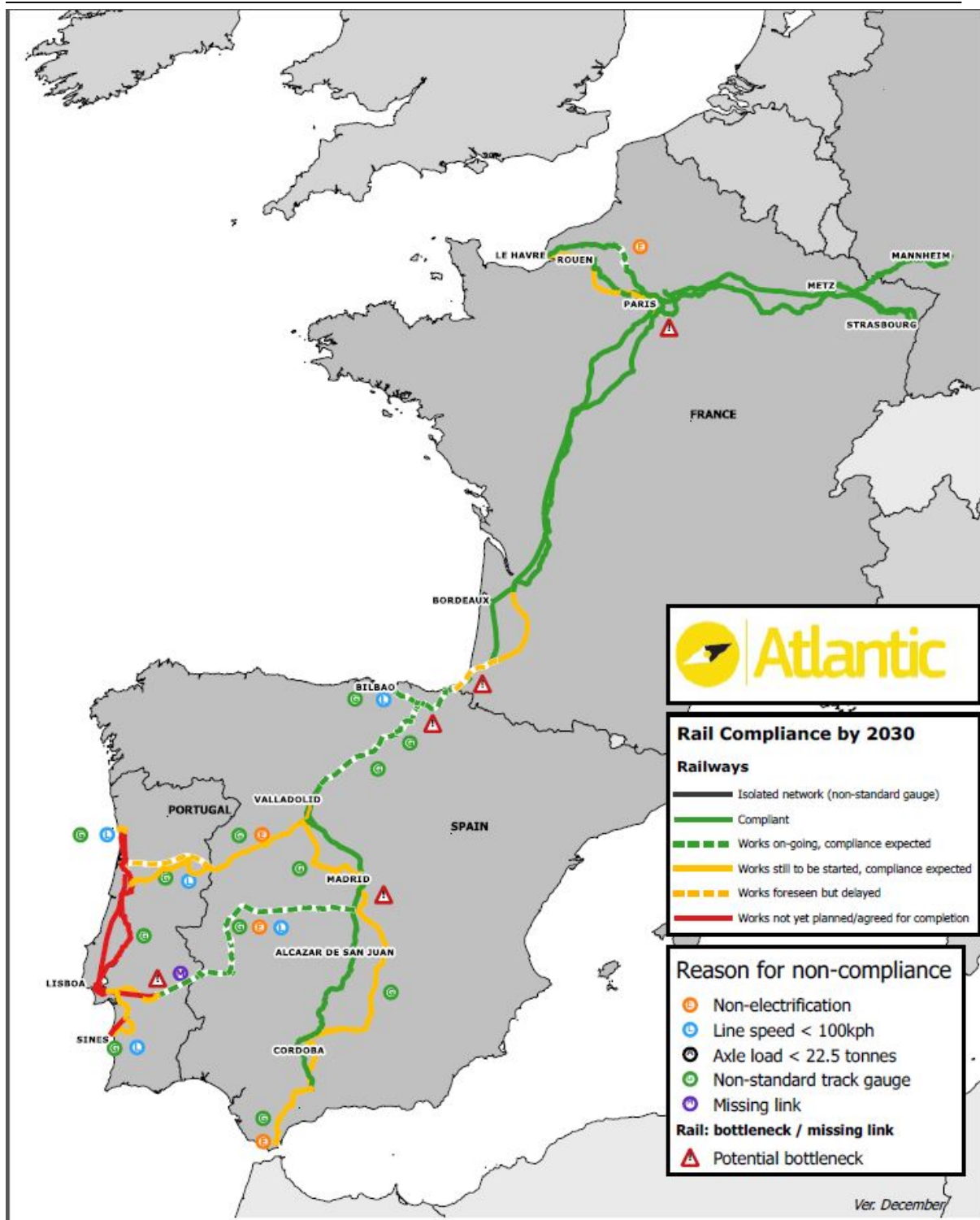


Figure 11 - Rail compliance by 2030: all criteria

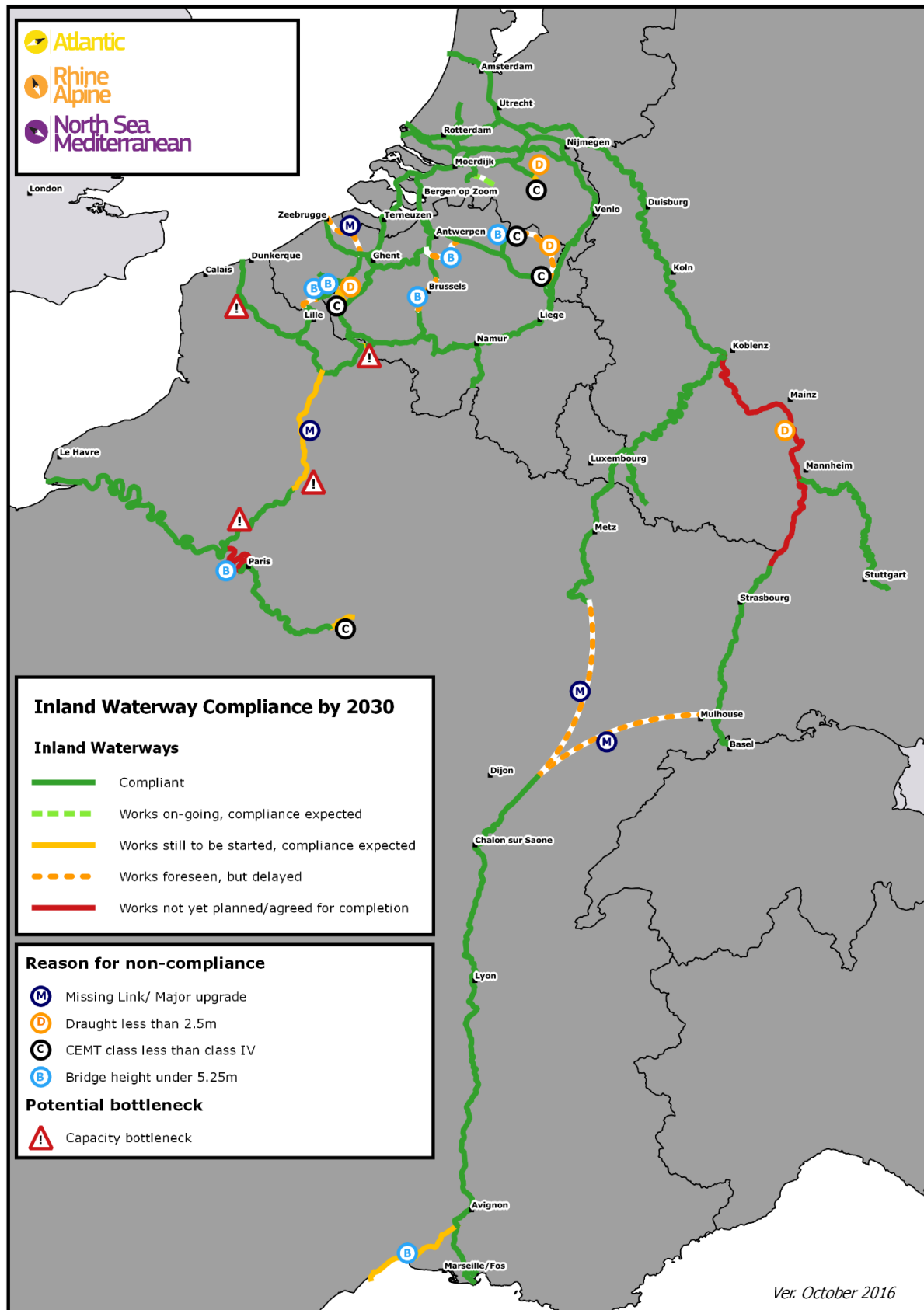


Figure 12 - IWW compliance by 2030: all criteria

5.3 Remaining bottlenecks

As developed under Chapter 4, several projects aimed at addressing many of the Corridor's critical issues, and whose results are expected to be visible until 2030, have been identified. Amongst those, the completion of the critical missing link in the Portuguese-Spanish border (Évora-Mérida; along the Madrid-Lisboa connection), the electrification of lines, the adaptations to longer freight trains and the improved port-rail connections are worth to be noticed.

Nevertheless, several limiting factors still hinder or are still expected to hinder the functioning of the Corridor. We are here looking at them mode by mode:

5.3.1 Rail infrastructure

- On the rail component, interoperability, notably related with track gauge, won't be fully achieved by 2030, although critical bottlenecks, notably on the French-Spanish border, will be significantly reduced. Moreover, by 2030, all four corridor cross-border sections will be connected in UIC gauge, electrified with compatible voltages and fully compliant with the TEN-T Regulation's criteria. Notwithstanding this progress, interoperability remains a critical issue, with relevant sections of the Portuguese network, such as those in the North line connecting the nodes of Lisboa and Porto, continuing to be in Iberian gauge.
- As developed under Chapter 2, differences in loading gauges and high gradients in some sections, although there are no-related requirements in the TEN-T Regulation, are also hampering the efficient functioning of the Corridor.
- In addition, we are currently facing a high risk of delay of the Y-Basque project, with completion likely to shift from 2019 to 2023, and more importantly, it recently appeared that the GPSO and especially the Bayonne-Dax and later the Dax-Spanish border high speed connections may not to be realised before many years. In that case, an upgrade of the existing line would be a must.
- Last, the revision of the TEN-T Regulation in a few years' time needs to take into account that the rail connection to the port of Sines can only be made through the current Comprehensive Network.

5.3.2 Road infrastructure

- In the next few years, the road component of the Corridor will be fully compliant with the TEN-T requirements. The criteria for highways or express roads are already almost fully met and the interoperability of road e-tolling is already quite advanced. The deployment of e-mobility and LNG along the Corridor is progressing.
- However, it is unlikely that the public sector will itself finance all necessary infrastructure for alternative fuels, as is the case also for safe parking areas. The private sector therefore needs to take a major role. This needs to be addressed, taking into account the progress on the National Action Plans, the context of existing concessions (i.e. in Portugal) and of course the expectations of the private sector in terms of financial returns.
- C-ITS services also have a strong potential for development, with the same issue regarding the financing raising on the horizon.

5.3.3 Seaports

- As already reviewed, the core requirements of the TEN-T Regulation for ports are fulfilled by all the core ports regarding maritime and hinterland infrastructure. However, beyond the minimum TEN-t requirements, several limitations are present in the interconnection between sea and rail, eventually also in road, but a lot of projects have been identified to address them.
- It should be noted also that the limited integration with the inland logistic chain still limits the role of most Corridor ports and that limited LNG availability at some ports could also limit the role of some Corridor ports in the rather near future if the necessary private financing cannot be attracted.

5.3.4 Inland waterways

- Most pending issues are either not solvable such as the height of bridges in Paris, or addressed in ongoing projects such as the electrification of the lines to the ports of Le Havre and Rouen.
- What is not yet addressed but already planned includes:
 - the improvement of the IWW connection to the new Port 2000 in Le Havre, which is however being studied;
 - the connection between the Seine/Oise and the Scheldt rivers, to connect Paris to the Benelux countries (as part of NSMED corridor).
- In addition, the future is still unclear regarding the use of the Douro River for freight traffic as well as for flows to and from the Port of Leixões, given the uncertainties associated to financing of works to eliminate the existing bottlenecks, notably the necessary interventions in locks and navigation channel.

5.3.5 Rail-Road terminals

The interconnecting nodes are also affected by limitations, thus artificially broadening the market share of roads:

- There is a clear potential for the provision of better multimodal services along the Corridor and improvement of multimodal connections; however an overall planning, implementation and management model for Rail-Road terminals, notably in the Iberia Peninsula, is still missing.
- Together with the infrastructure-related measures which are being addressed in several projects, a stronger emphasis on the deployment of logistic single windows along the Corridor, extending the current port single windows towards the hinterland and integrating with e-maritime services and information technologies, could have a strong impact.

5.3.6 Airports

The one bottleneck which is not yet addressed is the connection which the airport of Lisboa must have to the railways network. However this connection is not required before 2050.

5.3.7 Urban nodes

Most pending issues are addressed in ongoing projects.

Additionally, and in particular for port cities like Lisboa and Porto, and to some extent Mannheim, attention should be placed towards addressing the pressures of port activities on the urban environment (limited areas of expansion, emissions and noise, the later particularly relevant in the case of ports' night operations).

5.4 Persisting Administrative & Operational barriers

In addition to physical and technical barriers, also administrative and operational barriers hinder the full implementation of the Atlantic Corridor.

Many of them are general issues affecting transport all over Europe and a number of them are being addressed in various initiatives, such as the study on Permitting which DG MOVE conducted two years ago. The objective of that study was to identify barriers in the regulatory and administrative processes that impact the effective and efficient planning and implementation of TEN-T core network projects, and to deliver recommendations on how to address these barriers. The study presented a set of proposed policy options to be considered for an eventual Commission proposal for a legislative instrument. As a follow-up, an impact assessment was launched in 2017 to identify the best policy option to simplify the administrative and regulatory framework in the field of permitting, procurement and other relevant procedures necessary for the implementation of TEN-T projects. The Commission will release that best policy option in the second half of 2018.

Below an overview of the main administrative barriers is presented per mode:

5.4.1 Rail

Interoperability issues

In terms of rail transport, interoperability issues include:

- different electrification systems between the countries of the Corridor;
- different signalisation systems between the countries of the Corridor;
- low level of ERTMS deployment overall and different speeds of deployment in the countries, creating possible future ERTMS gaps.

ERTMS is one of the most important tool for rail interoperability but it is also very challenging: next to technical problems, there are often political, or project management-related difficulties. For further details on ERTMS, please see the ERTMS Work Plan.

Border crossing issues¹⁰

The only compulsory documentation in land border crossing is the international vehicle card, which mentions different information (dangerous goods, obligation of phytosanitary control, products for alimentation, animals, cereals, etc.).

¹⁰ Atlantic RFC, CID 2017

Depending on the border crossing, there may not be interoperable infrastructure, requiring a change of traction and of train driver. In that case, the new train driver must verify the respect of the security rules of the train (in its wagon composition), according to the requirements of the new network:

▪ Border crossing between Germany and France:

The border crossing between the German and French networks of the Atlantic Corridor takes place at Saarbrücken and Forbach. The networks have the same track gauge on both sides. The connection is equipped with a train protection system switch between the German system PZB and the French system KVB (contrôle de vitesse par balises). Both sides are electrified, but with different voltages (Germany: 15,000 V~ and France: 25,000 V~). The separation of the different voltage levels takes place in a neutral section on the German side of the border crossing (km 5,338 – 5,354).

▪ Border crossing between Spain and France:

This border crossing is the most difficult one due to the different track gauges, UIC on the French side and Iberian on the Spanish one. A freight transfer operation needs between 6 and 8 hours, depending on the methods and characteristics. The transfer is done inside the Irún/Hendaye complex.

Different procedures may apply depending in the freight and load:

- o Container transfer using gantry cranes
- o Manual transfer for different size merchandises (such as motor vehicles)
- o Load transfer using individual cranes
- o Axle changing done by the private company TRANSFESA (DB group)

▪ Border crossing between Portugal and Spain:

The border crossing takes place either at Elvas-Badajoz or at Vilar Formoso-Fuentes de Oñoro. Different from the French-Spanish border crossing, this connection has the same track gauge on both sides, thus times of stops are minimal. Yet there are procedures and documentation required:

Required procedures:

- o Stop for technical verification on the Spanish side (15-30 minutes)
- o Stop requested by operators for technical and operational issues: traction change, fuel supply, crew change, meal breaks for train drivers ...

Required documentation:

- o Permanent documents
- o Temporary rules and instructions
- o Traffic and train movement management documents
- o Security documents

▪ Change of locomotives and drivers:

The railway undertakings (RUs) will request the locomotive and driver changes to their best criteria under the current regulation in each country. These changes are taken into account as far as possible in the capacity offered by the Atlantic Rail Freight Corridor.

Rail Network Europe (RNE) has been implementing various tools and measures targeting at improving the coordination of the Rail Freight Corridors, such as Path coordination, Charging information system and Train Information system and Customer Information Platform. Those systems have been presented by the Atlantic Rail Freight Corridor in the Corridor Forum meetings.

Coordination of works in cross border sections

The Atlantic Rail Freight Corridor also implemented a coordinated approach whereby all rail infrastructural and equipment work that might restraint the available capacity must be coordinated at the level of the Corridor and are subject to an up-to-date publication. For cross border sections, the goal is to have the same maintenance periods on both sides, ensuring more capacity for international traffic.

5.4.2 Maritime

Port infrastructure is essential to develop the circulation of goods and passengers, but services are also necessary to use these infrastructures in the best way. The deployment of intelligent systems for efficiency, system integration and wide digital maritime services are critical for trade facilitation and ports competitiveness.

Port Community Systems fulfil here a very important role, notably through the automation, aggregation, optimisation of trade processes amongst the different players involved in the port operation (port authority, maritime authority, health, border, customs).

Moreover, since June 2015, it is compulsory to announce vessel calls at European ports electronically through a national single window (NSW).

As seen previously, all core ports are compliant in terms of telematics applications, including e-maritime services and VTMIS. The Atlantic ports dispose of highly performing single windows, in several cases already progressing from port to logistics single windows with integration and tracking of hinterland modes. Additionally, two other issues might be followed to bring added value to the already developed solutions in the Atlantic corridor:

- progressing on the adoption of the eManifest in the EU (synergies between DG TAXUD and DG MOVE);
- further enhancing the added value of satellite imaging as implemented with ESA support.

5.4.3 Inland Waterways

No specific administrative barriers were identified for the Seine River. However, and although not directly associated to administrative barriers or to a Corridor's inland waterways, it is worth noting that every year due to very high or very low water levels in the Rhine river, ship operations are forced to stop at the port of Mannheim. With foreseen climate changes, this phenomenon is likely to happen more frequently.

5.4.4 Multimodal

Finally, although no specific Corridor barriers have been identified affecting airport and road transport infrastructure and services, in view of the development of long distance traffic across the Union, due consideration shall be given to the promotion and development of digital links and initiatives for the exchange of traffic data and provision of information to the users. This is the case, for instance, for cross-modal and borderless commercial solutions for mobility (as well as freight) services. These are aspects where the countries on the Corridor already show important progress, notably in what concerns road traffic and travel time information, but not yet extended across borders.

Moreover, services information and travel planner multimodal platforms as well as "Mobility as a Service" solutions at different territorial and operational scales are

currently under development. Governance models, cybersecurity and privacy are just some of the challenges that need to be better addressed, in parallel with the ongoing technological developments.

5.5 Links with non-Corridor neighbouring sections and territories

As already acknowledged, enhancing and leveraging the maritime dimension of the Atlantic Corridor is an important priority. In that context, it is of utmost relevance for the Corridor to link the seaports (core and comprehensive) along its coastline to the deployment of maritime links through the Motorways of the Sea and to other core sections directly connected to the Corridor but not part of it.

This includes, without being exhaustive, a particular attention to:

- The comprehensive ports of Aveiro, Bayonne and particularly Setúbal, feeding the intermodal travel chain enabled by the rail corridor and with a major role in the SSS network;
- The Portuguese Douro river, which is a Core IWW with a Core port (Porto) connected to the Core maritime port of Leixões which freight potential, is not yet fully exploited, notably as a result of persisting bottlenecks associated to locks and the navigation channel itself;
- The French Core port of Nantes-Saint Nazaire, notably in view of taking advantage of the LNG facilities already in deployment (a methane terminal already offers refuelling to trucks). The port targets to become the reference in Europe for the energy and ecological transitions and several LNG-related actions are already part of its strategic plan for 2015-2020;
- Northeast Spain notably the core port of Gijón and also the comprehensive ports of Vigo, Santander and Pasajes who play a major role in the Motorways of the Sea and SSS network, and the port of Ferrol as regards the provision of LNG bunkering to the vessels navigating the Atlantic sea;
- Looking overseas, the islands of Canarias (core) and Madeira and Azores (comprehensive) as Corridor-feeders and also in view of the role these islands can play for curbing GHG emissions, notably by providing LNG bunkering facilities for vessels serving the North Atlantic;
- Additionally, it is worth also paying attention to the Minho railway line in the hinterland of the port of Leixões, which supports trade relations between the Minho region in Portugal and Galicia in Spain. The line is being improved, notably regarding electrification, with support of the EU structural funds.

6. Infrastructure implementation by 2030; environmental and socio-economic impacts; financial aspects

While acknowledging for the possible limitations brought about by the simulation (not all data are available, hypothesis have to be made etc.), the Atlantic Corridor appears to do relatively well when it comes to Innovation. Nevertheless, there is room to go one step further in this area. It also does well in terms of CO₂ reduction (-33% of CO₂ equivalent), especially thanks to the expected modal shift to Rail (+124% by 2030) as well as to Maritime and Inland Waterways. Yet, adaptation to climate change must be paid more attention to by project promoters. Not in the simulation but worth underlining are the efforts made to reduce health-harmful emissions such as NO_x and SO_x. Like on all Corridors, a careful allocation of public funding must be made to ensure the coverage especially of projects of EU added-value which do not have the capacity to attract private financing. Complementarily, the projects which generate revenues must be encouraged to seek as much leverage as possible from private financing or financial instruments.

6.1 What has still to be done

The TEN-T Regulation defines the transport infrastructure requirements for the Core Network, stating that these requirements need to be met by 2030 at the latest.

Application of these TEN-T requirements is a priority for the Corridor whenever feasible. In this regard, the most important interventions include: the deployment of UIC track gauge on the Iberian Peninsula; the electrification of cross border sections and of the railway lines connecting to the ports of Algeciras and Le Havre; the connections for 740m long trains to all Corridor's ports and the completion of rail missing links.

However, there are many cases where there is a need to go further and beyond the TEN-T requirements. This is in particular the case for land access to the Corridor's ports which calls also for qualitative and capacity improvements. For rail, we also need to address the issues related to the differences in voltage, the steep gradients and the non-harmonised loading gauges which make that not all routes permit the same vertical clearance, limiting the interoperability of trains. For roads, we need to address the issue of tolling interoperability.

Moreover, as developed earlier, there is a clear potential on the Corridor for the provision of better multimodal services and for improving multimodal connections. However, an overall planning, implementation, and management model for Rail-Road terminals, notably in Iberian Peninsula, is still missing. Last, there is also a strong opportunity to deploy logistic single windows along the Corridor, extending the current port single windows towards the hinterland and integrating with e-maritime services and information technologies. Finding innovative solutions to enhance multimodality on the Corridor is key to meet the continuous growth of maritime flows to the inland routes.

A case in point is the Júndiz platform which is in a very good position to develop a strong case for intermodal services for hinterland and port traffic and transshipment between local/national and international rail transport using different gauges:

- for interconnection between maritime services in the hinterland of major Atlantic ports and for continental rail intermodal services;
- for transshipment between Iberian and UIC gauge rail networks;

- for the launching of new rail motorways services for long distance transport between Spain, Portugal and northern Europe, including the Paris area, Belgium and The Netherland.

6.2 Innovation Deployment

Innovation projects targeting the deployment of clean fuels and simplification, such as those targeting LNG facilities and logistic single windows, are particularly relevant to boost the maritime potential of the Corridor. These are two issues where the Atlantic can be seen as a frontrunner of innovative solutions for further replication in other Corridors.

Innovation is of paramount importance for the achievement of the different strategic goals set for the transport sector in Europe, across all modes. The number of innovation projects for the Corridor is relatively small and of those only 34% have a direct contribution to transport decarbonisation (and reduction of health-harmful emissions). It is however important to note that there are many other projects which are not classified as Innovation but which also contribute to decarbonisation. Also, some projects not classified as Innovation are in essence technological innovations: for example, the articulation of two gauges for still several years has in itself a strong innovation character.

Regarding the level of innovation, it was observed that 30% of the projects on the Atlantic Corridor can be classified as 'innovative', most of them promoting catch-up innovations (i.e. addressing the transferability of innovative approaches from other projects, e.g. CEF or Horizon 2020), followed by 'incremental innovations' (i.e. relate to the implementation of known and tested technology in a way that a substantial increase of performance can be achieved) and 'radical innovations' with 5 projects (i.e. introduction of new technology which can generate a step-change of attractiveness for the users). Within these 'radical innovation' projects, four refer to LNG for trucks or ships and the last one is related to innovative safety technologies for rest and parking areas in road transport. However, innovation projects represent only roughly 6% of the total investment in the Corridor, implying that they have relatively lower budgets than non-innovation projects.

The assessment of the level of innovation also analysed the impacts of the innovation projects and provided some hints on barriers and enablers of innovation. The assessment of impacts refers to the project's expected contribution to achieve EU's transport policy objectives and/or their contribution to the European technological industry and jobs creation. The following five impact categories were identified: Transport digitalisation, Safety improvement, Transport decarbonisation (both direct and indirect impacts), Transport efficiency improvement through data sharing, and contribution to development of European technological industry. Compliance with the Regulation and coverage of Issue Papers ¹¹ seems to be assured in the Atlantic, however, again, most projects in number and budget are not dedicated to innovation.

Innovation projects in the Atlantic show a very high level of transferability, suggesting that the TEN-T can act as a space for rolling out transport innovations to a larger scale.

¹¹ Coordinators Issue Papers from 2015:

<https://ec.europa.eu/transport/sites/transport/files/themes/infrastructure/news/doc/2016-06-20-ten-t-days-2016/issues-papers.pdf>

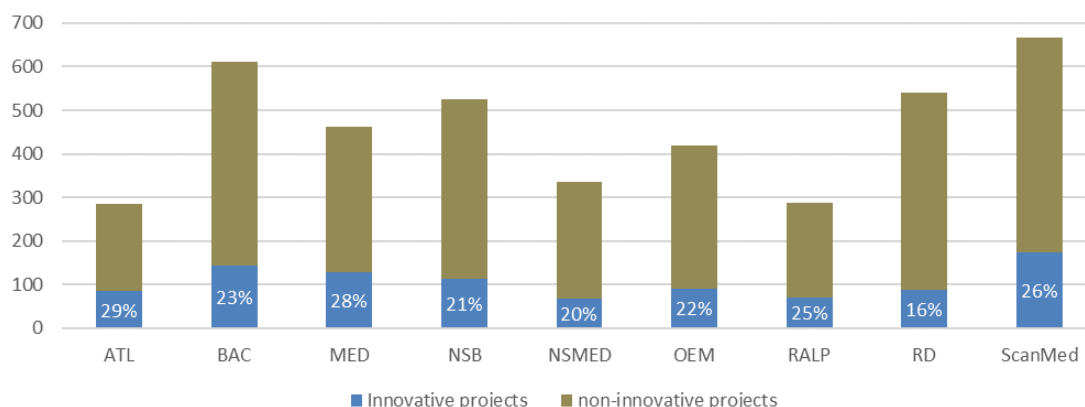


Figure 13 - Innovative projects in the nine CNC

6.3 Impacts on Jobs & Growth

An analysis of the jobs and growth impacts of the Corridor, applying a multiplier methodology based on the findings of the study "Cost of non-completion of the TEN-T"¹² has been carried out.

For the analysis, we classified the projects contained in our 2017 Project List into three mutually exclusive categories:

- Cross-border projects;
- Innovation projects;
- Other and thus average projects.

The three categories also present a hierarchy. It is first looked whether a project belongs to the cross-border category; if not it is checked whether it belongs to the Innovation category. If not it is regarded as an average project. Mixed rail and ERTMS projects are counted with 10% as Innovation project and the remaining 90% as average project. Only the projects not completed before 2016 were taken into the analysis. For each of the three categories we aggregated the projects' investments and thus obtained the total investments planned for the period 2016 until 2030.

The projects for which cost estimates are available and that are planned to be implemented over the period 2016 until 2030 amount to a total investment of 43,6 billion €2015. The implementation of these projects will lead to an increase of GDP over the period 2016 until 2030 of 419 billion €2015. 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 1.092.437 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. Note that this number must be taken with some caution as the jobs/Euro ratios used are highly dependent on the type of projects.

¹² Schade W., Krail M., Hartwig J., Walther C., Sutter D., Killer M., Maibach M., Gomez-Sanchez J., Hitscherich K. (2015): "Cost of non-completion of the TEN-T". Study on behalf of the European Commission DG MOVE, Karlsruhe, Germany

6.4 Climate change adaptation

In terms of the contribution of innovation projects in the Atlantic to decarbonisation, it is interesting to note that the focus is not so much on modal shift but rather on the deployment of alternative fuels. This suggests that the TEN-T completion may be a key enabler for low or zero carbon transport in Europe. However, modal shift contribution should not be underestimated when relevant and attention should be paid to the risk of modal (back) shift in the event of an increase of the price of fuels.

As far as climate change is concerned, it is not surprising to note that across all countries there are several very significant risks emerging from climate change. The major threats and impacts for the Atlantic Member States are summarised in the tables below:

Table 1 - Major climate change threats in the ATL corridor

Rail	Road	Air	Maritime	Inland waterways
- Increased summer temperature, thermal oscillations and heat waves - Changes in precipitation patterns: increased number of high precipitation days and floods; reduced rain seasons and increased droughts - Winds (e.g. average and extremes, number of days of high winds) - Winter cold and extreme low temperatures (only France)	- Increased intensity of extreme precipitation - Increased summer temperatures and heat waves - Changes in river flow	- Increased and more frequent extreme winds - Increased temperatures and heat waves - Change in frequency of Winter Storms	- Increased and more frequent storms and extreme winds - Sea level rise - Increase of water temperature	- High precipitation and flood - More frequent droughts - Increased variation of water levels

Table 2 - Major climate change impacts in the ATL corridor

Rail	Road	Air	Maritime	Inland waterways
- Rail buckling - Perturbation of power system and signalling - Earthworks, structures and drainage works damaged - Instability of	- pavement deterioration / bleeding of asphalt - Interruption of traffic due to forest fires - Road submersion - Risks for	- Traffic disruptions, including deviations and delays - Insufficient runway length (decrease of thrust power) - Degradation of	- Damage to infrastructure - Worsening of water quality, phytoplankton blooms - Risk of dam failure, overpass - Traffic	- Problems of passage under bridges - Access to quays and difficult (or impossible) transshipments - Traffic disruptions

Rail	Road	Air	Maritime	Inland waterways
embankments Interruption of traffic due to forest fires	bridges, including bridge scouring Overstrain of drainage systems	bituminous surface (runways) - Worsening of air quality - Jetstream change	disruptions and closure of ports and terminals	

As main recommendations deriving from the analysis, two emerge as critical and where particular attention should be devoted:

- To consider adaptation plans: infrastructure projects with financing from TEN-T/CEF shall pay adequate consideration to the existing plans for adaptation to climate change. Be it at national, regional or local levels these plans provide identification of current and future vulnerabilities and with a set of adaptation measures. Accordingly, the alignment of TEN-T projects with them shall be an important step to ensure increased resilience of the transport infrastructure;
- To address resilience in project planning and development: by analysing the climate adaptation plans, project developers will have access to information about the characteristics of future climate realities in the territories and their potential impacts. This should be taken into account in project development. For example, bridges in areas where the river flows are expected to change shall be designed to avoid bridge scouring; ports need to adapt their investment projects to potential increase in sea storms and sea level rise.

6.5. Modal shift and impact to decarbonisation

To calculate modal shift and impact to decarbonisation, a modelling exercise was done considering a baseline scenario for 2030 without the Atlantic Project List and a scenario where the Atlantic Project List is taken into account. The traffic forecast for the Corridor is pre-calculated from the EU Reference Forecast published in 2016. Noteworthy, by lack of data, maritime traffic is not included as well certain smaller categories such as air-freight and passenger/recreational inland waterway traffic. This is of course an important limitation of the calculations considering that maritime is estimated to take more freight traffic away from road than rail does. Moreover, the measurement of CO₂ reductions does not take into account how electricity is produced, which can be more or less CO₂ emitting. Therefore the results must be considered more as indications than certainties.

According to the modelling exercise, the Atlantic Corridor will have 3.1% more traffic by 2030. This growth will mainly come from rail with a significant modal shift to rail of +124%, and to a lesser extent from inland waterways with a modal shift of +17%. Road will decrease its share by -21%:

Table 3 - ATL Corridor Traffic

Transport modes	Corridor volumes (Million TKm per annum)		
	EU Reference scenario	Work Plan Scenario	Comparison EU Reference with Work Plan
Road	59.278	46.904	-20,9%
Rail	11.502	25.756	123,9%
Water	2.536	2.966	17,0%
Total	73.317	75.626	3,1%

This shift to more sustainable modes will lead to a net decarbonisation effect of the Corridor: by 2030, it is expected that CO₂ equivalent will decrease by 33% thanks to the modal shift to rail and inland waterways as well as improved vehicle fuel consumption efficiency and expected development of the share of alternative fuels:

Table 4 - ATL Corridor GHG 2030

Transport modes	CO2 equivalent (2030)		
	EU Reference scenario	Work Plan Scenario	Comparison EU Reference with Work Plan
Road	5665392	4482768	-35,6%
Rail	125361,3	280716,8	40,3%
Water	74177,29	86754,67	-9,8%
Total	5864930	4850240	-33,1%

In the Project List, 43 projects have been identified as contributing directly to decarbonisation. Most of them (23 projects) are related to alternative fuels, first LNG/CNG followed by electricity and hydrogen.

EU Reference forecast Scenario

Passenger traffic is forecasted to increase from 158 billion pkm today to 203 billion pkm by 2030 (road, rail and aviation). Road and aviation will account for 87% of the total traffic, and aviation will be the fastest growing mode at +2.4% per annum.

Freight traffic is forecasted to increase from 88 billion tkm today to 118 billion tkm by 2030 (road, rail, and inland waterway). Road will still account for 81% of the total traffic, but rail will be growing much faster at +2.7% per annum.

Table 5 - ATL Corridor Traffic 2015

TRAFFIC	Current situation: 2015				
	Passenger	Freight	Pax.Veh.	Freight.Veh.	Total Veh.
	bpkkm	btkm	pvkm	fvkm	vkm
Road	79,38	71,18	54,00	6,77	60,76
Rail	20,55	13,95	0,11	0,03	0,13
IWT	0,00	2,57		0,01	0,01
Maritime					
Aviation	58,48				
TOTAL	158,40	87,70	54,10	6,80	60,90

Table 6 - ATL Corridor Traffic 2030

TRAFFIC	2030 Situation -EU reference				
	Passenger	Freight	Pax.Veh.	Freight.Veh.	Total Veh.
	bpkkm	btkm	pvkm	fvkm	vkm
Road	90,68	94,34	61,68	8,97	70,65
Rail	28,61	20,80	0,15	0,04	0,19
IWT	0,00	3,11		0,01	0,01
Maritime					
Aviation	83,99				
TOTAL	203,28	118,25	61,83	9,02	70,85

Energy efficiency is forecast to increase over the 2015-2030 time period, but emissions are also estimated to increase slightly, from currently 29 million tonnes of CO2 equivalent to 30 million tonnes of CO2 equivalent in 2030, behind the expected growth in traffic:

Table 7 - ATL Corridor GHG 2015

GHG	Current situation: 2015				
	Passenger	Freight	Passenger	Freight	TOTAL
	MT of CO2 eq	MT of CO2 eq	gCO2/pkm	gCO2/tkm	MT of CO2 eq
Road	9,43	7,39	118,76	103,77	16,81
Rail	0,68	0,42	33,09	30,22	1,10
IWT	0,00	0,05		21,25	0,05
Maritime					
Aviation	11,03				11,03
TOTAL	21,14	7,86			29,00

Table 8 - ATL Corridor GHG 2030

GHG	2030 Situation -EU reference				
	Passenger	Freight	Passenger	Freight	TOTAL
	MT of CO2 eq	MT of CO2 eq	gCO2/pkm	gCO2/tkm	MT of CO2 eq
Road	8,07	8,23	89,04	87,28	16,31
Rail	0,83	0,49	28,98	23,51	1,32
IWT	0,00	0,06		20,03	0,06
Maritime					
Aviation	12,50				12,50
TOTAL	21,41	8,78			30,19

6.6 Infrastructure funding and innovative financial instruments

The development of the Core Network Corridors requires, inter alia, a critical mass of investment to take place within a short timeframe; therefore, a careful examination of the potential financial sources has to accompany Corridor planning. Some key criteria to be appraised are reported in this section of the Work Plan.

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

- a. For several revenue-generating projects "closer to the market" in terms of development (technological components, including large infrastructure of Key European Interest, brownfield upgrades) or service provision (terminals for freight / passengers, enhancement of infrastructure capacity / performances), a substantial component of the project funding can come from self-generated 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 cost of capital and receive a reward for the risk born (the higher the risk, the higher the return required).

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

- b. Hard-infrastructure, green-field, risky, long-term projects such as the majority of cross-border railway connections, as well as inland waterways' navigability improvements, might require a substantial public support through public funding, even if innovative approaches can apply to the 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 a lump-sum subsidy (grant), fiscal incentives, operational deficit coverage and availability payment schemes. As far as the share of the Member States in public funding is concerned, it is interesting to observe that there is variety with on the one hand France and Germany where regions take up a substantial part of that funding and on the other hand Spain and Portugal where the funding primarily or exclusively comes from the national level.

- c. In a variety of intermediate cases, the project will require a more limited funding component in order to reinforce its financial viability – these projects could be supported through a blending of funding (e.g. grants) and financing.

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

For the last two categories of projects, public intervention, with different degrees of intensity, is justified on the grounds of the high socio-economic and EU added value that these projects have, and also due to the fact that they substantially address the overall public service obligations, the suboptimal investment levels, 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 transfer of resources.

When considering the project funding structure in a comprehensive and multimodal setting, the earmarking of revenues and cross-financing solutions, applying the "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' life-cycle and clearly defining the 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.

As developed in the "Action Plan on making the best use of new financial schemes for European transport infrastructure projects", a pre-condition for effective project financing is a conducive regulatory and legal environment, in order to set the right incentives to enhance the public and private sector involvement.

It is worth highlighting the following projects along the Corridor, supported through innovative financial instruments, for their potential for cross-fertilization:

- A remarkable case of blending - synergic use of funding and financing – for a large-scale green-field project is the Tours-Bordeaux high-speed line (it has also highlighted that a careful approach toward the management of traffic risk is needed in green-field projects);
- It is worth recalling the ad-hoc platform for Spanish port accessibility, pooling several projects and port revenues, with financing by EIB and ICO (ES promotional bank) guaranteed by the EFSI (Juncker Plan financial branch);

- As a general case, several terminals in ports, airports, IWW ports and rail-road terminals are being supported by the EFSI and by commercial banks (including regional and city-logistics in the Île de France).

Worth underlining, eight projects involving the Atlantic Corridor have been presented to the CEF blending call, from Germany, France and Spain, for ERTMS deployment, airport connections, rolling motorways as well as clean fuels deployment as main topics. Two of them were selected for co-funding..

Still, the critical mass of investment needed to complete the corridor (the total cost of compliance with EU parameter can be estimated between 45 and 50 Billion EUR, over 11 Billions of which being on-going projects; a remarkable amount - 7-8 B EUR - is needed to achieve the full rail interoperability in the Iberian peninsula) calls for a certainty in the support also in terms of grants up to 2030, following the successful outcome of CEF Calls. Several projects needed to complete the corridor couldn't be endowed with adequate (or any) EU resource. Therefore, I consider it my duty to promote, from the MFF mid-term review to the budgetary negotiations for the next programming period, an adequate endowment for this successful chapter of the EU budget.

6.7 Projects Financial Sustainability

The analysis aimed to identify the funding sources of the projects in our Corridor Project List. The objective of the exercise was to determine the presence of funding gaps and the potential for other-than-public-grants forms of support.

As stated before, the Corridor Project List contains 272 projects, accounting for €43.6 billion. Of these, 61% present complete financial information and are hence eligible for the analysis. The corresponding amount, approx. €26.8 billion, is divided into the following financial sources:

- MS/ Public budget: €16.5 billion, or 61% of the total,
- EU Grants (CEF, ESIF): about €5.7 billion, or 21,2% of the total,
- Private/own resources: nearly €2.8 billion, or 10,5% of the total,
- EIB/Bank loan & others: about €1.9 billion, or 7% of the total.

The EU grants share of the total is then further divided into subcategories related to their origin:

- CEF/ TEN-T: €2.1 billion, or 37,5% of the total,
- ESIF: €1.7 billion, or 30,5% of the total,
- Other: €1.8 billion, or 32% of the total.

The analysis is further broken down considering the “potential” and “approved” share of funding, when available (e.g. when not specified, funding has been considered as potential):

Atlantic Corridor Work Plan Funding sources and financing

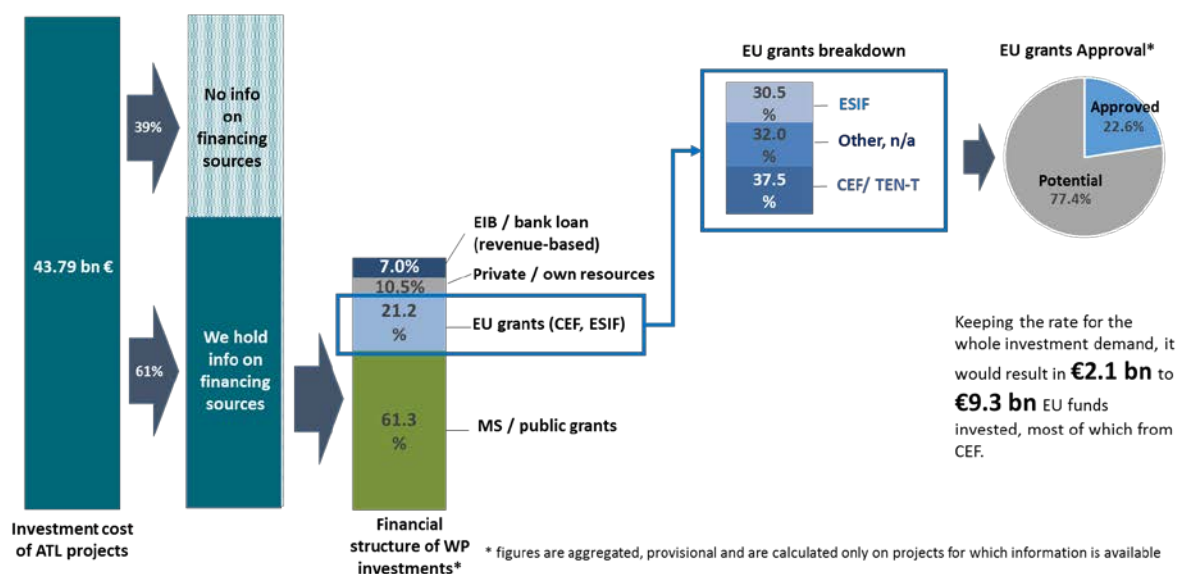


Figure 14 - Funding sources and financing in the Atlantic workplan

Approved funding accounts for 22.6% of the total, while the remaining 77.4% of the total is still potential.

If we keeping the rate fixed to 42% for the whole investment demand, it would result in €2.1 billion to €9.3 billion of EU funds deployed. The inclusion of private investors and the use of financing (properly favoured through financial instruments, when necessary) can strongly contribute to provide the resources the market needs.

Following the analysis of financially sustainable projects in the Atlantic Corridor list, the results show that about 18% (49 projects) are not financially sustainable, 71.3% are potentially financially sustainable (194 projects) and 10.3% (28 projects) are financially sustainable.

The total value of financially sustainable projects is € 28.7 billion. We can therefore see that, if 15% of CAPEX were financed with private capital/loans, the reduction in grand expenditure would be equal to € 4.3 billion.

Looking for EIB/EFSI support potential - A preliminary assessment of Atlantic WP pipeline

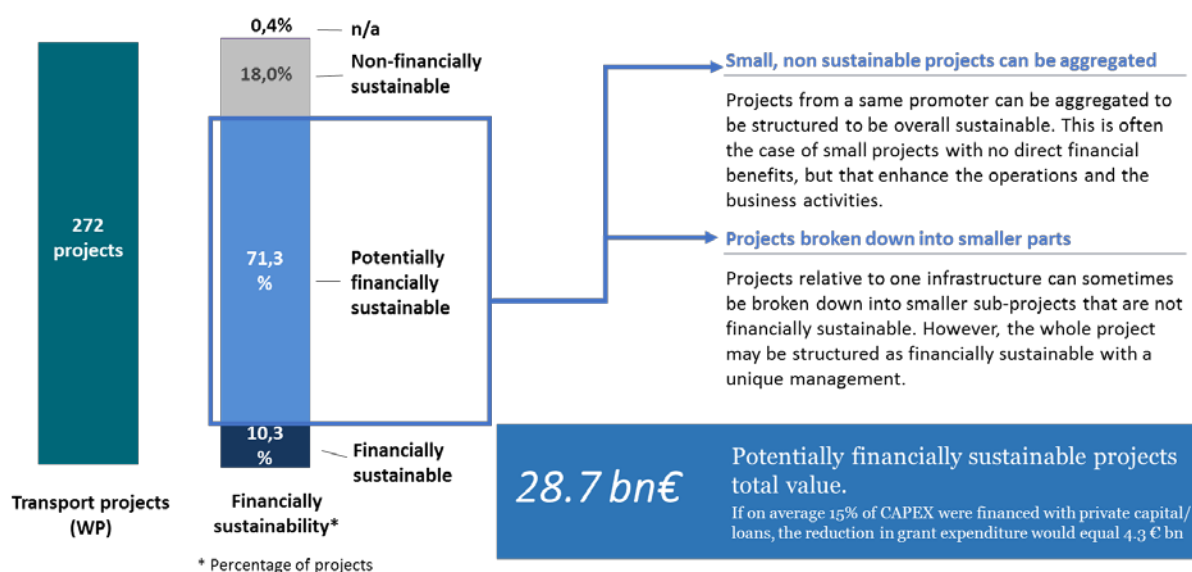


Figure 15 - Preliminary assessment of EIB / EFSI support potential

Within the Atlantic Corridor, a screening exercise on the Project List has highlighted the following projects for their potential for future development through the Innovative Financial Instruments:

- Terminals (Ports, inland waterway ports, airports and rail-road terminals),
- Port capacity enhancement,
- Dedicated connections, e.g.: on High-Speed for passengers to airports,
- Clean fuels deployment (bunkering, electric charging, vehicles, vessels, rolling stock).

7. Pilot initiatives

Stakeholders have the opportunity to present for CEF co-funding and financial instruments also projects aiming at implementing the EU transport policy through the TEN-T. We have identified some first such potential projects in the Atlantic Corridor, which we refer to as "pilot initiatives". They include alternative fuels (inland on the one hand and maritime on the other hand), a cross-border connection (in this case involving an urban area on both sides of the border) and logistics single windows. We encourage all relevant parties to embrace this approach and consider submitting proposals based on these pilot initiatives and/or come up with more ideas of this kind.

Pilot initiatives have been elaborated to boost the integration of infrastructure and transport policy. Overall, they aim to identify new types of projects targeted at achieving a transport policy objective defined as a theme, not restricted to one location or one stretch of road/rail, enhancing the added value of the corridor approach.

All Corridors have identified their pilot initiatives. For Atlantic, we have identified three such initiatives:

- Alternative fuels from Helsinki to Lisboa and South of Spain: to offer seamless electric recharging, LNG/CNG refuelling and H2 refilling on a road-based route from Lisboa to Helsinki, in cooperation with the North Sea Baltic Corridor from Helsinki to Brussels and with the North Sea Mediterranean Corridor from Brussels to Paris as well as with Scandinavian Mediterranean Corridor.
- LNG at ports on the Atlantic coast: to ensure that as many as possible core and comprehensive ports on the Atlantic coast have bunkering and possibly ship-to-ship infrastructure to refuel LNG-motored ships and to ensure that consumer vessels are also LNG-motored.
- Seamless Spain-France cross-border connection at Irun-Hendaye: to relieve the heavy road congestion at this connection by putting in place more sustainable local solutions for both passengers and freight, involving for example rail and coaches/buses.

7.1 Alternative fuels from Helsinki to Lisboa and South of Spain

This pilot initiative was developed based on an analysis of the existing EU and national regulatory framework and of data regarding existing and near-future existing infrastructure. The analysis also looked at potential benefits and needs for financial support of each fuel type. Information gathering about stakeholders was an essential last step to progress towards a concrete project.

Initial needs for financial support have been identified as follows:

- Electric charging (public fast charging station near the highway) has a high level of deployment. The pilot initiative focus is on adding missing stretches to the route Lisboa – Helsinki to ensure uninterrupted travel. This involves, for instance, adding electric charging points in Poland and Lithuania and in the cross-border sections of Portugal – Spain.
- CNG refuelling also a high level of deployment, similar to electric charging. The focus of the pilot initiative is on the gaps around the peripheral areas i.e. the areas furthest away from the corridors' urban nodes.
- LNG refuelling could be further developed in the regions where this fuel is available, for example in France.
- Hydrogen refilling is in its earliest stage of development. The regions of the Benelux and Northern Germany are the most mature, so the gaps are in the other regions along the route.

A very wide range group of stakeholders have been identified, including CEF project beneficiaries, car manufacturers, alternative fuel providers, local authorities, port authorities and others. These stakeholders now have the opportunity to work together to develop a project proposal for an upcoming CEF call, including a blending call since some revenues generation is involved in alternative fuels recharging/refuelling/refilling.

7.2 LNG at ports on the Atlantic coast

Background

In the 2014 CEF call, the Commission granted EUR 16.650.000 to the project "Core LNGas hive" which aims at developing a safe, efficient and integrated logistic chain for the supply of LNG as a fuel for the maritime sector in the Iberian Peninsula. This project integrates 42 partners from Spain and Portugal, of which 13 ports. It is testing several technical solutions to identify the most suited ones in different circumstances. This project needs a follow-up phase of concrete implementation and roll out of these solutions. This follow-up could be the basis for or part of the pilot initiative.

For France, developing LNG at ports fits with Law n°2015-992 of August 2015 about the energy transition and with the national framework of February 2017 for the deployment of the recharging and refuelling infrastructure for alternative fuels, in application of Directive 2014/94/EU.

Spain is committed to developing LNG based on existing infrastructure, including regasification plants, and in using LNG in the transport chain. The consolidated text of the Law of State Ports and Merchant Marine (RDL 2/2011) incorporates sustainability as one of the principles that should govern the model of planning and management of ports.

In Portugal, the Council of Ministers issued in June 2017 a decree to implement a national framework for the development of alternative fuels including LNG at ports, in application of Directive 2014/94/EU. Moreover, the strategy for the competitiveness of ports 2016-2026 incorporates clean fuels and notably LNG availability has a necessary condition for that competitiveness, being followed by a roadmap for maritime LNG.

Initiative

Very important to note is that the pilot initiative would supply LNG to vessels that depart from or arrive into the Atlantic corridor. However, these vessels would not necessarily be supplied at core ports of the Corridor nor necessarily at comprehensive ports of the TEN-T. But even then the supply would feed sustainable transport flows in the Atlantic Corridor and further into the rest of the core TEN-T and as such form an integral part of its functioning.

Concrete needs have been identified and quantified in terms of cost for several French, Spanish and Portuguese ports and for the related feeding vessels, virtual pipelines and training centres. These needs have been quantified for a total cost of around €300 million (this is only an indicative estimate). However the list of ports and their needs is subject to evolution and some ports are not included because they have already developed or have already secured financing for their LNG-related installations.

Stakeholders now have the opportunity to work together to develop a project proposal for an upcoming CEF call, including a blending call since revenues generation is involved in LNG supply. The EIB has already expressed interest.

7.3 Seamless Spain-France cross-border connection at Irun-Hendaye

Background

The cross-border connection Irun-Hendaye is suffering from road congestion. In that context, works have started on passenger high speed lines on the Spanish side within the Basque Region.

In 2014, a CEF grant was awarded for works and studies for the Bergara-San Sebastian-Bayonne rail section (2014-EU-TM-0600-M). That action involves parts of three railway lines: the existing cross-border line, part of the High Speed Line (HSL) San Sebastian-Bilbao/Victoria (namely “Y Vasca”) in Spain and a small part of the HSL Grand Project of South West (GPSO) in France (studies only). The “Y Vasca” is being completed during the course of this action, while the GPSO in France is unfortunately most likely postponed for many years: works on the Mondragon-Astigarraga section of the HSL “Y Vasca”, the upgrade of the Astigarraga-Irun section on the existing line, works on the international cross-border stations Hendaye-Irun and upgrading works of Atotxa-San Sebastian station. Studies concern: the upgrade of the existing Dax - Victoria line and the update of the preliminary studies of the new international link. The action cost €1.15 bn with a CEF contribution of €459 million. In addition, the region is also involved in the aim to improve rail-road freight services between Spain and France and especially the implementation of rolling motorway services.

Initiative

The cross-border connection has the specific situation of having a city on each side: Irun, part of the San-Sebastian area in Spain and Hendaye, part of the Bayonne area in France. There are important commuting flows in both directions.

There is an opportunity to complement the cross-border freight connection and the future long-distance passenger rail connection with more local actions to ensure efficient transport also for the local freight and for the inhabitants. There are 100.000 inhabitants directly at the border (Irun-Hendaye) and 600.000 in the larger San-Sebastian-Bayonne area. A study called Transfermuga was conducted in 2013 to define efficient local cross-border connections. Some funds were received from Interreg for studies and small infrastructure but there remain infrastructure investment needs which could be covered by CEF.

Needs have been identified and include amongst others: the adaptation of platforms for the extension of the regional SNCF trains to the station of Irun; works for connections by buses and coaches; the doubling of the tracks at the cross-border Euskotren station of Hendaye; the upgrade of the Hendaye-Kostorbe station; the implementation of an interoperable and cross-border ticketing system. This list is not exhaustive and other elements, especially related to freight, should complete the programme. In addition, the recent likelihood that the GPSO may be postponed for many years puts in question this initiative.

8. The European Coordinator's recommendations and future outlook

8.1 Findings from the analysis

The Atlantic Corridor has an important maritime dimension with eight Core seaports, as well as a significant potential to increase its modal share of rail especially for freight transport. It also shows important opportunities in the field of Innovation, related to especially alternative fuels, e-maritime/e-freight and C-ITS. This 3rd Work Plan was elaborated on the basis of the Corridor's goals, an intensive consultation and coordination process with the Member States and other relevant stakeholders, technical studies conducted by a consortium of consultants and focus on specific points on top of what was already analysed under the 1st and 2nd Work Plans.

The Atlantic Corridor already has to-date a high level of compliance with several TEN-T requirements. This is the case especially for Road, for certain rail parameters including line speed and axle load, for Inland Waterways and for the most important parameters of Maritime i.e. connection to high speed rail and inland waterways. Remaining gaps expected to be filled by 2030 include electrification of rail, train length, availability of clean fuels at inland ports and along roads and the connection of the airport of Madrid-Barajas to the high speed rail network. Where compliance will not be fully achieved by 2030 includes mainly track gauge (74% expected in 2030) and ERTMS deployment. The positive development of the Corridor evidences that inter-governmental working groups and agreements as well as regional/local cross-border cooperation are key to progress, next to of course financial support.

The Atlantic Corridor has a significant potential to increase its modal share of Rail, though competition with Road is important and low oil prices are a hampering factor. Maritime freight transport is expected to continue growing, calling for an increase of the capacity of ports as well as better connections of ports with rail and inland waterways especially in the first/last miles. As such, the increase of Maritime is expected to lead to an increase of the volume and share of also Rail and Inland waterways, increasing the sustainability of the land-based part of the Corridor. Other remaining capacity issues lie especially in the urban nodes and on the rail network related to: an insufficient deployment of ERTMS, restrictions for long trains, limited gauge of tunnels, differences in gauge in the Iberian Peninsula and at cross-border connections with France, lack of electrification and the missing Évora-Merida cross-border link. Most of if not all these issues are expected to be addressed by 2030. A challenge which will however require attention is the sufficient commitment at Member States level to ensure seamless high speed passenger flows at cross-border rail connections.

It is important to underline a specific exception to the corridor alignment in order to include the comprehensive sections Sines - Ermidas do Sado - Grândola in the core network. After the withdrawal of the only core network section linking Grândola with the Core Port of Sines, following the outcome of the environmental studies, these comprehensive sections ensure the only rail access to the port of Sines. An exceptional revision of the alignment is therefore needed as soon as possible for consistency with the Core Network methodology and to ensure the achievements of the Corridor's objectives.

The analysis of the Project List of the Atlantic Corridor, identifying all ongoing and planned projects, allows confirming that most of the remaining gaps vs. the TEN-T requirements and the remaining capacity issues should be filled/removed by 2030. In addition to what was listed above, we can highlight that the navigation on the Seine will be improved, adding value to the ports of Rouen and Le Havre; that the alternative

fuels, interoperability of e-tolling and C-ITS projects will make the road component of the Corridor clean, connected and smart; that there is no clarity yet on the timings for the availability of alternative fuels at airports; and that there is still significant room for improving the first/last miles of travel, both passengers and freight, in the Corridor's urban nodes.

Regarding track gauges, the gaps remaining after 2030 will be mainly in Portugal on the North line connecting Lisboa and Porto. In addition to completing the Corridor (track gauges interoperability, ERTMS deployment), challenges are identified in relation to the respect of timings of certain projects (though nothing critical which would be postponed beyond 2030); the need to convince the private sector to invest in alternative fuels recharging/refuelling/refilling and in C-ITS; the need to better connect the maritime ports to the inland logistics chains; the need to relieve the pressure of port activities on the urban environment; the general need to make procedures and permitting much more simple and faster; and the fact that efficient connection to neighbouring (Comprehensive) branches and territories must also be taken care of.

The Atlantic Corridor does relatively well when it comes to Innovation. Nevertheless, there is room to go one step further in this area. It also does well in terms of CO2 reduction, especially thanks to the expected modal shift to Rail as well as to Maritime and Inland Waterways. Yet, adaptation to climate change must be paid more attention to by project promoters. Like in all Corridors, a careful allocation of public funding must be made to ensure the coverage especially of projects of EU added-value which do not have the capacity to attract private financing. Complementarily, the projects which generate revenues must be encouraged to seek as much leverage as possible from private financing or financial instruments.

Stakeholders have the opportunity to present for CEF co-funding and financial instruments also more ambitious projects aiming at implementing the EU transport policy through the TEN-T. We have identified such potential projects in the Atlantic Corridor which we encourage them to look into. They are focused on alternative fuels (inland on the one hand and maritime on the other hand) and on urban nodes (in this case a cross-border urban node). We encourage all relevant parties to embrace this approach and come up with more proposals of this kind.

8.2 Recommendations and concluding remarks

I first would like to reflect about the above findings resulting from our analysis and studies and bring in my experience and the discussions with numerous stakeholders:

- First, I am pleased to see that we are already at a rather strong place and that projects ongoing or planned will fill most of the remaining gaps vs. the TEN-T requirements as well as leverage readily available additional opportunities ("quick wins"). What will be realised before 2030 includes: efficient first/last miles connections in urban nodes for both passengers and freight, (partial) ERTMS deployment, capacity for 740m freight trains, appropriate gauges of tunnels for freight trains, (partial) UIC gauge deployment (sometimes through polyvalent sleepers), electrification of rail, completion of the missing rail cross-border link Évora-Merida, availability of clean fuels at inland ports, maritime ports and along roads, connection of the airport of Madrid-Barajas to high speed rail, improvement of the navigation on the Seine, interoperability of e-tolling and deployment of C-ITS.
- But I am also glad to see that, beyond the TEN-T requirements and quick wins, we have a whole set of opportunities which we can seize to improve the efficiency of the Corridor. Without the list being exhaustive, I would like to highlight: 1) the upgrade of ports with increased capacity, better first/last miles connections to rail and inland

waterways, LNG facilities to refuel LNG-motored vessels and connections to inland logistics chains, 2) rail interoperability with full deployment of UIC gauge (sometimes with polyvalent sleepers) and of ERTMS, 3) availability of fuels at airports, 4) efficient connections to connecting branches and territories, 5) more simple and quicker procurement and permitting procedures, 6) specific project proposals (including flagship/pilot) aimed at addressing EU transport policy through the TEN-T, 7) more realistic planning and more rigorous management of the projects and 8) better convincing of private investors. I will stand by the Member States and other stakeholders to help them successfully go after these opportunities.

I would now like to go further into some specific points:

- I would like to thank all members of the Atlantic Corridor Forum for their active participation in the development of the Corridor over the last years. We would not have achieved our progresses without their involvement and dedication. I am especially pleased to have witnessed over time closer and closer cooperation between inter-dependent stakeholders, as can be evidenced for example by the setting-up of the Working Groups Spain-Portugal on rail interoperability and France-Spain on the rolling motorways. I would also like to thank in particular the Managing Director of the Atlantic Rail Freight Corridor, Mr Jacques Coutou, for his excellent cooperation and coordination with the work of the Atlantic Corridor, and our consortium of consultants who delivered valuable studies and analysis supporting that work.
- Speaking about the Rail Freight Corridor, I very much welcome its extension, decided by Commission Decision on 11 January 2018, to the terminal of Valongo near Porto, to Zaragoza, to La Rochelle and to Nantes-Saint-Nazaire, in line with important freight traffic which was not yet formally included. When circumstances allow, I would like to see these extensions mirrored on the Atlantic Core Network Corridor.
- Today, we are at a tipping point when almost all projects needed to complete the Atlantic Corridor are finished, ongoing or planned. There are a few exceptions, of course, which are detailed in this Work Plan and which will stay high on our radar screen until they are taken on board. In the next few months the French Government will reconsider its multiannual investment policy for transport infrastructure, following the assessment made by the Duron Report issued at the end of January 2018. As far as the Atlantic Corridor is concerned, we are confident that the need to better connect the southern peripheral regions to the centre of France will receive high attention, as well as the need for a better functioning rail link with Spain, to the benefit of the European single market, as clearly foreseen by the TEN-T Regulation.
- Yet, we have come a long way forward. We have now reached the point where further opportunities emerge to increase the efficiency of the Atlantic Corridor. On top of what I highlighted above, I can add e-freight/e-maritime and C-ITS for example. These opportunities are in line with the developments of the European transport policy towards a smart, connected and sustainable European transport system. The Atlantic Corridor is well placed to be a frontrunner on many of the related dimensions.
- Another important evolution which I would like to further underline is related to the approach to funding our projects. As developed under Chapter 6, we need to distinguish between the projects which can stand on their own feet, generating revenues and able to be financed by equity or private investment; the projects which can become financially attractive to private investors thanks to a (limited) funding (grants) component and the projects which cannot attract private investment but are nevertheless bringing important EU added-value and needed to achieve the TEN-T requirement and/or European transport policy objectives. Those last projects can only be supported by public funding and that is where we should focus our public resources. In the "Action plan on making the best use of innovative financial

instruments for EU transport infrastructure", which I wrote together with former Vice-President Henning Christophersen (†) and my colleague Coordinator Prof. Kurt Bodewig, I made specific recommendations to leverage as much as possible and as well as possible the liquidities and guarantees that can be found in the market, including from the Juncker Plan. Prof. Bodewig and I also issued a Progress Report on this action plan, taking stock of progresses and highlighting additional opportunities.

- Coming back on what is still needed to complete the Atlantic Corridor and fully meet the requirements of the TEN-T Regulation, I would like to call upon the Member States to place particular emphasis to: the completion of the Évora-Merida cross-border rail connection which will allow to finally provide a seamless rail connection between Lisboa and Madrid and further north to the rest of Europe; the development by 2030 of the Bordeaux-Spanish border high speed rail connection which will allow to remove a major bottleneck on the Corridor; the continuous follow-up of the established working group for the coordination of the works between Spain and Portugal for the interoperability of rail and in particular the upgrade from Iberian to UIC gauge; and the coordination also between Spain and Portugal of their respective planning with regards to rail-road terminals, multimodal terminals and single window platforms. These future achievements are all important in their own right, but also to successfully address at Corridor level the strong expected growth of maritime traffic, allowing our ports to remain competitive. The maritime dimension of our Corridor is indeed, let me emphasise this once again, a competitive edge which we must nurture. A significant share of the freight travelling through our Corridor, or connecting its branches through sea, arrives or leaves at one of these ports.
- I would also like to call upon the Member States to pay very close attention to the timely completion of the ongoing projects which have received TEN-T or CEF funding. To say things very clearly, there are cases on the Corridor where delays are putting at risk part of the EU grant. Ambitious, yet realistic planning is important and the implementing bodies must also be given the necessary means – technical, people and budget – to deliver against the planning. Situations where projects cannot be completed because part of the grant has to be given back and the national budget cannot compensate for it is a scenario to be avoided. They are lose-lose situations for all.
- Notwithstanding the fact that the work with and of the Member States is of utmost importance, we should not forget to keep the local communities involved in our Corridor's projects whenever relevant. Indeed, infrastructure projects aimed at long-distance transport and border-crossing sometimes generate negative externalities for these local communities. At the same time, they usually also reduce local congestion (especially road) and complementary measures to make local transport more efficient (for example, upgrading a local rail connection and introducing a common ticketing system at a cross-border section) can further enhance the positive externalities. This can help ensure a win-win situation with better public support.
- Before making my final point, I would like to refer to a joint idea of the European Coordinators to leverage rail breakthroughs over the next five years. By rail breakthroughs, we mean tangible improvements which can be made relatively quickly with low levels of investments. These apply especially to cross-border connections, in making them simple and fast, removing the operational and administrative barriers that still exist, notwithstanding the problems related to rail interoperability in the Iberian Peninsula, which will take more time to address. The Rail Freight Corridor is in a good position to identify these improvement opportunities and propose solutions with the assistance of the Member States. It is also important to involve the European railway Agency who should follow up on the compliant implementation of the solutions.

- Last but not least, I would like to refer to the "Joint Declaration of the European Coordinators on the future of TEN-T and CEF"¹³ which I co-signed with the other ten European Coordinators and to underline our key messages: we call for an even stronger EU support over the next financial period with an increased CEF 2 budget and for a greater use of blending and of financial instruments at the same time. As stated above, we stress that grants should be concentrated on projects of high EU added-value such as cross-border projects, the removal of bottlenecks with EU-wide effect and horizontal priorities such as SESAR, ERTMS and MoS. We also ask that CEF becomes the main instrument for infrastructure financing, removing overlaps with other funds such as the European Structural and Investment Funds. Last, we call for the removal of remaining regulatory barriers, for increased technical assistance to project promoters and for a better visibility of investment opportunities towards potential investors. This is what we hope to see realised from the side of the EU to help us complete our Corridors and make them an even stronger enabler of the EU transport policy.

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Annexes and useful links

available at https://ec.europa.eu/transport/themes/infrastructure/downloads_en
and https://ec.europa.eu/transport/themes/infrastructure/atlantic_en

¹³ https://ec.europa.eu/transport/sites/transport/files/coordinators_joint_declaration.pdf

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